

# **Environmental Impact Assessment of the Gipsy Lane Brickworks. Leicester, England**

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Date of Submission: 25-04-2020

Date of Acceptance: 08-05-2020

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## **I. Introduction**

### **1.0 LEGAL REQUIREMENTS AND GUIDANCE FOR THE IMPACTS OF THE INDUSTRIAL DEVELOPMENT AND ROAD EXTENSION OF THE GIPSY LANE BRICKWORKS.**

#### **1.1 AIR QUALITY**

- Part IV of the Environment Act 1995 which states that a local air quality management should be set up if the UK targets are not achieved.
- Clean Air for Europe(CAFE) Directive 2008/50/EC
- Air quality limit value regulation 2003 SI 2121 and equivalent regulations in the devolved administrations.
- The Air quality strategy for England, Scotland, wales and Northern Ireland: Addendum 2003 which includes the protection of human health and vegetation.
- Air quality standard regulations
- Defra technical guidance on local air quality management. TG(03) 2003
- Defra policy guidance of local air quality management. PG(03) 2003
- Design Manual For Roads and Bridges(DMRB) Section 11.3.1 HA 207
- Transport Analysis Guidance assessment
- DEFRA technical guidance document LAQM.TG(09).

#### **1.2 ARCHAEOLOGY AND CULTURAL HERITAGE**

- Ancient monuments and archaeological areas act 1979
- The planning act 1990 with the list of buildings and conservation regions
- Highway (Assessment of environmental impacts) regulations 1999 (SI NO 324) amendments to the highway act of 1980 and 1988 regulations.
- National heritage act 1983, amended in 2003
- Town and country planning (environmental assessment and permitted development) regulations. 1995 (S.I NO 417).
- Planning Policy Guidance (PPG) 16, Archaeology and planning.
- DoE Circular 18/84 ,DoE 15/88
- Local Planning Authority for guidance (Leicester city council)
- National heritage
- Historic Environment Records(HER) or Sites and Monument Records(SMR)
- National trust
- DMRB Section 11.3.2 HA 208/07

#### **1.3 ECOLOGY AND NATURE CONSERVATION**

- Section 19 and 21 of the national parks and access to country side parks.
- Section 11 of the 1968 country side act.
- Section 3, 28 (site of special scientific interest), 29, 35 and 36 of the 1981 wildlife and country side act (amended in 1985).
- Schedule 1, 5 and 8 of the 1981 wildlife and country side act.
- Section 128-139 of the environmental protection act 1990.
- 1992 badgers act (consolidated in 1973 and 1991 badgers act).

#### 1.4 LAND USE

- Planning policy guidance 7, department of environment(DoE) 1992
- Planning Policy Guidance 13: Transport (Department of the Environment, Transport and the Regions – revised guidance due 2001).
- Planning policy statement 23 (PPS 23).

#### 1.5 NOISE POLLUTION

- Article 3 of directive 85/337/EEC (As amended)
- Land compensation act 1973
- Noise insulation regulation 1975 (as amended 1988)
- The highways noise payments and movable homes regulations 2000
- The control of pollution act 1971
- Noise pollution act
- Environmental noise regulations 2006 (as amended 2008, 2009)

#### 1.6 WATER RESOURCES

- The water framework directive (WFD) 2000/60/EC
- The ground water daughter directive 2006/118/EC
- PPS25 (England)
- Groundwater directive 80/68/EEC

#### 1.7 GEOLOGY AND SOIL

- Earth Science Conservation in Great Britain - A Strategy. (Nature Conservancy Council).
- Planning Policy Guidance No 14 (PPG 14). Development on Unstable Land. DOE
- Planning Advice Note 33 Development of Contaminated Land. SDD.
- DMRB 4, HS 34/87 Ground Investigation procedures (department of transport 1987)
- 1987 road white paper (paragraph 5.1)

#### 1.8 IMPACT ON ROAD SCHEME (POLICY GUIDLINES)

- PPG1 General Policy Principles
- PPG2 Green Belts
- PPG3 Housing
- PPG4 Industrial and Commercial Development
- PPG5 Simplified Planning Zones
- PPG6 Town Centres and Retail Developments
- PPG7 The Countryside and the Rural Economy
- PPG9 [Now RPG9]
- PPG10 Strategic Guidance for the West Midlands
- PPG12 Development Plans and Regional Planning Guidance
- PPG13 Transport (for use in England)
- PPG13 Highways Considerations in Development
- PPG16 Archaeology and Planning
- PPG17 Sport and Recreation
- PPG18 Enforcing Planning Control
- PPG19 Outdoor Advertisement Control
- PPG21 Tourism

