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Figure 8- 1 Dust Deposition Monitoring Locations

INTRODUCTION

- 8.1 This chapter of the Environmental Impact Statement (EIS) provides supporting information to accompany a Planning Application to the Planning Authority by Roadstone Wood Limited in respect of the continuance of use of the existing limestone quarry including continuance of use of all ancillary, processing and manufacturing facilities at the existing Huntstown Quarry Complex, North Road, Finglas, Co. Dublin, beyond October 2014 as permitted by the existing planning permission.
- 8.2 This section of the EIS deals with the issue of air quality. It assesses the levels of dust deposition at the site associated with existing land use and assesses the increases in these levels, if any, that will be generated by the development. The assessment of impacts on air quality has been undertaken with reference to EIA good practice, the EIA Regulations, and other guidance documents.
- 8.3 Roadstone Wood Ltd. and BHP carried out the relevant baseline studies and SLR Consulting Ireland carried out the subsequent impact assessment for this section.

Relevant Air Quality Planning Policy, Legislation and Guidance

- 8.4 There are currently no Irish statutory standards or EPA guidelines relating specifically to dust deposition thresholds for inert mineral / aggregate dust. There are a number of methods to measure dust deposition but only the German TA Luft Air Quality Standard relates a specific method of measuring dust deposition with dust nuisance.
- 8.5 The EPA has adopted this standard for all licensable activities and the Department of Environment, Heritage and Local Government (DoEHLG, 2004) proposed its adoption by Local Authorities for planning applications relating to surface mineral workings. This standard measures total dust deposition i.e. both soluble and insoluble dust.

Environmental Management Guidelines (EPA, 2006)

- 8.6 The *Environmental Management Guidelines for the Extractive Industry (Non-Scheduled Minerals)* present a summary of current environmental management practices for surface workings within the extractive industry. They are based on a review of current environmental management practice in Ireland, the UK and Europe.
- 8.7 The published guidelines are intended to provide general advice and guidance in relation to environmental issues to practitioners involved in the planning, design, development, operation and restoration of surface extractive industry developments and ancillary facilities in Ireland.
- 8.8 In relation to surface extractive industry developments and ancillary activities, the guidelines recommend that total dust deposition (soluble and insoluble) from activities on site shall not exceed a dust emission limit value (ELV) at site boundaries of '350mg/m²/day (when averaged over a 30-day period)'

Guidelines for Planning Authorities - Quarries and Ancillary Activities (DoEHLG, 2004)

- 8.9 The DoEHLG Planning Guidelines on Quarries and Ancillary Activities are primarily addressed to statutory planning bodies. They provide an overview of environmental issues and best practice / possible mitigation measures associated with surface working of aggregates and associated ancillary activities. The guidelines are routinely referred to by practitioners involved in the planning, design, development, operation and restoration of surface workings and ancillary facilities in Ireland.

BASELINE STUDY

Outline of the Baseline Study

- 8.10 The purpose of the baseline study is to assess the existing air quality. A dust deposition monitoring programme has been in place at the existing quarry since 2001. Results from 2010 and 2011 were reviewed to determine the current air quality conditions. From these results assessment of the impact of the development on the existing air quality of the area.

Aspects of Dust Deposition

- 8.11 Dust in the air is a natural occurrence. The action of wind over dry ground will carry small particles into the air. Although large emissions of dust occur naturally, man-made dust events are caused by disturbance and working of land. Road uses, aggregate and mineral extraction, as well as industrial activity, all contribute further to ambient dust levels.
- 8.12 The extent to which dust particles can become a nuisance or a hazard will depend on the amount of the particles which become airborne and the extent to which they spread over a large area. Normally the particles will be of a wide size range. The larger particles will not remain airborne for long. In general, the smaller the particle the greater the distance over which it might travel. Dust effects will be dependent on the scale of release, frequency of wind speeds capable of carrying airborne dust (i.e. greater than 3m/s)¹ and frequency of rainfall considered sufficient to effectively suppress wind-blown dust emissions (greater than 0.2 mm/day)².
- 8.13 There is little evidence to suggest that the larger fractions of particulates are associated with health impacts. The Guideline for Planning Authorities produced by the DoEHLG (2004) states that '*residents living in proximity to quarries can potentially be affected by dust up to 0.5km from the source, although continual or severe concerns about dust are most likely to be experienced within about 100m of the dust source*'.
- 8.14 For the purpose of this Environmental Impact Statement, dust is defined as particulate matter that emanates from the working quarry and associated activities, or from the vehicles that serve it, which is borne by air and carried downwind from the point of origin or source. The amount of dust that may be

