

Assessment Method:

1. The normal Local Authority preferred approach when new noise sources are to be introduced to an area is to consider a relative assessment. The suggested guidance is that of BS4142:1997. *Method for rating industrial noise affecting mixed industrial and residential areas*. Discussions with Lucy Allen at Barnsley Council Environmental Services Department confirmed that a BS4142 assessment was required.
2. Lucy Allen advised that the recycling equipment inside the factory building was not considered to be an issue and her main concern was about noise from the external generator and any other relevant equipment.
3. BS4142 requires several parameters to be determined:
 - a) Specific Noise, LAeq (Equivalent Continuous Level). This is the energy average of the expected noise of the proposed equipment at the NSR.
 - b) Background Noise, LAF90. (Level exceeded for 90% of the time). This is the statistical 90% level of the existing ambient noise without the Specific Noise.
 - c) An assessment of the character of the noise.
4. The Background Noise is subtracted from the Specific Noise, after a correction if the Specific Noise is within 10dB of the existing ambient noise. If the result is around +10dB, then complaints are very likely. If the result is around +5dB, complaints are deemed to be marginally likely. If the result is around -10dB, then complaints are very unlikely. There is a +5dB penalty for any distinctive character of the Specific noise.
5. For night time noise, BS4142 requires an assessment of the effect of the Specific noise over a 5 minute period to accommodate any variation in the noise profile and the increased susceptibility of local residents at night.
6. The noise level at a distance can be calculated using the formula:

$$\text{Noise (at x metres)} = \text{Noise (at y metres)} - 20\log(x / y) \dots\dots\text{in dB}$$

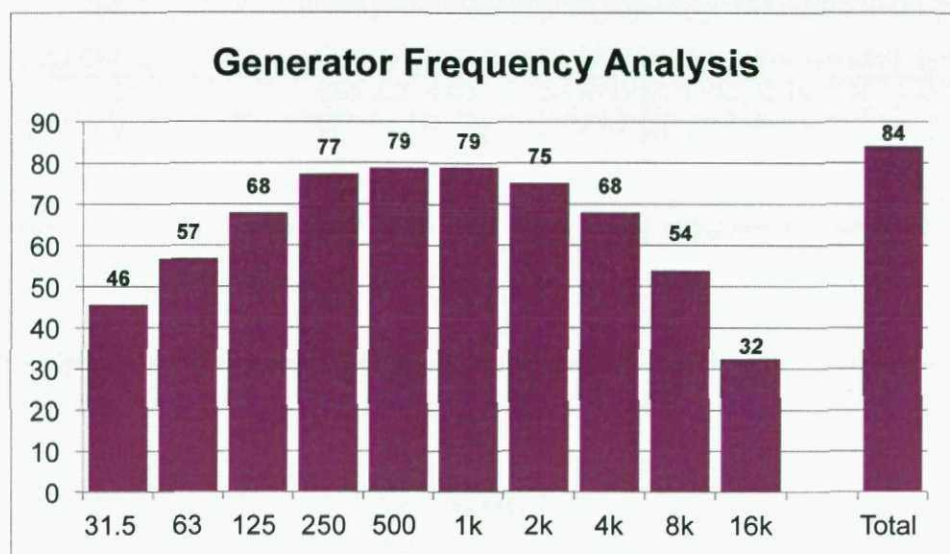
Results:

Subjective assessment:

1. The noise of the generator on site was assessed during normal operation of the plant on Tuesday 9th October. This noise dominates the site and completely swamps the noise of the recycling plant in the factory building. There was no change in the overall noise level at the site perimeter even when the factory doors were opened.
2. The background noise at the nearest dwellings was affected by the passing traffic on the A633 road in the period around midnight on Monday 8th October when the measurements were taken. However, there were times with no immediate traffic present and the noise levels at these times were very quiet and have been taken as typical of the likely noise when traffic has ceased in the middle of the night.
3. The daytime ambient noise situation was assessed at the rear of the houses during normal daytime operation of the generator. It was not possible to distinguish the noise of the generator at all. This was largely due to the fact that there is a large industrial building associated with the Billington company that is positioned directly between the G B Cullet site and the houses. This building acts as a very significant noise barrier.

Measured data: All values used in calculations are rounded to the nearest dB in line with standard procedure.

1. The noise of the generator was measured at a distance of about 1m and at the perimeter of the site. The overall level and octave frequency analysis of the measurement at 1m is shown below. The frequency spectrum of the noise shows a general wideband noise centred around 500/1kHz with no particular tonal effects. The overall level was 84dB(A). The perimeter level dropped to 76dB(A).



