EMISSIONS IMPACT ASSESSMENT REPORT

AIR EMISSION IMPACTS

The information / air emission impact assessment presented herein is based on that presented in Chapter 8 (Air Quality) of the EIAR which accompanies this waste licence review application. Details of the baseline air environment and a description of the methodologies employed for the purposes of this impact assessment are also presented in the EIAR .

Operational Stage Dust Impact - Assessment

Given the inert nature of the soil and stone materials being imported and used to restore the South Quarry and the absence of biodegradable (organic) wastes, no landfill gas emissions will arise from future waste recovery activities there. The principal air quality impacts arising from the activity will be dust and traffic related emissions.

An overview of the sources and processes associated with the soil recovery activities at the South Quarry, and their respective potential for dust deposition, is presented below in Table 7-1-3-3A.

Table 7-1-3-3A
Sources of Particulate Emissions

Activity	Source	Emission Potential	Comments
Material placement and onsite handling	Onsite plant and equipment handling dry loose material.	High when dry material being handled during strong windy weather. High on unpaved road surfaces	Emissions due to prevailing meteorological conditions and amount of dry loose material. Emissions due to re-suspension of loose material on surfaces.
Material storage	Dry loose material in stockpiles	High when dry material being stored during strong windy weather	Emissions due to prevailing meteorological conditions (high winds).
Material transfer on-site and traffic moving off site	HGVs / Road vehicles	Low - on paved road surfaces High on unpaved road surfaces	Dependant on the amount of loose material on road surface available for re-suspension and track out.

Human Receptors

Twelve (12) residential receptors (including one cluster) have been identified within a 500m study area around the South Quarry recovery area or at greater distance (downwind) along the R135 Regional Road. All of these receptors, identified in Figure 7-1-3-3A, have been progressed to an assessment of the potential risk of dust impact. Each receptor is assessed against the frequency of exposure and the distance from the source to the receptor (i.e. the pathway) in accordance with the methodology described in Appendix 8-A of the EIAR which accompanies this waste licence review application.

The frequency of exposure of each receptor is based upon the frequency of winds capable of carrying dust particles blowing in the direction, from the source to the receptor, on days when rainfall does not inhibit dust from becoming airborne. Representative data on the local wind climate is therefore required for this assessment.

The wind-rose for the licensed site (presented previously in the Receiving Environment Report in Attachment 7-1-3-2) is taken from the Meteorological Station at Dublin Airport nearby and illustrates the predominant wind direction is from the south-west and west. The potential for the generation of airborne dust will increase with wind speed, with winds greater than 3m/s capable of carrying airborne dust[1].

The wind rose shows the frequency of winds at wind speeds of greater than 2m/s, together with the individual frequencies for each 10-degree compass sector used within the impact assessment. In the assessment however, wind speeds over 2m/s were used as this is how the data on percentage occurrence of wind frequency and wind speed is calculated and presented by Met Eireann. For this reason, therefore, the impact assessment presented herein should be considered to be conservative.

A summary of the risk assessment of dust impacts from sources around the proposed soil waste recovery facility at the South Quarry is presented in Table 7-1-3-3B below.

Table 7-1-3-3B
Dust Risk Assessment Screening (Without Mitigation Measures)

Receptor Reference	Distance from Operations (m)	Relevant. Wind Direction (A)	Potential Exposure Duration (B)	Relative Wind / Distance Rank (C)	Risk Evaluation
R1	540 NE	200-230	8.9	3/1	Insignificant
R2	634 NE	210-240	11.2	4/1	Insignificant
R3	657 NE	210-240	11.2	4/1	Insignificant
R4	752 NE	220-240	9.3	4/1	Insignificant
R5	908 E	230-260	13.7	5/1	Insignificant
R6	944 E	230-260	13.7	5/1	Insignificant
R7	938 E	240-270	13.8	5/1	Insignificant
R8	972 E	240-270	13.8	5/1	Insignificant
R9	625 E	230-340	24.5	6/1	Insignificant
R10	508 S	330-30	2.8	1/1	Insignificant
Group R11	195 S	320-40	4.1	2/5	Acceptable
R12	50 SW	340-80	5.5	2/8	Slight Adverse

Table Note:

(A) – relevant wind direction based on upwind sector (i.e. the direction its blowing from) which would potentially convey emissions from site towards the receptor.

*(B) – Potential duration of exposure based on frequency of moderate to high wind speed (adjusted for dry days only) expressed as overall % of time (as described in the methodology in **EIAR Appendix 8-A**).*

*(C) – Ranking as per methodology in **EIAR Appendix 8-A***

*Refer to **Figure 7-1-3-3A** for Receptor Locations*

[1] Department of the Environment, Transport and the Regions, 1995. *The Environmental Effects of Dust from Surface Mineral Workings* – Volume 2. Technical Report. December 1995.

From Table 7-1-3-3B above, it is observed that the risk of impact from dust emissions associated with the backfilling and recovery activities at Huntstown South Quarry (without any mitigation measures in place) generally varies from:

- Slight Adverse at receptor R12; to
- Acceptable and/or Insignificant at all remaining receptors.

Note that this assessment ***does not consider*** implementation of mitigation measures in respect of the planned activities that include retention / strengthening of perimeter vegetation / hedgerows and screening berms, dust suppression measures etc. (refer to section on Mitigation Measures below). Furthermore, it should be noted that this assessment is likely conservative on the basis of the moderate wind speeds (>2m/s) adopted in the risk evaluation.

Ecological Receptors

It is considered that the maximum distance for which the proposed backfilling and recovery activities should be evaluated in terms of potential dust / air quality impacts on designated (ecological) sites is up to a maximum radius of 2km, unless there are any potential source-pathway-receptor links between it and any designated site(s) beyond this distance.