¹ K. W. Nicholson (1988) A review of particle re-suspension. Atmospheric Environment Volume 22, Issue 12, 1988, Pages 2639-2651

² Leeds University. Good Quarry. Available at: <http://www.goodquarry.com/>

emitted from any operation, activity or wind action is a function of two main factors:

- The susceptibility of the material involved to erosion.
- The erosive actions to which the material is subjected.

Susceptibility of Material to Erosion

- 8.15 The nature and particle size of the materials being handled at a site have a fundamental influence on their tendency to be broken down and to generate fugitive dust emissions. Particles that may become suspended in air are generally 75µm in diameter (i.e. silt size) or smaller. A material's 'erodibility' is therefore directly related to the proportion of particles smaller than this size. This 'erodibility' is reduced by cohesion within the material. Cohesion increases with clay and moisture content, but decreases with sand content. The presence of larger particles such as coarse sand, gravel or stone also reduces the tendency to erosion and, by implication dust generation.
- 8.16 Dust may be generated by the handling and storage of soils etc and by vehicles using unpaved site haul roads. Experience of aggregate extraction operations indicates that mechanical activity is the most significant factor in material erosion and dust generation (i.e. as it produces dust particles greater than 10µm in diameter). Dust emanates from a number of site activities (refer to Table 8.2). However the effect of wind and/or prolonged periods of dry weather are also important factors in dust generation. Problems may arise at quarry workings when these factors arise, if appropriate mitigation measures are not in place.
- 8.17 There are three main types of dust source that may arise from the operation of a quarry. These are:
- **Point Source** – where dust is generated by activities such as loading, dozers, earth-moving plant, processing screens, crushers and conveyor transfer points.
 - **Line Source** – where dust is generated by activities identified above along well-defined haul roads and open conveyors.
 - **Dispersed Source** – where dust is generated by activities such as topsoil stripping, uncontrolled placement of these soils and general activity on the quarry floor. Stockpiles are also considered to be a dispersed dust source.

Dust Dispersal

- 8.18 The amount of dust capable of being dispersed to a particular location during windy conditions is related to several factors:
- Distance
 - Weather (i.e. wind speed, wind direction, rainfall)
 - Topography & Vegetation

- 8.19 As dust travels downwind from the source it disperses outwards and upwards and progressively falls to the ground surface, with larger particles falling first. The concentration of dust therefore reduces very quickly from the emission source. Most emitted dust is in fact deposited close to its source, generally within approximately 100m of the dust source.

Existing Environment

- 8.20 Roadstone Wood Ltd.'s Huntstown Quarry complex comprises existing quarrying and concrete and asphalt production businesses.
- 8.21 There are a small number of existing residences located in close proximity to the application site. The nearest sensitive locations are residences located immediately to the west along the Kilshane Road and to the east of the site along the R135 Regional Road (the former N2 National Primary Road). The locations of these residences are shown in Figure 8-1.
- 8.22 The lands to the immediate north and north-east of the application site are primarily used for agricultural grassland.
- 8.23 At a greater distance, the Huntstown Power station (operated by Viridian), the North Road and the N2 Dual Carriageway all lie to the east of the application site. The M50 Motorway lies to the south, while the lands to the south-west and west have been developed as light industry and science and technology parks (Ballycoolin Business Park, Rosemount Business Park, Millennium Business Park and Northwest Business Park).

