

# Attachment 4-7

## BAT Assessment

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## 1. INTRODUCTION

This report provides details of best available techniques (BAT) applicable to the proposed Soil Recovery Facility at Garryhesta including details of conformance with relevant EPA National BAT Notes. It should be noted that there is no specific EPA BAT Guidance Notes with respect to Soil Recovery and as such a site-specific determination of BAT has been provided.

The drawing numbering referencing is as per the Waste Licence Application. Cross referencing of the Environmental Impact Assessment (EIAR) which accompanied the Waste Licence Application is also used where relevant so as to avoid unnecessary repetition.

## 2. INTERPRETATION OF BAT

BAT was introduced as a key principle in the IPPC Directive, 96/61/EC. This Directive has been incorporated into Irish law by the Protection of the Environment Act 2003. To meet the requirements of this Directive, relevant Sections of the Environmental Protection Agency Act 1992 and the Waste Management Act 1996 have been amended to replace BATNEEC (Best Available Technology not Entailing Excessive Costs) with BAT.

Best available techniques (BAT) is defined in Section 5 of the Environmental Protection Agency Acts, 1992 to 2007, and Section 5(2) of the Waste Management Acts 1996 to 2010 as the “most effective and advanced stage in the development of an activity and its methods of operation, which indicate the practical suitability of particular techniques for providing, in principle, the basis for emission limit values designed to prevent or eliminate or where that is not practicable, generally to reduce an emission and its impacts on the environment as a whole” where:

**B ‘best’** in relation to techniques, means the most effective in achieving a high general level of protection of the environment as a whole

**A ‘available techniques’** means those techniques developed on a scale which allows implementation in the relevant class of activity under economically and technically viable conditions, taking into consideration the costs and advantages, whether or not the techniques are used or produced within the State, as long as they are reasonably accessible to the person carrying on the activity

**T ‘techniques’** includes both the technology used and the way in which the installation is designed, built, managed, maintained, operated and decommissioned.

The range of BAT associated emission levels specified in Section 6 indicate those that are achievable through the use of a combination of the process techniques and abatement

technologies specified as BAT in Section 5. The licensee must demonstrate to the satisfaction of the Agency, during the licensing process, that the installation/facility will be operated in such a way that all the appropriate preventative measures are taken against pollution through the application of BAT and justify the application of other than the most stringent ELV in the range.

At the facility level the most appropriate techniques will depend on local factors.

A local assessment of the costs and benefits of available options may be needed to establish the best option. The choice may be justified on the basis of:

- The technical characteristics of the facility;
- The geological location;
- Local environment considerations;
- The economic and technical viability of upgrading existing installations.

The overall objective of ensuring a high level of protection for the environment as a whole will often involve making trade-off judgments between different types of environmental impacts, and these judgments will often be influenced by local considerations. On the other hand, the obligation to ensure a high level of environmental protection including the minimisation of long-distance or transboundary pollution implies that the most appropriate techniques cannot be set on the basis of purely local considerations.

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## 2.1 BAT Hierarchy

In the identification of BAT emphasis is placed on pollution prevention techniques rather than end-of-pipe treatment.

The IPPC Directive 2008/1/EC and the Environmental Protection Agency Acts 1992 to 2007 (Section 5(3)), require the determination of BAT to consider in particular the following, having regard to the likely costs and advantages of measures and to the principles of precaution and prevention:

- (i) the use of low-waste technology,
- (ii) the use of less hazardous substances,
- (iii) the furthering of recovery and recycling of substances generated and used in the process and of waste, where appropriate,
- (iv) comparable processes, facilities or methods of operation, which have been tried with success on an industrial scale,
- (v) technological advances and changes in scientific knowledge and understanding,
- (vi) the nature, effects and volume of the emissions concerned,
- (vii) the commissioning dates for new or existing activities,
- (viii) the length of time needed to introduce the best available techniques,
- (ix) the consumption and nature of raw materials (including water) used in the process and their energy efficiency,
- (x) the need to prevent or reduce to a minimum the overall impact of the emissions on the environment and the risks to it,
- (xi) the need to prevent accidents and to minimize the consequences for the environment, and
- (xii) the information published by the Commission of the European Communities pursuant to any exchange of information between Member States and the industries concerned on best available techniques, associated monitoring, and developments in them, or by international organisations, and such other matters as may be prescribed.

### 3. SECTOR SPECIFIC GUIDANCE NOTE

There is no Specific EPA BAT Guidance Notes with respect to Recovery of Inert Soils and stone. This BAT Assessment is site specific and covers activities set out in the table below.

*Table 1 Proposed Activities*

| <i>Licensed Waste Recovery Activities, in accordance with the Fourth Schedule of the Waste Management Act 1996 as amended</i> |   |
|---|---|
| Class R 5<br>(Principal Activity)   | Recycling/ reclamation of other inorganic materials, which includes soil cleaning resulting in recovery of the soil and recycling of inorganic construction materials.  |
| Class R 13  | Storage of waste pending any of the operations numbered R 1 to R 12 (excluding temporary storage (being preliminary storage according to the definition of 'collection' in section 5(1)), pending collection, on the site where the waste is produced). |

The only waste to be accepted at the facility for restoration of the lands will comprise “inert” soils and stone, and river derived dredge spoil material (EWC 17 05 04 & 17 05 06). As such the material does not undergo any complicated process other than inspection prior to recovery and placement. As such there is little or no requirement to apply Best Available Technology (BAT) with respect to the recovery operations.

However, consideration has been given through preparation of this application with respect to control and abatement measures to ensure the facility will operate within accepted emission limit values for this type of operation.

The following documents were considered in preparation of the application for Best Available Techniques:

- Final Draft BAT Guidance Note on Best Available Technique for the Waste Sector: Waste Transfer and Materials Recovery (2011)
- Final Draft BAT Guidance Note on Best Available Techniques for the Waste Sector: Landfill Activities (2011). This BAT Guidance Note does not cover waste soil recovery facilities.
- Guidance Note for Noise Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4, January 2016)

**4. PROCESS DESCRIPTION, RISK TO THE ENVIRONMENT AND CONTROL TECHNIQUES**

**4.1 Description of Process**

**4.1.1 Overview of Soil Recovery Facility**

A flow diagram of the delivery, inspection & acceptance procedure is provided in Figure 1 below. Refer to Attachment 4-6-8 Operational Report for a full description of the facility operation/process.

