



NPL REPORT AS 67

**Site Suitability Assessment of Proposed Black Carbon Network
Sites**

BP Sweeney
DM Butterfield

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Analytical Science Division

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Approved on behalf of NPLML by Martyn Sene, Operations Director

Executive Summary

The Department for Food, Rural Affairs and the Environment (DEFRA) is looking to restructure the UK Black Carbon Network and has commissioned NPL to perform site suitability surveys against EU Directive 2008/50/EC on ambient air quality and cleaner air for Europe. Each site was assessed against the macroscale and microscale siting requirements of the EU directive.

The following sites were found to meet these requirements:

Tyburn Roadside, Birmingham (Urban Roadside),
Detling, Kent (Rural Background),
Hope Street, Glasgow (Urban Roadside),
Margam, Port Talbot (Urban Industrial),
Cym Park, Swansea (Urban Background),
Weybourne, Norfolk (Rural Background, with coastal influence).

and can therefore be used for short or long-term monitoring for black carbon.

The total cost involved for installing the Aethalometer, inlet pipework and cyclone into all sites is £9140.

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Introduction

The Department for Food, Rural Affairs and the Environment (DEFRA) is looking to restructure the UK Black Carbon Network and has commissioned NPL to perform site suitability surveys against EU Directive 2008/50/EC on ambient air quality and cleaner air for Europe.

The following monitoring sites were assessed:

Tyburn Roadside, Birmingham (Urban Roadside),
Detling, Kent (Rural Background),
Hope Street, Glasgow (Urban Roadside),
Margam, Port Talbot (Urban Industrial),
Cym Park, Swansea (Urban Background),
Weybourne, Norfolk (Rural Background, with coastal influence).

If these sites are found to be suitable then the Aethalometer could be installed for either short-term or long-term monitoring of black carbon.

Proposed Sites

Each site was assessed against the macroscale and microscale siting requirements of EU Directive 2008/50/EC. The location of each site along with pictures of the site and surrounding area are also given.

Tyburn Roadside, Birmingham

Site Address:

Tyburn Rd
Birmingham

Latitude 52° 30' 44.01"

Longitude -1° 49' 50.85"

Easting, Northing 411576, 290495

Elevation 96m

Site Type Urban Roadside

Site Overview



Location of proposed
monitoring site

Pictures from Proposed Monitoring Site

The following pictures show the outlook at various compass points from the location of the proposed monitoring site

Picture of the monitoring site





Looking North



Looking East



Looking South



Looking West

Although black carbon is not specifically covered by EC Air Quality Directives, it is useful to compare the proposed site against criteria established for the establishment of monitoring sites which are used to assess compliance with EC Directives.

Text in italics comes from **DIRECTIVE 2008/50/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 21 May 2008 on ambient air quality and cleaner air for Europe**

Macroscale siting

1. Protection of human health

(a) Sampling points directed at the protection of human health shall be sited in such a way as to provide data on the following:

- the areas within zones and agglomerations where the highest concentrations occur to which the population is likely to be directly or indirectly exposed for a period which is significant in relation to the averaging period of the limit value(s),*
- levels in other areas within the zones and agglomerations which are representative of the exposure of the general population,*

The site, in a partially residential area, is located approximately 7m from the westbound carriageway of the A38, Tyburn Road, which carries 27000 vehicles per day. The 2008 estimate for the population of Birmingham is 1.04M, however, some 2.4M people live in the surrounding conurbation, centred around Birmingham. The proposed site is part of the AURN, where continuous measurements of NO_x, PM₁₀ and PM_{2.5} are made. Of particular interest, in this case, is the Birmingham Tyburn Urban Background site, situated some 60m to the south of the roadside site, at which continuous black carbon measurements are also undertaken (As well as continuous measurements of NO_x, ozone, PM and SO₂)

Where the objective is to assess rural background levels, the sampling point shall not be influenced by agglomerations or industrial sites in its vicinity, i.e. sites closer than five kilometres;

Not applicable.

Sampling points should also, where possible, be representative of similar locations not in their immediate vicinity.

The major source of pollution affecting this site will be the effect of emissions from the A38 acting in addition to the background air quality climate of the West Midlands. As there are no significant point sources in the vicinity of the site, it is likely that concentrations measured at this site will be representative of those seen at other similarly busy roads throughout the West Midlands. Furthermore, the site is some 0.7km from the busy (130 000 vehicles/day) M6 motorway which transects Northern Birmingham, so the Tyburn sites are likely to be affected by this road.

