



(TRADING AS DARRINGTON QUARRIES LIMITED)

**ENVIRONMENTAL PERMIT VARIATION APPLICATION
WASTE RECOVERY PLAN**

**SKELBROOKE QUARRY EXTENSION AREA
STRAIGHT LANE
SKELBROOKE
DONCASTER**

**Document Reference: WR7640/09.R2
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Information Sheet**

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SKELBROOKE QUARRY EXTENSION AREA, STRAIGHT LANE, SKELBROOKE,
DONCASTER**

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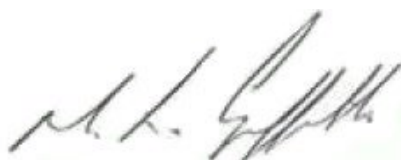
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**SKELBROOKE EXTENSION
STRAIGHT LANE
SKELBROOKE
DONCASTER**

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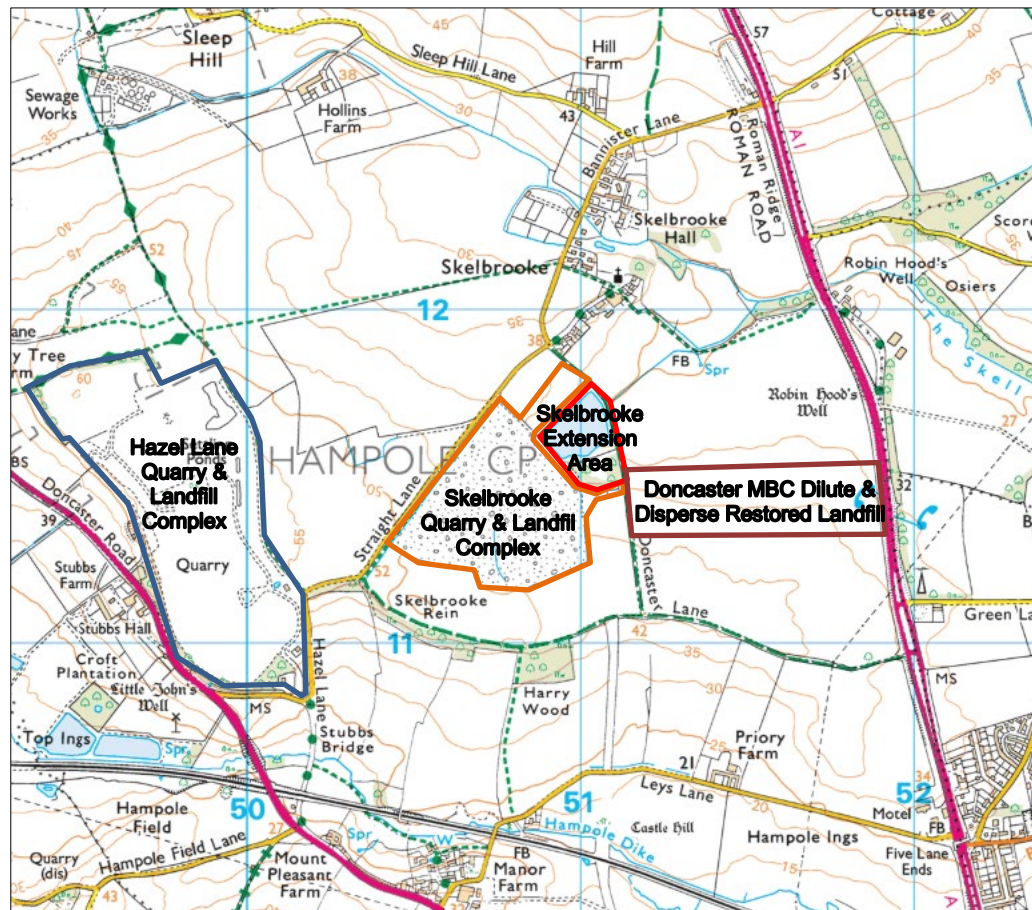
1.0 Introduction

