patel tonra ltd
environmental solutions

For the Attention of
Administration
Environmental Licensing Programme
Office of Climate, Licensing & Resource Use
Environmental Protection Agency
PO Box 3000
Johnstown Castle Estate
Co. Wexford

Our Ref.: RG0201/WLA
Direct Dial: 01 8020523
Direct Fax: 01 8050525
Email: louise.odonnell@pateltonra.com

Date: 5th September 2013

Re.: EPA Ref. W0279-01

Rehab Glassco Ltd. - Application to the Environmental Protection Agency for a Waste Licence for a Glass and Can Recycling Facility at an Existing Waste Management Facility *at* Unit 4, Osberstown Industrial Park, Caragh Road, Naas, Co. Kildare

Dear EPA,

Patel Tonra Ltd., Environmental Solutions, is acting for Rehab Glassco Ltd., under the instruction of Mr Zeki Mustafa, Managing Director of Rehab Glassco Ltd.

Please find enclosed, documentation in response to the EPA notice in accordance with Article 14(2)(b)(ii) of the Waste Management (Licensing) Regulations (dated 02 July 2013).

I enclose 2 No. print copies and 2 No. CD-ROM copies. I confirm that the content of the electronic files on the accompanying CD-ROMs is a true copy of the original application form.

If you have any further queries, please do not hesitate to contact me.

Yours sincerely,

Louise O'Donnell
Director, Patel Tonra Ltd.

Rehab Glassco

EPA REF. W0279-01

Application to the EPA for a Waste Licence for a Glass and Can Recycling Facility at an Existing Waste Management Facility

Response to Notice in accordance with Article 14(2)(b)(ii) of Waste Management (Licensing) Regulations

SEPTEMBER 2013

Rehab Glassco Ltd.,
Unit 4, Osberstown Industrial Park,
Caragh Road, Naas, Co. Kildare
Ireland

Application documentation prepared by:

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Rehab Glassco

Unit 4, Osberstown Industrial Park,
Caragh Road, Naas, Co. Kildare, Ireland

APPLICATION TO THE EPA FOR A WASTE LICENCE

EPA REF. W0279-01

Response to Notice in accordance with Article 14(2)(b)(ii) of Waste Management (Licensing) Regulations

SEP. 2013

Prepared by:

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1 'Article 14' Response Document

2 Appendices and Drawings

3 Dust Monitoring Report
(ORS Consulting Engineers, 12th August 2013)

4 Dispersion Modelling Assessment of Classical Air Pollutants
(Odour Monitoring Ireland, 21st August 2013)

5 Surface Water Discharge Monitoring Report
(Patel Tonra Ltd., August 2013)

6 Environmental Noise Survey
(ORS Consulting Engineers, July 2013)

7 Report on ELRA, CRAMP and Financial Provision
(Patel Tonra Ltd., September 2013)

8 Documentation submitted to An Bord Pleanála
(Tom Phillips & Associates, 9th July 2013)

9 Report on the Control of Birds
(Bird Control Ireland, 2nd July 2013)

10 Revised Waste Licence Application Non-Technical Summary
(Patel Tonra Ltd., August 2013)

Rehab Glassco Ltd.

EPA Waste Licence Application W0279-01: Response to Notice in accordance with Article 14(2)(b)(ii) of Waste Management (Licensing) Regulations

September 2013

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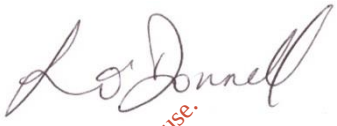
Report Issue Form

IF-11B
Revision: 02 (21st July 2011)

Client Name:	Rehab Glassco Ltd.
Client Address:	Unit 4, Osberstown Industrial Park, Caragh Road, Naas, Co. Kildare, Ireland
Report Title:	EPA Waste Licence Application W0279-01: Response to Notice in accordance with Article 14(2)(b)(ii) of Waste Management (Licensing) Regulations
Project Code:	RG0201

Project Manager (Name):	Louise O'Donnell
Project Manager (Sign):	
Project Manager (Date):	3rd September 2013

Approved by Project Director (Name):	Vip Patel
Approved by Project Director (Sign):	
Approved by Project Director (Date):	3rd September 2013

Issue No.	Date	Status
01	03/09/2013	Final version. Issue to Client and EPA.

Notes/Comments:

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Appendix 1: EPA notice under Article 14 of 02/07/2013

Appendix 2: Technical Specifications of the Emissions Abatement System (Glass Drying Operation)

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Appendix 4: Completed Tables E.1(ii) and E.1(iii) re. Emissions to Atmosphere

Appendix 5: Diesel tanks bund conformance certificates

Appendix 6: Rehab Glassco Emergency Response Procedure

Drawings

Register of Drawings and Revision Control

Attached Drawings (revised/additional to WLA, July 2011):

Drawing WLA-04 (Rev01): Site Plan

Drawing WLA-06 (Rev01): Site Drainage Drawing

Drawing WLA-07 (Rev01): Unit Operations

Drawing WLA-13 (Rev01): Emissions Points

Drawing WLA-14 (Rev01): Monitoring Locations

Drawing WLA-15 (Rev00): Drainage Layout showing Proposed Attenuation Area

Related Reports

Dust Monitoring Report (ORS Consulting Engineers, 12th August 2013)

Dispersion Modelling Assessment of Classical Air Pollutants from Named Emission Point Located in Rehab Glassco Ltd, Osberstown Industrial Park, Naas, Co Kildare (Odour Monitoring Ireland, 21st August 2013)

Surface Water Discharge Monitoring Report (Patel Tonra Ltd., August 2013)

Environmental Noise Survey (ORS, July 2013)

Report on ELRA, CRAMP and Financial Provision for Glass Recycling Facility (EPA Waste Licence Application W0279-01) (Patel Tonra Ltd., September 2013)

Documentation submitted to An Bord Pleanála on behalf of Rehab Glassco under Substitute Consent Application, An Bord Pleanála ref. SU 09.SU0015 (Tom Phillips & Associates, 9th July 2013)

Report on the Control of Birds (Bird Control Ireland, 2nd July 2013)

Revised Waste Licence Application Non-Technical Summary (Patel Tonra Ltd., August 2013)

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Background and Introduction

1. Rehab Glassco Ltd. submitted an application to the Environmental Protection Agency (EPA, or 'the Agency') for a Waste Licence on 26th July 2011 for a glass and can recycling facility at Unit 4, Osberstown Industrial Park, Caragh Road, Naas, Co. Kildare, Ireland. The EPA reference number is W0279-01.

2. The Agency issued a notice in relation to application W0279-01 in accordance with Article 14(2)(b)(ii) of the Waste Management (Licensing) Regulations on 2nd July 2013. Please find attached as **Appendix 1**.

3. This response has been prepared by Patel Tonra Ltd., Environmental Solutions, on behalf of the Applicant, Rehab Glassco Ltd.

4. The following Article 12 compliance requirements are addressed herein (with related reports attached):

    Chapter 1: Grid reference

    Chapter 2: Air emissions

    Chapter 3: Storm water discharge

    Chapter 4: Noise

    Chapter 5: Compliance with BAT

    Chapter 6: Compliance with Directives

    Chapter 7: Liability, Closure and Financial Provision

    Chapter 9: Revised Non-technical Summary (Waste Licence Application) and Drawings

5. A Remedial Environmental Impact Statement (REIS) was prepared to accompany an application for Substitute Consent to An Bord Pleanála for the purpose of regularising the existing Rehab Glassco glass recycling facility and ancillary activities. The Substitute Consent application was lodged with An Bord Pleanála on 6th March 2013; the application is under assessment at the time of writing. The REIS was also submitted to the Agency under W0279-01.

6. Further documentation was provided to An Bord Pleanála in July 2013 in relation to the application for Substitute Consent. This is included in this report as follows:

    Chapter 8: Additional Information (as submitted to An Bord Pleanála)

1.0 Grid Reference

1.1 Article 14 Requirements

Submit a national grid reference for the facility location. The figures submitted with the application are not correct. You are requested to confirm that all other grid references (e.g. for emission points) in the application are correct.

1.2 Response

1.2.1 The grid reference included in the Waste Licence Application (July 2011) was: E 296767, N 220379.

1.2.2 We hereby clarify that the easting value included a typographical error. The correct grid reference[1] should read: E 286767, N 220379.

1.2.3 It is further noted that a newer grid system, the Irish Transverse Mercator (ITM), is used by some agencies. Under the ITM system, the reference point given in **Section 1.2.2** above is: E 686699 N 720408.

1.2.4 **Drawing WLA-04** has been amended to reflect the corrected grid reference.

1.2.5 A full review of all grid references stated in the Waste Licence Application has been completed by Brian Pyper & Associates for the purpose of (a) verifying the accuracy under the Irish Grid reference system, and (b) providing a corresponding ITM reference. The findings of this review are detailed in **Table 1.1**.

[1] This is the Irish Grid reference.

Table 1.1: Grid References as per Waste Licence Application

Ref.	Location	WLA Section	Irish grid ref. provided in WLA[2]	Irish grid ref. corrected	Equivalent ITM grid ref.
Site reference point	Corner of Drying Plant building	Application Form, B.2; Attachments, B.2.1	E 296767 N 220379	E 286767 N 220379	E 686699 N 720408
A1	Stack at Drying Plant	Application Form, Table E.1(ii); Attachments, Table F.7.1	E 221379 N 293767	E 286764 N 220379	E 686696 N 720408
SW1[3]	On-site manhole after Interceptor#1 (located adjacent to Drying Plant building)	Application Form, Table E.2(ii)	E 111443 N 269368	E 286775 N 220372	E 686707 N 720401
SW2	On-site manhole after Interceptor#2 (located adjacent to stockpiles/ storage bays)	Not Applicable	Not applicable	E 286727 N 220398	E 686659 N 720427
SE1	Connection to foul sewer outside facility entrance	Application Form, Table E.3(i)	E 269368 N 111443	E 286740 N 220266	E 686672 N 720295
NSL1	Noise receptor (neighbouring property)	Application Form, Table I.6(i)	E 175718 N 166379	E 286648 N 220322	E 686580 N 720351
NSL1	Noise receptor (neighbouring property)	Attachments, Table F.7.2	E 166379 N 175718	E 286648 N 220322	E 686580 N 720351
D1	Dust monitoring location (on the southern boundary of the site close to the site access)	Attachments, Table F.7.2	E 101849 N 288319	E 286761 N 220258	E 686693 N 720287
D2	Dust monitoring location (on the north of the site close to the site access road adjacent to the nearest residential property)	Attachments, Table F.7.2	E 256531 N 232770	E 286701 N 220410	E 686633 N 720439

[2] July 2011

[3] In the Waste Licence Application (July 2011), SW1 was referred to as the combined emission to surface water. Drainage arrangements have since been clarified (See **Section 3.2**), such that there are two separate emissions to surface water from the site – now referred to as SW1 (from Interceptor#1) and SW2 (from Interceptor#2).

2.0 Air Emissions

2.1 Article 14 Requirements

(a) Confirm whether the air emission point in the dryer plant is denoted as A1 or A2-01. Contradictory denotations are used in the application.

(b) Provide a description of the air emissions abatement system on the dryer plant stack. Reference is made to a bag filter in the application, however, no other detail has been provided on the bag filter (e.g. effectiveness, compliance with BAT etc.).

(c) Confirm whether additional dust deposition monitoring has been carried out at the facility since submission of the application and EIS. Submit any additional monitoring data where available.

(d) Complete Tables E.1(ii) and E.1(iii) of the application form for the air emission point. Where available, provide pre- and post-treatment air emissions data.

(e) Carry out an assessment, using air dispersion modelling and with reference to current relevant ambient air quality standards, of the impact of the air emissions on ambient air quality. Air dispersion modelling should be in accordance with the 'Air Dispersion Modelling from Industrial Installations Guidance Note (AG4)' published by the Agency.

2.2 Response (a)

2.2.1 In response to this query, we confirm that the air emission point from the Drying Plant is referred to as 'A1' consistently throughout the Waste Licence Application[4]; the same emission point was referenced as 'A2-01' in the Remedial Environmental Impact Statement, Appendix 5.3.

2.2.2 With regard to EPA Waste Licence Application Guidance Notes, Section E, there are no landfill gas emission points associated with the facility; therefore the air emission reference 'A1' is deemed to be logical and simple, and in keeping with the notation for the other emission points identified on **Drawing WLA-13**:

- A1 denotes emission point to air
- SW1 denotes emission point to surface water
- SE1 denotes emission point to sewer

2.2.3 This air emission point from the Drying Plant will be referred to as 'A1' henceforth.

2.3 Response (b)

2.3.1 In relation to the air emissions abatement system at the Drying Plant, Rehab Glassco Ltd. has confirmed that there are two independent systems in operation:

i. The Emissions Abatement System from the glass drying operation; and

ii. The Dust Extraction System related to the processing of glass in the Drying Plant building.

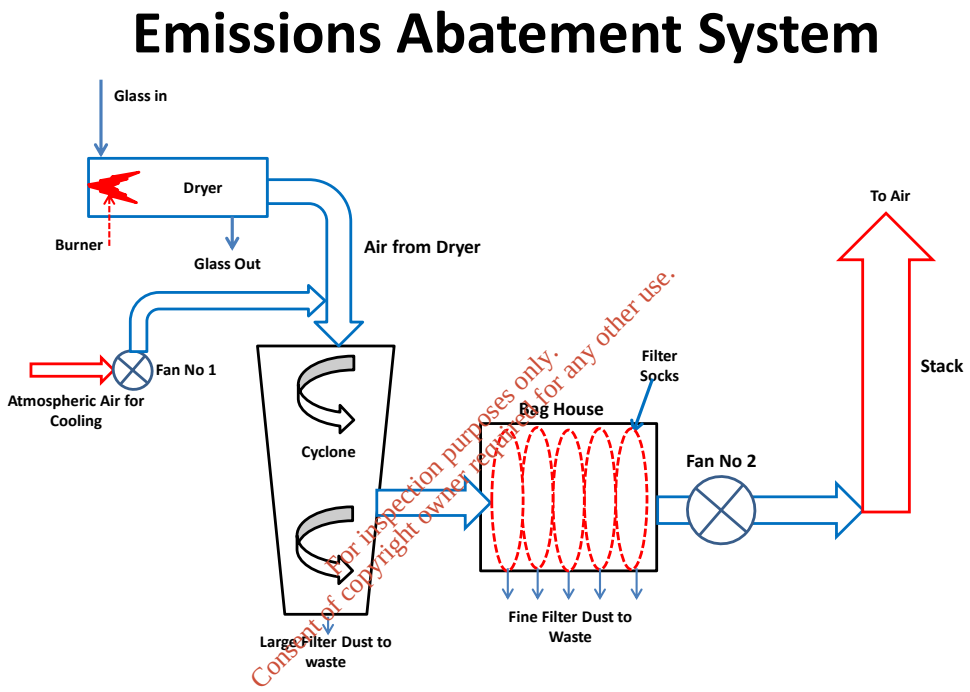
[4] Application Form: Table E.1(ii) and Table F.2; Attachments: Section E.1.2 and Table F.7.1; Drawings: WLA-13 and WLA-14

2.3.2 Each of the above systems is described below, with a schematic diagram and supporting documentation, as appropriate.

Emissions Abatement System - Glass Drying Operation

2.3.3 The emissions abatement system was designed to filter exhaust air from the dryer before its emission to atmosphere. The system is shown graphically in **Figure 2.1**.

Figure 2.1: Schematic of Emissions Abatement System, Glass Drying Operation



2.3.4 The emissions abatement system consists of the following:

- Pipework with extraction point at the end of the dryer
- Small fan (No. 1) taking in air to cool air before bag house
- Cyclone to remove large dust fragments (large dust goes to waste)
- Enclosed bag house filter, with filter socks to remove fine dust (fine dust goes to waste)
- High velocity exhaust fan (No. 2)
- Mild steel ductwork
- Stack emitting to air

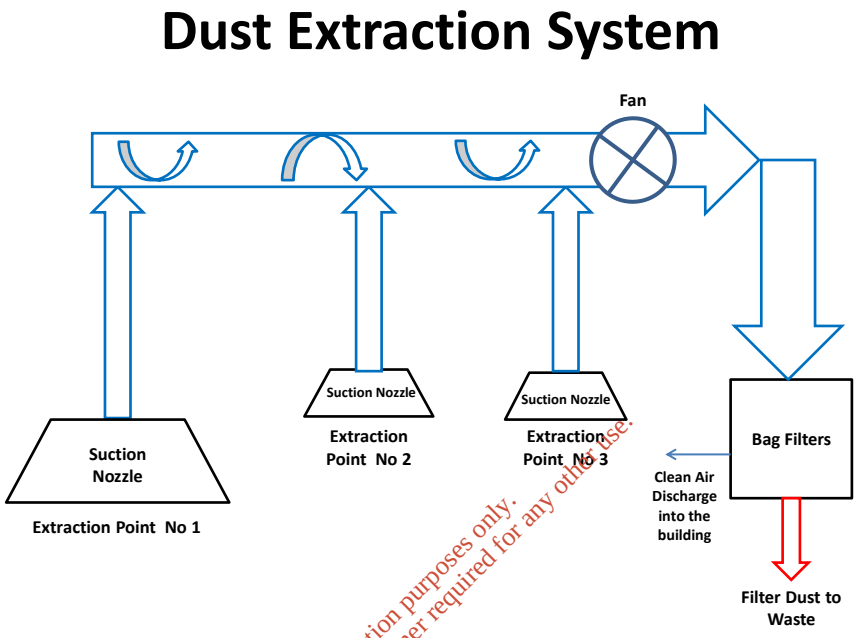
2.3.5 The technical specifications of the emissions abatement system, including the bag-house filter is given in **Appendix 2**.

2.3.6 Monitoring data relating to emissions from the stack are detailed in **Section 2.5**.

Dust Extraction System – Drying Plant Building

2.3.7 The dust extraction system (which is independent from the emissions abatement system described above) has been designed to collect and remove dust via dust extractor nozzles from specific points inside the plant. The system is shown graphically in **Figure 2.2**.

Figure 2.2: Schematic of Dust Extraction System – Drying Plant Building



2.3.8 The dust extraction system consists of the following:

- Suction nozzles to remove dust from 3 extractions points
- Air ductwork from fans to bag filters
- Fan for conveying dust to bag filters
- Bag filters
- Clean air discharge to ambient air in the plant
- Filtered material deposited into plastic bags as a waste product

2.3.9 The technical specifications of key components of the dust extraction system, including the extraction fans and the bag filters are detailed in **Appendix 3**.

2.4 Response (c)

2.4.1 Dust deposition was monitored by ORS Consulting Engineers at three locations at the Rehab Glassco site between the 8th July and 7th August 2013. The monitoring report is attached.

RELATED REPORTS:

- Dust Monitoring Report (ORS Consulting Engineers, 12th August 2013)

2.4.2 Results indicate an ongoing issue in relation to dust levels on site. It is recommended that remedial/mitigation measures outlined in the Remedial EIS (March 2013) are implemented in full.

2.5 Response (d)

2.5.1 Please find completed Tables E.1(ii) and E.1(iii) re. Emissions to atmosphere attached as **Appendix 4**.

2.6 Response (e)

2.6.1 Odour Monitoring Ireland was commissioned by Axis Environmental Ltd. (on behalf of Rehab Glassco Ltd.) to perform a classical air pollutants air quality dispersion modelling assessment of the existing dryer process operations located in Rehab Glassco Ltd., Osberstown Industrial Park, Naas, Co. Kildare. The report is attached.

RELATED REPORTS:

- Dispersion Modelling Assessment of Classical Air Pollutants from Named Emission Point Located in Rehab Glassco Ltd, Osberstown Industrial Park, Naas, Co Kildare (Odour Monitoring Ireland, 21st August 2013)

3.0 Storm Water Discharge

3.1 Article 14 Requirements

Provide all available monitoring data for the discharge from the interceptor (SW1) for the past 12 months.

3.2 Response

3.2.1 Monitoring of emissions to surface water was completed by Patel Tonra Ltd. in July 2013; details are included in the following report.

RELATED REPORTS:
Surface Water Discharge Monitoring Report (Patel Tonra Ltd., August 2013)

3.2.2 In addition, surface water discharge monitoring results, for samples taken by Rehab Glassco in July 2012 at SW-2, are included in Section 10.2 of the REIS (March, 2013). Results can be summarised as follows (Certs. of Analysis are included in the REIS):

Table 3.1: Results of 2012 Interceptor Discharge Monitoring at SW-2

Parameter	Sample: 25/07/12 Laboratory Result (mg/l)	Limit Value (mg/l)[5]
Suspended solids	183	35
BOD	240	25
Mineral oil >C10 C40	1.69	10

Clarification of Surface Water Drainage Arrangements

3.2.3 Text provided in the Waste Licence Application (July 2011), Section D.1.k, *Sewage and Surface Water Drainage Infrastructure*, is clarified as follows.

3.2.4 The Waste Licence Application indicated that there was one combined emission point to surface water from the site; however it has been verified by Brian Pyper & Associates that there are two separate discharge points from the site, both of which emit to a storm culvert, which runs adjacent to the north-eastern site boundary.

3.2.5 A purpose-designed surface water management system has been installed at the facility (see **Drawing WLA-06_Rev 01**), to include an engineered surface water drainage network, a silt trap and 2 No. interceptors.

3.2.6 A silt trap is installed at the vehicle washing area on the southern site boundary.

[5] Waste Facility Permit, Ref. WFP-KE-08-0357-01, Schedule B

3.2.7 The on-site surface water drainage system works in two parts (see **Drawing WLA-06_Rev 01**): the eastern portion of the site falls to the interceptor ('Interceptor#1') to the rear (north-east) of the Drying Plant[6]; the western portion of the site drains to the interceptor ('Interceptor#2') and attenuation tank located in the north-west of the site[7].

3.2.7 The installed interceptors are detailed as follows:

- Interceptor#1: Generic by-pass separator, which covers the eastern portion of the site.
- Interceptor#2: BPDA10000 Class 1 ref NSB18, which covers the western portion of the site (supplied by JFC Manufacturing).

3.2.8 The discharge from Interceptor#1 connects to the culvert downstream of this interceptor (it runs from the manhole downstream of the interceptor called up as SMH CL81.00 IL 79.20, to the culvert; see **Drawing WLA-06_Rev 01**). This is labelled as emission point SW1 on **Drawing WLA-13_Rev 01**.

3.2.9 The discharge from Interceptor#2 is directed to storm drainage attenuation (underground hydro chambers). The output flow rate from the attenuation tank is controlled by a hydro-valve. The discharge from this system connects to the culvert at the manhole called up as CHH CL80.30 IL 77.90 (see **Drawing WLA-06_Rev01**). This is labelled as emission point SW2 on **Drawing WLA-13_Rev 01**.

3.2.10 Discharges from both interceptor systems are to the storm culvert, which runs adjacent to the north-eastern site boundary. This storm culvert also conveys storm-water from other sites and roadways within the industrial park.

3.2.11 As result of the clarification of drainage/discharge arrangements, edits to emission points and monitoring locations are detailed as follows.

3.2.12 As Section E.2, *Emissions to Surface Water*, of the Waste Licence Application, two surface water emission points are now identified, as detailed below and shown on **Drawing WLA-13_Rev01**.

Table 3.3: Surface Water Emission Points

Monitoring Location	Type	Grid Reference	
		Easting	Northing
SW1	Discharge to Surface Water (Interceptor#1, adjacent Drying Plant building)	286775	220372
SW2	Discharge to Surface Water (Interceptor#2, adjacent stockpiles/ storage bays)	286727	220398

3.2.13 As Section F.3, *Surface Water Monitoring and Sampling Points*, of the Waste Licence Application, two surface water emission monitoring points are now proposed, as detailed below and shown on **Drawing WLA-14_Rev01**.

[6] This represents the original site area, prior to the extension of the site in 2009.
[7] This represents the extended site area (2009).

Table 3.4: Surface Water Discharge Monitoring

Monitoring Location	Type	Grid Reference		Proposed Monitoring Frequency
		Easting	Northing	
SW1	Discharge to Surface Water (Interceptor#1, adjacent Drying Plant building)	286775	220372	Quarterly[8]
SW2	Discharge to Surface Water (Interceptor#2, adjacent stockpiles/ storage bays)	286727	220398	

Storm-water attenuation

3.2.14 The Remedial EIS (March 2013), Section 10.6, identified the requirement for remedial measures in relation to storm-water attenuation, as follows.

