



## Module 6: Air Quality Local Assessment

Detailed Emissions Inventory & Dispersion Modelling  
Figures Appendix

Prepared for the  
Airports Commission

May 2015

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## Contents

### **Gatwick – 2R**

Figure 4.1 – Principal Study Area and AQMA Boundaries– Gatwick 2R

Figure 4.2 – Wider Study Area – Gatwick 2R

Figure 4.3 – Traffic Simulation Area – Gatwick 2R

Figure 4.4 – PCM Annual Mean Roadside NO<sub>2</sub> Concentrations (ug/m<sup>3</sup>) - 2009

Figure 4.5 – International and National Statutory Nature Conservation Designations

Figure 4.6 – Do-Minimum Predicted Annual Mean NO<sub>2</sub> Concentrations (ug/m<sup>3</sup>) – 2030

Figure 4.7 – Gatwick 2R Predicted Annual Mean NO<sub>2</sub> Concentrations (ug/m<sup>3</sup>) – 2030

Figure 4.8 – Incremental Change to Annual Mean NO<sub>2</sub> Concentrations (ug/m<sup>3</sup>) – 2030

Figure 4.9 – Source Apportionment Receptors Gatwick 2R

Figure 4.10 – Do-Minimum Predicted Annual Mean PM<sub>10</sub> Concentrations (ug/m<sup>3</sup>) – 2030

Figure 4.11 – Gatwick 2R Predicted Annual Mean PM<sub>10</sub> Concentrations (ug/m<sup>3</sup>) – 2030

Figure 4.12 – Incremental Change to Annual Mean PM<sub>10</sub> Concentrations (ug/m<sup>3</sup>) – 2030

Figure 4.13 – PCM Annual Mean Roadside NO<sub>2</sub> Concentrations (ug/m<sup>3</sup>) – 2030  
All at risk PCM links (>32ug/m<sup>3</sup>) within 2km of the airport boundary and at risk PCM links (>32ug/m<sup>3</sup>) within 200m of “Affected Roads”.

### **Heathrow - NWR**

Figure 5.1 – Principal Study Area and AQMA Boundaries – Heathrow NWR

Figure 5.2 – Wider Study Area – Heathrow NWR

Figure 5.3 – Traffic Simulation Area – Heathrow NWR

Figure 5.4 – PCM Annual Mean Roadside NO<sub>2</sub> Concentrations (ug/m<sup>3</sup>) - 2009

Figure 5.5 – International and National Statutory Nature Conservation Designations

Figure 5.6 – Do-Minimum Predicted Annual Mean NO<sub>2</sub> Concentrations (ug/m<sup>3</sup>) – 2030

Figure 5.7 – Heathrow NWR Predicted Annual Mean NO<sub>2</sub> Concentrations (ug/m<sup>3</sup>) – 2030

Figure 5.8 – Incremental Change to Annual Mean NO<sub>2</sub> Concentrations (ug/m<sup>3</sup>) – 2030

Figure 5.9 – Source Apportionment Receptors Heathrow NWR

Figure 5.10 – Do-Minimum Predicted Annual Mean PM<sub>10</sub> Concentrations (ug/m<sup>3</sup>) – 2030

Figure 5.11 – Heathrow NWR Predicted Annual Mean PM<sub>10</sub> Concentrations (ug/m<sup>3</sup>) – 2030

Figure 5.12 – Incremental Change to Annual Mean PM<sub>10</sub> Concentrations (ug/m<sup>3</sup>) – 2030

Figure 5.13 – PCM Annual Mean Roadside NO<sub>2</sub> Concentrations (ug/m<sup>3</sup>) – 2030  
All at risk PCM links (>32ug/m<sup>3</sup>) within 2km of the airport boundary and at risk PCM links (>32ug/m<sup>3</sup>) within 200m of “Affected Roads”.

### **Heathrow - ENR**

Figure 6.1 – Principal Study Area and AQMA Boundaries – Heathrow ENR

Figure 6.2 – Wider Study Area – Heathrow ENR

Figure 6.3 – Traffic Simulation Area – Heathrow ENR

Figure 6.4 – PCM Annual Mean Roadside NO<sub>2</sub> Concentrations (ug/m<sup>3</sup>) - 2009

Figure 6.5 – International and National Statutory Nature Conservation Designations

Figure 6.6 – Do-Minimum Predicted Annual Mean NO<sub>2</sub> Concentrations (ug/m<sup>3</sup>) – 2030

Figure 6.7 – Heathrow ENR Predicted Annual Mean NO<sub>2</sub> Concentrations (ug/m<sup>3</sup>) – 2030

Figure 6.8 – Incremental Change to Annual Mean NO<sub>2</sub> Concentrations (ug/m<sup>3</sup>) – 2030

Figure 6.9 – Source Apportionment Receptors Heathrow ENR

Figure 6.10 – Do-Minimum Predicted Annual Mean PM<sub>10</sub> Concentrations (ug/m<sup>3</sup>) – 2030

Figure 6.11 – Heathrow ENR Predicted Annual Mean PM<sub>10</sub> Concentrations (ug/m<sup>3</sup>) – 2030

Figure 6.12 – Incremental Change to Annual Mean PM<sub>10</sub> Concentrations (ug/m<sup>3</sup>) – 2030

Figure 6.13 – PCM Annual Mean Roadside NO<sub>2</sub> Concentrations (ug/m<sup>3</sup>) – 2030  
All at risk PCM links (>32ug/m<sup>3</sup>) within 2km of the airport boundary and at risk PCM links (>32ug/m<sup>3</sup>) within 200m of “Affected Roads”.

**Appendix B**

Figure B1 – MCAT Assignments Heathrow Baseline 2009. MCAT group shown along top axis. Aircraft ID shown along bottom axis. Lead aircraft shown as shaded bar.

Figure B2 – MCAT Assignments Gatwick Baseline 2009 MCAT group shown along top axis. Aircraft ID shown along bottom axis. Lead aircraft shown as shaded bar.

Figure B3 – MCAT Assignments Heathrow Do-Minimum, NWR and ENR MCAT group shown along top axis. Aircraft ID shown along bottom axis. Lead aircraft shown as shaded bar.

Figure B4 – MCAT Assignments Gatwick Do-Minimum and 2R MCAT group shown along top axis. Aircraft ID shown along bottom axis. Lead aircraft shown as shaded bar.

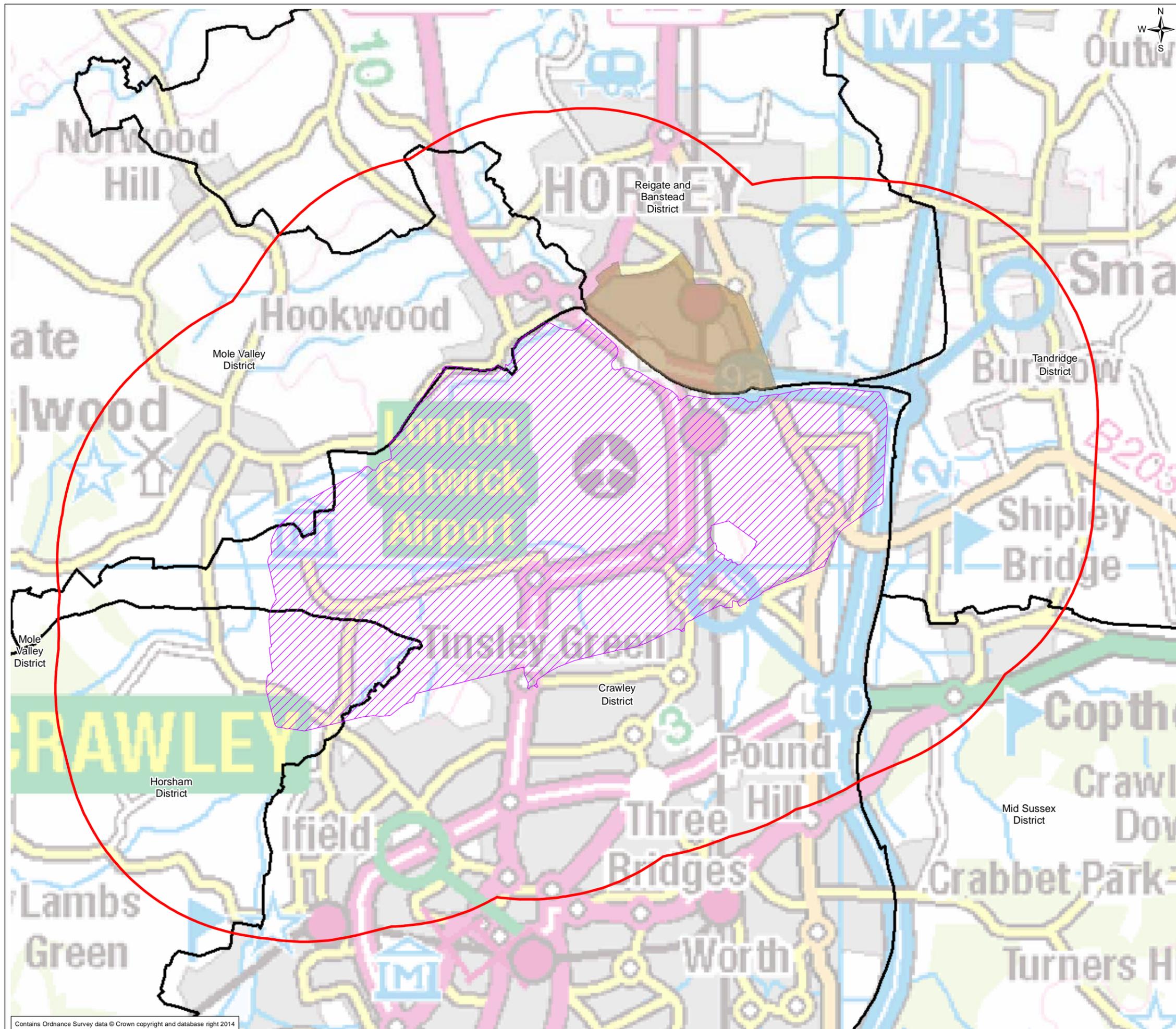
**Appendix E**

Figure E1 – Location of Monitoring Sites in Gatwick Study Area used for 2009 Model Verification

Figure E2 – Location of Monitoring Sites in Heathrow Study Area used for 2009 Model Verification

**FIGURE 4.1**

- Legend
-  Gatwick 2R boundary
  -  Principal study area
  -  Administrative boundaries
  -  Air Quality Management Areas



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 Principal Study Area and AQMA Boundaries - Gatwick 2R

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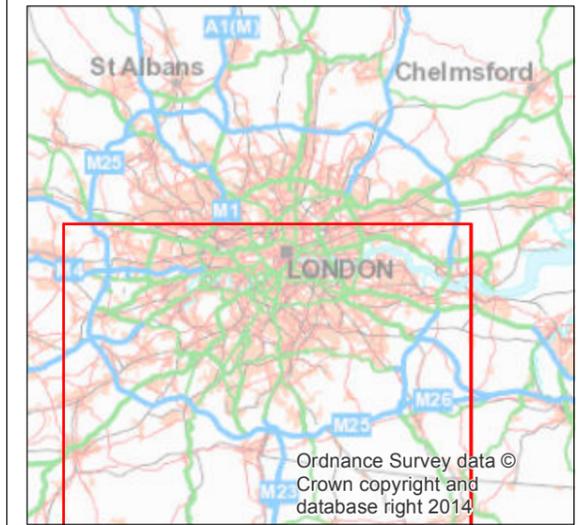
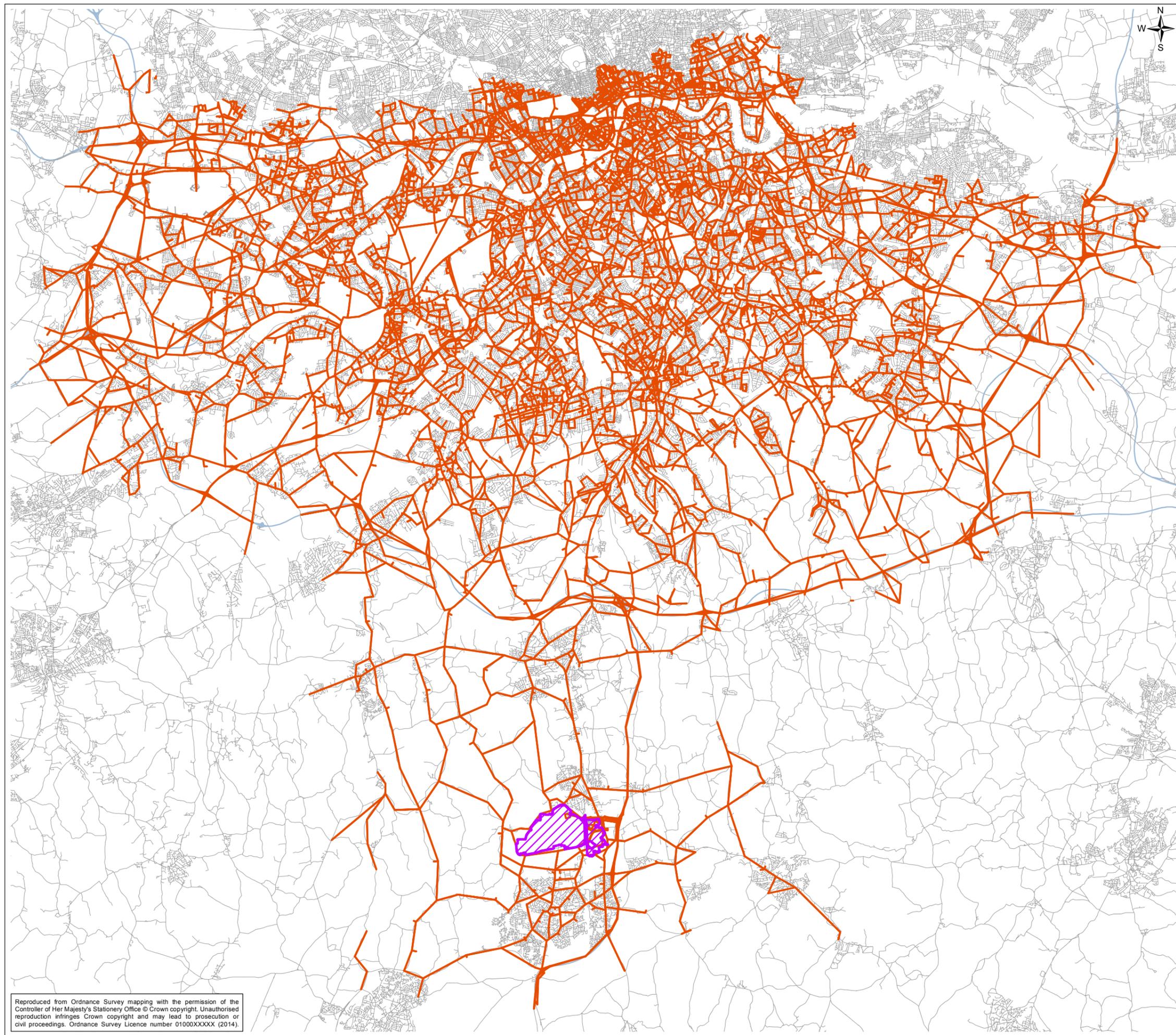
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**FIGURE 4.3**

**Legend**

-  2R Traffic Simulation Area
-  Gatwick Existing Boundary



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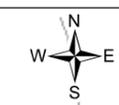
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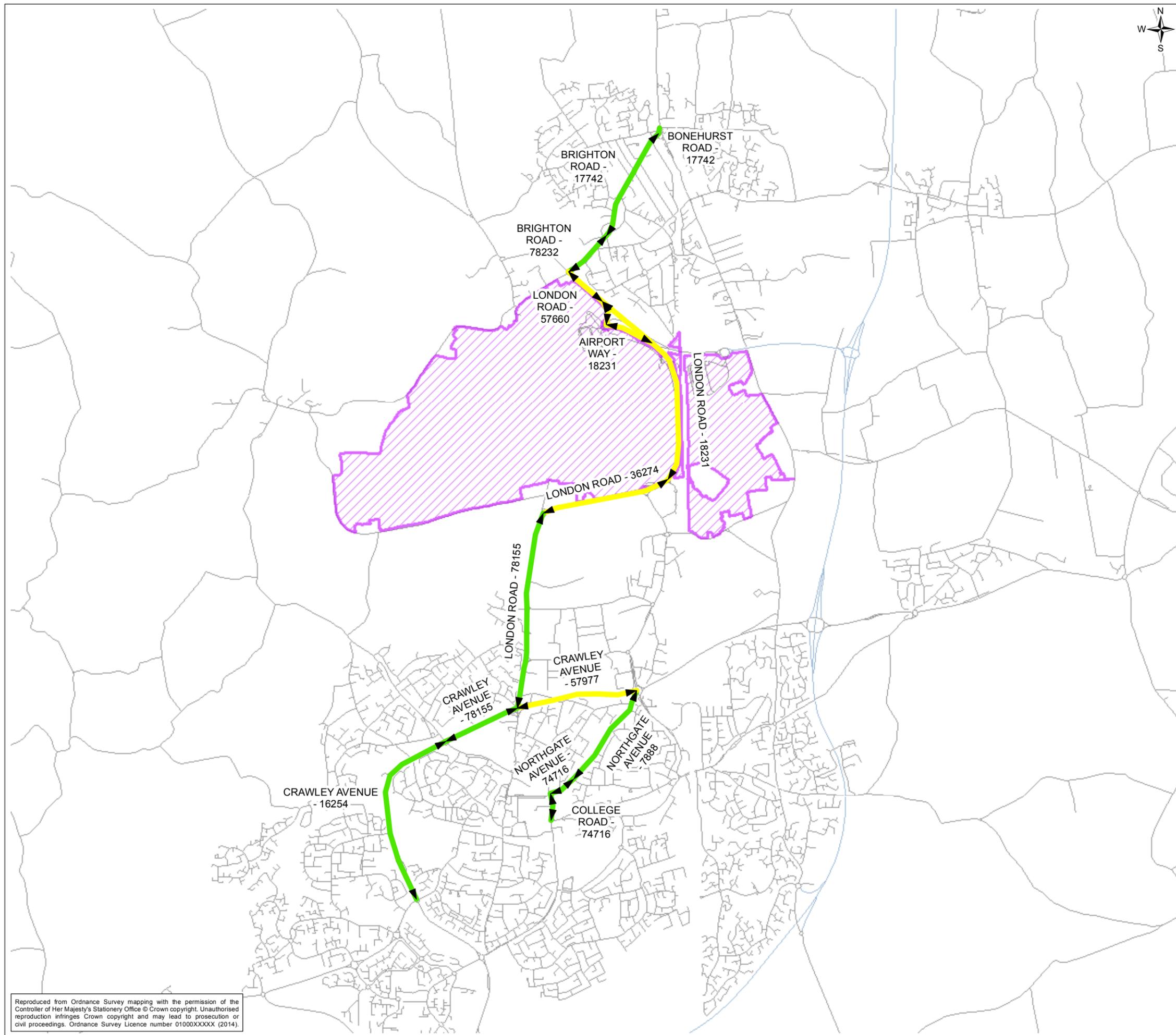
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**FIGURE 4.4**



- Legend
- 32 - 40 At Risk of Exceeding the Limit Value
  - >40 Exceeding the Limit Value
  - Gatwick Existing Boundary

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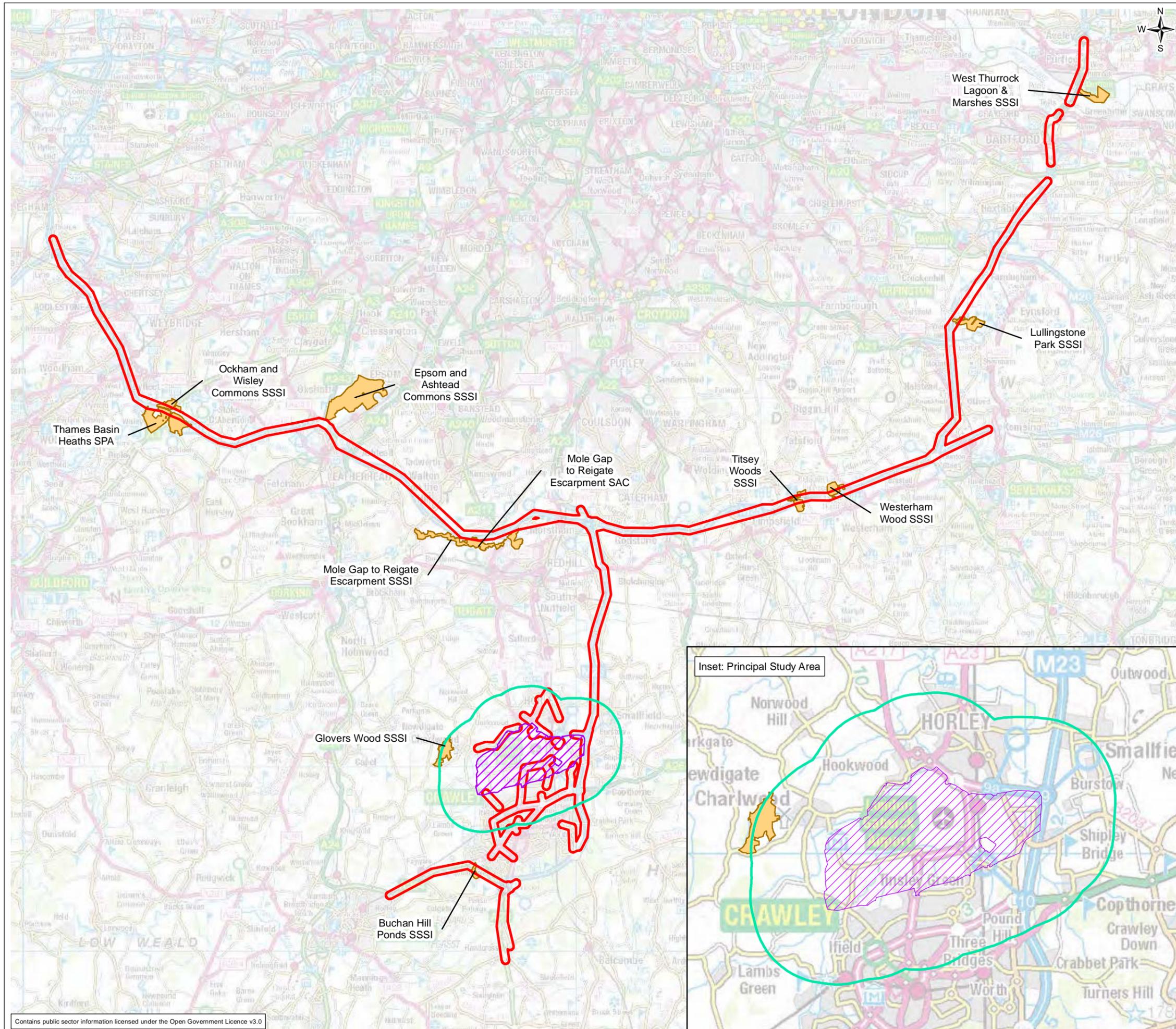
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**FIGURE 4.5**

Legend

-  Gatwick 2R boundary
-  Wider Study Area
-  Principal Study Area
-  Statutory Designated Nature Conservation sites of International/European and National importance\*

\*Explanatory note:  
 These sites include Ramsar sites, Special Areas of Conservation (SAC), Special Protection Areas (SPA), Sites of Special Scientific Interest (SSSI) and National Nature Reserves (NNR) where they are located within or adjacent to the Principal and Wider study areas (with the exception of sites identified as not sensitive to N deposition and NOx concentrations).



