



1rL10129

REPORT FOR

ARTIFICIAL LIGHTING IMPACT ASSESSMENT

AT

HECKMONDWIKE ROAD, DEWSBURY

PREPARED FOR

ARIF ASMAL

PREPARED BY

LEWIS ELLISON

PLANNING AND ENVIRONMENTAL CONSULTANTS

Date

16TH APRIL 2024

Mr Arif Asmal
Heckmondwike Road, Dewsbury
1rL10129
16th April 2024



QUALITY ASSURANCE

Issue / Revision	Issue	Revision 1	Revision 2
Remarks	DRAFT	Issue 1	
Date	16 th April 2024	16 th April 2024	
Prepared By	Lewis Ellison	Lewis Ellison	
Job Title	Technical Director	Technical Director	
Signature			



Contents

EXECUTIVE SUMMARY	4
1 INTRODUCTION	5
1.1 Background	5
1.2 Site Location and Context	5
1.3 Limitations	5
2 LEGISLATION, GUIDANCE AND POLICY	6
2.1 Local Planning Policy	6
3 METHODOLOGY	9
3.1 Baseline	9
3.2 Impact Significance	9
3.3 Lighting Classes	10
4 BASELINE ASSESSMENT	11
4.1 Existing Lighting Environment	11
4.1.1 Surrounding Area	11
4.1.2 Environmental Zone	11
4.2 Road Lighting Classification	11
4.3 Operational Area Lighting	12
4.4 Proposed Artificial Lighting	12
4.5 Sensitive Ecological Receptors	15
4.5.1 Operational Phase Sensitive Receptors	15
5 ASSESSMENT	17
5.1 Operational Phase Assessments	17
5.1.1 Sensitive Residential Receptors	17
5.1.2 Operational Assment	19
6 BEST PRACTICE MEASURES	20
7 CONCLUSION	21
ABBREVIATIONS	22
Appendix I - Figures	23
Assessors CV	29

Mr Arif Asmal
Heckmondwike Road, Dewsbury
1rL10129
16th April 2024



EXECUTIVE SUMMARY

PEC were commissioned by Mr Arif Asmal to undertake an Artificial Lighting Impact Assessment in support of a proposed commercial development at Heckmondwike Road, Dewsbury Moor, Dewsbury, WF133NS.

The proposals comprise of the construction of a petrol filling station with associated retaining wall, jet wash and parking.

As part of the proposed development a number of artificial lights will be installed across the site for various uses including site safety, security and decoration. Subsequently, there is potential for the proposals to cause impacts at nearby sensitive receptors as a result of the proposed artificial lighting. An Artificial Lighting Impact Assessment is therefore required in order to determine baseline conditions at the site, assess site suitability for the proposed end-use and assess the potential impacts as a result of the proposed development.

Modelling was undertaken in order to determine suitable locations for the proposed lighting, determine safe levels of artificial light for the proposed development and predict impacts associated with changes in lighting levels at nearby sensitive locations.

The modelling results indicated that following the proposed lighting systems installation in line with the details provided within this report, sufficient levels of lighting will be achieved at the relevant areas across the proposed development. Additionally lighting levels at nearby sensitive areas can be considered **not significant**. Based on the assessment results, the site is considered suitable for the proposed end use and artificial lighting is **not considered a constraint** to planning consent for the proposed development.

Commented [KS1]: BRIEF FROM CLIENT!!

Before the installation of external artificial lighting commences a lighting scheme shall be submitted to and approved in writing by the Local Planning Authority. The scheme should include the following information:

- a) The proposed hours of operation of the lighting*
- b) The location and specification of all of the luminaires*
- c) The proposed design level of maintained average horizontal illuminance for the areas that needs to be illuminated.*
- d) The predicted vertical illuminance that will be caused by the proposed lighting when measured at windows of any properties in the vicinity.*
- e) The measures that will be taken to minimise or eliminate glare and stray light arising from the use of the lighting that is caused beyond the boundary of the site*
- f) The methods of switching and controlling the lighting so that it is only operated at*

the permitted times and at times when it is required. The external artificial lighting shall be installed and operated thereafter in accordance with the approved scheme.

Reason: *In the interests of the protection of residential amenity to adjacent dwellings and to accord with Policies LP24 and LPS2 of the Kirklees Local Plan and in the interests of Policies set out in Chapter 12 of the National Planning Policy Framework*

Mr Arif Asmal
Heckmondwike Road, Dewsbury
1rL10129
16th April 2024



1 INTRODUCTION

1.1 BACKGROUND

Planning and Environmental Consultants (PEC) Ltd have been commissioned by Mr Arif Asmal, hereafter referred to as “the Client” to undertake an Artificial Lighting Assessment in support of a planning application for a proposed commercial petrol filling station at Heckmondwike Road, Dewsbury Moor, Dewsbury, WF133NS, herein after referred to as the “Proposed Development”.

1.2 SITE LOCATION AND CONTEXT

The Proposed Development is located at Heckmondwike Road, Dewsbury Moor, Dewsbury, WF133NS at approximate National Grid Reference (NGR) 422700, 422050. Reference should be made to Figure 1 within Appendix I for a location plan.

The proposals comprise the construction of a petrol filling station, with associated commercial space, retaining wall, jet wash and parking (including electric vehicle charging).

As part of the proposal, a number of artificial lights will be introduced in close proximity to a number of existing residential units. Subsequently, the Proposed Development has the potential to cause impacts at nearby sensitive residential receptors as a result of light spill during the operation of the development.

An Artificial Lighting Impact Assessment is therefore required to quantify baseline conditions, consider the suitability of the site for the proposed end-use and to assess potential impacts as a result of the development. This is detailed in the following report.

1.3 LIMITATIONS

This report has been produced in accordance with PEC Ltd standard terms of engagement. This report is solely for the use of the Client and those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed. Should any third party wish to use or rely upon the contents of the report, written approval must be sought from PEC Ltd at which point a charge may be levied against such approval.



2 LEGISLATION, GUIDANCE AND POLICY

The following legislation, guidance and policy will be considered and adhered to during the preparation of the Lighting Impact Assessment:

- The National Planning Policy Framework (NPPF), updated on 20th December 2023.
- The National Planning Practice Guidance (NPPG), relevant chapters updated on 1st November 2019.
- Clean Neighbourhoods and Environmental Act, 2005.
- Guidance Notes for the Reduction of Obtrusive Light, Institution of Lighting Professionals, 2021.
- Lighting in the Countryside: Towards Good Practice, Department for Communities and Local Government, 2005.
- Bats and Artificial Lighting in the UK, Institute of Lighting Professionals, BATS Conservation Trust Lighting Guidance, 2023.
- Environmental Protection Act, 1990.
- BS EN 12464-2:2014 Light and lighting – Lighting of work places

2.1 LOCAL PLANNING POLICY

The Kirklees Council Local Development Plan¹ was adopted in February 2019 and provides guidance and policy on development and construction within the local administration. A review of the plan provides the following policies in relation to artificial lighting:

Policy LP24

Design

Good design should be at the core of all proposals in the district and should be considered at the outset of the development process, ensuring that design forms part of pre-application consultation of a proposal. Development briefs, design codes and masterplans should be used to secure high quality, green, accessible, inclusive and safe design, where applicable. Where appropriate and in agreement with the developer schemes will be submitted for design review.