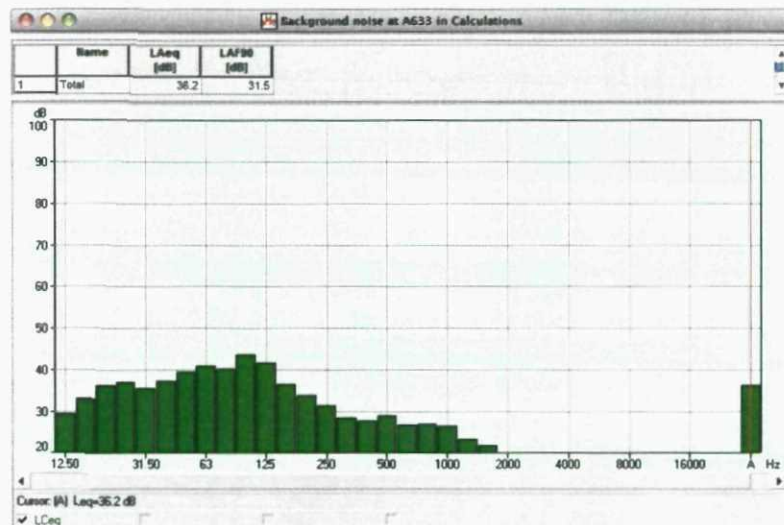
Results (continued):

2. The Specific noise effect at the NSR for a BS4142 calculation is given by taking the LAeq value of 84dB at 1m and translating that to a distance of 150m using the formula from the Assessment Method section above.

ie: $20\log 150 = \text{reduction of } 43\text{dB}$.

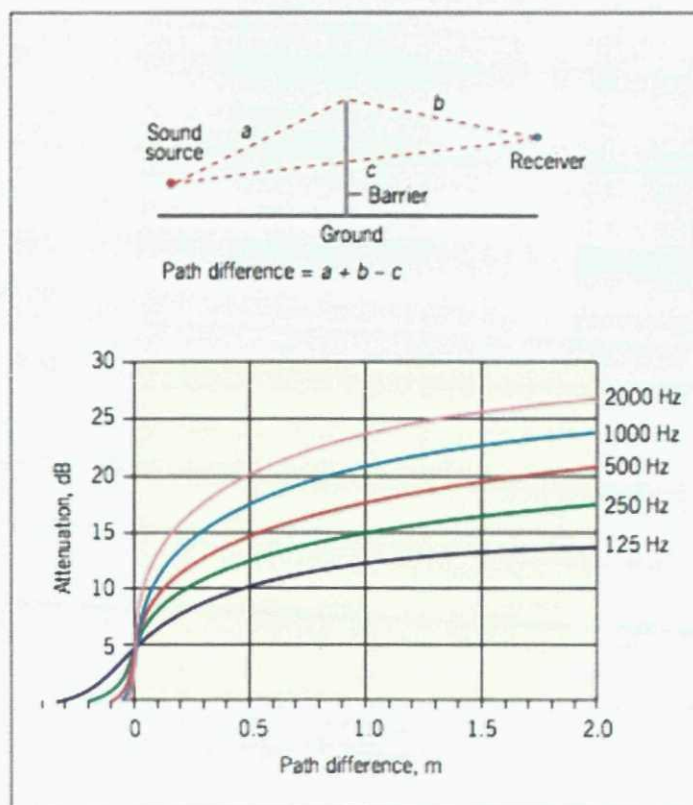
Thus, the expected noise level at the nearest dwellings would be around 41dB(A) if there were no intervening barriers or other noise reducing effects.

3. The frequency spectrum and overall level of the night time background noise at the rear of the houses is shown below. The difference between the LAeq and LAF90 values demonstrates that there must have been some distant traffic noise causing variation in the noise level although this was not subjectively noticeable during the measurement. However, the value of 31dB(A) for LAF90 is entirely sensible for this type of location.



Calculations:

1. The Specific Level of the generator at the houses was estimated as likely to be about 41dB LAeq. The night time average of Background Noise was measured as around 31dB LAF90. According to BS4142, this indicates a Noise Rating Level of **10dB**.
2. However, the above calculation takes no account of the intervening Billington's building and the fact that the G B Cullet site is also at a considerably lower height than the NSR position. The Billington's building is approximately 7m in height and the ground level is estimated as around 3m (possibly more) above the Generator position. Since the Billington's building runs the length of the G B Cullet site and considerably longer, these factors create the effect of a 10m high noise barrier between the G B Cullet generator and the top of the Billington's building. The effect on the NSR side is not as significant for the same ground level reasons and the height is effectively reduced from 7m to about 5m differential.
3. The effect of a noise barrier is determined by the path difference between the direct sound and the refracted sound. The amount of noise reduction is frequency dependant. A good graphical representation of the barrier attenuation effect is given in *Building Bulletin 93, Section 2: Noise Control*, which is part of the UK Building Regulations 2000 and is shown below.



Calculations (continued):

4. The ridge of the Billington's building is about 80m from the G B Cullet generator site and 70m from the rear windows of the nearest houses. A simple use of Pythagoras's Theorem gives an effective path difference of around 0.79m. The graph above in paragraph 3. shows that the noise reduction would be between 17 and 20dB at the main frequencies of the generator noise.
5. This suggests that the actual residual noise likely at the NSR position due to the G B Cullet generator would be around 21 to 24dB(A). This level is considerably **BELOW** the existing Background noise level of 31dB LAF90 and indicates according to BS4142 that complaints would be unlikely.