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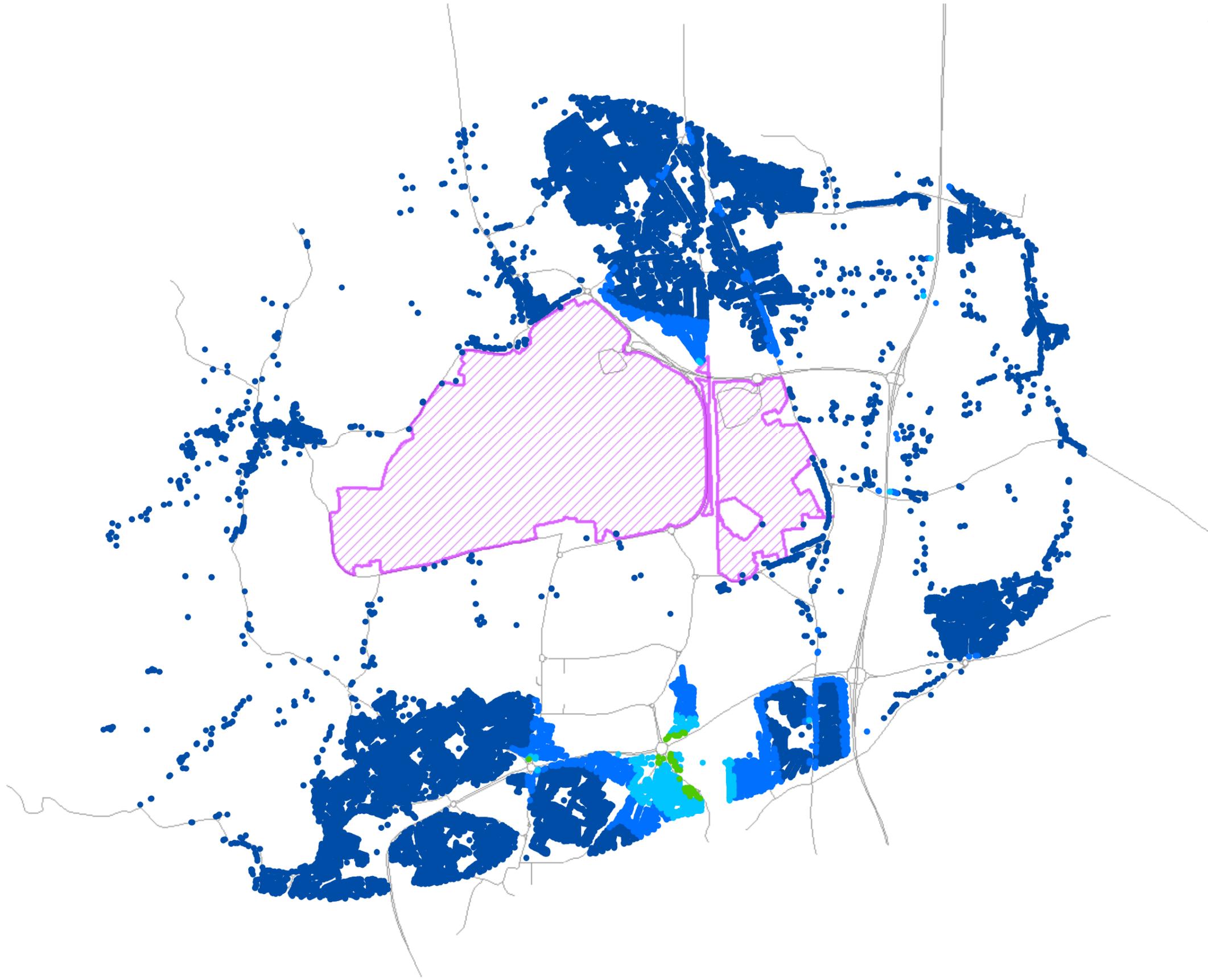


**FIGURE 4.6**

Legend

**Predicted Annual Mean NO<sub>2</sub> Concentrations (µg/m<sup>3</sup>) - 2030**

- < 20
  - 20 - 25
  - 25 - 30
  - 30 - 35
  - 35 - 40
  - 40 - 45
  - 45 - 50
- ▨ Gatwick Existing Boundary



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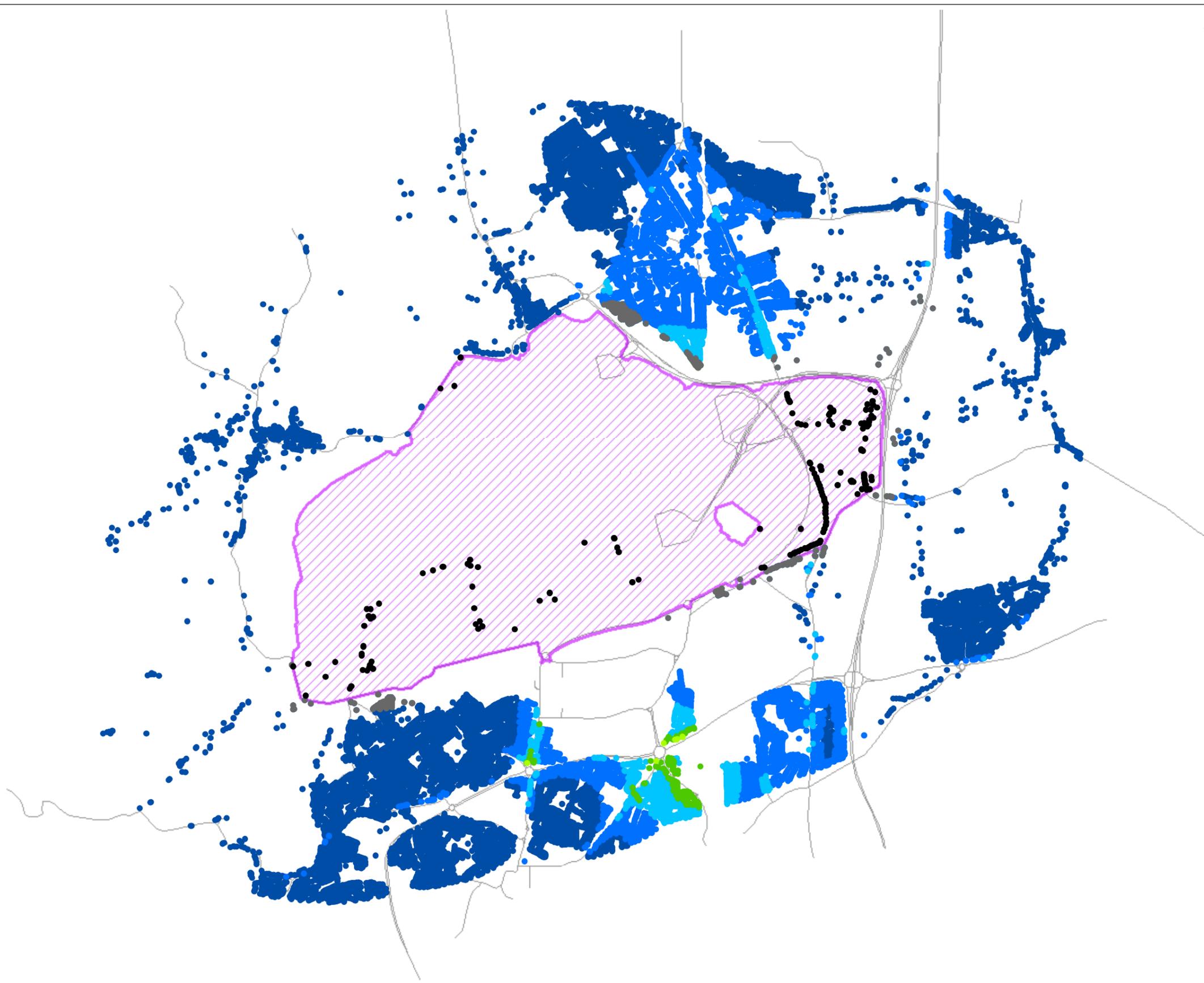


**FIGURE 4.7**

Legend

**Predicted Annual Mean NO<sub>2</sub> Concentrations (µg/m<sup>3</sup>) - 2030**

- < 20
- 20 - 25
- 25 - 30
- 30 - 35
- 35 - 40
- 40 - 45
- 45 - 50
- Receptors within 200m of modelled indicative new road alignment
- Receptors Directly Impacted by Scheme
- ▨ Gatwick 2R Scheme Boundary



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 Gatwick 2R Predicted Annual Mean NO<sub>2</sub> Concentrations (µg/m<sup>3</sup>) - 2030

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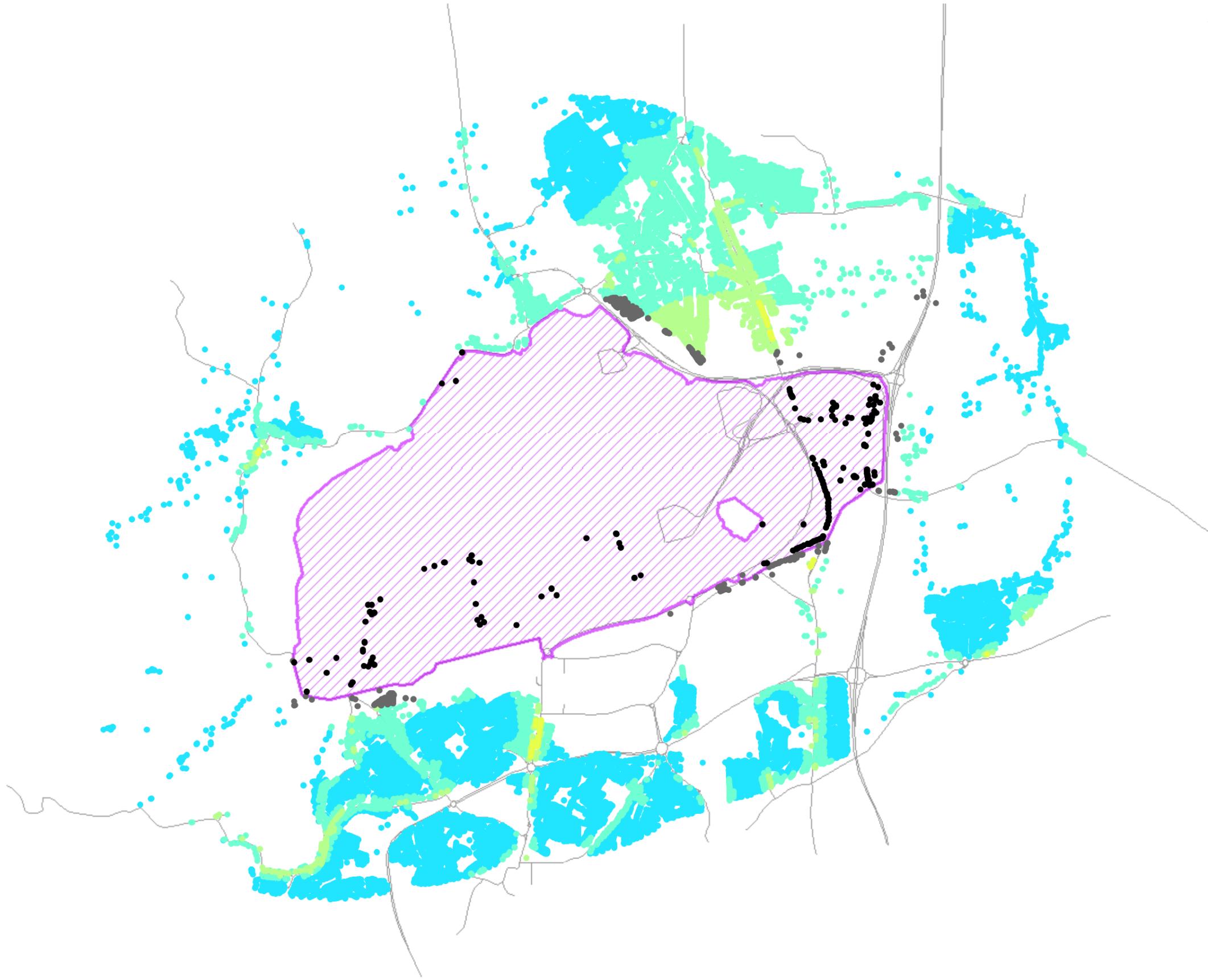


**FIGURE 4.8**

**Legend**

**Incremental Change to Annual Mean NO<sub>2</sub> Concentrations (ug/m<sup>3</sup>) - 2030**

- -6 - -4
- -4 - -2
- -2 - 0
- 0 - 2
- 2 - 4
- 4 - 6
- 6 - 8
- 8 - 10
- 10 - 12
- 12 - 14
- 14 - 16
- Receptors within 200m of modelled indicative new road alignment
- Receptors Directly Impacted by Scheme
- ▨ Gatwick 2R Scheme Boundary



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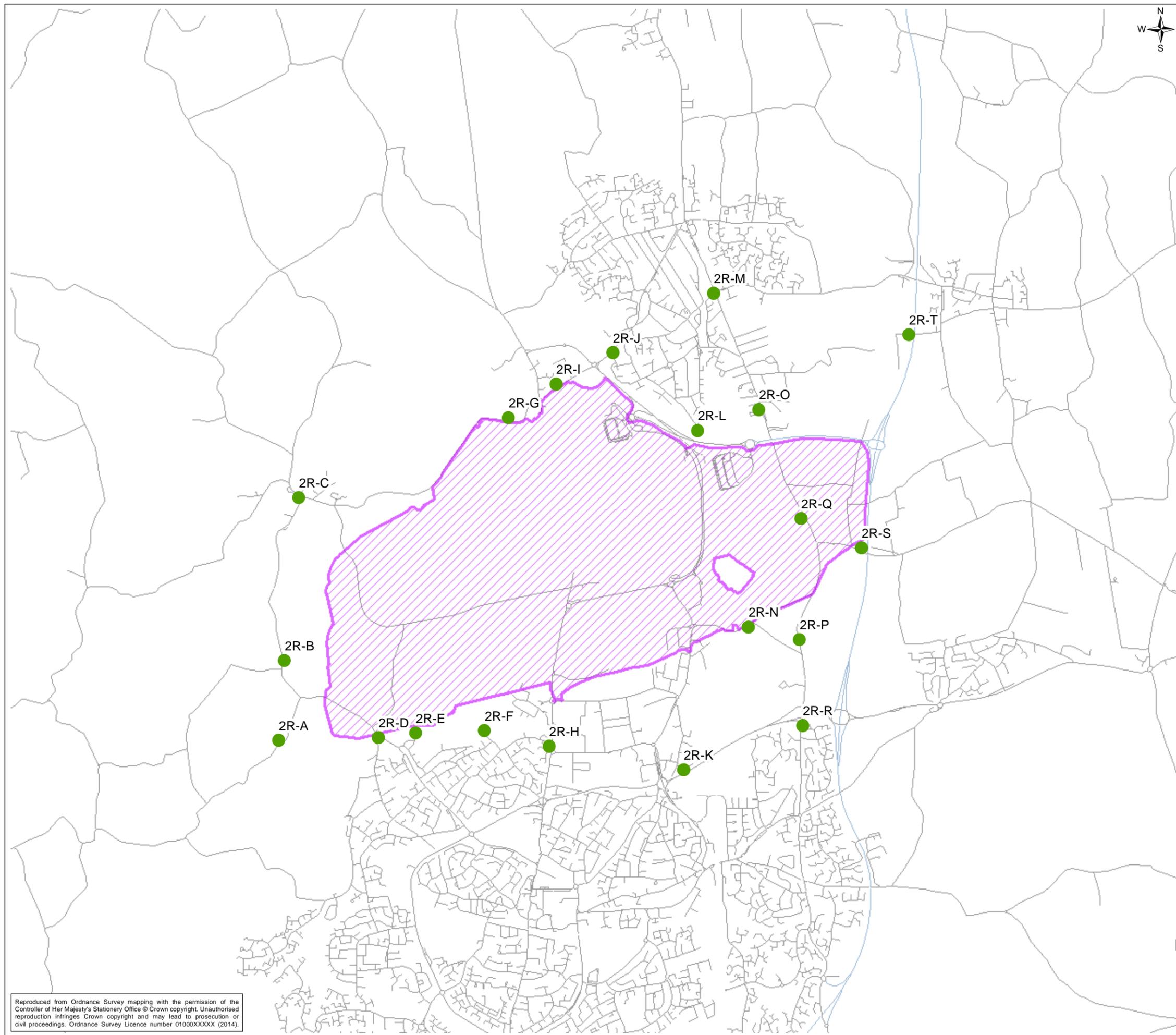
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**FIGURE 4.9**

- Legend**
- Source Apportionment Receptors
  - Gatwick 2R Scheme Boundary



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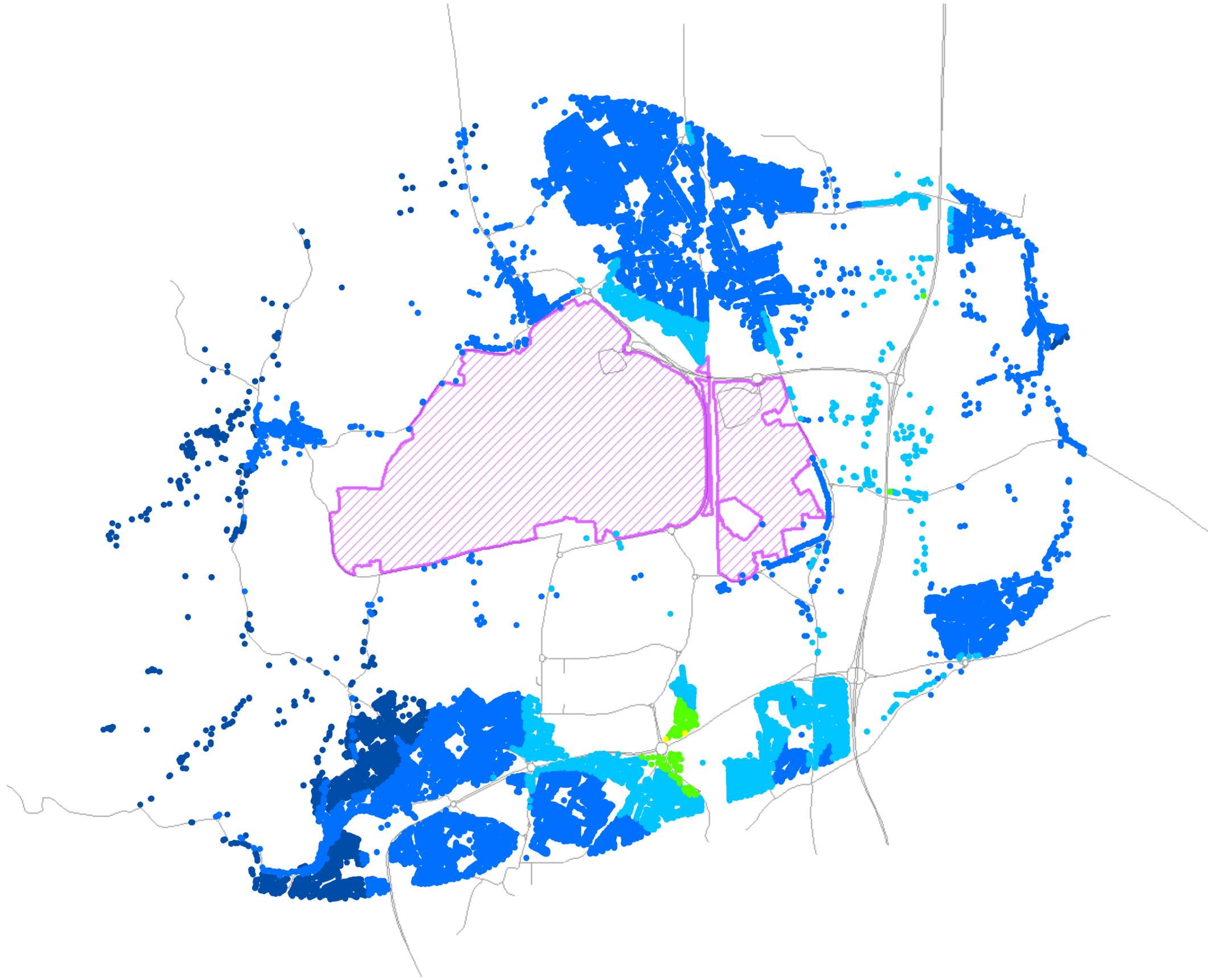
**FIGURE 4.10**

Legend

**Predicted Annual Mean PM<sub>10</sub> Concentrations (µg/m<sup>3</sup>) - 2030**

- < 16
- 16 - 18
- 18 - 20
- 20 - 22
- 22 - 24
- 24 - 26

Gatwick Existing Boundary



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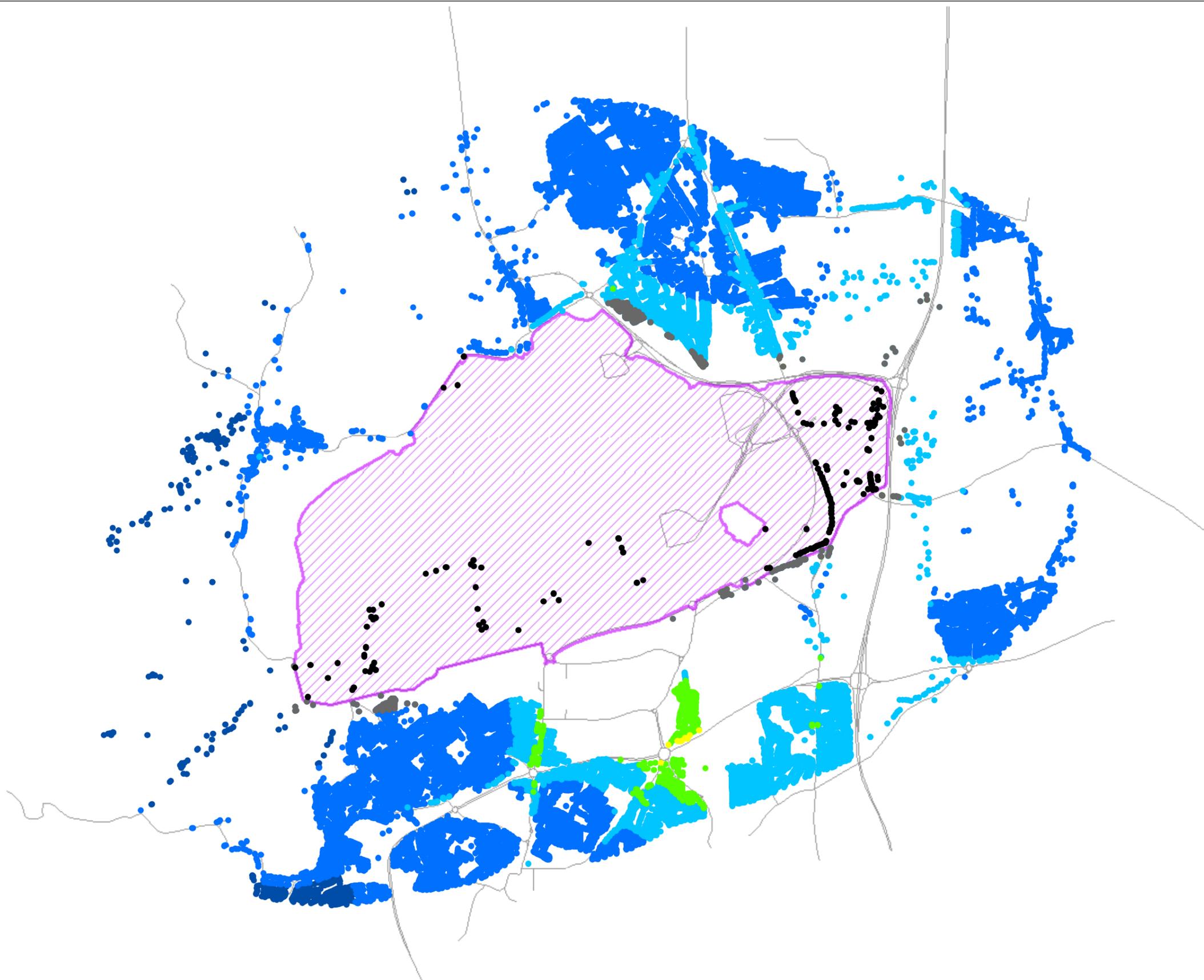


**FIGURE 4.11**

Legend

**Predicted Annual Mean PM<sub>10</sub> Concentrations (µg/m<sup>3</sup>) - 2030**

- < 16
- 16 - 18
- 18 - 20
- 20 - 22
- 22 - 24
- 24 - 26
- Receptors within 200m of modelled indicative new road alignment
- Receptors Directly Impacted by Scheme
- ▨ Gatwick 2R Scheme Boundary



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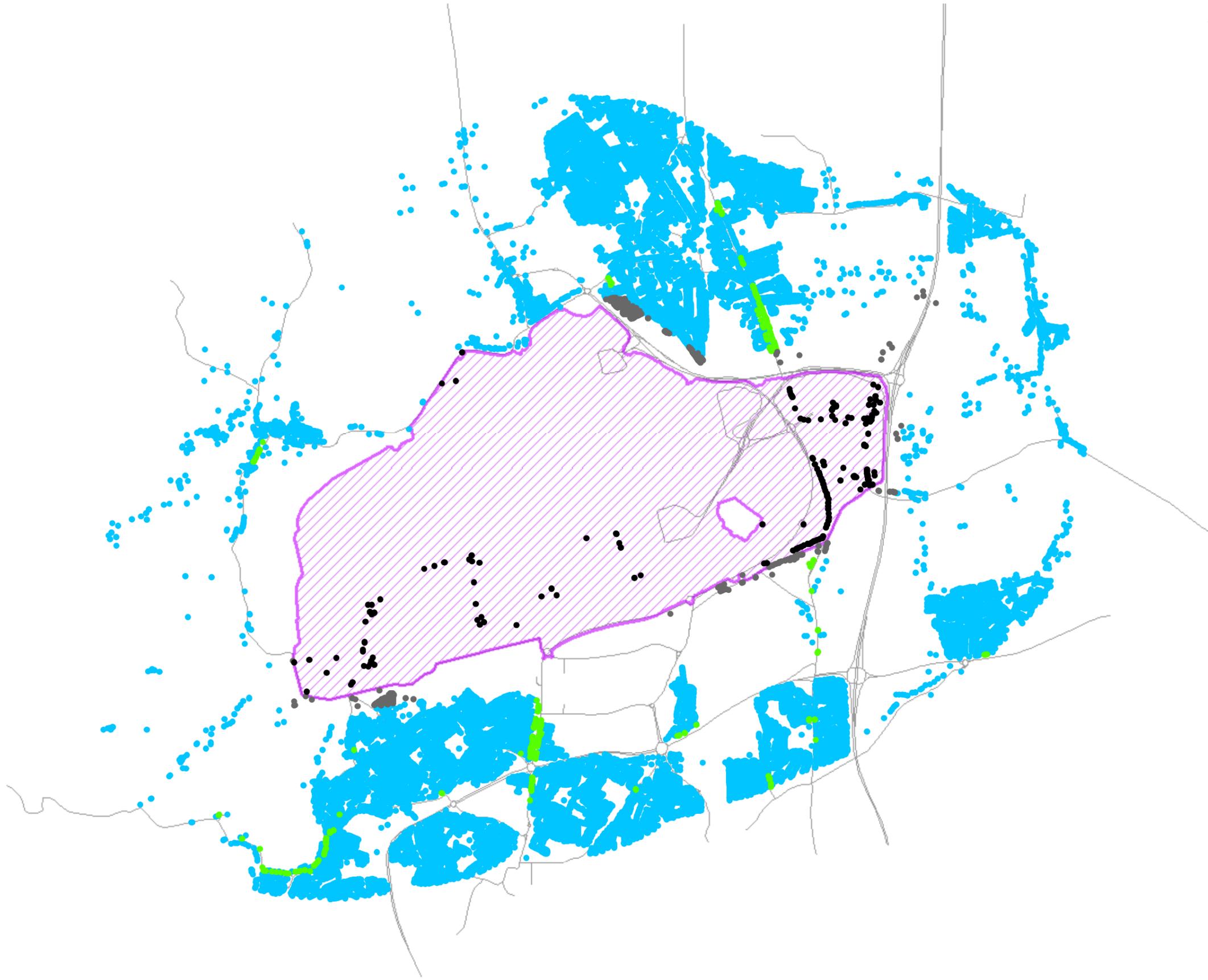