Proposals should promote good design by ensuring:

- a. the form, scale, layout and details of all development respects and enhances the character of the townscape, heritage assets and landscape;*
- b. they provide a high standard of amenity for future and neighbouring occupiers; including maintaining appropriate distances between buildings and the creation of development-free buffer zones between housing and employment uses incorporating means of screening where necessary;*
- c. extensions are subservient to the original building, are in keeping with the existing buildings in terms of scale, materials and details and minimise impact on residential amenity of future and neighbouring occupiers;*
- d. high levels of sustainability, to a degree proportionate to the proposal, through:*
 - i. The re-use and adaptation of existing buildings, where practicable;*
 - ii. design that promotes behavioural change, promoting walkable neighbourhoods and making walking and cycling more attractive;*
 - iii. considering the use of innovative construction materials and techniques, including reclaimed and recycled materials;*
 - iv. where practicable, minimising resource use in the building by orientating buildings to utilise passive solar design. This includes encouraging the incorporation of vegetation and tree planting to assist heating and cooling and considering the use of renewable energy;*
 - v. providing charging points to encourage the use of electric and low emission vehicles;*

¹ Kirklees Local Plan – Adopted 27th February 2019



- vi. incorporating adequate facilities to allow occupiers to separate and store waste for recycling and recovery that are well designed and visually unobtrusive and allows for the convenient collection of waste;*
 - vii. designing buildings that are resilient and resistant to flood risk, where such buildings are acceptable in accordance with flood risk policies and through incorporation of multi-functional green infrastructure where appropriate;*
 - viii. designing places that are adaptable and able to respond to change, with consideration given to accommodating services and infrastructure, access to high quality public transport facilities and offer flexibility to meet changing requirements of the resident / user.*
- e. the risk of crime is minimised by enhanced security, and the promotion of well-defined routes, overlooked streets and places, high levels of activity, and well-designed security features;*
 - f. the needs of a range of different users are met, including disabled people, older people and families with small children to create accessible and inclusive places;*
 - g. any new open space is accessible, safe, overlooked and strategically located within the site and well integrated into wider green infrastructure networks;*
 - h. development contributes towards enhancement of the natural environment, supports biodiversity and connects to and enhances ecological networks and green infrastructure;*
 - i. the retention of valuable or important trees and where appropriate the planting of new trees and other landscaping to maximise visual amenity and environmental benefits; and*
 - j. the provision of public art where appropriate.*

Policy LP25

Advertisements and shop fronts

Shop fronts, signs and advertisements make a significant contribution to the character and local identity of the district's town centres.

- 1. The development of new or replacement shop front units and display of advertisements will only be permitted if they satisfy the following criteria:*
 - a. the design is consistent with the character of the existing building in terms of scale, quality and use of materials;*
 - b. proposals respect the character of the locality and any features of historic, architectural, cultural or other special interest;*
 - c. the shop fascia is designed to be in scale, in its depth and width, with the façade and street scene of which it forms part.*
- 2. Proposals for the alteration of existing shop fronts or installation of new shop fronts and display of advertisements on a Listed Building or within a Conservation Area should preserve or enhance the character and appearance of the building, the area in which it is located and any features of architectural or historical interest. Existing traditional shop fronts shall be retained and restored unless exceptional circumstances apply. Proposals for new shop fronts and advertisements must be of a high standard of design and be appropriate in style, scale and materials to the building and its setting.*

Policy LP52

Protection and improvement of environmental quality

Proposals which have the potential to increase pollution from noise, vibration, light, dust, odour, shadow flicker, chemicals and other forms of pollution or to increase pollution to soil or where environmentally sensitive development would be subject to significant levels of pollution, must be accompanied by evidence to show that the impacts have been evaluated and measures have been incorporated to prevent or reduce the pollution, so as to ensure it does not reduce the quality of life and well-being of people to an unacceptable level or have unacceptable impacts on the environment.

Such developments which cannot incorporate suitable and sustainable mitigation measures which reduce pollution levels to an acceptable level to protect the quality of life and well-being of people or protect the environment will not be permitted.

Where possible, all new development should improve the existing environment

Mr Arif Asmal
Heckmondwike Road, Dewsbury
1rL10129
16th April 2024



Reference has been made to these policies by assessing impacts on existing sensitive receptors as a result of the proposals as well as assessing the suitability of the site for the proposed end use.

3 METHODOLOGY

The Artificial Lighting Impact Assessment included the production of a computational model of the development and an evaluation of associated impacts. This included assessment of light trespass at residential receptor locations.

In order to assess the potential impacts of proposed artificial lighting in the area, a model of assumed lighting design, has been constructed using the Relux Lighting Software (V2024.1.12). The calculations performed within the assessment assumed the worst-case effect of the proposed development lighting on existing receptors.

The methodology for each element of the assessment is outlined in the following subsections.

3.1 BASELINE

Existing lighting conditions in the vicinity of the development site were identified in order to provide a reference for assessment. The Lighting in the Countryside² document states the following items should be considered during the determination of baseline:

- A review of the area and landscape together with any designations;
- An overview of existing lighting;
- Identification of potential receptors; and
- Environmental Zone Classification.

The Institute of Lighting Professionals (ILP) has developed an Environmental Zone classification system for the categorisation of assessment locations. This is summarised in Table 1.

Table 1: Environmental Zone Classification

Category	Description	Examples
E0	Dark landscapes	UNESCO Starlight Reserves and IDA Dark Sky Parks
E1	Intrinsically dark landscapes	National Parks, Areas of Outstanding National Beauty, etc
E2	Low district brightness areas	Village or relatively dark outer suburban locations
E3	Medium district brightness	Small town centres or suburban locations
E4	High district brightness areas	Town/city centres with high levels of night-time activity

The criteria shown in Table 1 were utilised to determine the most appropriate Environmental Zone for the development location.

3.2 IMPACT SIGNIFICANCE

The development was assessed for the disturbance and/or nuisance to nearby existing residential receptors due to artificial lighting.

Light trespass was considered for the relevant Environmental Zone, as previously outlined in Table 1. Obtrusive light limitations for exterior lighting installations, relevant to this assessment, have been determined by the ILP. These are summarised in Table 2.

² Lighting in the Countryside; Towards Good Practice, Department for Communities and Local Government, 2005.



Table 2: Obtrusive Light Limitations for Exterior Lighting Installations

Environmental Zones	Light Trespass (into Windows) E_v (lux) ^(a)		Maximum Luminous Intensity (cd)		Maximum Building Luminance (cf/m ²)
	Pre-Curfew	Post-Curfew ^(b)	Pre-Curfew	Post-Curfew ^(b)	
E0	0	0	0	0	0
E1	2	1 ^(b)	2500	0	0
E2	5	1	7500	500	5
E3	10	2	10000	1000	10
E4	25	5	25000	2500	25

NOTE: (a) Vertical Illuminance measured flat at the glazing at the centre of the window.
 (b) From public road lighting installations only.