At a distance greater than 2km and in the absence of any potential source-pathway-receptor link, it is considered that no designated sites would be affected by any direct loss of habitat or otherwise impacted by the effects of dust deposition or traffic emissions.

As there are no designated ecological sites within 2km radius of the proposed backfilling and recovery area at the South Quarry, no dust or air quality impact will arise at any such site.

Traffic Emissions - Assessment

Backfilling and recovery activities at the South Quarry will generate an average of 12 movements to and 12 movements from the quarry every hour of every working day (and a total of 24 movements per hour). This compares with the current average rate of 23 movements per hour in each direction (or a total of 46 movements per hour) which is currently permitted for the ongoing (licensed) backfilling and recovery operations at the North Quarry.

Given that there will be a reduction in HGV traffic levels (relative to present day levels) should backfilling and recovery activities proceed as proposed at the South Quarry, and as none of the public roads in the surrounding local road network will therefore meet any of the traffic criteria requiring air quality impact assessment set out in LA 105 (DMRB, 2019), the impact of traffic emissions is deemed 'negligible' in terms of local air quality, and no further air quality assessment is considered necessary.

On this basis, the impact of the future backfilling / soil recovery activities at the South Quarry from changes in HGV traffic levels can be screened out and it is considered that combustion emissions (primarily oxides of nitrogen) from vehicle exhaust emissions associated with the transportation of materials to and from the recovery facility will not have the potential to contribute to any increase in local air pollution.

PM_{10} Contribution from Soil Recovery Activities - Assessment

In terms of PM_{10}, the maximum annual mean measured baseline background concentration was 14µg/m³ in 2019 at the Finglas monitoring station. Therefore, even allowing for the highly conservative assumption of a potential additional contribution of 5µg/m^3 to the annual mean background concentration of the coarse particulate fraction (2.5 to 10µm diameters) around the South Quarry recovery area, the resulting change would be insignificant, with ambient concentrations remaining well below the threshold mean annual concentration of 40µg/m³.

On this basis, the potential impacts of future recovery activity at the South Quarry on ambient PM_{10} concentration can be classified as 'negligible', particularly when the limited duration of conditions and the nature and magnitude of the projected change in site activities at the quarry are considered.

Mitigation Measures

A number of mitigation measures are recommended in respect of backfilling and soil recovery activities at Huntstown. The principal factor which will reduce and mitigate emissions from recovery activities at the South Quarry will be placing soils within the existing quarry void, often significantly below the surrounding ground level, below and/or behind existing perimeter slopes and screening berms, the effect of which will be to effectively inhibit and/or limit emission of fugitive dust off-site.

Site Specific Mitigation Measures

The South Quarry at Huntstown will be backfilled progressively in phases on the western side of the quarry and upwards from the quarry floor to original (proposed restoration) ground level. As backfilling advances restored ground will be seeded at the earliest opportunity to minimise the area of exposed soil and the volume of soil particulates which potentially could become airborne.

In addition to these measures, a number of further control measures will be implemented to reduce or mitigate potential dust impacts at the recovery facility so as to achieve specified dust emission limits. Mitigation measures to be implemented are set out in Table 7-1-3-3C below.

Table 7-1-3-3C
Particulate Emission Mitigation Measures

Source	Emission Potential	Recommended Mitigation Measures	Effectiveness
Excavator / HGV	High – dry or fine particulate matter during strong windy weather	Minimise drop heights when handling waste materials. Dampen materials using sprinklers or water bowser. Time / schedule recovery activities close to the site perimeter having regard to expected weather conditions.	High
	Low – wet particulate matter during conditions of low wind speed	Minimise drop heights when handling waste materials, protection from wind where possible.	High
Onsite Vehicles	High when travelling over unpaved and dry site roads	Minimise distances of on-site haul routes.	High
		Use of water sprays / tractor and bowser to moisten surfaces during dry weather.	High
		Restrict vehicle speeds through signage / staff training.	High
		Location of haul routes away from sensitive receptors.	High
Road Vehicles (transfer off-site)	Low / Moderate on paved road surfaces	All HGVs exiting the facility to be routed through a wheelwash facility and over paved ground thereafter.	High

Source	Emission Potential	Recommended Mitigation Measures	Effectiveness
		Use of road sweeper to reduce the amount of available material for re-suspension.	Moderate / High
		Consider paving additional sections of the access road leading to the recovery facility (if necessary to achieve emission limit).	High
		Consider installation of sprinkler system along haul roads and/or around perimeter of the waste recovery facility (if necessary to achieve emission limits).	High
Stockpiles	Potentially high when dry or fine material stored or handled during windy weather (dependent on overall volume)	Seed / vegetate soil surfaces and stockpiles which may be undisturbed / exposed for extended periods of time.	High
		Limit mechanical disturbance of materials more likely to become airborne and time activities having regard to expected weather conditions.	
Moderate and Slight Adverse Risk Receptors	High – during dry and strong windy weather	Retain existing perimeter slope / screening berm and strengthen / reinforce with additional planting if necessary.	High
		Time / schedule recovery activities close to the quarry perimeter having regard to expected weather conditions.	
		Hardstanding areas / site roads and stockpiles with the potential to give rise to dust will be regularly watered as appropriate during dry and/or windy conditions by water bowser and/or sprinklers.	

Good Practice Measures

Effective site management practices are critical to demonstrate the facility operator's commitment to control dust emissions. Monitoring of dust deposition and recording of any complaints shall be carried out to take appropriate measures to reduce emissions in a timely manner.

Training on dust mitigation measures shall be provided to site-based staff. Training will also cover an 'emergency preparedness plan' to react quickly in case of any failure of dust mitigation measures.