Microscale Siting

The flow around the inlet sampling probe shall be unrestricted (free in an arc of at least 270°) without any obstructions affecting the airflow in the vicinity of the sampler (normally some metres away from buildings, balconies, trees and other obstacles and at least 0,5 m from the nearest building in the case of sampling points representing air quality at the building line),

The flow around the inlet will be unrestricted in 360 degrees of arc.

- *in general, the inlet sampling point shall be between 1,5 m (the breathing zone) and 4 m above the ground. Higher positions (up to 8 m) may be necessary in some circumstances. Higher siting may also be appropriate if the station is representative of a large area,*

The sampling inlet will be within 1.5m and 4m above the ground

- *the inlet probe shall not be positioned in the immediate vicinity of sources in order to avoid the direct intake of emissions unmixed with ambient air.*

The sampling inlet will not be in the immediate vicinity of sources

- *the sampler's exhaust outlet shall be positioned so that recirculation of exhaust air to the sampler inlet is avoided*

The sampler exhaust outlet will be positioned so as to avoid recirculation of exhaust air to the sampler inlet.

- *for all pollutants, traffic-orientated sampling probes shall be at least 25 m from the edge of major junctions and no more than 10 m from the kerbside.,*

The sample inlet is less than 10m from the side of the road, and more than 25m from a major junction.

Site Assessment Conclusion

The proposed site satisfies the criteria set out in DIRECTIVE 2008/50/EC of 21 May 2008 on ambient air quality and cleaner air for Europe as an Urban Roadside site.

Costs for installation of Black Carbon Analyser

The cost for installing the black carbon analyser at Birmingham Tyburn Roadside will be £360 labour charges, and £1025 for the additional pipework, filter tape and cyclone.

Detling, Kent

Site Address:

Scragged Oak Road
Detling
Maidstone
Kent

Latitude 51° 18' 28.04"

Longitude 0° 34' 57.35"

Easting, Northing 580075, 159700

Elevation 183m

Site Type Rural Background

Site Overview



Proposed location of
monitoring site

Pictures from Proposed Monitoring Site

The following pictures show the outlook at various compass points from the location of the proposed monitoring site

Picture of the monitoring site





Looking North



Looking East



Looking South



Looking West

Although black carbon is not specifically covered by EC Air Quality Directives, it is useful to compare the proposed site against criteria established for the establishment of monitoring sites which are used to assess compliance with EC Directives.

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Macroscale siting

1. Protection of human health

(a) Sampling points directed at the protection of human health shall be sited in such a way as to provide data on the following:

- the areas within zones and agglomerations where the highest concentrations occur to which the population is likely to be directly or indirectly exposed for a period which is significant in relation to the averaging period of the limit value(s),*
- levels in other areas within the zones and agglomerations which are representative of the exposure of the general population,*

The site is located on elevated open agricultural land, (elevation 182m) with no significant sources or sinks within 500m. The site is approximately 1km North of the A249 dual carriageway, which carries some 47000 vehicles per day, and some 2.3km North of the M20 (carrying 110000 vehicles per day) With the absence of local sources and sinks, the site is representative of the surrounding area.

Where the objective is to assess rural background levels, the sampling point shall not be influenced by agglomerations or industrial sites in its vicinity, i.e. sites closer than five kilometres;

The site is approximately 6km north east of Maidstone, (population 75000, 2001) and 1.5 km NNE of Detling, population approximately 800 (2001). Thus, the site will be representative of similar locations not in the immediate vicinity.

Sampling points should also, where possible, be representative of similar locations not in their immediate vicinity.

The site will be collocated with a Local Authority monitoring station, which monitors NO_x, ozone, PM₁₀ and PM_{2.5} concentrations using TEOM analysers.

Microscale Siting

The flow around the inlet sampling probe shall be unrestricted (free in an arc of at least 270°) without any obstructions affecting the airflow in the vicinity of the sampler (normally some metres away from buildings, balconies, trees and other obstacles and at least 0,5 m from the nearest building in the case of sampling points representing air quality at the building line),

The flow around the inlet will be unrestricted in 360 degrees of arc.