The criteria in Table 2 were utilised to determine the potential for adverse impacts of light trespass at sensitive locations across the development.

3.3 LIGHTING CLASSES

All selection procedures and parameters present within the assessment are assessed using guidelines outlined within CEN TR 13201-1 2014 "Road lighting - Part 1: Guidelines on selection of lighting classes". All calculations for individual road networks are assessed in compliance to lighting classes within BS EN 5489-1:2020.

The adaptive lighting level(s) should maintain average luminance or illuminance in line with lighting limits of selected M, C or P classes.

The assessment of classes is based upon the inherit speeds of proposed or existing highway networks. For lighting classes M and C typical road designations range from motorways (very high, >100km/h) to urban roads.

Lighting class P is considered for a range of low speeds roads (<40km/h) to pedestrianised paths and cycle routes.



4 BASELINE ASSESMENT

Existing lighting conditions in the vicinity of the proposed development site were identified in order to provide a baseline for assessment. These are detailed in the following sections.

4.1 EXISTING LIGHTING ENVIRONMENT

4.1.1. SURROUNDING AREA

The proposed development site is situated on a plot of currently disused land in a predominantly residential area. The site is located on a hill and as such there is an elevation change from the front to the rear of the site of several meters. The residential receptors located on the land north and west of the Proposed Development are situated approximately 2 meters lower than the site plot. The residential receptors to the east and the south are located on the same level as the proposed development.

4.1.2. ENVIRONMENTAL ZONE

For the purpose of the assessment, the surrounding area has been classified as category E3 “Medium district brightness - Small town centres or suburban locations”. It should be noted that there are a number of existing artificial lights in the form of streetlights and residential lighting already present around the site, that have not been factored into this model to ensure a worst case assessment and that the site is not impacting the surrounding area.

4.2 ROAD LIGHTING CLASSIFICATION

Roadways across the proposed development will be assessed against Road Lighting Class P which is considered for a range of low speeds roads (<40km/h) with expected pedestrian use and parked cars. Class P has been utilised to determine the level of artificial light required for the internal road system.

Table 3: Parameters for the Selection of Lighting Class P

Parameter	Option	Description	Weighting Value
Travel Speed	Very Low (walking speed)	Very low, walking speed	0
Use Intensity	Busy		1
Traffic Composition	Pedestrians and motorised traffic		1
Parked Vehicles	Present		1
Ambient Luminosity	High	shopping windows, advertisement expressions, sport fields, station areas, storage areas	1
Total: Sum of the Weighting Values (VWS)			4
Number of lighting class P = 6 - VWS			P2

As such a class of P2 has been used for the assessment of the lighting requirements for the internal road network. According to the BSI Standards Publication – Road Lighting Part 2: Performance requirements³, the following horizontal illuminance should be greater than 10lx average and no less than 2lx.

³ BS EN 13201-2:2015, BSI Standards Publication – Road Lighting Part 2: Performance requirements (2016)

4.3 OPERATIONAL AREA LIGHTING

The lighting levels in external operational areas of the Petrol station are also required to comply with BS EN 12464-2 as detailed within Table 4.

Table 4: Operational Area Lighting Levels

Activity	Maintained illuminance (Lux)
Vehicle Parking/Storage Area	5
Entry and exit driveways: dark environment	20
Entry and exit driveways: light environment	50
Air pressure and water checking points and other service areas	150
Meter reading area	150

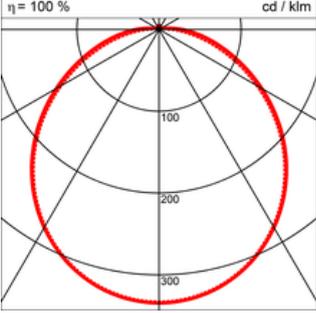
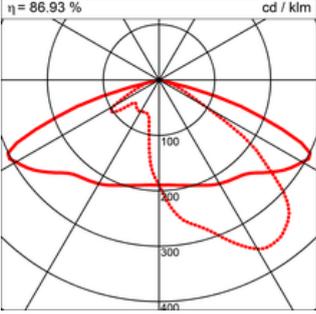
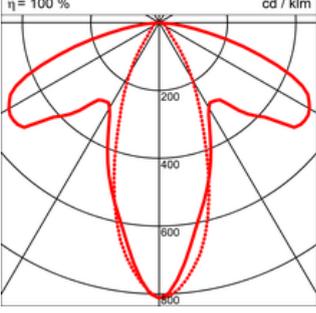
4.4 PROPOSED ARTIFICIAL LIGHTING

Based on the finding of the baseline assessment (section 4), a selection of luminaires have been indicated which allow for adequate illuminance across the site. Table 5 indicates the proposed forms of artificial light which will be utilised across the proposed development including luminaires which will be installed around the site to provide security and ease of access for future users.

The products specified within Table 5 are examples which are used to determine the required specifications which the final products should mirror.

Table 5: Proposed Artificial Lighting

Luminaire	Luminaire Data	LDC
1. Cree Lighting – Dot Multi-KTEA-S-_-12L-407 + KT-KIT		
	LiTG Class	A30
	CIE Flux Codes	29 71 98 100 87
	Efficiency	86.82%
	System Power	39 W
	Luminaire Output	158.9 lm/W
	System Light Flux	6199 lm
	Protection Class	Protection Class II
	Protection Degree	IP 66

Luminaire	Luminaire Data	LDC	
2. Ovia - Utility - Bulkhead - Evo Orb-OV9700WH12			
	LiTG Class	A41	$\eta = 100\%$ 
	CIE Flux Codes	46 76 93 97 100	
	Efficiency	Absolute Photometry	
	System Power	12 W	
	Luminaire Output	91.7 lm/W	
	System Light Flux	1100 lm	
	Protection Class	Protection Class II	
	Protection Degree	IP 65	
3. Cree Lighting - ENERGY DUE-TRMA-02-_-9L-228			
	LiTG Class	A30	$\eta = 86.93\%$ 
	CIE Flux Codes	37 77 98 100 87	
	Efficiency	86.93 %	
	System Power	67 W	
	Luminaire Output	104 lm/W	
	System Light Flux	6966 lm	
	Protection Class	Protection Class I	
	Protection Degree	IP 66	
4. Selux - Olivio-SX 960 43-9			
	LiTG Class	A40	$\eta = 100\%$ 
	CIE Flux Codes	49 75 96 100 100	
	Efficiency	Absolute Photometry	
	System Power	39 W	
	Luminaire Output	92.3 lm/W	
	System Light Flux	3600 lm	
	Protection Class	Protection Class II	
	Protection Degree	IP 65	

Mr Arif Asmal
Heckmondwike Road, Dewsbury
1rL10129
16th April 2024



The proposed Luminaire 1 as detailed in Table 5 is to be installed to the underside of the forecourt canopy at a height of approximately 4.7 meters (or as close as practically possible) as detailed in Figure 2. Additionally, the canopy lights should be rotated and tilted as detailed in Table 6. This will provide sufficient light for future users to safely access and use the petrol filling pumps without the need of additional lighting, it will also provide a level of security. The lights should be switched off outside of operational hours. Furthermore, two additional units should be attached under the lip of the roof over the shop front to provide additional illumination to the parking area and the shop front. These lights should be tilted to the floor at the base of the parking spaces as detailed in Table 6 and either switched off outside of operational hours or attached to sensors and a 1-minute timer applied if needed for additional security.