- Additional storm-water attenuation capacity was included in engineering designs for the site; however one of the two attenuation units has not been constructed. Current attenuation capacity for the site is inadequate and the installation of additional attenuation capacity is in line with regional drainage policies[9]. It is proposed that a storm-water attenuation pond is constructed in the north-east of the site, as shown in **Drawing WLA-15**[10], attached with this report. The attenuation pond will be approximately 75m (length) x 5m (width) x 1.2m (depth).
- Engineering design calculations for the attenuation pond were included in an appendix to the REIS (REIS Appendix 10.2: Attenuation pond – Engineering Design Calculations).
- The construction of the new storm-water attenuation pond should be completed within three months of the relevant authorisations being received from the Planning Authority.
- Mitigation measures relating to the construction of the attenuation pond area are discussed in the REIS, Section 10.8.

[8] Patel Tonra Ltd. (August 2013) *Surface Water Discharge Monitoring Report.* Section 3: "If results are consistently within acceptable limits, this frequency may be reduced to bi-annual or annual, subject to agreement by the Regulator".

[9] The Greater Dublin Strategic Drainage Study (GDSDS)

[10] Based on drawing included in REIS: Drawing REIS-10.2

4.0 Noise

4.1 Article 14 Requirements

(a) Confirm whether noise complaints have been received by the facility in the last 12 months.

(b) Provide noise monitoring data which includes plant operation in the presence of the acoustic barrier that was installed in January 2013.

4.2 Response (a)

4.2.1 A number of noise complaints have been received from the nearest neighbouring residential property to the north west of the facility. The noise complaints for the period of the last 12 months as requested by the Article 14 Notice (July 2012 to July 2013) have been extracted from the environmental complaints register and tabulated with appropriate measures undertaken, as follows:

Table 4.1: Rehab Glassco Complaints Register – Noise Issues

Date and Time	From	Received By	Nature of Complaint	Assigned To	Measures Taken
07/03/2103, 19:00	Michael Culhane	Seamus Clancy	Noise	Zeki Mustafa	Drying plant night time to cease operations immediately, further noise monitoring to take place, PH spoke with MC who advised that there were no noise issues following closure, plant to remain closed at night.
06/03/2013, 16:12	Michael Culhane	Seamus Clancy	Noise from drying plant	Paul Hodder	Now apparent that barrier and other measures have not solved the issue of noise coming from the Drying Plant. Plan to be put in place asap to stop drying plant working at night.
03/12/2012, 14:50	Michael Culhane	Patel Tonra Ltd at Remedial Environmental Impact Statement (REIS) Consultation meeting in Naas	General noise emissions from the facility	PTL/RG	Agreed to commission further expert noise monitoring, advised that noise screens have been installed at loading bay 2, restriction of certain vehicle use during evening time is in place and a Motorway style barrier to be installed in Dec 2013.

4.3 Response (b)

4.3.1 An Environmental noise survey was conducted by ORS Consulting Engineers on the 1st and 2nd of July 2013 at the Rehab Glassco facility at 1 noise sensitive location (NSL1) outside the boundary of the facility (see report attached).

RELATED REPORTS:

- Environmental Noise Survey (ORS, July 2013)

4.3.2 The acoustic barrier was in place during this noise monitoring survey.

4.3.3 The noise monitoring survey was conducted with the Drying Plant turned off from 19:00 to 07:00 hrs.

4.3.4 The Drying Plant was noted in the REIS as being a likely contributor to noise levels at NSL1. Rehab Glassco elected to cease operation of the Drying Plant between 19:00hrs and 07:00hrs. The noise monitoring survey completed in July 2013 indicated that results at NSL1 were within guideline limit values[11] for daytime and evening noise measurements; there was a slight exceedance (1dB) during the night-time monitoring period, which can be attributable to external noise sources (discussed further in the monitoring report).

4.3.5 The Applicant has committed to the ongoing restriction of the operation of the Drying Plant to daytime hours only, i.e. 07:00hrs to 19:00hrs[12] (Monday to Saturday).

4.3.6 This is further detailed in response document to An Bord Pleanála (Tom Phillips & Associate, 9th July 2013) – Section 2.6 *Noise and Hours of Operation*; see **Chapter 8**.

[11] EPA (2012) Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)

[12] With the exception of the Drying Plant, opening hours remain as stated in the REIS:

> The hours of waste acceptance (the hours during which the facility accepts waste) are: Monday to Saturday (including bank holidays): 07:00 (7am) to 19:00 (7pm); Sunday: closed.
>
> The hours of operation (the hours during which the facility is operational) are: Monday to Friday (including bank holidays): 24-hours; Saturday: 07:00 (7am) to 23:00 (11pm); Sunday: closed.

5.0 Compliance with BAT

5.1 Article 14 Requirements

Provide a clear description as to how the proposed facility will comply with the relevant requirements of BAT and/or Bref. You should identify the key BAT which is to be applied to manage the relevant environmental aspect/emissions (including air emissions, dust deposition and noise) associated with each unit operation.

5.2 Response

5.2.1 Best Available Techniques (BAT) was introduced as a key principle in the IPPC Directive 96/61/EC. The Final Draft BAT Guidance Note on Waste Transfer and Material Recovery, published by the EPA, is dated December 2011.

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

- proper design of the facility;
- effective management of the facility; and
- the selection of appropriate processes, technologies and facility operations

Draft BAT Guidance Notes – Key Issues for Waste Transfer and MRFS

5.2.3 The key issues identified in this section of the guidance note which applies to the Rehab Glassco site are the following:

- Site Location
- Design Considerations
- Decommissioning
- EMS
- Waste Acceptance procedures
- Waste Dispatch

5.2.4 The Rehab Glassco facility is located and constructed in an industrial park with major road and motorway access. Ancillary services such as surface water management, foul water services and utilities services have been readily available on site for Rehab Glassco and all industrial park users.

5.2.5 The Rehab Glassco plant is a state-of-the-art facility which was upgraded in 2011. The plant relies on proven technology which includes sophisticated optical technology, screening systems and air classification to separate various mixes, contamination and colours of glass-based material into furnace-ready clean cullet for remanufacture into glass products. The process also uses manual pre-sort and quality control (QC) techniques to separate out contaminants at key stages of the process.

5.2.6 The facility conforms to continuous improvement of environmental performance, e.g. improved house-keeping/management techniques, monitoring of plant, equipment and processes. This combined with investment in new tools/techniques, technologies and regular plant maintenance, has created a regime of effective management and operations.

5.2.7 A fully detailed and costed Closure Plan and Environmental Liabilities Risk Assessment (ELRA) have been prepared on behalf of Rehab Glassco (see **Chapter 7**). This detailed report has followed the EPA guidance currently in force from 2006. The report takes account of items which cover the decommissioning of the site from a planned and unplanned closure scenario, including risks from unplanned one-off events and the associated liabilities.

5.2.8 Rehab Glassco is implementing an Environmental Management System for the facility in Osberstown, to include environmental and operational control procedures and policy statements.

5.2.9 There is an established waste acceptance and quarantine procedure in place at the Rehab Glassco facility. Full details of the waste acceptance procedures are detailed in Attachment H.2 of the Waste Licence Application (July 2011).

5.2.10 Records of all wastes removed (processed, residual and non-processed) and dispatched from the site are retained by Rehab Glassco. Only appropriately licensed/permitted waste contractors and facilities are used for all categories.

5.2.11 A Remedial Environmental Impact Statement (REIS) was prepared by Patel Tonra Ltd. in March 2013 to accompany an application for Substitute Consent to An Bord Pleanála. The purpose of the application was to regularise the existing Rehab Glassco glass recycling facility and ancillary activities. The REIS identified a series of remedial and mitigation measures for the facility. Remedial and mitigation measures were formulated by Patel Tonra Ltd. with due regard to the principles of BAT. The following text includes extracts from the REIS in relation to:

- Air and Climate
- Noise and Vibration
- Surface Water
- Litter and Birds Nuisance

Air and Climate[13]

Remedial Measures

The following remedial measures have recently been put in place:

- A new water bowser was purchased by the operator as a dust management technique (in particular for concrete hardstanding areas) and its use on site commenced in February 2013.
- The primary dust suppression system (e.g. at conveyors, material drop points/chutes/hoppers) in the Drying Plant building was modified at the end of December 2012, to include the installation of a new fan which provided additional extraction capacity, and new dust hoods at critical points.

The following additional (dust management) remediation measures are proposed:

- The primary conveying system and storage bin transfer chutes and openings [for end product] in the Drying Plant will be fully enclosed/contained and connected to the dust suppression system to prevent the release of fine, dusty material to air. This should be identified, reviewed and remedied within three months of the relevant authorisations being received from the Planning Authority.

[13] Patel Tonra Ltd. (March 2013) *Remedial Environmental Impact Statement for Glass Recycling Facility at Osberstown Industrial Park, Caragh Road, Naas, Co. Kildare* – CHAPTER 5

- Housekeeping in the Drying Plant building will be improved, including the clean-up of spillage of material/product (effective immediately).
- Pilot operations at the pelletising unit (housed in the Drying Plant) will be reviewed for dust containment and dust management measures. The pelletiser unit should be contained, insofar as possible, with exhaust emissions managed through the existing bag-house filtration system (or modified/enhanced, as required). These works will be completed within three months of the relevant authorisations being received from the Planning Authority. Works will be overseen by a competent person.
- The operation, robustness and effectiveness of the dust extraction/filtration system at the Drying Plant will be reviewed by a competent person. A documented evaluation report will be retained as part of site records. This assessment will be completed within six months of the relevant authorisations being received from the Planning Authority.
- Repeat dust monitoring is proposed at the three dust monitoring locations identified in Section 5.2 [of the REIS]. Monitoring will be completed between May and September 2013. Repeat monitoring is required to determine if there are consistently high dust levels associated with site activities.14
- Should repeat dust monitoring demonstrate a persistent dust nuisance, the Drying Plant building will be contained. The operator will assess feasibility options for total enclosure of the building, and consider the following: heavy-duty plastic strip curtains, fast-opening roller shutter doors, or alternative, at the Drying Plant building entrance. This will mitigate against dust emissions from the building to the environment. If dust levels associated with the operation of the Drying Plant remain high, a whole-building system, e.g. negative air pressure system, or equivalent, will be investigated.

Mitigation Measures

The following dust mitigation measures are ongoing/proposed:

- Continued annual dust monitoring in line with regulatory requirements will be undertaken15. Results will be reported to the regulator. Any exceedance of prescribed limit values will be recorded as an incident, with an appropriate level of response identified.
- Continued annual monitoring of point source emissions from the Drying Plant, in line with regulatory requirements. Emission Limit Values will be agreed with the Regulator. Any exceedance of prescribed limit values will be recorded as an incident, with an appropriate level of response identified.
- All emissions from the Drying Plant will be managed through the plant's primary and secondary (whole-building) air suppression and filtration system, which includes a combination of cyclone filters and bag-house filtration systems. An ongoing filter checking, maintenance and replacement programme will be implemented, with filters replaced regularly (and annually, as a minimum). Records of the maintenance/replacement programme will be retained on site.
- Fine product (i.e. output from the Drying Plant <0.2mm), which is light and has the potential to become wind-blown, will be stored in sealed bags and covered/wrapped, as appropriate.

[14] UPDATE: Repeat dust monitoring was completed by ORS Consulting Engineers in July-August 2013. See **Section 2.4**.

[15] More frequent monitoring may be appropriate, in the short-term, to evaluate the effectiveness of remedial measures.

- The height of outdoor stockpiles will be restricted to a maximum of 3m.
- The continued use of the water bowser during spells of dry weather, or as otherwise may be required, as a dust control measure.
- Regular sweeping of the yard/hardstanding areas using a mechanical sweeper will be undertaken.
- Regular and routine housekeeping measures will be undertaken on site, i.e. dust cleaning/wiping and sweeping.

Noise and Vibration[16]

Remedial Measures

A noise barrier/screen was installed at the western site boundary (in proximity to the nearest residential neighbour) in January 2013. A noise barrier/screen has also been installed at the loading bay of the Main Process building. This is likely to provide a degree of localised noise attenuation.

Point noise sources at the plant will be considered in terms of noise insulation, maintenance and proper use of plant and equipment, Best Available Techniques (BAT) for plant and equipment (choosing inherently quiet plant & machinery), relocation on site of noisy activities, plant or layout changes, screening of noise-generating plant and building doors/openings. These measures will be undertaken within two months of the relevant authorisations being received from the planning authority.

Further noise monitoring will be conducted within three months of the relevant authorisations being received from the planning authority. If monitoring results indicate that noise levels exceed 'Evening' and 'Night-time' by EPA NG4, it is proposed that operations at the Drying Plant (thought to be a major contributor to noise levels at NSL1, the closest residential receptor) will be restricted to meet these requirements, i.e. the Drying Plant will not operate between 19:00hrs and 07:00hrs.[17]

Mitigation Measures

No material will be accepted into or removed from the facility between the hours of 7pm and 7am; therefore there is no related HGV noise at this time.

Noise monitoring will be conducted annually (as a minimum), or as per waste regulatory requirements. Any incidents will be reported to the regulator, with corrective actions identified, as appropriate.

Any noise complaints will be recorded and investigated.

An ongoing plant and equipment maintenance procedure will be implemented to minimise noise levels. Any new equipment acquired will conform to EU noise standards.

[16] Patel Tonra Ltd. (March 2013) *Remedial Environmental Impact Statement for Glass Recycling Facility at Osberstown Industrial Park, Caragh Road, Naas, Co. Kildare* – CHAPTER 6

[17] UPDATE: Further noise monitoring was completed by ORS Consulting Engineers in July 2013. The operation of the Drying Plant is restricted to daytime hours only. See **Section 4.3**.

Surface Water[18]

Remedial Measures
Current attenuation capacity for the site is inadequate and the installation of additional attenuation capacity is in line with regional drainage policies[19]. It is proposed that a storm-water attenuation pond is constructed in the north-east of the site, as shown in Drawing REIS-10.2. Engineering design calculations for the attenuation pond are included in the REIS. The construction of the new storm-water attenuation pond should be completed within three months of the relevant authorisations being received from the Planning Authority. Mitigation measures relating to the construction of the attenuation pond area are discussed in REIS Section 10.8.

Storage of bulk, uncontained input materials and product will be restricted to hardstanding areas only. Stockpiled input material, which had previously been stored outside of the hardstanding areas, in the south-east of the site was moved to the processing area/and or the concrete hardstanding area during Quarters 3-4, 2012. During 2012, measures have been taken to reduce the amount of material retained in the stockpile area, and to reduce the length of storage time on site. Stockpile areas require ongoing management and control, as detailed in the mitigation measures in REIS Section 10.8.

In response to elevated levels of suspended solids and BOD detected in the interceptor discharge sample[20], an additional silt trap will be installed at the interceptor, prior to discharge to surface water. The installation of the new silt trap will be completed within one month of the relevant authorisations being received from the Planning Authority. Repeat sampling of discharge to surface water is recommended as soon as possible. Ongoing monitoring at this point is detailed as a mitigation measure in REIS Section 10.8.

Litter management and housekeeping issues (which impact on the stream/ditch at the north-eastern site boundary) are discussed in REIS Chapter 13.

Mitigation Measures
The following mitigation measures have been implemented, and are required to be maintained on an ongoing basis:

- Control of surface water emission at one discharge point only[21], via the site drainage system, 2 No. interceptors and silt trap at the vehicle washing/power-wash area. Drains, silt traps and interceptors are subject to ongoing inspection, cleaning and maintenance.
- Emissions to surface water at the discharge point are sampled on a bi-annual basis (with a weekly visual inspection), in accordance with Waste Facility Permit regulatory requirements.

[18] Patel Tonra Ltd. (March 2013) *Remedial Environmental Impact Statement for Glass Recycling Facility at Osberstown Industrial Park, Caragh Road, Naas, Co. Kildare* – CHAPTER 10

[19] The Greater Dublin Strategic Drainage Study (GDSDS)

[20] UPDATE: Monitoring of emissions to surface water was completed by Patel Tonra Ltd. in July 2013. There were no exceedances of Emission Limit Values specified in Waste Facility Permit WFP-KE-08-0357-01.

[21] Drainage arrangements have been clarified, such that there are 2 No. separate discharge points from the site, both of which emit to a storm culvert, which runs adjacent to the north-eastern site boundary. See **Section 3.2**.

- There are currently two fuel storage tanks on site (see Drawing REIS-2.1). Both tanks are bunded/double skinned.[22] Inspections and conformance records will be retained on-site.
- Bunded drip trays are in place in the Vehicle Maintenance building and all hazardous liquids will be stored thereon.
- Temporary ground covers only [no permanent fixtures] are used on the wayleave area (Newbridge Rising Main) on the north-eastern boundary, to permit access by the authorities, if required.
- Storage of bulk, uncontained input materials and product is on hardstanding areas only (ongoing operational requirement as good site practice). Storage outside of the hardstanding areas is only permissible for bagged/contained materials.
- The height of stockpiles will be restricted to 3m maximum to ensure the consistent movement of material through the process, thereby avoiding the on-site storage of material for prolonged periods.
- Non-conforming input wastes and waste residues are contained in appropriate waste receptacles, e.g. bins, skips or specialist containers.
- A documented emergency response system is in place.
- Any environmental incidents are logged and reported to the regulator, as required.
- Use of the bowser as a dust mitigation measure is considered in REIS Chapter 5.

The additional mitigation measures proposed are as follows:

- It is recommended that construction works associated with the storm-water attenuation pond works are supervised by a competent engineer. Works to be completed in line with Eastern Regional Fisheries Board guidelines[23], to include the following precautionary measures:
    - Fuels, oils, greases and hydraulic fluids must be stored in bunded compounds well away from the watercourse. Refuelling of machinery, etc., should be carried out in bunded areas.
    - Runoff from any machine service and concrete mixing areas must not enter the watercourse.
    - Stockpile areas for sands and gravel should be kept to minimum size, well away from the watercourse.
    - Watercourse banks should be left intact if possible. If they have to be disturbed, all practicable measures should be taken to prevent soils from entering the watercourse.
- To avoid soils washing into the stream/ditch along the north-eastern site boundary (during the operational phase), a suitable level of planting is recommended to ensure the stability of the bank. This is further discussed in REIS Chapter 8, Flora and Fauna.
- Litter management procedures and litter picks will be strictly enforced, with particular reference to the potential for site-generated litter and glass residue to enter the stream/ditch on the north-eastern boundary. This is further discussed in REIS Chapter 13.

[22] Both tanks are self-bunded.

[23] *Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites*

- Emergency spill kits will be positioned at areas of risk. Staff will be trained on environmental emergency response/use of spill kits.
- Future renovation/re-fit works will consider the potential for rainwater harvesting, as a resource-saving and environmental good practice measure.

Litter and Birds nuisance [24]

Remedial Measures
A litter-pick will be conducted, particularly at site boundaries (and notably at the ditch/stream on the north-eastern boundary) to remove any litter present. The timeframe for this remedial action is immediate.

In response to concerns expressed during the REIS consultation exercise (REIS Section 13.2) in relation to birds, Rehab Glassco commissioned the services of Bird Control Ireland Ltd., who noted a variety of rook, jackdaw, hooded crow and magpie on site. Based on the specialist's recommendations, 2 No. bird control hawk kites were installed on site (see REIS Photograph 2.47) in January 2013. In addition, a hand-held distress call unit will be employed from March 2013.[25]

Mitigation Measures
A daily site inspection procedure will be implemented, to include a litter/housekeeping check on site and at the site boundaries. Litter picks/cleaning/sweeping will be implemented immediately, as required.

Site roads and hardstanding areas will be swept regularly using a mechanical sweeper.

Perimeter planting and boundary treatment will be maintained to reduce wind impacts and avoid litter hotspots.

Bird control measures described in 'remedial measures' above will be employed and evaluated on an ongoing basis.

A vermin control plan will be established, ensuring that vermin control measures do not cause environmental harm. Pest-control specialists will be used to control vermin levels if they become a problem.

Plant, equipment and vehicles operated by Rehab Glassco are subject to regular maintenance and service programmes to ensure that plant and vehicles are running as efficiently as possible. Procedures for assessing energy fuel use on site will also be implemented in order to monitor efficiency (as REIS Section 12.8).

[24] Patel Tonra Ltd. (March 2013) *Remedial Environmental Impact Statement for Glass Recycling Facility at Osberstown Industrial Park, Caragh Road, Naas, Co. Kildare* – CHAPTER 13, CUMULATIVE IMPACTS, OTHER IMPACTS AND INTERACTIONS

[25] UPDATE: Additional information relating to bird control was submitted to An Bord Pleanála in July 2013 – see **Chapter 8**.

6.0 Compliance with Directives

6.1 Article 14 Requirements

Provide a clear description as to how the proposed facility will comply with the requirements of the following legislation (where applicable): Water Framework Directive, European Communities Environmental Objectives (Surface Water) Regulations (2009); European Communities Environmental Objectives (Groundwater) Regulations (2010); IPPC Directive; and the Environmental Liabilities Directive.

6.2 Response

Water Framework Directive

6.2.1 The purpose of this Directive is to establish a framework for the protection of inland surface waters, transitional waters, coastal waters and groundwater which:

a) prevents further deterioration and protects and enhances the status of aquatic ecosystems and, with regard to their water needs, terrestrial ecosystems and wetlands directly depending on the aquatic ecosystems;

b) promotes sustainable water use based on a long-term protection of available water resources;

c) aims at enhanced protection and improvement of the aquatic environment, inter alia, through specific measures for the progressive reduction of discharges, emissions and losses of priority substances and the cessation or phasing-out of discharges, emissions and losses of the priority hazardous substances;

d) ensures the progressive reduction of pollution of groundwater and prevents its further pollution, and

e) contributes to mitigating the effects of floods and droughts

f) and thereby contributes to:

- the provision of the sufficient supply of good quality surface water and groundwater as needed for sustainable, balanced and equitable water use,
- a significant reduction in pollution of groundwater,
- the protection of territorial and marine waters, and
- achieving the objectives of relevant international agreements, including those which aim to prevent and eliminate pollution of the marine environment, by Community action under Article 16(3) to cease or phase out discharges, emissions and losses of priority hazardous substances, with the ultimate aim of achieving concentrations in the marine environment near background values for naturally occurring substances and close to zero for man-made synthetic substances.

6.2.2 The key issues for the Rehab Glassco facility in relation to the protection of waters are identified as follows:

i. Controlled discharge to surface water, using effective drainage systems, interceptors and silt traps.

ii. Effective storm-water management.

iii. Appropriate storage of liquid materials, i.e. fuels, oils, etc.

iv. Emergency response procedure.

Controlled discharge to surface water

6.2.3 Surface water drainage arrangements are detailed in **Section 3.2**, and include 2 No. interceptors.

Effective storm-water management

6.2.4 There is an existing underground attenuation pond, located in the west of the site. Additional storm-water storage capacity is proposed, as detailed in Section 10.2 of the REIS (March 2013).

Appropriate storage of liquid materials

6.2.5 Diesel is stored in 2 No. self-bunded storage tanks (see certificates attached in **Appendix 5**).

6.2.6 Liquid materials used in the Vehicle Maintenance building, e.g. oils, lubricants, etc., are stored on bunded drip trays.

Emergency response procedure

6.2.7 Rehab Glassco has implemented an Emergency Response Procedure; copy included in **Appendix 6**.

6.2.8 The Water Framework Directive and related matters are further considered in Chapter 10 of the REIS (March 2013).

European Communities Environmental Objectives (Surface Water) Regulations (2009)

6.2.9 The Regulations apply to all surface waters and provide, *inter alia*, for:

- The establishment of legally binding quality objectives for all surface waters and environmental quality standards for pollutants.
- The examination and where appropriate, review of existing discharge authorisations by Public Authorities to ensure that the emission limits laid down in authorisations support compliance with the new water quality objectives/standards.
- The classification of surface water bodies by the EPA for the purposes of the Water Framework Directive.
- The establishment of inventories of priority substances by the EPA.
- The drawing up of pollution reduction plans by coordinating local authorities (in consultation with the EPA) to reduce pollution by priority substances and to cease and/or phase out discharges, emissions or losses of priority hazardous substances.

6.2.10 Chapter 10 of the REIS (March 2013) details the status and environmental objectives for receiving surface water at, and in the vicinity of, the Rehab Glassco facility. There are controlled discharges from the Rehab Glassco site to surface water, which (ultimately) enter the River Liffey.

6.2.11 The River Liffey flows in a west-east direction and is located approximately 120m to the north of the subject site (at the closest point). The river status of the Liffey (at the river section closest to the subject site, ref. EA_Liffey168_Liffey1_Lower_3) is 'Moderate'. Its water body score is '1a, At risk of not achieving good status'. The target for the Liffey (at the river section closest to the subject site, ref. Liffey1_Lower) is to achieve 'Good' status by 2021.

6.2.12 Surface water drainage arrangements are detailed in **Section 3.2**, and include 2 No. interceptors.

6.2.13 Monitoring of surface water discharge is completed on a regular basis; further recommendations relating to surface water discharge monitoring are included in **Section 3.2**.