- *in general, the inlet sampling point shall be between 1,5 m (the breathing zone) and 4 m above the ground. Higher positions (up to 8 m) may be necessary in some circumstances. Higher siting may also be appropriate if the station is representative of a large area,*

The sampling inlet will be within 1.5m and 4m above the ground

- *the inlet probe shall not be positioned in the immediate vicinity of sources in order to avoid the direct intake of emissions unmixed with ambient air.*

The sampling inlet will not be in the immediate vicinity of sources

- *the sampler's exhaust outlet shall be positioned so that recirculation of exhaust air to the sampler inlet is avoided*

The sampler exhaust outlet will be positioned so as to avoid recirculation of exhaust air to the sampler inlet.

- *for all pollutants, traffic-orientated sampling probes shall be at least 25 m from the edge of major junctions and no more than 10 m from the kerbside.,*

Not applicable.

Conclusion

The proposed site satisfies the criteria set out in DIRECTIVE 2008/50/EC of 21 May 2008 on ambient air quality and cleaner air for Europe as a Rural Background site.

Costs for installation of Black Carbon Analyser

The cost for installing the black carbon analyser at Detling will be £480 labour charges, and £1025 for the additional pipework, filter tape and cyclone.

Hope Street, Glasgow

Site Address:

Hope Street
Glasgow

Latitude 55° 51' 32.16"

Longitude -4° 15' 32.95"

Easting, Northing 258716, 665189

Elevation 21m

Site Type Urban Roadside

Site Overview

Location of proposed monitoring site



Pictures from Proposed Monitoring Site

The following pictures show the outlook at various compass points from the location of the proposed monitoring site

Picture of the monitoring site

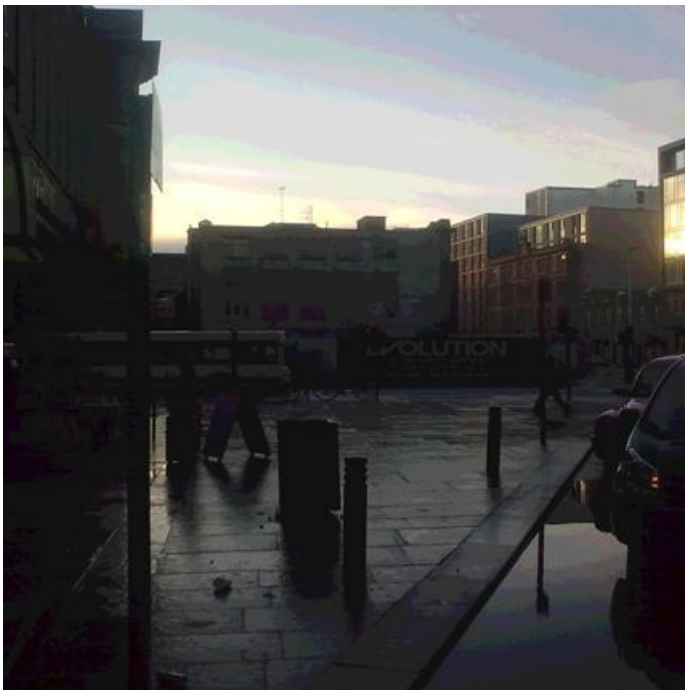




Looking North



Looking East



Looking South



Looking West

Although black carbon is not specifically covered by EC Air Quality Directives, it is useful to compare the proposed site against criteria established for the establishment of monitoring sites which are used to assess compliance with EC Directives.

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Macroscale siting

1. Protection of human health

(a) Sampling points directed at the protection of human health shall be sited in such a way as to provide data on the following:

- the areas within zones and agglomerations where the highest concentrations occur to which the population is likely to be directly or indirectly exposed for a period which is significant in relation to the averaging period of the limit value(s),*
- levels in other areas within the zones and agglomerations which are representative of the exposure of the general population,*

The site is located in a busy city centre area, with mainly commercial usage. The population of Glasgow is 581 000 (2006), with 1.75M living in the Clyde Valley conurbation of which Glasgow is the centre. The proposed site is approximately 40m from the junction of Hope St and Argyle St, and is subject to frequent congestion during peak times. Average daily traffic flow along Argyle St is 23 000 vehicles/day; DfT do not publish data for Hope St. The site inlet manifold is between 1 and 2 metres from the side of Hope St. The proposed site is currently part of the AURN, where continuous measurements of NO_x, PM₁₀ and PM_{2.5} are also made. It is understood that the monitoring site is to be moved to an alternative, but still roadside location. This is likely to happen within the next 6 to 9 months.