The proposed Luminaire 2 as detailed in Table 5 is to be located one the outside of the proposed building, as shown in Figure 2, at an approximate height of 1.8 meters to ensure the luminaries on the west side of the building are below the level of the fence, preventing unnecessary light spillage. These lights are to provide safety and security to the shop building and to light staff only access areas. These luminaires should be attached to sensors and a 1-minute timer applied outside of operational hours.

The proposed Luminaire 3 as detailed in Table 5 are to be located to the south of the site to light the entrance, exit and the jet wash area as detailed in Figure 2 and Table 6. These luminaires should be set at a height of 6 meters and switched off outside of operational hours. It should be noted that there is currently a public streetlight already placed next to the exit on the pavement just outside of the site boundary which has not been considered in this model.

The proposed Luminaire 4, as detailed in Table 5 are to be located in the jet wash area at an approximate height of 1.4 m (or as close as practically possible) to ensure the light is hung below the height of the surrounding fence and tilted to reduce light spillage onto nearby residential receptors. See Figure 2 for location details and Table 6 for the angle and tilt information. These lights are to ensure the jet was area is lit to sufficient standards and should be switched off outside of operational hours or attached to sensors and a 1-minute timer applied if needed for additional security.

The operating hours of this development are proposed to be 07.00-22.00 Monday to Friday and 07.30-22.00 Saturdays and Sundays. Outside of these hours, no activities are to be carried out on the premises and all lights, with the exception of security lighting, should be turned off. Any lights necessary for security should be attached to sensors and set on a one-minute timer.

Table 6: Luminaire Angle and Rotation Information

Luminaire	Angle (Z Rotation) (°)	Tilt (C0 Rotation)(°)
1A	204	-4
1B	204	-4
1C	264	
1D	140	
1E	264	
1F	140	
1G	264	
1H	140	
1I	320	
1J	86	
1K	320	
1L	86	
1M	320	
1N	86	
2	Wall mounted, fixed angle	Wall mounted, fixed tilt
3A	65	
3B	56	
3C	167	
3D	62	
3E	167	
4A	340	69
4B	62	69

4.5 SENSITIVE RECEPTORS

A sensitive receptor is defined as any residential area which may be affected by changes in lux levels as a result of a development. Potential receptors which are sensitive to artificial light have been identified in Figure 3.

4.5.1. OPERATIONAL PHASE SENSITIVE RECEPTORS

A desk-top study was undertaken in order to identify any sensitive receptor locations in the vicinity of the site that require specific consideration during the assessment and are summarised in Table 7.

Table 7: Sensitive Receptor Locations

Receptors	House Address
R1	25 Spen View
R2	23 Spen View
R3	21 Spen View
R4	19 Spen View
R5	17 Spen View
R6	15 Spen View
R7	The Woolpack, 167 Heckmondwike Road
R8	142 & 138 Heckmondwike Road
R9	130-136 Heckmondwike Road

Mr Arif Asmal
Heckmondwike Road, Dewsbury
1rL10129
16th April 2024



Receptors	House Address
R10	Quarry View
R11	128 & 126 Heckmondwike Road
R12	143 Heckmondwike Road
R13	139 & 141 Heckmondwike Road
R14	112 - 120 Heckmondwike Road

The sensitive residential receptors identified in Table 7 represent worst-case locations. However, this is not an exhaustive list and there may be other locations within the vicinity of the site that may experience artificial lighting impacts as a result of the proposed development that have not been individually identified above.

Reference should be made to Figure 3 within Appendix I for a graphical representation of operational phase artificial lighting sensitive receptor locations.

5 ASSESSMENT

There is the potential for artificial lighting impacts on sensitive receptors as a result of the operation of the Proposed Development. These are assessed in the following Sections.

5.1 OPERATIONAL PHASE ASSESSMENTS

5.1.1. SENSITIVE RESIDENTIAL RECEPTORS

Additional artificial lighting associated with the operation of the proposed development has the potential to impact upon receptors either form direct light or light spill. An assessment was therefore undertaken using dispersion modelling in order to quantify potential lux levels at sensitive locations in the vicinity of the site.

Predicted lux levels across the nearby receptors are summarised in Table 8. Exceedances of 2.0lx are highlighted in **bold**.

Table 8: Predicted lux levels across nearby sensitive receptors

Residential Receptor	Window ID	Z (m)	vertical illuminance (lx)
R1	R1 -1	1.5	0
	R1 -2	1.5	0.18
R2	R2 -1	1.5	0.21
R3	R3 -1	1.5	0.06
R4	R4 -1	1.5	0
	R4 -2	4	0.01
R5	R5 -1	1.5	0.01
	R5 -2	1.5	0.01
	R5 -3	6	0
R6	R6 -1	1.5	0.01
	R6 -2	4	0
R7	R7 -1	2	0.5
	R7 -2	2	0.21
	R7 -3	2	0.07
R8	R8 -1	6	0.02
	R8 -2	3.5	0.2
	R8 -3	6	0.03
	R8 -4	3.5	0.26
	R8 -5	6	0.06
	R8 -6	3.5	0.38
	R8 -7	6	0.07
	R8 -8	3.5	0.36
	R8 -9	6	0.06
R9	R9 -1	3.5	0.02
	R9 -2	6	0
R10	R10 -1	3.5	0.01
	R10 -2	6	0
	R10 -3	3.5	0



Residential Receptor	Window ID	Z (m)	vertical illuminance (lx)
	R10 -4	6	0.01
R11	R11 -1	3.5	0.21
	R11 -2	6	0.01
	R11 -3	3.5	0.17
	R11 -4	6	0.01
R12	R12 -1	3.5	1.14
	R12 -2	3.5	0.12
	R12 -3	3.5	1.06
	R12 -4	6	0.01
R13	R13 -1	0	0
	R13 -2	0	0
	R13 -3	3.5	0.06
	R13 -4	6	0
R14	R14 -1	3.5	0.02
	R14 -2	6	0.03
	R14 -3	3.5	0.01
	R14 -4	6	0
	R14 -5	3.5	0.01
	R14 -6	6	0

The predicted concentrations shown in Table 8 indicate that there were no exceedances of 2lx at any of the sensitive residential receptor locations. All residential receptor locations experience lighting levels below the post-curfew limit of 2lx (see figure 4 &5 for graphical representation) and as such it is considered that these locations do not require the implementation of any further mitigation measures to prevent light spillage causing nuisance complaints. As such artificial lighting impacts from the development are not considered to require any further mitigation and should not be considered a constraint to planning.

5.1.2. OPERATIONAL ASSESSMENT

The artificial lighting must provide enough illumination to meet needs for the proposed end use. An assessment was therefore undertaken using dispersion modelling in order to quantify potential lux levels across the site.