When adverse conditions apply, sprayed water from a bowser should be used to dampen down particulate materials from operations and/or stockpiles as and when required, principally in windy periods during extended dry spells. As noted above, should it be necessary to ensure emissions limits are consistently below threshold values, automated sprinkler systems should be installed around the recovery facility to systematically dampen down stockpiled / exposed soils.

Trackout Measures

When adverse conditions apply (dry, windy weather), water from a bowser will be sprayed on dry unpaved road surfaces in order to minimize dust rise. Any paved surfaces around the site and/or the access road leading in and out of the facility will also be sprayed as required.

All heavy goods vehicles leaving the South Quarry recovery facility will be routed through the established wheelwash facility in order to remove and / or dampen any dust / clay material attaching to the undercarriage and to prevent transport of fine particulates off-site, onto the local public road network.

Residual Impact Assessment

Between the range of mitigation measures incorporated by design and those actively implemented as part of the environmental management scheme, it is considered that the risk of dust impact at receptors from future backfilling and recovery activity at the South Quarry reduces further.

After an assessment of potential adverse effects produced by the development, it was concluded that there would be no significant adverse air quality effects for both human and ecological receptors which cumulatively would not hinder the licence extension area or the surrounding lands. Overall, the effects of the proposed development on air quality are considered to be negligible to acceptable.

A summary of the residual dust risk impact assessment is provided in Table 7-1-3-3D.

Table 7-1-3-3D
Residual Dust Risk Assessment (With Mitigation Measures)

Receptor Reference	Risk Evaluation
R1	Insignificant
R2	Insignificant
R3	Insignificant
R4	Insignificant
R5	Insignificant
R6	Insignificant
R7	Insignificant
R8	Insignificant
R9	Insignificant
R10	Insignificant
Group R11	Insignificant
R12	Acceptable

On the basis of the assessment presented above, it is concluded that the proposed quarry backfilling and recovery activities at the South Quarry, with the range of mitigation measures to be implemented and design measures incorporated into the working scheme, will not have a dust deposition impact on any identified sensitive receptors.

NOISE EMISSION IMPACTS

The information / noise emission impact assessment presented herein is based on that presented in Chapter 10 (Noise and Vibration) of the EIAR which accompanies this waste licence review application. Details of the baseline noise environment and a description of the methodologies employed for the purposes of this impact assessment are presented in the EIAR .

To determine the noise impact arising from backfilling and soil recovery activities at the South Quarry, SLR Consulting Ireland carried out a noise prediction assessment, whereby resultant noise levels were calculated for nearby clusters of noise sensitive receptors identified on Figure 7-1-3-3B.

Operational $L_{Ar,\ 1hr}$ noise predictions at each receptor location are based on BS5228: Part 1 (2009)+ A1:2014 "*Code of Practice for Noise and Vibration Control on Construction and Open Sites*''

For the purposes of this assessment, it is assumed the following plant will be used continuously for backfilling and soil recovery activities on site at Huntstown South Quarry (over and above that present at the time of the baseline / reference noise survey):

- Bulldozer
- Excavator
- No. HGVs (assuming 10-minute turnaround).

For the purposes of this assessment, it is assumed that all of the above listed noise sources are active and arise continuously and simultaneously during assessment hours, and that the attenuation distance to the selected closest receptors is calculated from the extended licence boundary ***rather than from the noise source***.

Noise generated by soil intake and handling at the quarry will for the most part, be screened by surrounding landforms, and by the existing quarry faces in particular. For the purposes of this impact assessment, a reduction of -10 dB(A) has been assumed for partial noise screening by existing quarry faces and screening berms along the Roadstone property boundary. This reduction is likely to be conservative and to understate the degree of attenuation provided by the quarry faces and screening berms.

On the basis of the methodology outlined above, it is considered that the noise impact assessment presented herein is sufficiently robust and conservative and represents a worst-case scenario. Detailed noise assessment calculations are provided in Appendix 10-B of the EIAR submitted in support of this waste licence review application.

Operational Activities

As set out in Annex D of the updated Environmental Noise Standard, ISO 1996-2:2017 (*Acoustics — Description, measurement and assessment of environmental noise — Part 2: Determination of environmental noise levels)* a prominent, discrete tonal component may be detected in one-third octave spectra if the level of a one-third octave band exceeds the level of the adjacent bands by some constant level difference.

The appropriate level differences vary with frequency. They should be greater than or equal to the following values in both adjacent one-third-octave bands:

- 15dB in low-frequency one-third-octave bands (25Hz to 125Hz);
- 8dB in middle-frequency bands (160Hz to 400Hz), and;
- 5dB in high-frequency bands (500Hz to 10,000Hz).

The noise characteristics of the plant to be used for the proposed backfilling and soil waste recovery activities at the South Quarry and considered in this noise assessment are shown in Table 7-1-3-3E below. Notwithstanding the fact that a mechanical excavator may only be used occasionally for short intermittent periods at the facility, it is included in this noise assessment to ensure it is robust and sufficiently conservative. There will be no tonal components within the frequency range.

Table 7-1-3-3E
Octave Band Noise Spectra : Backfilling Plant / HGVs

Plant	Octave Band Sound Pressure Levels @ 10m, Hz								L_{Aeq} @10m
	63	125	250	500	1,000	2,000	4,000	8,000	
Excavator	75	76	72	68	65	63	57	49	71
Dozer	79	77	76	74	68	67	60	59	75
HGV Truck	91	79	77	74	71	69	64	61	77

The plant and equipment used at the soil recovery facility will not generate impulsive or tonal noise. As such, no penalty has been added to the predicted operational $L_{Ar,\ 1hr}$ noise level for presence of tonal or impulsive noise.

The operational $L_{Ar,\ 1hr}$ noise prediction for each receptor location under assessment is presented in Table 7-1-3-3F below. Table 7-1-3-3F also shows the comparison between the predicted operational $L_{Ar,\ 1hr}$ noise level and the prescribed noise limit (from the EPA's NG4 Guidance) for 'all other areas' at each receptor.