Conclusions and Recommendations:

1. According to the BS4142 based assessment above, the planned night use of the generator at the G B Cullet location is unlikely to present any meaningful level of noise nuisance. It is very likely that at most times the noise of the machinery would actually be inaudible due to the A633 traffic noise.
2. However, as an added safety factor, it would be prudent to construct a noise barrier on site around the generator itself. A solid barrier positioned at about 1m and with a height of 1m above the generator should reduce the noise emission at source by a further 10dB.
3. Also, any fork-lift trucks or other material handling vehicles should be fitted with "hush" reversing alarms instead of the conventional tonal "beeping" versions. Although it is understood that this kind of vehicle might only be used about once an hour, this improvement would avoid any potential short-term intrusion effects of this kind of tonal noise.
4. If the above matters are addressed, then there would appear to be no valid reason from a noise aspect that would prevent this application for night operation being approved.

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The Cullet Yard Drainage Assessment





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Drainage Assessment

The Cullet Yard

Project:	The Cullet Yard
Site:	The Cullet Yard, Wombwell
For:	GB Cullet Ltd
Status:	Final
Date:	October 2012
Author:	Keelan Serjeant, BSc (Hons), MSc - Principal Hydrologist
Reviewer:	Matt Travis, BSc (Hons), MSc, MCIWEM, C.WEM, CEnv, CSci - Director
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1.0 INTRODUCTION

1.1 Background

At the request of GB Cullet Ltd (GBC) a Drainage Assessment, in accordance with National Planning Requirements and the Local Planning Authority (LPA), has been undertaken for the proposed development at The Cullet Yard, Wombwell, Barnsley, S73 8HR.

This report details the existing and proposed water drainage network at the site in support of the enclosed change of use planning application and environmental permit application. It is understood that GBC intends to operate a specialised Waste Transfer Station with treatment on the site.

It is recognised that developments that are designed without regard to the foul and storm water sewers are likely to result in increased impact on existing off site service provision. In addition, it is possible that substantial services cross the site, which may have associated easements. Understanding the impact of existing services and potential reinforcement can be helpful in determining development areas of the scheme and also associated costs. In addition, any drainage strategy may also require an understanding of existing capacity.

In order to achieve the overall project aim, a number of objectives will be satisfied by Enzygo:

- Review the existing drainage network at the site and within the vicinity of the site;
- Assess the drainage requirements for the site;
 - A preliminary assessment of foul water runoff;
 - A preliminary assessment of the proposed surface water runoff;
 - A preliminary assessment of contaminated run off;
- Assess the site's suitability for a range of drainage techniques;
- Discussions were held with the Environment Agency, Barnsley Council and Yorkshire Water to discuss the proposals and detail of the assessments required. Enzygo will also take this opportunity to collect any additional data that has become available; and
- Prepare an outline schematic design and prepare a report.

1.2 Project Scope

In order to achieve the aims outlined above a staged approach has been adopted in undertaking this Drainage Assessment in accordance with current best practice. A screening study has initially been undertaken to identify whether there are any sewerage services at the site, which may warrant further consideration. Any potential sewerage services identified in the screening study have subsequently been considered in a scoping study. The aim of the scoping study is to review all available information and provide a

qualitative assessment of the sewerage services to the site and the impact of the site on the sewerage services elsewhere.

1.3 Report Structure

This Drainage Assessment has the following report structure:

- Section 2 identifies the sources of information that have been consulted during the Drainage Assessment;
- Section 3 describes the application area including the existing and proposed development;
- Section 4 details the existing site drainage network of the southern site area;
- Section 5 describes the proposed drainage network of the southern site area;
- Section 6 details the existing site drainage network of the northern site area;
- Section 7 describes the proposed drainage network of the northern site area; and
- Section 8 presents a summary and conclusions.

2.0 SOURCES OF INFORMATION

2.1 Sources of Information

General information regarding the site setting of the application site has been obtained from OS Explorer 278: Sheffield & Barnsley.

A location plan is shown on Drawings 1.

Information regarding the current drainage networks at the site has been obtained from Yorkshire Water, Barnsley Council, a site walkover, topographic survey, CCTV survey and condition reports.

2.2 CCTV

A CCTV survey of the sites drainage network was undertaken on the 7th September 2012, this allowed the existing site drainage network to be accurately mapped, and the condition of the networks and manholes to be assessed (see Appendix 1).

2.3 Site Visit

A site walkover survey was undertaken by a consultant from Enzygo on the 18th September 2012 this included the identification of the site drainage network and discharge locations.

2.4 Discussion with Regulators

A wide range of regulators should be consulted when carrying out a Drainage Assessment. These include the Environment Agency, LPA, and Sewerage Undertakers. Consultation and discussions with the relevant regulators have been undertaken during this Drainage Assessment.

2.4.1 Environment Agency

The Environment Agency is responsible for the protection of the water environment. A telephone conversation has been held with Emily Boothby, Regulations Officer at the Environment Agency for this region of England. Discussions were held with regards to the scale of the proposed development and the required Drainage Assessment. It was agreed that the Drainage Assessment should assess the existing drainage network at the site and whether this would be suitable for the proposed use of the site (see Appendix 2).