Predicted lux levels across the site are summarised in Table 9.

Table 9: Predicted lux levels across the site

Relevant Area	Z (m)	Horizontal Illuminance (lx)
Entrance	0.1	77.58
Under Canopy	0.1	221.02
Jet Wash	0.1	150.99
Shop Front	0.1	78.12
Exit	0.1	64.23

The road lighting classification for the Proposed Development is P2 as an area with low traffic speeds (less than walking speed) and with mixed use including moving vehicles, parked cars and pedestrians. Consequently, according to the BSI Standards Publication; Road Lighting Part 2: Performance requirements⁴, the following horizontal illuminance should be greater than 10lx average and no less than 2lx. The lighting scheme design more than covers this recommendation.

Furthermore, according to the BSI Standards Publication; Light and lighting - Lighting of work places – Part 2: Outdoor work places⁵, for petrol filling stations, the maintained illuminance should exceed 50 lx at entrance and exit driveways (in a light environment) and 150 lx in “Air pressure and water checking points and other service areas” as well as “Meter reading and areas”. As indicated in Table 9, these expectations have been met in all areas, with the area under the canopy reaching 216.15 lx at floor level and the Jet wash area reaching 150.99lx.

The operating hours of this development are proposed to be 07.00-22.00 Monday to Friday and 07.30-22.00 Saturdays and Sundays. Outside of these hours, no activities are to be carried out on the premises and all lights, with the exception of security lighting, should be turned off. Any lights necessary for security should be attached to sensors and set on a one-minute timer.

⁴ BS EN 13201-2:2015, BSI Standards Publication – Road Lighting Part 2: Performance requirements (2016)

⁵ BS EN 12464-2:2014, BSI Standards Publication – Light and Lighting; Lighting of Work Places Part 2: Outdoor Work Places (2014)

Mr Arif Asmal
Heckmondwike Road, Dewsbury
1rL10129
16th April 2024



6 BEST PRACTICE MEASURES

The model takes into account an amount of best practice measures to ensure artificial lighting impacts at sensitive receptors are not significant. The following best practice measures have been included within this assessment and should be implemented as much as practically possible during construction and operational phases in order to keep lighting levels below the ILP criteria and away from the proposed residential units.

Measure to include:

- The use of luminaires that lack UV elements;
- LED luminaires are used due to their sharp cut-off, lower intensity, good colour rendition and dimming capability;
- Internal luminaires should be recessed in proximity to windows to reduce light spill;
- Column heights of 6m on street lighting should be installed to minimise light spill;
- Any external security lighting should be set on motion-sensors and 1 minute timers;

It should be noted that a number of these considerations may also have financial and environmental benefits to the future site users as a result of reduced electricity usage.

Mr Arif Asmal
Heckmondwike Road, Dewsbury
1rL10129
16th April 2024



7 CONCLUSION

PEC were commissioned by Mr Arif Asmal to undertake an Artificial Lighting Impact Assessment in support of a proposed commercial petrol filling station development at Heckmondwike Road, Dewsbury Moor, Dewsbury, WF133NS.

Modelling was undertaken in order to predict impacts associated with changes in artificial lighting levels at sensitive residential receptor locations around the site boundary.

The modelling results indicated that impacts on nearby residential receptors were predicted to be **insignificant** as a result of the proposed development. As such artificial lighting impacts on nearby residential properties **should not be considered a constraint to planning**.

Based on the overall assessment results, **artificial lighting is not considered a constraint to planning consent** for the proposed development.

Mr Arif Asmal
Heckmondwike Road, Dewsbury
1rL10129
16th April 2024



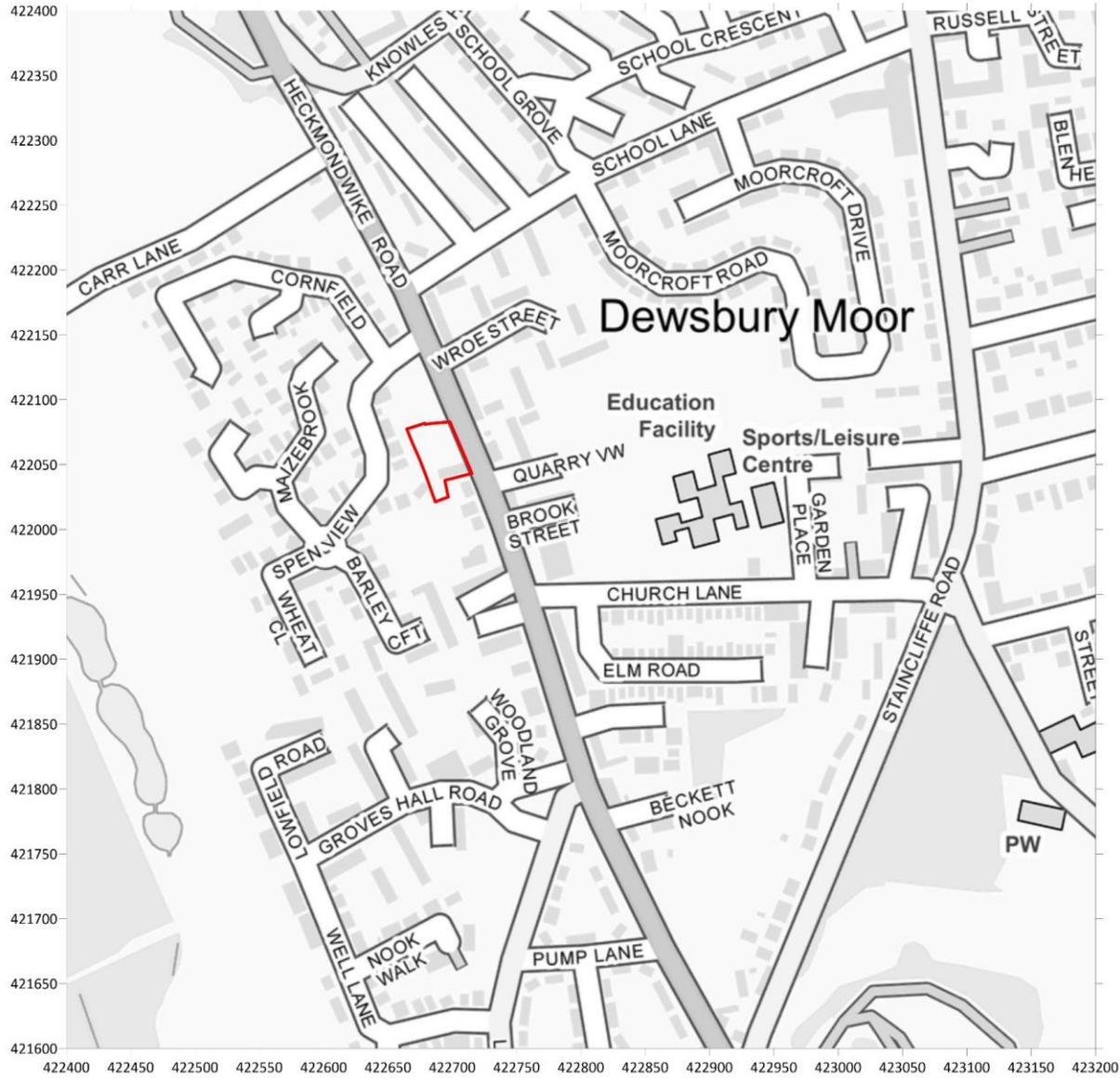
ABBREVIATIONS

BSI	British Standards Institution
ILP	Institute of Lighting Professionals
NGR	National Grid Reference
NPPF	National Planning Policy Framework
NPPG	National Planning Practice Guidance
PEC	Planning and Environmental Consultants
UNESCO	United Nations Educational, Scientific and Cultural Organization