Table 7-1-3-3F
Operational Noise : Soil Recovery Activity at Huntstown South Quarry

Receptor	Period	Noise Limit $L_{Aeq,\ 1hr}$ dB (A)	Operational* $L_{Aeq\ ,\ 1hr}$ dB(A)	Difference
R1	Daytime	55	40	15
R2	Daytime	55	39	16
R3	Daytime	55	38	17
R4	Daytime	55	37	18
R5	Daytime	55	35	20
R6	Daytime	55	35	20
R7	Daytime	55	35	20
R8	Daytime	55	35	20
R9	Daytime	55	39	16
R10	Daytime	55	40	15
Group R11	Daytime	55	49	6
R12	Daytime	55	61	-6
Millennium Business Park	Daytime	55	55	0

**Operational Noise Level = Predicted Noise Level without a 5 dB penalty*

As can be seen from the above assessment, the noise levels generated solely by the continuous backfilling and recovery activities at Huntstown, even in a worst-case scenario, are comfortably below prescribed EPA NG4 Daytime Noise criterion limits at all nearby noise sensitive locations apart from the Millennium Business Park and residential receptor R12.

It is emphasised that the assessment is very much a worst-case scenario, with separation distance between all noise sources and receptor taken to be a minimum, equivalent to the distance to the extended licence boundary. In reality however, the separation distance will be greater, providing scope for greater noise attenuation and reducing resultant noise to below threshold levels.

To identify the potential impact of continuous backfilling and soil waste recovery activity at the extended facility, predicted specific $L_{Aeq,1hr}$ dB(A) noise levels have been logarithmically added to existing ambient noise levels. The cumulative levels have been compared to the existing ambient noise levels at each of the noise sensitive locations for each time-period. The cumulative assessment is presented in Table 7-1-3-3G below.

Table 7-1-3-3G
Cumulative Operational Noise : Soil Recovery Activity at Huntstown South Quarry

Location	Receptor	Existing Baseline $L_{Aeq,T}$ dB(A)	Operational $L_{Ar,\ 1hr}$ dB(A)*	Cumulative $L_{Aeq,\ T}$ dB(A)	Difference	Short Term Impact	Long Term Impact
BN2	R1	71	40	71	0	Negligible	Negligible
BN2	R2	71	39	71	0	Negligible	Negligible
BN2	R3	71	38	71	0	Negligible	Negligible
BN2	R4	71	37	71	0	Negligible	Negligible
BN1	R5	62	35	62	0	Negligible	Negligible
BN1	R6	62	35	62	0	Negligible	Negligible
BN1	R7	62	35	62	0	Negligible	Negligible
BN1	R8	62	35	62	0	Negligible	Negligible
N2	R9	53	39	53	0	Negligible	Negligible
BN4	R10	63	40	63	0	Negligible	Negligible
BN4	Group R11	63	49	63	0	Negligible	Negligible
BN5	R12	74	61	74	0	Negligible	Negligible
BN3	Millennium Business Pk	64	55	65	1	Minor	Negligible

**Operational Noise Level = Predicted Noise Level without the 5 dB penalty for tonal or impulsive noise*

With reference to the *Guidelines for Noise Impact Assessment* produced by the Institute of Environmental Management and Assessment (IEMA, 2014), the long-term cumulative noise impact from the proposed backfilling and recovery operations at all residential receptors is determined to be ***negligible*** under a worst-case scenario.

However, when backfilling and recovery activities take place close to the original ground level along the western and south-western boundaries, the worst case short-term (temporary) noise impacts at the adjoining Millennium Business Park is assessed as ***minor***.

Traffic Noise

The backfilling and recovery activities at the South Quarry as proposed will generate an average of 12 movements to and 12 movements from the quarry every hour of every working day (and a total of 24 movements per hour). This compares with the current average rate of 23 movements per hour in each direction (or a total of 46 movements per hour) which is currently permitted for the ongoing (licensed) backfilling and recovery operations at the North Quarry.

Given the existing high level of HGV traffic around Huntstown quarry and the high level of ambient / traffic noise captured in the baseline / reference noise surveys, together with the future reduction in HGV traffic levels associated with the proposed backfilling of the South Quarry, it is considered that the potential noise impact of the traffic movements will not meet any of the assessment criteria set out in LA 111 (DMRB, 2020) and that the impact of the traffic can be screened out and deemed to be 'negligible' in terms of noise and no further assessment is considered necessary.

Mitigation Measures

Where necessary, the three established strategies for impact mitigation are avoidance, reduction and remedy. Where it is not possible or practical to mitigate all impacts, then the residual impacts must be clearly described in accordance with the system for impact description set out in the EPA Guidelines (NG4). The adoption of Best Practicable Means is generally considered to be the most effective means of controlling noise emissions.

Notwithstanding the findings of the impact assessment above, which determined that any future soil recovery activity at Huntstown South Quarry will have a negligible long-term noise impact on residential amenity, and in line with established practice at other sites, the following best practice measures will be implemented wherever practicable to minimise the potential noise impact of backfilling and recovery activities:

Screening

- existing screening banks and screening / planting around the facility will be retained to act as acoustic barriers. Existing / temporary berms will be inspected on a regular basis and maintained / strengthened / reinforced with planting as necessary.

Plant

- all mobile plant used for recovery activities should have noise emission levels that comply with the limiting levels defined in EC Directive 2000/14/EC and any subsequent amendments thereof (transposed into Irish law under S.I. No. 632 of 2000, as amended);
- all plant items should be properly maintained and operated according to the manufacturers' recommendations, in such a manner as to avoid causing excessive noise (i.e. all moving parts are kept well lubricated, all cutting edges are kept sharpened, the integrity of silencers and acoustic hoods are maintained); and

- all plant should be fitted with effective exhaust silencers which are maintained in good working order to meet manufacturers' noise rating levels. Any defective silencers should be replaced immediately.