European Communities Environmental Objectives (Groundwater) Regulations (2010)

6.2.14 The Regulations establish clear environmental objectives to be achieved in groundwater bodies within specified timeframes and introduce the legal basis for a more flexible, proportionate and risk-based approach to implementing the legal obligation to prevent or limit inputs of pollutants into groundwater, which already exists under Directive 80/68/EEC. Measures for this purpose include the following:

- measures to prevent or limit the input of pollutants into groundwater and to prevent the deterioration of the status of all bodies of groundwater measures to protect, enhance and restore all bodies of groundwater and to
- ensure a balance between abstraction and recharge of groundwater, with the aim of achieving good groundwater within a particular timeframe
- measures requiring the reversal of any significant and sustained upward trend in the concentration of any pollutant resulting from the impact of human activity in order to progressively reduce pollution of groundwater
- measures for determining groundwater quantitative and chemical status
- measures establishing procedures for the identification of significant and sustained upward trends and the definition of the starting point for trend reversal
- the laying down of rules for the presentation and reporting of groundwater monitoring results, trend assessments and the classification of quantitative status and chemical status of groundwater bodies

6.2.15 Chapter 9 of the REIS (March 2013) details the status and environmental objectives for groundwater at the Rehab Glassco facility. The groundwater status of the area under the Water Framework Directive is 'good'. The Naas groundwater body is identified as being at risk of not achieving good status (Category 1a).

6.2.16 There are no discharges to groundwater associated with the Rehab Glassco facility. Mitigation measures (Section 9.8 of the REIS) for the protection of groundwater relate to bunding/spill containment and measures to protect groundwater during the construction stage of the new storm-water attenuation pond.

IPPC Directive

6.2.17 The purpose of this Directive is to achieve integrated prevention and control of pollution arising from the activities listed in Annex I to the Directive. It lays down measures designed to prevent or, where that is not practicable, to reduce emissions in the air, water and land from the abovementioned activities, including measures concerning waste, in order to achieve a high level of protection of the environment taken as a whole, without prejudice to Directive 85/337/EEC and other relevant Community provisions.

6.2.18 Article 3 states requires that installations are operated in such a way that:

- (a) all the appropriate preventive measures are taken against pollution, in particular through application of the best available techniques;
- (b) no significant pollution is caused;
- (c) waste production is avoided in accordance with Directive 2006/12/EC of the European Parliament and of the Council of 5 April 2006 on waste; where waste is produced, it is recovered or, where that is technically and economically impossible, it is disposed of while avoiding or reducing any impact on the environment;
- (d) energy is used efficiently;
- (e) the necessary measures are taken to prevent accidents and limit their consequences;
- (f) the necessary measures are taken upon definitive cessation of activities to avoid any pollution risk and return the site of operation to a satisfactory state.

6.2.19 The facility currently operates under a Waste Facility Permit (register number WFP-KE-08-0357-01) issued by Kildare County Council in 2008. On the basis of increased tonnage inputs in 2011, it was deemed necessary to make an application to the Environmental Protection Agency (EPA) for a Waste Licence. An application for a Waste Licence was lodged with the EPA on 26th July 2011. The EPA reference number is W0279-01. The Waste Licence Application considered a range of environmental information relevant to the application process.

6.2.20 A Remedial Environmental Impact Statement was prepared in March 2013 (and submitted to the Agency in May 2013) to assess significant effects on the environment, which have occurred or which are occurring or which can reasonably be expected to occur as a result of the development.

6.2.21 Remedial and mitigation measures identified in the REIS (summarised in Chapter 14 of the REIS) should be implemented in full by the Operator.

6.2.22 The application of Best Available Techniques is further considered in **Chapter 5** of this report.

6.2.23 A proposed Closure Plan is presented in **Chapter 7**.

6.2.24 It is noted that the IPPC Directive will be repealed with effect from 7th January 2014 by Directive 2010/75/EU on industrial emissions. This is subject to assessment in response to EPA correspondence and will be addressed by the Operator under separate cover.

Environmental Liabilities Directive

6.2.25 The purpose of this Directive is to establish a framework for environmental liability based on the 'polluter-pays' principle, to prevent and remedy environmental damage.

6.2.26 A Remedial Environmental Impact Statement was prepared in March 2013 (and submitted to the Agency in May 2013) to assess significant effects on the environment, which have occurred or which are occurring or which can reasonably be expected to occur as a result of the development. Remedial and mitigation measures identified in the REIS (summarised in Chapter 14 of the REIS) should be implemented in full by the Operator.

6.2.27 An Appropriate Assessment (AA) was included as Appendix 8.1 to the REIS. It concluded that there is no likelihood of the project having a negative effect on any Natura 2000 sites or their conservation objectives.

6.2.28 An Environmental Liability Risk Assessment (ELRA) (and related Financial Provision) has been completed for the facility, as detailed in **Chapter 7**.

7.0 Liability, Closure and Financial Provision

7.1 Article 14 Requirements

In accordance with section 53(1) of the Waste Management Acts 1996 to 2013, please furnish particulars in respect of the ability of Rehab Glassco Ltd to meet the financial commitments of liabilities that will be entered into or incurred in carrying on the proposed activity and provide evidence that Rehab Glassco Ltd will be in position to make financial provision that is adequate to discharge these financial commitments.

Specifically:
(a) Prepare a fully detailed and costed Closure, Restoration and Aftercare Management Plan (CRAMP) for the facility, to include as a minimum the following:

- *A scope statement for the plan.*
- *The criteria which define the successful closure and restoration of the facility or part thereof, and which ensure minimum impact to the environment.*
- *A programme to achieve the stated criteria.*
- *Where relevant, a test programme to demonstrate the successful implementation of the plan.*
- *Details of the long-term supervision, monitoring, control, maintenance and reporting requirements for the restored facility.*
- *Details of the costings for the plan and the financial provisions to underwrite those costs.*

(b) Prepare a fully detailed and costed Environmental Liabilities Risk Assessment (ELRA) which addresses the liabilities and potential liabilities from past and proposed activities, including those liabilities and costs identified in the CRAMP. Provide evidence that the assessment was prepared or reviewed, and was found to be complete and accurate, by an independent and appropriately qualified consultant or expert.

(c) Provide a proposal for financial provision to cover any liabilities associated with the operation and identified in the ELRA (including closure, restoration and aftercare and unanticipated accidents, incidents and liabilities). Provide evidence that Rehab Glassco Ltd will be in a position to put such financial provision in place in the event that a waste licence is granted and prior to development works commencing.

The preparation of the CRAMP and ELRA and evaluation of the amount and form of financial provision should have regard to Environmental Protection Agency guidance including Guidance on Environmental Liability Risk Assessment, Residuals Management Plans and Financial Provision (2006).

7.2 Response

RELATED REPORTS:

Report on ELRA, CRAMP and Financial Provision for Glass Recycling Facility (EPA Waste Licence Application W0279-01) (Patel Tonra Ltd., September 2013)

8.0 Additional Information (as submitted to An Bord Pleanála)

8.0.1 Documentation was submitted to An Bord Pleanála by Tom Phillips & Associates, on behalf of Rehab Glassco Ltd., on 9th July 2013, under Substitute Consent application, An Bord Pleanála ref. SU 09.SU0015. A copy of the submission is included as follows:

RELATED REPORTS:

Documentation submitted to An Bord Pleanála on behalf of Rehab Glassco under Substitute Consent Application, An Bord Pleanála ref. SU 09.SU0015 (Tom Phillips & Associates, 9th July 2013)

8.0.2 The Tom Phillips & Associates submission to An Bord Pleanála (9th July 2013) appended the following specialist reports:

- *Report on the Control of Birds* (Bird Control Ireland, 2nd July 2013)
- Environmental Noise Survey (ORS, July 2013)
- Response to Kildare County Council's Observations Relating to the REIS Roads and Traffic Chapter 4 (Atkins, July 2013)

8.0.3 The *Report on the Control of Birds* is attached herewith.

RELATED REPORTS:

Report on the Control of Birds (Bird Control Ireland, 2nd July 2013)

8.0.4 The *Environmental Noise Survey* is detailed in **Chapter 4**.

8.0.5 The *Response to Kildare County Council's Observations Relating to the REIS Roads and Traffic Chapter 4* is deemed not to be of direct relevance to the Agency; however copies are available on request by the Agency.

9.0 Revised Non-technical Summary (Waste Licence Application) and Drawings

9.1 Article 14 Requirements

Your reply to this notice should include a revised non-technical summary (Application Form and EIS) which reflects the information you supply in compliance with the notice, insofar as that information impinges on the non-technical summary.

In the case where any drawings already submitted are subject to revision consequent on this request, a revised drawing should be prepared in each case. It is not sufficient to annotate the original drawing with a textual correction. Where such revised drawings are submitted, provide a list of drawing titles, drawing numbers and revision status, which correlates the revised drawings with the superseded versions.

9.2 Response

RELATED REPORTS:

Revised Waste Licence Application Non-Technical Summary (Patel Tonra Ltd., August 2013)

9.2.1 Revised drawings and a register of drawings and revision control is attached herewith.

Appendix 1: EPA notice under Article 14 of 02/07/2013

Environmental Protection Agency
An Ghníomhaireacht um Chaomhnú Comhshaoil

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Louise O'Donnell
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02 July 2013 **W0279-01**

Notice in accordance with Article 14(2)(b)(ii) of the Waste Management (Licensing) Regulations

Dear Ms O'Donnell,

I am to refer to the above referenced application for a waste licence relating to the Rehab Glassco Facility at Unit 4, Oberstown Industrial Park, Caragh Road, Naas, County Kildare. Having examined the documentation submitted, I am to advise that the Agency is of the view that the documentation does not comply with Article 12 of the Waste Management (Licensing) Regulations.

You are therefore requested, in accordance with Article 14(2)(b)(ii) of the regulations, to take the steps and supply the information detailed below:

ARTICLE 12 COMPLIANCE REQUIREMENTS

1. Grid Reference

Submit a national grid reference for the facility location. The figures submitted with the application are not correct. You are requested to confirm that all other grid references (e.g. for emission points) in the application are correct.

2. Air Emissions

- Confirm whether the air emission point in the dryer plant is denoted as A1 or A2-01. Contradictory denotations are used in the application.
- Provide a description of the air emissions abatement system on the dryer plant stack. Reference is made to a bag filter in the application, however, no other detail has been provided on the bag filter (e.g. effectiveness, compliance with BAT etc.).
- Confirm whether additional dust deposition monitoring has been carried out at the facility since submission of the application and EIS. Submit any additional monitoring data where available.
- Complete Tables E.1(ii) and E.1(iii) of the application form for the air emission point. Where available, provide pre- and post-treatment air emissions data.

- Carry out an assessment, using air dispersion modelling and with reference to current relevant ambient air quality standards, of the impact of the air emissions on ambient air quality. Air dispersion modelling should be in accordance with the 'Air Dispersion Modelling from Industrial Installations Guidance Note (AG4)' published by the Agency.

3. Storm water discharge (discharge from interceptor)

Provide all available monitoring data for the discharge from the interceptor (SW1) for the past 12 months.

4. Noise

- Confirm whether noise complaints have been received by the facility in the last 12 months.
- Provide noise monitoring data which includes plant operation in the presence of the acoustic barrier that was installed in January 2013.

5. Compliance with BAT

Provide a clear description as to how the proposed facility will comply with the relevant requirements of BAT and/or Bref. You should identify the key BAT which is to be applied to manage the relevant environmental aspect/emissions (including air emissions, dust deposition and noise) associated with each unit operation.

6. Compliance with Directives

Provide a clear description as to how the proposed facility will comply with the requirements of the following legislation (where applicable): Water Framework Directive, European Communities Environmental Objectives (Surface Water) Regulations (2009); European Communities Environmental Objectives (Groundwater) Regulations (2010); IPPC Directive; and the Environmental Liabilities Directive.

7. Liability, Closure and Financial Provision

In accordance with section 53(1) of the Waste Management Acts 1996 to 2013, please furnish particulars in respect of the ability of Rehab Glassco Ltd to meet the financial commitments of liabilities that will be entered into or incurred in carrying on the proposed activity and provide evidence that Rehab Glassco Ltd will be in position to make financial provision that is adequate to discharge these financial commitments. Specifically:

(a) Prepare a fully detailed and costed Closure, Restoration and Aftercare Management Plan (CRAMP) for the facility, to include as a minimum the following:

- A scope statement for the plan.
- The criteria which define the successful closure and restoration of the facility or part thereof, and which ensure minimum impact to the environment.
- A programme to achieve the stated criteria.
- Where relevant, a test programme to demonstrate the successful implementation of the plan.

- Details of the long-term supervision, monitoring, control, maintenance and reporting requirements for the restored facility.
- Details of the costings for the plan and the financial provisions to underwrite those costs.

(b) Prepare a fully detailed and costed Environmental Liabilities Risk Assessment (ELRA) which addresses the liabilities and potential liabilities from past and proposed activities, including those liabilities and costs identified in the CRAMP. Provide evidence that the assessment was prepared or reviewed, and was found to be complete and accurate, by an independent and appropriately qualified consultant or expert.

(c) Provide a proposal for financial provision to cover any liabilities associated with the operation and identified in the ELRA (including closure, restoration and aftercare and unanticipated accidents, incidents and liabilities). Provide evidence that Rehab Glassco Ltd will be in a position to put such financial provision in place in the event that a waste licence is granted and prior to development works commencing.

The preparation of the CRAMP and ELRA and evaluation of the amount and form of financial provision should have regard to Environmental Protection Agency guidance including *Guidance on Environmental Liability Risk Assessment, Residuals Management Plans and Financial Provision (2006).*

Your reply to this notice should include a revised non-technical summary (Application Form and EIS) which reflects the information you supply in compliance with the notice, insofar as that information impinges on the non-technical summary.

In the case where any drawings already submitted are subject to revision consequent on this request, a revised drawing should be prepared in each case. It is not sufficient to annotate the original drawing with a textual correction. Where such revised drawings are submitted, provide a list of drawing titles, drawing numbers and revision status, which correlates the revised drawings with the superseded versions.

Please supply the information in the form of a one (1) original plus one (1) copy in hardcopy format within 8 weeks of the date of this notice. In addition submit sixteen (16) copies of the requested information to the Agency in electronic searchable PDF format on CD-ROM. Please note that all maps/drawings should not exceed A3 in size.

Please note that the application's register number is **W0279-01**. Please direct all correspondence in relation to this matter to Administration, *Environmental Licensing Programme, Office of Climate, Licensing & Resource Use, Environmental Protection Agency, Headquarters, PO Box 3000, Johnstown Castle Estate, County Wexford* quoting the register number.

Yours sincerely,

Michael Owens
Inspector
Office of Climate, Licensing & Resource Use

Appendix 2: Technical Specifications of the Emissions Abatement System (Glass Drying Operation)

SPECIFICATION

FOR

EXHAUST AIR SYSTEM

CYCLONE

This will be fabricated in flanged sections from mild steel, with the body, internal tube and top section in 5.0mm plate, and bottom cone in 3.0mm sheet. Wear plates will be fitted to the inlet as appropriated.

A rotary valve will be fitted to the bottom of the cone.

Supplied complete with mild steel support frame.

BAG FILTER

Reverse jet filter with 72 m^2 of filter area, having Nomex needlefelt reinforced cloth bags. The filter bags mounted on corrosion resisting support and accessible from the clean side of the filter.

The bags are divided into groups and each area cleaned via compressed air jets on a timed sequence.

The filter bags are contained within a galvanised sheet steel enclosure insulated externally.

Filter supplied complete with discharge hopper, rotary valve, access ladder and hand railing to roof.

CONTROL DAMPER

A variable multi-vane damper will be fitted into the exhaust ductwork after the filter and prior to the exhaust fan. This will regulate the flow of air drawn through the system.

EXHAUST FAN

This will be of the centrifugal type, fabricated from carbon steel plate, with circular flanged suction inlet and rectangular flanged outlet. The fan impeller will be a backward laminar design, statically and dynamically balanced.

The impeller will be mounted on a mild steel shaft carried in two substantial plummer block bearings, bolted to a fabricated support pedestal. The shaft will be extended and fitted with a suitably guarded vee rope drive to a TEFC motor. The fan case will be fitted with a suitable inspection door and drain.

DUCTWORK

Mild steel interconnecting ductwork will be provided between the dryer and cyclone, cyclone to filter, filter to fan and an exhaust stack xxx m high. Fabricated from 3.0mm sheet with flanged and bolted connections. The outside bends on the ducting between dryer and cyclone and cyclone to filter will be fitted with wear plates.

Technical Data

Application.....Crushed Glass from Rotary Dryer.

Filter Type : MJX72/M/10/11 Reverse Jet.

Air Volumn: 9000m3/h at 200 deg C

Filtering Area 72 m3

Filter media; Nomex.

Number of filtering Elements 110 off x 1600mm long.

Filtering Velocity. 2.08 m/min.

Fan Duty; 9000 m3h at 266mm static pressure.

Fan Motor 15 kW at 2900 RPM.

Compressed Air consumption 15.6 m3/h at 6.2 bar.

Andrew Webron Ltd
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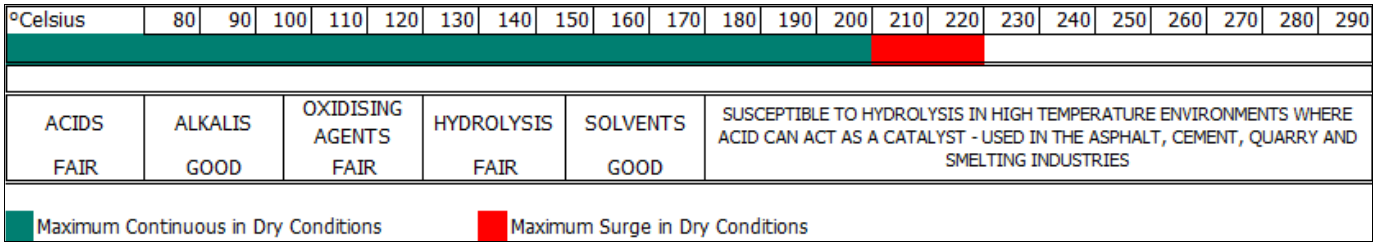
Rawtenstall, Lancs, BB4 7JL UK
Tel: +44(0)1706 214 001
Fax: +44(0)1706 830 003
Email: sales@andrewwebron.com
Web: www.andrewwebron.com

Product Information for: A0550A1M

Fibre Blend:	m Aramid
Scrim Type:	m Aramid
Finish:	ePTFE Membrane
Chemical Treatment:	Not Applicable
Weight:	550 g/m²
Thickness:	2.4 mm
Permeability:	30 dm³/dm²/min @200Pa 50 mm/sec @200Pa
Electrical Resistance:	N/A

	Machine Direction	**Cross Direction**
Strength N/5cm:	825	2075
Strain at 50N/5cm (%):	1.2	2.5
Strain at Peak (%):	85	45
Shrinkage at 200°C (%):	1.0	0.5



Revision Date: 22/11/2010

The above data are based on measurements taken from production and are subject to industry-wide tolerances. The information does not imply a guarantee and the company reserves the right to make amendments without notice.

Appendix 3: Technical Specifications of Dust Extraction System Components (Drying Plant Building)

Rehab Glassco Dust extraction Dryer Plant

System No 2 November 2011

Supplier. Fan and filters,Williams Engineering UK.

Filter chest and Structure, Village Engineering ltd.

Scope.

Fit Dust extraction Hood over main screen after Rotary drier and connect to fan with 500 mm dia main duct. Fit 3 off additional branches at transfer points using 150mm ducts with damper valves to adjust air flow as required.

Equipment Description.

(1) Centrifugal Fan fitted with 30HP 22Kw 3 phase Motor 1400 rpm. Max air flow 26000 CFM at 225 (mmH20 pressure)

(2) Filter chest system fitted with 8 no filter socks on top. Each sock with surface area aprox 60 sq feet. dust collection hopper fitted under,with rotary valve,suitable for discharging into forklift skip or jumbo dust bag.

(3) Filter socks made from Polyester material . Manufacturer data sheet attached.

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Hareholme Mill
Bacup Road
Rawtenstall
Lancashire BB4 7JL
England
+44 (0)1706 238701
sales@andrewwebron.com
www.andrewwebron.com

Andrew Webron Ltd

Product Information for: P0350P1G+LR5

Fibre Blend:	Polyester
Scrim Type:	Polyester
Finish:	Superglaze
Chemical Treatment:	A treatment designed to provide liquid repellency and at the same time can provide limited chemical resistance. Can also assist with the release of certain dust cakes.
Weight:	350 g/m²
Thickness:	1.35 mm
Permeability:	275 dm³/dm²/min @200Pa 458 mm/sec @200Pa
Electrical Resistance:	N/A

	Machine Direction	Cross Direction
Strength N/5cm:	1625	1125
Elongation at 50N/5cm:	0.5	1.3
Elongation at Peak:	27	50
Shrinkage at 170°C:	1.5	1.1

°Celsius	80	90	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240	250	260	270	280	290

ACIDS	ALKALIS	OXIDISING AGENTS	HYDROLYSIS	SOLVENTS	
GOOD	FAIR	GOOD	POOR	GOOD	AVOID STRONG ALKALI AND ACID ENVIRONMENTS AT ELEVATED TEMPERATURES - THE MOST VERSATILE OF THE LOW TEMPERATURE FIBRES, USED IN THE CEMENT AND QUARRY, METAL PROCESSING, FLOUR AND WOOD INDUSTRIES

Maximum Continuous in Dry Conditions Maximum Surge in Dry Conditions

Revision Date: 15-Jan-10

The above data are based on measurements taken from production and are subject to industry-wide tolerances. The information does not imply a guarantee and the company reserves the right to make ammendments without notice.

Appendix 4: Completed Tables E.1(ii) and E.1(iii) re. Emissions to Atmosphere

TABLE E.1(ii) MAIN EMISSIONS TO ATMOSPHERE (1 Page for each emission point)

Emission Point Ref. N^{o}:	**A1**
Source of Emission:	**Stack at Drying Plant**
Location :	**Drying Plant**
Grid Ref. (12 digit, 6E,6N):	**E 286764 N 220379**
Vent Details Diameter: Height above Ground(m):	 **0.50 m** **7.5 m**
Date of commencement:	**2011**

Characteristics of Emission :

(i) Volume to be emitted:			
Average/day	72,000 m^3/d	Maximum/day	114,000 m^3/d
Maximum rate/hour	9,500 m^3/h	Min efflux velocity	22.07 $m.sec^{-1}$
(ii) Other factors			
Temperature	200 ^{o}C(max)	100 ^{o}C(min)	140 ^{o}C(avg)
For Combustion Sources: Not applicable Volume terms expressed as : ☐ wet. ☐ dry. _____%O_2			

(iii) Period or periods during which emissions are made, or are to be made, including daily or seasonal variations (*start-up /shutdown to be included):*

Periods of Emission (avg)	60 min/hr 12 hr/day 312 day/yr

TABLE E.1(iii): MAIN EMISSIONS TO ATMOSPHERE - Chemical characteristics of the emission (1 table per emission point)

Emission Point Reference Number: **A1**

Parameter	Prior to treatment[1]				Brief	As discharged[1]					
	mg/Nm^3		kg/h		description	mg/Nm^3		kg/h.		kg/year	
	Avg	Max	Avg	Max	of treatment	Avg	Max	Avg	Max	Avg	Max
Particulates	-	-	-	-	Bag Filter	-	50	-	0.475	-	1778.4
NOx as NO_2	-	-	-	-	Not Applicable	-	50	-	0.475	-	1778.4
SO_2	-	-	-	-	Not Applicable	-	50	-	0.475	-	1778.4
TOC as C	-	-	-	-	Not Applicable	-	80	-	0.76	-	2845.44
CO	-	-	-	-	Not Applicable	-	300	-	2.85	-	10670.4

1. Concentrations should be based on Normal conditions of temperature and pressure, (i.e. 0^{o}C,101.3kPa). Wet/dry should be the same as given in Table E.1(ii) unless clearly stated otherwise.

Appendix 5: Diesel tanks bund conformance certificates

From: John Rowe [mailto:info@rotech.ie]
Sent: 01 August 2013 09:13
To: Zeki Mustafa
Subject: From John @ Rotech

ERROL FOWLER & SONS
TANK MANUFACTUTERS
TEST CERT.

To Whom It May Concern,
31/7/ 2013

Job Ref. Rehab,

Tank Serial No. 2662

Tank Capacity. 5,000ltrs

This is to state that the bunded tank produced by this company E. Fowler & Sons Ltd, was manufactured to B.S. 799, parts 5 and 6 and all welding carried out by a coded welder to B.S 4872. The primary oil tank is contained within its own bunded area, with a capacity greater than 110%. This tank and bund were pressure tested to 0.7 bar and passed by Adrian Fowler.