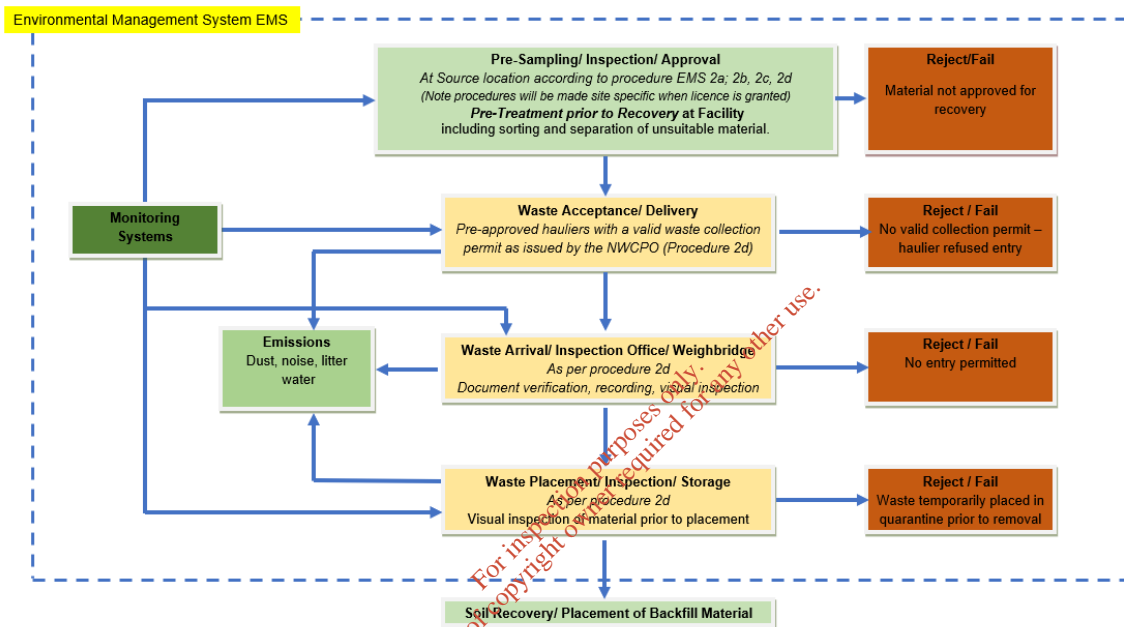


Figure 1 Summary of Soil Recovery Activities

## 4.1.2 Key Issues for Soil Recovery Facility

### 4.1.2.1 Site Location

The site is located c. 1.5 km to the west of the village of Ovens, within the townland of Knockanemore, Co. Cork (Irish Transverse Mercator (ITM) Ref. E552400, N569850). The site is in the valley of the Bride River, c. 7 km west of the centre of Ballincollig, and c. 15 km west of the centre of Cork City.

Land-use in the surrounding area is largely agriculture and quarrying with a scattered rural pattern of residential dwellings along the N22, which runs immediately to the north of the site, and along other local roads to the south and east of the site. The site is well screened from outside views along the N22 by well-established planting.

The nearest large population centre is the town of Ballincollig, approximately 7km to the northeast, whilst there are no significant population centres within a 1km radius of the site. The nearest small settlement to the site is Farran Village situated 2km to the west.

The application site is particularly advantageous as it is strategically located in central south Cork, in a rural area with direct access to the N22 regional road, and can serve the needs for recovery of inert soils and stone and river derived dredge spoil sourced from across much of the county, including Cork City and the major towns of Macroom, Bandon, Kinsale, Carrigaline, Blarney and Ballincollig, all of which are within 25 km.

There is currently a lack of licensed inert soil recovery facilities in the Cork area. As the economy recovers there will be a need to provide additional void space for the recovery of soils and stones and river dredged material in the Cork area.

The site is not located within any designated areas such as proposed Natural Heritage Areas (pNHA), candidate Special Areas of Conservation (SAC) or Special Protection Areas (SPA). The nearest designated area, the Lee Valley pNHA (Site Code: 0094) is located over 4km northeast of the site. It has been assessed that there is no likelihood of significant ecological effects from this development on any of the sites in the Natura 2000 network or on their conservation objectives.

Government Policy in a National and Regional context with respect to the proposed development is address in EIAR Appendix 5.1. Consideration has been given to the Southern Region Waste Management Plan 2015 – 2021 (Refer to EIAR Appendix 5.1.1.2.2).

The County Development Plan (CDP) sets out Cork County Council's overall strategy for the proper planning and sustainable development of Cork County and the associated planning policies looking towards the horizon year of 2022. The plan is set in the context



of the sustainable development strategy for the country as set out in the National Spatial Strategy 2002-2020 and the South West Regional Planning Guidelines 2010-2022. Relevant CDP objectives and measures proposed to address same with respect to the proposed development of a Soils Recovery Facility (SRF) at Garryhesta quarry are provided in EIAR section 3.2.2.8.1.

A geological assessment of the site has been carried out for the site of the proposed Soil Recovery Facility (Refer to EIAR Section 4.3). A detailed Hydrological/Hydrogeological Assessment has also been prepared by Hydro Environmental Services in support of this application (Refer to EIAR Section 4.4). As stated in EIAR Section 4.4.3.8.6 – Water Resources of the attached report *“based on the GSI mapping there are no groundwater protection zones for existing public water or group water schemes mapped within 7km of the proposed development site. The closest public supply to the site is the Coachford PWS (Public Water Supply) which exists approximately 7.5km to the northwest of the site. The site is not located within the Zone of Contribution (ZOC) of this source”*.

A flood risk assessment is also included in EIAR Section 4.4.3.7. No recurring flood incidents in the area of the proposed site were identified from OPW’s indicative river and coastal flood map. There is no surface water connection between the proposed site and the River Bride and therefore the proposed development can have no influence on downstream flooding in the Bride River. There is no risk of pluvial flooding (*i.e.* rainfall ponding) at the site as all rainfall landing in the pit percolates through the pit floor into the underlying sands and gravels.

The existing site comprises a worked-out sand and gravel pit. The proposal to import inert soil and stone backfill will facilitate proper restoration, landscaping, and the long-term security of the site and ensure that the lands are returned to beneficial after-use.

Reclamation of the Garryhesta quarry will result in infilling of a large exposed void and partial restoration of the disturbed landscape to its original pre-extraction condition, with emplacement of soil cover to protect the underlying groundwater.

The main potential source of emissions from an inert SRF is noise and dust associated with movement, handling and placement of materials. Other possible emissions to the atmosphere are from machinery exhaust fumes, and possible emissions to surface and/or groundwater in the event of fuel or oil spillage. These are addressed in detail in Section 4 of the EIAR which accompanies the Waste Licence Application.

Emissions to Atmosphere and Water are currently monitored in compliance with planning permission (QR19 06/11798 & PL04.225332) for the quarry development. The existing EMS includes an 'Environmental Monitoring Programme' for the monitoring of water, dust

and noise, and will be revised subject to compliance with any conditions attached to any decision to grant planning permission and a Waste Management Licence for the proposed SRF.

#### 4.1.2.2 Design Considerations

The proposed development consists of restoration of part (c. 6.7 ha) of existing quarry (QR19 06/11798 & PL04.225332) by importation of up to 300,000 tonnes per annum of inert soil and stones and river dredging spoil (EWC 17-05-04 and 17-05-06). It is estimated that 1,276,043 m<sup>3</sup> (2,996,877 tonnes) of material is required for restoration and to develop the lands for beneficial use (agriculture use and wildlife habitat). It is proposed that that the void space will be filled over a period of c.8 to 10 years.