- 1.1 Sirius Environmental Limited ('Sirius') has been commissioned by Darrington Quarries Limited ('DQL'), part of the FCC Group of Companies, to prepare an application to vary the Environmental Permit EPR/CP3994ZR to support a revised scheme of restoration for a former quarry near Skelbrooke, Doncaster
- 1.2 The current permit authorises restoration of the quarry by means of a non-hazardous landfill disposal activity, although the site is currently 'closed' and no wastes have been deposited at the site to date. The revised low-level scheme of quarry restoration seeks to achieve final levels by the permanent deposit of suitable wastes as a waste recovery operation due to the flooded nature of the void.
- 1.3 DQL are seeking to derive an alternative scheme of restoration for the extension area, principally to address safety concerns associated with the flooded part of the site. The revised scheme of restoration seeks to restore the site to a low-level profile that will bring the ground levels within the flooded section above that of current water levels within the void and therefore support long-term management of surface waters for the wider restored quarry and landfill complex.

2.0 Site Setting

- 2.1 Skelbrooke Quarry and Landfill is located 7.5 kilometres northwest of Doncaster, approximately 1km to the west of the A1(T) at National Grid Reference SE 510 116.

Figure 1: Site Location



- 2.2 The area covered by the existing permit forms an (north-)eastern extension, of 4.5 hectares of the main quarry located to the south. The extension is bounded to the north and west by Straight Lane, to the north and east by Doncaster Lane, to the south by the quarry and landfill access road and to the southeast by restored landfill.
- 2.3 The edge of the village of Skelbrooke lies some 250 metres to the north of the site, though the closest properties, at the junction of Doncaster Lane with Straight Lane, are some 200 metres from the edge of the landfill at its closest point. The village of Hampole lies 600 metres to the south east of the site. Immediately to the east, across Doncaster Lane, lies a restored Doncaster Metropolitan Borough "dilute and attenuate" landfill. Hazel Lane Quarry and Landfill complex is also located ~800m to the east of the site.
- 2.4 The solid geology comprises marls and limestones deposited within the Permian Magnesian Limestone Formation, which, in Yorkshire, comprises two dolomitic limestones separated by a horizon of marl. The limestone units are classified as Principal Aquifers as it provides baseline flow to the local rivers. Groundwater flow within the limestone is principally through fracture flow.
- 2.5 The main water courses within the vicinity of Skelbrooke Landfill are the River Skell ('The Skell'), which is located approximately ~520m northeast of the site, and the Hampole Dike, which is located ~500m to the south of the landfill complex. Both of these water courses flow in a general easterly direction.
- 2.6 A tributary of the River Skell rises, via a number of springs, to the immediate north-east of the Skelbrooke site.
- 2.7 Surface water run-off from the capped landfill is collected via a network of collection ditches around the periphery and across the capped surface and discharged into flooded void of the extension area.

3.0 Development History

- 3.1 Quarry operations at Skelbrooke Quarry have been present since the mid-1800's. The quarry has been developed within the Permian Magnesian Limestone, subject to a number of planning approvals. Messrs J. Hinchcliffe & Son Ltd developed quarry operations prior to the mid-1970's. Darrington Quarries Ltd has operated the site since 1976. Darrington Quarries became part of Waste Recycling Group plc in 1998. No other operations occurred within the area of Skelbrooke Quarry prior to the development of the quarry.
- 3.2 The development layout of the main Skelbrooke Landfill facility to the south of the northern extension area is illustrated in **Drawing No. WR7640/01/01**. Cell 1 of the main Skelbrooke Landfill Site was initially developed by Darrington Quarries in 1992. Landfilling within Cell 1 was completed in June 1993 and the cell capped off in August 1993. Subsequent landfill cells 2 to 5 were developed, filled and capped between June 1993 and October 2001. Tipping operations were suspended between August 1995 and October 1996, and again between November 1998 and July 1999. With landfilling operations within Cell 6 commencing in August 2001 and ceasing in 2005. The main landfill area is currently closed to the receipt of further waste deposits, although the site has yet to be filled to its approved final landform. The site was permitted to receive hazardous, non-hazardous and inert wastes.
- 3.3 Mineral extraction in the northern extension area commenced around 1998 and was completed prior to 2001/02, following which the void was allowed to flood with groundwater. Bathymetric surveys of the flooded section of the extension

area (**Drawing No. WR7640/01/01**) indicates that this area has been excavated to depths of between ~16 and 20mAOD, relative to surrounding ground levels of ~35mAOD and 29mAOD along the south-western and north-eastern edges of the flooded extension area. This void is also now used to balance surface water run-off from the restored surface of the adjacent landfill site prior to pumped discharge of the waters to a tributary of The Skell river that flows north from the edge of the site.