Where the objective is to assess rural background levels, the sampling point shall not be influenced by agglomerations or industrial sites in its vicinity, i.e. sites closer than five kilometres;

Not applicable.

Sampling points should also, where possible, be representative of similar locations not in their immediate vicinity.

As the site is located sufficiently far from the nearby junction, it is likely that the concentrations will be representative of similar locations in the immediate vicinity.

Microscale Siting

The flow around the inlet sampling probe shall be unrestricted (free in an arc of at least 270°) without any obstructions affecting the airflow in the vicinity of the sampler (normally some metres away from buildings, balconies, trees and other obstacles and at least 0,5 m from the nearest building in the case of sampling points representing air quality at the building line),

The flow around the inlet will be unrestricted in 360 degrees of arc.

- *in general, the inlet sampling point shall be between 1,5 m (the breathing zone) and 4 m above the ground. Higher positions (up to 8 m) may be necessary in some circumstances. Higher siting may also be appropriate if the station is representative of a large area,*

The sampling inlet will be within 1.5m and 4m above the ground

- *the inlet probe shall not be positioned in the immediate vicinity of sources in order to avoid the direct intake of emissions unmixed with ambient air.*

The sampling inlet will not be in the immediate vicinity of sources

- *the sampler's exhaust outlet shall be positioned so that recirculation of exhaust air to the sampler inlet is avoided*

The sampler exhaust outlet will be positioned so as to avoid recirculation of exhaust air to the sampler inlet.

- *for all pollutants, traffic-orientated sampling probes shall be at least 25 m from the edge of major junctions and no more than 10 m from the kerbside.,*

The site is approximately 40m from the middle of the closest lane at the junction of Hope St and Argyll St. It is less than 2 metres from the kerbside.

Site Assessment Conclusion

The proposed site satisfies the criteria set out in DIRECTIVE 2008/50/EC of 21 May 2008 on ambient air quality and cleaner air for Europe as an Urban Roadside site.

Costs for installation of Black Carbon Analyser

The cost for installing the black carbon analyser at Glasgow Roadside will be £800 labour charges, and £1025 for the additional pipework, filter tape and cyclone.

Margam, Port Talbot

Site Address:

Fire Station
Central Rd
Port Talbot

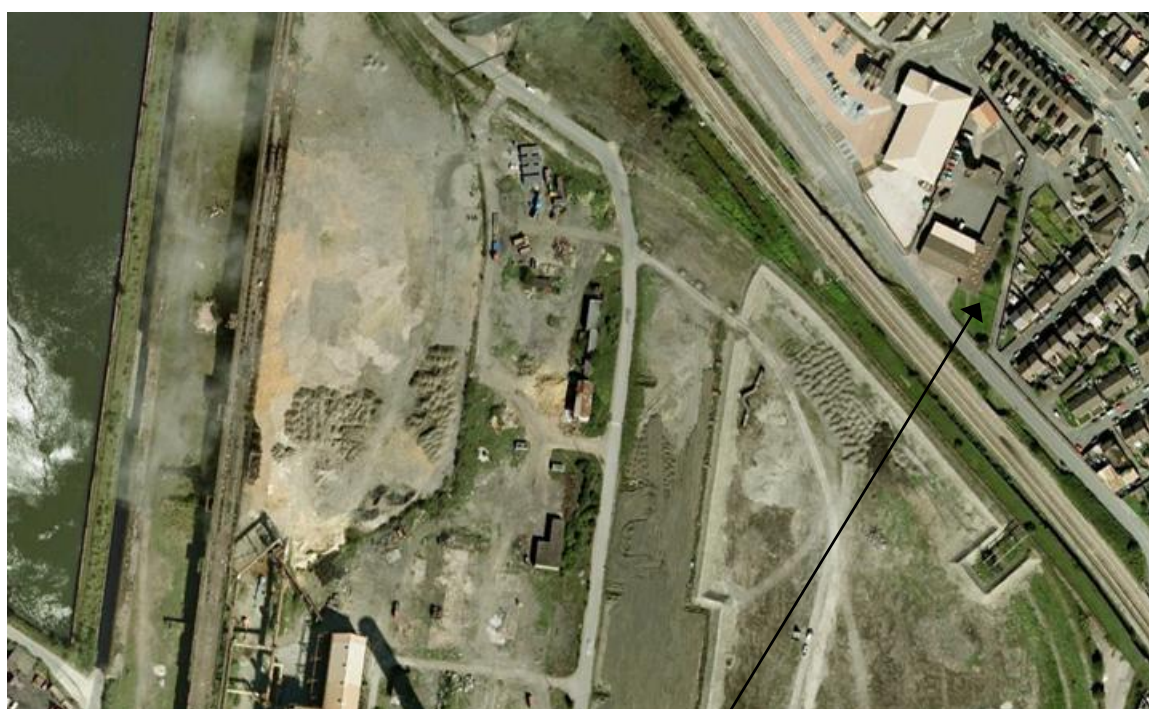
Latitude 51° 35' 02.82"
Longitude -3° 46' 15.16"