**FIGURE 4.12**

Legend

**Incremental Change to Annual Mean PM<sub>10</sub> Concentrations (ug/m<sup>3</sup>) - 2030**

- -1 - 0
- 0 - 1
- 1 - 2
- 2 - 3
- 3 - 4
- 4 - 5
- Receptors within 200m of modelled indicative new road alignment
- Receptors Directly Impacted by Scheme
- ▨ Gatwick 2R Scheme Boundary



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**FIGURE 4.13**

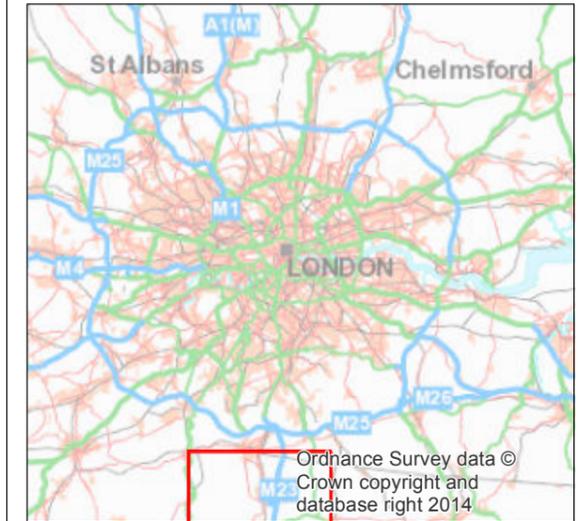


**Legend**

**Annual Mean Roadside NO<sub>2</sub> Concentrations (µg/m<sup>3</sup>) - 2030**

- █ 32 - 40 At Risk of Exceeding the Limit Value
- █ >40 Exceeding the Limit Value
- Gatwick Existing Boundary

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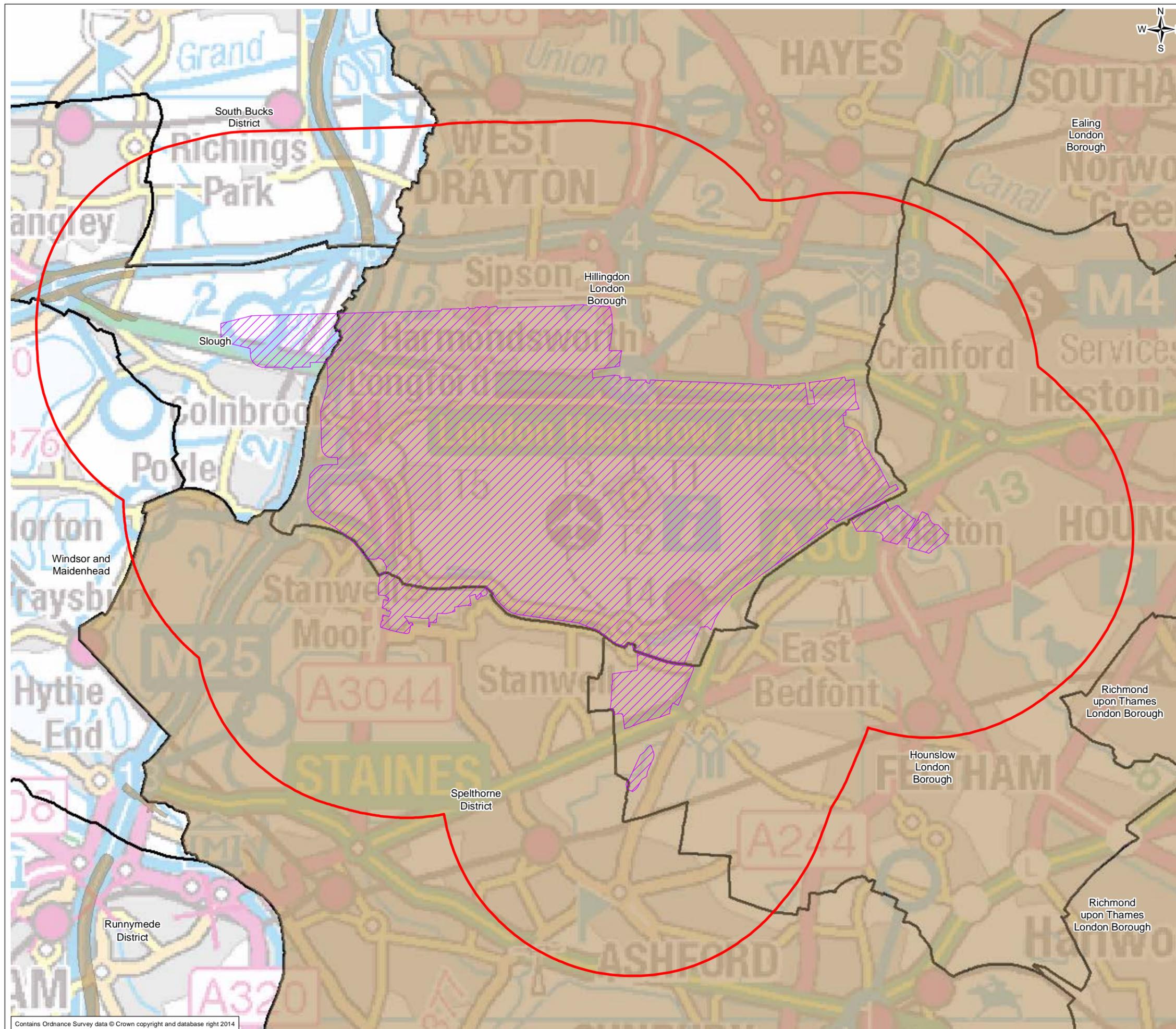
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**FIGURE 5.1**

- Legend
-  Heathrow NWR boundary
  -  Principal study area
  -  Administrative boundaries
  -  Air Quality Management Areas



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 Principal Study Area and AQMA Boundaries - Heathrow NWR

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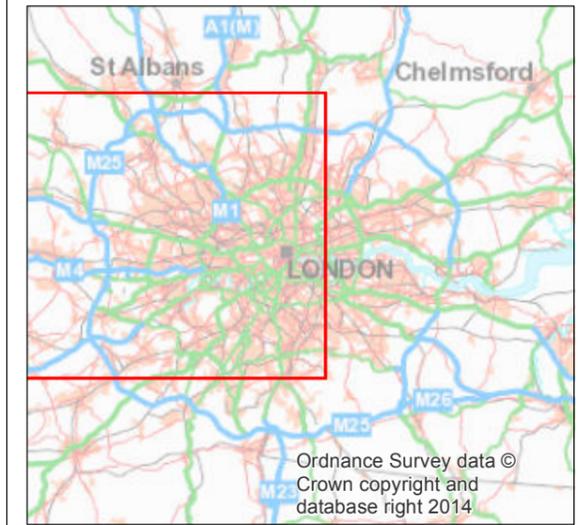
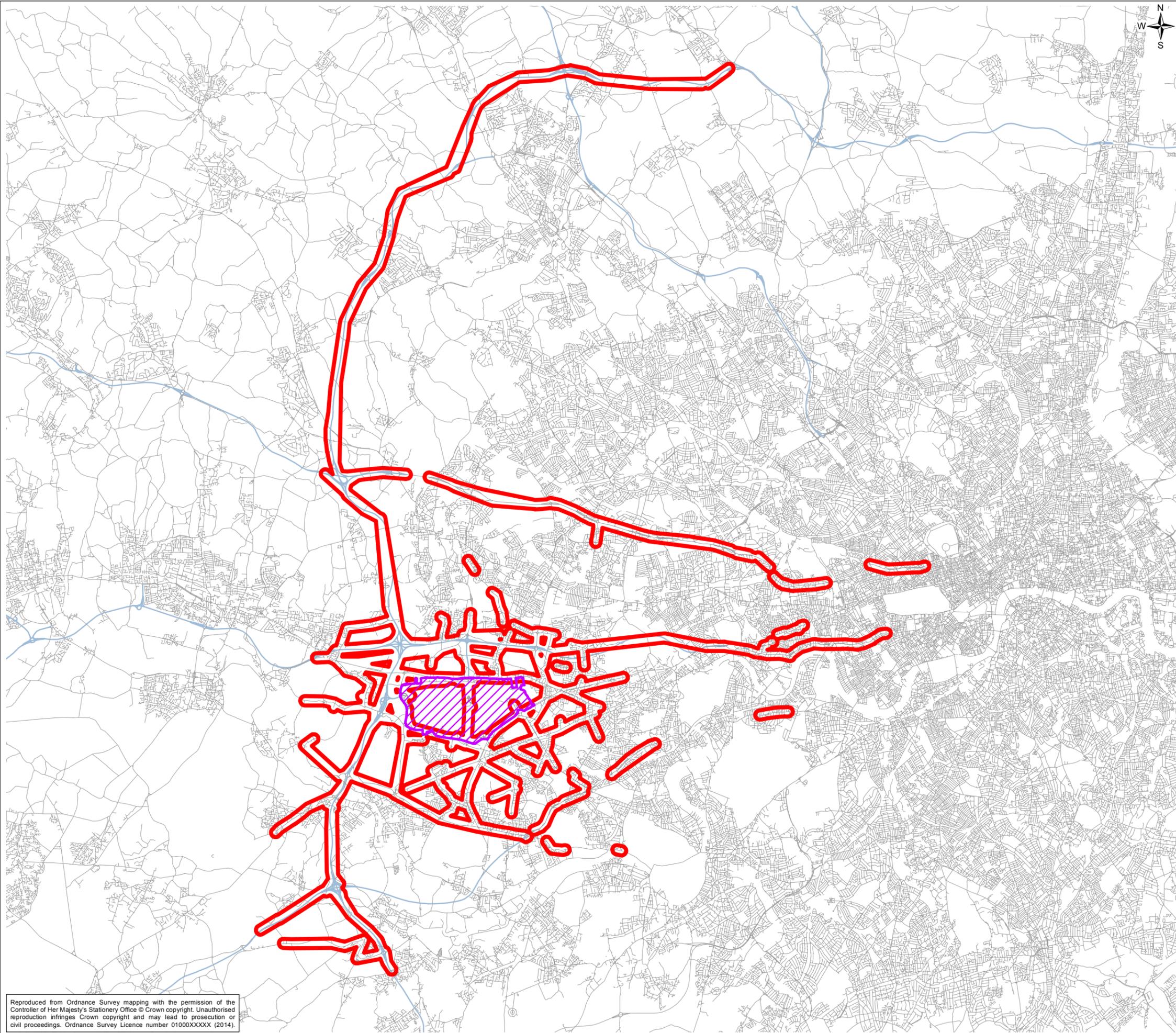
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**FIGURE 5.2**

**Legend**

-  NWR Wider Study Area (Road Links Affected by the Scheme)
-  Heathrow Existing Boundary



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**Wider Study Area – Heathrow NWR**

Scale @ A3	1:160,000	DO NOT SCALE
Jacobs No.	B4160007	
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Drawing No.  
**FIGURE 5.2**

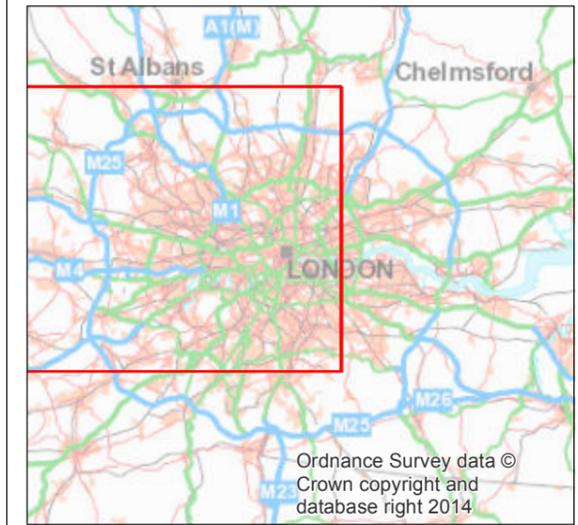
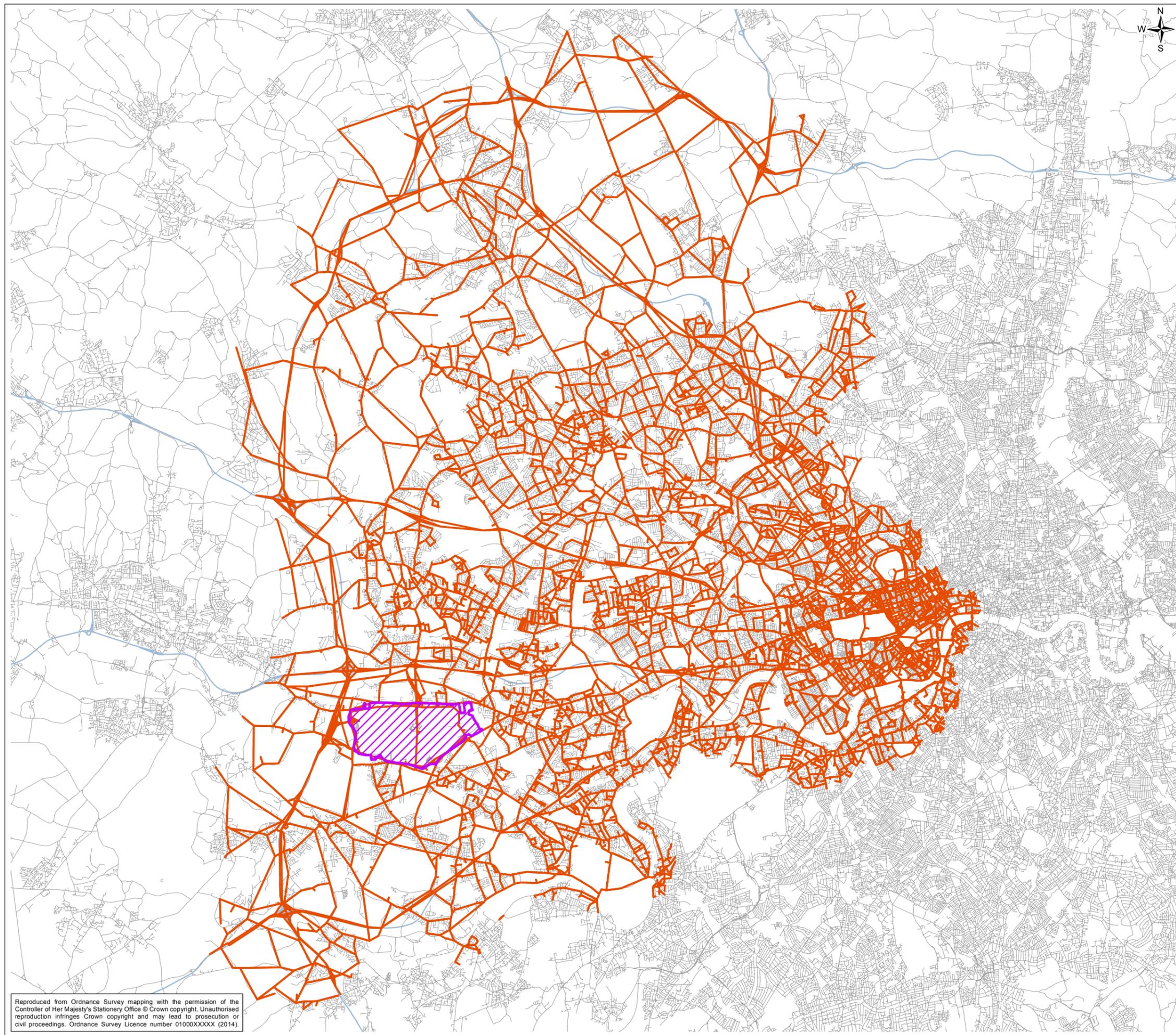
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**FIGURE 5.3**

**Legend**

-  NWR Traffic Simulation Area
-  Heathrow Existing Boundary



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Drawing Title  
 Traffic Simulation Area – Heathrow NWR

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 FIGURE 5.3

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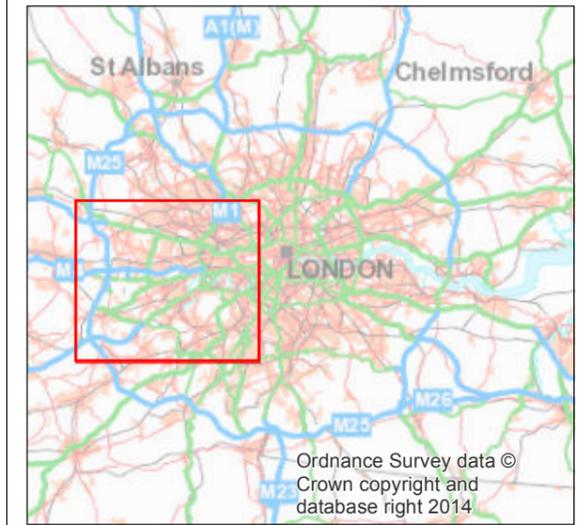
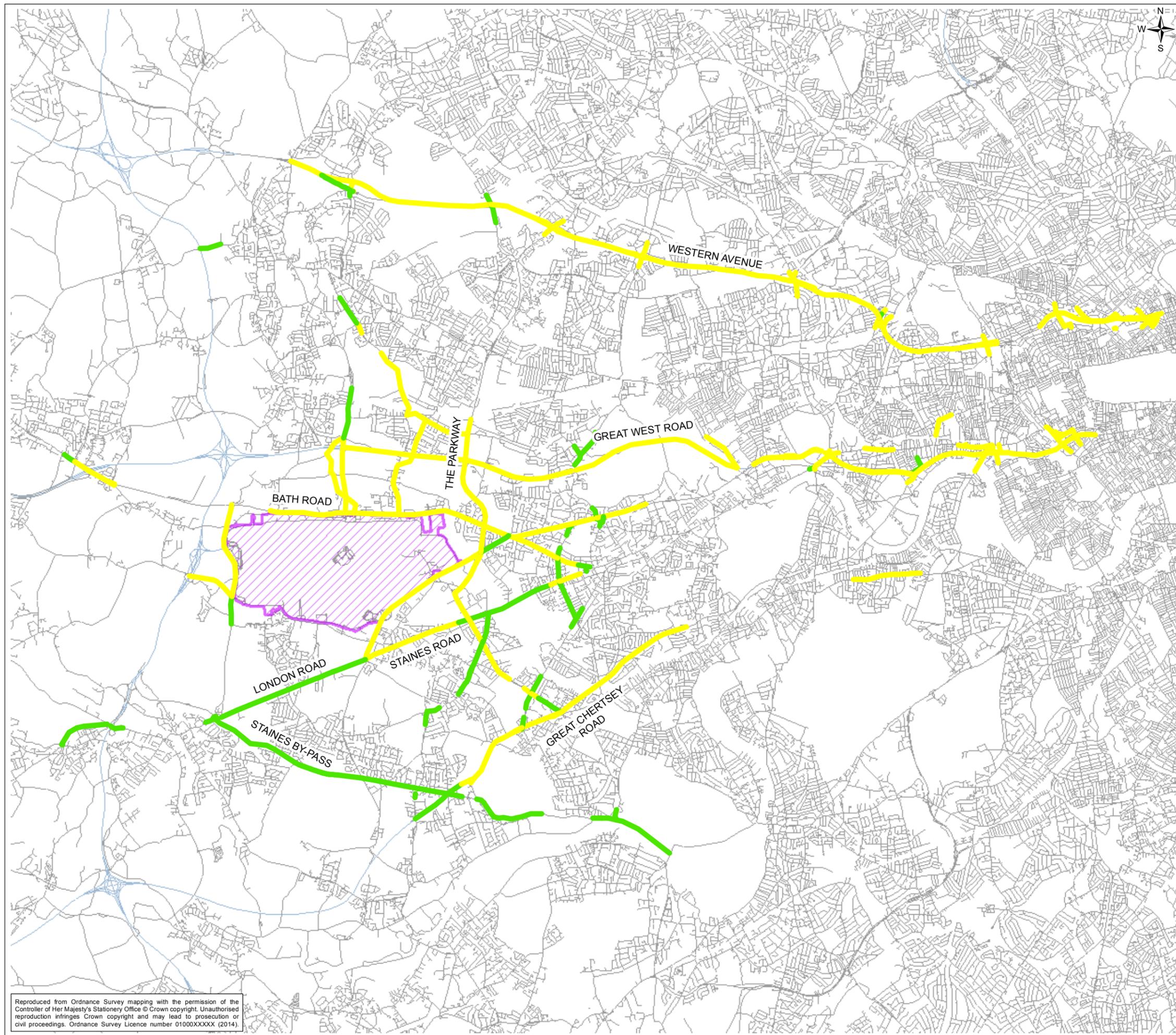
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**FIGURE 5.4**

Legend

**Annual Mean Roadside NO<sub>2</sub> Concentrations (µg/m<sup>3</sup>) - 2009**

- 32 - 40 At Risk of Exceeding the Limit Value
- >40 Exceeding the Limit Value
- Heathrow Existing Boundary



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Drawing Title  
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Drawing Status  
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Drawing No.  
 FIGURE 5.4

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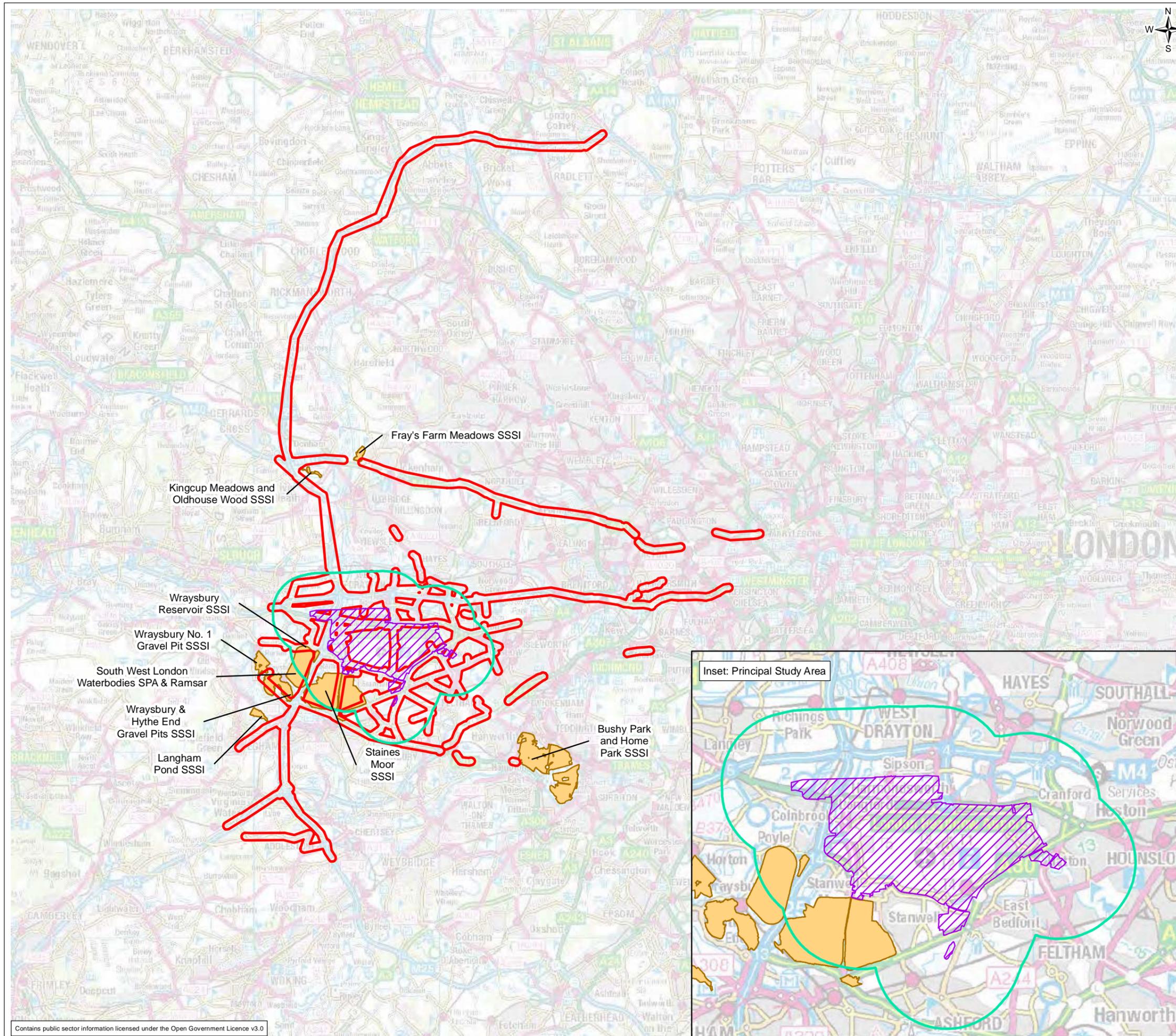
**FIGURE 5.5**

Legend

-  Heathrow NWR boundary
-  Wider Study Area
-  Principal Study Area
-  Statutory Designated Nature Conservation sites of International/European and National importance\*

\*Explanatory note:

These sites include Ramsar sites, Special Areas of Conservation (SAC), Special Protection Areas (SPA), Sites of Special Scientific Interest (SSSI) and National Nature Reserves (NNR) where they are located within or adjacent to the Principal and Wider study areas (with the exception of sites identified as not sensitive to N deposition and NOx concentrations).