2.4.2 Barnsley Council

The LPA is Barnsley Council. Planning guidance written by Barnsley Council regarding drainage has been consulted to assess the mitigation policies currently in place. These documents included the Local Development Framework and the Local Plan.

Correspondence has been received from Wayne Atkins Senior Engineer – Drainage and Highways at Barnsley Council (see Appendix 3). Barnsley Council maintains a number of private sewers within this area.

2.4.3 Yorkshire Water

Yorkshire Water is the Sewerage Undertaker within this area and is responsible for the disposal of waste water in the area of the site. Public sewers within this area have been adopted and are maintained by Yorkshire Water. Appendix 4 provides information on the foul and surface water sewers alongside clean water supply within the vicinity of the site.

3.0 DESCRIPTION OF THE APPLICATION AREA

3.1 Site Location

The site is located at The Cullet Yard, Acorn House, Mitchell's Enterprise Centre, Bradbury Balk Lane, Wombwell, Barnsley, S73 8HR. The National Grid Reference of the site is SE 391 041 (439190, 404150).

The site that is subject to the change of use planning application as well as the permit application is the entire area within the red line as shown on Drawing 2. The site is bounded by commercial properties to the north, east, and south and by scrubland to the west.

The site area is 0.55 hectares (ha).

3.2 Existing Development

GBC currently occupies and operates out of land located on Mitchell's Enterprise Park. The operation is centred around re-cycling, specifically targeted towards waste generated from the glazing industry.

The core business of the company is glass re-cycling. Off-cuts of glass are collected from double glazing manufactures, returned to site and prepared by, GBC, for onward re-cycling at "float glass manufacturers".

The site is comprised of southern and northern areas with a Bradbury Balk Lane running between the two. These areas currently consist of the following:

- Southern Area - industrial portal framed building, yard area, car park, entrance. This area is surfaced in hardstanding sloping gently towards Bradbury Balk Lane with a formal drainage network which has been surveyed by CCTV.
- Northern Area - yard/storage/working area, weighbridge, porta cabin, welfare facilities, workshop and storage facilities. The northern portion of this area is surfaced in hardstanding with no formal drainage network. However, the southern portion of this area is used as a storage area and is currently permeable with no formal drainage network. However, the infiltration rate of these permeable surfaces is negligible due to the hard pact nature of the substrate.

3.3 Proposed Development

It is understood that GBC intends to operate a specialised Waste Transfer Station with treatment on the site. GBC plans to expand their operation at this site in 2012/13, this expansion will involve the commission of a de-lamination processing plant for laminated safety glass.

This is not a re-development but an application for change of use to the existing building and site. In conjunction, there is an application for a bespoke environmental permit which

will cover the existing site and the proposed development site for the purpose of the de-lamination process.

The site will be comprised of southern and northern areas with a Bradbury Balk Lane running between the two. These areas will consist of the following:

- Southern Area - industrial portal framed building, yard area, car park and entrance. This area will be surfaced in hardstanding sloping gently towards Bradbury Balk Lane with a formal drainage network.
- Northern Area - yard/working area, weighbridge, porta cabin, welfare facilities, and workshop and storage facilities. This area will be surfaced in hardstanding and a formal drainage network will be installed across the whole of the northern area.

Further details with regard to the proposed development can be found in the accompanying information to the planning application and environmental permit application.

3.4 Topographic Survey

A topographical survey was undertaken on the 20th April 2012 (see Appendix 5). The site is relatively flat with a maximum ground level of 39.22mAOD to the north of the site and a minimum ground level of 34.05mAOD. The site generally slopes from north west to south east however, within the Southern Area the site slopes gently towards Bradbury Balk Lane.

3.5 Catchment Hydrology

The nearest surface drain to the site is located approximately 150m from the south eastern boundary of the site (see Drawing 2). The former Dearne and Dove Canal is identified as a drain and feeds into the surface water drainage network. The channel is located approximately 10m to the south west of the site. This drains in a south easterly direction to join the surface drain identified above at a location approximately 150m to the south east of the site. The drain flows in an easterly direction and joins the River Dore at a location approximately 475m to the east of the site. The River Dove is situated approximately 150m to the north east of the site.

4.0 EXISTING WATER DRAINAGE NETWORKS – SOUTHERN AREA

4.1 Introduction

This section details the existing water drainage network infrastructure within and adjacent to the southern area of the site.

The current site drainage network has been identified and assessed using a number of techniques including; correspondence with Yorkshire Water, and Barnsley Council, site walkover, topographical survey and CCTV survey.

4.2 Existing Foul Sewers

4.2.1 Existing Public Foul Sewers

A review of the asset records supplied by Yorkshire Water indicates that a public combined sewer is located approximately 20m to the west of the site (see Appendix 4).

Table 1 shows the details of the public combined sewer. Combined sewers carry both surface water and foul sewage. No detail with regards to the manholes and invert levels has been provided by Yorkshire Water.