Baseline Ambient Dust Concentrations

- 8.24 The principal sources of existing air and dust emissions in the receiving environment around the site of the facility are those associated with:
- quarrying of limestone bedrock;
 - aggregate processing activities (crushing and screening);
 - readymix concrete and asphalt production plant;
 - road traffic along the local road network, and the N2 Dual Carriageway and M50 Motorway in particular.
- 8.25 A dust deposition monitoring program has been established at the site. This comprises five "Bergerhoff-Type Dust Deposit Gauges" at the locations detailed below:
- D1** To the east of the existing landholding, adjacent to the site entrance (refer to D1 – Figure 8-1).
- D2** To the south-east of the processing area (refer to D2 – Figure 8-1).
- D3** To the west of the central quarry and to the south of the north quarry and the processing area (refer to D3 – Figure 8-1).
- D4** To the west of the existing landholding (refer to D4 – Figure 8-1).
- D5** To the south of the central quarry and to the north of the southern quarry (refer to D5 – Figure 8-1).

- 8.26 The results of the dust deposition monitoring programme for 2010 – 2011 (to date) are as follows:

**Table 8-1
Dust Deposition Monitoring Results 2010 to 2011**

| Date | Deposition (mg/m ² /day) | | | | |
|----------------|-------------------------------------|-------|-------|-------|-------|
| | D1 | D2 | D3 | D4 | D5 |
| January 2010 | - | - | 118 | - | - |
| February 2010 | 61 | 81 | 37 | 88 | - |
| March 2010 | 22 | 92 | 80 | 61 | - |
| April 2010 | 70.5 | 144.4 | 71.1 | 58.3 | 41.1 |
| June 2010 | 130 | 167.2 | 80.6 | 184.4 | 12.2 |
| July 2010 | 20 | 337.4 | 316.6 | 121.7 | 112.8 |
| August 2010 | 80 | 196.7 | 71.7 | 82.8 | 60.6 |
| September 2010 | 173.8 | 286.1 | 146.2 | 307.9 | 158.4 |
| November 2010 | 15.6 | 298.3 | 313.8 | 55.6 | 12.8 |
| December 2010 | ND | ND | 10.9 | ND | ND |
| January 2011 | 150.4 | 146.1 | 25.4 | 56.4 | 103.9 |
| February 2011 | 52.7 | 130.1 | 32.8 | 55.9 | 5.4 |
| March 2011 | 341.1 | 360.0 | 245.0 | 239.4 | 307.2 |
| April 2011 | 73.3 | 192.2 | Void | 45.9 | 276.1 |

Void Sample deemed void as contaminated

ND No Data – jar broken

- 8.27 At a greater distance, the Huntstown Power station (operated by Viridian), the North Road and the N2 Dual Carriageway all lie to the east of the planning application area. The M50 Motorway lies to the south, while the lands to the south-west and west have been developed as light industry and science and technology parks (Ballycoolin Business Park, Rosemount Business Park, Millennium Business Park and Northwest Business Park).
- 8.28 The dust deposition sample at D3 for April 2011 was contaminated. The DoEHLG (2004) dust deposition limit value of 350mg/m²/day applies at the site boundary. As this dust monitoring location is to the west of the central quarry and to the south of the north quarry and the processing area, it is deemed that dust deposition levels monitored at this location are not representative of the levels which would be present at the site boundary. It

is proposed to move the monitoring location of D3 to the southwest boundary, refer to Figure 8-2.

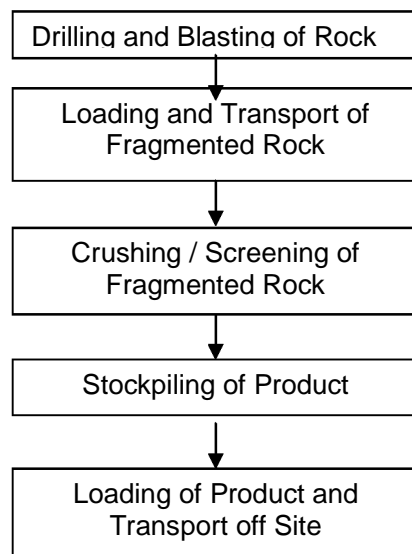
- 8.29 The dust deposition sample at D2 for March 2011 exceeded the DoEHLG (2004) dust deposition limit value of 350mg/m²/day (which should apply at the site boundary). As this dust monitoring location is to the east of the processing area, it is deemed that dust deposition levels monitored at this location are not representative of the levels which would be present at the site boundary. It is proposed to move the monitoring location of D2 to the northern boundary, refer to Figure 8-2.
- 8.30 Excluding samples which were contaminated, the dust monitoring results show that the baseline dust deposition levels are within the dust threshold limits recommended in the DoEHLG (2004) Quarries and Ancillary Activities: Guidelines for Planning Authorities which states that the:

'TA Luft dust deposition limit value be adopted at site boundaries near quarry developments: Total dust deposition (soluble and insoluble): 350 milligrams per square metre per day (when averaged over a 30 day period).'

Proposed development

- 8.31 The development involves the continued operation and development of the existing quarry. It entails a series of operational activities shown in Table 8.2. There are four quarry / extraction areas, described as the north quarry, the south quarry, the central quarry and the western quarry. In addition the central plant area contains the offices, workshops, block plant, concrete and tarmacadam plants, block storage areas which are associated with the extraction and processing operations. A mobile processing plant is also located on the floor of the south quarry.

Table 8-2
Quarry Operational Activities



- 8.32 Each of the quarry areas currently being excavated (i.e. the south, north and central quarry areas) are worked on a bench system, whereby the levels are reduced in steps or benches up to 18m in height by means of in-situ blasting of the rock. The material is then moved to the central processing area for crushing and screening or in the case of the south quarry this is carried out by mobile plant on the quarry floor.
- 8.33 All overburden associated with accessing the in-situ rock at each of the extraction locations has already been stripped. This material has been utilised in the existing screening berms around the periphery of the site to screen the site and aid in the reduction of dust impacts on the surrounding area.
- 8.34 There are no new activities envisaged by this proposal and the intensity of rock extraction will be similar to that undertaken during the baseline studies.
- 8.35 Mitigation measures are employed, as part of ongoing operational procedures, to minimise this erosion / dust generation.
- 8.36 The above generalised flow chart in shows the main site activities that may give rise to potential fugitive dust emissions.
- 8.37 Fugitive dust emissions are generated wherever there is movement of dust relative to the air. The emission of fugitive dust from mineral workings is very dependent on weather conditions. Where nuisance complaints from activities at quarries arise, they are generally as a result of a combination of specific site activities and particular weather conditions.
- 8.38 A variety of mitigation measures will be employed, as part of on-going operational procedures, to limit erosion and dust generation as much as possible.

Vehicle Emissions

- 8.39 Vehicle exhaust emissions resulting from traffic generated by the operation of the facility may have the potential to temporarily affect local pollution levels, both within and surrounding the application site. No combustion emissions are expected during operation of the facility.
- 8.40 Apart from the quarrying and processing / production activities at Huntstown, the only other significant source of air pollution in the vicinity of the application site is traffic travelling over the existing local road network. Many of the pollutants emitted by motor vehicles are also produced by a wide range of other industrial and domestic processes.

ASSESSMENT OF IMPACTS

Direct Impacts

- 8.41 The dust from quarry operations is fine particles of soil, clay and the principal rock type. The dust can be described as inert and harmless in the chemical context. In particular, they would not include any of the harmful compounds as described and listed in Atmospheric Emissions by T.A. Luft, (1986), Section 2.3. The impact, if any, will be direct, temporary and non-cumulative and largely confined to the quarry area. The potential for dust impact will be

low due to the natural attenuation provided as dust falls out of suspension and is deposited on the ground.

- 8.42 The results of dust deposition monitoring to date show that the dust deposition levels at the existing quarry generally comply with the DoEHLG (2004) / EPA (2006) recommended dust deposition limit of 350 mg/m²/day (averaged over a 30-day period and measured at the site boundary).
- 8.43 As mentioned above, mitigation measures are / will be implemented to eliminate and / or minimise any potential impacts.