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Drawing Title  
 International and National Statutory Nature Conservation Designations: Heathrow NWR

Drawing Status  
 Scale @ A3: 1:200,000 DO NOT SCALE  
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Drawing No.  
 FIGURE 5.5

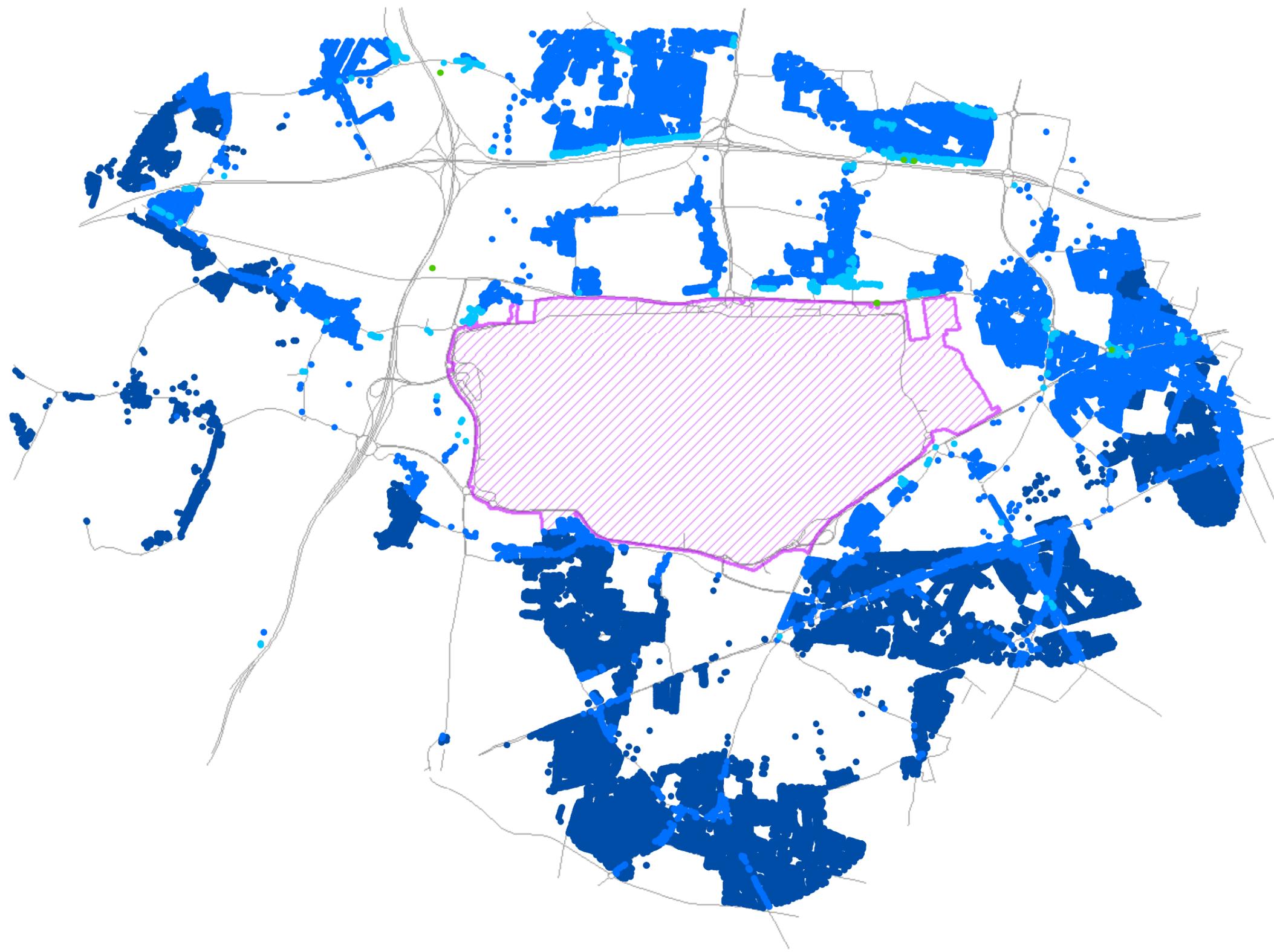
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**FIGURE 5.6**

**Legend**  
**Predicted Annual Mean NO<sub>2</sub> Concentrations (µg/m<sup>3</sup>) - 2030**

- < 20
- 20 - 25
- 25 - 30
- 30 - 35
- 35 - 40
- 40 - 45
- 45 - 50
- ▨ Heathrow Existing Boundary



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Project  
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Drawing Title  
 Do-Minimum Predicted Annual Mean NO<sub>2</sub> Concentrations (µg/m<sup>3</sup>) - 2030

Drawing Status  
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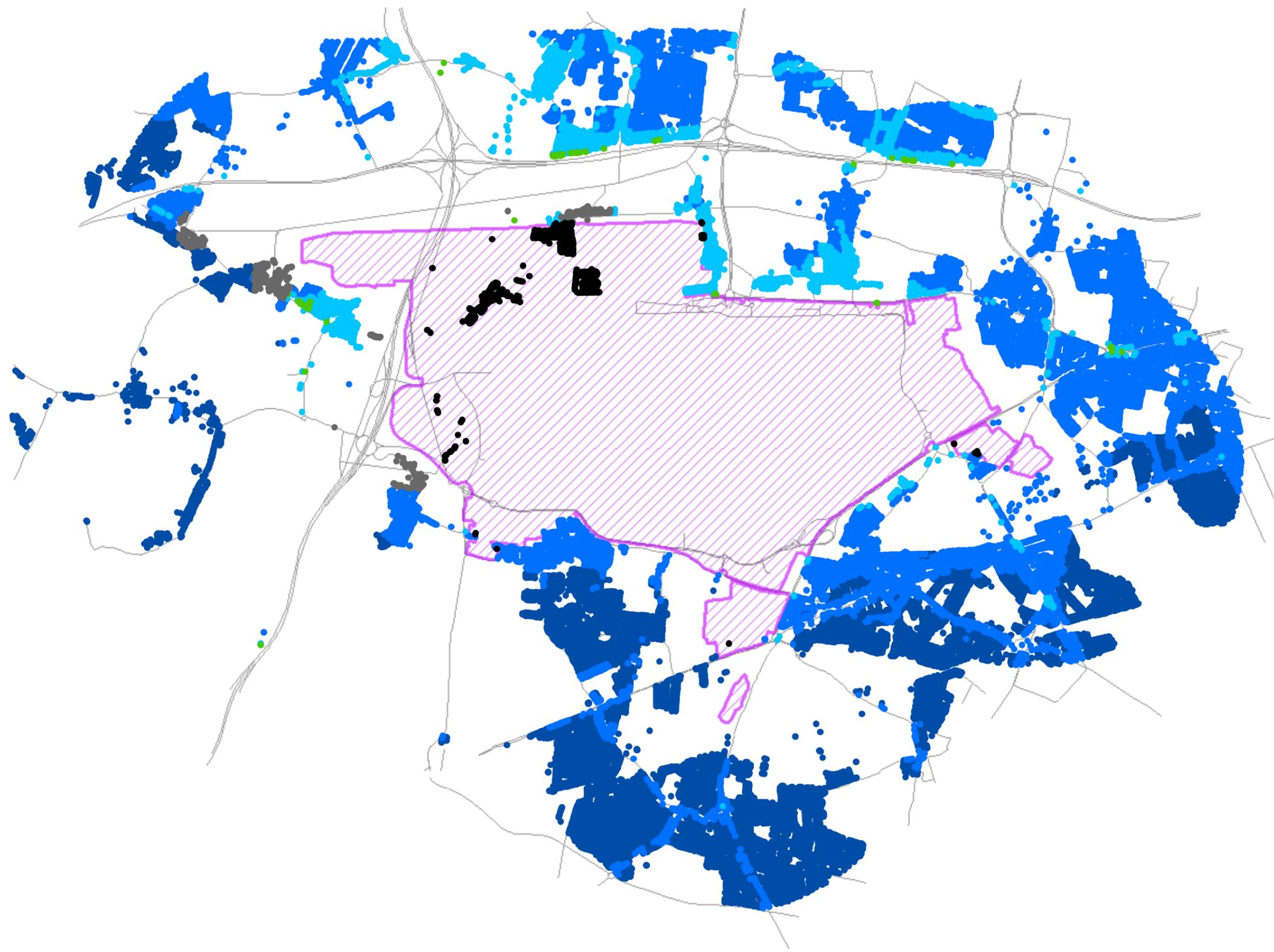


**FIGURE 5.7**

Legend

**Predicted Annual Mean NO<sub>2</sub> Concentrations (µg/m<sup>3</sup>) - 2030**

- < 20
- 20 - 25
- 25 - 30
- 30 - 35
- 35 - 40
- 40 - 45
- 45 - 50
- Receptors within 200m of modelled indicative new road alignment
- Receptors Directly Impacted by Scheme
- ▨ Heathrow NWR Scheme Boundary



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**Airports Commission**

Project  
B4160007 - DfT Airports Commission Environmental Support

Drawing Title  
**Heathrow NWR Predicted Annual Mean NO<sub>2</sub> Concentrations - 2030**

Drawing Status  
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Client No.:

Drawing No.  
**FIGURE 5.7**

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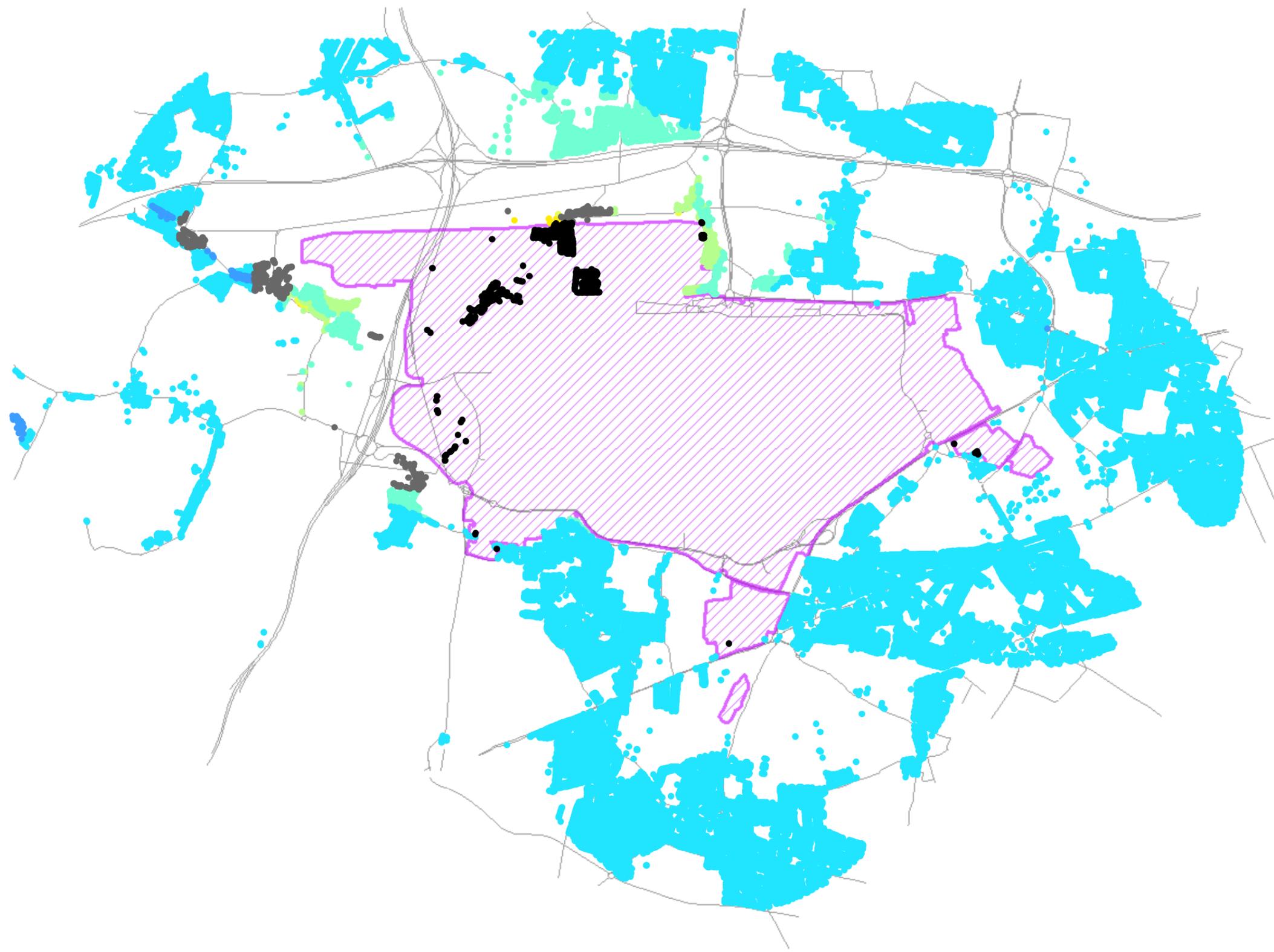


**FIGURE 5.8**

Legend

**Incremental Change to Annual Mean NO<sub>2</sub> Concentrations (ug/m<sup>3</sup>) - 2030**

- -6 - -4
- -4 - -2
- -2 - 0
- 0 - 2
- 2 - 4
- 4 - 6
- 6 - 8
- 8 - 10
- 10 - 12
- 12 - 14
- 14 - 16
- Receptors within 200m of modelled indicative new road alignment
- Receptors Directly Impacted by Scheme
- ▨ Heathrow NWR Scheme Boundary



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Drawing Status  
 Scale @ A3: 1:45,000 DO NOT SCALE

Jacobs No. B4160007

Drawing No. **FIGURE 5.8**

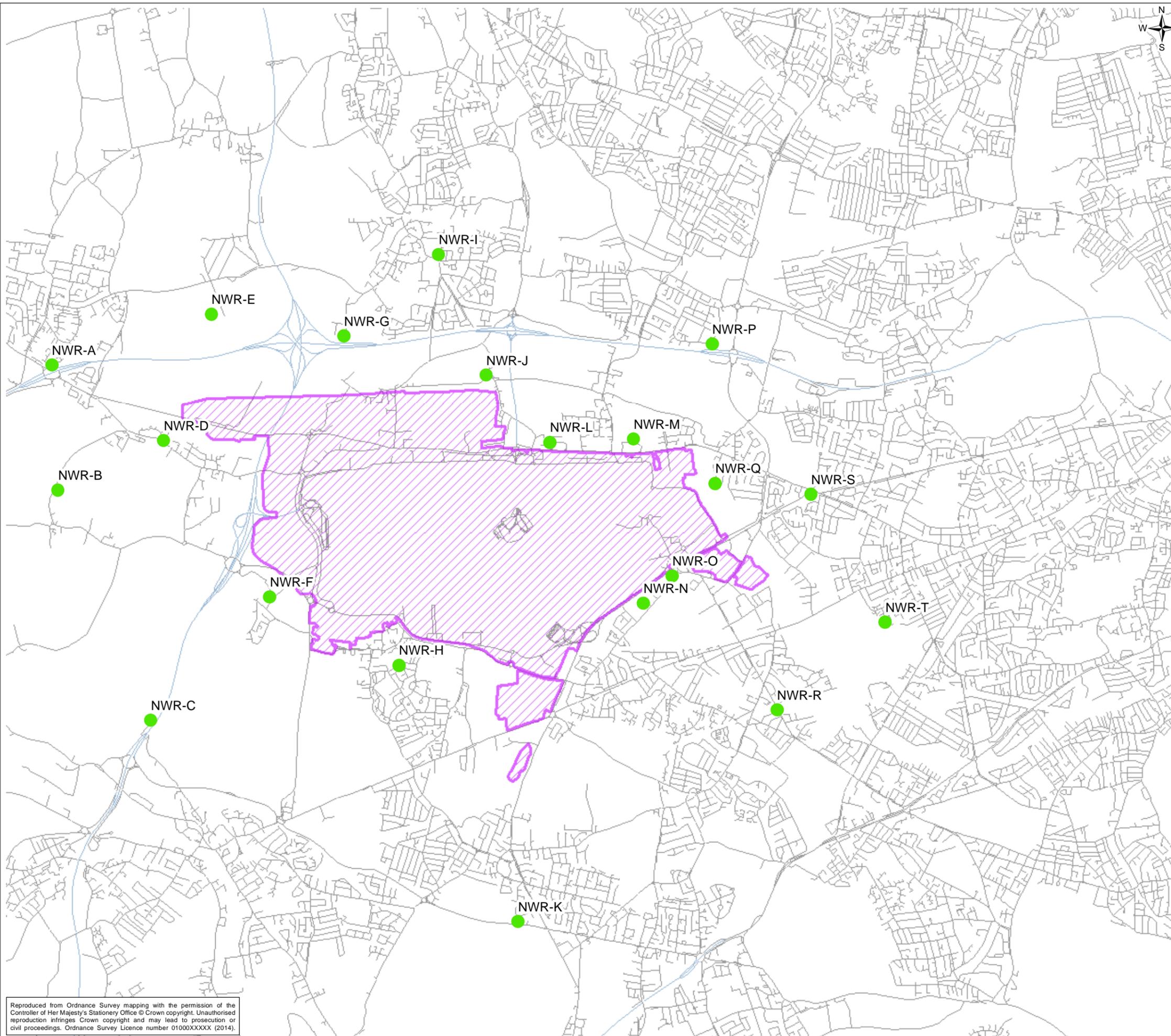
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**Figure 5.9**

**Legend**

- Source Apportionment Receptors
- Heathrow NWR Scheme Boundary



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**Source Apportionment Receptors Heathrow NWR**

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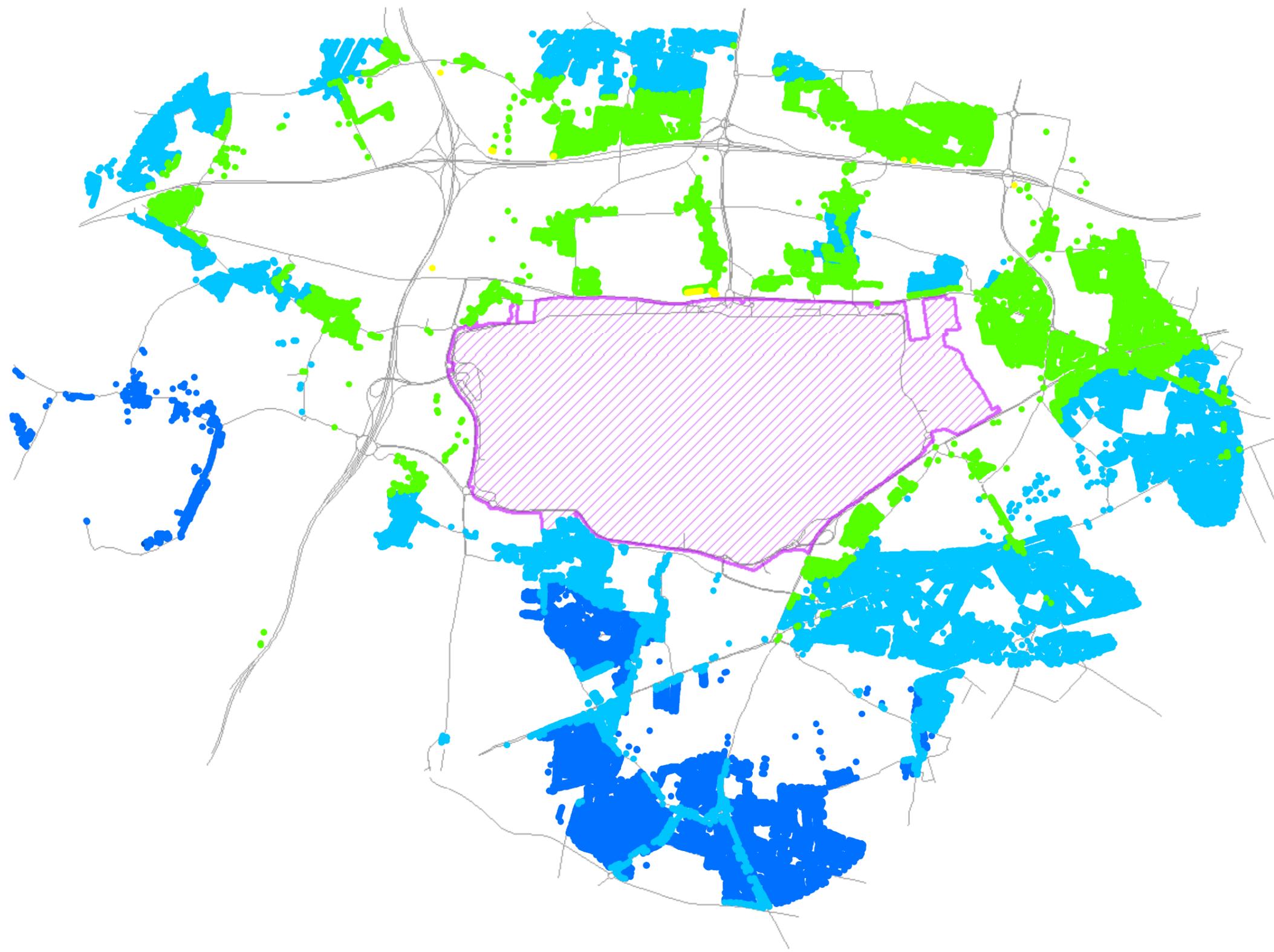


**FIGURE 5.10**

Legend

**Predicted Annual Mean PM<sub>10</sub> Concentrations (µg/m<sup>3</sup>) - 2030**

- < 16
- 16 - 18
- 18 - 20
- 20 - 22
- 22 - 24
- 24 - 26
- ▨ Heathrow Existing Boundary



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Drawing Title  
**Do-Minimum Predicted Annual Mean PM<sub>10</sub> Concentrations (µg/m<sup>3</sup>) - 2030**

Drawing Status		
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Drawing No.	FIGURE 5.10	

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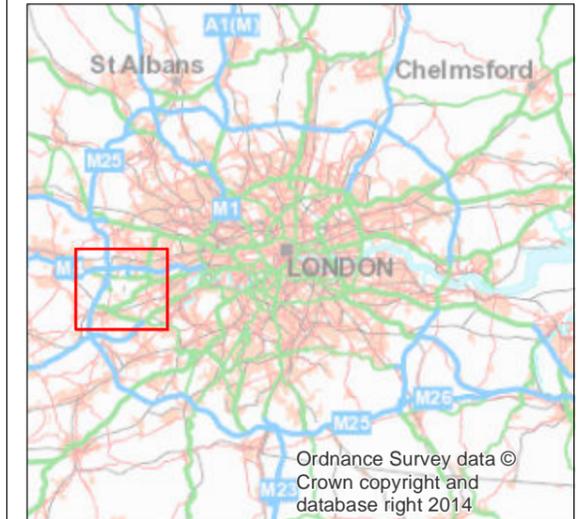
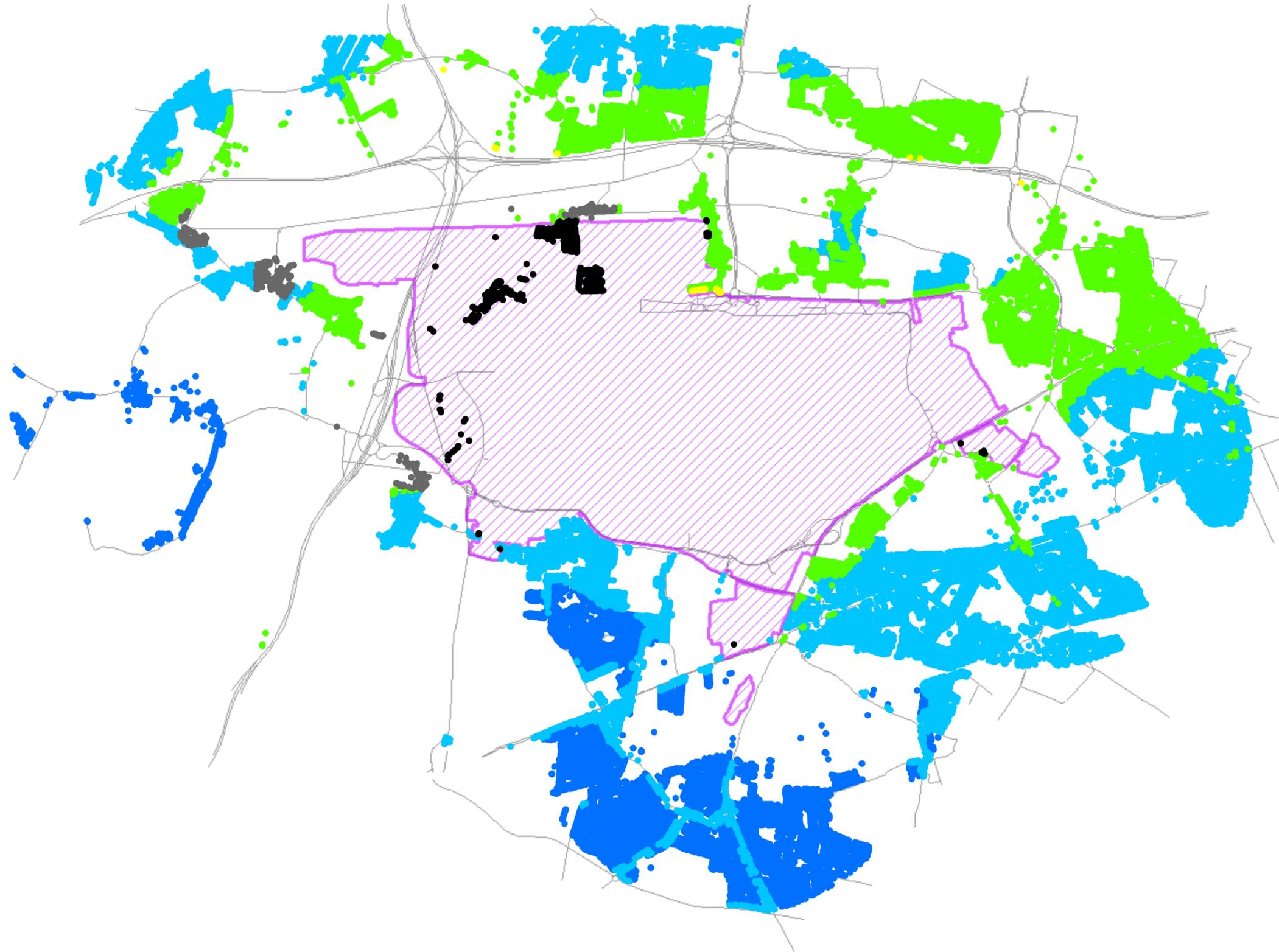