The proposed Soil Recovery Facility (SRF) will utilise the permitted quarry infrastructure including internal roads, site office, welfare facilities and other ancillaries to complete the works (Refer to Drawing D01 Site Plan - Existing Survey). Access to the site will be from the permitted main entrance on the N22 National Primary Road. A wheel wash and weighbridge will be provided as part of the proposed development and the existing workshop will be utilised as a quarantine area. A hard-stand with drainage to oil interceptor will also be provided as a designated refuelling area. The total application area including the site infrastructure covers 7.9 ha of lands. The development will be subject to the requirements of a waste management licence.

The proposed site for backfilling using imported inert soil and stone is located on the north-western corner of the landholding. The pit proposed for infilling is approximately 430m in length and 150m in width with a depth of up to c. 31 m below the local natural ground level.

The proposed site layout is shown on the attached Site Layout Drawings D02 to D04. The proposed site area being within the quarry is screened from outside views and nearest residences by perimeter hedgerows screening berms constructed as part of the quarry development (Refer to Drawing D01).

It is considered that accidents and emergency situations resulting in effects on the environment is confined to possible emissions to groundwater in the event of a fuel spillage. The operator has put in place an emergency response procedure for hydrocarbon spills and appropriate training of site staff in its implementation. (Refer to EIAR Appendix 5.3.5). It should be noted that significant emphasis has been placed on control and abatement measures to ensure there is no risk to surface and /or groundwater (Refer to EIAR Section 3.3.3.2.8).

The layout of the facility is driven by the basic processes of recovery of soil with the recovery by backfilling of otherwise unusable materials to meet the requirement to reclaim

the quarry back to beneficial after-use (e.g. agriculture and/or secure wildlife habitat). Integration of the soil recovery facility layout with that of the existing quarry is driven by the numerous common processes of sorting and separation as well as backfilling of the quarry. In addition, there is a need to minimise any adverse impact, particularly visual impact, and to optimise the quarry for a restoration scheme to beneficial after-use.

The site is well screened by mature planting along the N22 and other boundaries. Its location in a valley ensures that there are no significant outside views of the area to be restored by backfilling with inert soil and stones and river dredged materials.

The site also benefits from economy of scale in terms of the established quarrying activity, site infrastructure and plant and machinery as opposed to the alternative of developing a proliferation of smaller waste recovery facilities to meet demand. It is acknowledged that a licenced facility will have been subject to rigorous assessment by the Regulatory through the EIA process and Waste Licensing.

#### **4.1.3 Environmental Management System (EMS)**

The quarry has in place an accredited (I.S. EN ISO 14001:2015) Environmental Management System (EMS). The existing EMS was established in compliance with Planning Permission Condition no. 39 of Planning Permission QR19 06/11798 & PL04.225332 for the quarry. The EMS will be revised accordingly subject to compliance with any conditions attached to any grant of planning permission and waste licence for the operation of the soil recovery facility at Garryhesta.

Roadstone regards environmental protection management as an integral and essential part of good business practice. They are committed to achieving and maintaining a high standard of environmental quality in all of their operations.

Roadstone are committed to providing the necessary information, training and equipment to enable their employees to carry out their duties safely and in an environmentally responsible manner. All staff and persons working for and/or on behalf of Roadstone are made aware of the Environment Policy.

Roadstone already have a competent management structure in place with respect to management of the proposed Soil Recovery Facility. A facility manager will be appointed by Roadstone to ensure that the Environmental Management System, Environmental Objectives & Targets and the Environmental Monitoring Plan are fully implemented.

The EMS includes an 'Environmental Monitoring Programme' for the monitoring of water, dust and noise, and will be revised subject to compliance with any conditions attached to any decision to grant planning permission and a Waste Management Licence for the

proposed SRF. The monitoring programme results will be submitted to the relevant regulatory Authority on a regular basis, and therefore made available for inspection by interested parties. Environmental monitoring locations are shown on Drawing D06.

The facility will maintain full and complete records, including a log of intake and deliveries, documentation relating to planning, health and safety, environmental monitoring, the environmental management system (EMS), etc. The record keeping will be revised to achieve compliance with any conditions attached to any decision to grant planning permission and a Waste Management Licence for the proposed SRF. The Location Manager will be responsible for maintaining detailed records of all waste material brought to the site. Full details of all waste materials brought to this facility will be kept at the site office. Site records will be available for inspection by the Local Authority and/or EPA at all times.

An annual report will be prepared by the site manager and submitted to the EPA as will be required in accordance with any Waste Licence.

A corrective action procedure will form part of the EMS and will be used for recording and reporting non-conformities and corrective actions.

#### 4.1.4 Waste Acceptance

The proposed development consists of restoration of part (c. 6.7 ha) of existing quarry (QR19 06/11798 & PL04.225332) by importation of up to 300,000 tonnes per annum of inert soil and stones and river dredging spoil (EWC 17-05-04 and 17-05-06).

Standard Operating Procedures (SOP's) will be put in place to ensure that all inert waste imported to site for recovery will be subject to comprehensive waste acceptance, inspection and sampling procedures (Refer to EIAR Appendix 5.3 for typical examples of SOP's).

All waste accepted for recovery will undergo a site pre-approval procedure (Refer to EIAR Appendix 5.3.4).

Each consignment of material arriving at the facility will be inspected at the point of entry by trained personnel to ensure it complies with what was agreed in the pre-approval stage. Basic characterisation of the material will be carried out in accordance with the Waste Inspection Procedure (Refer to EIAR Appendix 5.3.2).

Only suitable material will be permitted to be accepted in the facility (i.e. inert soil and stones and river dredging spoil (EWC 17-05-04 and 17-05-06)).

Material not suitable for recovery at the facility will be rejected either at the pre-approval stage, the onsite verification stage, or before recovery stage at the customers expense. If

reloading cannot occur immediately, it will be separated and moved to the quarantine area. The existing workshop will be utilised as a quarantine area (Refer to Site Plans D02 and D03 which accompany the Waste Licence Application). The recycling manger will be informed immediately. A waste acceptance/rejection procedure will be put in place (Refer to EIAR Appendix 5.3.3).

Any non-natural materials in the consignment will be manually removed where possible and transferred to the appropriate waste skip for disposal at an appropriate facility.

Material accepted at the facility will undergo routine testing as detailed in the Roadstone Waste Intake Sampling Procedure (Refer to EIAR Appendix 5.3.1).

Basic characterisation will be undertaken a second time, upon tipping. Following the second inspection the material will be accepted and placed within the infill area, placed and graded by a bulldozer/excavator.

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## 4.2 Risks to the Environment

Risks to the environment are primarily associated with emissions from an activity. The term “emission” is defined in the Waste Management Acts (WMA) 1996 to 2010 and Environmental Protection Agency (EPA) Acts 1992 to 2007, Section 3, to mean:

Any direct or indirect release of substances, vibrations, heat or noise from individual or diffuse sources in the installation into the air, water or land, and includes: -

- An emission into the atmosphere of a pollutant within the meaning of the Air Pollution Act, 1987.
- A discharge of polluting matter, sewage effluent or trade effluent within the meaning of the Local Government (Water Pollution) Act 1977, to waters or sewers within the meaning of that Act.
- Noise (note that the definition of noise includes vibration).