4.0 Planning History

- 4.1 Planning consent (96/50/1641/P/MIN) for mineral extraction and restoration of the extension area was originally granted in 1998. A copy of the original consent is presented in **Appendix WRP1**.
- 4.2 The original scheme of restoration allowed for the landfilling of “controlled wastes, but excluding special wastes”, and allowed for 25% settlement.
- 4.3 In 2005, planning consent (Ref.: 03/7149/P – refer to **Appendix WRP2**) was issued approving a revised scheme of restoration for the extension area. This revised scheme incorporated a low-level restoration profile that would be completed with suitable non-degradable fill materials. This planning permission has since expired and new planning consent has since been acquired.
- 4.4 The new application for planning permission (Ref.: 21/01331/FULM) was submitted in April 2021 and determined in March 2022 by the Mineral Planning Authority, Doncaster Council. As with the 2005 planning consent, the new consent seeks the low level restoration of the remaining quarry void and landfill site through infilling with suitable restoration materials, with the site ultimately restored to agriculture, woodland and a wetland area. Differences between the 2005 and 2022 consents are relatively minor, principally to account for changes in surface water management guidelines.

5.0 Licensing/Permit History

- 5.1 Environmental Permit EPR/CP3994ZR was originally issued under the Waste Management Licensing Regulations 1994 in July 2001 (Licence Ref.: EAWML65052). The permit originally authorised the disposal of biodegradable wastes in engineered cells, although no cells have been engineered within the extension area to date and no wastes therefore deposited.
- 5.2 In 2007, the permit/licence was modified to remove conditions allowing the acceptance of waste at the site, with the exception of waste to support landfill restoration activities (where appropriate), subject to prior written agreement with the Environment Agency.
- 5.3 In January 2015, an EA initiated variation to the permit was determined to close the facility following which no wastes are currently permitted for disposal at the site. A Closure Plan (*Doc. Ref.: 1776/R/025/1*) dated October 2014 was incorporated into the permit as part of this variation.
- 5.4 The extension area forms part of wider former limestone quarry and landfill complex located to the southwest of the extension area, which has already been restored by landfilling under a separately regulated landfill activity (Environment Permit EPR/BV1470IE). Completion to the final levels approved under the planning consent for the site has yet to be achieved at the adjacent Skelbrooke Landfill facility, but all existing deposits are currently capped and definite closure has been agreed with the EA.

- 5.5 The extension area void is flooded due to groundwater levels within the surrounding geology, although the site also forms part of the surface water management system for the adjacent, closed landfill facility.
- 5.6 The site originally benefited from a discharge consent that allowed the discharge of surface water via a land drain located along the north-eastern boundary of the extension area, in which the volumes and rate of discharge were limited to 200m³/day and 20m³/hr respectively. This consent was subsequently incorporated into Environmental Permit EPR/BV1470IE for the main landfill.
- 5.7 Currently, the Environmental Permit held for the restoration of the remaining void supports the development of an inert landfill facility. In light of the void's current flooded status, under the current permitted restoration option, DQL are required to dewater the void and engineer the sidewalls in accordance with the Landfill Directive.