Traffic

- all soil intake will be programmed to arrive during working hours only. Care should be taken when unloading vehicles to reduce or minimise potential disturbance to local residents;
- traffic speed within the facility will be limited / controlled;
- access / internal haul roads will be kept clean and maintained in a good state of repair (i.e. any potholes will be filled, and large bumps removed, to avoid unwanted rattle and "body-slap" from heavy goods vehicles); and
- delivery vehicles waiting within the facility will be prohibited from leaving their engines running and there should be no unnecessary revving of engines.

Experience from other waste recovery facilities has shown that by implementing these measures, typical noise levels from construction works and/or recovery operations can bring about a reduction of up to 5dB(A) in ambient noise levels.

Residual Impact Assessment

The worst-case noise assessment has shown that in accordance with the scale in the *Guidelines for Noise Impact Assessment* (IEMA, 2014) the long-term cumulative noise impact from plant associated with backfilling and recovery activity at all receptor locations is ***negligible.***

Table 7-1-3-3H summarises the impacts, mitigation measures and residual impact for operational plant noise at each of the noise sensitive receptors considered by this assessment.

Table 7-1-3-3H
Operational Noise Summary Table

Receptors	Increase in Operational Noise $L_{Aeq,1hr}$ dB(A)	Impact Without Mitigation Measures		Mitigation	Reduction in Noise from Mitigation $L_{Aeq,1hr}$ dB(A)	Increase in Operational Noise $L_{Aeq,1hr}$ dB(A)	Residual Short-Term Impact	Residual Long-Term Impact
		Short Term	Long Term					
R1	0	Negligible	Negligible	Not Required	-5	0	Negligible	Negligible
R2	0	Negligible	Negligible	Not Required	-5	0	Negligible	Negligible
R3	0	Negligible	Negligible	Not Required	-5	0	Negligible	Negligible
R4	0	Negligible	Negligible	Not Required	-5	0	Negligible	Negligible
R5	0	Negligible	Negligible	Not Required	-5	0	Negligible	Negligible
R6	0	Negligible	Negligible	Not Required	-5	0	Negligible	Negligible
R7	0	Negligible	Negligible	Not Required	-5	0	Negligible	Negligible

Receptors	Increase in Operational Noise $L_{Aeq, 1hr}$ dB(A)	Impact Without Mitigation Measures		Mitigation	Reduction in Noise from Mitigation $L_{Aeq, 1hr}$ dB(A)	Increase in Operational Noise $L_{Aeq, 1hr}$ dB(A)	Residual Short-Term Impact	Residual Long-Term Impact
		Short Term	Long Term					
R8	0	Negligible	Negligible	Not Required	-5	0	Negligible	Negligible
R9	0	Negligible	Negligible	Not Required	-5	0	Negligible	Negligible
R10	0	Negligible	Negligible	Not Required	-5	0	Negligible	Negligible
Group R11	0	Negligible	Negligible	Not Required	-5	0	Negligible	Negligible
R12	0	Negligible	Negligible	Not Required	-5	0	Negligible	Negligible
Millennium Business Pk	1	Minor	Negligible	Short-term Required	-5	0	Negligible	Negligible

GROUND EMISSIONS IMPACTS

This waste licence review application provides for the importation of inert material for backfilling / recovery purposes on the western side of Huntstown South Quarry. Backfilling at the quarry (using imported soil waste and/or by-product) already has the benefit of planning permission. No new infrastructure is required to facilitate transfer and re-location of established soil waste recovery operations to the South Quarry or the extension of the licensed site area to include this area.

During the operational phase, there is potential for accidental spills or leaks of fuel, hydrocarbons or other hazardous substances being used or stored at the facility to adversely impact land quality. The potential for uncontrolled emissions to ground exists at the existing licenced facility at present and is minimised by implementing a series of mitigation measures (outlined in section on groundwater impacts below) and adhering to the Environmental Management System (EMS), which includes, amongst other features, detailed systems and procedures providing for the implementation of these mitigation measures and for proper handling, storage, control and monitoring for all potentially hazardous substances.

Site based personnel at the existing soil and stone waste recovery facility use toilet, hand washing and welfare facilities at on-site offices and the staff canteen located around the central infrastructure area at Huntstown and will continue to do so for the duration of backfilling and recovery activities at the South Quarry. Wastewater from these locations is collected and fed via a sewerage pipe to an on-site wastewater treatment plant (septic tank). No new or upgraded wastewater treatment facilities are required or proposed to support waste recovery activities at the South Quarry.

Experience at the existing licensed facility to date is that management practices can serve to minimise and prevent any uncontrolled emissions to ground and any potentially adverse implications for land quality or ground contamination.

With the mitigation measures in place, it is considered that any potential impacts on land quality arising from the backfilling of the quarry will be slight. With the long-term restoration of the quarry to grassland / agricultural use, the post-closure impact on land is assessed as minor and positive.

SURFACE WATER AND GROUNDWATER EMISSION IMPACTS

The information / noise emission impact assessment presented herein is based on that presented in Chapter 7 (Hydrology and Hydrology / Water) of the EIAR which accompanies this waste licence review application. Details of the baseline water environment and a description of the methodologies employed for the purposes of this impact assessment are presented in the EIAR .

Operation Stage Impacts (No Mitigation)

The operation stage is taken to comprise the importation, backfilling and recovery of inert soil and stone waste at Huntstown South Quarry at a rate of 750,000 tonnes per annum. These activities are required to progress the infilling of Huntstown South Quarry to former ground level and its restoration to agricultural use / grassland.