Easting, Northing 277410, 188724

Elevation 12m

Site Type Urban Industrial

Site Overview



Location of proposed monitoring site

Pictures from Proposed Monitoring Site

The following pictures show the outlook at various compass points from the location of the proposed monitoring site

Picture of the monitoring site





Looking North



Looking East



Looking South



Looking West

Although black carbon is not specifically covered by EC Air Quality Directives, it is useful to compare the proposed site against criteria established for the establishment of monitoring sites which are used to assess compliance with EC Directives.

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Macroscale siting

1. Protection of human health

(a) Sampling points directed at the protection of human health shall be sited in such a way as to provide data on the following:

- the areas within zones and agglomerations where the highest concentrations occur to which the population is likely to be directly or indirectly exposed for a period which is significant in relation to the averaging period of the limit value(s),*
- levels in other areas within the zones and agglomerations which are representative of the exposure of the general population,*

The site, in a partially residential area, is located approximately 10m from the Central Road, a quiet road leading to the steelworks. Some 450m to the south-west of the proposed site lies the Port Talbot Steelworks. Extending in an arc from N to SE of the site at a closest distance of 110m, lies the A48 Commercial Rd, carrying some 10 000 vehicles per day. The population of Port Talbot is 47 000. Prevailing wind direction is from the South West; the site is well placed, therefore, to measure the effects on ambient concentrations of emissions from the Steel Works. The proposed site is part of the AURN, where continuous measurements of NO_x, PM₁₀ and PM_{2.5} are also made.

Where the objective is to assess rural background levels, the sampling point shall not be influenced by agglomerations or industrial sites in its vicinity, i.e. sites closer than five kilometres;

Not applicable.

Sampling points should also, where possible, be representative of similar locations not in their immediate vicinity.

The major source of pollution affecting this site will be the effect of emissions from the steel works acting in addition to the background air quality climate of the Port Talbot. As there are no significant point sources in the vicinity of the site, other than the steel works, it is likely that concentrations measured at this site will be representative of those seen at other areas down-wind of the steel works throughout the town.

Microscale Siting

The flow around the inlet sampling probe shall be unrestricted (free in an arc of at least 270°) without any obstructions affecting the airflow in the vicinity of the sampler (normally some metres away from buildings, balconies, trees and other obstacles and at least 0,5 m from the nearest building in the case of sampling points representing air quality at the building line),

The flow around the inlet will be unrestricted in 360 degrees of arc.

- *in general, the inlet sampling point shall be between 1,5 m (the breathing zone) and 4 m above the ground. Higher positions (up to 8 m) may be necessary in some circumstances. Higher siting may also be appropriate if the station is representative of a large area,*

The sampling inlet will be within 1.5m and 4m above the ground

- *the inlet probe shall not be positioned in the immediate vicinity of sources in order to avoid the direct intake of emissions unmixed with ambient air.*

The sampling inlet will not be in the immediate vicinity of sources

- *the sampler's exhaust outlet shall be positioned so that recirculation of exhaust air to the sampler inlet is avoided*

The sampler exhaust outlet will be positioned so as to avoid recirculation of exhaust air to the sampler inlet.

- *for all pollutants, traffic-orientated sampling probes shall be at least 25 m from the edge of major junctions and no more than 10 m from the kerbside.,*

Not applicable.

Site Assessment Conclusion

The proposed site satisfies the criteria set out in DIRECTIVE 2008/50/EC of 21 May 2008 on ambient air quality and cleaner air for Europe as an Urban Industrial site.

Costs for installation of Black Carbon Analyser

The cost for installing the black carbon analyser at Port Talbot will be £400 labour charges, and £1025 for the additional pipework, filter tape and cyclone.