Table 1 – Public Combined Sewer Data (southern area)

Function	Size	Shape	Material
Combined	375	Circular	Vitrified Clay

4.2.2 Existing Private Foul Sewers

Within the site is a private foul sewer network (see Appendix 1) which discharges from the office building at two locations.

A schematic of the existing private foul drainage network is shown on Figure 1 and is also shown on Drawing 3. Table 2 shows the details of the private foul sewer network located within the site.



Function	Size	Shape	Material
Surface	100	Circular	Polyvinyl chloride

Currently the foul water from the site drains (adjacent to the office building) to the Barnsley Council main foul sewer located within Bradbury Balk Lane. It is understood that this Barnsley Council main foul sewer finally discharges into the public sewer network near the boundary of the Mitchell's Enterprise Centre to the south of the site.

4.3 Existing Surface Water Sewers

4.3.1 Existing Public Surface Water Sewers

A review of the asset records supplied by Yorkshire Water indicates that there is no existing public surface sewerage infrastructure within the vicinity of the site (see Appendix 4).

4.3.2 Existing Private Surface Water Sewers

Within the site is a private surface water sewer (see Appendix 1).

Currently the surface water and rainfall from the site drains to these on-site private surface water sewers. The surface water drainage networks collect surface water runoff and rainwater from the yard area and buildings via drainage channels, gullies and manholes. The rainwater that falls on the office building currently drains to the surface water drainage network via downfall pipes and local sewers. A schematic of the existing private surface water drainage network is shown on Figure 1 and is also shown on Drawing 3. Table 3 shows the details of the private surface water sewers located within the site.

A private main surface water sewer is located within Bradbury Balk Lane to the east of the site which flows from north to south. No detail with regards to the manholes and invert levels has been obtained. It is understood that this private main surface water sewer is maintained by Barnsley Council (see Appendix 3).

The on-site private surface water sewers discharge to the Barnsley Council main surface sewer located within Bradbury Balk Lane.

Surface water runoff from the yard area discharge adjacent to the entrance and roof runoff discharges adjacent to the building to the Barnsley Council main surface water sewer. It is understood that the sewer adjacent to the building is currently in need of repair.

Table 3 – Onsite Private Surface Water Sewer Data (southern area)

Function	Size	Shape	Material
Surface	100	Circular	Polyvinyl chloride

4.4 Sewage Treatment

The nearest Sewage Treatment Works is Wombwell Sewage Treatment Works which is located 1.7km to the east of the site and is the responsibility of Yorkshire Water (see Appendix 4).

4.5 Planning / Building Conditions

The Barnsley Council main sewers within Bradbury Balk Lane will be subject to a 'Restricted Building Zone'. This would normally be a surface area equivalent to the depth of the sewer measured from the centre line of the sewer on either side. No construction will be permitted within that zone. The developer should also note that deep and wide rooted trees must not be planted in close proximity to live sewers. Access to sewers must be maintained at all times and no interference to manholes will be permitted during construction works.

4.6 Adoption Agreements

If an agreement for the adoption of sewers under Section 104 of the Water Industry Act 1991 is being contemplated, a submission in accordance with 'Sewers for Adoption', Sixth Edition will be required, taking into consideration any departures from the general guide stipulated by Yorkshire Water.

5.0 PROPOSED WATER DRAINAGE NETWORKS – SOUTHERN AREA

5.1 Drainage Strategy

Drainage of the site will continue to take place with separate systems for foul and surface water drainage. The separate system will extend to the Barnsley Council main sewers within Bradbury Balk Lane.

5.2 Foul Water Drainage Strategy

The site will continue discharge to the Barnsley Council main foul water sewer located within Bradbury Balk Lane to the east of the site adjacent to the office building (see Drawing 4). General maintenance of the on-site private foul sewers has been undertaken and may be required to bring them up to standard.

5.2.1 Foul Water Runoff Rates

The foul water runoff rates will be no different compared to current conditions; the rates of runoff will not increase due to the proposed development and will continue to drain by gravity.

The existing and proposed foul flows from the site has been calculated in accordance with the 'Sewers for Adoption', Sixth Edition. The foul flow has been assumed to be 0.5l/s per hectare as the current and proposed use of the site is normal industry and has been calculated using the following formula:

$$Q = 0.5\text{l/s per hectare}$$

$$0.042\text{l/s} = 0.5 / 0.12 \text{ (site area in hectares)}$$

Where:

- Q – Discharge (l/s)

The existing and proposed foul flow from the site is and will be 42l/s. Foul flows will therefore remain unchanged from the existing conditions and will have no impact on the capacity of the sewer network.

5.3 Surface Water Drainage Strategy

The surface water runoff will continue to discharge to the Barnsley Council main sewer located within Bradbury Balk Lane adjacent to the entrance to the site. An appropriately sized separator will be required before the surface water runoff discharges from the site (see Section 5.3.2). Surface water runoff from communal parking and hardstanding must pass through an adequately sized full retention separator (Class) 1 oil, petrol and grit

separator before discharge to the Barnsley Council main sewer within Bradbury Balk Lane. Full retention separators treat the full flow that can be delivered by the drainage system, which in this case is equivalent to the flow generated by a rainfall intensity of 65mm/hr, as advised by Klargestter.