Some minor works will be undertaken at the outset of the operational phase to facilitate soil waste intake and recovery activities. These will principally comprise:

- Upgrading and/or maintenance of existing haul roads and hardstanding areas as required to facilitate routing of HGV / trucks across the quarry complex;
- Construction of temporary access ramps (if required) to access initial backfill areas on the western side of the South Quarry; and
- Establishment of any additional environmental control and monitoring infrastructure required by the EPA waste licence in respect of backfilling / recovery activities.

Direct Impacts

During the operational stage, the direct impacts identified below will apply :

- accidental spillage of fuels and lubricants by construction plant during the restoration, backfilling and soil recovery activities, with the potential for contaminated runoff entering surface water and groundwater, and;
- increase in suspended solids and potential for runoff with suspended solids entering surface water and groundwater during the restoration, backfilling and soil recovery activities.

  It is noted that the effects of any accidental spillage will be impeded by the placement of inert soil and stone backfill on the floor of the existing quarry and as such, risks to groundwater quality will reduce following the initial backfilling stages:
- In addition, the following potential impacts, relating specifically to ongoing soil recovery activities over the course of the operation stage, could also arise in the absence of any mitigation:
- the unintended importation of non-inert material or a rogue load with contaminated soils has the potential to adversely impact on groundwater quality of the locally important bedrock aquifer and nearby private water supply;
- dewatering of the South Quarry will continue for much of the backfilling stage. The reduction in, and ultimate cessation, of dewatering around the South Quarry as backfilling works progress will result in a local rise in groundwater level and contribute to increased flow around or beneath the quarry, as well as a likely reduction in the discharge to surface waters;
- infilling of the site with low permeability inert fill material has the potential to create a low permeability zone which could reduce recharge to the underlying bedrock aquifer over the excavated quarry footprint; and

- the restoration of the site with inert material will increase the thickness of unsaturated material above the groundwater table. This measure will afford additional protection to groundwater from potential pollutants, thus reducing the groundwater vulnerability across the backfilled area to impact from human activities.

The significance of the identified potential impacts is presented in Table 7-1-3-3I below.

Indirect Impacts

No indirect impacts are anticipated for surface water and groundwater over the operational stage.

Post - Operational Stage Impacts (No Mitigation)

Direct Impacts

During the post-operational stage, all plant and equipment at the quarry / recovery facility will be decommissioned and removed and the former quarry restored to agricultural after-use.

Following the completion of restoration works at the quarry, some rainfall will infiltrate naturally to the ground through near-surface soil while the bulk of it will likely be rejected and flow overground, as surface water run-off, northwards over the final restored landform toward the watercourse which flows off-site to the headwaters of the Finglas Stream. Drains or channels will be provided as required to intercept runoff and channel it toward the watercourse running off-site.

It is not considered that there are any direct impacts on groundwater associated with the post operational restoration of the site.

Indirect Impacts

There are no indirect impacts anticipated with this stage.

Summary of Potential Impacts

A summary of potential impacts *without mitigation* is presented in Table 7-1-3-3I below. The assessment of impacts on existing environment water receptors (specifically bedrock groundwater / Finglas Stream / private water supplies) have an importance and sensitivity rated as "**medium**".

Table 7-1-3-3I
Classification of Significance of Water Related Impacts (No Mitigation)

No.	Identified Potential Impact	Magnitude of Impact (with Description) (No Mitigation)	Significance of Impact (No Mitigation)
Operation Stage – Direct - Groundwater			
1	Impact on groundwater quality in bedrock aquifer due to unintentional import of non-inert material	**Low** - Potential to affect groundwater quality in underlying aquifer through vertical migration. Impact is unlikely as the intent is to use only inert, uncontaminated soil for backfilling purposes. The risk to groundwater will be reduced following the initial backfilling stage due to the placement of inert, low permeability (clay-bound) soil and stone across the floor of the existing quarry.	**Slight**
2	Impact on groundwater quality in private water supplies due to unintentional import of non-inert material	**Low** - Potential to affect groundwater quality in underlying aquifer through lateral migration. Impact is unlikely as the intent is to use only inert, uncontaminated soil for backfilling purposes. The risk to groundwater will be reduced following the initial backfilling stage due to the placement of inert, low permeability (clay-bound) soil and stone across the floor of the existing quarry	**Slight**
3	Reduction in dewatering and resultant increase in groundwater levels	**Low** - The potential impact from the reduction in, and ultimate cessation of, quarry dewatering will result in localised groundwater level rise and increased groundwater flow around the backfilled quarry.	**Slight**
4	Impact on groundwater recharge to bedrock aquifer due to low permeability zone	**Low** - Recharge over the quarry footprint is currently limited by dewatering and rainfall is diverted to surface water. The potential impact from backfilling will be minimal. While some recharge may occur as dewatering is scaled back, it will be limited by low permeability backfill material. The area to be backfilled with low permeability soil is also limited within the overall aquifer catchment area.	**Not Significant**
5	Impact on groundwater quality in bedrock aquifer from accidental fuel leakage/ spillage	**Low - Medium** - Potential to affect groundwater quality in underlying aquifer through vertical migration. Any leakage / spillage would be accidental only and of limited volume only. The risk to groundwater will be reduced following initial backfilling stage due to the placement of inert low permeability (clay-bound) soil and stone across the floor of the existing quarry.	**Slight - Moderate**