The underlying objective of BAT is to eliminate or reduce emissions from processes. Emissions, and hence environmental pollution, can be eliminated or reduced by:

- Proper design of the facility.
- Effective management of the facility.
- The selection of appropriate processes, technologies and facility operations.

The following section examines the potential emissions from the proposed “inert” soil recovery activities to air, water and land.

### 4.2.1 Potential Emissions to Air

The following activities may give rise to potential fugitive dust emissions.

- Internal movement of vehicles
- Tipping and levelling
- Loading and unloading vehicles

The materials to be recovered are inert soil and stones and river dredged material. Any dust generated by the operation will comprise inert particulate matter.

There will also be emissions to air from the exhaust of the site plant & machinery, and the haulage trucks; arriving/departing the site.

Experience of inert SRF's, quarry workings and associated ancillary activities indicates that mechanical activity is the most significant factor in material erosion and dust generation. However, the effect of wind and high ambient temperatures are also important factors in dust generation and migration. Problems may arise at sites when all these factors arise simultaneously.

The impacts of any dust deposition from the operations will be direct, of short duration, temporary and largely confined to the site area.

The Air Quality Standards Regulations (2002 S.I. No. 271 of 2002) sets limit values for sulphur dioxide, nitrogen dioxide, particulate matter and lead in ambient air. The regulations apply to ambient air quality in the vicinity of land use/development types including Soil Recovery Facilities. The development requires movement of materials by road, and transport by other methods is not practical in this situation. Given the proximity of the site to the National Road network fuel consumption and therefore exhaust emissions will be reduced relative to more removed locations. The current air quality in the region is known to be “good” (Refer to EIAR Section 4.6.4.3), and thus the impact on air quality with respect to the SRF is considered to be negligible.

Consideration has been given to existing ambient background conditions as well as relevant Air Quality Standards set either under the Irish Air Quality Standards Regulations 2002 (S.I. 271 of 2002 which has replaced S.I. 244 of 1987) or the EU Framework Directive on Air Quality (96/62/EC) and its Daughter Directives (1999/30/EC and 2000/69/EC). The Air Quality Standards Regulations sets limit values for sulphur dioxide, nitrogen dioxide, particulate matter and lead in ambient air. The regulations apply to ambient air quality in the vicinity of land use/development types including Soil Recovery Facilities. The development requires movement of materials by road, and transport by other methods is not practical in this situation. Given the proximity of the site to the National Road network fuel consumption and therefore exhaust emissions will be reduced relative to more removed locations. The current air quality in the region is known to be “good” (Refer to EIAR Section 4.6.4.3), and thus the impact on air quality with respect to the SRF is considered to be negligible.

#### **4.2.2 Potential Emissions to Water, (Including Groundwater) and Land**

There are no surface water flowpaths from the proposed development site to either the River Bride or the River Lee and therefore no direct impacts on either of these surface water bodies is possible from any runoff generated on-site.

Surface water features in the vicinity of the site include a stream and small man-made pond. The stream rises on high ground to the northwest of the site and then flows along the western and southern boundary of the application site (i.e. proposed infill area) prior to flowing into a small man-made pond which exists immediately to the southeast of the application site. There is no visible surface water outfall from the pond and therefore all inflows to the pond via the stream appear to percolate down through the base of the pond into the underlying sand and gravels. The stream and pond appear to be perched on a



layer of low permeability overburden (silts/clays) which overlies the sand and gravel deposits in this area. There are no pathways for runoff from the application site towards the stream or pond as there is an embankment present along the southern and western boundaries of the application site. The embankment separates the application site from the stream and pond. As stated previously the pit itself is up to 31m in depth and any rainfall that falls in the pit just percolates through the floor into the underlying sand and gravels

During infilling there will be no pathway for surface water to leave the site other than by recharging into groundwater. The infilling works will require significant ground works and site levelling, and despite the lack of pathway certain measures can be implemented to ensure no indirect issue with groundwater quality.

The proposed infill material is inert soil and stone (EWC 17 05 04) and river dredging spoil (EWC 17 05 06). Infilling of the site with inert soil and dredging spoil should pose a low risk to groundwater quality regardless of the vulnerability rating as no harmful contaminants will be present. In addition, inert soil and stone and river dredging spoil will not contain either organic matter or liquids that will form a source of organic contaminants of microbial pathogens, nor provide a substrate to feed microbial pathogens.

Risks to groundwater on site relate primarily to the use and storage of hydrocarbon liquids. The existing welfare facilities including toilets provided in the quarry will be utilised by the proposed development. A holding tank is provided which is emptied on a routine basis by a certified waste collection contractor to an approved waste facility.

#### **4.2.3 Potential Noise Emissions**

The main source of noise and vibration will be from the movement of trucks on internal haul roads, the tipping of material, placing and grading of material.

The principal noise sources at the application site will be intermittent noise generated by movement of a bulldozer and trucks on and off site.

#### **4.2.4 Environmental Liabilities**

A key element to understanding and managing environmental risk is the carrying out of an environmental liabilities risk assessment for known and unknown liabilities (incl. aftercare phase), and the financial provision for same.



#### 4.2.4.1 Closure Plan

A Closure Plan & Environmental Liability Risk Assessment has been provided in support of this application (Refer to Attachment 9.2.1).

In this case only inert soils and stones and river derived dredging spoil will be acceptable for recovery at the facility for recovery and phased restoration of part of a sand and gravel pit to a landform that will be in keeping with the surrounding landscape.

Clean closure is envisaged such that all plant is safely removed for reuse or recycling, and all wastes are removed off site at the time of closure for appropriate recovery or disposal. Monitoring undertaken should demonstrate that there are no outstanding environmental issues.

There will be no on-going requirement for environmental monitoring after recovery operations have ceased.

An aftercare scheme will be implemented with the aim of bringing the restored soils (and hence land) into a condition which does not need to be treated differently from undisturbed land in the same use.

Roadstone propose to carry out the reclamation works in accordance with the Green, Low Carbon, Agri-environment Scheme (GLAS). i.e. Consideration will be given through the land reclamation scheme to conservation of arable grass margins, conservation of solitary bees, coppicing and planting of native trees and hedgerows, establishment of species rich hay meadow.

A final site-inspection 6 months after site closure will be carried out to ensure that the final site restoration scheme implemented is functioning and progressing as required.

It is evident from the above description given the relatively short-term measures necessary to close the site satisfactorily, that there will be no environmental liabilities once closure, decommissioning and residuals management are completed, and so only a closure plan is considered necessary.

For the purposes of closure planning adequate provision has been included in the costings and this scenario is considered to represent a worst-case scenario in the event of cessation resulting from abandonment of the activity.