## **II. List Of Impacts**

1. AIR QUALITY: the construction of the gipsy lane and the industrial development will give rise to two phases of air pollution; first is the construction phase emissions (during construction) and operational phase emission (predominantly vehicle emissions after construction).
  - Dust generation as a result of the road construction (i.e preparation of ground, concrete mixing, and movement of HGVs).
  - Poor air quality as a result of pollutants such as NO<sub>x</sub>, CO etc.
2. The alteration of ecosystem
3. The removal of some vegetative part of the golf course
4. Oil spillages from vehicles used for the road construction

5. Increase in noise and vibrations
6. Landscape alteration
7. Water pollution
8. Increase in waste
9. Noise pollution
10. Severance

## 2.1 INDIRECT IMPACTS OF THE GIPSY LANE ROAD EXTENSION AND INDUSTRIAL DEVELOPMENT

2.1.1 IMPACT ON HEALTH (POOR AIR QUALITY): the road extension of the gipsy lane and industrial development will have a negative indirect impact on the health of the local population as a result of the poor air quality. Dust and particulate matter will be released during the construction thereby polluting the atmosphere. Furthermore, vehicle emissions will be increased after the construction. The increase in air pollution will give rise to respiratory discomfort and diseases as well as the aggravation of asthma (Asthma UK, 2014).

### 2.1.2 MITIGATION FOR AIR POLLUTION

The following procedures can be implemented in order to reduce air pollution

- Surfaces and exposed materials should be protected from wind.
- Storage mound surfaces should be sealed as soon as it is practicable
- Exposed mound surfaces should be sprayed in order to retain surface moisture
- The practice of hoarding( temporary wooden fencing) should be implemented in sensitive areas
- The use of water spray will reduce dust
- The reduction of drop height when applicable
- The mineral processing(depending on the equipment) should be in a close enclosure using air-extractors and filters when applicable
- Construction materials should be dampened and protected from wind
- Materials should be inspected for dust particle before external storage
- The use of hybrid cars, fuel cell vehicles and electric vehicles should be encouraged (SEA Technical report 1999).
- Vehicle speed should be limited
- The implementation of traffic control schemes will reduce car emissions (SEA Technical report 1999).
- The use of public transport should be encouraged in order to reduce vehicle emissions
- The use of tailpipe particulate traps will reduce particulate emissions from diesel engines
- More frequent street cleaning will reduce the dust that is as a result of car tyre/road interaction (SEA Technical report 1999).

2.2 LIGHTING: the lighting of the gipsy road will be increased because of the increased numbers of vehicle that will be on the road. The increased number of vehicle lights and streetlights will have an impact on the lighting of the locality. Local residents will be exposed to more lighting which might have an effect on their relaxation or sleep.

WASTE GENERATION: there will be an increase in waste as a result of the proposed development. There will be a tendency to have construction waste from the site which will in-turn encourage the act of fly-tipping (indiscriminate waste disposal). There is a tendency that vehicle drivers and passengers will throw out dirt (for example cigarettes) on the road.

WATER POLLUTION: there will be an increase in run-off because of the change in the land surface characteristics. Roads will become impermeable and oil leakages from vehicles will be washed off quickly to the nearest waterbody (for example, the pond close to the humberstone farm) thereby leading to water contamination. Furthermore, the run-off of muddy water from the construction site will pollute the local waterbodies. The development will affect the water table thereby affecting the ecology of the closest waterbody around the gipsy lane.

SOIL CONTAMINANTS MIGRATION: due to the proposed road construction contaminants in the soil will be vulnerable to migrate because of construction activities such as tilling and digging. On an event of a rainfall, these soil contaminants will react with water thereby forming toxic solutions that might be washed down to the low level residential areas (for example: hampen road and Fairfax road).

NOISE POLLUTION: the noise level and vibration of the locality will be increased as a result of heavy duty vehicles and equipment used during the road construction and the increase of vehicles plying the road after construction.

#### NOISE POLLUTION MITIGATION MEASURES

- Rail services and underground roads should be encouraged.
- Pedestrianisation
- Improved and more stringent noise emission standards should be introduced
- Heavy duty vehicles engines encapsulation would reduce noise pollution
- The use of low noise surfaces for roads
- The implementation of speed regulations and traffic noise management will reduce noise
- The use of noise barriers

#### NOISE RESIDUAL IMPACT:

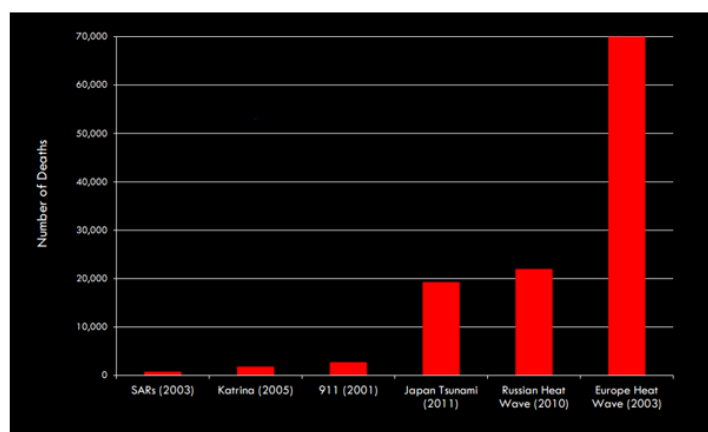
- The visual impact of the noise barrier