**FIGURE 5.11**

Legend

**Predicted Annual Mean PM<sub>10</sub> Concentrations (µg/m<sup>3</sup>) - 2030**

- < 16
- 16 - 18
- 18 - 20
- 20 - 22
- 22 - 24
- 24 - 26
- Receptors within 200m of modelled indicative new road alignment
- Receptors Directly Impacted by Scheme
- ▨ Heathrow NWR Scheme Boundary



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**Airports Commission**

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B4160007 - DfT Airports Commission Environmental Support

Drawing Title  
**Heathrow NWR Predicted Annual Mean PM<sub>10</sub> Concentrations (µg/m<sup>3</sup>) - 2030**

Drawing Status  
Scale @ A3: 1:45,000 DO NOT SCALE

Jacobs No. B4160007

Drawing No. **FIGURE 5.11**

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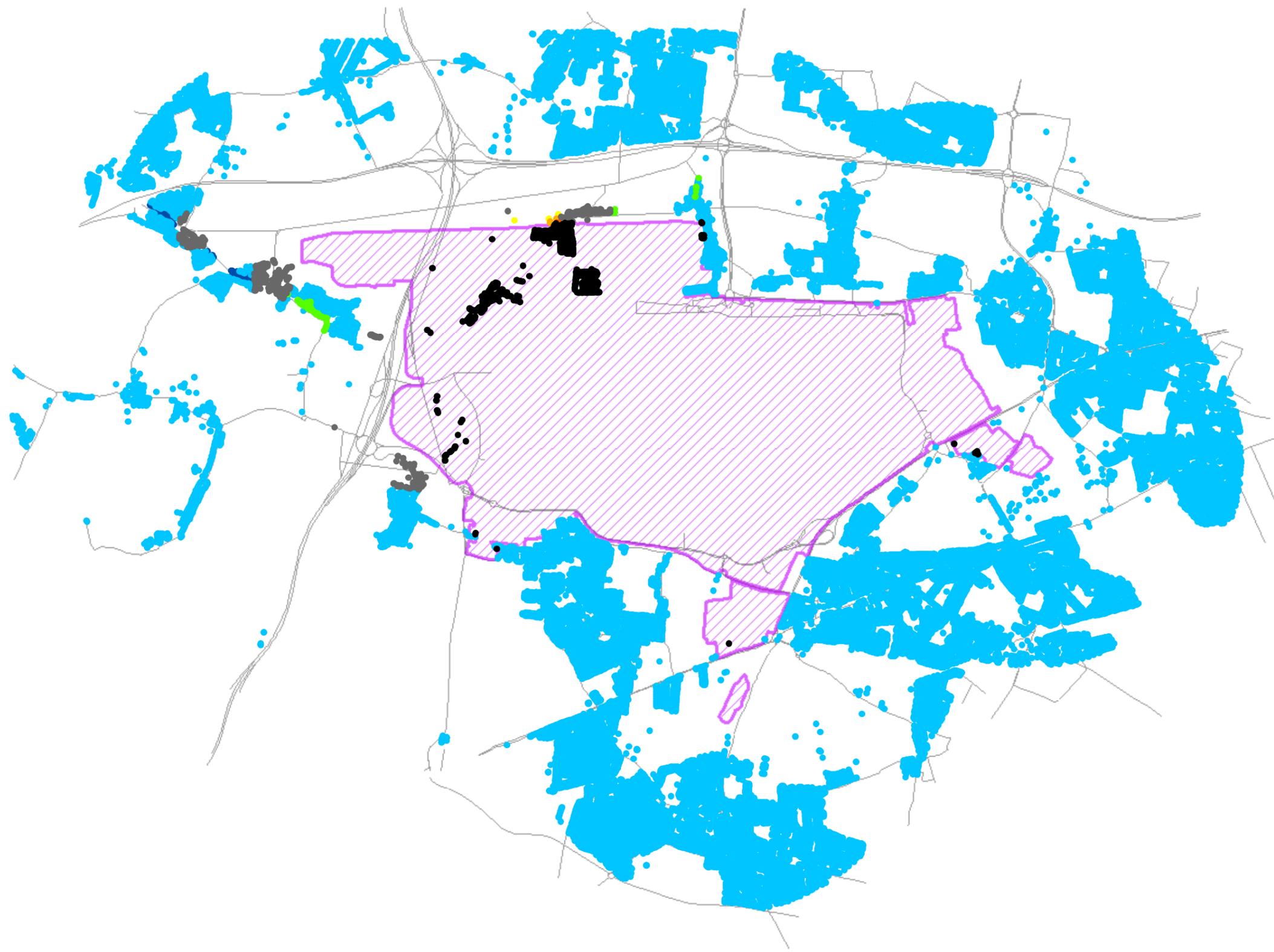


**FIGURE 5.12**

Legend

**Incremental Change to Annual Mean PM<sub>10</sub> Concentrations (ug/m<sup>3</sup>) – 2030**

- -1 - 0
- 0 - 1
- 1 - 2
- 2 - 3
- 3 - 4
- 4 - 5
- Receptors within 200m of modelled indicative new road alignment
- Receptors Directly Impacted by Scheme
- ▨ Heathrow NWR Scheme Boundary



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**Incremental Change to Annual Mean PM<sub>10</sub> Concentrations (ug/m<sup>3</sup>) – 2030**

Drawing Status  
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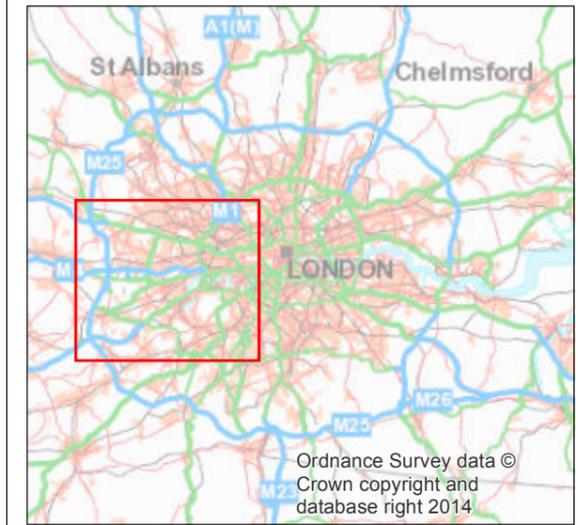
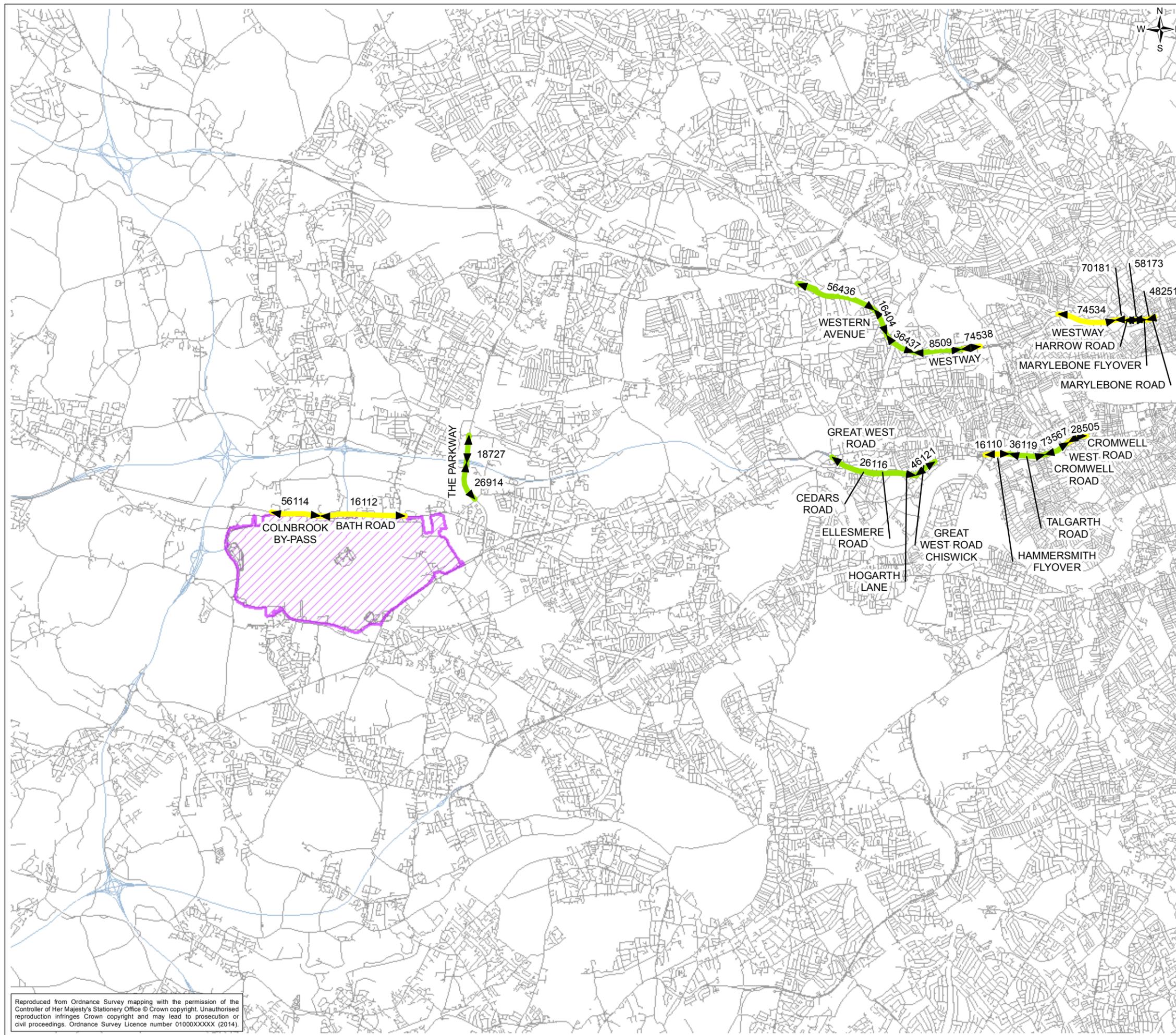
**FIGURE 5.13**

Legend

**Annual Mean Roadside NO<sub>2</sub> Concentrations (µg/m<sup>3</sup>) - 2030**

- 32 - 40 At Risk of Exceeding the Limit Value
- >40 Exceeding the Limit Value
- Heathrow Existing Boundary

The numbers displayed are the Census Area Identification Numbers.



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Drawing Title  
**PCM Annual Mean Roadside NO<sub>2</sub> Concentrations (µg/m<sup>3</sup>) - 2030**

Scale @ A3	1:90,000	DO NOT SCALE
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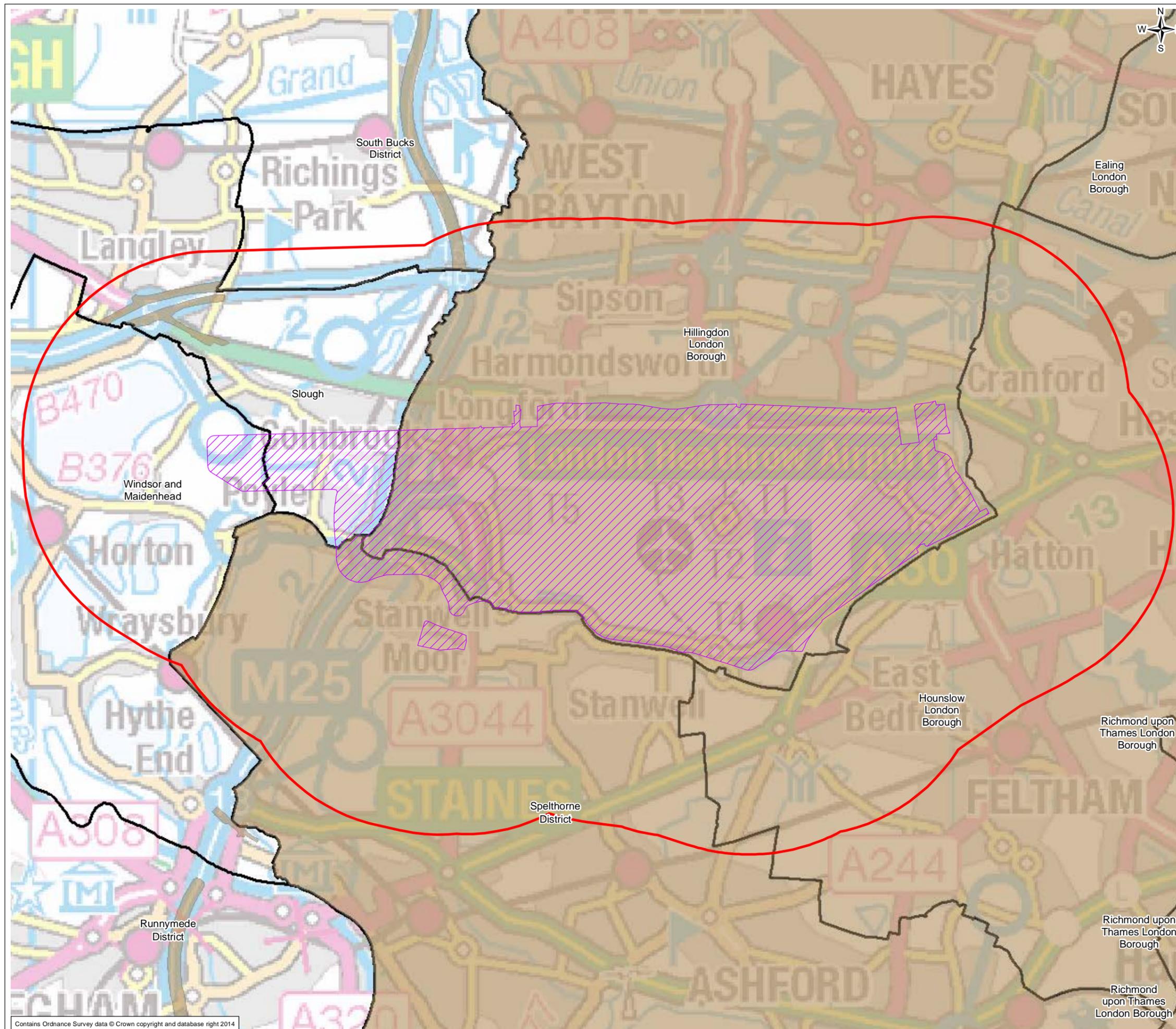
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**FIGURE 6.1**



- Legend
-  Heathrow ENR boundary
  -  Principal study area
  -  Administrative boundaries
  -  Air Quality Management Areas

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Drawing Title  
 Principal Study Area and AQMA Boundaries - Heathrow ENR

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Client No.		

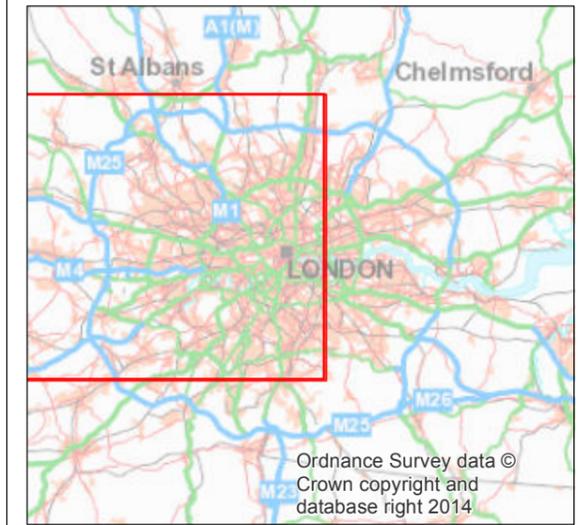
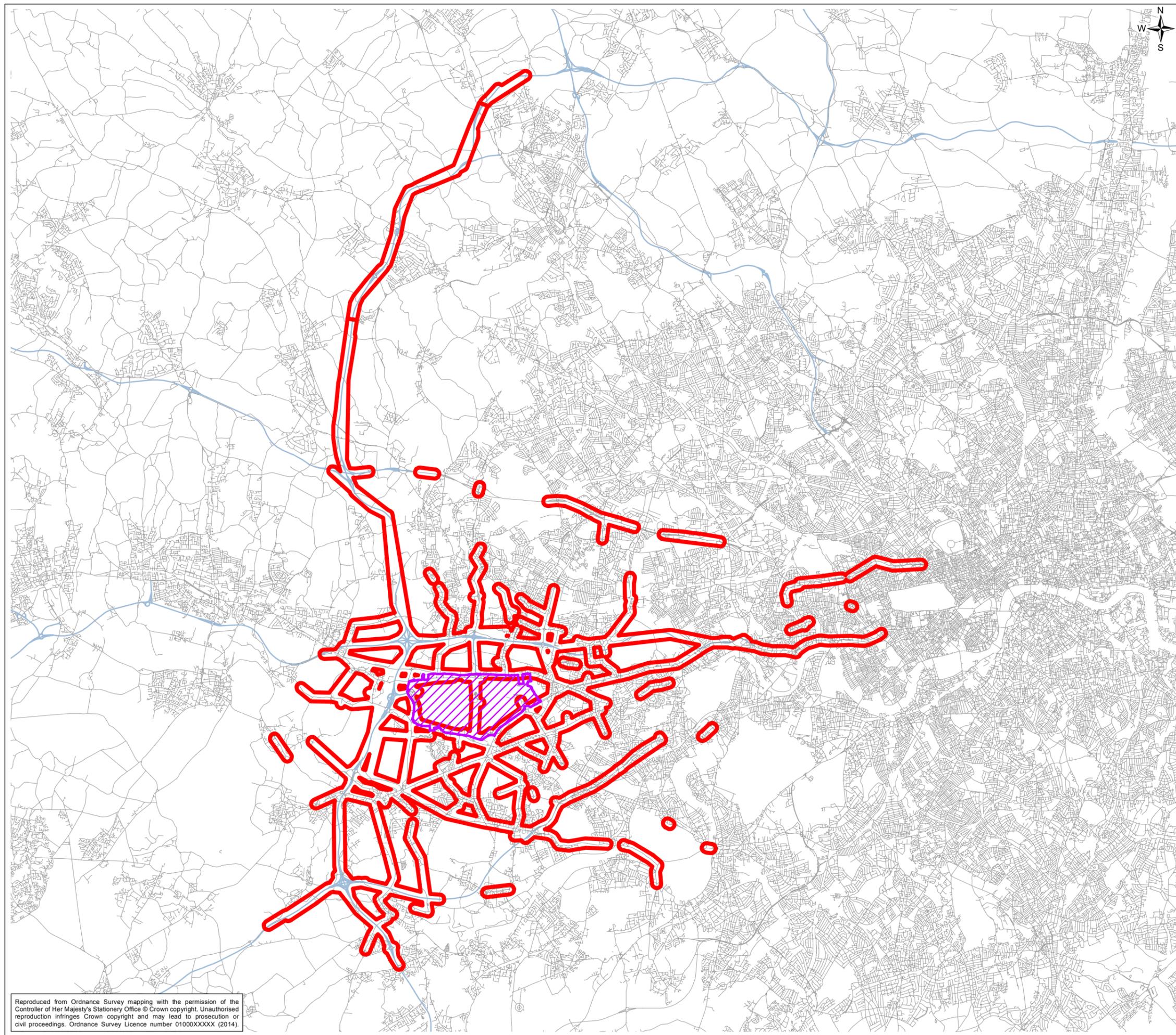
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**FIGURE 6.2**

- Legend**
-  ENR Wider Study Area (Road Links Affected by Scheme)
  -  Heathrow Existing Boundary



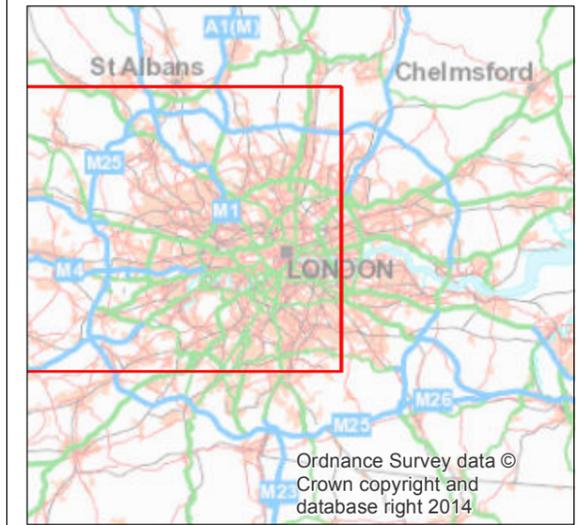
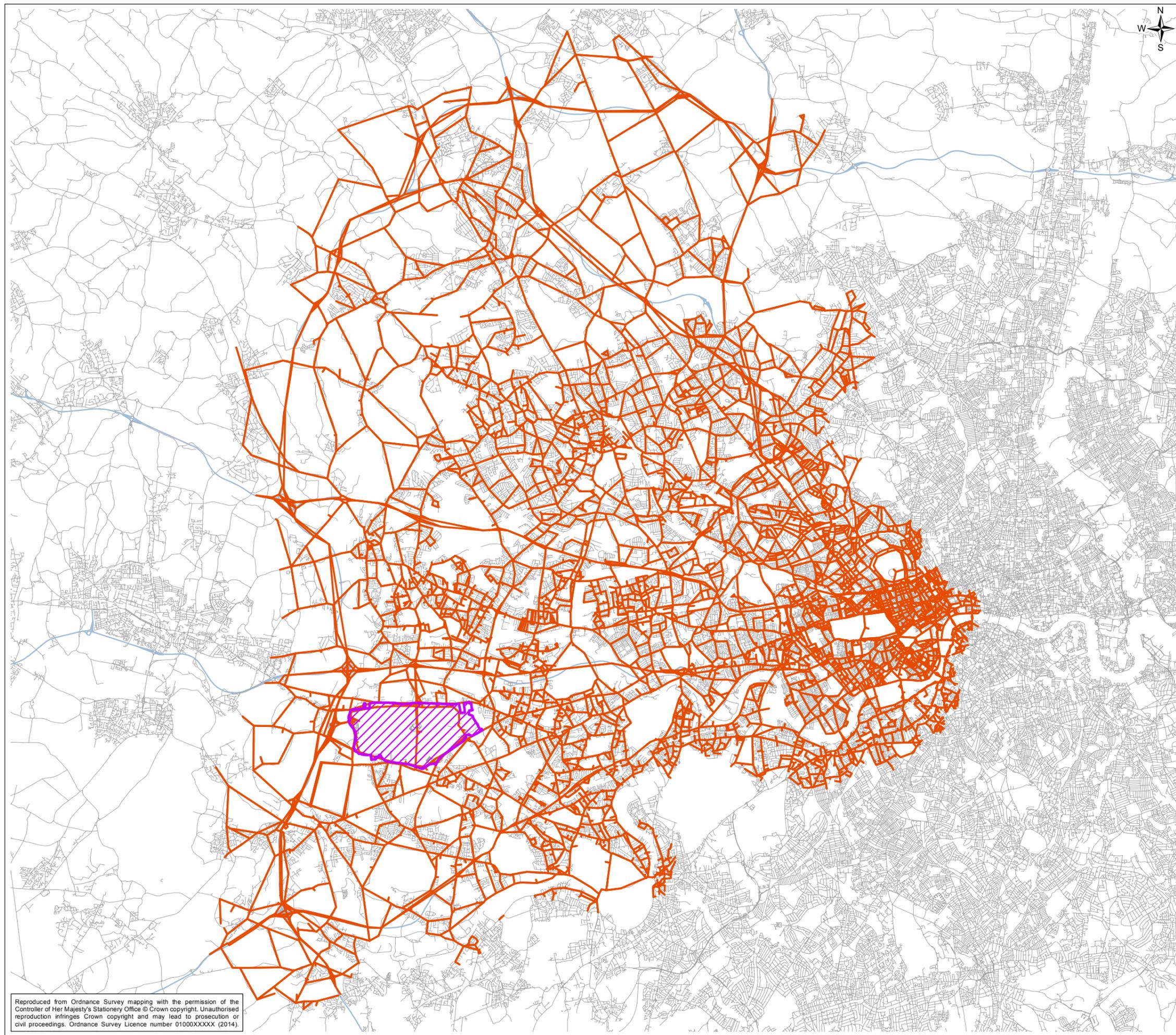
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**FIGURE 6.3**

**Legend**

-  ENR Traffic Simulation Area
-  Heathrow Existing Boundary



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Drawing Title  
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**FIGURE 6.3**