Kind Regards,

Adrian Fowler.
E. Fowler & Sons,
6 Mount Gorry,
Malahide Rd,
Swords,
Co. Dublin
Tel. 01-8401742,
Website. www.fowleroiltanks.ie

From: John Rowe [mailto:info@rotech.ie]
Sent: 12 August 2013 14:23
To: Zeki Mustafa
Subject: 10,000 LITRE TANK CERT

ERROL FOWLER & SONS
TANK MANUFACTUTERS
TEST CERT.

To Whom It May
Concern,

31/7/ 2013

Job Ref. Rehab Glasco,
Tank Serial No. 1242
Tank Capacity. 10,000ltrs

This is to state that the bunded tank produced by this company E. Fowler & Sons Ltd, was manufactured to B.S. 799, parts 5 and 6 and all welding carried out by a coded welder

to B.S 4872. The primary oil tank is contained within its own bunded area, with a capacity greater than 110%. This tank and bund were pressure tested to 0.7 bar and passed by Adrian Fowler.

Kind Regards,

Adrian Fowler.
E. Fowler & Sons,
6 Mount Gorry,
Malahide Rd,
Swords,
Co. Dublin
Tel. 01-8401742,
Website. www.fowleroiltanks.ie

ROTECH
John Rowe
Hilltown, Killinick,
Co.Wexford,
Ireland
TEL: 00353(0)53 9135165 E-Mail: info@rotech.ie
FAX: 00353(0)53 9135437 Website: www.rotechie

Appendix 6: Rehab Glassco Emergency Response Procedure

EMERGENCY RESPONSE PROCEDURE GUIDELINES

Scope: This procedure details how staff should react to emergencies.

Responsibility: The Health & Safety Officer is responsible for ensuring that all relevant personnel are trained on this procedure.

Communication: Management should be notified in the event of any emergency immediately after the following steps have been carried out.

Possible emergencies:

1. Bodily injury

In the event that a person is injured first aid should be administered by a qualified person. If the injury is serious the emergency services should be called. Management should also be notified of any injury immediately

2. Vehicle Breakdown

In the event of vehicle breakdown the driver should turn on the hazard lights, put the breakdown triangles to the front and rear of the vehicle to alert oncoming road users of the hazard and seek mechanical assistance. If the vehicle is causing a major obstruction and/or is a safety hazard the Gardai should be phoned immediately

3. Vehicle overturn

In the event of a vehicle overturning the emergency services should be called immediately. Hazard lights should be turned on and breakdown triangles put on the road. Assistance should be sought from other members of the public if necessary to alert other road users of the hazard.

4. Waste spillage

In the event of waste being spilled the driver should first of all try to stop any further spillage taking place. The driver should then try to contain the spill and collect the spilled material using the appropriate equipment. If the spill is causing a hazard to other road users the emergency services should be phoned immediately. The driver should then phone management who will inform the relevant local authority.

Rehab Glassco Ltd, Unit 4 Osberstown Industrial Park, Caragh Road, Naas, Co. Kildare, Ireland
Tel Dublin: +353 (0)1 6854400 **Fax:** +353 (0)1 4430621
Tel Cork: +353 (0)21 2429900 **Fax:** +353 (0)21 4580529
Tel Galway: +353 (0)91 395400 **Fax:** +353 (0)91 394066
Web: www.rehabglassco.ie **E-mail:** info@rehabglassco.ie
Waste Collection Permit No: WCP-DC-08-1150-01 **Waste Permit No:** WFP-KE-08-0357-01

Registered in Ireland No: 365472 **Registered Office:** Unit 4 Osberstown Industrial Park, Caragh Road, Naas, Co. Kildare, Ireland **Directors:** K. Poole, S. Clancy, Z. Mustafa (Managing), D. Cooper

Any spillage that takes place on the Rehab Glassco site should be minimized using a spill kit.

5. Fire

In the event of the vehicle or materials catching fire, the emergency services should be phoned immediately.

6. Hazardous waste

In the event of hazardous waste being discovered prior to loading, the material should not be loaded. If hazardous waste is discovered on board the vehicle the driver should try to ensure that the waste is contained within the vehicle and cannot escape. The driver should then pull in to the side of the road and call management for further instructions.

Any hazardous waste found to be delivered to the Glassco site should be isolated and removed from the normal storage bays and placed into the quarantine area. A qualified hazardous waste company will then deal with the material appropriately.

7. Any operation that may lead to environmental pollution

Any operation or activity that may lead to environmental pollution should not be carried out by staff. If an activity is likely to lead to environmental pollution the employee should not carry out the activity and should phone management for advice on what to do.

8. Contact phone numbers

Emergency services: Gardai/Fire Brigade/Ambulance	999
Environmental Protection Agency:	1890-335599

9. List of Emergency response equipment stored on vehicles

- breakdown triangles
- brush, shovel and waste container
- emergency spill kit
- mobile phone

IF YOU ARE IN DOUBT ABOUT THE POTENTIAL DANGER OF ANY SITUATION YOU SHOULD PHONE THE EMERGENCY SERVICES. REMEMBER THAT IT'S BETTER TO BE SAFE THAN SORRY!

Drawings

Register of Drawings and Revision Control

Drawing No.	WLA Attachment	Title	Rev00[a]	Rev01
Drawing WLA-01	Attachment B.1	Site Location Map	July 2011[b]	
Drawing WLA-02	Attachment B.1	Ownership Plan	April 2011[c]	
Drawing WLA-03	Attachment B.2	Site Location Map (with 500m offset)	July 2011[b]	
Drawing WLA-04	Attachment B.2	Site Plan	April 2011[c]	Aug. 2013
Drawing WLA-05	Attachment B.2	Services Plan	May 2011[d]	
Drawing WLA-06	Attachment B.4	Site Drainage Drawing	April 2011[c]	Aug. 2013
Drawing WLA-07	Attachment D.1	Unit Operations	April 2011[c]	Aug. 2013
Drawing WLA-08	Attachment D.1	Main Process (Sorting) Plant General Layouts (Sheet 1)	April 2011[c]	
Drawing WLA-09	Attachment D.1	Main Process (Sorting) Plant General Layouts (Sheet 2)	April 2011[c]	
Drawing WLA-10	Attachment D.1	Main Process (Sorting) Plant – Elevations and Section	April 2011[c]	
Drawing WLA-11	Attachment D.1	Garage Building – Plans, Elevations and Section	April 2011[c]	
Drawing WLA-12	Attachment D.1	Drying Plant Building – Plans, Elevations and Section	April 2011[c]	
Drawing WLA-13	Attachment E	Emissions Points	April 2011[c]	Aug. 2013
Drawing WLA-14	Attachment F	Monitoring Locations	April 2011[c]	Aug. 2013
Drawing WLA-15	Not applicable	Drainage Layout showing Proposed Attenuation Area	Aug. 2013[e]	

NOTES:
[a] Drawings submitted with WLA (July 2011) showed a blank Rev No. This is assumed as Rev00.
[b] Date not shown on drawing; date assumed as July 2011.
[c] Dated April 2011, but submitted to EPA as part of WLA in July 2011.
[d] Date May 2011, but submitted to EPA as part of WLA in July 2011.
[e] Drawing not submitted with original WLA; included in Article 14 response document.

Attached Drawings (revised/additional to WLA, July 2011):

Drawing WLA-04 (Rev01): Site Plan

Drawing WLA-06 (Rev01): Site Drainage Drawing

Drawing WLA-07 (Rev01): Unit Operations

Drawing WLA-13 (Rev01): Emissions Points

Drawing WLA-14 (Rev01): Monitoring Locations

Drawing WLA-15 (Rev00): Drainage Layout showing Proposed Attenuation Area

REV.	DATE.	AMENDMENT.	INITIALS.
01	AUG 13	MINOR REVISONS TO LAYOUT	B.P.

CLIENT: REHAB GLASSCO

PROJECT:
EPA WASTE LICENCE APPLICATION
OSBERSTOWN BUSINESS PARK, NAAS.

DRAWING:
SITE PLAN

SCALE.	DATE.	DRAWN BY.
1:1000	APRIL 2011	B.P.

DRAWING NO. WLA-04

REVISION NO. 01

DRAWING STATUS:	
PRELIMINARY	X
FOR INFORMATION	
FOR APPROVAL	
FOR CONSTRUCTION	

BRIAN PYPER AND ASSOCIATES
PROJECT DESIGN AND MANAGEMENT SERVICES
DASH HOUSE, 34 SHORE ROAD,
HOLYWOOD, CO. DOWN, BT18 9HX
TEL: 00 44 (0) 28 9039 3395 FAX: 00 44 (0) 28 9039 3396
E-MAIL: bpyper@gmail.com

N

0 10m 20m 30m 40m

HALVERSTOWN ROAD

EXISTING HOUSE

Trees

SITE 17

SITE 12

SITE 3

SITE 8

SITE 6&7

Shrubs

Shrubs

Facility Notice Board

ESB Sub Station

Noise Barrier

Storage Bays

Storage Bays

Storage Bays

Storage Bays

Storage Bays

GAS

Container Storage
(blinded hardcore)

WAYLEAVE – NEWBRIDGE RISING MAIN

Vehicle Maintenance Building

1

2

Drying Plant

Truck Parking

(concrete)

(concrete)

Car Parking

Car Parking

Car Parking

Car Parking

Car Parking

Weighbridge

Site Entrance

Offices, Canteen, WCs, etc.

(concrete)

Truck Wash

(concrete)

Main Process (Sorting) Plant

one way system

(concrete)

(unsurfaced)

Ref. Point (wall intersection)
N 220379
E 286767

KEY:
ONE WAY SYSTEM
1 FUEL STORAGE TANK No. 1
2 FUEL STORAGE TANK No. 2
BIRD CONTROL HAWK KITE
WAYLEAVE
SITE BOUNDARY

tank

tank

admin. building

Osberstown WWTW
(Kildare Co Co)

REV.	DATE.	AMENDMENT.	INITIALS.
01	AUG 13	MINOR REVISIONS TO LAYOUT	B.P.

CLIENT: REHAB GLASSCO

PROJECT:
EPA WASTE LICENCE APPLICATION
OSBERSTOWN BUSINESS PARK, NAAS.

DRAWING:
EXISTING DRAINAGE LAYOUT

SCALE.	DATE.	DRAWN BY.
1:1000	APRIL 2011	B.P.

DRAWING NO. WLA–06

REVISION NO. 01

DRAWING STATUS:	
PRELIMINARY	X
FOR INFORMATION	
FOR APPROVAL	
FOR CONSTRUCTION	

BRIAN PYPER AND ASSOCIATES
PROJECT DESIGN AND MANAGEMENT SERVICES
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HOLYWOOD, CO. DOWN, BT18 9HX
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E-MAIL: bpyper@gmail.com

0 10m 20m 30m 40m

N

HALVERSTOWN ROAD

EXISTING HOUSE

SITE 17

SITE 12

SITE 3

SITE 8

SITE 6&7

INTERCEPTOR#2

INTERCEPTOR#1

SMH CL=80.95 IL=79.50
SMH CL=80.30 IL=79.10
SMH CL=81.15 IL=76.65
SMH CL=80.32 IL=79.00
SMH CL=80.80 IL=79.78
SMH CL=80.55 IL=79.58
Rod. Eye CL=81.35 IL=80.20
Rod. Eye CL=80.20 IL=79.45
Rod. Eye CL=80.35 IL=79.60
CMH CL 80.30 IL 77.90
FMH CL 82.00 IL 79.65
SMH CL 81.10 IL 79.70
SMH CL 81.00 IL 79.50
SMH CL 81.00 IL 79.30
SMH CL 81.00 IL 79.20
SMH CL 81.00 IL 80.05
SMH CL 81.00 IL 79.80
CMH CL 81.20 IL 78.10

300 DIA
375 DIA
225 DIA
150 DIA
1500 DIA. CULVERT
HYDRO-VALVE
SILT TRAP
Car Parking
Truck Parking
RG

WAYLEAVE – NEWBRIDGE RISING MAIN

KEY:
- CMH — STORM CULVET / MANHOLE
- SMH — STORM DRAIN / MANHOLE
- FMH — FOUL SEWER / MANHOLE
- STORM DRAINAGE ATTENUATION (UNDERGROUND HYDRO CHAMBERS)
- RG — ROAD GULLEY
- DIRECTION OF SURFACE FALL

tank
tank
admin. building
Osberstown WWTW (Kildare Co Co)

REV.	DATE.	AMENDMENT.	INITIALS.
01	AUG 13	MINOR REVISIONS TO LAYOUT	BP

CLIENT: REHAB GLASSCO

PROJECT:
EPA WASTE LICENCE APPLICATION
OSBERSTOWN BUSINESS PARK, NAAS.

DRAWING:
UNIT OPERATIONS

SCALE.	DATE.	DRAWN BY.
1:1000	APRIL 2011	B.P.

DRAWING NO. WLA-07

REVISION NO. 01

DRAWING STATUS:	
PRELIMINARY	X
FOR INFORMATION	
FOR APPROVAL	
FOR CONSTRUCTION	

BRIAN PYPER AND ASSOCIATES
PROJECT DESIGN AND MANAGEMENT SERVICES
DASH HOUSE, 34 SHORE ROAD,
HOLYWOOD, CO. DOWN, BT18 9HX
TEL: 00 44 (0) 28 9039 3395 FAX: 00 44 (0) 28 9039 3396
E-MAIL: bpyper@gmail.com

0 10m 20m 30m 40m

HALVERSTOWN ROAD

EXISTING HOUSE

SITE 17

SITE 12

SITE 3

SITE 8

SITE 6&7

DRYING PLANT UNIT OPERATIONS:

A. Weigh in
B. Material Inspection and Storage
C. Loading for Drying
D. DRYING / PROCESSING
E. Pelletisation
F. Glass Product for Off-site
G. Pelletising of Glass Fines (Pilot Process)
H. Residual Waste Storage Pending Off-site Removal
I. Weigh out

MAIN GLASS PROCESSING PLANT UNIT OPERATIONS:

1. Weigh in
2. Material Inspection and Storage
3. Glass Loading into Main Process
4. SORTING / PROCESSING
5. Clean Glass / Can Output Storage
6. Residual Waste Storage Pending Off-site Removal
7. Can Crushing and Palletising
8. Bulk Glass Cullet Storage Pending Off-site Removal
9. Metals Storage Pending Off-site Removal
10. Weigh out

Storage Bays
Container Storage
(blinded hardcore)
GAS
WAYLEAVE - NEWBRIDGE RISING MAIN
Truck Parking
(concrete)
Garage Building
ESB Sub Station
Car Parking
Site Entrance
Weighbridge
Offices, Canteen, WCs, etc.
Drying Plant
Ref. Point (wall intersection)
N 220379
E 286767
Truck Wash
Main Process (Sorting) Plant
one way system
(unsurfaced)
tank
admin. building
Osberstown WWTW
(Kildare Co Co)

REV.	DATE.	AMENDMENT.	INITIALS.
01	AUG 13	MINOR REVISIONS TO LAYOUT	BP

CLIENT: REHAB GLASSCO

PROJECT:
EPA WASTE LICENCE APPLICATION
OSBERSTOWN BUSINESS PARK, NAAS.

DRAWING:
EMISSION POINTS PLAN

SCALE.	DATE.	DRAWN BY.
1:1000	APRIL 2011	B.P.

DRAWING NO. WLA–13

REVISION NO. 01

DRAWING STATUS:	
PRELIMINARY	X
FOR INFORMATION	
FOR APPROVAL	
FOR CONSTRUCTION	

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0 10m 20m 30m 40m

N

HALVERSTOWN ROAD

EXISTING HOUSE

SITE 17

SITE 12

SITE 3

SITE 8

SITE 6&7

SW2

A1

SW1

SE1

tank

tank

admin. building

Osberstown WWTW
(Kildare Co Co)

KEY:
- A1 denotes Air Emmission Point
- SW1/2 denotes Emmission to Surfacewater
- SE1 denotes Emmission to Sewer

REV.	DATE.	AMENDMENT.	INITIALS.
01	AUG 13	MINOR REVISIONS TO LAYOUT	BP

CLIENT: REHAB GLASSCO

PROJECT:
EPA WASTE LICENCE APPLICTION
OSBERSTOWN BUSINESS PARK, NAAS.

DRAWING:
MONITORING POINTS PLAN

SCALE.	DATE.	DRAWN BY.
1:1000	APRIL 2011	B.P.

DRAWING NO. WLA–14

REVISION NO. 01

DRAWING STATUS:	
PRELIMINARY	X
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0 10m 20m 30m 40m

N

HALVERSTOWN ROAD

EXISTING HOUSE

NSL1

SITE 17

SITE 12

SITE 3

SITE 8

SITE 6&7

D1

D2

SW1

SW2

A1

tank

tank

admin. building

Osberstown WWTW
(Kildare Co Co)

KEY:
- A1 denotes Air Monitoring Point
- SW1/2 denotes Surfacewater Monitoring Point
- NSL1 denotes Noise Monitoring Point
- D1/2 denotes Dust Monitoring Point

REV.	DATE.	AMENDMENT.	INITIALS.

CLIENT: REHAB GLASSCO

PROJECT:
EPA WASTE LICENCE APPLICATION
OSBERSTOWN BUSINESS PARK, NAAS.

DRAWING:
DRAINAGE LAYOUT SHOWING PROPOSED ATTENUATION AREA

SCALE.	DATE.	DRAWN BY.
1:1000	AUGUST 2013	B.P.

DRAWING NO. WLA–15

REVISION NO.

DRAWING STATUS:
- PRELIMINARY [X]
- FOR INFORMATION [ ]
- FOR APPROVAL [ ]
- FOR CONSTRUCTION [ ]

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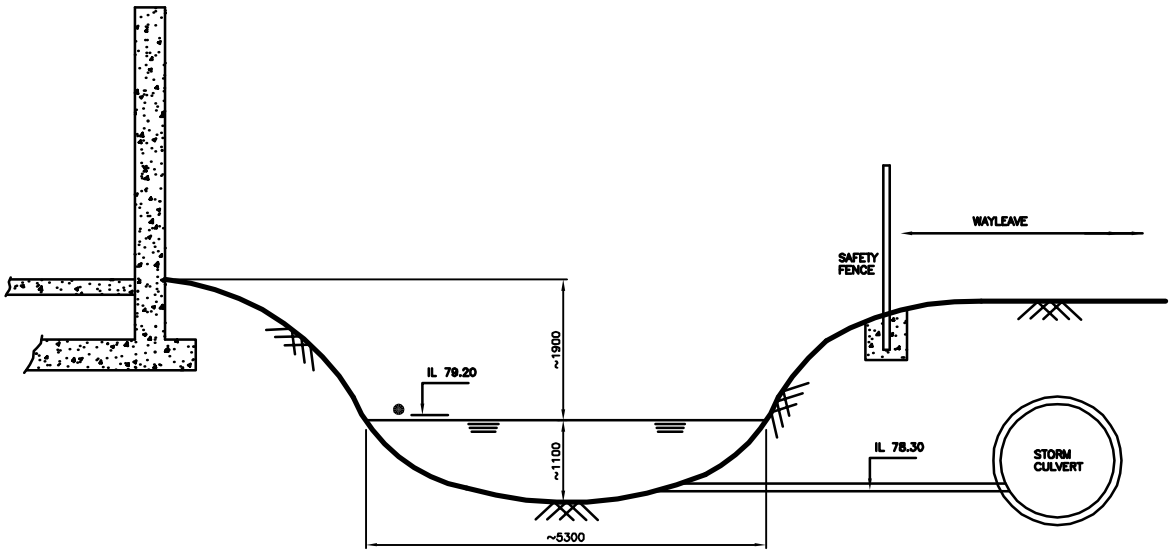

SECTION X - X

0 10m 20m 30m 40m

HALVERSTOWN ROAD

N

EXISTING HOUSE

SITE 17

SITE 12

SITE 3

SITE 8

SITE 6&7

SMH CL=80.95 IL=79.50
SMH CL=80.30 IL=79.10
SMH CL=81.15 IL=76.65
SMH CL=80.32 IL=79.00
SMH CL=80.80 IL=79.78
SMH CL=80.55 IL=79.58
Rod. Eye CL=80.20 IL=79.45
Rod. Eye CL=81.35 IL=80.20
Rod. Eye CL=80.35 IL=79.60
CMH CL 80.30 IL 77.90
CMH CL 81.20 IL 78.10
FMH CL 82.00 IL 79.65
SMH CL 81.10 IL 79.70
SMH CL 81.00 IL 79.50
SMH CL 81.00 IL 79.30
SMH CL 81.00 IL 79.20
SMH CL 81.00 IL 80.05
SMH CL 81.00 IL 79.80
300 DIA
225 DIA
375 DIA
150 DIA
1500 DIA. CULVERT
INTERCEPTOR#2
INTERCEPTOR#1
HYDRO-VALVE
RG
Truck Parking
Car Parking
SILT TRAP

WAYLEAVE – NEWBRIDGE RISING MAIN

PROPOSED SAFETY FENCE

PROPOSED 350m3 CAPACITY ATTENUATION POND

tank
tank
admin. building

Osberstown WWTW
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Environmental Dust Monitoring
Rehab Glassco,
Unit 4 Osberstown Industrial Park,
Caragh Road,
Naas,
Co. Kildare.

Client	Revision	Date	Compiled	Checked	Approved
Rehab Glassco	D2	12/08/2013	DH	DC	
Unit 4 Osberstown Industrial Park, Caragh Road, Naas, Co. Kildare					

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Executive Summary

Dust deposition was monitored at three locations at the Rehab Glassco site, Osberstown Industrial Park, Caragh Road, Naas, Co. Kildare between the 8th July and 7th August 2013.

The dust fall concentrations are laid down in the waste facility permit no. WFP-KE-08-0357-01 which specifies a limit of 350 mg m^{-2} day^{-1}. The dust levels measured on site exceed this limit.

1 Scope

ORS Environmental Consultants were commissioned by Zeki Mustafa of Rehab Glassco to carry out environmental dust monitoring at the Rehab Glassco plant at Caragh Rd, Naas, Co. Kildare. Monitoring was as a result of requirements set out in the waste facility permit no. WFP-KE-08-0357-01.

The dust deposition monitors were installed on Monday 8th July and left in situ for 30 days. The monitors were collected on Wednesday 7th August 2013.

Dust is a natural occurring product of the environment with typical background levels in the region of <70mg m^{-2} day^{-1} TA Luft VDI 2119 guidelines. Human activities will generally increase this level due to the creation of hard standing areas, vehicle movements and dust associated with the reduction of dampened areas.

Dust generation within the Rehab Glassco plant is generated from traffic movements within the site, stock piling material, material movement and general day to day activities. Dust monitoring is carried out at the site boundaries to ascertain the potential dust leaving the site.

2 Monitoring Locations

Environmental dust deposition monitoring was carried out at the predetermined locations D1, D2 & D3. The monitoring locations are detailed below in Table 1 and presented in the attached map in Appendix B.

Table 1. Monitoring Locations

Monitoring Locations	Description
D1	Located on the South western boundary of the site adjacent site entrance
D2	Located to the north boundary of the site
D3	Located on the eastern boundary of the site

3 Activities on Site

Activities that take place on the site that may generate dust include the entering / exiting of vehicles from the site via the site entrance, stock piling material and vehicle movements within the site etc.

4 Methodology

The standard method used for monitoring dust deposition is VDI 2119 *'Measurement of Dustfall, Determination of Dustfall using Bergerhoff Instrument (Standard Method)'*, (EPA Guidance Notes). With this method, atmospheric deposits are collected in vessels over a 30-day period ± 2 days. The collected samples are then concentrated and the residue subjected to gravimetric weight analysis.

Collecting jars with a volume of 1.5 litres were placed in the deposition stands. The top of the jar was positioned 1.5 metres above ground level.

4.1 Jar Preparation

Prior to sampling the jars and lids were acid washed and dried in a fan assisted oven at 100°C. The lids were placed on the jars and labelled. On arrival at the site the lids were removed and the jars were placed in wire containers for a period of 30days (± 2 days).

4.2 Sample Preparation

On completion of the collection period the jars were removed and immediately sealed air tight and transported directly to the laboratory.

Sample preparation and analysis was carried out in accordance with the VDI 2119 standard.

5 Calculations

Results were calculated from the formula correlating the dust collected, sampling period and the collecting surface of the jars. Results were expressed as mg m^{-2} d^{-1}.

6 Results

6.1 Dust Gauges

Dust Deposition Results
Results are quoted as mg m^{-2} d^{-1} (milligrams per metre^2 per day)

Monitoring Locations	Dust Deposition mg m^{-2} d^{-1}	Waste Facility Permit Limit 350 mg m^{-2} d^{-1}
D1	605	350
D2	367	350
D3	850	350

The quantity of dust fall is determined as the difference between the gross weight of the evaporating dish and the final weight of the evaporating dish (containing the residue). The quantity is then converted into general reference quantities (mg m^{-2} d^{-1}) using the following formula:

$$X = \frac{G}{F.T}$$

Where;

X = dustfall in g m^{-2} d^{-1}
F = collecting surface in m^2
G = mass of dustfall in g
T = sampling period in days

7 Evaluation of Results

The Rehab Glassco monitoring locations are deemed to be indicative of the level of dust likely to arise from the on-site activities. Monitoring stations were located within the site boundary and were fully exposed to typical on-site activities.