Indirect Impacts

- 8.44 Apart from the direct impact of the deposition of particulate material, there may be an associated visual impact with fugitive dust generation. This impact will be minimised by the mitigation measures described in Section 8.51 and 8.52. Generation of fugitive dust is effectively a form of erosion. Mitigation measures described in Soils and Geology (refer to Section 5) to limit erosion are also of direct benefit in terms of dust mitigation.

Interaction with Other Impacts

- 8.45 There are no interactions with other impacts associated with air quality issues emanating directly from the proposed development.

MITIGATION AND MONITORING

- 8.46 Baseline monitoring within the existing quarry and experience from similar types of development indicate that, subject to implementation of the following mitigation measures, the development can comply with the DoEHLG (2004) / EPA (2006) recommended dust deposition limit of 350 milligrams per day (averaged over a 30 day period and measured at the site boundary).

Mitigation

- 8.47 A number of mitigation measures are / will be put in place to minimise the generation / migration of fugitive dust and to ensure that the site development, extraction, processing and restoration operations comply with the recommended emission limit value stated above. These mitigation measures are in accordance with the '*best practice / mitigation*' measures described in Section 3.3 of the DoEHLG (2004) guidelines and include:

8.48 Stone Extraction / Processing:

- Mobile processing plant (crushing, screening and washing) is used in the existing quarry. These plants are located within the quarry close to the extraction area thereby minimising the internal haulage requirements.
- The quarry faces act as screening barriers and minimise the migration of any fugitive dust arising from the processing activities within the quarry extraction area.

- The mobile crushing and screening plant is fitted with dust suppression systems.
- All plant and machinery are regularly maintained.
- Dust suppression (e.g. water bowser) is utilised to suppress dust on internal haul road surfaces, in dry weather.
- Existing site boundary hedgerows will be retained. These together with the existing vegetation and landscaped screening bunds will eliminate / minimise migration of dust beyond the site boundary (refer to EIS Section 10).
- Where necessary, stockpiled products will be sprayed with water in periods of dry weather.
- Overburden storage areas and landscaped screening berms will be constructed with relatively low slope angles 1:1.5 (approximately 35° to the horizontal) to reduce wind turbulence along their surface. The mounds will be re-vegetated as quickly as possible and will further mitigate against the migration of dust beyond the site boundary.
- Internal haul roads will be maintained to minimise dust generation.
- Vehicle speeds will be controlled on all internal haul roads.

8.49 Site Entrance / Access

- The internal entrance and all access are paved.
- Vehicle speeds are controlled on the access road.
- If necessary, the section of public road in the vicinity of the site entrance will be cleaned regularly using a vacuum road sweeper.

Monitoring

- 8.50 Roadstone Wood Ltd. will continue to carry out the dust deposition monitoring programme on site on a monthly basis. As recommended in the DoEHLG (2004) guidelines the Bergerhoff Method will be used.
- 8.51 As the DoEHLG (2004) dust threshold limits apply at the site boundaries, it is recommended that a number of the existing dust monitoring locations are relocated to the site boundaries, refer to Figure 8.2. The dust monitoring locations will be reviewed on an annual basis and revised where necessary.
- 8.52 The results of the monitoring will be submitted to Fingal County Council on a regular basis. These records will be available for inspection at the offices of the planning authority by interested third parties.

CONCLUSIONS

- 8.53 This air quality assessment has considered the continued operation and development of the existing quarry at Huntstown on the aerial environment. The assessment has considered dust and particulates associated with all on-site activities.

- 8.54 The predicted impact from deposited dust at residential receptors is considered to be negligible.
- 8.55 Mitigation measures for dust control are already in place at the site and included in the existing site Environmental Management Plan. The effective application of these mitigation measures will continue to be monitored.
- 8.56 Through the implementation of these measures it is considered that the impact of fugitive dust, if any, generated by this development beyond the site boundary will be within the recommended DoEHLG (2004) / EPA (2006) dust deposition emission limit value, and will not result in any significant impact to neighbouring residents, property or livestock adjacent to the site.
- 8.57 Roadstone Wood Ltd. presently operates Huntstown Quarry within guidelines of the Irish Concrete Federation and current best practice for the quarrying industry as set out in the DoEHLG (2004) and EPA (2006) guidelines for the sector. The Applicant is committed to achieving and maintaining environmental standards that can be considered world standard. To this end, the company have established environmental monitoring systems and procedures for all of their operations. ISO 14001 accreditation was gained by the company on the 4th September 2002. The Applicant has endeavoured to maintain a good relationship with the neighbouring community, local businesses and local authorities.