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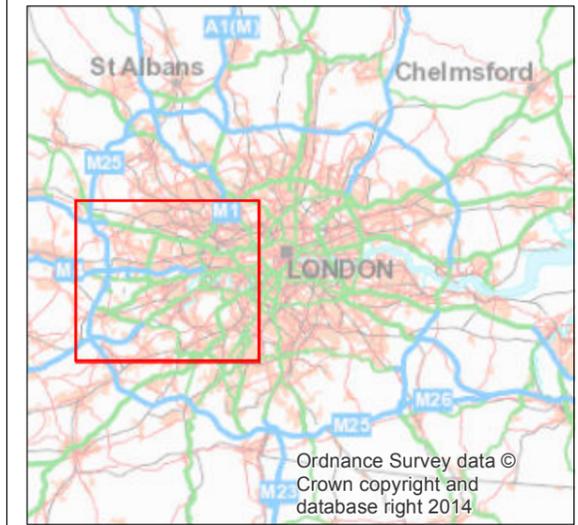
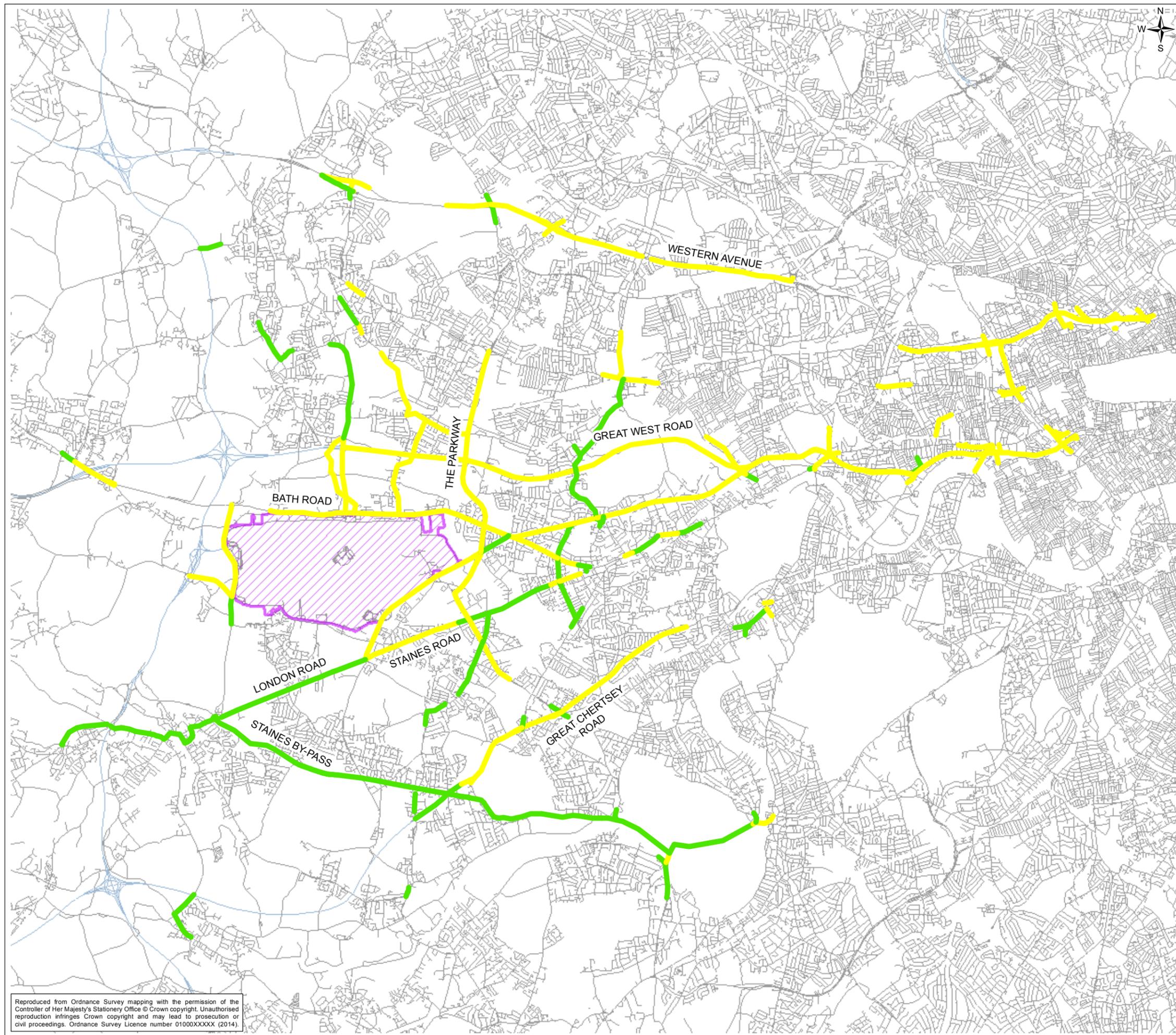
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**FIGURE 6.4**

Legend

**Annual Mean Roadside NO<sub>2</sub> Concentrations (µg/m<sup>3</sup>) - 2009**

- 32 - 40 At Risk of Exceeding the Limit Value
- >40 Exceeding the Limit Value
- Heathrow Existing Boundary



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**FIGURE 6.4**

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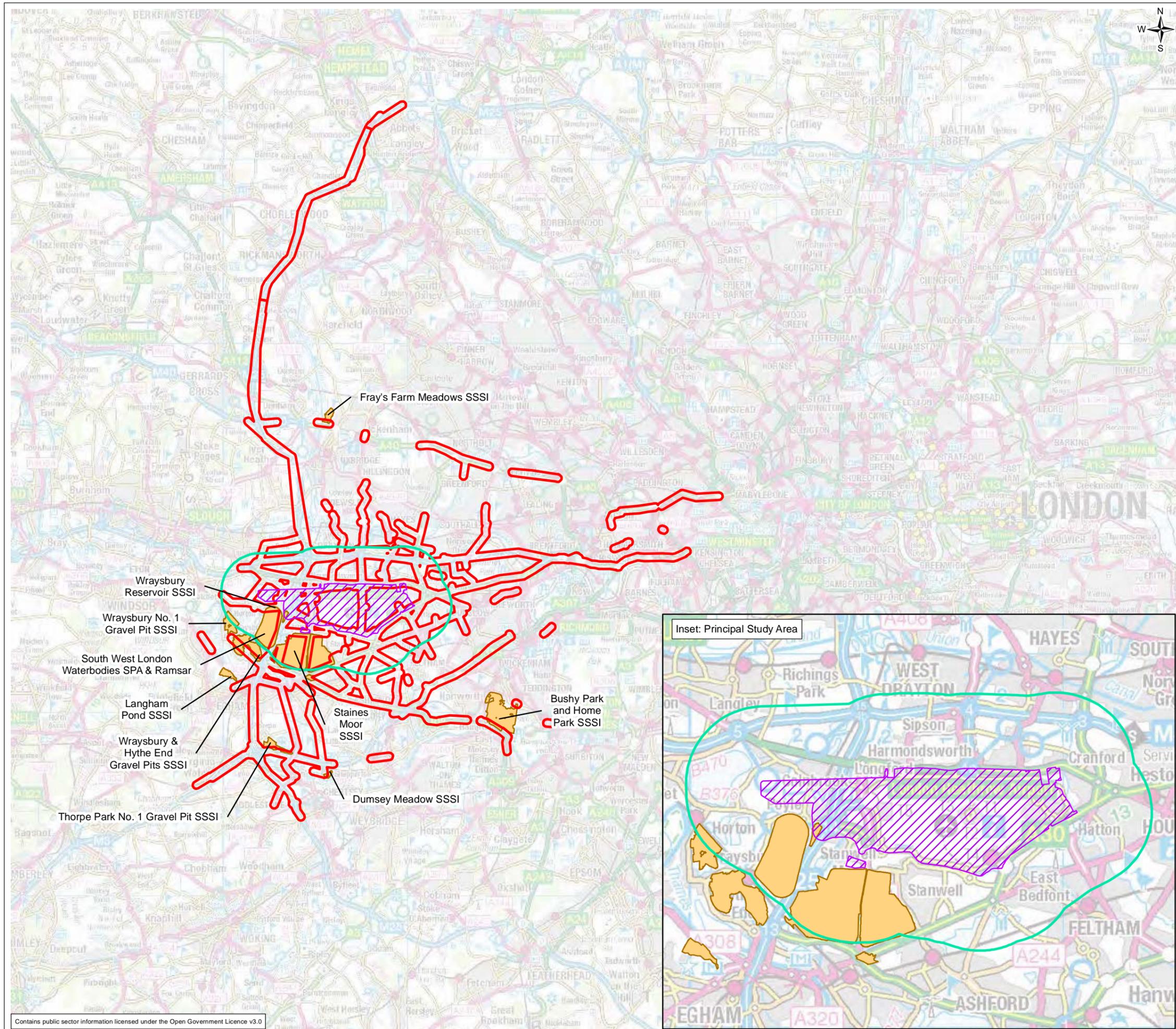
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**FIGURE 6.5**

Legend

-  Heathrow ENR boundary
-  Wider Study Area
-  Principal Study Area
-  Statutory Designated Nature Conservation sites of International/European and National importance\*

\*Explanatory note:  
 These sites include Ramsar sites, Special Areas of Conservation (SAC), Special Protection Areas (SPA), Sites of Special Scientific Interest (SSSI) and National Nature Reserves (NNR) where they are located within or adjacent to the Principal and Wider study areas (with the exception of sites identified as not sensitive to N deposition and NOx concentrations).



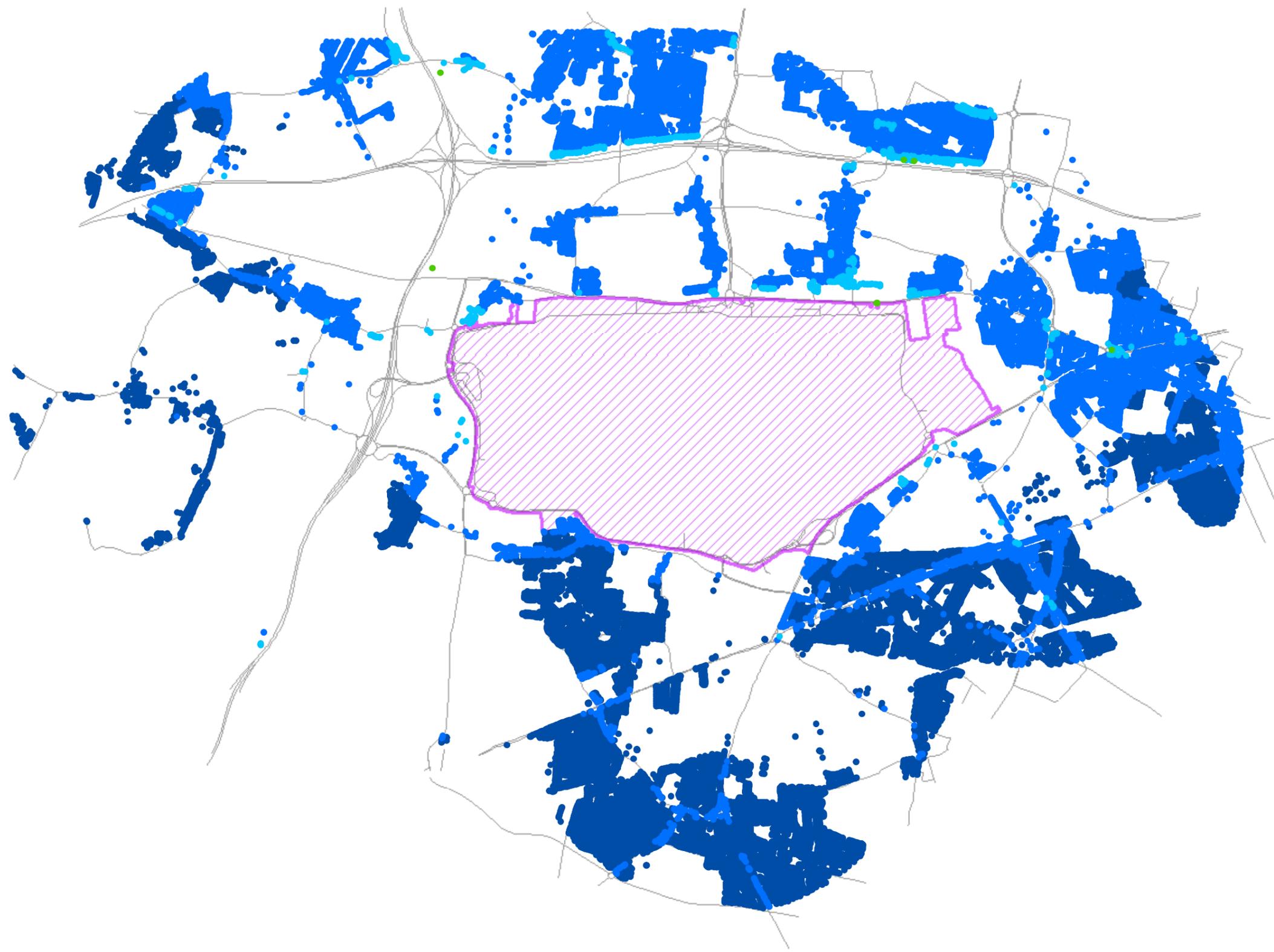
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International and National Statutory Nature Conservation Designations: Heathrow ENR						
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**FIGURE 6.6**

Legend  
**Predicted Annual Mean NO<sub>2</sub> Concentrations (µg/m<sup>3</sup>) - 2030**

- < 20
- 20 - 25
- 25 - 30
- 30 - 35
- 35 - 40
- 40 - 45
- 45 - 50
- ▨ Heathrow Existing Boundary



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 Do-Minimum Predicted Annual Mean  
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Drawing Status  
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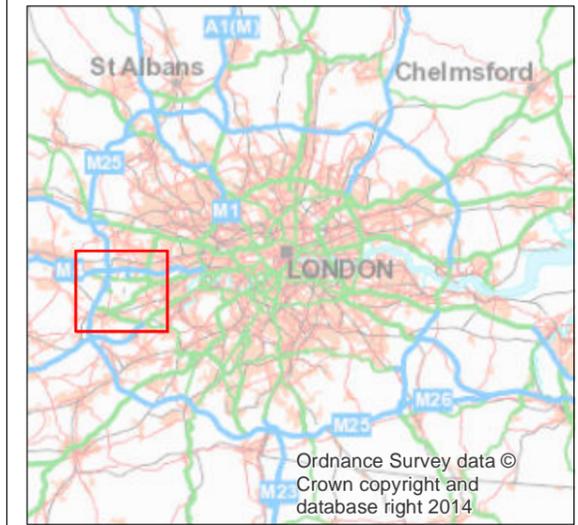
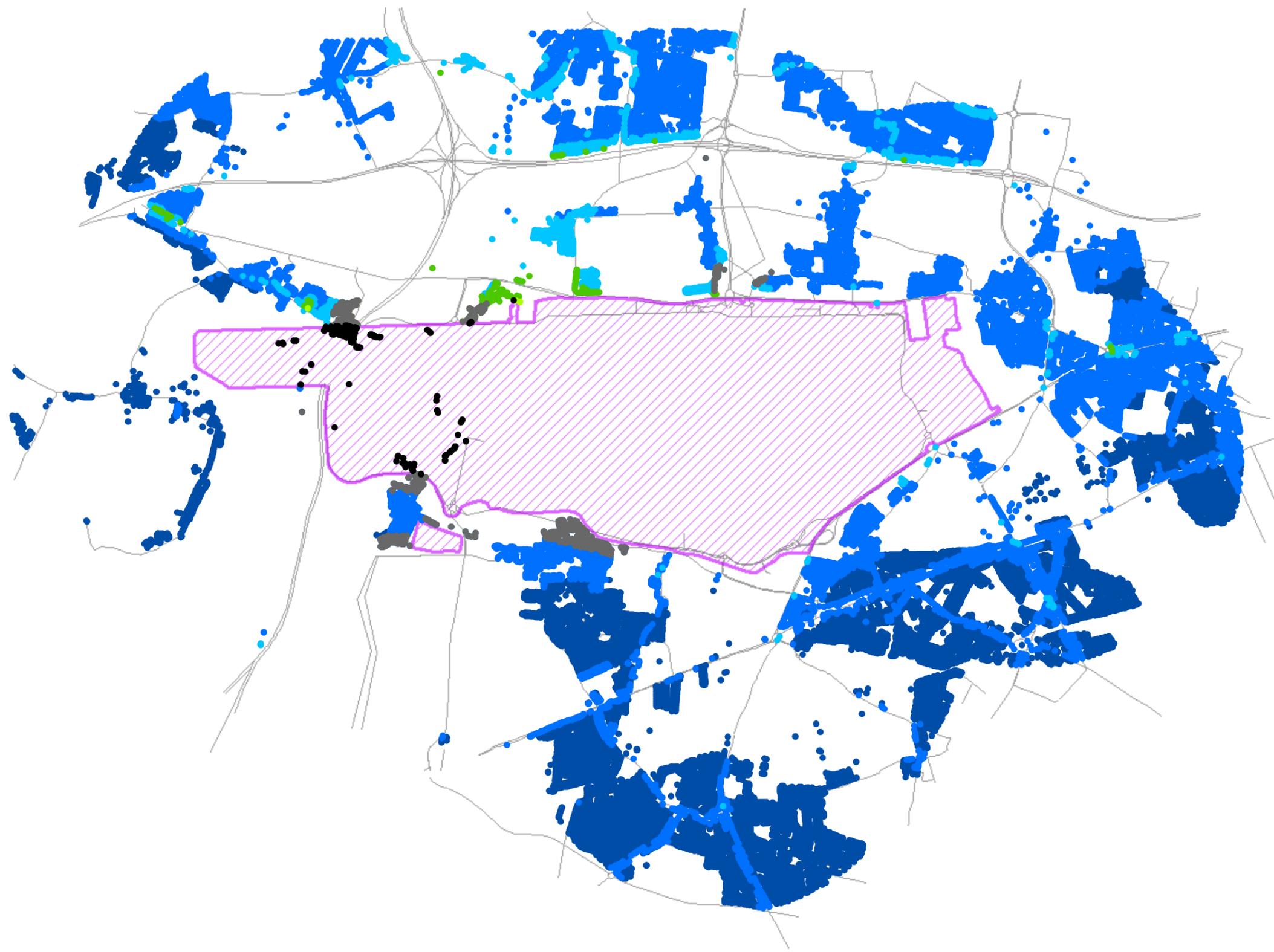


**FIGURE 6.7**

Legend

**Predicted Annual Mean NO<sub>2</sub> Concentrations (µg/m<sup>3</sup>) - 2030**

- < 20
- 20 - 25
- 25 - 30
- 30 - 35
- 35 - 40
- 40 - 45
- 45 - 50
- Receptors within 200m of modelled indicative new road alignment
- Receptors Directly Impacted by Scheme
- ▨ Heathrow ENR Scheme Boundary



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Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd



Client  
**Airports Commission**

Project  
B4160007 - DfT Airports Commission Environmental Support

Drawing Title  
**Heathrow ENR Predicted Annual Mean NO<sub>2</sub> Concentrations (µg/m<sup>3</sup>) - 2030**

Drawing Status		
Scale @ A3	1:45,000	DO NOT SCALE
Jacobs No.	B4160007	
Client No.		
Drawing No.	FIGURE 6.7	

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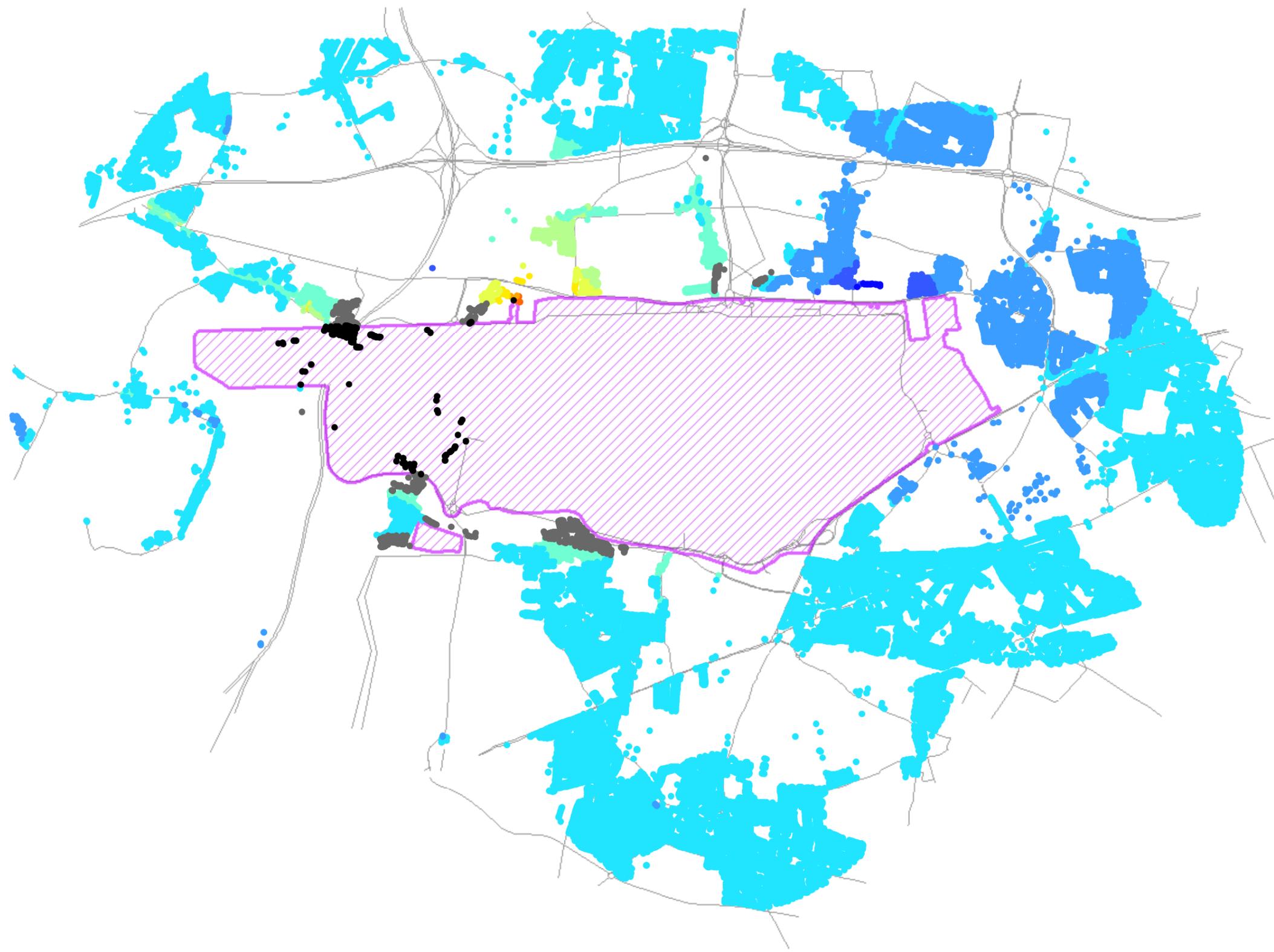


**FIGURE 6.8**

Legend

**Incremental Change to Annual Mean NO<sub>2</sub> Concentrations (ug/m<sup>3</sup>) - 2030**

- -6 - -4
- -4 - -2
- -2 - 0
- 0 - 2
- 2 - 4
- 4 - 6
- 6 - 8
- 8 - 10
- 10 - 12
- 12 - 14
- 14 - 16
- Receptors within 200m of modelled indicative new road alignment
- Receptors Directly Impacted by Scheme
- ▨ Heathrow ENR Scheme Boundary



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Project  
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Drawing Title  
**Incremental Change to Annual Mean NO<sub>2</sub> Concentrations (ug/m<sup>3</sup>) - 2030**

Drawing Status  
 Scale @ A3: 1:45,000 DO NOT SCALE

Jacobs No. B4160007

Drawing No. **FIGURE 6.8**

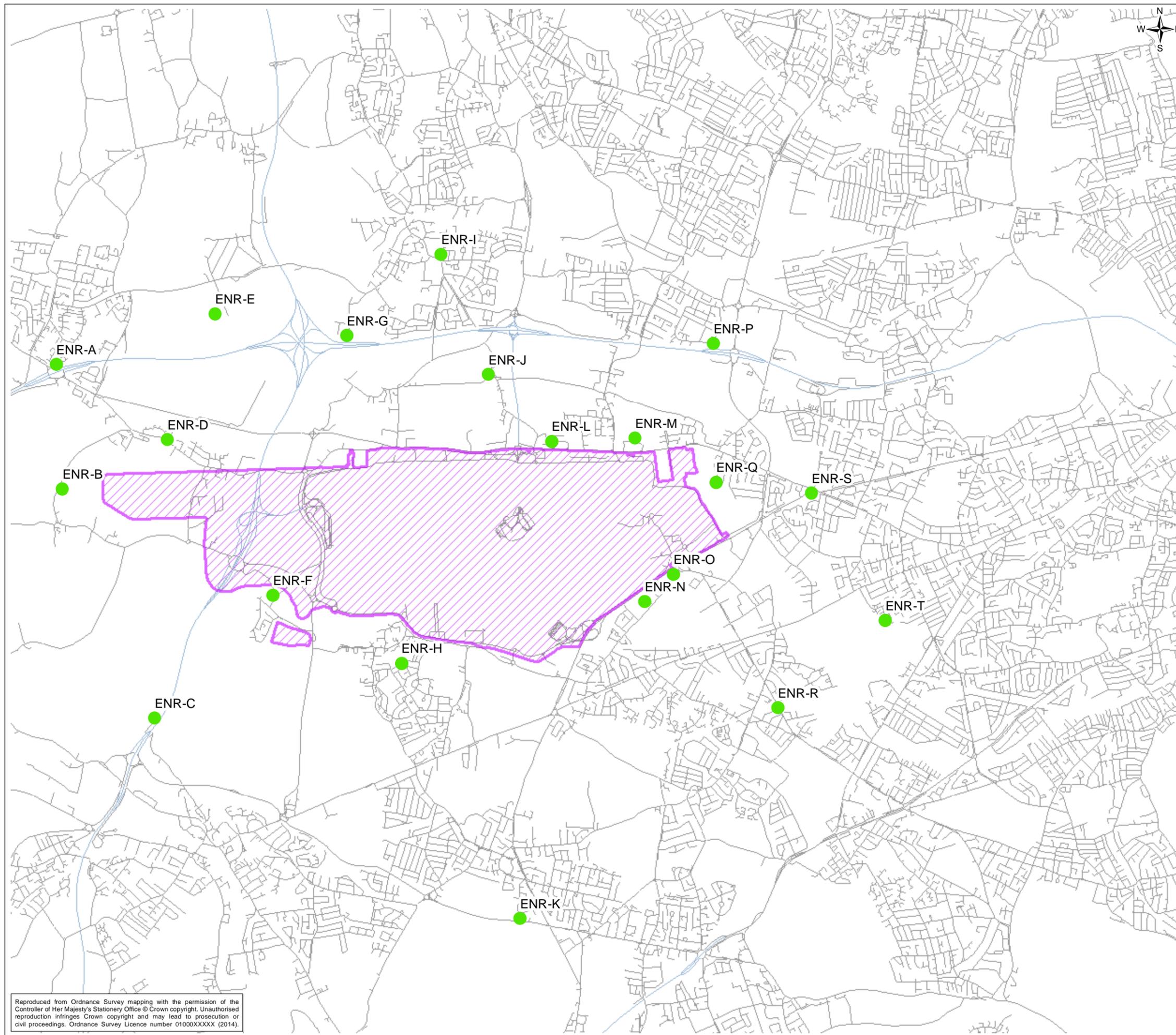
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**FIGURE 6.9**