6.0 Scheme of Restoration

- 6.1 As mentioned above, the current permitted restoration scheme requires that the void is dewatered and that the sidewalls are engineered in line with the Landfill Directive. However, it is considered that dewatering the quarry has the potential to influence groundwater levels around the edge of the adjacent non-hazardous landfill managed by DQL, whilst also potentially drawing in contaminated groundwater from the neighbouring historical and unlined Doncaster MBC dilute and disperse landfill.
- 6.2 To avoid the need to dewater and engineer the void it has been alternatively proposed to seek to restore the site through the direct tipping of suitably uncontaminated materials into the flooded void. Under these proposals, the contaminative nature of these wastes will need to account for dilution available within and the baseline quality of local hydrogeological environment. As such, in order to comply with the requirements of the Groundwater Directive the waste types to be deposited directly into water and which will be located below the water table associated with the Magnesian Limestone Aquifer will be restricted to low-risk waste types (e.g. quarry fines and overburden, and soils and stones – refer to **Appendix WRP5**) which will be subjected to an enhance characterisation and verification testing regime to ensure that the waste acceptance criteria (WAC) have been met.
- 6.3 The final 1m soil profile will be accepted based on Soil Screening Values (SSVs) which are derived via Atkins ATRISK guidance. These soil thresholds are calculated by using the appropriate Contaminated Land Exposure Assessment Protocol (CLEA). The proposed 'generic' end-use of the restoration is that of grassland and trees/shrubs which are planted on the restoration area and maintained throughout the aftercare period specified in the planning permission. For the majority of the components, the guideline concentration has been set at a value significantly lower than the corresponding SSV to ensure a conservative approach has been taken and that the hazardous waste threshold is not exceeded.
- 6.4 In line with EA Guidance on Waste Recovery Plans (April 2021) and the letter from the EA in response to original version of this WRP dated July 2020 (**Appendix WRP6**), evidence is needed to show that non-waste materials could be used and that there remains an obligation to restore the remaining void despite the expiration of the previous planning permission (Ref. 03/7149/P).

- 6.5 While the original planning permission for the restoration of the site specified the use of imported waste materials to support the restoration, the local planning authority have confirmed via email (**Appendix WRP7**) that either suitable waste or non-waste would be acceptable, subject to the EA's agreement. Therefore, the use of inert / non-hazardous waste material to restore the site would be replacing the option to use non-waste material. In line with the EA's Guidance on Waste Recovery Plans and Deposit for Recovery Permits (21st April 2021), depositing waste is classified as a recovery activity if it is shown that the operator could and would have carried out the works using non-waste material, therefore the use of waste instead would be a 'substitution'.
- 6.6 Furthermore, the local planning authority, Doncaster Council, have confirmed that they still wish to see the void restored, despite the lapsed planning permission (Ref.:03/7149/P). As a result of the health and safety concerns for the site following an incident described in **Section 6.12** of this document, the council would like to see the whole site restored. New planning consent has been acquired (Ref.: 21/01331/FULM) for the revised restoration scheme and an obligation to restore the site therefore still remains. The Decision Notice for this has been included in **Appendix WRP8**. The existence of an obligation to restore the site, using either suitable non-hazardous waste or non-waste materials is in line with the section on 'Evidence to Support Recovery of Waste' in the EA Guidance on Waste Recovery Plans and Deposit for Recovery Permits (dated 21st April 2021). This section states that an obligation to carry out the works would indicate that non-waste could be used for the proposed works and this supports the proposal as a waste recovery activity. The planning permission allows for the deposit of suitable non-hazardous construction, demolition and excavation waste to support restoration of the site.
- 6.7 The initial revised scheme of restoration proposed in 2020 was modelled and a volume of ~235,100m³ was found to be required to achieve final levels. However, in order to provide more capacity and free board space in the surface water lagoon to enable flood attenuation, revised modelling has shown that now only 230,000m³ of restoration material will be required. Of this, ~6,000m³ will comprise site-won material through regrading of surrounding areas, therefore, the volume of non-hazardous waste required to be imported for the restoration will be 224,000m³; a reduction of ~11,100m³ when compared to the originally modelled volume. Resultantly, a smaller volume of input material will now be required to reach final levels. This is in line with EA Guidance on Waste Recovery as the minimum volume required will be used for the restoration of the norther extension area.
- 6.8 The European Waste Category (EWC) Codes proposed for the restoration (**Appendix WRP5**) are in line with the EA's Guidance "check if your waste is suitable for deposit for recovery" (updated June 2023). Waste will be characterised in line the 'Waste classification Technical guidance (WM3)' to confirm that it is not hazardous. Only suitable non-hazardous and uncontaminated waste will be used, for which site-specific waste acceptance procedures have been derived.
- 6.9 The following sections detail the current revised scheme of restoration.
- 6.10 Due to a decline in the availability of non-hazardous wastes with the local market and the presence of other similar landfill facilities close to Skelbrooke (e.g. Hazel Lane Quarry Landfill located to the west of the site), DQL determine that an alternative low-level scheme of restoration would provide a more sustainable option for restoring the quarry. The revised low-level scheme of restoration approved by the Mineral Planning Authority under planning consent reference