REFERENCES

Department of Environment Heritage and Local Government (2004) *Quarries and Ancillary Activities: Guidelines for Planning Authorities*

Environmental Protection Agency, (2008) *Air Quality in Ireland 2007*

Environmental Protection Agency, (2009) *Air Quality in Ireland 2008*

Environmental Protection Agency, (2000) *Ireland's Environment: A Millennium Report*

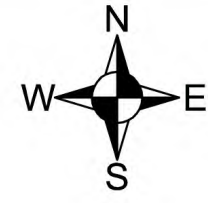
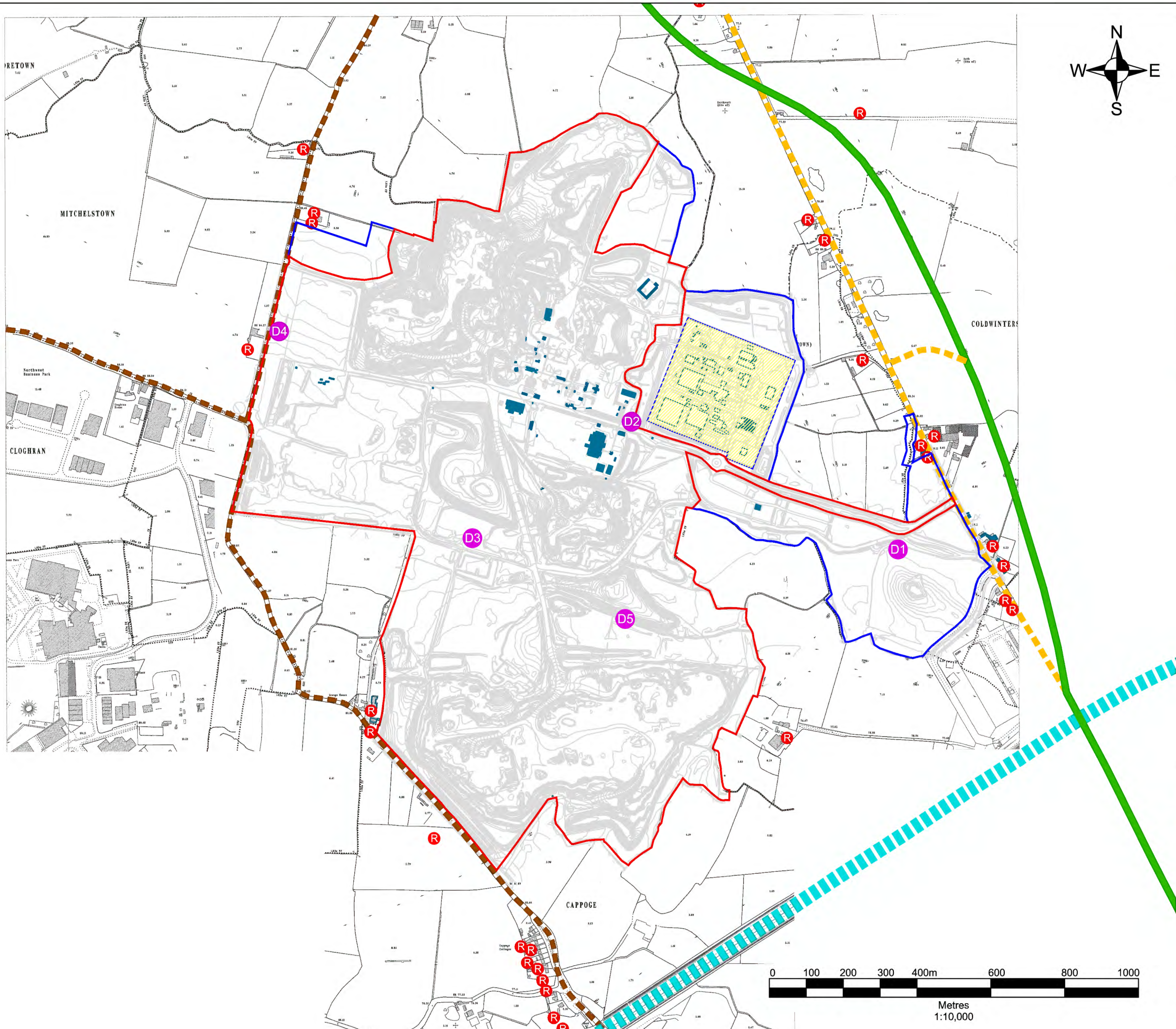
European Union (1999) *Council Directive 1999/30/EC of 22 April 1999 relating to Limit Values for Sulphur Dioxide, Nitrogen Dioxide and Oxides Of Nitrogen, Particulate Matter and Lead in Ambient Air*