It is acknowledged that as a typical condition of any waste licence that the Agency may amend the licence at any time in certain circumstances in accordance with section 42B of the Waste Management Act 1996 as amended, to require, or not require as the case may be, the putting in place of a financial provision to incorporate costings for CRAMP and/or Environmental Liabilities Risk Assessment. This amendment may be implemented by the

Agency in the event of an incident that creates a significant residual environmental liability or where the environmental risk profile changes on site.

Roadstone Ltd has estimated the closure and restoration/ aftercare requirements (€157,388). Roadstone, if deemed necessary will put in place a secure fund, and/or on demand performance bond. The form and value of the financial provision being subject to agreement with the EPA.

The Closure Plan will be reviewed and updated annually as part of the Annual Environmental Report submission to the EPA.

#### **4.2.4.2 Environmental Liability Risk Assessment (ELRA)**

An Environmental Liability Risk Assessment has been provided in support of this application (Refer to Attachment 9.2.1 – Section 4).

The ELRA approach is a standard risk assessment that involves the assessment of the likelihood of occurrence of an event in combination with the consequences of that event. This is followed by the costing of the plausible worst-case scenario for the purposes of informing the level of financial provision (cover) necessary.

The plausible worst-case scenario is taken to be the risk associated with the importation of a rogue load of contaminated material. For the purpose of a worst-case scenario it has been assumed that due to unforeseen circumstances there has been a breakdown in delivery, inspection and acceptance procedures for a working day resulting in up to 10 loads of non-hazardous material (suitable for disposal to Inert landfill) being placed in the backfill area.

Whilst due consideration has been given to the quantification and costing of the above plausible worst-case scenario; the operator proposes to put in place comprehensive delivery, inspection and acceptance procedures and management systems to ensure that such an eventuality will not arise.

Implementation of the results of the ELRA will be reported to the EPA annually through a statement of measures included with the facility AER. The ELRA will be reviewed as necessary to reflect any significant changes on site, and in any case every three years.

The financial provision has been based on the plausible worst-case scenario as detailed above. This is the maximum liability that may be incurred and as such, financial provision is calculated as €12,496 based on this event.

Environmental Impairment Liability (EIL) Insurance is, in principle, an acceptable financial instrument for potential liabilities from incidents. EIL Insurance must cover “*the full costs*

*of responding and remedial measures if an incident occurs at a licenced facility". (EPA 2016).*

Roadstone Ltd has in place adequate Pollution Liability insurance with respect to the Garryhesta Facility.

Any cover for the licenced facility/activity (to the amount determined by ELRA) will be ring-fenced from the cover for the other elements of the business (e.g. other sites or off-site transport activities). The cover for environmental response and remedial measures (to the amount determined by ELRA) will be ring-fenced from the cover for other liabilities (while still extending to clean-up of the Licensee's property and third party property).

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### 4.3 Control Techniques

The existing or possible measures for eliminating, reducing and controlling emissions at a soil recovery facility are described in this section. Refer also to EIAR Section 3.3.3.4 - Environmental Treatment, Abatement and Control Systems.

#### 4.3.1 Techniques for Prevention and Minimisation of Resource Consumption

##### 4.3.1.1 Use of Energy

The Waste Management Acts 1996 to 2010 require that permitted installations should be operated in such a way that energy is used efficiently. Soil Recovery Facilities use energy on a smaller scale than large process industries. However, the applicant still needs to demonstrate that energy efficiency has been considered.

Details with respect to energy usage (i.e. electricity & fuel) are provided in Attachment 4.6.1-Water and Energy Use. It has been assessed that 30,000 litres per year will be required to service the plant and machinery used on site and electricity usage including lighting, office heating and operation of the weighbridge will amount to 20 MWH per annum.

An existing single-phase overhead electricity supply provides for lighting and heating of the office. Energy awareness notices will be posted around the site to ensure employees are aware of the need to conserve energy. Energy efficiencies will be achieved by using modern plant and equipment and servicing that equipment on a scheduled basis. Plant and equipment not in use will be shut off.

The quarry has in place an accredited (I.S. EN ISO 14001:2015) Environmental Management System (EMS). The existing EMS was established in compliance with Planning Permission Condition no. 39 of Planning Permission QR19 06/11798 & PL04.225332 for the quarry. Roadstone also have in place an accredited (I.S. EN ISO 50001:2011) Energy Management System for the quarry at Garryhesta.

Roadstone have appointed a number of dedicated performance managers who have been appointed with the responsibility for reviewing and managing each location's energy data against set key performance indicators (KPIs). Energy Management Awareness Campaigns are also held bi-annually. Group workshops are also held to facilitate further dissemination of information within the company.

Each location has an energy representative and the energy manager has responsibility for assisting all location energy teams to maintain and sustain energy improvements including carrying out regular internal audits, awareness campaigns and sessions.

On a higher level, there is an annual Energy Management Review meeting which is held centrally and attended by each location manager and the top management. 'This meeting highlights the outcomes of the previous year and also lessons learned. It gives each attendee an opportunity to make suggestions for improvements that could be made for the coming year.

On an energy and environment level, Roadstone became a member of the Sustainable Energy Authority of Ireland (SEAI) in 2007.

From Roadstone's perspective 'IS 50001' offered a systematic approach for the development and implementation of energy management. In developing the programme, their focus has been to evolve the energy management system so that continuous improvement is at the core of the system, and furthermore, it can be demonstrated. They have invested resources in implementing energy monitoring systems nationwide to establish where energy is used, set baselines, evaluate and implement savings measures and demonstrate savings.

#### **4.3.1.2 Raw Materials**

The Waste Management Acts 1996 to 2010 require that permitted installations should be operated in such a way that materials are used efficiently.

The only waste to be accepted at the proposed facility will be inert soil and stone and river dredged spoil. As such the materials will not undergo any form of processing involving the use of chemicals or additives.

The only raw materials used on site are diesel, hydraulic oil and engine oil, which will be used to operate diesel powered plant on site. As only an excavator/bulldozer will be used in the proposed SRF, the quantities of fuel oil used on site will be relatively small.

#### **4.3.2 Techniques for Prevention & Minimisation of Emissions**

##### **4.3.2.1 Minimisation of Emissions to Air**

The materials to be recovered are inert soil and stones and river dredged material. Any dust generated by the operation will comprise inert particulate matter.

There will also be emissions to air from the exhaust of the site plant & machinery, and the haulage trucks; arriving/departing the site.

The principal measures employed to control fugitive (ground) dust emissions from general site activity, internal haulage and land reclamation operations as follows:

- In accordance with condition No. 14 of Planning Permission (QR19 06/11798 & PL04.225332) a fixed water spray system has been installed to include the access road and internal roads,
- During dry weather the haul roads and tipping area will be sprayed with water to dampen any likely dust blows.
- A mobile water browser is provided in periods of dry or windy weather to cover locations where it is impractical or inappropriate to use a fixed water spray system.
- Consideration will be given to location of mobile plant to ensure that any principle dust sources cannot adversely affect sensitive off-site locations.
- A wheel wash facility will be installed on site and all vehicles required to pass through the wheel wash on exiting the site.
- Main site haulage routes within the site shall be maintained with a good temporary surface, as is the case at present.
- All internal roadways will be adequately drained, to prevent ponding.
- A road sweeper is available for use on site and adjacent sections of the N22 at least on a weekly basis and/or if a spillage occurs onto the public roadway.
- Reclaimed areas will be seeded at the earliest appropriate time.