“21/1331/FULM” is presented in **Drawing No. WR7747/07/10**. A copy of the planning consent is presented in **Appendix WRP8**.

- 6.11 The use of imported materials is necessary to support the restoration of the flooded section of the site and a small portion of the south-eastern area; the extent of which is as indicated in **Drawing No. WR7640/10/WRP01**. The quantity of materials that need to be imported to site to achieve the final levels of the approved scheme of restoration has been modelled at 224,000m³. An additional 6,000 m³ of material will be deposited which will be site-won; making the total quantity of waste to be deposited a volume of 230,000 m³.

Figure 2: Restoration status of Skelbrooke Quarry Extension



Source: Google Earth (Imagery Date: June 2018)

- 6.12 Whilst there has been no urgent requirement to restore the quarry since extraction ceased at the site in ~2001/2002, a recent incident means that restoration of the site is now a priority. The incident took place during the summer of 2018, whereby a member of the public gained unauthorised access to the site and subsequently died whilst swimming in the flooded section. This incident was widely reported in the media at the time (e.g. BBC, 2018), with a subsequent campaign and statements focussing on this incident made again during the summer of 2019 (Bateman, 2019). Whilst further security measures have been implemented at the site since the incident, DQL have therefore taken the decision to prioritise the restoration of the quarry to ensure that similar incidents don't occur at the site in the future.
- 6.13 A recent bathymetric survey of the flooded section of the quarry void had shown that this area has been excavated to depths of between ~16 and 20 mAOD, relative to surrounding ground levels of ~35 and 29 mAOD along the south-western and north-western edges of the flooded extension area. As previously mentioned, it was initially determined that in order to achieve the previously approved restoration contours under the original planning permission (Ref: 03/7149/P), it was calculated that ~235,100m³ of imported restoration materials would be required. However, due to the need to provide increased flood

attenuation capacity in line with current guidelines, there will be a reduced volume of restoration materials required. Only 224,000 m³ of non-hazardous material will be imported for the restoration work, with ~6,000 m³ of site-won material also being re-used. Therefore, there has been a reduction of ~11,100 m³ of imported waste required for the restoration from that originally estimated. Sections depicting the fill profile for the site are presented in **Drawing No. WR7640/10/WRP01**. The revised restoration profile is also shown in **Drawing No. WR7640/01/01**. Fill depths in the flooded section are typically approximately 16m thick, reducing to approximately 2m in the south-eastern section of the site.