Cym Park, Swansea

Site Address:

Cym Level Park
Cym Level Rd
Landore
Swansea

Latitude 51° 38' 44.63"
Longitude -3° 56' 22.37"

Easting, Northing 265914, 195896

Elevation 33m

Site Type Urban Background

Site Overview



Location of
proposed
monitoring site

Pictures from Proposed Monitoring Site

The following pictures show the outlook at various compass points from the location of the proposed monitoring site

Picture of the monitoring site



Pictures taken from the monitoring site.



Looking North



Looking East



Looking South



Looking West

Although black carbon is not specifically covered by EC Air Quality Directives, it is useful to compare the proposed site against criteria established for the establishment of monitoring sites which are used to assess compliance with EC Directives.

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Macroscale siting

1. Protection of human health

(a) Sampling points directed at the protection of human health shall be sited in such a way as to provide data on the following:

- the areas within zones and agglomerations where the highest concentrations occur to which the population is likely to be directly or indirectly exposed for a period which is significant in relation to the averaging period of the limit value(s),*
- levels in other areas within the zones and agglomerations which are representative of the exposure of the general population,*

The site is located in open parkland in the Landore district of Swansea. The 2010 estimate for the population of Swansea is 232,500. The site has a number of busy roads within a few hundred meters: the A4067 carries 33,250 vehicles per day and the A4217 carries 28,250 vehicles per day. The surrounding land use is mainly residential, with some industrial and retail units.

Where the objective is to assess rural background levels, the sampling point shall not be influenced by agglomerations or industrial sites in its vicinity, i.e. sites closer than five kilometres;

Not applicable.

Sampling points should also, where possible, be representative of similar locations not in their immediate vicinity.

Being situated on a park within a larger urban area, the site will be representative of the wider urban area. There are no specific sources within 100m of the site. The site also contains an NO₂ analyser and meteorological measurements operated by the local authority,

Microscale Siting

The flow around the inlet sampling probe shall be unrestricted (free in an arc of at least 270°) without any obstructions affecting the airflow in the vicinity of the sampler (normally some metres away from buildings, balconies, trees and other obstacles and at least 0,5 m from the nearest building in the case of sampling points representing air quality at the building line),

The flow around the inlet will be unrestricted in 360 degrees of arc.

- *in general, the inlet sampling point shall be between 1,5 m (the breathing zone) and 4 m above the ground. Higher positions (up to 8 m) may be necessary in some circumstances. Higher siting may also be appropriate if the station is representative of a large area,*

The sampling inlet will be within 1.5m and 4m above the ground

- *the inlet probe shall not be positioned in the immediate vicinity of sources in order to avoid the direct intake of emissions unmixed with ambient air.*

The sampling inlet will not be in the immediate vicinity of sources

- *the sampler's exhaust outlet shall be positioned so that recirculation of exhaust air to the sampler inlet is avoided*

The sampler exhaust outlet will be positioned so as to avoid recirculation of exhaust air to the sampler inlet.

- *for all pollutants, traffic-orientated sampling probes shall be at least 25 m from the edge of major junctions and no more than 10 m from the kerbside.,*

The site is more than 25m from the edge of major junctions and is more than 10m from the roadside.

Site Assessment Conclusion

The proposed site satisfies the criteria set out in DIRECTIVE 2008/50/EC of 21 May 2008 on ambient air quality and cleaner air for Europe as an Urban Background site.

Costs for installation of Black Carbon Analyser

The cost for installing the black carbon analyser at Swansea will be £300 labour charges, and £1025 for the additional pipework, filter tape and cyclone.

Weybourne, Norfolk

Site Address:

Weybourne Atmospheric Observatory
Weybourne
Norfolk

Latitude 51° 18' 28.04"

Longitude 0° 34' 57.35"

Easting, Northing 609831, 343799

Elevation 20m

Site Type Rural Background

Site Overview

Proposed location of
monitoring site



Pictures from Proposed Monitoring Site

The following pictures show the outlook at various compass points from the location of the proposed monitoring site

Picture of the monitoring site



Pictures taken from the monitoring site.



Looking North



Looking East



Looking South



Looking West

Although black carbon is not specifically covered by EC Air Quality Directives, it is useful to compare the proposed site against criteria established for the establishment of monitoring sites which are used to assess compliance with EC Directives.