Dust emissions from the facility will be controlled and monitored. Dust emissions and their management will be addressed in a revamped 'Environmental Management System' (EMS) for the entire Garryhesta site.

Regular servicing of facility plant & machinery will ensure that exhaust emissions are kept to a minimum.

#### **4.3.2.2 Minimisation of Emissions to Water**

##### **4.3.2.2.1 Surface Water**

Management of surface water runoff and mitigation of surface water runoff impacts will be undertaken as follows:

- Infilling will only be undertaken when the groundwater level is at or below the base of the pit (i.e. infilling will not be completed during very wet periods over winter when the pit floor can become submerged with groundwater);
- Prior to pit floor backfilling the existing residual sand and gravel in the floor of the pit will be levelled to ensure there is no potential for ponding or exposed groundwater during the backfilling operations;

- Runoff collected within the pit will be routed in a temporary sump and allowed to recharge into the ground via a percolation area; and,
- The infilled area will be seeded for establishment of grassland at the soonest opportunity to avoid erosion.

These mitigation measures will ensure no significant impacts on local surface waters will occur.

In addition to the above measures, the following pertinent points are relevant to impacts on the surface water quality in Cork Harbour SPA:

- The proposed development site is 23km upstream from Cork Harbour SPA and has no direct surface water connection to the River Bride / River Lee.
- There will be no direct discharges to surface water from the site.
- Local groundwater flow on site is towards the River Bride.
- The proposed Waste Facility Management Licence will address the following:
  - Pre-agreed sites for inert material ensuring no pollutants, unauthorised material, invasive species.
  - Will be operated under an Environmental Management System.
  - Will implement pollution prevention measures.
  - Will prepare an Emergency response procedure.
  - Will complete environmental monitoring, including local groundwater and surface water monitoring.
  - Will implement a phased restoration of the site, and end with the closure of site.
  - Will have a documented waste recording procedure for all material entering the site.
  - Will not allow unauthorised dumping of waste.
- The construction of a proposed wheel-wash and weighbridge will be located near the entrance and not on the pit floor. The facility will utilise the existing administration and welfare facilities at the site entrance being removed from the pit floor area.

Therefore, for the above reasons and these additional on-site controls no impacts on the downstream Cork Harbour SPA are anticipated.

An emergency response procedure for hydrocarbon spills and appropriate training of site staff in its implementation, are in place. Surface water emissions from the facility and their

management will be addressed in a revamped 'Environmental Management System' (EMS) for the Garryhesta site.

#### 4.3.2.2.2 Groundwater

The proposed infill material is inert soil and stone (EWC 17 05 04) and river dredging spoil (EWC 17 05 06). Infilling of the site with inert soil and dredging spoil should pose a low risk to groundwater quality regardless of the vulnerability rating as no harmful contaminants will be present. In addition, inert soil and stone and river dredging spoil will not contain either organic matter or liquids that will form a source of organic contaminants or microbial pathogens, nor provide a substrate to feed microbial pathogens.

In terms of impacting on the groundwater vulnerability of the site, the importing of the inert fill will have a positive effect on the site in that the groundwater vulnerability rating will be lower.

In terms of mitigation for groundwater quality protection it is proposed that infilling will only be undertaken when the groundwater level is at or below the base of the pit (i.e. infilling will not be completed during very wet periods over winter when the pit floor becomes submerged in groundwater).

Risks to groundwater on site relate primarily to the use and storage of hydrocarbon liquids. Proposed mitigation measures are outlined as follows:

- A hard-stand with drainage to oil interceptor will be provided as a designated refuelling area.
- All plant and machinery will be serviced before being mobilised to site, and regular leak inspections will be completed during the backfilling works;
- No plant maintenance will be completed on site, any broken-down plant will be removed from site to be fixed; and,
- An emergency spill kit with oil boom, absorbers etc. will be kept on site for use in the event of an accidental spill.
- All waste oils will be removed from the site for authorised disposal by licenced waste contractors. A record of all waste removal will be kept in the site office.
- The operator has put in place an emergency response procedure for hydrocarbon spills and appropriate training of site staff in its implementation.



A groundwater monitoring programme has been put in place to ensure that there is no impact on water quality because of the recovery operations. 4 no. monitoring wells were installed in the area of the proposed infill site (MW1 – MW4) in October 2017.

#### 4.3.2.3 Minimisation of Noise Emissions

The main source of noise and vibration will be from the movement of trucks on internal haul roads, the tipping of material, placing and grading of material.

In compliance with the current planning permission for the quarry development and environmental due diligence, the applicant has put in place a number of mitigation measures that will benefit the proposed development of the SRF.

The type of mitigation techniques implemented to reduce noise are detailed below:

- The site benefits from an established mature planted screening berm along the site boundary with the N22 Primary Route.
- The provision of temporary screen banks to screen site activities from outside views as necessary.
- The existing designated internal haul roads will be utilised to manage traffic entering and leaving the site to ensure that site traffic is removed from nearest noise sensitive receptors.
- Internal haul road gradients will be kept as low as possible to reduce engine / brake noise from heavy vehicles.
- All machinery used will be CE certified for compliance with EU noise control limits.
- Regular maintenance of all plant and machinery is an integral part of site management and is important in helping to minimise noise impact.
- All plant and machinery are switched off when not in use.
- A noise management programme will be defined as part of the EMS.

Noise emissions from the facility will be controlled and monitored. Noise emissions from the facility and their management will be addressed in the revamped 'Environmental Management System' (EMS) for the Garryhesta site. The issue of noise and the mitigation measures available to reduce noise to acceptable levels is dealt with in detail in EIAR Section 4.7 - Noise.

#### 4.3.2.4 Fuel/Oil

No fuel or oil will be stored on site. A double skinned fuel bowser will be mobilised to site as required. A hard-stand with drainage to oil interceptor will also be provided as a designated refuelling area (Refer to Drawings D02 to D04). The following measures will also be implemented with respect to refuelling.

- Supervision of all fuel refilling works by the Manager or other authorised member of staff;
- The placement of a clean drum/bucket under the refuelling point, during refuelling operation, to collect any spillages that may occur;
- The storage of 'Spill Kits' close to the refuelling point to soak up any spillages which may occur immediately.
- All plant/machinery will be inspected regularly to ensure that there are no leakages of fuel or hydraulic fluid and all plant/machinery will be serviced regularly.

Spill kits and materials used for treating hydrocarbon spills are available onsite. These materials are stored in the facility shed/workshop.

The operator has put in place an emergency response procedure for hydrocarbon spills and appropriate training of site staff in its implementation. (Refer to EIAR Appendix 5.3.5).

#### 4.3.3 Minimisation of Nuisances

Details with respect to minimisation of Litter, Bird & Vermin Control, Fire Control, Traffic Control and Road Cleaning are provided in EIAR Section 3.3.3.4.6- Environmental Nuisances.