**Legend**

- Source Apportionment Receptors
- Heathrow ENR Scheme Boundary



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 FIGURE 6.9

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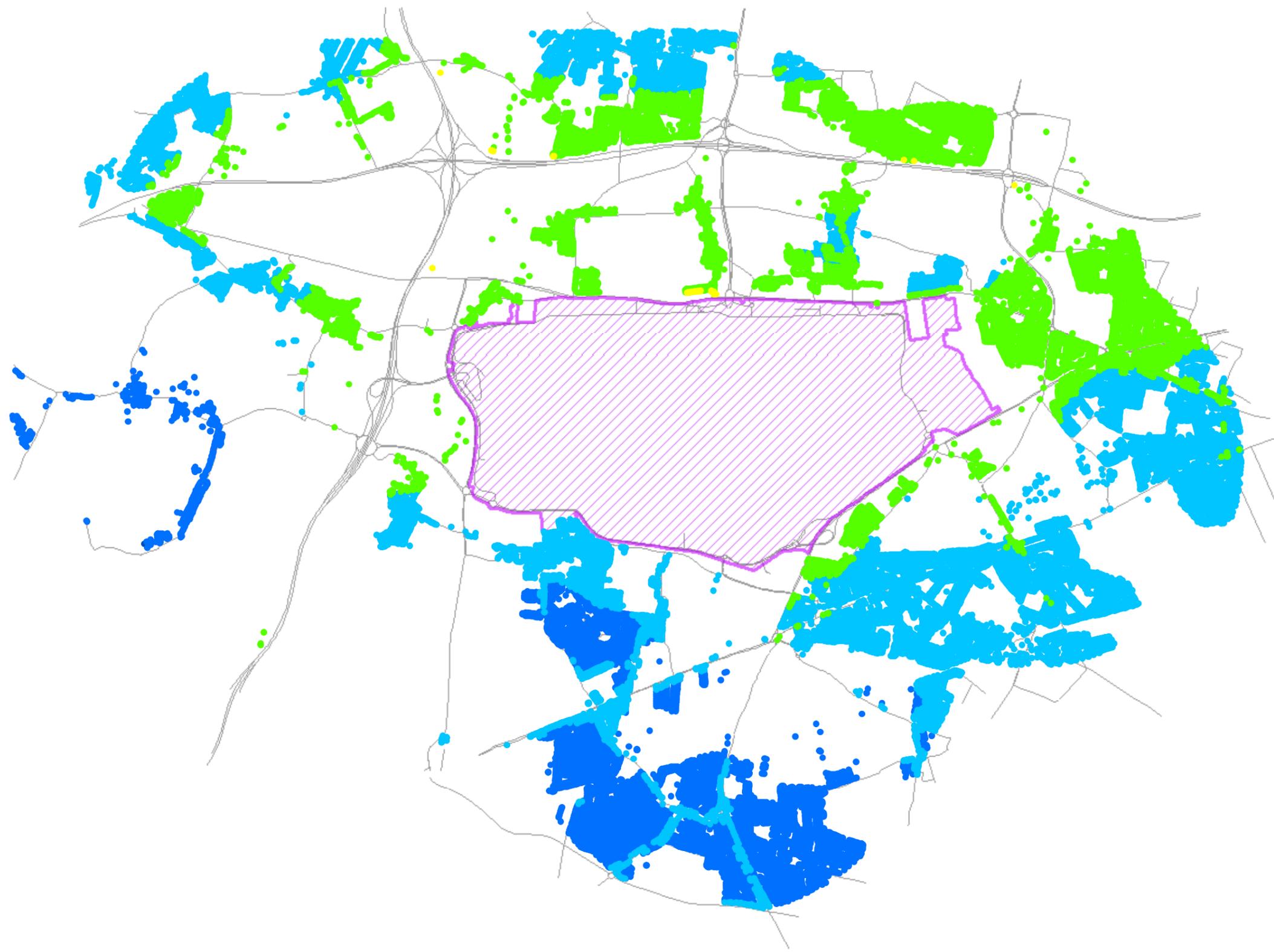
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**FIGURE 6.10**

**Legend**  
**Predicted Annual Mean PM<sub>10</sub> Concentrations (µg/m<sup>3</sup>) - 2030**

- < 16
- 16 - 18
- 18 - 20
- 20 - 22
- 22 - 24
- 24 - 26
- ▨ Heathrow Existing Boundary



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Drawing Title  
 Do-Minimum Predicted Annual Mean PM<sub>10</sub> Concentrations (µg/m<sup>3</sup>) - 2030

Drawing Status		
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Drawing No.  
 FIGURE 6.10

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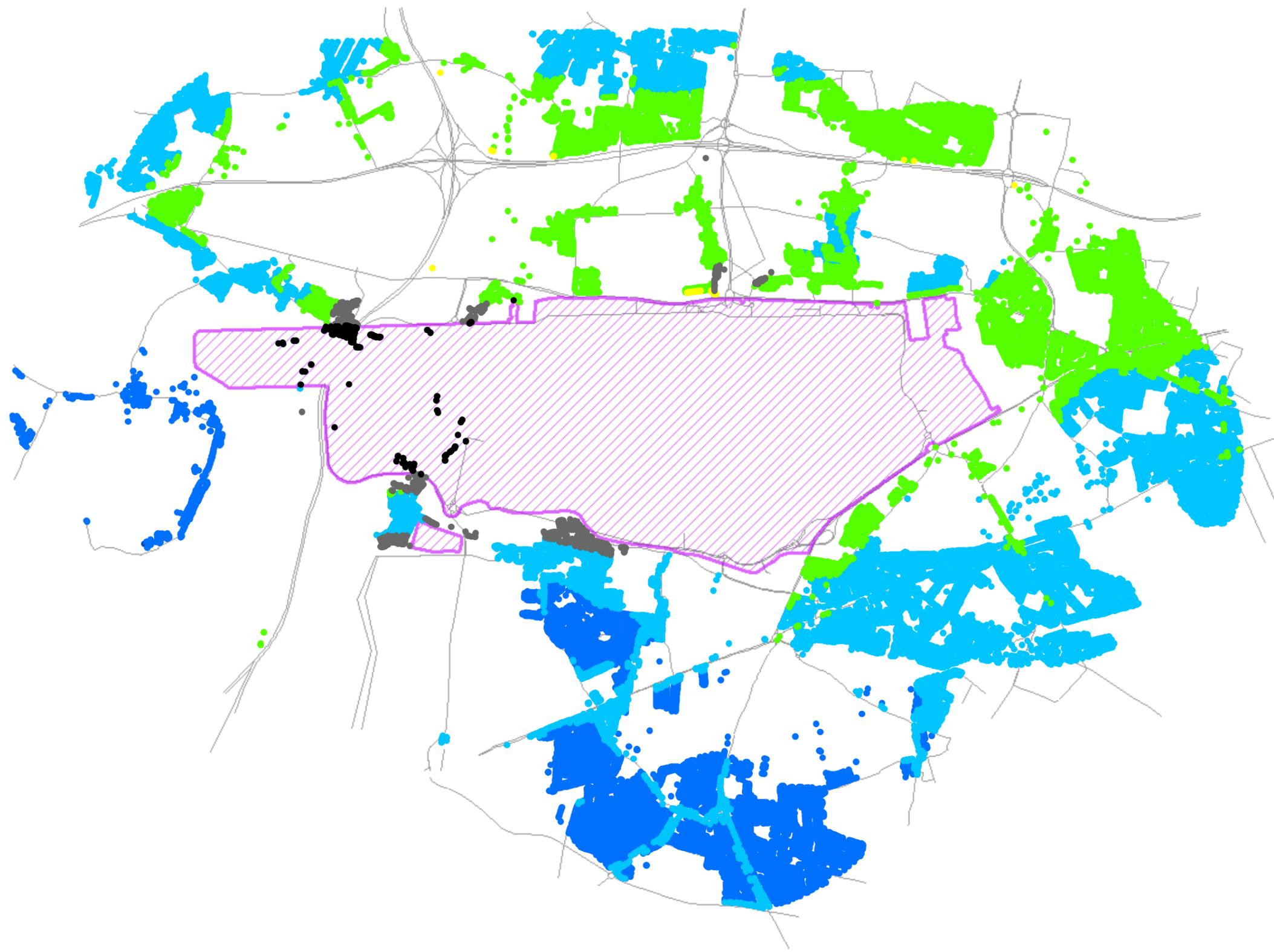


**FIGURE 6.11**

Legend

**Predicted Annual Mean PM<sub>10</sub> Concentrations (µg/m<sup>3</sup>) - 2030**

- < 16
- 16 - 18
- 18 - 20
- 20 - 22
- 22 - 24
- 24 - 26
- Receptors within 200m of modelled indicative new road alignment
- Receptors Directly Impacted by Scheme
- ▨ Heathrow ENR Scheme Boundary



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Drawing Title  
**Heathrow ENR Predicted Annual Mean PM<sub>10</sub> Concentrations (µg/m<sup>3</sup>) - 2030**

Drawing Status

Scale @ A3	1:45,000	DO NOT SCALE
Jacobs No.	B4160007	
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**FIGURE 6.11**

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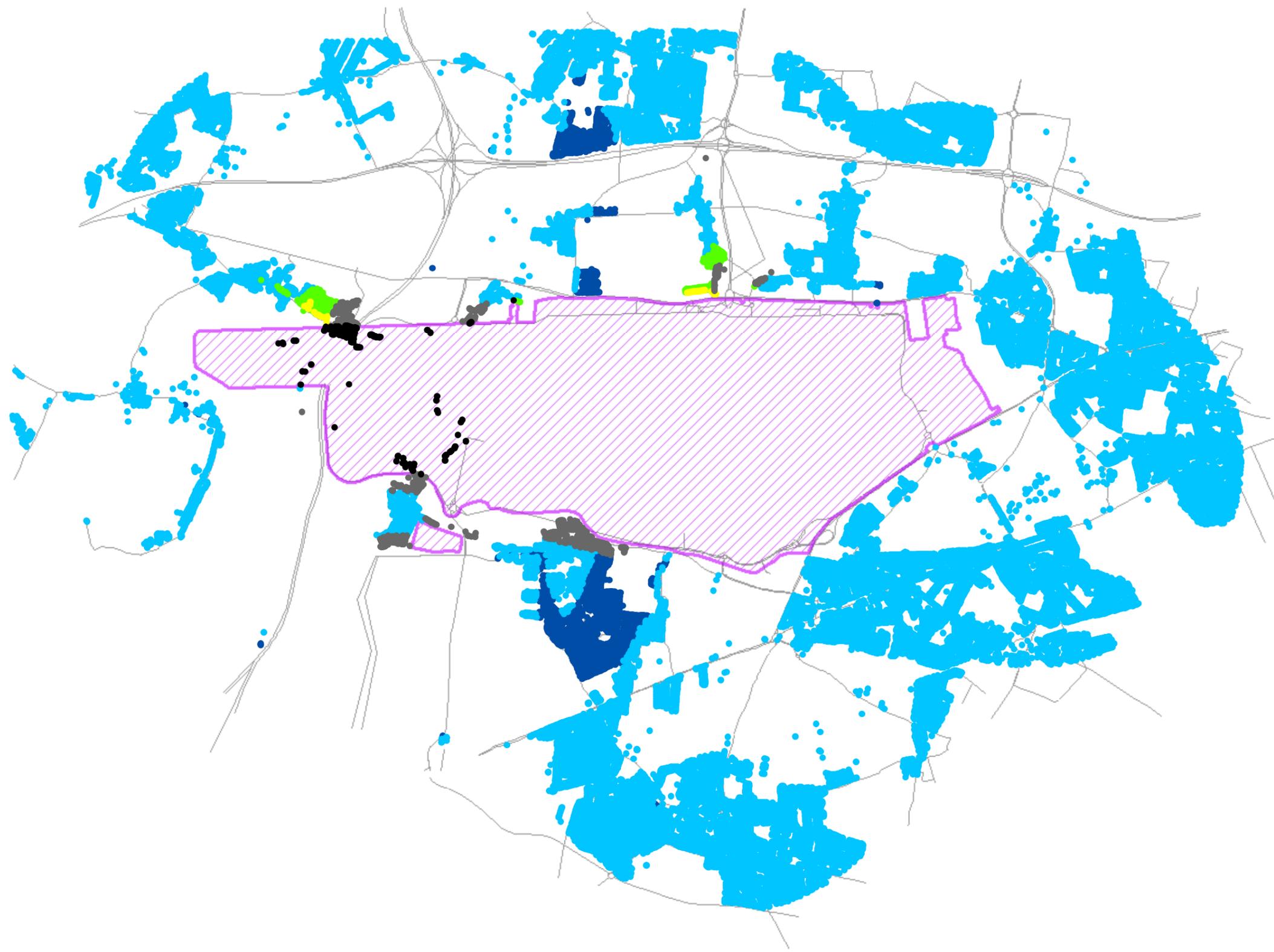


**FIGURE 6.12**

Legend

**Incremental Change to Annual Mean PM<sub>10</sub> Concentrations (ug/m<sup>3</sup>) - 2030**

- -1 - 0
- 0 - 1
- 1 - 2
- 2 - 3
- 3 - 4
- 4 - 5
- Receptors within 200m of modelled indicative new road alignment
- Receptors Directly Impacted by Scheme
- ▨ Heathrow ENR Scheme Boundary



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Drawing Title  
**Incremental Change to Annual Mean PM<sub>10</sub> Concentrations (ug/m<sup>3</sup>) - 2030**

Drawing Status  
 Scale @ A3: 1:45,000 DO NOT SCALE  
 Jacobs No.: B4160007  
 Client No.:

Drawing No.  
**FIGURE 6.12**

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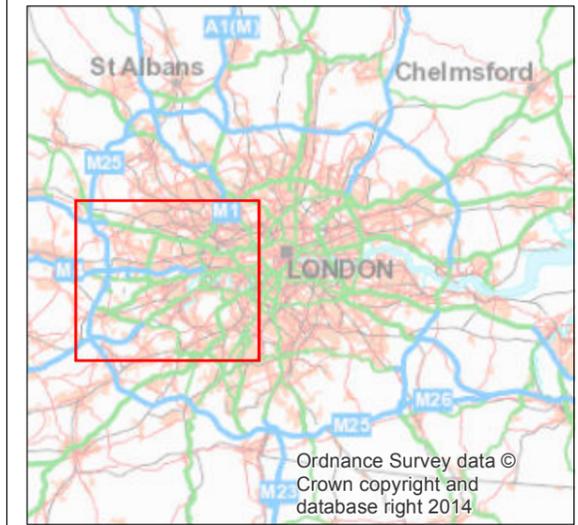
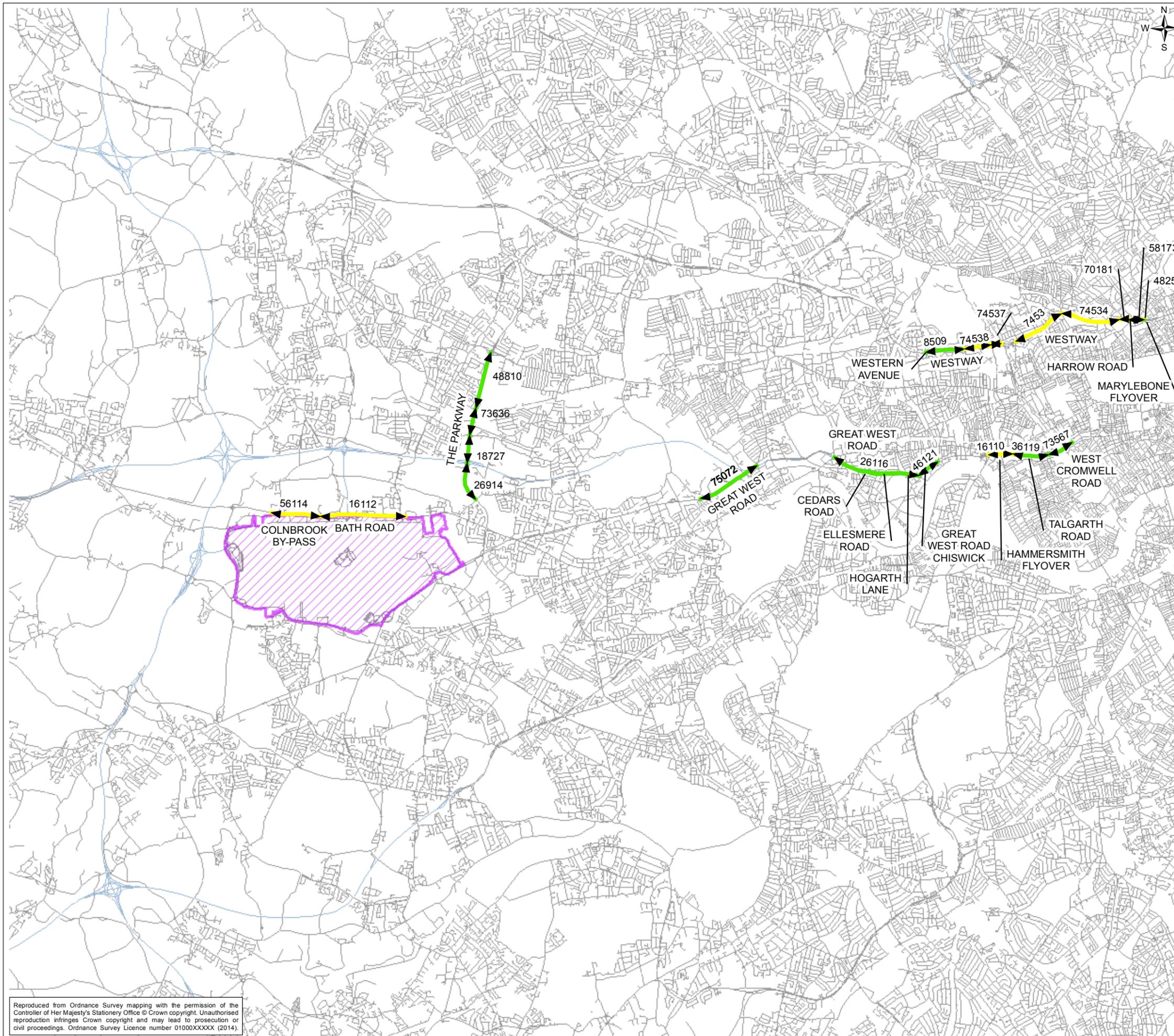
**FIGURE 6.13**

Legend

**Annual Mean Roadside NO<sub>2</sub> Concentrations (µg/m<sup>3</sup>) - 2030**

- 32 - 40 At Risk of Exceeding the Limit Value
- >40 Exceeding the Limit Value
- Heathrow Existing Boundary

The numbers displayed are the Census Area Identification Numbers.



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Drawing Title  
**PCM Annual Mean Roadside NO<sub>2</sub> Concentrations (µg/m<sup>3</sup>) – 2030**

Drawing Status  
 Scale @ A3: 1:90,000 DO NOT SCALE

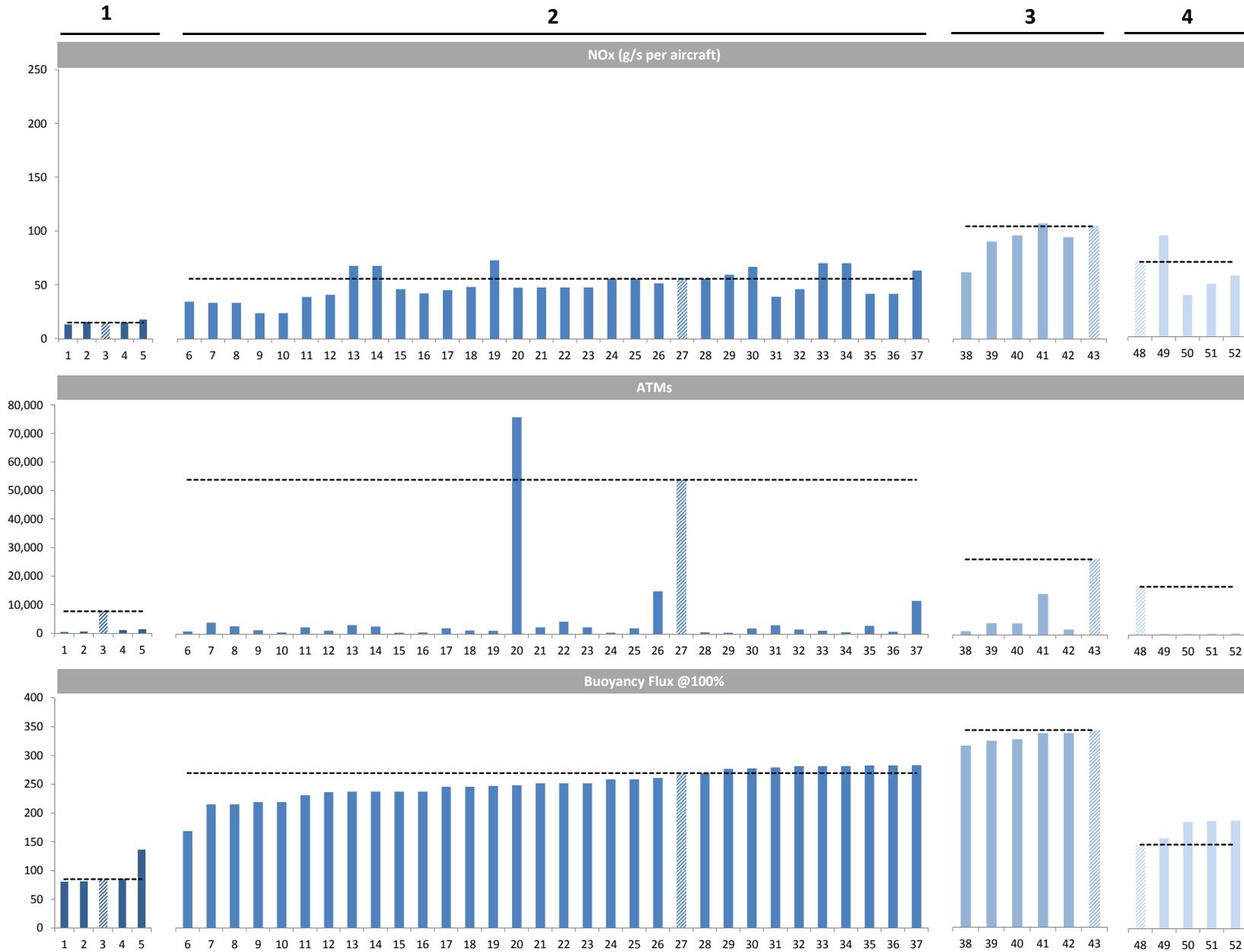
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**FIGURE 6.13**

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**Figure B1 – MCAT Assignments Heathrow Baseline 2009. MCAT group shown along top axis. Aircraft ID shown along bottom axis. Lead aircraft shown as bar with hatched shading.**



5

6

7

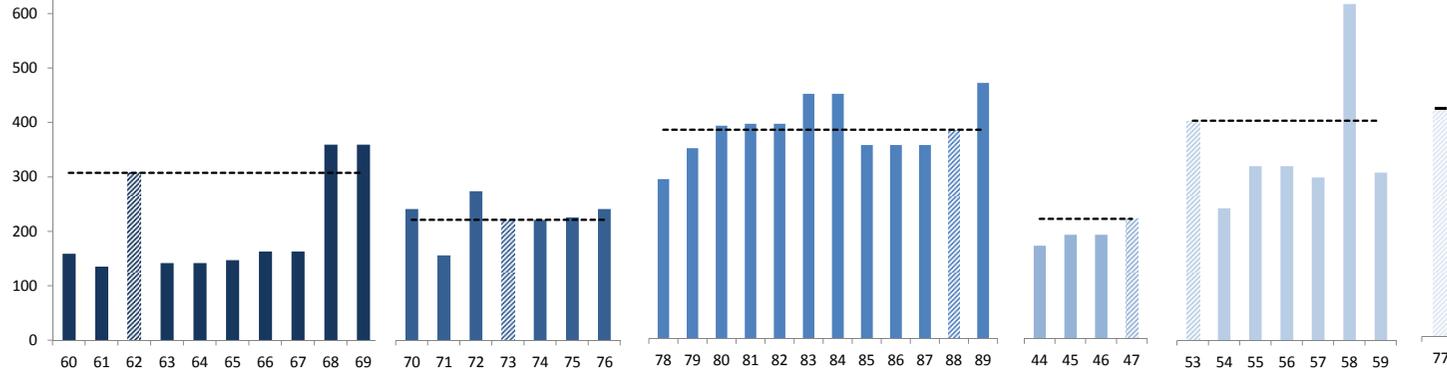
8

9

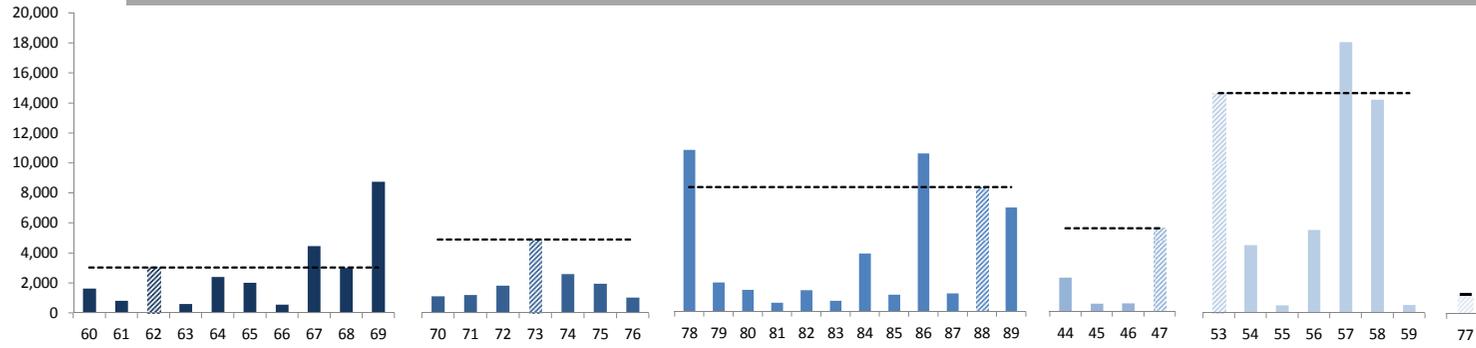
10

NOx (g/s per aircraft)