The separator will be located upstream of discharge from the site. A number of the sewers have recently been repaired on-site to bring them up to standard.

Roofs areas will continue to discharge to the Barnsley Council main sewer located within Bradbury Balk Lane adjacent to the building. Run off from low risk areas, such as roofs, will not be connected to the separator. It is understood that the sewer adjacent to the building is currently in need of repair therefore, the sewer will be repaired. General maintenance will be undertaken to keep them at the required standard.

5.3.1 Surface Water Runoff Rates

The existing impermeable surfacing will be retained and it is not proposed to introduce any new hard paved areas. All workings areas will therefore be constructed from hardstanding and will therefore be made up of impermeable surface, which will prevent pollution of the soil substrate and groundwater.

The existing and proposed surface water runoff rate from the site has been calculated using the following formula:

$$Q_p = A I / 3600$$

$$0.0221\text{m}^3/\text{s} = 1224 \times 0.065 / 3600$$

$$\text{To convert to l/s: } 0.0221\text{m}^3/\text{s} \times 1000 = 22.1\text{l/s}$$

Where:

- A – Impermeable Area: 1224m²
- I – Rainfall Intensity (m/hr): 0.065 (65 mm/hr i.e. the 'full flow')
- Q_p – Discharge (m³/s)

The existing and proposed surface water runoff rate from the site during the 65mm/hr rainfall event is and will be 22l/s.

Surface runoff will therefore remain unchanged from the existing conditions therefore ensuring that the development will not increase flood risk elsewhere. Therefore, the surface water runoff from the site will not need to be attenuated.

Barnsley Council has confirmed that if it is proposed to discharge from the site to the Barnsley Council main sewer in Bradbury Balk Lane there will be no increase in surface water runoff from the developed site and therefore attenuation of surface water runoff will not be required.

5.3.2 Separator

A full retention Class 1 separator will be required as it is proposed to discharge from the site (see Drawing 4) to a surface water sewer in accordance with the Environment Agency Pollution Prevention Guidelines (PPG3).

Class 1 separators are designed to achieve a discharge concentration of less than 5 mg/litre of oil under standard test conditions. Many Class 1 separators contain coalescing devices, which draw the oil droplets together and facilitate the separation.

Full retention separators treat the full flow that can be delivered by the drainage system. The 'full flow' is normally equivalent to the flow generated by a rainfall intensity of 65 mm/hour.

Full retention separators are used where there is a risk of regular contamination with oil and a foreseeable risk of significant spillages (e.g. parking areas and vehicle loading/unloading areas).

The flow rates of potential spillages delivered to the separator from the drainage system and the oil storage volume of the separator will be sufficient to retain the entire spillage.

The separator has been sized in accordance with PPG3. See Table 4 for further information. Appendix 6 confirms that the separator has been sized correctly by Klargestor and provides more information.

Nominal size

Separators are tested in accordance with the standard test procedure in the European Standard. Full separators are allocated a nominal size (NS) on the basis of the test results.

The nominal size of a full retention separator that is required for a catchment area (A) is obtained using the following formula:

$$NS = 0.018 \times A \text{ (in m}^2\text{)}$$

$$22 = 0.018 \times 1224\text{m}^2$$

In addition, capacity for silt storage (C) must be provided for all separators, either as an integral part of the separator or as a separate upstream unit, according to the following:

$$C \text{ (in litres)} = NS \times 100$$

$$2203 \text{ litres} = 22 \times 100$$

Separators must be designed such that when the silt chamber or silt area of the separator is full of silt, this will not affect the operation of the separator, the skim pipe or the by-pass device.

Oil Storage Capacity

The oil storage capacity is defined as the volume of separated oil that can be stored in the separator without any of the stored oil entering the inlet or outlet of the separator. The oil storage volume (V) is given by the following:

$$V \text{ (in litres)} = NS \times 10$$

$$220 \text{ litres} = 22 \times 10$$

The oil storage capacity is sufficient to retain any such spillage and a separator slightly larger than that identified above will be sued.

Minimum size

The minimum working capacity (which excludes any provision for silt deposition) of a separator should be 1000 litres.

Table 4 – Proposed Separator (southern area)

Nominal Size	Flow (l/s)	Drainage Area (m ²)	Storage Capacity (litres)	
			Silt	Oil
22	22	1224	2203	220

Oil level alarm

PPG3 requires that all separators are fitted with an intrinsically safe visual and audible alarm. This will be a robust device to provide visual and audible warning (if necessary to a remotely located supervisory point) when the level of oil reaches 90% of the oil storage volume (V) under static liquid level conditions. The device will be fitted within the separator to provide protection against damage. It will be installed and calibrated by a technician who is familiar with the system. Regular maintenance and testing are essential. Any electrical device used in the separator shall be intrinsically safe and certified to an explosion protection standard suitable for Zone 0 and conform to the requirements of BS5345 part 1 and BS EN60079-10 1996.