## 5. BEST AVAILABLE TECHNIQUES (BAT) FOR SOIL RECOVERY ACTIVITIES

### 5.1 Primary Requirements

The main potential source of emissions from an inert SRF is noise and dust associated with movement, handling and placement of materials. Other possible emissions to the atmosphere are from machinery exhaust fumes, and possible emissions to surface and/or groundwater in the event of fuel or oil spillage.

The following primary measures are considered BAT for the proposed soil recovery facility:

- Financial Provision for environmental liabilities (known and unknown), including restoration and aftercare (Refer to Section 4.2.4 above).
- An EMS that incorporates the following features:
  - Management and Reporting Structure.
  - Schedule of Environmental Objectives and Targets.
  - Annual Environmental Report (AER).
  - Environmental Management Programme (EMP).
  - Documentation System.
  - Corrective Action Procedures.
  - Awareness and Training Programme.
  - Communications Programme.
  - Maintenance Programme
  - Efficient Process Control
  - Invasive Species Prevention and Eradication Plan
- Waste Acceptance Procedures (Refer to EIAR Appendix 5.3 for typical examples of SOP's).

### 5.2 Environmental Liabilities

BAT in respect of provision of adequate financial indemnity/security to address the liabilities associated with accidents (unforeseen events/unknown liabilities), as well as for the provision of security for closure and aftercare is as set out in Section 4.2.4 above.

### 5.3 Emissions to Water

There will be no discharge of effluent and/or storm water either directly to surface water or to sewer associated with the inert soil recovery facility. Any surface water run-off will be directed to a temporary 4m x8m sump to allow recharge to ground (Refer to Drawings D02 & D03).

The proposed infill material is inert soil and stone (EWC 17 05 04) and river dredging spoil (EWC 17 05 06). Infilling of the site with inert soil and dredging spoil should pose a low risk to groundwater quality regardless of the vulnerability rating as no harmful contaminants will be present. In addition, inert soil and stone and river dredging spoil will not contain either organic matter or liquids that will form a source of organic contaminants or microbial pathogens, nor provide a substrate to feed microbial pathogens.

BAT is to carry out the management and control techniques outlined in Section 4.3.2.2.

#### **5.4 Emissions to Air**

Fugitive dust emissions are generated wherever there is movement of dust relative to the air. The emission of fugitive dust from inert SRF activities generally arise from loading and unloading of vehicles and Internal movement of vehicles.

BAT is to carry out the management and control techniques outlined in Section 4.3.2.1.

#### **5.5 Noise**

The main source of noise will be from the movement of trucks on the haul road and the tipping, placing and grading of material.

BAT is to carry out the management and control techniques outlined in Section 4.3.2.3.

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## 6. BAT ASSOCIATED EMISSION LEVELS

### 6.1 Emission Levels for Discharges to Water

During infilling there will no pathway for surface water to leave the site other than by recharging into groundwater. However, Roadstone will continue to monitor the local stream (SW1) and the pond (SW2) which form the southern boundary to the lands under consideration (Refer to Environmental Monitoring Plan Drawing D06 for locations).

Surface Water samples will be tested for a number of physical and chemical parameters in order to assess water quality and detect possible contamination relative to European Communities Environmental objectives (Surface Waters) Regulations 2009 (S.I. No. 272 of 2009).

### 6.2 Emission Levels for Discharge to Sewer

All discharges to sewer are subject to approval from the Water Services Authority. Compliance with the Water Framework Directive (2000/60/EC) is required where relevant.

There will be no discharge of effluent to sewer. The existing welfare facilities including toilets provided in the quarry will be utilised by the proposed development. A holding tank is provided which is emptied on a routine basis by a certified waste collection contractor to an approved waste facility.

### 6.3 Emission Levels for Discharge to Groundwater

Groundwater samples will be tested for a number of physical and chemical parameters in order to assess water quality and detect possible contamination relative to European Communities Environmental Objectives (Groundwater) Regulations 2010 (S.I. No. 9 of 2010) and European Union (Drinking Water) Regulations 2014 (SI 122 of 2014). Summary details of the groundwater parameters and trigger levels to be monitored in accordance with the above regulations are detailed in Attachment 9.1 - Environmental Management Techniques.

### 6.4 Emission Levels for Discharge to Air

Emissions to air from Soil Recovery Facilities generally occur as *fugitive emissions* from vehicle and materials movements on site.

The impact of dust is usually monitored by measuring rates of dust deposition (DoE, 1995). There are currently no Irish statutory standards relating specifically to dust deposition thresholds for inert dust. There are a number of methods to measure dust deposition but only the German TA Luft Air Quality Standards specify a method of measuring dust deposition – The Bergerhoff Method (German Standard VDI 2119, 1972). It is the only

enforceable method available. On this basis, both the DoEHLG (2004) and EPA (2006) recommended that the following TA Luft dust deposition limit value be adopted at site boundaries associated with quarry developments – total dust deposition (soluble and insoluble): 350 mg/m<sup>2</sup>/day (when averaged over a 30-day period). This limit is in accordance with condition No. 13 of existing planning permission (QR19 06/11798 & PL04.225332) for the quarry development.

*Table 2 Fugitive Air Emission Level Values*

| Parameter                                 | Concentration Limit        |
|---|----------------------------|
| Total Dust Deposition (Bergerhoff Method) | 350 mg/m <sup>2</sup> /day |

## 6.5 Emission Levels for Noise

The following are Environmental noise limits based on Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4, January 2016) as produced by the Environmental Protection Agency (EPA 2016). It should be noted “that the guidance within this document relates to the assessment and measurement of noise in relation to **Agency scheduled activities only**”.

*Table 3 Recommended General Noise Limit Criteria (For EPA Scheduled Activities (NG4, 2016))*

| Daytime Noise<br>Criterion, dB L <sub>Ar,T</sub><br>(07:00 to 19:00hrs) | Evening Noise<br>Criterion, dB L <sub>Ar,T</sub><br>(19:00 to 23:00hrs) | Night-time Noise<br>Criterion, dB L <sub>Ar,T</sub><br>(23:00 to 07:00hrs) |
|---|---|--|
| 55dB  | 50dB  | 45dB   |

Where tonal and/or Impulsive noise is identified a rating level based on the penalty as outlined in Table 4 is to be applied to the measured L<sub>Aeq</sub>.

*Table 4 Recommended Tonal/Impulsive Noise Ratings*

| Period            | Sound Characteristic   | Correction to L <sub>Aeq</sub> to Arrive at Rating<br>Level L <sub>Ar,T</sub> (dB) |
|-------------------|--|--|
| Daytime & Evening | Tonal/Impulsive  | 5  |
| Night-time        | Tonal/Impulsive noise from the facility should not be audible at any NSL |  |

If more than one adjustment is potentially applicable for the type or character of a given single sound source (i.e. a source that is both tonal and impulsive), only a single adjustment shall be applied.