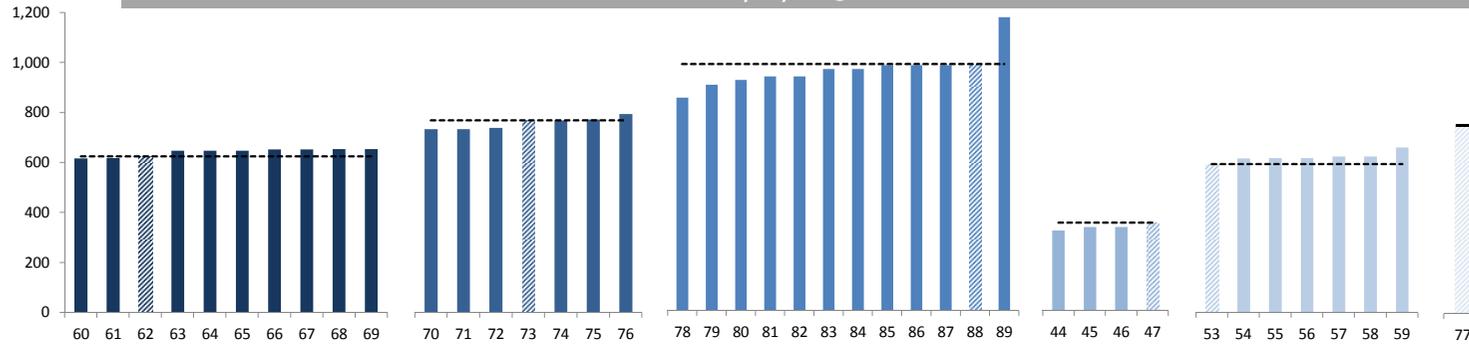
4 engines



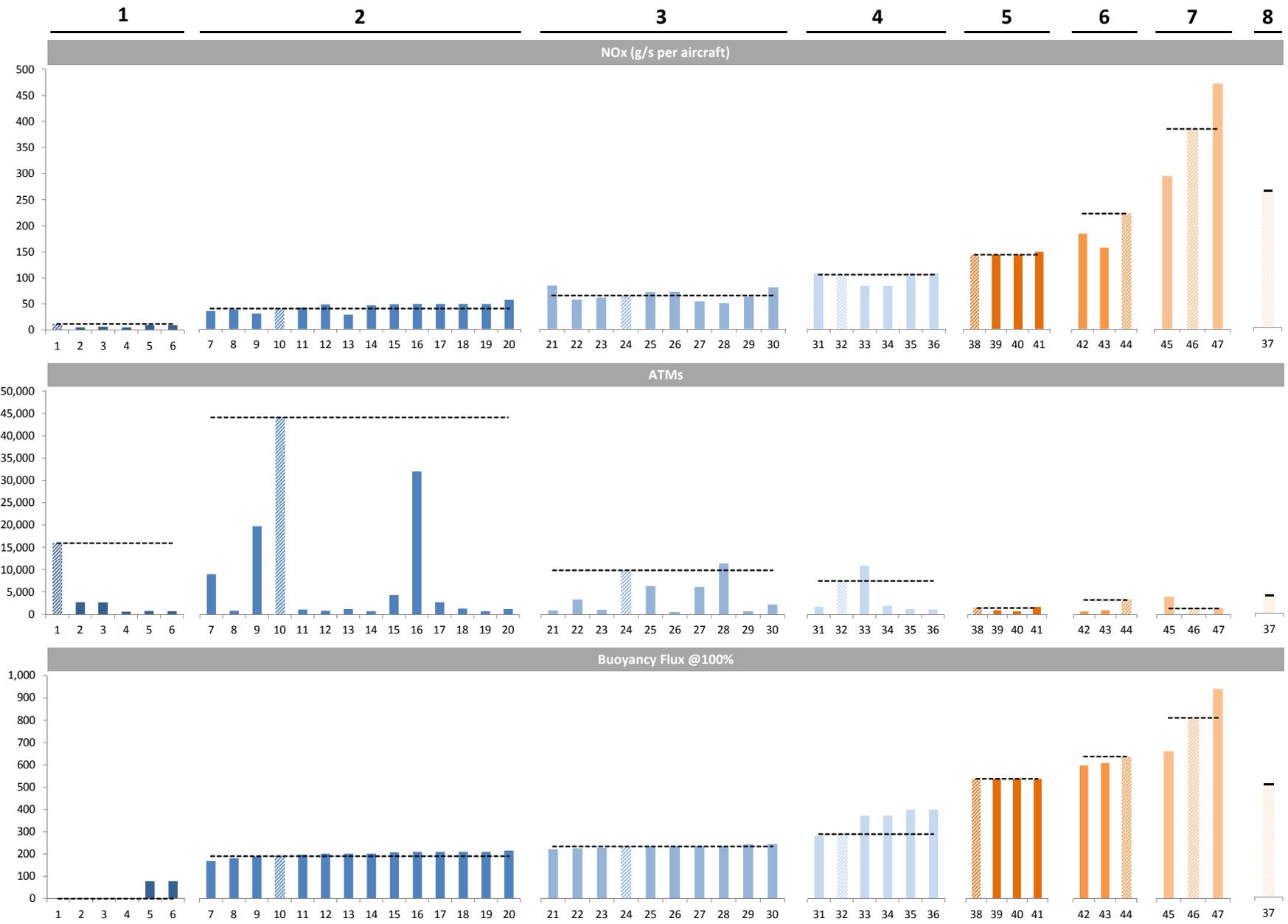
ATMs



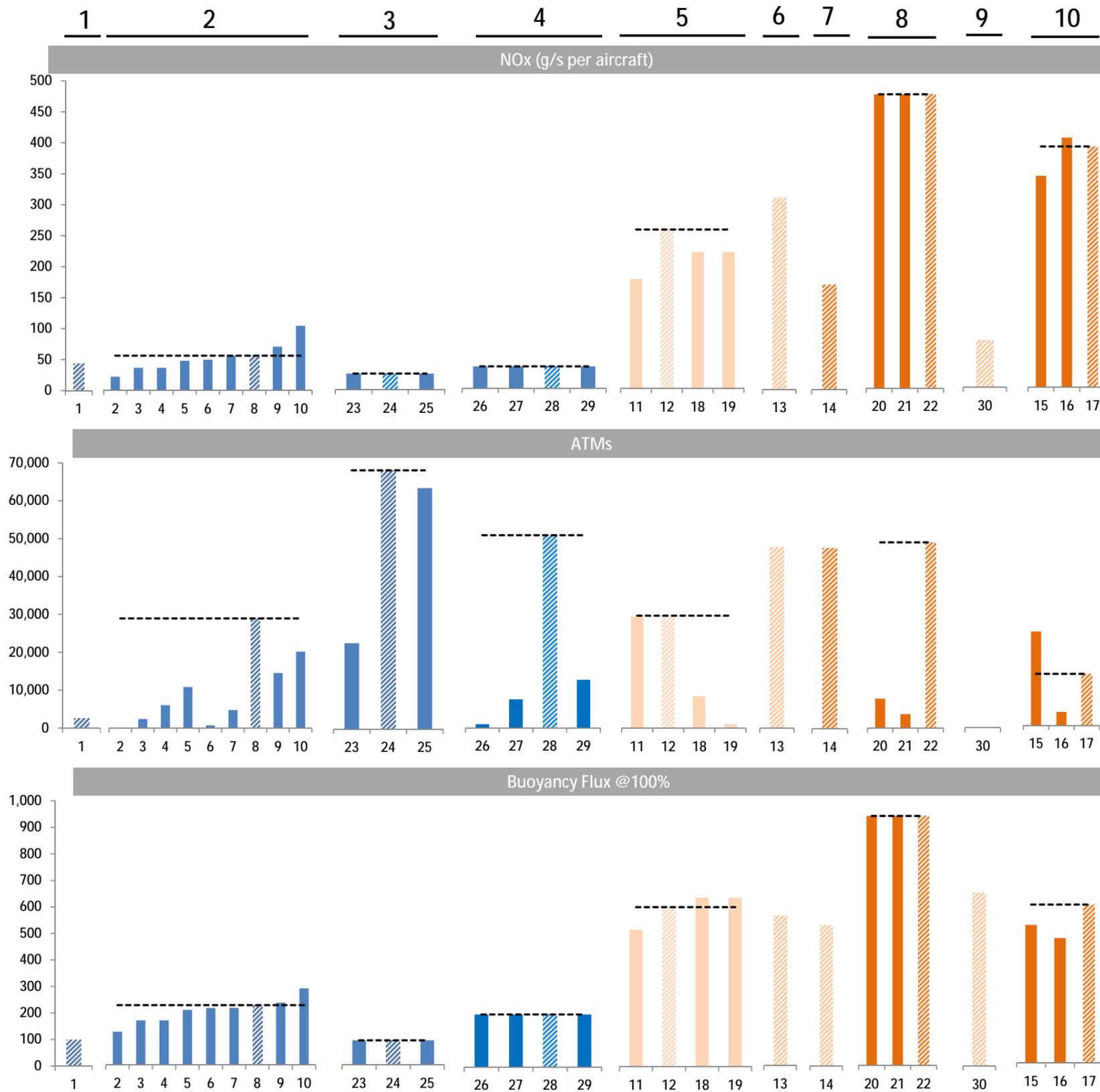
Buoyancy Flux @100%



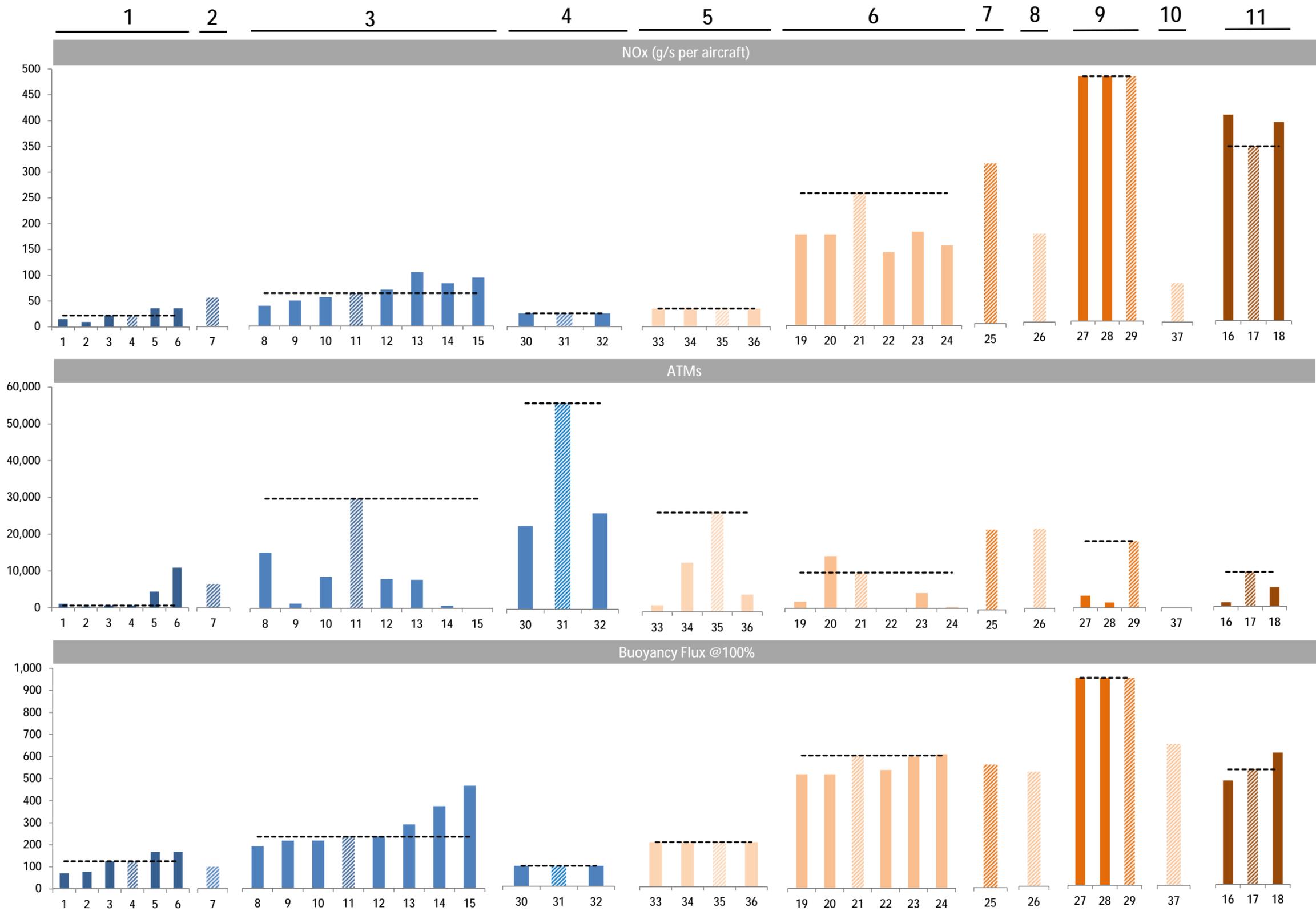
**Figure B2 - MCAT Assignments Gatwick Baseline 2009 MCAT group shown along top axis. Aircraft ID shown along bottom axis. Lead aircraft shown as bar with hatched shading.**



**Figure B3 – MCAT Assignments Heathrow Do-Minimum, NWR and ENR MCAT group shown along top axis. Aircraft ID shown along bottom axis. Lead aircraft shown as bar with hatched shading.**



**Figure B4 - MCAT Assignments Gatwick Do-Minimum and 2R MCAT group shown along top axis. Aircraft ID shown along bottom axis. Lead aircraft shown as bar with hatched shading.**



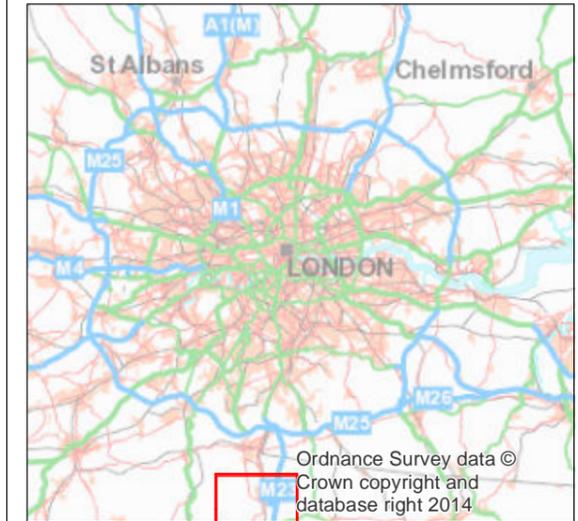
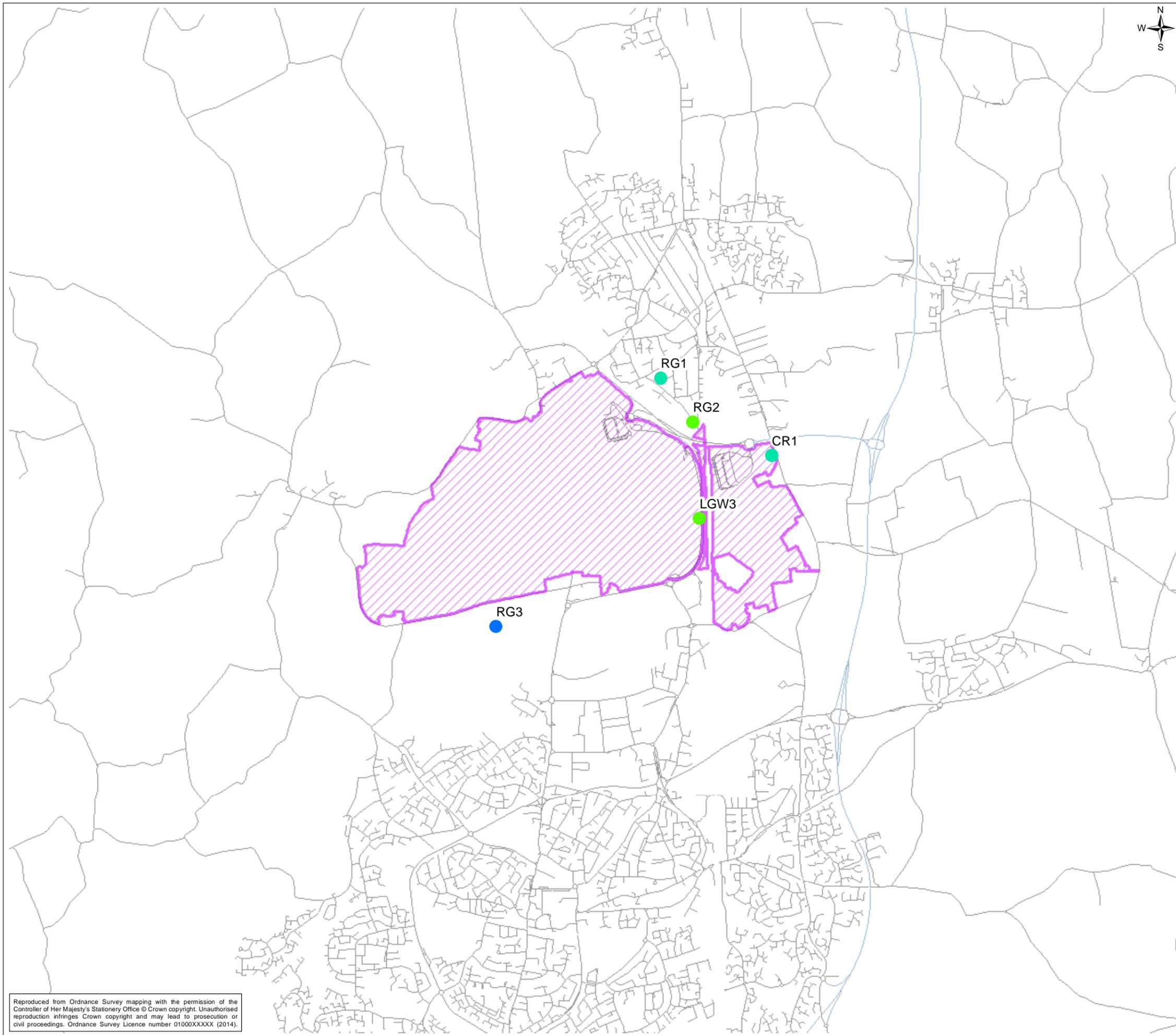
**FIGURE E1**



**Legend**

**Measured Annual Mean NO<sub>2</sub> Concentrations (µg/m<sup>3</sup>) - 2009**

- < 10
- 10 - 20
- 20 - 30
- 30 - 40
- 40 - 50
- 50 - 60
- > 60
- Gatwick Existing Boundary



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Drawing Title  
**Location of Monitoring Sites in the Gatwick Study Area Used for 2009 Model Verification**

Drawing Status  
Scale @ A3: 1:40,000 DO NOT SCALE

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Client No.

Drawing No. **FIGURE E1**

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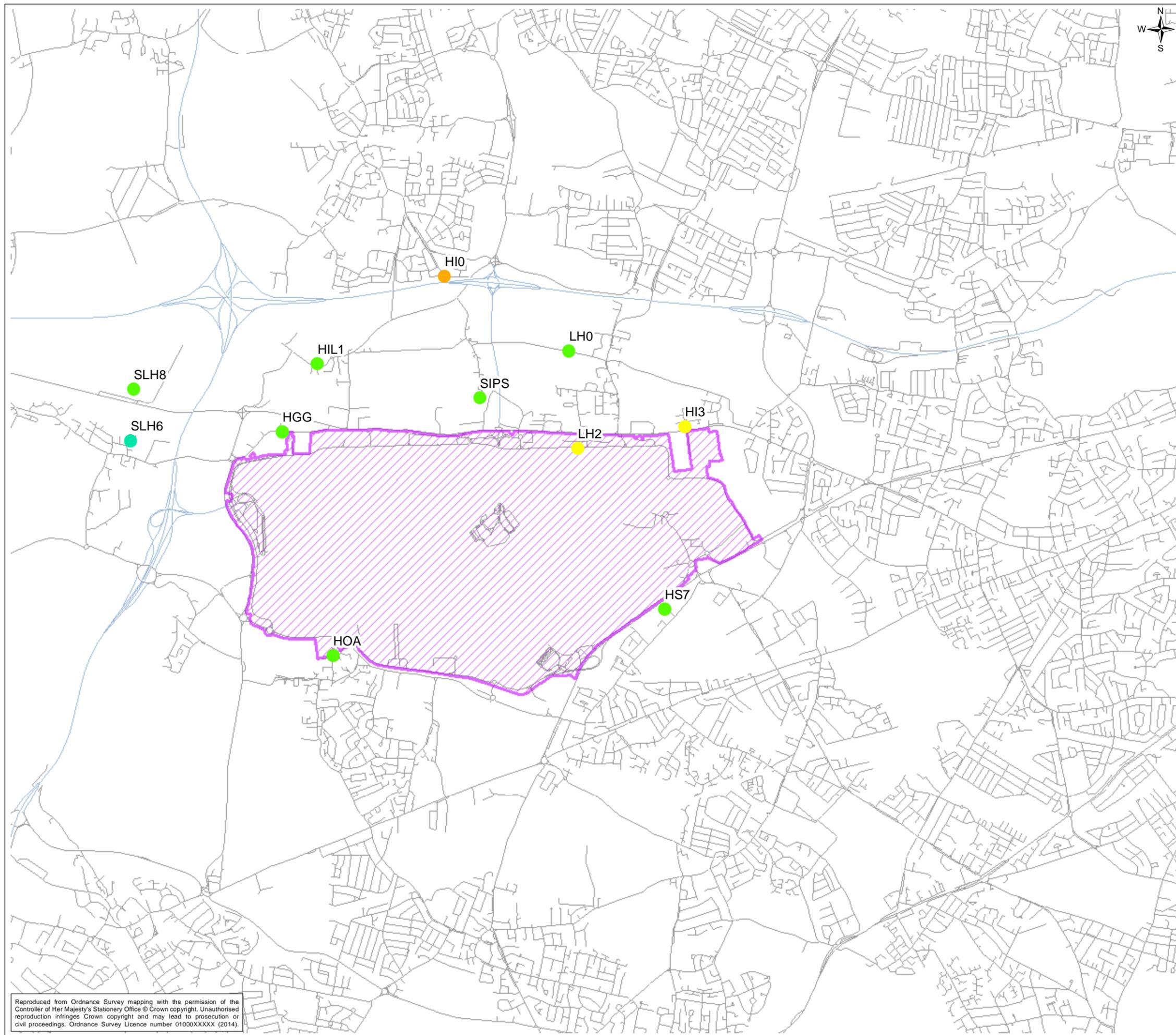
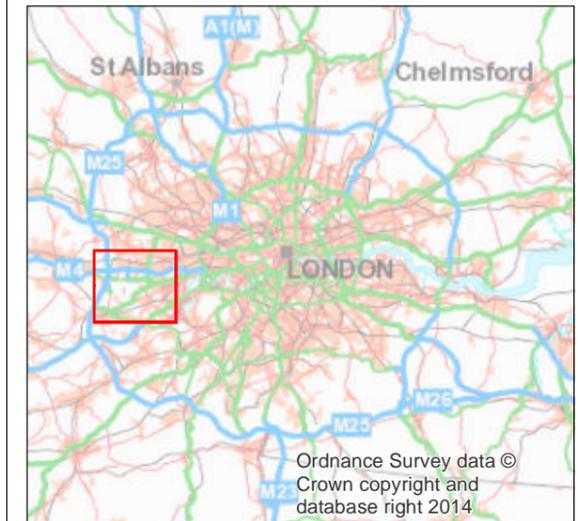
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**FIGURE E2**

Legend

**Measured Annual Mean NO<sub>2</sub> Concentrations (µg/m<sup>3</sup>) - 2009**

- < 10
- 10 - 20
- 20 - 30
- 30 - 40
- 40 - 50
- 50 - 60
- > 60
- Heathrow Existing Boundary



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Drawing Title						
Location of Monitoring Sites in the Heathrow Study Area Used for 2009 Model Verification						
Drawing Status						
Scale @ A3	1:40,000		DO NOT SCALE			
Jacobs No.	B4160007					
Client No.						
Drawing No.	FIGURE E2					
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