Silt level alarm

In order to prevent the build-up of excessive levels of silt, a silt level alarm may be used.

It is proposed that the detailed design of the final scheme would be agreed with the Environment Agency and LPA prior to works commencing.

5.4 Risk Management

The sources of contaminants on the site are oils, fuels and chemicals associated with the movement of vehicles and processes proposed at the site.

As noted in Section 5.3 a full retention Class 1 separator will be used before the discharge of the surface water runoff from the site. Therefore, surface water runoff from the site will be treated, managed and mitigated so that the discharge of surface water from the site will not be contaminated therefore, controlling the pollution risk proposed by the proposed development.

Oils, fuels or chemicals will be stored safely, legally and will reduce the risk of a potentially costly pollution incident.

The tanks, drums or other containers will be strong enough to hold the oil without leaking or bursting. The containers are positioned away from any vehicle traffic to avoid damage from collision.

Secondary containment, such as a bund or drip tray, is provided to catch any oil leaks from the container or its ancillary pipe work and equipment. The secondary containment is sufficient to contain at least 110% of the maximum contents. Where more than one container is stored, the secondary containment is capable of storing 110% of the largest tank or 25% of the total storage capacity, whichever is the greater.

The secondary containment base and walls are impermeable to water and oil. All valves, filter, sight gauge, vent pipe or other ancillary equipment are kept within the secondary containment when not in use.

All workings areas are and will be constructed from hardstanding and are therefore made up of impermeable surface, which prevents any pollution of the soil substrate and groundwater.

Regular maintenance of the drainage network will be undertaken to prevent blockages and to protect the drainage network on the site and into which the site discharges into.

An easement of a minimum of 10m measured from the top of bank will be maintained for all the watercourses shown on Drawing 2 therefore providing further protection of surface watercourses. Barnsley Council requires an easement of at least 3m (see Appendix 3) and the Environment Agency require an easement of at least 10m.

6.0 EXISTING WATER DRAINAGE NETWORKS – NORTHERN AREA

6.1 Introduction

This section details the existing water drainage network infrastructure within and adjacent to the northern area of the site.

The current site drainage network has been identified and assessed using a number of techniques including; correspondence with Yorkshire Water, and Barnsley Council, site walkover, topographical survey and CCTV survey.

6.2 Existing Foul Sewers

6.2.1 Existing Public Foul Sewers

A review of the asset records supplied by Yorkshire Water indicates that a public combined sewer is located approximately 30m to the west of the site (see Appendix 4).

Table 5 shows the details of the public combined sewer. Combined sewers carry both surface water and foul sewage. No detail with regards to the manholes and invert levels has been provided by Yorkshire Water.

Table 5 – Public Combined Sewer Data (northern area)

Function	Size	Shape	Material
Combined	375	Circular	Vitrified Clay

6.2.2 Existing Private Foul Sewers

A review of the asset records supplied by Yorkshire Water indicates that there is a public foul water sewer is located approximately 30m to the west of the site (see Appendix 4).

6.3 Existing Surface Water Sewers

6.3.1 Existing Public Surface Water Sewers

A review of the asset records supplied by Yorkshire Water indicates that there is a public surface water sewer is located approximately 30m to the west of the site (see Appendix 4). It is understood that this discharges into the former Dearne and Dove Canal which is identified as a drain and feeds into the surface water drainage network.

Table 6 shows the details of the public surface water sewer. No detail with regards to the manholes and invert levels has been provided by Yorkshire Water.

Table 6 – Public Surface Water Sewer Data (northern area)

Function	Size	Shape	Material
Surface Water	300	Square	Vitrified Clay

6.3.2 Existing Private Surface Water Sewers

A private surface water sewer is located adjacent to the building located near the western boundary of the site. No detail with regards to the manholes and invert levels has been provided. It is understood that this then discharges to the public surface water sewer identified in Section 6.3.1.

6.4 Sewage Treatment

The nearest Sewage Treatment Works is Wombwell Sewage Treatment Works which is located 2.0km to the east of the site and is the responsibility of Yorkshire Water (see Appendix 4).

6.5 Planning / Building Conditions

The sewers identified in Section 6 will be subject to a 'Restricted Building Zone'. This would normally be a surface area equivalent to the depth of the sewer measured from the centre line of the sewer on either side. No construction will be permitted within that zone. The developer should also note that deep and wide rooted trees must not be planted in close proximity to live sewers. Access to sewers must be maintained at all times and no interference to manholes will be permitted during construction works.

6.6 Adoption Agreements

If an agreement for the adoption of sewers under Section 104 of the Water Industry Act 1991 is being contemplated, a submission in accordance with 'Sewers for Adoption', Sixth Edition will be required, taking into consideration any departures from the general guide stipulated by Yorkshire Water.

7.0 PROPOSED WATER DRAINAGE NETWORKS – NORTHERN AREA

7.1 Drainage Strategy

Drainage of the site will take place with a system for surface water drainage.

7.2 Foul Water Drainage Strategy

No foul water discharge from the site is proposed.