The EPA Guidance Note (NG4) also addresses a number of specific activities including Quarrying and Mining Operations. Detailed guidance in relation to noise and vibration associated with these activities is provided in the Agency publication Environmental

Management in the Extractive Industry (EPA, 2006a). Section 3.5 Noise & Vibration of this document sets out appropriate Emission Limit Values (ELV's) and deals with control of noise, vibration and air overpressure i.e.

In relation to quarry developments and ancillary activities, it is recommended that noise from the activities on site shall not exceed the following noise ELVs at the nearest noise-sensitive receptor:

|            |                 |                    |           |
|------------|-----------------|--------------------|-----------|
| Daytime    | (08:00 — 20:00) | $L_{Aeq}$ (1 hour) | 55 dB (A) |
| Night-time | (20:00 — 08:00) | $L_{Aeq}$ (1 hour) | 45 dB (A) |

*(Note: 95% of all noise levels shall comply with the specified limit value(s). No noise level shall exceed the limit value by more than 2 dBA).*

These same “appropriate Emission Limit Values (ELV's)” for quarry developments are also set out in the 2<sup>nd</sup> Edition of the Irish Concrete Federation Environmental Code (ICF, 2005). As acknowledged in these guidelines “the Code has gained national recognition and has now become a reference document in the Department of the Environment, Heritage and Local Government’s “Quarries and Ancillary Activities Guidelines for Planning Authorities” and in the EPA “Environmental Management in the Extractive Industry (Non-Scheduled Minerals) – Guidelines for Operators”.

These levels are also consistent with guidance issued by the Department of the Environment: “Quarries and Ancillary Activities – Guidelines for Planning Authorities (2004) DOEHLG”.

The most recent noise limit imposed at the quarry is in accordance with Condition No.32 of Planning Permission (QR19 06/11798 & PL04.225332). i.e.

*“During the operation of the quarry, the noise level from within the site, measured at noise sensitive locations in the vicinity, shall not exceed an  $L_{Aeq}$  value of 55 dB(A) during the period 0800 hours to 1800 hours from Monday to Friday (inclusive) and 0800 hours to 1600 hours on Saturdays and an  $L_{Aeq, 15mins}$  value of 45 dB(A) at any other time”.*

Cork County Council have recently issued notification of decision to grant planning permission for the soil recovery facility at Garryhesta (P.A. Ref. 18/05155). Condition No. 24 of this permission is consistent with the above Emission Limit Values. i.e.

*“Noise levels emanating from the proposed development when measured at the boundary of the nearest noise sensitive locations which require protection from disturbance, shall not exceed 55 dBA (30-minute Leq) between 08.00 hours and 20.00 hours Mondays to Saturdays inclusive and shall not exceed 45 dBA (15-minute Leq) at any other time. Measurements shall be made in accordance with I.S.O. Recommendations R.1996/1 “Acoustics Description and Measurement of Environmental Noise, Part 1: Basic Quantities*

*and Procedures. "If the noise contains a discrete, continuous note (whine, hiss, screech, hum, etc.), or if there are distinct impulses in the noise (bangs, clicks, clatters, or thumps), or if the noise is irregular enough in character to attract attention, a penalty of +5 dBA should be applied to the measured noise level and this increased level shall be used in assessing compliance with the specified levels. (Ref. BS 4142 Section 7.2)".*

It is considered that the noise limit imposed at the proposed SRF should be in accordance with condition No. 24 of notification of decision to grant planning permission for the soil recovery facility at Garryhesta (P.A. Ref. 18/05155) being consistent with both the EPA (2006a) and DoEHLG(2004b) guidelines as detailed above.

Adoption of the above ELV's will ensure that there is no significant impact on noise sensitive receptors in the vicinity of the site.

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## 7. COMPLIANCE MONITORING

An environmental monitoring programme is already in place at the quarry for the monitoring of water, dust and noise in compliance with planning permission (QR19 06/11798 & PL04.225332). The Environmental Monitoring locations (Water, Dust and Noise) are shown on Environmental Monitoring Plan Drawing D06.

In preparation of this application consideration has been given to updating the environmental monitoring programme including provision of four ground water monitoring wells (MW1 to MW4), and also groundwater quality testing at the farm well to the west of the site. A number of the monitoring locations have been relocated due to difficulties with access and vegetation growth (i.e. Dust Locations D1 to D3 and noise monitoring location N5).

The future monitoring programme will be revised accordingly, subject to compliance with any conditions attached to any decision to grant planning permission and subsequent Waste Management Licence.

### 7.1 Monitoring of Emissions to Surface Water

Roadstone will continue to monitor the local stream (SW1) and the pond (SW2) which form the southern boundary to the lands under consideration (Refer to Environmental Monitoring Plan Drawing D06 for locations). SW1 is located upstream of the proposed site and SW2 is located downstream of the site.

It is proposed that surface water monitoring will be carried out Biannually for a number of physical and chemical parameters in order to assess water quality and detect possible contamination relative to European Communities Environmental objectives (Surface Waters) Regulations 2009 (S.I. No. 272 of 2009). Refer to EIAR Table 4.4.4 for details of relevant parameters to be monitored.

### 7.2 Monitoring of Emissions to Groundwater

4 no. monitoring wells both up-gradient and down-gradient were installed in the area of the proposed infill site (MW1 – MW4) and an adjoining farm well is also monitored. The locations of the monitoring wells are shown on Environmental Monitoring Plan Drawing D06.

Summary details of the groundwater parameters and trigger levels to be monitored in accordance with the above regulations are detailed in Attachment 9.1 - Environmental Management Techniques. It is proposed that groundwater monitoring will be carried out on a quarterly basis.

### 7.3 Monitoring of Emissions to Air

Dust deposition monitoring has been carried out at the site in compliance with condition No. 13 of existing planning permission (QR19 06/11798 & PL04.225332) for the quarry development. Dust monitoring is carried out at three monitoring locations (D1, D2, D3) (Refer to Environmental Monitoring Plan Drawing D06 for locations). It is also proposed to establish an additional dust monitoring station (D4) on the southern boundary of the landholding. Dust monitoring will continue to be carried out on a monthly basis.

### 7.4 Monitoring of Noise Emissions

Roadstone currently carry out noise monitoring on a quarterly basis in accordance with the EMS for the quarry. Noise monitoring is carried out at 5 monitoring locations at the quarry (N1-N5). An additional noise monitoring station (N6) is to be established on the southern boundary of the landholding for future reference. Refer to Environmental Monitoring Plan Drawing D06 for locations.

### 7.5 Monitoring of Wastes

The recording in a register of the types, quantities, date and manner of disposal/recovery of all wastes.

General characterisation testing and acceptance of waste must be based on the three-level hierarchy, of Level 1: Basic characterisation, Level 2: Compliance testing, and Level 3: On-site verification, as detailed in Annex II of the Landfill Directive 1999/31/EC, and Council Decision 2003/33/EC.

Standard Operating Procedures (SOP's) will be put in place to ensure that all inert waste imported to site for recovery will be subject to comprehensive waste acceptance, inspection and sampling procedures (Refer to EIAR Appendix 5.3 for typical examples of SOP's).