Mr Arif Asmal
Heckmondwike Road, Dewsbury
1rL10129
16th April 2024



APPENDIX I - FIGURES



Legend

 Site Boundary

Title

Figure 1
Site Location

Project

Heckmondwike Road, Dewsbury

Project Number

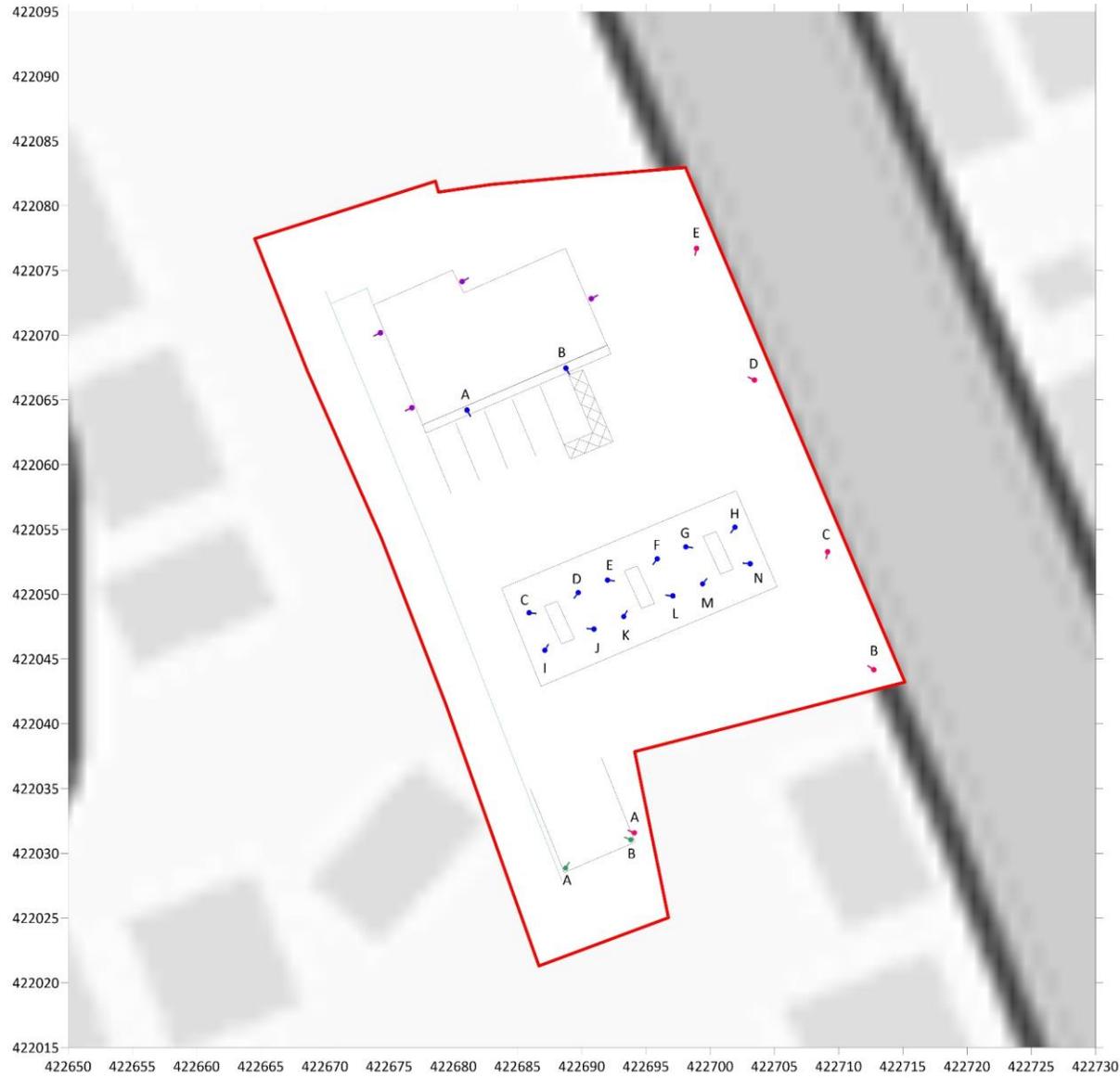
L10129

Contains Ordnance Survey Data
© Crown Copyright and Database Act 2010

Planning and Environmental
Consultants Ltd

Second Floor, 198 Elliott Street,
Tyldesley, Manchester, M29 8DS
www.pectd.org
info@pectd.org
01942 556259





Legend

-  Side Boundary
-  Building Footprint
-  Acoustic Fence
-  Luminaire 1
-  Luminaire 2
-  Luminaire 3
-  Luminaire 4