**HABITAT FRAGMENTATION:** Habitat fragmentation can arise as a result of road construction whereby natural habitat of animal species such as badgers are disrupted. The road construction will affect the natural habitat of several species of animal (Fahrig 2003). Furthermore, there could be an increase in the death of animals as a result of being hit by vehicles. The road which acts as barrier might prevent animals from crossing and recolonizing areas where local species has gone extinct and limit their access to seasonal variable resources (Primack 2012). Road construction can separate animal populations into smaller groups that are more vulnerable to extinction.

#### CUMULATIVE IMPACTS:

**Acid rain:** the emissions from vehicles will give rise to the amount of nitrogen oxides (NO<sub>x</sub>) and Sulphuric oxide in the atmosphere. These chemicals reacts with water vapour, oxygen and other chemicals to form acidic compounds. Acid rain can be defined as a mixture of wet and dry deposition from the atmosphere containing nitric and sulphuric acids (EPA 2013). Acid rain will affect the pond that is close to humberstone farm and other waterbodies that are close to the gipsy lane. Lakes and waterbody gets clearer as they become more acidic .The acid rain will lead to the acidification of waterbodies which will affect the aquatic ecology. The acidification can be passed through a food chain thereby affecting fish eating animals which could lead to the extinction of a specie. Although frogs can survive in some level of acid concentration, salmons and shrimps are highly sensitive to low Ph. Aquatic plants and animal could die as a result of the acidification thereby impairing the biodiversity of an ecosystem. Furthermore, Buildings, Sculptures (especially limestone sculptures) and other social amenities will be affected by the acid rain. Acid rain causes damage to vegetation and soil thereby contaminating the land and soil degradation. Acid rain could also lead to eutrophication. When aquatic plants and animals die due the acidification of water, oxygen is required by decomposing bacteria thereby reducing the amount of oxygen in the aquatic ecosystem.

**Climate change:** the increase in GHG emission from vehicles and the felling of trees for the road construction will have a cumulative impact on the local climate. GHG gases deplet the ozone layer which traps the ultraviolet radiation from the sun. The felling of trees for the road construction and industrial development will increase the amount CO<sub>2</sub> emissions because trees take-in CO<sub>2</sub>.the change in the weather patterns will further affect the health of human beings. Increase in temperature will give rise to extreme weather conditions like warmer wetter winters and hotter drier summers thereby leading to heatwaves. According to world health organisation, over 70000 deaths were recorded in Europe during the 2003 heatwave occurrence.(see figure 1) below. Furthermore, climate change will result to increase in sea level and river over-flooding thereby exposing the local population to flood.



Source: Stone(2012)

**FLOOD RISK:** The road construction and industrial development will change the land surface characteristics of the gipsy area. Moist and permeable surfaces will be replaced by dry and impermeable surfaces thereby giving rise to increased run-off; this increased run-off could lead to flash flood when an intense rainfall occurs. Furthermore, buildings could be built on floodplains as a result of the proposed development, thereby making people vulnerable to flood when there is a rise in sea level which is a consequence of climate change. According to Few et al, 2004 more than half of the world population resides within a 60km radius to a sea and 6.8 million deaths and 1.8 million injuries from flood events have been recorded.

**REDUCTION IN WATERSUPPLY:**As a result of the road construction and the proposed industrial development, there will be increase in population thereby giving rise to the demand of water-supply. This increase in demand could lead to indiscriminate abstraction of water. Furthermore, there will be underground water contamination as result of increase in oil spillages from vehicles and increase in the waste generation as a result of population increase.

### **HABITAT LOSS / LOSS OF GREEN SPACES**

The road construction will and industrial development will replace vegetated land thereby affecting the habitat of some animals especially badgers. Birds that make their nest on trees will be affected by the proposed development. This habitat loss will have a negative impact on the biodiversity of region. Furthermore, the destruction of some part of the gulf course will result to loss of green spaces.

**SOIL EROSION:** Due to construction activities such as excavation, soil surfaces will be vulnerable to erosion thereby leading to soil degradation especially in the gulf course.

**WASTE GENERATION:** Apart from the direct waste from the construction site, there will be an increase in waste generation because of the increase in population, which is as a result of the proposed development. The inappropriate management of waste will make the local population vulnerable to health hazards and injuries from construction waste and sharp materials.

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ObidikeEmekaEsae. "Environmental Impact Assessment of the Gipsy Lane Brickworks. Leicester, Enlang." *IOSR Journal of Environmental Science, Toxicology and Food Technology (IOSR-JESTFT)*, 14(5), (2020): pp 01-06.