No.	Identified Potential Impact	Magnitude of Impact (with Description) (No Mitigation)	Significance of Impact (No Mitigation)
6	Impact on groundwater quality in bedrock aquifer from increased suspended solids	**Low** - Potential to affect groundwater quality in underlying aquifer through vertical migration. The risk to groundwater will be reduced following the initial backfilling stage due to the placement of inert low permeability (clay-bound) soil and stone across the floor of the existing quarry.	**Slight**
7	Impact on groundwater quality in private water supplies from accidental fuel leakage/ spillage	**Low - Medium** - Potential to affect groundwater quality in underlying aquifer through lateral migration. Any leakage / spillage would be accidental only. The risk to groundwater will be reduced following the initial backfilling stage due to the placement of inert low permeability (clay-bound) soil and stone across the floor of the existing quarry	**Slight - Moderate**
8	Impact on groundwater quality in private water supplies from increased suspended solids	**Low** - Potential to affect groundwater quality in underlying aquifer through lateral migration. The risk to groundwater will be reduced following the initial backfilling stage due to the placement of inert low permeability (clay-bound) soil and stone across the floor of the existing quarry	**Slight**
Operation Stage – Direct – Surface Water			
9	Impact on surface water quality in Finglas Stream from accidental fuel leakage/ spillage	**Low - Medium** - Potential to affect surface water quality in Finglas Stream, and in turn Tolka River, through contaminated runoff. Any leakage / spillage would be accidental only and of limited volume.	**Slight - Moderate**
10	Impact on surface water quality in Finglas Stream from increased suspended solids	**Low - Medium** - Potential to affect surface water quality in Finglas Stream, and in turn Tolka River, through increased sediment in run-off.	**Slight - Moderate**
11	Reduction in dewatering and resultant decrease in discharge volumes	**Low** - The potential impact from the gradual scaling back of and ultimate cessation of dewatering will result in a decrease in discharge volumes from the quarry void to the Finglas Stream. This will be compensated by long-term increase in run-off from the restored landform at the South Quarry to the existing drainage channel to the north and to the Finglas Stream thereafter.	**Slight**

Table 7-1-3-3I above indicates that if no mitigation measures are applied to take account of the quarry backfilling and recovery operations, there is potential for these activities to increase the risk of pollution to groundwater.

Similarly, in the absence of an effective surface water management system, the backfilling and recovery operations have the potential to increase the risk of pollution to the Finglas Stream, and in turn the Tolka River further downstream.

Mitigation Measures

Mitigation measures are required to reduce the assessed significance of potential impacts associated with the placement of imported soil waste materials to "slight" (or lower) for water environment receptors. In order to mitigate against the risk of pollution to groundwater and surface water occurring arising during the backfilling and recovery of Huntstown South Quarry, the following water / environmental control measures will be implemented:

Existing Mitigation Measures

- Any dewatered groundwater and surface water will continue to be collected in sumps (and/or at low points) and pumped to existing settlement / attenuation ponds. The treated surface water is then passed through a silt trap and hydrocarbon interceptor prior to its discharge off-site. The water treatment system reduces the concentration of suspended solids and removes any hydrocarbon contamination in water discharged off-site;
- The existing traffic management system will continue to evolve and will be further developed to reduce potential conflicts between vehicles travelling to and from the South Quarry and those travelling to other areas within the quarry complex. By minimising / avoiding interaction between vehicles transiting to different areas, the risk of accidental vehicle collisions and associated fuel spills or oil leaks will be reduced;
- All plant is regularly maintained and inspected daily for leaks of fuels, lubricating oil or other contaminating liquids / liquors;.
- Fuel for plant and equipment used for quarry backfilling and recovery operations will continue to be stored in existing fuel storage tanks at the central infrastructure and production area within the Huntstown quarry complex;
- These tanks are constructed on sealed concrete surfaces and bunded to provide a storage volume equivalent to 110% of the tank storage volume;
- The plant and equipment undertaking the backfilling works at the South Quarry will be refuelled over concrete surfaced areas around existing bunded fuel storage tanks, from mobile, double skin fuel bowsers or fuel lorries on the quarry floor or hardstanding areas. Any refuelling of mobile plant undertaken within the quarry void is only to be undertaken using drip trays to contain spillages. When refuelling directly from fuel trucks, drivers will be required to carry spill kits, to cut off delivery when fuel tanks are full and limit deliveries to a maximum of 200 litres;
- Oil and lubricant changes and servicing of wheeled or tracked plant employed at the South Quarry will continue to be undertaken at the existing maintenance sheds;
- A small bunded area for waste oils is provided within the maintenance shed. Oil collected in tanks is emptied at intervals by a licensed waste contractor and disposed off-site at an authorised waste facility;
- Numerous spill kits are available and plant operators are briefed during 'toolbox' talks and site induction on where the spill kits are kept and how and when they are deployed; and
- Regular visual inspection and testing is undertaken of the integrity of tanks, drums, bunded pallets and double skinned containers.

Proposed Additional Mitigation Measures

- Only soil and stone waste and C&D material carried by authorised waste collectors will be accepted at the waste recovery facility at Huntstown South Quarry. All waste intake and acceptance will be subject to regulation and control by way of the amended EPA Waste Licence;
- Any waste consignment observed to have other non-approved wastes intermixed with it on the basis of a CCTV / visual inspection at the weighbridge will not be accepted for intake and will be immediately rejected and re-directed off-site;
- As with the existing / established soil recovery operations at the North Quarry, a comprehensive system of in-situ compliance monitoring and testing of imported waste materials will be implemented, and detailed records will be kept of all testing;
- All soil and stone unloaded (end-tipped) from trucks at the backfill areas will be further inspected by site-based personnel to ensure that there is no non-hazardous or hazardous waste intermixed with it. Should any intermixed, non-inert waste be identified at this point, the entire consignment will be rejected, reloaded back onto the HGV and the haulier directed to remove it off-site to another authorised facility;
- Any soil and stone waste which is accepted for intake to the facility but is subsequently suspected to be non-compliant with agreed waste acceptance criteria will be transferred to the waste inspection and quarantine facility for closer examination and/or testing. The shed is roofed, closed on three sides and has a concrete floor, protecting quarantine material from rainfall and avoiding potential to generate (suspect) contaminated surface water run-off;
- All surface water discharges will comply with the emission limits set by the discharge licence (or those which may supersede them in any amended waste licence issued by the EPA); and
- The upper surface of the backfilled soil will be graded so as to ensure that surface water run-off falling over the quarry footprint falls to sumps at temporary low points within the quarry floor or within the backfilled materials. These temporary sumps will effectively function as primary settlement ponds.