Title

Figure 2
Luminaire Locations

Project

Heckmondwike Road, Dewsbury

Project Number

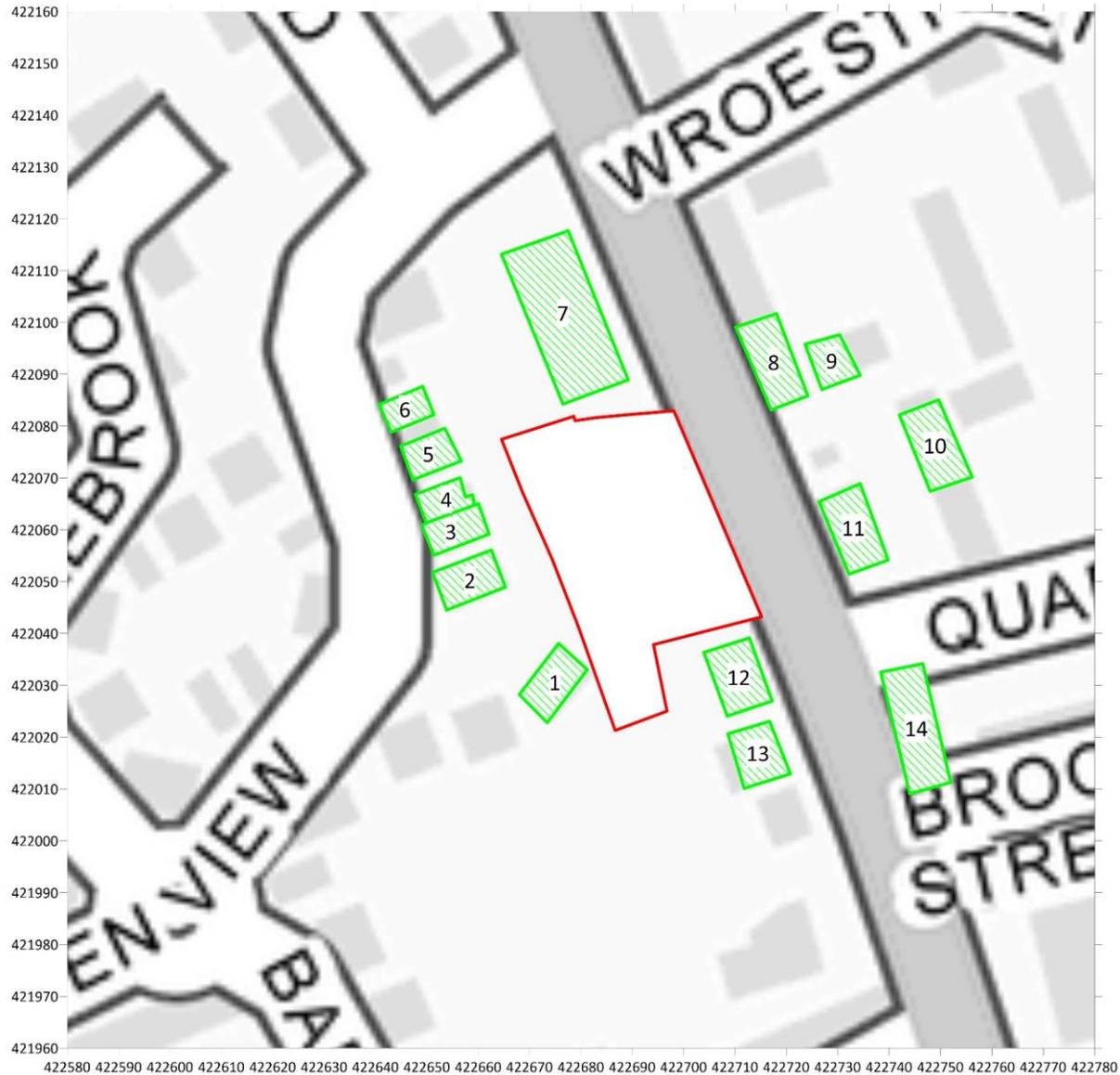
L10129

Contains Ordnance Survey Data
© Crown Copyright and Database Act 2010

Planning and Environmental
Consultants Ltd

Second Floor, 198 Elliott Street,
Tyldesley, Manchester, M29 8DS
www.pectd.org
info@pectd.org
01942 556259





Legend

-  Site Boundary
-  Residential Sensitive Location

Title

Figure 3
Sensitive Receptor Locations

Project

Heckmondwike Road, Dewsbury

Project Number

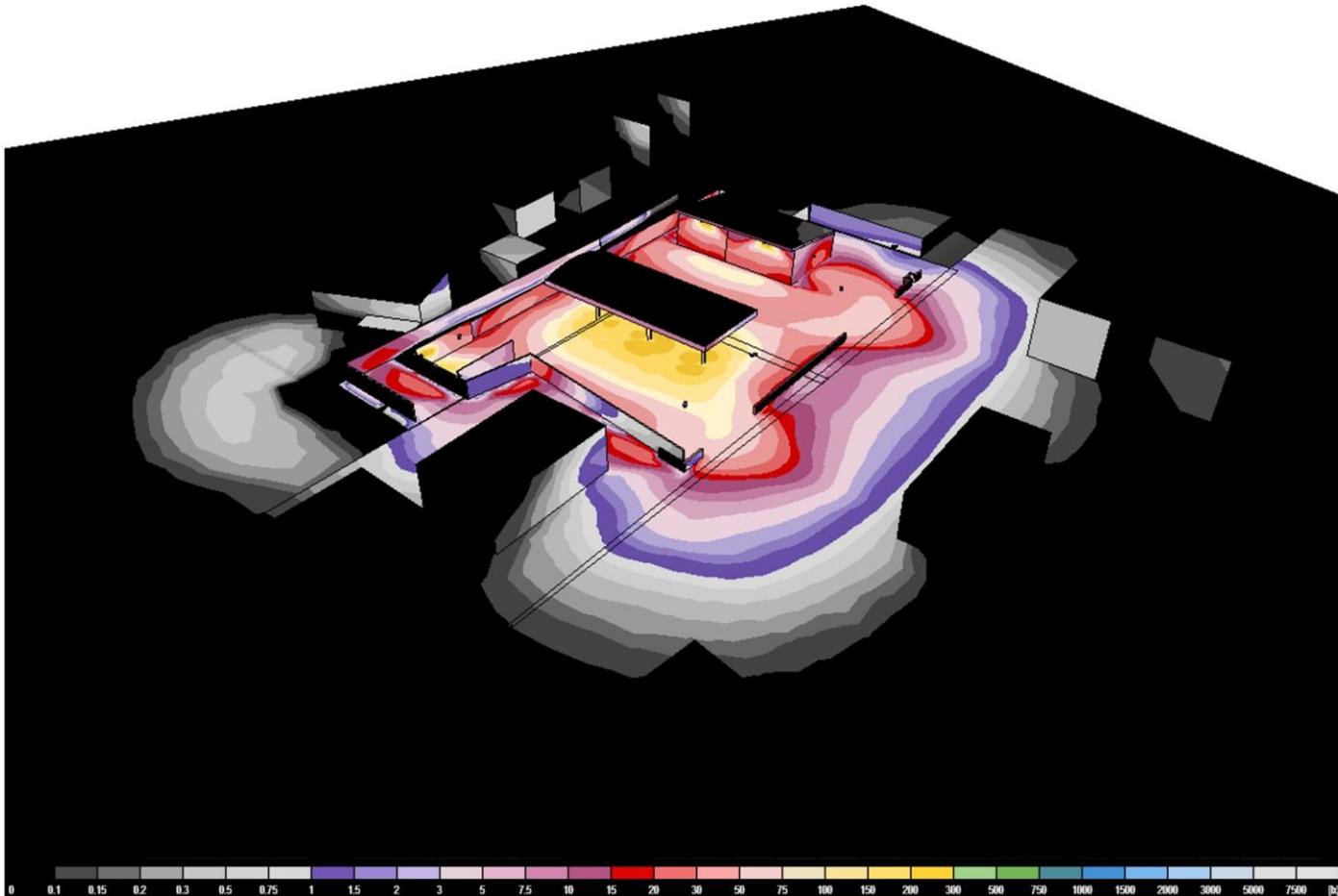
L10129

Contains Ordnance Survey Data
© Crown Copyright and Database Act 2010

Planning and Environmental
Consultants Ltd

Second Floor, 198 Elliott Street,
Tyldesley, Manchester, M29 8DS
www.pectd.org
info@pectd.org
01942 556259





Title

Figure 4
 Predicted Lux Levels from Dispersion
 Modeling showing Residential Receptors
 to the North and West