The schedule of conditions for the Rehab Glassco Site states that the total dust depositions arising from the on-site activities shall not exceed 350 mg m^{-2} d^{-1} averaged over a continuous period of thirty days at any position along the boundary of the development.

8 Conclusion

Dustfall limits are laid down in the waste facility permit for the site or issued by the Local Authority or EPA. The dust fall concentrations laid down specifies a limit of 350 mg m^{-2} d^{-1}. All monitoring points were deemed to exceed this limit.

A severe exceedance of limits occurs at monitoring location D3. It should be noted that the dyer is located adjacent to this monitoring location and appears to generate a large amount of dust as part of its operation. It was also noted that at the time of monitoring the doors were open with a large amount of dust coming from the building.

The exceedance at the other monitoring points can be attributed to ongoing site operations on a large hard standing area (i.e. concrete surface) combined with a two week period of high temperatures and no rain which occurred during the monitoring period.

To reduce the level of dust coming from the Dryer building it would be recommended that all doors to the building should remain closed, if possible, during operations and/or PVC strip doors be installed. If possible it may also be prudent to install an extractor fan with filter so that workers inside the building do not feel any ill effects.

It is also recommended that dampening down of the sites hard standing areas with a fine spraying of water at set intervals would be the most effective way of reducing dust emissions from the site.

Appendix A – Dust Analysis

	Units	Dust		
		D1	D2	D3
Date In (Oven)	dd/mm/yy	07/08/13	07/08/13	07/08/13
Date Out (Oven)	dd/mm/yy	08/08/13	08/08/13	08/08/13
Mass of Undissovled Solids	grams	0.198	0.120	0.278
Calculation of Dust Deposition	mg m^{-2} d^{-1}	605	367	850
Description of Dust		Large traces of grey dust matter	Traces of grey dust matter with the presence of organic material	Large traces of grey dust matter with the presence of plant & organic material
No. of Days Exposed		30	30	30

Appendix B – Dust Monitoring Locations

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DISPERSION MODELLING ASSESSMENT OF CLASSICAL AIR POLLUTANTS FROM NAMED EMISSION POINT LOCATED IN REHAB GLASSCO LTD, OBERSTOWN INDUSTRIAL PARK, NAAS, CO. KILDARE.

PERFORMED BY ODOUR MONITORING IRELAND ON THE BEHALF OF AXIS ENVIRONMENTAL LTD.

REPORT PREPARED BY:	Dr. Brian Sheridan
REPORT VERSION:	Document Ver.1
ATTENTION:	Mr. Mark McGarry
DATE:	21st August 2013
REPORT NUMBER:	2013848(1)

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Document Amendment Record

Client: ***Axis Environmental Ltd***

Title: Dispersion modelling assessment of classical air pollutants from named emission point located in Rehab Glassco Ltd, Oberstown Industrial Park, Naas, Co. Kildare.

Project Number: 2013848(1)			**DOCUMENT REFERENCE:** Dispersion modelling assessment of classical air pollutants from named emission point located in Rehab Glassco Ltd, Oberstown Industrial Park, Naas, Co. Kildare.		
2013848(1)	Document for review	B.A.S.	JMC	B.A.S	21/08/2013
Revision	**Purpose/Description**	**Originated**	**Checked**	**Authorised**	**Date**

EXECUTIVE SUMMARY

Odour Monitoring Ireland was commissioned by Axis Environmental Ltd to perform a classical air pollutants air quality dispersion modelling assessment of the existing dryer process operations located in Rehab Glassco Ltd, Oberstown Industrial Park, Naas, Co. Kildare. Proposed emission limit values based on actual measurements for Volume flow, Carbon monoxide, Oxides of nitrogen, Sulphur dioxide, Total particulates and Total organic carbon on emission point glass dryer emission point was utilised in conjunction with source characteristics within the dispersion modelling assessment. This was used to assess compliance with SI180 of 2011 and Directive 2008/50/EC.

Dispersion modelling assessment was performed utilising AERMOD Prime (12060) dispersion model. Five years of hourly sequential meteorological data from Casement (2004 to 2008 inclusive) was used within the dispersion model (Worst case year 2004). The total mass limit emission rate of Carbon monoxide, Oxides of nitrogen, Sulphur dioxide, Total particulates and Total Organic Carbon was inputted with source characteristics for the existing operations into the dispersion model in order to assess compliance with SI180 of 2011 and 2008/50/EC CAFÉ directive on air quality.

The following conclusions are drawn from the study:

1. The assessment was carried out to provide information in line with relevant information for investigation of downwind impact from a facility.
2. Specific dispersion modelling was performed for Carbon monoxide, Oxides of nitrogen, Sulphur dioxide Particulate matter (Pm_{10} and $PM_{2.5}$) and Total organic carbon.
3. With regard to Carbon monoxide, the maximum GLC+Baseline at the worst case sensitive receptor at or beyond the facility boundary for Carbon monoxide is 494 µg/m^3 for the maximum 8-hour mean concentration at the 100th percentile. When combined predicted and baseline conditions are compared to the SI180 of 2011 and Directive 2008/50/EC, this is less than or equal to 4.94% of the impact criterion for emissions from the combined existing operations.
4. With regard to Oxides of nitrogen, the maximum GLC+Baseline at worst case sensitive receptor at or beyond the facility boundary for Oxides of nitrogen is 37 µg/m^3 for the maximum 1-hour mean concentration at the 99.79th percentile. When combined predicted and baseline conditions are compared to the SI180 of 2011 and Directive 2008/50/EC, this is less than or equal to 18.50% of the impact criterion for emissions from the combined existing operations. An annual average was also generated to allow comparison with the SI 180 of 2011 and Directive 2008/50/EC for Oxides of nitrogen. The maximum predicted annual average + baseline ground level concentration at worst case sensitive receptor for NO_2 is 11.40 µg/m^3. When compared, the annual average NO_2 air quality impact is less than or equal to 28.50% of the impact criterion for emissions from the combined existing operations.
5. With regards to Sulphur dioxide, the maximum GLC+Baseline at worst case sensitive receptors at or beyond the facility boundary for Sulphur dioxide is 61 and 36 µg/m^3 for the maximum 1 hr and 24-hour mean concentration at the 99.73th and 99.18th percentile. When combined predicted and baseline conditions are compared to the SI180 of 2011 and Directive 2008/50/EC, this is 17% and 29% of the impact criterion for emissions from the combined existing operations. An annual average was also generated to allow comparison with the SI 180 of 2011 and Directive 2008/50/EC for Sulphur dioxide. The maximum predicted annual average + baseline ground level concentration at worst case sensitive receptors at or beyond the facility boundary for SO_2 was 6.40 µg/m^3. When compared, the annual average SO_2 air quality impact is up to 32% of the impact criterion for emissions from the combined existing operations.
6. With regard to Total particulates as $PM_{10/2.5}$, the maximum GLC+Baseline at worst case sensitive receptors for Total particulates as PM_{10} is 26 µg/m^3 for the maximum 24-hour mean concentration at the 90.40th percentile. When combined predicted and baseline conditions are compared to the SI180 of 2011 and Directive 2008/50/EC, this is less than or equal to 52% of the impact criterion for emissions from the combined existing operations. An annual average was also generated to allow comparison with the SI 180 of 2011 and Directive 2008/50/EC for Total particulates as $PM1_{10}$ and

$PM_{2.5}$. The maximum predicted annual average + baseline ground level concentration at worst case sensitive receptors for PM_{10} and $PM_{2.5}$ is 17.40 and 12.40 µg/m^3, respectively. When compared, the annual average PM_{10} and $PM_{2.5}$ air quality impact is less than or equal to 44 and 50% of the impact criterion for emissions from the combined existing operations.

7. With regard to Total Organic Carbon as Benzene, the maximum GLC+Baseline at worst case sensitive receptors for TOC as Benzene is 3.90 µg/m^3 for the maximum annual average concentration. When combined predicted and baseline conditions are compared to the SI180 of 2011 and Directive 2008/50/EC, this is less than or equal to 78% of the impact criterion for emissions from the combined existing operations. Please note that it is assumed that all TOC is benzene which is not the case.

1. Introduction and scope

1.1 Introduction

Odour Monitoring Ireland was commissioned by Axis Environmental Ltd to perform a dispersion modelling assessment of existing air emissions from the glass drying process located in Rehab Glassco for Carbon monoxide, Oxides of nitrogen, Sulphur dioxide Total particulates and Total organic carbon which could potentially be emitted from the onsite glass dryer located in Oberstown Industrial Park, Naas, Co. Kildare.

The assessment allowed for the examination of proposed short and long term ground level concentrations (GLC's) of Carbon monoxide, Oxides of nitrogen, Sulphur dioxide, Total particulates and Total organic carbon as a result of existing operations located at the facility.

Predicted dispersion modelling GLC's were compared to regulatory / guideline ground level limit values for Carbon monoxide, Oxides of nitrogen, Sulphur dioxide Total particulates and Total organic carbon contained in SI180 of 2011 and Directive 2008/50/EC.

The materials and methods, results, discussion of results and conclusions are presented within this document.

1.2 Scope of the work

The main aims of the study included:

- Calculation of total mass emission rate of Carbon monoxide, Oxides of nitrogen, Sulphur dioxide, total particulates and Total organic carbon from the existing emission point A1-1 for use within a dispersion modelling assessment.
- Dispersion modelling assessment of Carbon monoxide, Oxides of nitrogen, Sulphur dioxide, Total particulates and Total organic carbon emission limit values in accordance with EPA guidance AG4.
- Assessment of whether the predicted ground level concentrations of Carbon monoxide, Oxides of nitrogen, Sulphur dioxide, Total particulates and Total organic carbon from the single emission point is in compliance with ground level concentration limit values at receptors in the vicinity of the facility (as taken from SI 180 of 2011 and Directive 2008/50/EC).

The approach adopted in this assessment is considered a worst-case investigation in respect of Carbon monoxide, Oxides of nitrogen, Sulphur dioxide, Total particulates and Total organic carbon emissions to the atmosphere from the existing operation of the emission point. These predictions are therefore most likely to over estimate the GLC that may actually occur for each modelled scenario. These assumptions are summarised and include:

Emissions to the atmosphere from the existing operations were assumed to occur 24 hours each day / 7 days per week, 365 days per year, 100% output for all sources.
Five years of hourly sequential meteorological data from Casement 2004 to 2008 inclusive was used in the modelling screen which will provide statistical significant results in terms of the short and long term assessment. The worst case year 2004 was used for data analysis. This is in keeping with current national and international recommendations (EPA Guidance AG4). In addition, AERMOD incorporates a meteorological pre-processor AERMET PRO. The AERMET PRO meteorological pre-processor requires the input of surface characteristics, including surface roughness (z0), Bowen Ratio and Albedo by sector and season, as well as hourly observations of wind speed, wind direction, cloud cover, and temperature. The values of Albedo, Bowen Ratio and surface roughness depend on land-use type (e.g., urban, cultivated land etc.) and vary with seasons and wind direction. The assessment of appropriate land-use type was carried out to a distance of 10km from the meteorological station for Bowen Ratio and Albedo and to a distance of 1km for surface roughness in line with USEPA recommendations.

- Maximum GLC's at receptors beyond the facility boundary + Background were compared with relevant air quality limits values.
- All emissions were assumed to occur at maximum potential emission concentration and mass emission rates for each scenario and were assumed to occur for 24 hours per day, 365 days per year.
- AERMOD Prime (12060) dispersion modelling was utilised throughout the assessment in order to provide the most conservative dispersion estimates.
- All building wake affects that could occur within the site were assessed within the dispersion model using the Prime algorithm and appropriate site maps.
- 10 m spaced topographical data was inputted into the model in order to take account of the rolling terrain in the vicinity of the site and to ensure receptor heights were appropriate.

2. Materials and methods

This section describes the materials and methods used throughout the dispersion modelling assessment.

2.1 Dispersion modelling assessment

2.1.1 Atmospheric dispersion modelling of air quality: What is dispersion modelling?

Any material discharged into the atmosphere is carried along by the wind and diluted by wind turbulence, which is always present in the atmosphere. This process has the effect of producing a plume of air that is roughly cone shaped with the apex towards the source and can be mathematically described by the Gaussian equation. Atmospheric dispersion modelling has been applied to the assessment and control of emissions for many years, originally using Gaussian form ISCST 3. Once the compound emission rate from the source is known, (g s^{-1}), the impact on the vicinity can be estimated. These models can effectively be used in three different ways:

- Firstly, to assess the dispersion of compounds;
- Secondly, in a "reverse" mode, to estimate the maximum compound emissions which can be permitted from a site in order to prevent air quality impact occurring;
- And thirdly, to determine which process is contributing greatest to the compound impact and estimate the amount of required abatement to reduce this impact to within acceptable levels (McIntyre et al. 2000).

In this latter mode, models have been employed for imposing emission limits on industrial processes, control systems and existing facilities and processes (Sheridan et al., 2002).

Any dispersion modelling approach will exhibit variability between the predicted values and the measured or observed values due to the natural randomness of the atmospheric environment. A model prediction can, at best, represent only the most likely outcome given the apparent environmental conditions at the time. Uncertainty depends on the completeness of the information used as input to the model as well as the knowledge of the atmospheric environment and the ability to represent that process mathematically. Good input information (emission rates, source parameters, meteorological data and land use characteristics) entered into a dispersion model that treats the atmospheric environment simplistically will produce equally uncertain results as poor information entered into a dispersion model that seeks to simulate the atmospheric environment in a robust manner. It is assumed in this discussion that pollutant emission rates are representative of maximum emission events, source parameters accurately define the point of release and surrounding structures, meteorological conditions define the local atmospheric environment and land use characteristics describe the surrounding natural environment. These conditions are employed within the dispersion modelling assessment therefore providing good confidence in the generated predicted exposure concentration values.

2.1.2 Atmospheric dispersion modelling of air quality: dispersion model selection

The AERMOD model was developed through a formal collaboration between the American Meteorological Society (AMS) and U.S. Environmental Protection Agency (U.S. EPA). AERMOD is a Gaussian plume model and replaced the ISC3 model in demonstrating compliance with the National Ambient Air Quality Standards (Porter et al., 2003) AERMIC (USEPA and AMS working group) is emphasizing development of a platform that includes air turbulence structure, scaling, and concepts; treatment of both surface and elevated sources; and simple and complex terrain. The modelling platform system has three main components: AERMOD, which is the air dispersion model; AERMET, a meteorological data pre-processor; and AERMAP, a terrain data pre-processor (Cora and Hung, 2003).

AERMOD is a Gaussian steady-state model which was developed with the main intention of superseding ISCST3 (NZME, 2002). The AERMOD modeling system is a significant departure from ISCST3 in that it is based on a theoretical understanding of the atmosphere rather than depend on empirical derived values. The dispersion environment is characterized by turbulence theory that defines convective (daytime) and stable (nocturnal) boundary layers instead of the stability categories in ISCST3. Dispersion coefficients derived from turbulence theories are not based on sampling data or a specific averaging period. AERMOD was especially designed to support the U.S. EPA's regulatory modeling programs (Porter at al., 2003)

Special features of AERMOD include its ability to treat the vertical in-homogeneity of the planetary boundary layer, special treatment of surface releases, irregularly-shaped area sources, a three plume model for the convective boundary layer, limitation of vertical mixing in the stable boundary layer, and fixing the reflecting surface at the stack base (Curran et al., 2006). A treatment of dispersion in the presence of intermediate and complex terrain is used that improves on that currently in use in ISCST3 and other models, yet without the complexity of the Complex Terrain Dispersion Model-Plus (CTDMPLUS) (Diosey et al., 2002).

Input data from stack emissions, and source characteristics were used to construct the basis of the modelling scenarios.

2.2 Air quality impact assessment criteria

The predicted air quality impact from the operation of the existing emission points for each scenario is compared to relevant air quality objectives and limits. Air quality standards and guidelines referenced in this report include:

- SI 180 of 2011 – Air Quality Standards Regulations 2011.
- EU limit values laid out in the Directive on Air Quality 2008/50/EC.

Air quality is judged relative to the relevant Air Quality Standards, which are concentrations of pollutants in the atmosphere, which achieve a certain standard of environmental quality. Air quality Standards are formulated on the basis of an assessment of the effects of the pollutant on public health and ecosystems.

In general terms, air quality standards have been framed in two categories, limit values and guideline values. Limit values are concentrations that cannot be exceeded and are based on WHO guidelines for the protection of human health. Guideline values have been established for long-term precautionary measures for the protection of human health and the environment. European legislation has also considered standard for the protection of vegetation and ecosystems.

The relevant air quality standards for the existing emission sources are presented in *Table 2.1*.

2.2.1 Air Quality Guidelines value for Classical air pollutants

Table 2.1 illustrates the guideline and limit values for classical air quality pollutants in Ireland.

Table 2.1. EU and Irish Limit values laid out in the SI 180 of 2011 and 2008/50/EC.

POLLUTANT	Objective			
	Concentration	**Maximum No. Of exceedences allowed**	**Exceedence expressed as percentile**	**Measured as**
Carbon monoxide (CO)	10 mg m^{-3}	None	100th percentile	Running 8 hour mean
Oxides of nitrogen (2008/50/EC and SI180 of 2011)	300 µg m^{-3} NO_2 200 µg m^{-3} NO_2 40 µg m^{-3} NO_2	18 times in a year 18 times in a year --	99.79th percentile 99.79th percentile --	1 hour mean 1 hour mean Annual mean
Sulphur dioxide	350 µg m^{-3} 125 µg m^{-3} 20 µg m^{-3}	24 times in a year 3 times in a year --	99.73th percentile 99.18th percentile --	1 hour mean 24 hour mean Annual mean and winter mean
Particulates (PM10) (2008/50/EC and SI180 of 2011)	50 µg m^{-3} 40 µg m^{-3} 20 µg m^{-3}	35 times in a year None None	90.40th percentile --	24 hour mean Annual mean Annual mean
Particulates (PM2.5) (2008/50/EC and SI180 of 2011)	25 µg m^{-3} – Stage 1 20 µg m^{-3} – Stage 2	None None	-- --	Annual mean Annual mean
TOC as benzene	5.0 µg m^{-3}	None	--	Annual mean

2.3 Existing Baseline Air Quality

The EPA has been monitoring national Air quality from a number of sites around the country. This information is available from the EPA's website. The values presented for Carbon monoxide, Oxides of Nitrogen Sulphur dioxide, Total particulates as $PM_{10,\ 2.5}$ and Benzene give an indication of expected imissions of these pollutants are listed in *Table 2.1*. *Table 2.2* illustrates the baseline data expected to be obtained from a zone D area for these classical air pollutants. The existing facility would be considered to be located in a Zone D area according to the EPA's classification of zones for air quality (www.epa.ie). Traffic and industrial related emissions would be low to low / medium.

Table 2.2. Baseline air quality data used to assess air quality impact criterion in a number of Zone D region.

Reference air quality data – Source identity	Annual average Carbon monoxide conc. (µg m^{-3})	Annual average Oxides of nitrogen conc. (µg m^{-3})	Annual average Sulphur dioxide Conc. (µg m^{-3})	Annual average Total particulates conc (µg m^{-3})	Annual average Benzene conc. (µg m^{-3})	Details
Castlebar	-	8	--	14	-	Measured 2011
Glashaboy Cork	-	9	--	-	-	Measured 2011
Kilkitt	-	3	3	9	-	Measured 2011
Shannon town - Clare	200	6	1	11	0.40	Measured 2011
Shannon Estuary	-	--	3	-	-	Measured 2011
Longford town	-	-	-	9 ($PM_{2.5}$)	-	Measured 2011
Claremorris	-	-	-	12 (6 $PM_{2.5}$)	-	Measured 2011

Notes: [1] denotes taken from Air quality in Ireland 2011 – Key indicators of ambient air quality, www.epa.ie.

2.4 Meteorological data

Five years of hourly sequential meteorological data was chosen for the modelling exercise (i.e. Casement 2004 to 2008 inclusive). A schematic wind rose and tabular cumulative wind speed and directions of all five years are presented in *Section 7*. All five years of met data was screened to provide more statistical significant result output from the dispersion model. The worst case year 2004 was used for data presentation. This is in keeping with national and international recommendations on quality assurance in operating dispersion models and will provide a worst case assessment of predicted ground level concentrations based on the input emission rate data. Surface roughness, Albedo and Bowen ratio were assessed and characterised around Casement met station for AERMET Pro processing.

2.5 Terrain data

Topography effects were not accounted for within the dispersion modelling assessment as terrain was considered simple in the vicinity of the site with no significant deviations in the topography relative to the overall stack height. In addition, maximum ground level concentrations were predicted within the site boundary thereby eliminating any effects that deviations in terrain could have on predicted ground level concentrations.

2.6 Building wake effects

Building wake effects are accounted for in modelling scenarios through the use of the Prime algorithm (i.e. **all** building features located within the facility were assessed and the effects of same on plume grounding and dispersion) as this can have a significant effect on the compound plume dispersion at short distances from the source and can significantly increase GLC's in close proximity to the facility. All building structures and stack heights and orientations were inputted into the dispersion model in order to allow for wake effects to be taken in to account in the calculations.

3. Results

This section describes the results obtained from the dispersion modelling assessment of emissions from the existing operation located in Rehab Glassco Limited facility. All input data and source characteristics were developed in conjunction with engineering drawings and source characteristics for the emission point supplied by Axis Environmental Ltd.

3.1. Dispersion model input data – Source characteristics and input data

Table 3.1 illustrates the source characteristics utilised within the dispersion model for the named emission point. Grid reference location, stack height (A.G.L), maximum volume flow and temperature of the emission point(s) are presented within this table for reference purposes.

Table 3.1. Source characteristics for existing emission point – A1-1 – Glass drier stack

Emission point identity	A1-1 – Existing glass drier emission point
X cord(m)	286765.9
Y cord (m)	220378.9
Finish floor level (m)	78
Stack height (m)	7.50
Temp (K)	423.15
Efflux velocity (m)	22.07
Stack tip dia. dimensions (m)	0.50
Worst case building height (m)	8.34 (Drier building), there are other buildings higher but not next to the stack
Stack orientation (m)	Vertical
Volumetric airflow rate (Nm^3/hr dry ref)	9,000
Volumetric airflow rate (Am^3/hr wet)	15,593
Carbon monoxide flue gas conc. (mg/Nm^3)	300
Oxides of nitrogen flue gas conc. (mg/Nm^3)	50
Sulphur dioxide flue gas conc. (mg/Nm^3)	50
Total particulates flue gas conc. (mg/Nm^3)	50
Total organic carbon flue gas conc. (mg/Nm^3)	80
Carbon monoxide mass emission rate (g/s)	0.75
Oxides of nitrogen mass emission rate (g/s)	0.125
Sulphur dioxide mass emission rate (g/s)	0.125
Total particulates mass emission rate (g/s)	0.125
Total organic carbon mass emission rate (g/s)	0.20

3.2 Dispersion modelling assessment

AERMOD Prime (12060) was used to determine the overall ground level impact of the existing emissions from the named emission point operating 24/7/365 days per year. These computations give the relevant GLC's at each 25 and 150-meter X Y Cartesian grid receptor location that is predicted to be exceeded for the specific air quality impact criteria. Receptor elevations were established at 1.80 m height above ground (normal breathing zone). A total Cartesian receptors gird of 2,357 points was established within the dispersion model giving a fine and course grid coverage of 1.0 km sq and 14.10 km sq centred on the exhaust stack.

Five years of hourly sequential meteorological data from Casement (Casement 2004 to 2008 inclusive) was screened with the worst case year 2004 been used for results presentation. Source characteristics as detailed in *Table 3.1* including emission data contained in *Table 3.1*) was inputted into the dispersion model.

Various averaging intervals were chosen to allow direct comparison of predicted GLC's with the relevant pollutant air quality assessment criteria as outlined in *Table 2.1*. In particular, 1 hr, 8 hr, 24-hour, percentile and annual average GLC's of the pollutants were calculated at distances from the site. Relevant percentiles of these GLC's were also computed for comparison with the relevant Air Quality Standards.

For modelling classical air pollutants and in order to obtain the predicted environmental concentration (PEC), background data was added to the process emissions. In relation to the annual averages, the ambient background concentration was added directly to the process concentration. However, in relation to the short-term peak 1 hr concentrations, concentrations due to emissions from elevated sources cannot be combined in the same way. Guidance from the UK Environment Agency advises that an estimate of the maximum combined pollutant concentration can be obtained by adding the maximum short-term concentration due to emissions from the source to twice the annual mean background concentration.