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Macroscale siting

1. Protection of human health

(a) Sampling points directed at the protection of human health shall be sited in such a way as to provide data on the following:

- the areas within zones and agglomerations where the highest concentrations occur to which the population is likely to be directly or indirectly exposed for a period which is significant in relation to the averaging period of the limit value(s),*
- levels in other areas within the zones and agglomerations which are representative of the exposure of the general population,*

The site is located on coastal land, some 200m from the North Sea, which lies to the North. Elevation is 15m. There are no significant sources or sinks within 500m. The site is approximately 900m North of the A149 coastal road, which carries some 3500 vehicles per day, and some 4km North of the A148 (carrying 10000 vehicles per day) With the absence of local sources and sinks, the site is representative of the surrounding area.

Where the objective is to assess rural background levels, the sampling point shall not be influenced by agglomerations or industrial sites in its vicinity, i.e. sites closer than five kilometres;

The site is approximately 1.4km north west of Weybourne, (population 520, in 2001) and 5.7 km WNW of Sheringham, population approximately 7000, in 2001.

Sampling points should also, where possible, be representative of similar locations not in their immediate vicinity.

The proposed site is collocated with a National Network ozone monitoring station, which also measures a large range of atmospheric pollutants and precursors. As noted, the site is some 200m from the shore and this may affect its representativeness as regards the wider rural surrounding area. (It is worth noting, though, that the EC Directive does not specifically exclude sites near the coast.) However, even with concerns regarding the site's overall representativeness, given that a host of other measurements are undertaken here, this site may give valuable scientific/research input, rather than providing data solely for human or vegetation exposure assessment.

Microscale Siting

The flow around the inlet sampling probe shall be unrestricted (free in an arc of at least 270°) without any obstructions affecting the airflow in the vicinity of the sampler (normally some metres away from buildings, balconies, trees and other obstacles and at least 0,5 m from the nearest building in the case of sampling points representing air quality at the building line),

The flow around the inlet will be unrestricted in 360 degrees of arc.

- *in general, the inlet sampling point shall be between 1,5 m (the breathing zone) and 4 m above the ground. Higher positions (up to 8 m) may be necessary in some circumstances. Higher siting may also be appropriate if the station is representative of a large area,*

The sampling inlet will be within 1.5m and 4m above the ground

- *the inlet probe shall not be positioned in the immediate vicinity of sources in order to avoid the direct intake of emissions unmixed with ambient air.*

The sampling inlet will not be in the immediate vicinity of sources The sampler inlet will be placed greater than 1.5 m from extant samplers to avoid contamination of the sample.

- *the sampler's exhaust outlet shall be positioned so that recirculation of exhaust air to the sampler inlet is avoided*

The sampler exhaust outlet will be positioned so as to avoid recirculation of exhaust air to the sampler inlet.

- *for all pollutants, traffic-orientated sampling probes shall be at least 25 m from the edge of major junctions and no more than 10 m from the kerbside.,*

Not applicable

Site Assessment Conclusion

Due to its proximity to the coast, the proposed site does not strictly satisfy the criteria set out in DIRECTIVE 2008/50/EC of 21 May 2008 on ambient air quality and cleaner air for Europe as a Rural Background site because of the coastal influence. However, given that the Black Carbon network is primarily a research network, the co-location of black carbon data with data from other parameters is likely to be of interest.

Costs for installation of Black Carbon Analyser

The cost for installing the black carbon analyser at Weybourne will be £650 labour charges, and £1025 for the additional pipework, filter tape and cyclone.

Cost Summary

The costs involved for installing the Aethalometer, inlet pipework and cyclone into each site is summarised in the Table below:

Site	Cost
Tyburn Roadside, Birmingham	£1385
Detling, Kent	£1505
Hope Street, Glasgow	£1825
Margam, Port Talbot	£1425
Cym Park, Swansea	£1325
Weybourne, Norfolk	£1675
Total	£9140

Conclusions

The following sites meet the siting requirements of EU Directive 2008/50/EC on ambient air quality and cleaner air for Europe:

Tyburn Roadside, Birmingham (Urban Roadside),
 Detling, Kent (Rural Background),
 Hope Street, Glasgow (Urban Roadside),
 Margam, Port Talbot (Urban Industrial),
 Cym Park, Swansea (Urban Background),
 Weybourne, Norfolk (Rural Background, with coastal influence),

and can therefore be used for short or long-term monitoring for black carbon.