T.A Luft (1988) *Atmospheric Emissions*

FIGURES

**Figure 8- 1
Dust Deposition Monitoring Locations**

**Figure 8- 2
Proposed Re-Located Dust Deposition Monitoring Locations**



NOTES

- EXTRACT FROM 1:2,500 ORDNANCE SURVEY DIGITAL SHEET NO'S. 3062-A, 3062-B, 3062-C, 3062-D, 3063-A, 3063-C, 3130-A & 3130-B
- ORDNANCE SURVEY IRELAND LICENCE NO. SU 0000712 (C) ORDNANCE SURVEY & GOVERNMENT OF IRELAND
- TOPOGRAPHIC SURVEY PREPARED BY FUGRO BKS BASED ON MAY 2009 AERIAL PHOTOGRAPHY

LEGEND

| | |
|--|---|
| | ROADSTONE WOOD LTD. LANDHOLDING (c. 211 ha) |
| | HUNTSTOWN POWER STATION (NOT OWNED BY RWL) |
| | PLANNING APPLICATION AREA (c. 167.5 ha) |
| | EXISTING DUST MONITORING LOCATIONS |



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ROADSTONE WOOD LTD.
 ENVIRONMENTAL IMPACT STATEMENT

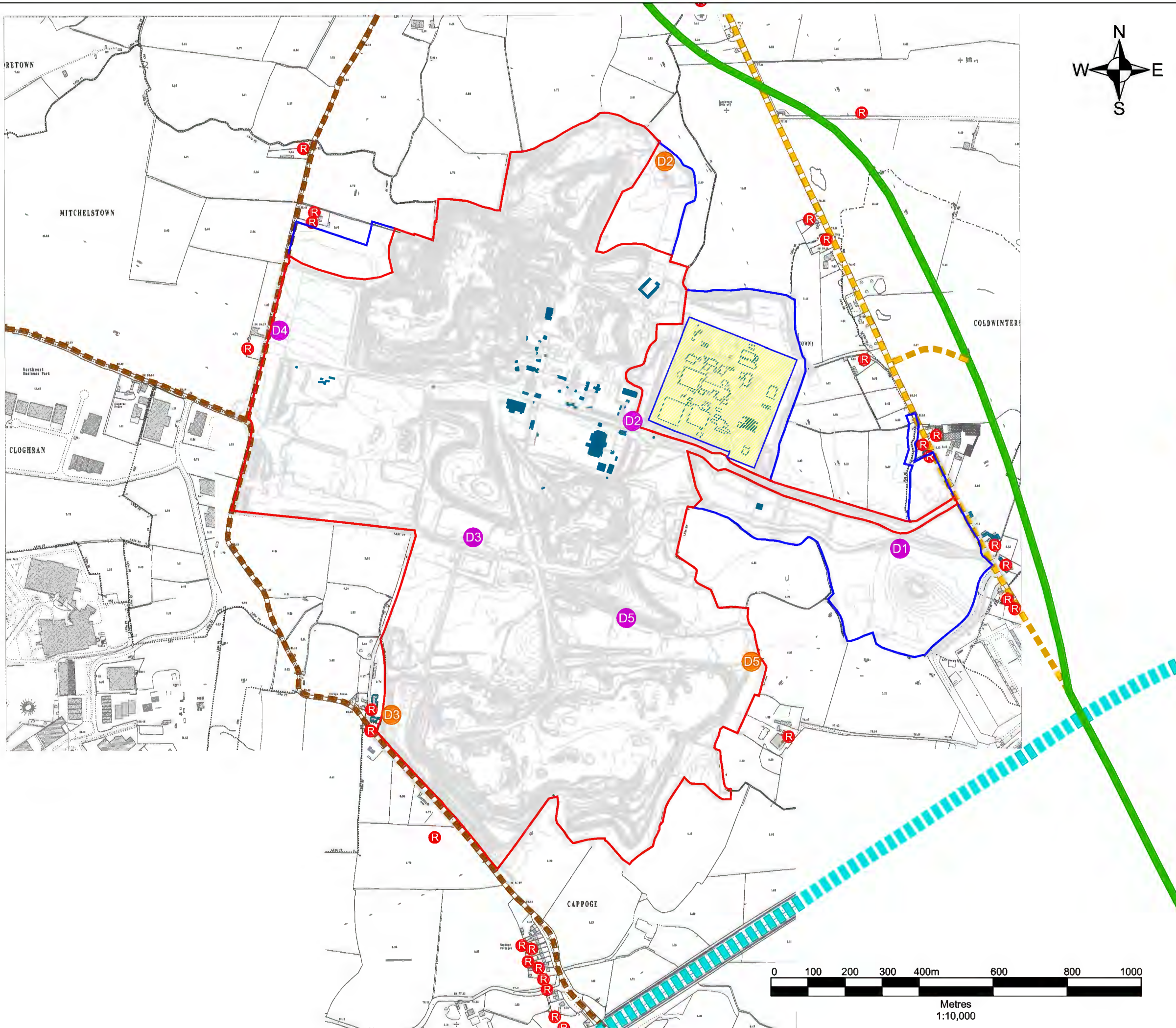
CONTINUANCE OF USE
 HUNTSTOWN QUARRY,
 NORTH ROAD, FINGLAS, DUBLIN 11

EXISTING DUST
 MONITORING LOCATIONS

FIGURE 8-1