- 6.14 The flooded section of the site is also currently used to support the management of surface water run-off from the adjacent restored landfill facility, into which the current collection network discharges. The approved scheme of restoration also includes the creation of a wetland habitat that will continue to be fed by and support the current collection network from the adjacent restored landfill facility. The surrounding land will also be graded to drain towards this wetland feature.
- 6.15 The long-term plan for managing surface waters within the wider Skelbrooke Quarry and Landfill complex is to enable all waters to discharge directly, under gravity, to a tributary drain of the Skell, the source of which is located immediately beyond the northern boundary of the extension area.
- 6.16 To enable the site to continue to support the management of surface water run-off from the wider quarry complex without the requirement to construct a temporary management system elsewhere on the site, it is not proposed to drain the flooded section of the extension area prior to deposit of restoration materials.
- 6.17 Additionally, a permeability range of between ~0.01 and ~130m/d was confirmed by SLR (2004) from rising head tests performed in various boreholes installed around the periphery of the main Skelbrooke landfill facility. Taking into account published permeability ranges of between ~2.5 and ~10 m/d for the Magnesian Limestone, an abstraction rate of between ~250 and ~2,200m³/d is estimated to maintain dry conditions within the void. This rate excludes additional volumes generated from the surface water management system and additional volumes necessary to initially dewater the void. Pumping calculations are presented in **Appendix WRP3**.
- 6.18 Moreover, by reducing water levels within the quarry could draw in contaminated groundwaters from the neighbouring restored Doncaster MBC landfill, that operated under the principles of dilute and disperse. Draw down estimates at present in **Appendix WPR3**. Historic correspondence between Doncaster MCB and the Environment present in **Appendix WRP4** highlights that the landfill is contaminating groundwater and surface water (i.e. The Skell) locally. This could present further issues in terms of discharging abstracted groundwaters from the site. Similarly, there is limited potential to influence hydraulic containment conditions within the adjacent Skelbrooke Landfill facility
- 6.19 On this basis, the wastes to be deposited within the void will be of a quality that presents a pollution potential that is less than, or equal to, the natural quality of the surrounding geology/groundwater. The primary source of material to be deposited is proposed to be quarry wastes/fines from local quarries, although soils and other wastes with a low pollution potential, including soils from local greenfield or low-risk brownfield development sites will also be considered. A full list of wastes is present in **Appendix WRP5**. Site specific waste acceptance criteria and procedures will be derived for other wastes that may be accepted

at the site. Appropriate criteria will be derived from baseline groundwater quality associated with the Magnesian Limestone.

- 6.20 As indicated earlier, the northernmost area has already been restored to agricultural pasture using indigenous materials and does not therefore form part of these waste recovery proposals. Full details of the specification to which the site will be restored is presented in **Drawing No. WR7747/07/10**.

7.0 Conclusions

- 7.1 The extension area to which this Waste Recovery Plan relates forms part of a wider quarry complex, much of which has been restored through the disposal of non-hazardous biodegradable wastes. The extension area is also located in close proximity to the restored historic Doncaster MBC dilute and disperse landfill.
- 7.2 The Mineral Planning Consent that authorised the extraction of limestone from the extension area was originally granted on the basis that the void would be restored. The original scheme of restoration for the extraction void was consented by means of a non-hazardous landfill, but changes in local market conditions meant that restoration of the site by such means was no longer viable. Consequently, the original approved scheme of quarry restoration was amended to allow for a low-level restoration profile using indigenous and imported non-hazardous materials.
- 7.3 The revised scheme of restoration includes for the creation of ecological habitats with a small section restored to agricultural land use. The proposals also support surface water management requirements for the wider restored quarry and landfill complex.
- 7.4 To date only the northern section of the extension area has been restored using indigenous materials. The main extraction void and southern area remain un-restored, for which 224,000m³ of material needs to be imported to restore the remaining areas of the extension area. A further 6,000 m³ of site-won material will also be utilised for the restoration.
- 7.5 Whilst restoration of the site has not been a priority to date, following a death at the site during the summer of 2018, it is now key to infill the quarry void to reduce the risk that it currently poses to public safety.
- 7.6 It is not proposed to dewater flooded sections of the site to support infilling operations due to pumping requirements and the risk of drawing in contaminated groundwaters from the neighbouring dilute and disperse Doncaster MBC landfill. Consequently, infill materials will be selected that has a pollution potential less than, or equal to, the natural quality of the surrounding geology/water to ensure that the materials will not result in the deterioration of groundwater quality.
- 7.7 It is therefore considered that restoration of the extension area supports the overall obligation in that extraction of the quarry void would be followed up by subsequent restoration of the site. The quantity of materials required to achieve the approved final levels also represents the minimum quantity of materials needed to support surface water management requirements for the wider restored quarry and landfill complex, as well as supporting habitat development at the site. Achieving these final levels will also remove the inherent risk to public safety posed by the deeps water currently present at the site.

8.0 References

Bateman. S, 2019. Warning about the dangers lurking in open water during Drowning Prevention Week, Published by Doncaster Freepress. Report Date: 18th June 2019. Available from: <https://www.doncasterfreepress.co.uk/news/people/warning-about-dangers-lurking-open-water-during-drowning-prevention-week-172749>

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