In modelling air dispersion of NOx from combustion sources, the source term should be expressed as NO_2, e.g., NOx mass (expressed as NO_2). Some of the exhaust air is made up of NO while some is made up of NO_2. NO will be converted in the atmosphere to NO_2 but this will depend on a number of factors to include Ozone and VOC concentrations. In order to take account of this conversion the following screening can be performed.

Worse case scenario treatment

35% for short-term and 70% for long-term average concentration should be considered to assess compliance with the relevant air quality objective.

This is in accordance with recommendations from the Environmental Agency UK for the dispersion modelling of NO_2 emissions from combustion processes, www.environmentagency.gov.uk

3.3 Dispersion modelling scenarios

Ten distinct scenarios were assessed within the dispersion model. The output data was analysed to calculate the following:

Ref Scenario 1: Predicted Carbon monoxide emission contribution of all exhaust emission points to plume dispersal at the 100th percentile of an 8 hour average for an Carbon monoxide concentration of less than or equal to 200 µg/m^3 for 5 years of screened hourly sequential meteorological data (worst case year Casement 2004) (*see Figure 6.2*).

Ref Scenario 2: Predicted Oxides of nitrogen emission contribution of all exhaust emission points to plume dispersal at the 99.79th percentile of an 1 hour average for an Oxides of nitrogen concentration of less than or equal to 11 µg/m^3 for 5 years of screened hourly sequential meteorological data (worst case year Casement 2004) (*see Figure 6.3*).

Ref Scenario 3: Predicted Oxides of nitrogen emission contribution of all exhaust emission points to Oxides of nitrogen plume dispersal for the Annual average for an Oxides of nitrogen concentration of less than or equal to 2 µg/m^3 for 5 years of screened hourly sequential meteorological data (worst case year Casement 2004) (*see Figure 6.4*).

Ref Scenario 4: Predicted Sulphur dioxide emission contribution of all exhaust emission points to plume dispersal at the 99.73th percentile of an 1 hour average for an Sulphur dioxide concentration of less than or equal to 40 µg/m^3 for 5 years of screened hourly sequential meteorological data (worst case year Casement 2004) (*see Figure 6.5*).

Ref Scenario 5: Predicted Sulphur dioxide emission contribution of exhaust stack of all exhaust emission points to plume dispersal at the 99.18th percentile of an 24 hour average for an Sulphur dioxide concentration of less than or equal to 26 µg/m^3 for 5 years of screened hourly sequential meteorological data (worst case year Casement 2004) (*see Figure 6.6*).

Ref Scenario 6: Predicted Sulphur dioxide emission contribution of all exhaust emission points to Sulphur dioxide plume dispersal for the Annual average for an Sulphur dioxide concentration of less than or equal to 2.50 µg/m^3 for 5 years of screened hourly sequential meteorological data (worst case year Casement 2004) (*see Figure 6.7*).

Ref Scenario 7: Predicted Total particulates as PM10 emission contribution of all exhaust stack of exhaust emission points to plume dispersal at the 90.4th percentile of an 24 hour average for an Total particulates as PM10 concentration of less than or equal to 8.0 µg/m^3 for 5 years of screened hourly sequential meteorological data (worst case year Casement 2004) (*see Figure 6.8*).

Ref Scenario 8: Predicted Total particulates as PM_{10} emission contribution of all exhaust emission points to plume dispersal for the Annual average for an Total particulates as PM_{10} concentration of less than or equal to 2.50 µg/m^3 for 5 years of screened hourly sequential meteorological data (worst case year Casement 2004) (*see Figure 6.9*).

Ref Scenario 9: Predicted Total particulates as $PM_{2.5}$ emission contribution of all exhaust emission points to plume dispersal for the Annual average for an Total particulates as $PM_{2.5}$ concentration of less than or equal to

2.5 µg/m^3 for 5 years of screened hourly sequential meteorological data (worst case year Casement 2004) (*see Figure 6.10*).

Ref Scenario 10: Predicted TOC as benzene emission contribution of all exhaust emission points to plume dispersal for the Annual average for an TOC as benzene concentration of less than or equal to 4 µg/m^3 for 5 years of screened hourly sequential meteorological data (worst case year Casement 2004) (*see Figure 6.11*).

4. Results and Discussion of results

This section will describe the results obtained throughout the study.

AERMOD GIS Pro Prime (Ver. 12060) was used to determine the overall air quality impact of existing operations at Rehab Glassco Ltd, Oberstown Industrial Park, Naas, Co. Kildare. *Table 4.1* illustrates the tabular concentration results at each of the sensitive receptors in the vicinity of the facility.

Predicted GLC's presented within these tables will allow for comparison with SI 180 of 2011 and Directive 2008/50/EC guideline and limit values.

4.1 Assessment of air quality impacts for pollutants from named emission points.

Table 4.1 presents the comparison between model predictions at each sensitive receptor for air quality impacts for Carbon monoxide, Oxides of nitrogen, Sulphur dioxide, Total particulates and TOC as Benzene and the maximum percentage value of the air quality impact criterion.

Table 4.1. Predicated combined baseline and ground level concentration of named pollutant at each sensitive receptor and at or beyond the facility boundary.

Receptor identity	X coordinate (m)	Y coordinate (m)	Scen 1 (µg/m^3)	Scen 2 (µg/m^3)	Scen 3 (µg/m^3)	Scen 4 (µg/m^3)	Scen 5 (µg/m^3)	Scen 6 (µg/m^3)	Scen 7 (µg/m^3)	Scen 8 (µg/m^3)	Scen 9 (µg/m^3)	Scen 10 (µg/m^3)
R1	286532	220570	16.76	4.51	0.13	4.45	0.96	0.13	0.36	0.13	0.13	0.21
R2	286616	220551	22.17	6.76	0.20	6.65	1.59	0.20	0.56	0.20	0.20	0.32
R3	286620	220505	32.87	7.80	0.27	7.63	2.03	0.27	0.74	0.27	0.27	0.43
R4	286727	220568	25.39	6.81	0.31	6.46	1.74	0.31	0.81	0.31	0.31	0.49
R5	286777	220578	20.56	6.36	0.41	6.21	1.72	0.41	0.98	0.41	0.41	0.65
R6	286821	220579	22.76	6.12	0.59	5.93	2.16	0.59	1.42	0.59	0.59	0.94
R7	286638	220334	68.57	14.33	0.69	14.04	5.92	0.69	2.27	0.69	0.69	1.10
R8	286651	220238	44.15	8.12	0.28	7.79	3.33	0.28	0.57	0.28	0.28	0.45
R9	286887	220363	39.82	7.79	1.27	7.76	4.89	1.27	3.08	1.27	1.27	2.04
R10	286692	220177	29.18	5.38	0.18	5.15	1.47	0.18	0.33	0.18	0.18	0.28
R11	286826	220212	37.58	9.36	0.32	8.74	2.39	0.32	0.86	0.32	0.32	0.52
R12	286831	220180	31.54	8.14	0.25	7.73	1.90	0.25	0.63	0.25	0.25	0.40
R13	286825	220153	27.10	7.64	0.21	7.39	1.73	0.21	0.50	0.21	0.21	0.33
Max predicted value (µg/m^3)	-	-	68.57	14.33	1.27	14.04	5.92	1.27	3.08	1.27	1.27	2.04
Baseline value (µg/m^3)	-	-	200.00	18.00	9.00	6.00	3.00	3.00	14.00	14.00	9.00	0.40
Max predicted value at or beyond the facility boundary (µg/m^3)	-	-	294.00	19.00	2.40	55.00	33.00	3.40	12.00	3.40	3.40	3.50
Limit value (µg/m^3)	-	-	10,000	200	40	350	125	20	50	40	25	5
% value of impact criterion at or beyond the facility boundary	-	-	4.94	18.5	28.5	17.4	28.8	32	52	43.5	49.6	78
% value of impact criterion at receptor location	-	-	2.69	16.16	25.68	5.72	7.13	21.36	34.17	38.18	41.09	48.71

As can be observed in *Table 4.1*, the predicted maximum averaging ground level concentration and baseline concentration at each receptor location and at or beyond the facility boundary are within the guideline / limit value for each pollutant.

4.1.1 Carbon monoxide

The results for the potential air quality impact for dispersion modelling of Carbon monoxide based on the emission rates in *Table 3.1* are presented in *Table 4.1.* Results are presented for the maximum predicted percentile emission regime at each sensitive receptor and facility boundary. As can be observed in *Table 4.1,* the maximum GLC+Baseline predicted at the worst case sensitive receptor for Carbon monoxide is 494 µg/m^3 for the maximum 8-hour mean concentration at the 100th percentile. When combined predicted and baseline conditions are compared to the SI180 of 2011 and Directive 2008/50/EC, this is less than or equal to 4.94% of the impact criterion for emissions from the combined existing operations.

4.1.2 Oxides of nitrogen

The results for the potential air quality impact for dispersion modelling of Oxides of nitrogen based on the emission rates in *Table 3.1* are presented in *Table 4.1.* Results are presented for the maximum predicted percentile emission regime at each sensitive receptor. As can be observed in *Table 4.1,* the maximum GLC+Baseline at the worst case sensitive receptor for Oxides of nitrogen is 37 µg/m^3 for the maximum 1-hour mean concentration at the 99.79th percentile. When combined predicted and baseline conditions are compared to the SI180 of 2011 and Directive 2008/50/EC, this is less than or equal to 18.50% of the impact criterion for emissions from the combined existing operations.

An annual average was also generated to allow comparison with the SI 180 of 2011 and Directive 2008/50/EC for Oxides of nitrogen. The maximum predicted annual average + baseline ground level concentration at the worst case sensitive receptor for NO_2 is 11.40 µg/m^3. When compared, the annual average NO_2 air quality impact is less than or equal to 28.50% of the impact criterion for emissions from the combined existing operations.

4.1.3 Sulphur dioxide

The results for the potential air quality impact for dispersion modelling of Sulphur dioxide based on the emission rates in *Table 3.1* are presented in *Table 4.1.* Results are presented for the maximum predicted percentile emission regime. As can be observed in *Table 4.1,* the maximum GLC+Baseline at the worst case sensitive receptor for Sulphur dioxide is 61 and 36 µg/m^3 for the maximum 1 hr and 24-hour mean concentration at the 99.73th and 99.18th percentile. When combined predicted and baseline conditions are compared to the SI180 of 2011 and Directive 2008/50/EC, this is 17.40 and 28.80% of the impact criterion for emissions from the combined existing operations.

An annual average was also generated to allow comparison with the SI 180 of 2011 and Directive 2008/50/EC for Sulphur dioxide. The maximum predicted annual average + baseline ground level concentration at the nearest worst case sensitive receptor for SO_2 is 6.40 µg/m^3. When compared, the annual average SO_2 air quality impact is less than or equal to 32% of the impact criterion for emissions from the combined existing operations.

4.1.4 Total particulates as PM10 and PM2.5

The results for the potential air quality impact for dispersion modelling of Total particulates based on the emission rates in *Table 3.1* are presented in *Table 4.1.* Results are presented for the maximum predicted percentile emission regime. As can be observed in *Table 4.1,* the maximum GLC+Baseline at the worst case sensitive receptors for Total particulates as PM10 is 26 µg/m^3 for the maximum 24-hour mean concentration at the 90.40th percentile. When combined predicted and baseline conditions are compared to the SI180 of 2011 and Directive

2008/50/EC, this is less than or equal to 52% of the impact criterion for emissions from the combined existing operations.

An annual average was also generated to allow comparison with the SI 180 of 2011 and Directive 2008/50/EC for Total particulates as PM10 and PM2.5. The maximum predicted annual average + baseline ground level concentration at the nearest worst case sensitive receptor for Total particulates as PM10 and PM2.5 is 17.40 and 12.40 µg/m^3. When compared, the annual average Total particulates as PM10 and 2.5 air quality impact is less than or equal to 43.50 and 49.60% of the impact criterion for emissions from the combined existing operations.

4.1.5 TOC as benzene

The results for the potential air quality impact for dispersion modelling of Total organic carbon as benzene based on the emission rates in *Table 3.1* are presented in *Table 4.1.* Results are presented for the maximum predicted percentile emission regime. As can be observed in *Table 4.1,* the maximum GLC+Baseline at the worst case sensitive receptors for TOC as Benzene is 3.90 µg/m^3 for the maximum annual average concentration. When combined predicted and baseline conditions are compared to the SI180 of 2011 and Directive 2008/50/EC, this is less than or equal to 78% of the impact criterion for emissions from the combined existing operations. Please note this is assuming that all emissions are benzene which is not the case. Emissions of TOC are most likely due to the presence of un burnt fuel in the exhaust flume

5. Conclusions

Odour Monitoring Ireland was commissioned by Axis Environmental Ltd to perform a desktop dispersion modelling study in order to assess the potential Carbon monoxide, Oxides of nitrogen, Sulphur dioxide, Total particulates and TOC as Benzene air quality impact associated with existing operations at Rehab Glassco Limited facility located in Oberstown Industrial Park, Naas, Co. Kildare. Following a detailed desktop review and dispersion modelling assessment, it was demonstrated that no significant Carbon monoxide, Oxides of nitrogen, Sulphur dioxide, Total Particulates or TOC as Benzene impact will occur as a result of operation of existing facility.

The following conclusions are drawn from the study:

1. The assessment was carried out to provide information in line with relevant information for investigation of downwind impact from a facility.
2. Specific dispersion modelling was performed for Carbon monoxide, Oxides of nitrogen, Sulphur dioxide Particulate matter (Pm_{10} and $PM_{2.5}$) and Total organic carbon.
3. With regard to Carbon monoxide, the maximum GLC+Baseline at the worst case sensitive receptor at or beyond the facility boundary for Carbon monoxide is 494 µg/m^3 for the maximum 8-hour mean concentration at the 100th percentile. When combined predicted and baseline conditions are compared to the SI180 of 2011 and Directive 2008/50/EC, this is less than or equal to 4.94% of the impact criterion for emissions from the combined existing operations.
4. With regard to Oxides of nitrogen, the maximum GLC+Baseline at worst case sensitive receptor at or beyond the facility boundary for Oxides of nitrogen is 37 µg/m^3 for the maximum 1-hour mean concentration at the 99.79th percentile. When combined predicted and baseline conditions are compared to the SI180 of 2011 and Directive 2008/50/EC, this is less than or equal to 18.50% of the impact criterion for emissions from the combined existing operations. An annual average was also generated to allow comparison with the SI 180 of 2011 and Directive 2008/50/EC for Oxides of nitrogen. The maximum predicted annual average + baseline ground level concentration at worst case sensitive receptor for NO_2 is 11.40 µg/m^3. When compared, the annual average NO_2 air quality impact is less than or equal to 28.50% of the impact criterion for emissions from the combined existing operations.
5. With regards to Sulphur dioxide, the maximum GLC+Baseline at worst case sensitive receptors at or beyond the facility boundary for Sulphur dioxide is 61 and 36 µg/m^3 for the maximum 1 hr and 24-hour mean concentration at the 99.73th and 99.18th percentile. When combined predicted and baseline conditions are compared to the SI180 of 2011 and Directive 2008/50/EC, this is 17% and 29% of the impact criterion for emissions from the combined existing operations. An annual average was also generated to allow comparison with the SI 180 of 2011 and Directive 2008/50/EC for Sulphur dioxide. The maximum predicted annual average + baseline ground level concentration at worst case sensitive receptors at or beyond the facility boundary for SO_2 was 6.40 µg/m^3. When compared, the annual average SO_2 air quality impact is up to 32% of the impact criterion for emissions from the combined existing operations.
6. With regard to Total particulates as $PM_{10/2.5}$, the maximum GLC+Baseline at worst case sensitive receptors for Total particulates as PM_{10} is 26 µg/m^3 for the maximum 24-hour mean concentration at the 90.40th percentile. When combined predicted and baseline conditions are compared to the SI180 of 2011 and Directive 2008/50/EC, this is less than or equal to 52% of the impact criterion for emissions from the combined existing operations. An annual average was also generated to allow comparison with the SI 180 of 2011 and Directive 2008/50/EC for Total particulates as $PM1_{10}$ and $PM_{2.5}$. The maximum predicted annual average + baseline ground level concentration at worst case sensitive receptors for PM_{10} and $PM_{2.5}$ is 17.40 and 12.40 µg/m^3, respectively. When compared, the annual average PM_{10} and $PM_{2.5}$ air quality impact is less than or equal to 44 and 50% of the impact criterion for emissions from the combined existing operations.
7. With regard to Total Organic Carbon as Benzene, the maximum GLC+Baseline at worst case sensitive receptors for TOC as Benzene is 3.90 µg/m^3 for the maximum annual average concentration. When combined predicted and baseline conditions are

compared to the SI180 of 2011 and Directive 2008/50/EC, this is less than or equal to 78% of the impact criterion for emissions from the combined existing operations. Please note that it is assumed that all TOC is benzene which is not the case.

6. *Appendix I* - Air dispersion modelling contour plots (Process contribution only).

These contour plots are for illustrative purposes only. The pollutant contour values were selected for illustrative purposes only to allow for graphical representation of dispersion from the identified source.

6.1 Site layout drawing and location of existing and proposed emission points.

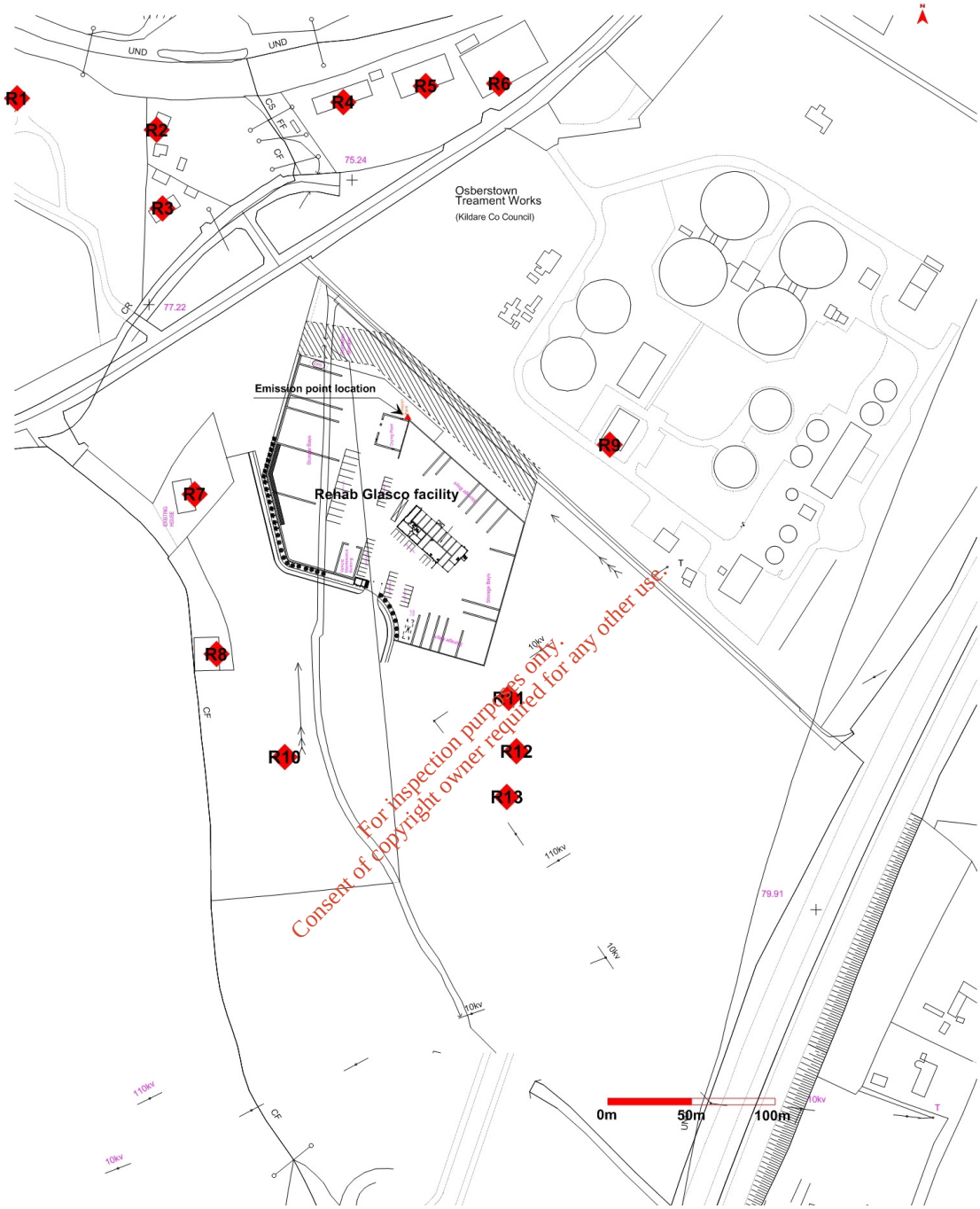

Figure 6.1. Plan view facility layout drawings for existing emission point and nearest receptor locations.

6.2 Carbon monoxide contour.

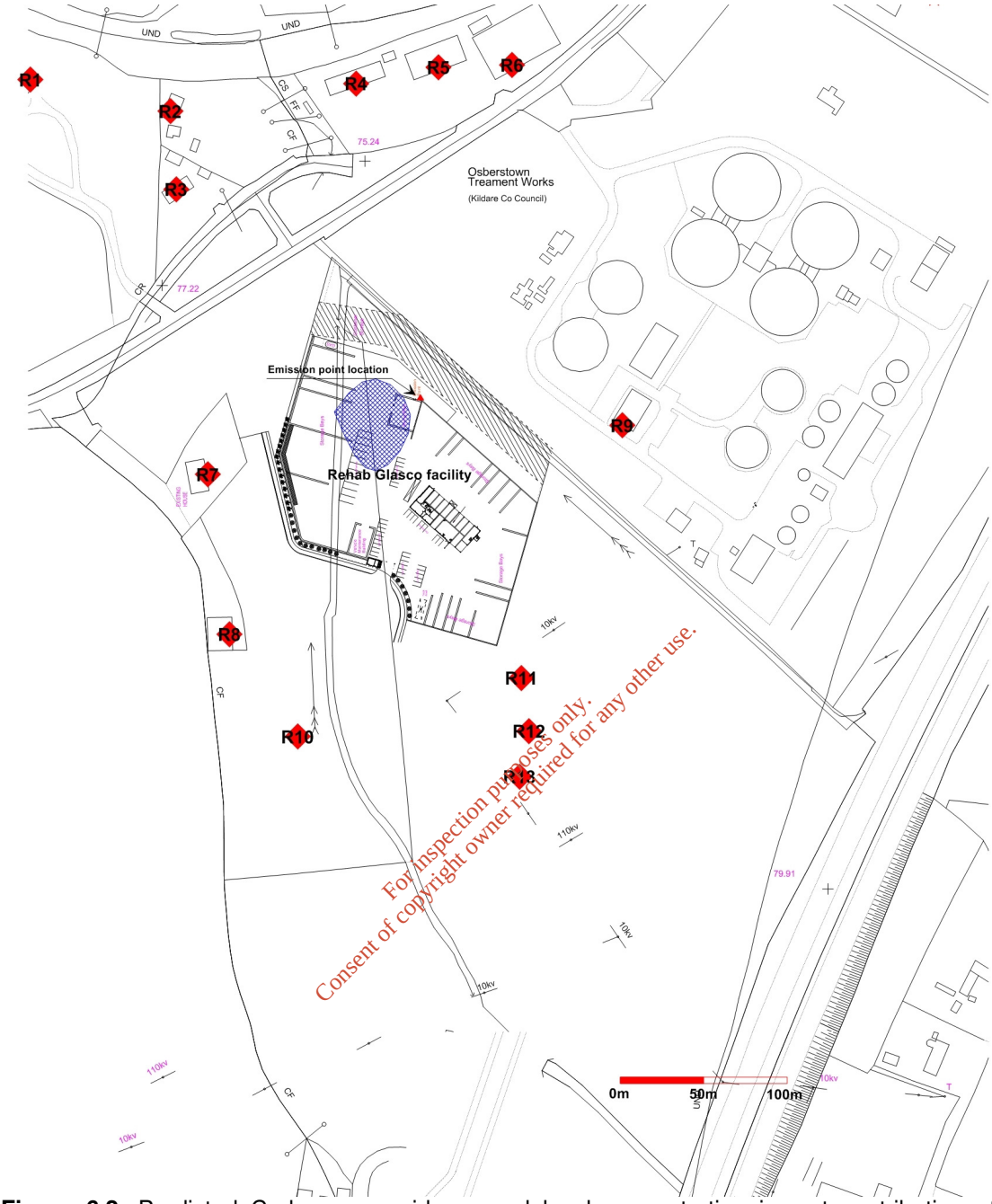

Figure 6.2. Predicted Carbon monoxide ground level concentration impact contribution of cumulative existing emissions from all named emission points for the 8 hr 100th %ile ground level concentration of ≤ 200 µg/m^3 (▬) for worst case meteorological year Casement 2004.