7.3 Surface Water Drainage Strategy

A number of options are available for the discharge of the surface water runoff from the site. This will be finalised after further discussions are undertaken with the owner of the private surface water sewer, Yorkshire Water and Barnsley Council.

The options are discharge to:

- Private surface water sewer which is located adjacent to the building located near the western boundary of the site.
- Public foul water sewer which is located approximately 30m to the west of the site (see Appendix 4).
- Public surface water sewer which is located approximately 30m to the west of the site (see Appendix 4).

An appropriately sized separator will be required before the surface water runoff discharges from the site (see Section 7.3.2). Surface water runoff from communal parking and hardstanding must pass through an adequately sized full retention separator (Class) 1 oil, petrol and grit separator before discharge to the sewer network. Full retention separators treat the full flow that can be delivered by the drainage system, which in this case is equivalent to the flow generated by a rainfall intensity of 65mm/hr, as advised by Klargester. The separator will be located upstream of discharge from the site.

7.3.1 Surface Water Runoff Rates

The existing site area will be surfaced in impermeable materials. All workings areas will therefore be constructed from hardstanding and will therefore be made up of impermeable surface, which will prevent pollution of the soil substrate and groundwater.

The existing and proposed surface water runoff rate from the site has been calculated using the following formula:

$$Q_p = A I / 3600$$

$$0.0221\text{m}^3/\text{s} = 2614 \times 0.065 / 3600$$

$$\text{To convert to l/s: } 0.0472\text{m}^3/\text{s} \times 1000 = 47.2\text{l/s}$$

Where:

- A – Impermeable Area: 2614m^2
- I – Rainfall Intensity (m/hr): 0.065 (65 mm/hr see Section 7.3)
- Qp – Discharge (m^3/s)

The existing and proposed surface water runoff rate from the site during the 65mm/hr rainfall event is and will be 47l/s.

The infiltration rate of the existing permeable surfaces is negligible due to the hard pact nature of the substrate. Surface runoff will therefore remain unchanged from the existing conditions therefore ensuring that the development will not increase flood risk elsewhere. Therefore, the surface water runoff from the site will not need to be attenuated.

7.3.2 Separator

A full retention Class 1 separator will be required as it is proposed to discharge from the site (see Drawing 4) to a surface water sewer in accordance with the Environment Agency PPG3.

Class 1 separators are designed to achieve a discharge concentration of less than 5 mg/litre of oil under standard test conditions. Many Class 1 separators contain coalescing devices, which draw the oil droplets together and facilitate the separation.

Full retention separators treat the full flow that can be delivered by the drainage system. The 'full flow' is normally equivalent to the flow generated by a rainfall intensity of 65 mm/hour.

Full retention separators are used where there is a risk of regular contamination with oil and a foreseeable risk of significant spillages (e.g. parking areas and vehicle loading/unloading areas).

The flow rates of potential spillages delivered to the separator from the drainage system and the oil storage volume of the separator will be sufficient to retain the entire spillage.

The separator has been sized in accordance with PPG3. See Table 4 for further information. Appendix 6 confirms that the separator has been sized correctly by Klargester and provides more information.

Nominal size

Separators are tested in accordance with the standard test procedure in the European Standard. Full separators are allocated a nominal size (NS) on the basis of the test results.

The nominal size of a full retention separator that is required for a catchment area (A) is obtained using the following formula:

$$NS = 0.018 \times A \text{ (in m}^2\text{)}$$

$$47 = 0.018 \times 2614\text{m}^2$$

In addition, capacity for silt storage (C) must be provided for all separators, either as an integral part of the separator or as a separate upstream unit, according to the following:

$$C \text{ (in litres)} = NS \times 100$$

$$4700 \text{ litres} = 47 \times 100$$

Separators must be designed such that when the silt chamber or silt area of the separator is full of silt, this will not affect the operation of the separator, the skim pipe or the by-pass device.

Oil Storage Capacity

The oil storage capacity is defined as the volume of separated oil that can be stored in the separator without any of the stored oil entering the inlet or outlet of the separator. The oil storage volume (V) is given by the following:

$$V \text{ (in litres)} = NS \times 10$$

$$470 \text{ litres} = 47 \times 10$$

The oil storage capacity is sufficient to retain any such spillage and a separator slightly larger than that identified above will be sued.

Minimum size

The minimum working capacity (which excludes any provision for silt deposition) of a separator should be 1000 litres.

Table 7 – Proposed Separator (northern area)

Nominal Size	Flow (l/s)	Drainage Area (m ²)	Storage Capacity (litres)	
			Silt	Oil
47	47	2614	4700	470

Oil level alarm

PPG3 requires that all separators are fitted with an intrinsically safe visual and audible alarm. This will be a robust device to provide visual and audible warning (if necessary to a remotely located supervisory point) when the level of oil reaches 90% of the oil storage volume (V) under static liquid level conditions. The device will be fitted within the separator to provide protection against damage. It will be installed and calibrated by a technician who is familiar with the system. Regular maintenance and testing are essential. Any electrical device used in the separator shall be intrinsically safe and certified to an explosion