Residual Impact Assessment

With the above mitigation measures in place at the proposed recovery facility, it is projected that the following reduction in the assessed significance of impacts will result:

- Reduction of the potential impact on groundwater quality in bedrock aquifer from accidental fuel leakage/ spillage during the operational stage from “slight – moderate” to “slight” (No. 5 in Table 7-1-3-3I).
- Reduction of the potential impact on groundwater quality in private water supplies from accidental fuel leakage/ spillage during the operation stage from “slight – moderate” to “slight” (No. 7 in Table 7-1-3-3I).
- Reduction of the potential impact on surface water quality in Finglas Stream from accidental fuel leakage/ spillage from “slight – moderate” to “slight” (No. 9 in Table 7-1-3-3I).
- Reduction of the potential impact on surface water quality in Finglas Stream from suspended solids from “slight – moderate” to “slight” (No. 10 in Table 7-1-3-3I).

Examination of the identified potential impacts on the receiving environment show that with the mitigation measures in place, there are no significant residual impacts with respect to groundwater and surface water during the construction / operational / post operational stages of the soil waste recovery and backfilling activities. Following mitigation, the significance of all potential impacts identified will be reduced to “**slight**” or lower.

N

KILSHANE KENNELS

NORTHWEST BUSINESS PARK

MITCHELSTOWN HOUSE

JAVA REPUBLIC

NORTHWEST BUSINESS PARK

J&D FURNITURE

MILLENIUM BUSINESS PARK

HUNTSTOWN BUSINESS PARK

ROSEMOUNT BUSINESS PARK

NATIONAL TRUCK RENTAL

HARVEY NORMAN WAREHOUSE

STADIUM BUSINESS PARK

PREMIER BUSINESS PARK

RAVENSWOOD HOUSING

DOGS TRUST IRELAND

VIRIDIAN POWER STATION
(NOT OWNED BY ROADSTONE LIMITED)

BEECH VISTA GARDEN CENTRE

ENERGIA AD PLANT
(NOT OWNED BY ROADSTONE LIMITED)

VETERINARY CLINIC

ESB 220 Kv STATION

1km

500m

D1 D2 D3 D4 D5 D6

R R1 R2 R3 R4 R5 R6 R7 R8 R9 R10 R11 R12

Location	Easting	Northing
D1	211856	241119
D2	211106	242252
D3	210519	241193
D4	210417	241914
D5	211341	240899
D6	211158	241465

0 100 200 300 400m 600 800 1000

Metres 1:12,500

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. CYAL50167032 (C) ORDNANCE SURVEY IRELAND/ GOVERNMENT OF IRELAND

3. SURVEY COMPLETED ON 22ND FEBRUARY 2021 BY ASM IRELAND TO ITM AND MALIN HEAD DATUM

LEGEND

- ROADSTONE LIMITED LAND INTEREST **(C. 171.8 HA)**
- AMENDED WASTE LICENCE AREA (COMPRISING EXISTING LICENCE AREA AND PROPOSED EXTENSION) **(C. 77.5 HA)**
- PROPOSED EXTENSION TO CURRENT WASTE LICENCE AREA
- D1 DUST MONITORING LOCATION
- R RECEPTOR LOCATIONS
- 500M & 1KM OFFSET FROM APPLICATION AREA
- N2 DUAL CARRIAGEWAY
- R135 REGIONAL ROAD (NORTH ROAD)
- LOCAL ROAD
- M50 MOTORWAY

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ROADSTONE LIMITED

WASTE LICENCE REVIEW APPLICATION

HUNTSTOWN WASTE RECOVERY FACILITY
NORTH ROAD, FINGLAS, DUBLIN 11

DUST MONITORING LOCATIONS

FIGURE 7-1-3-3A

Scale 1:12,500 @ A3

Date DECEMBER 2021

0180.00313.FIG 7-1-3-3A.Dust Monitoring Locations2021.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**.

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- PROPOSED EXTENSION TO CURRENT WASTE LICENCE AREA
- N1 — WASTE LICENCE NOISE MONITORING LOCATIONS
- BN1 — BASELINE NOISE SURVEY MONITORING LOCATIONS
- R — RECEPTOR LOCATIONS
- 500M and 1KM OFFSET FROM APPLICATION AREA
- M50 MOTORWAY
- N2 DUAL CARRIAGEWAY
- R135 REGIONAL ROAD (NORTH ROAD)
- LOCAL ROAD

LOCATION EASTING NORTHING

Licence Noise Monitoring Locations

N1	212064	241078
N2	211412	240698
N3	210556	241071
N4	210287	241884
N5	211257	242159

Baseline Noise Monitoring Locations

BN1	212033	241142
BN2	211903	241463
BN3	210369	240790
BN4	210881	240144
BN5	210642	240378

0 100 200 300 400m 600 800 1000

Metres 1:12,500

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ROADSTONE LIMITED

WASTE LICENCE REVIEW APPLICATION

HUNTSTOWN WASTE RECOVERY FACILITY
NORTH ROAD, FINGLAS, DUBLIN 11

NOISE MONITORING LOCATIONS

FIGURE 7-1-3-3B

Scale 1:12,500 @ A3

Date DECEMBER 2021

0180.00313.FIG 7-1-3-3B.Noise Monitoring Locations2021.dwg