Project

Heckmondwike Road, Dewsbury

Project Number

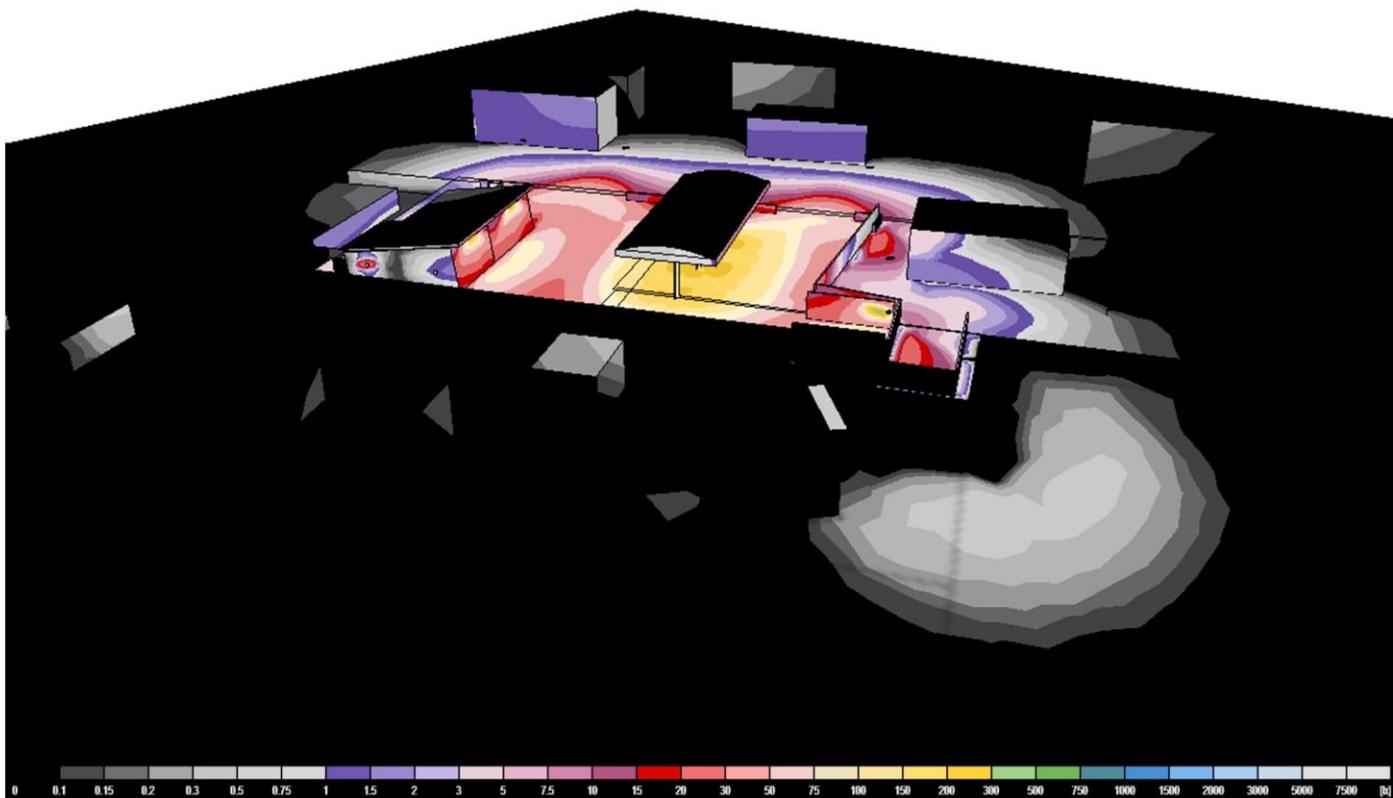
L10129

Contains Ordnance Survey Data
 © Crown Copyright and Database Act 2010

Planning and Environmental
 Consultants Ltd

Second Floor, 198 Elliott Street,
 Tyldesley, Manchester, M29 8DS
www.pectd.org
info@pectd.org
 01942 556259





Title
 Figure 5
 Predicted Lux Levels from Dispersion
 Modeling showing Residential Receptors
 to the East and South

Project
 Heckmondwike Road, Dewsbury

Project Number
 L10129

Contains Ordnance Survey Data
 © Crown Copyright and Database Act 2010

Planning and Environmental
 Consultants Ltd
 Second Floor, 198 Elliott Street,
 Tyldesley, Manchester, M29 8DS
 www.pecltd.org
 info@pecltd.org
 01942 556259



Lewis Ellison

Technical Director

MOcean, MIEEnvSc, MIAQM

KEY EXPERIENCE

Lewis is a Technical Director with specialist experience in the air quality sectors. His key capabilities include:

- Production of Air Quality Assessments to the Department for Environment, Food and Rural Affairs (DEFRA), Environment Agency and Environmental Protection UK (EPUK) methodologies for clients from the residential, retail and commercial sectors.
- Detailed dispersion modelling of road vehicle emissions using ADMS-Roads. Studies have included impact assessment of pollutant concentrations at various floor levels and assessment of suitability of development sites for proposed end-use.
- Assessment of dust impacts from construction sites to the Institute of Air Quality Management (IAQM) methodology.
- Assessment of Odour Impact from commercial and industrial processes in line with Environment Agency (EA) and IAQM methodologies and guidance
- Quantification of Ecological Impacts associated with Nitrogen and Acid Deposition from industrial processes
- Production of air quality mitigation strategies for developments throughout the UK.

SELECT PROJECTS SUMMARY

Permit Application Support

- Elliot Hire Salford
- Elliot Hire Wakefield
- Elliot Hire Scunthorpe

ES Chapters

- Lyle Park West, Newham – residential development in close proximity to an active industrial estate.
- Deansgate, Manchester – residential multistorey development in the centre of Manchester.
- Land West of Stevenage – 1350 residential unit development with the potential to negatively impact local air quality

Air Quality

- Goulton Street Hull – Outline planning permission for 7 industrial units within Hull
- Empire Cinema, Birmingham – Diffusion tube survey and air quality assessment for an assisted living accommodation
- Tirrell's Lane, Tenbury Wells – residential assessment in the village of Tenbury Wells.

Odour Assessments

- Gowanbank, Forfar – Odour survey to support a residential development in close proximity to Gowanbank recycling centre
- Squires Close, Pocklington – Odour risk assessment in support of a residential in close proximity to a sewage treatment works
- Hawthorn Fields, Rufforth - Odour risk assessment in support of a residential in close proximity to a waste water treatment works

Dust Assessment

- Liverpool Docks – Construction dust monitoring survey
- Lyle Park West – Dust impact assessment from adjacent concrete batching plant
- High Street, Burton – Construction dust risk assessment

London Experience

- Gurnell Leisure Centre – mixed use development including residential, sports and commercial land use
- Springfield Village Wandsworth – residential development and extension to the existing hospital building
- Evelyn House, Greenwich – residential apartment block

Monitoring & Surveying Experience

- Liverpool Waters – Frisbee Dust gauge monitoring
- Gownbank, Forfar – Field odour survey “sniff test”
- Empire Cinema Birmingham – Diffusion tube survey

QUALIFICATIONS

- Masters of Geological Oceanography
- Odour Acuity Certified Master of Science