Scale 1:10,000 @ A3 Date FEBRUARY 2012

00180.00015.18.8-1.R0.EXIST DUST MON LOCATIONS.dwg



NOTES

1. EXTRACT FROM 1:2,500 ORDNANCE SURVEY DIGITAL SHEET NO'S. 3062-A, 3062-B, 3062-C, 3062-D, 3063-A, 3063-C, 3130-A & 3130-B
2. ORDNANCE SURVEY IRELAND LICENCE NO. SU 0000712 (C) ORDNANCE SURVEY & GOVERNMENT OF IRELAND
3. TOPOGRAPHIC SURVEY PREPARED BY FUGRO BKS BASED ON MAY 2009 AERIAL PHOTOGRAPHY

LEGEND

| | |
|--|---|
| | ROADSTONE WOOD LTD. LANDHOLDING (c. 211 ha) |
| | HUNTSTOWN POWER STATION (NOT OWNED BY RWL) |
| | PLANNING APPLICATION AREA (c. 167.5 ha) |
| | EXISTING DUST MONITORING LOCATIONS |
| | PROPOSED DUST MONITORING LOCATIONS |



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ROADSTONE WOOD LTD.
 ENVIRONMENTAL IMPACT STATEMENT

CONTINUANCE OF USE
 HUNTSTOWN QUARRY,
 NORTH ROAD, FINGLAS, DUBLIN 11

**PROPOSED RE-LOCATED
 DUST MONITORING LOCATIONS**

FIGURE 8-2

Scale 1:10,000 @ A3 Date FEBRUARY 2012

00180.00015.18.8-2.R0.PROP DUST MON LOCATIONS.dwg