6.3 Oxides of nitrogen contours.

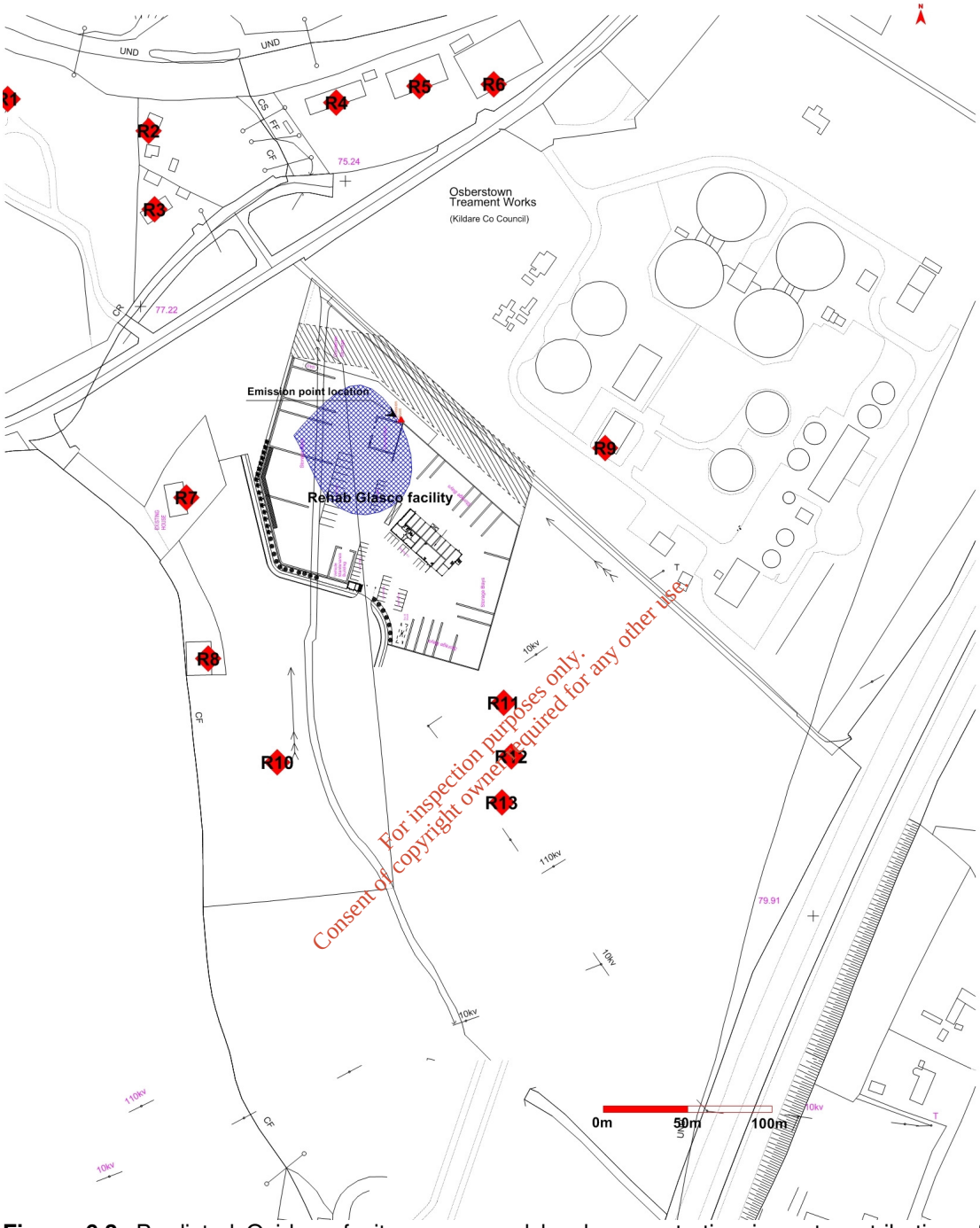

Figure 6.3. Predicted Oxides of nitrogen ground level concentration impact contribution of cumulative existing emissions from all named emission points for the 1 hr 99.79th %ile ground level concentration of ≤ 11 µg/m^3 (▬) for worst case meteorological year Casement 2004.

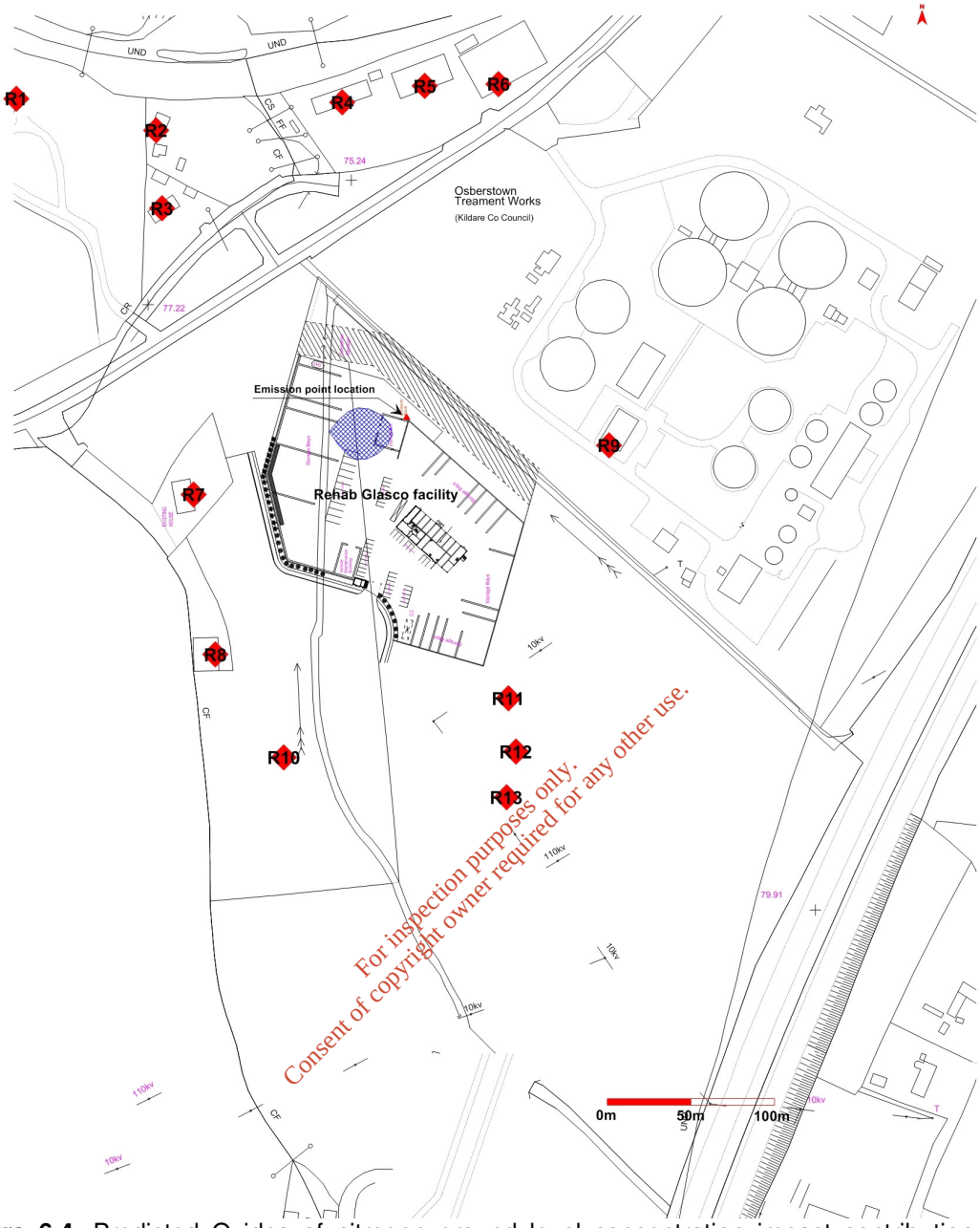

Figure 6.4. Predicted Oxides of nitrogen ground level concentration impact contribution of cumulative existing emissions from all named emission points for the Annual average ground level concentration of ≤ 2.0 µg/m^3 (▬) for worst case meteorological year Casement 2004.

6.4 Sulphur dioxide contours.

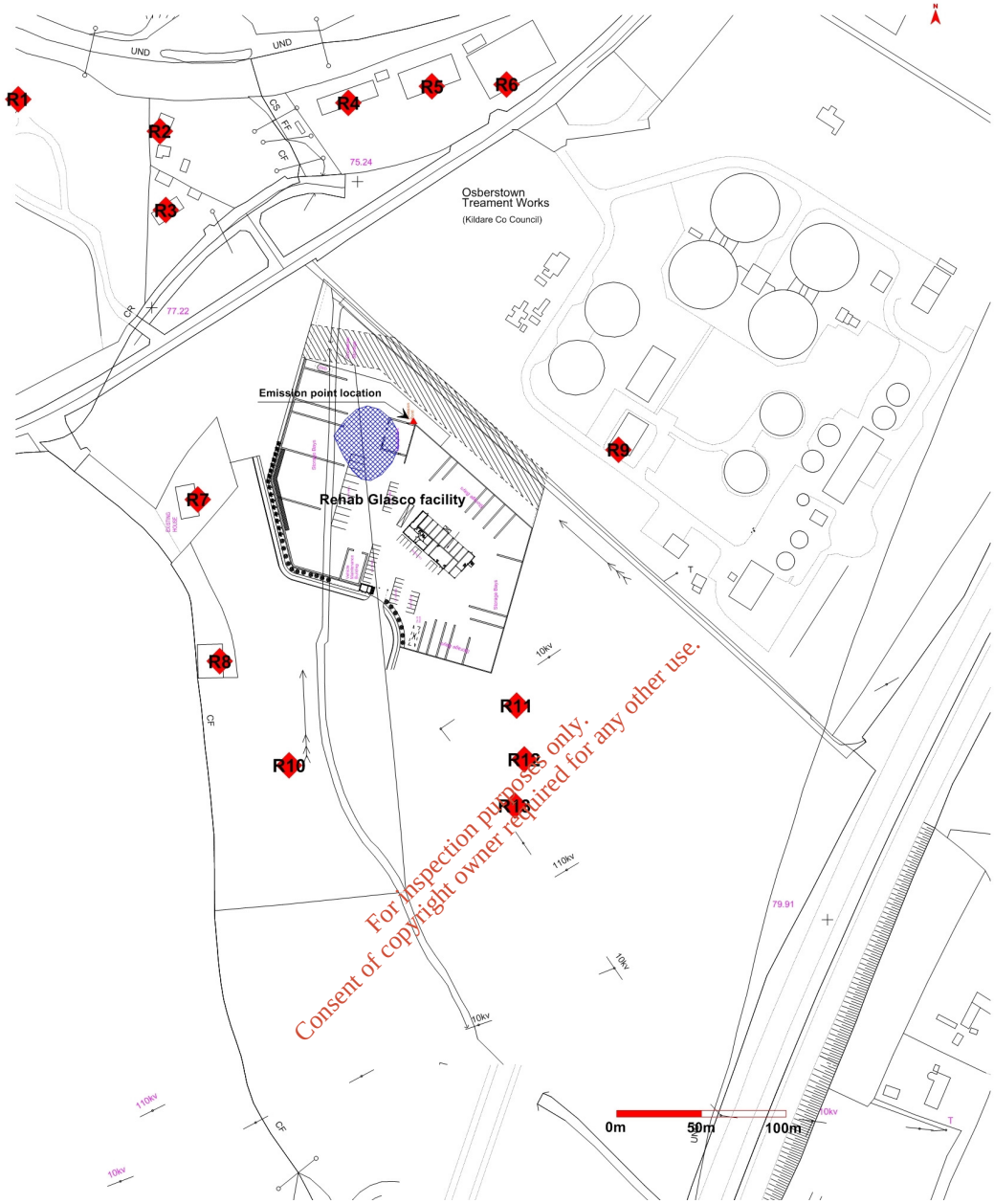

Figure 6.5. Predicted Sulphur dioxide ground level concentration impact contribution of cumulative existing emissions from all named emission points for the 1 hour 99.73th %ile ground level concentration of ≤ 40 µg/m^3 (▬) for worst case meteorological year Casement 2004.

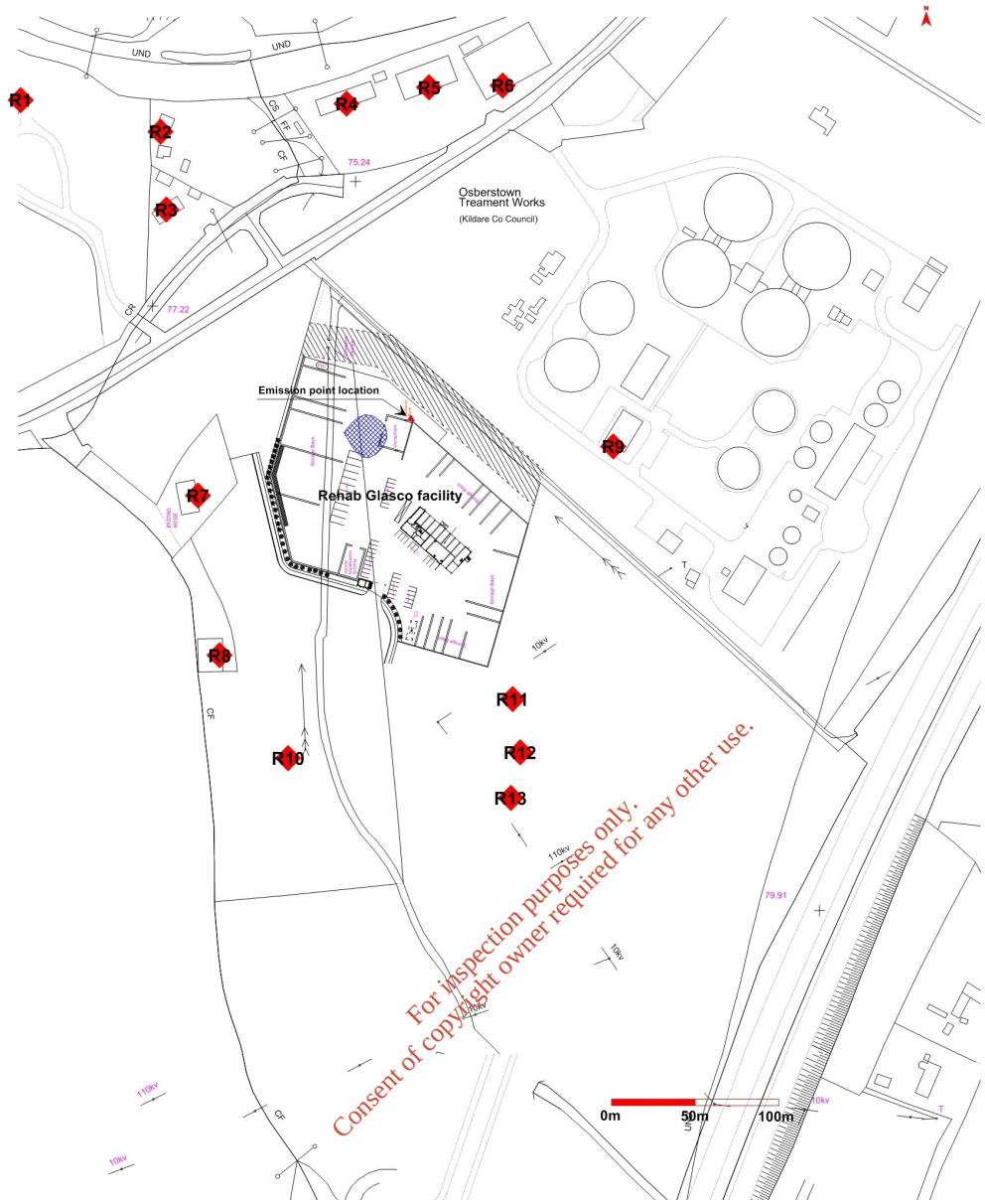

Figure 6.6. Predicted Sulphur dioxide ground level concentration impact contribution of cumulative existing emissions from all named emission points for the 24 hour 99.18th %ile ground level concentration of ≤ 26 µg/m^3 (▬) for worst case meteorological year Casement 2004.

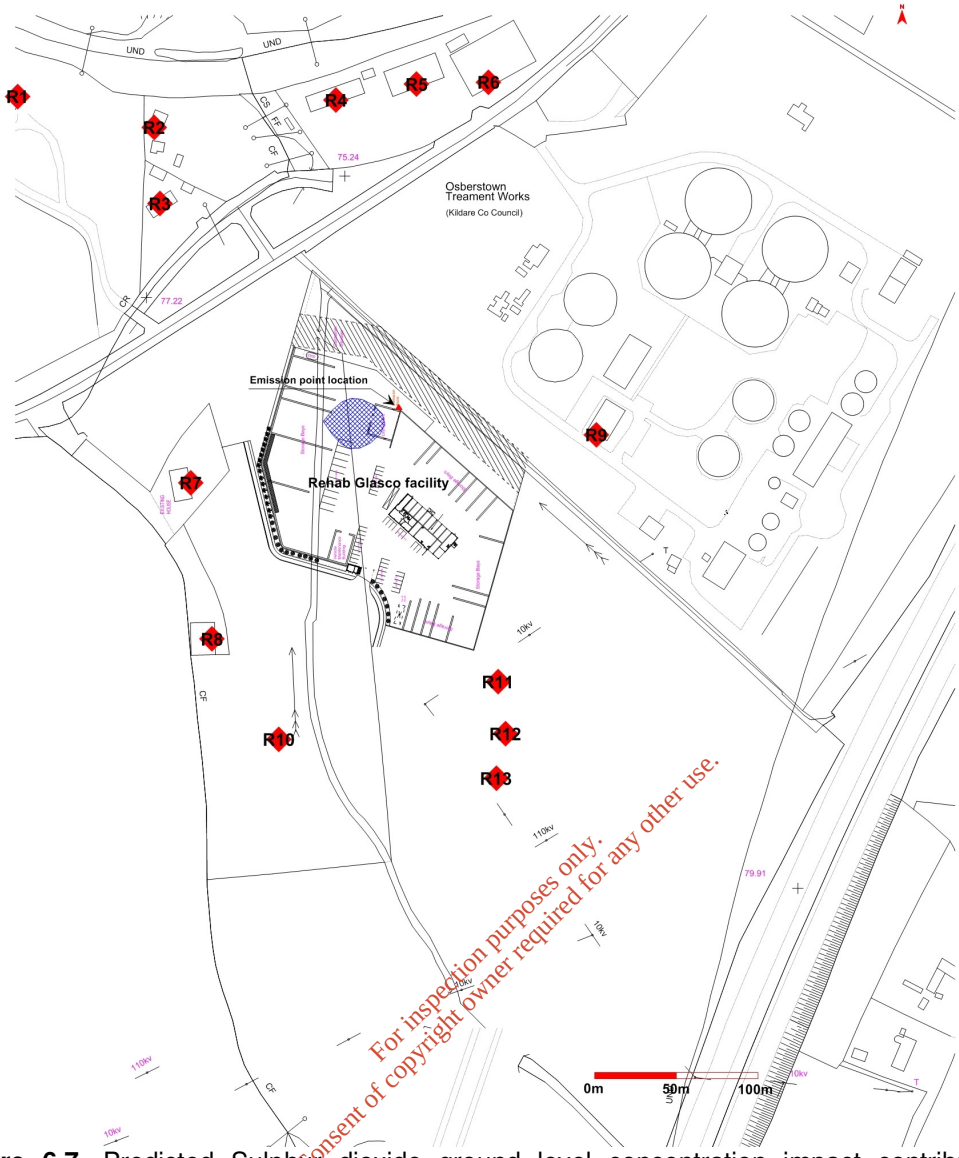

Figure 6.7. Predicted Sulphur dioxide ground level concentration impact contribution of cumulative existing emissions from all named emission points for the Annual average ground level concentration of ≤ 2.50 µg/m^3 (▬) for worst case meteorological year Casement 2004.

6.5 Total particulates contours.

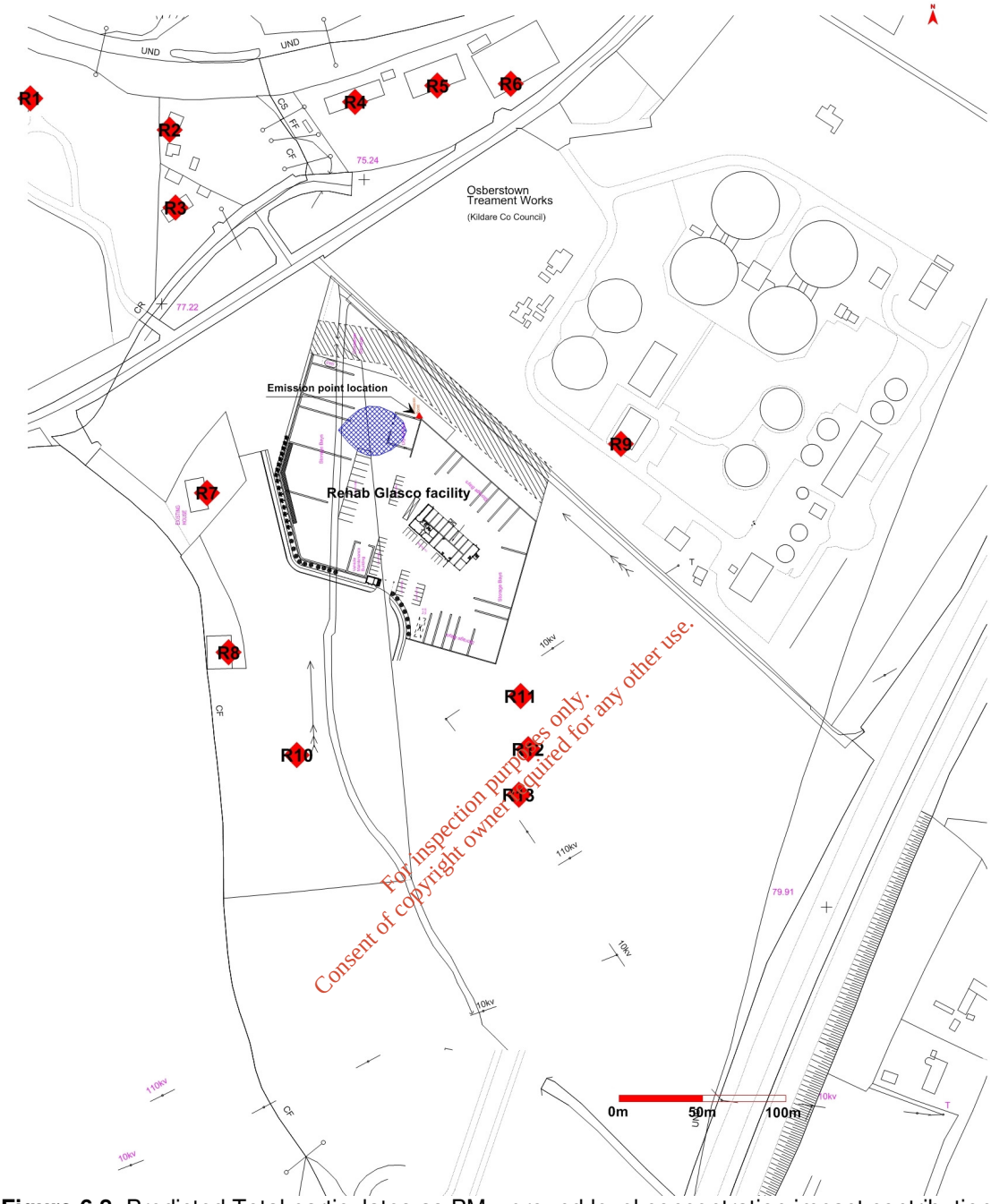

Figure 6.8. Predicted Total particulates as PM_{10} ground level concentration impact contribution of cumulative existing emissions from all named emission points for the 24 hour 90.40th %ile ground level concentration of ≤ 8 µg/m^3 (▬) for worst case meteorological year Casement 2004.

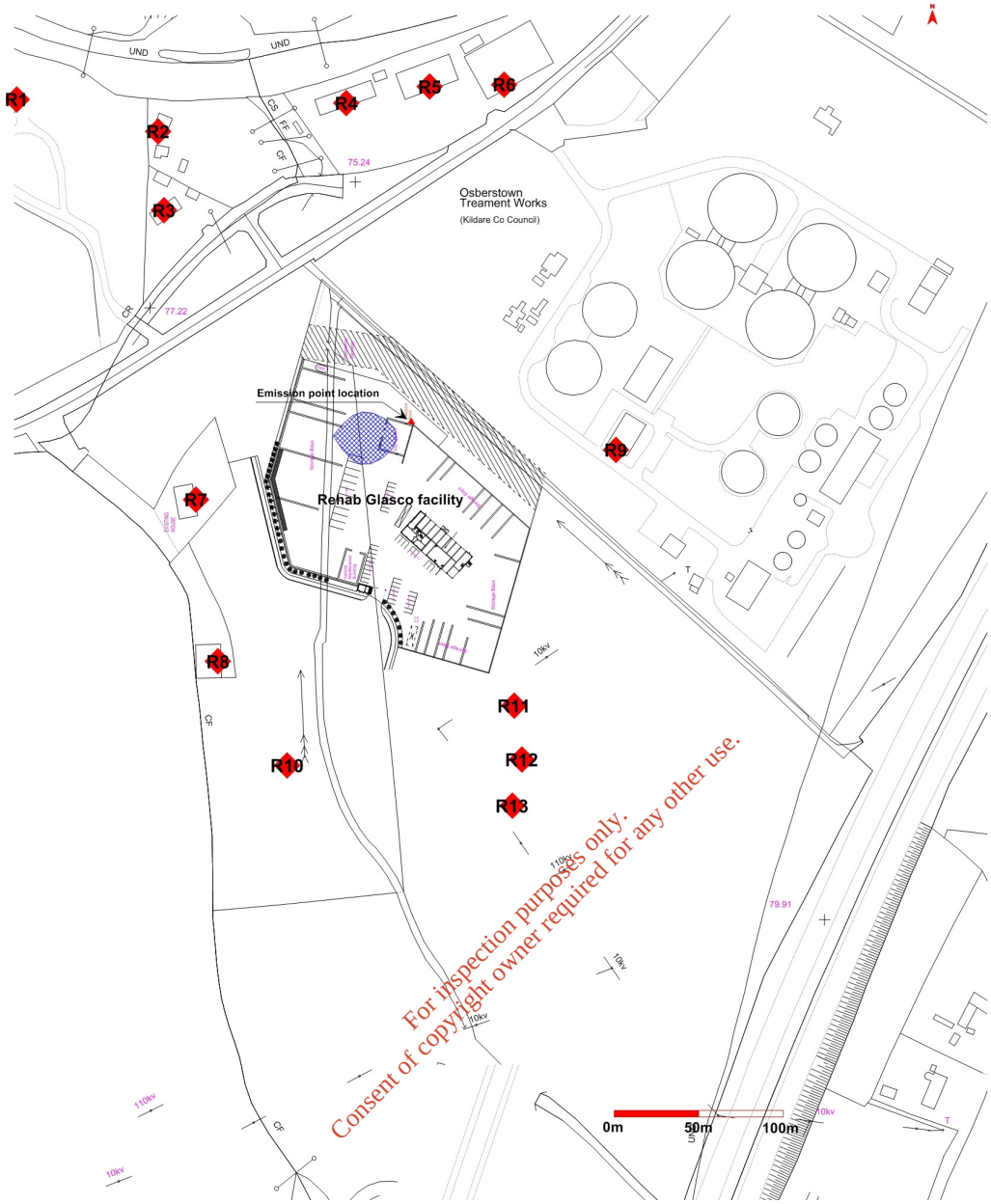

Figure 6.9. Predicted Total particulates as PM_{10} ground level concentration impact contribution of cumulative existing emissions from all named emission points for the Annual average ground level concentration of ≤ 2.50 µg/m^3 (▬) for worst case meteorological year Casement 2004.

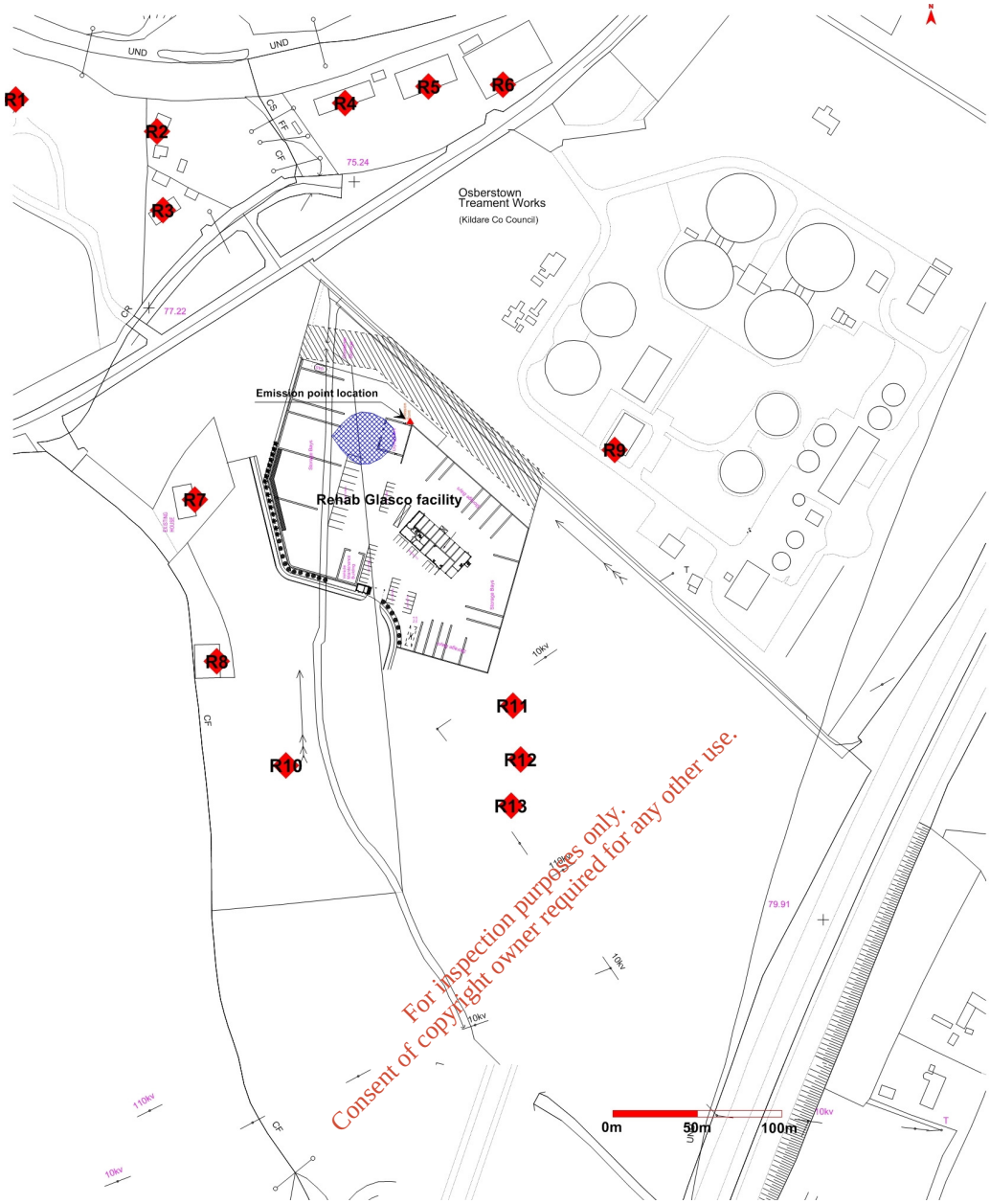

Figure 6.10. Predicted Total particulates as $PM_{2.5}$ ground level concentration impact contribution of cumulative existing emissions from all named emission points for the Annual average ground level concentration of ≤ 2.50 µg/m^3 ( ) for worst case meteorological year Casement 2004.

6.5 Total Organic Carbon as Benzene contour.

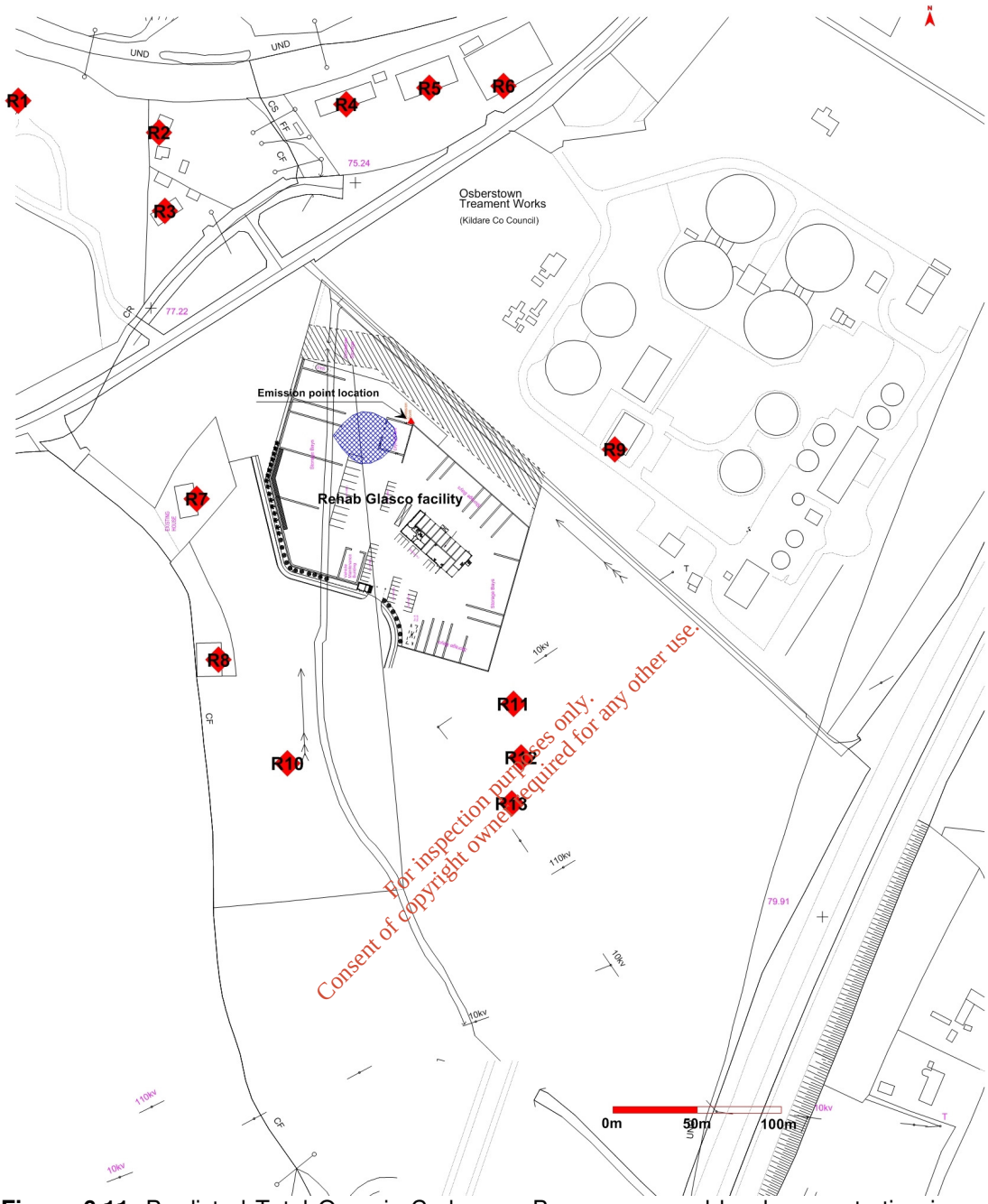

Figure 6.11. Predicted Total Organic Carbon as Benzene ground level concentration impact contribution of cumulative existing emissions from all named emission points for the Annual average ground level concentration of ≤ 4.0 µg/m^3 (▬) for worst case meteorological year Casement 2004.

7. *Appendix II* - Meteorological data used within the Dispersion modelling study.

Meteorological file Casement 2004 to 2008 inclusive

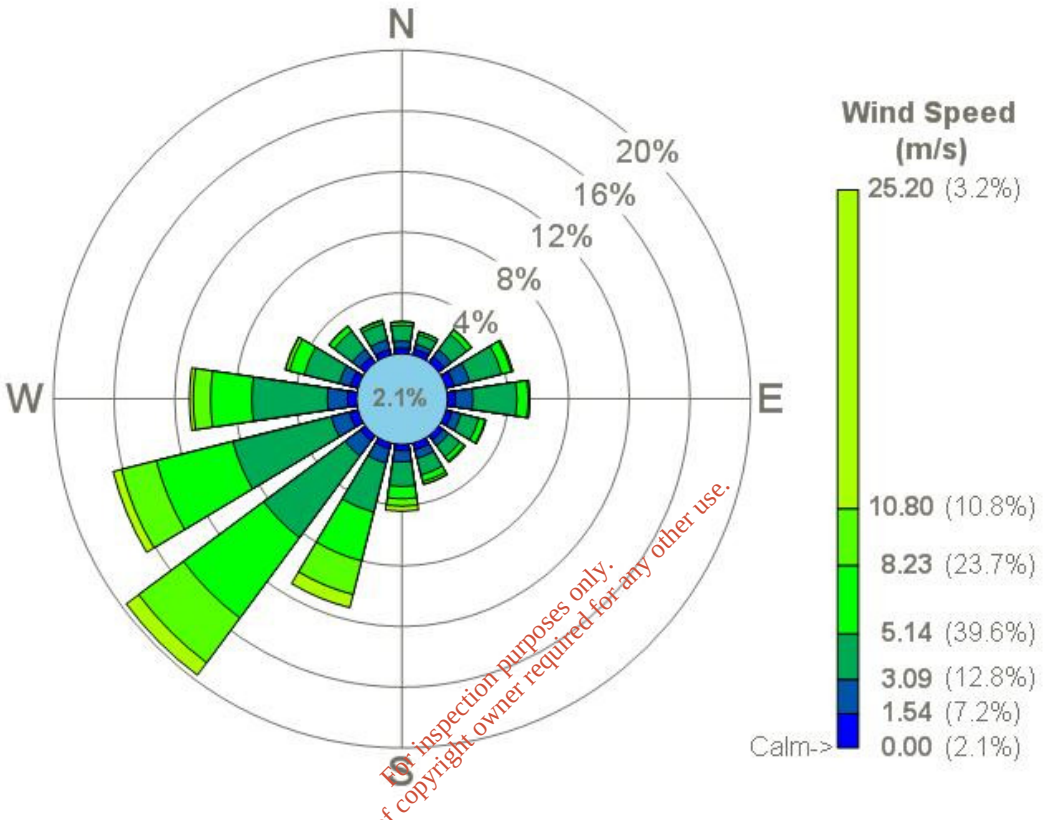

Figure 7.1. Schematic illustrating windrose for meteorological data used for atmospheric dispersion modelling – Casement 2004 to 2008 inclusive.

Table 7.1. Cumulative wind speed and direction for meteorological data used for atmospheric dispersion modelling Casement 2004 to 2008 inclusive.

Cumulative Wind Speed Categories							
Relative Direction	**> 1.54**	**>3.09**	**>5.14**	**>8.23**	**> 10.80**	**< 10.80**	**Total**
0	0.37	0.47	1.03	0.23	0.00	0.00	2.10
22.5	0.39	0.35	0.64	0.20	0.01	0.00	1.58
45	0.47	0.58	1.27	0.37	0.03	0.00	2.72
67.5	0.54	1.06	2.18	0.66	0.10	0.00	4.54
90	0.52	1.15	2.91	0.74	0.10	0.01	5.44
112.5	0.40	0.61	1.21	0.43	0.05	0.01	2.72
135	0.37	0.46	0.93	0.33	0.10	0.02	2.20
157.5	0.46	0.58	1.12	0.45	0.18	0.03	2.82
180	0.41	0.74	1.62	0.81	0.48	0.34	4.40
202.5	0.38	0.98	3.33	3.31	2.29	0.90	11.19
225	0.43	1.24	6.69	6.60	3.68	1.02	19.66
247.5	0.58	1.24	6.68	5.22	2.37	0.57	16.66
270	0.60	1.33	4.98	2.73	1.14	0.26	11.04
292.5	0.51	0.76	2.38	1.01	0.26	0.04	4.96
315	0.45	0.63	1.50	0.40	0.03	0.00	3.01
337.5	0.38	0.64	1.09	0.21	0.03	0.00	2.37
Total	**7.24**	**12.83**	**39.58**	**23.70**	**10.85**	**3.20**	**97.40**
Calms	**--**	**-**	**-**	**-**	**-**	**-**	**2.12**
Missing	**-**	**-**	**-**	**-**	**-**	**-**	**0.48**
Total	**-**	**-**	**-**	**-**	**-**	**-**	**100.00**

8. *Appendix III* - Checklist for EPA requirements for air dispersion modelling reporting

Table 8.1. EPA checklist as taken from their air dispersion modelling requirements report.

Item	Yes/No	Reason for omission/Notes
Location map	Section 6	-
Site plan	Section 6	-
List of pollutants modelled and relevant air quality guidelines	Yes	-
Details of modelled scenarios	Yes	-
Model description and justification	Yes	-
Special model treatments used	Yes	-
Table of emission parameters used	Yes	-
Details of modelled domain and receptors	Yes	-
Details of meteorological data used (including origin) and justification	Yes	-
Details of terrain treatment	Yes	-
Details of building treatment	Yes	-
Details of modelled wet/dry deposition	N/A	-
Sensitivity analysis	N/A	Five years of hourly sequential data used from nearest valid met station-Casement 2004 to 2008 inclusive. Worst case year was Year 2004.
Assessment of impacts	Yes	Pollutant emissions assessment from process identified.
Model input files	No	DVD can be sent upon request. Files are a total of 4.60 GB in size.

Rehab Glassco Ltd.

Surface Water Discharge Monitoring Report for Glass and Can Recycling Facility (W0279-01/WFP-KE-08-0357-01)

August 2013

patel tonra ltd
environmental solutions

a | patel tonra ltd, 3f fingal bay business park, balbriggan, co. dublin, ireland
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patel tonra ltd
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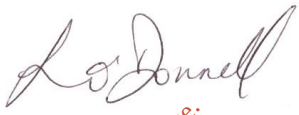
Report Issue Form

IF-11B
Revision: 02 (21st July 2011)

Client Name:	Rehab Glassco Ltd.
Client Address:	Unit 4, Osberstown Industrial Park, Caragh Road, Naas, Co. Kildare, Ireland
Report Title:	Surface Water Discharge Monitoring Report for Glass and Can Recycling Facility (W0279-01/WFP-KE-08-0357-01)
Project Code:	RG0201

Project Manager (Name):	Louise O'Donnell
Project Manager (Sign):	
Project Manager (Date):	9th August 2013

Approved by Project Director (Name):	Vip Patel
Approved by Project Director (Sign):	
Approved by Project Director (Date):	9th August 2013

Issue No.	Date	Status
01	09/08/2013	Final version; issue to Client; submit to EPA.
02	13/08/2013	Edits re. notation for SW-1 and SW-2; clarification of drainage arrangements.

Notes/Comments:

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2.0 Results 4
3.0 Discussion/Conclusion 5

Appendices

Appendix 1: Field Monitoring Records
Appendix 2: Calibration Records for pH/Conductivity/DO meters
Appendix 3: Chain of Custody Records
Appendix 4: Laboratory Results

Figures

Figure 1: Monitoring Locations Drawing

Executive Summary

1. Rehab Glassco Ltd. (also referred to as 'Rehab Glassco' hereinafter) operates a glass and can recycling facility at Unit 4, Osberstown Industrial Park, Caragh Road, Naas, Co. Kildare.

2. The facility currently operates under Kildare County Council Waste Facility Permit No. WFP-KE-08-0357-01. On the basis of increased tonnage inputs in 2011, it was deemed necessary to make an application to the Environmental Protection Agency (EPA) for a Waste Licence. An application for a Waste Licence was lodged with the EPA on 26th July 2011. The EPA reference number is W0279-01.

3. Monitoring of surface water discharge at Rehab Glassco was carried out by Patel Tonra Ltd on the 15th July 2013 (Quarter 3, 2013) for the purpose of reporting to Kildare County Council (under WFP-KE-08-0357-01) and the EPA (under Waste Licence Application W0279-01).

4. There were no exceedances of Emission Limit Values specified in Waste Facility Permit WFP-KE-08-0357-01.

5. This report (**Chapter 3**) makes recommendations in relation to: (i) ongoing/future monitoring of surface water discharge; and (ii) screening for a wider range of parameters.

1.0 Introduction

1.1 Background

1.1.1 Rehab Glassco Ltd. (also referred to as 'Rehab Glassco' hereinafter) operates a glass and can recycling facility at Unit 4, Osberstown Industrial Park, Caragh Road, Naas, Co. Kildare.

1.1.2 The facility currently operates under a Waste Facility Permit (register number WFP-KE-08-0357-01) issued by Kildare County Council in 2008. On the basis of increased tonnage inputs in 2011, it was deemed necessary to make an application to the Environmental Protection Agency (EPA) for a Waste Licence. An application for a Waste Licence was lodged with the EPA on 26th July 2011. The EPA reference number is W0279-01.

1.1.3 Patel Tonra Ltd., Environmental Solutions was commissioned by Rehab Glassco Ltd. to undertake sampling, analysis and reporting of emissions to surface water at the facility, to meet the requirements of Kildare County Council and the EPA.

1.2 Monitoring Locations

1.2.1 The surface water discharge monitoring locations are listed in **Table 1.1** (see **Figure 1**).

Table 1.1: Location of surface water discharge monitoring locations at Rehab Glassco

Monitoring Ref.	Description
SW-1	The source of the sample is discharge from Interceptor#1. The interceptor at this location receives input drainage from the western part of site. This represents the original site area, prior to the extension of the site in 2009. Accessed via ground-level manhole; located to the northern side of the Drying Plant.
SW-2	The source of the sample is discharge from Interceptor#2 (prior to entering the underground attenuation pond). The interceptor at this location receives input drainage from the eastern part of site. This represents the extended site area (2009). Accessed via ground-level manhole; adjacent input material stockpiles.

1.3 Sampling Personnel

1.3.1 Sampling was carried out by Louise O'Donnell (BSc(Hons), MSc, MCIWM) of Patel Tonra Ltd. on the 15th July 2013.

1.4 Sampling Methodology

1.4.1 Grab samples were taken from each monitoring location.

1.4.2 Conductivity, pH, dissolved oxygen and temperature were measured *in situ*. Field monitoring results are attached in **Appendix 1**. The meter was calibrated before use; please see the calibration records in **Appendix 2**.

1.4.3 All samples were returned to the laboratory and appropriately stored at 4°C according to standard sampling techniques.

1.5 Laboratory Details

1.5.1 Analysis of water samples was conducted by Jones Environmental Laboratory. Jones Environmental Laboratory are UKAS accredited. Chain of Custody documentation is included in **Appendix 3**. Laboratory results are included in **Appendix 4**.

1.6 Interpretation of Results

1.6.1 Interpretive reports have been prepared and reviewed by senior personnel at Patel Tonra Ltd.

1.6.2 Surface water results were examined with reference to:

- Emission limit values specified in Waste Facility Permit WFP-KE-08-0357-01
- European Communities Environmental Objectives (Surface Water) Regulations 2009, SI 272 of 2009 – referred to as the 'Surface Water Regulations 2009'
- European Communities (Quality of Salmonid Waters) Regulations, SI 293 of 1988 – referred to as the 'Salmonid Water Regulations'

1.6.3 EPA *Parameters of Water Quality – Interpretation and Standards (2001)* was referenced throughout the interpretation (however it was noted that additional/amended legislation may now be in force).

1.6.4 Where results exceeded limits prescribed in legislation or trigger levels, this is highlighted in the report and possible causes described.

2.0 Results

2.0.1 SW-1 and SW-2[1] monitoring results for Quarter 3, 2013 are included in **Table 2.1** below.

Table 2.1: Surface Water Discharge Monitoring Results, Q3, 2013

Parameter	Units	ELV[2]	Salmonid Water Regs	SW-1	SW-2
Temperature	degC	N/A	N/A	17.6	18.2
pH	pH units	N/A	6 – 9	7.8	8.1
Conductivity	mS/ cm	N/A	N/A	390	1890
Dissolved Oxygen	mg/l	N/A	N/A	1.0	1.4
Odour	N/A	N/A	N/A	None	None
Visual	N/A	N/A	N/A	Clear, small amount of black sediment	Brown-orange tint
Total Suspended Solids	mg/l	35	≤25	20	17
BOD	mg/l	25	≤5	7	6
Mineral Oil	mg/l	10	N/A	<0.01	<0.01

[1] Please note that sample IDs for SW-1 and SW-2 were incorrectly stated on the Chain of Custody (**Appendix 3**) and Laboratory Results (**Appendix 4**). Sample results are correctly referenced against SW-1 and SW-2 in **Table 2.1**, following clarification of drainage/surface water emission arrangements post-sampling.

[2] Emission Limit Value specified in Waste Facility Permit WFP-KE-08-0357-01

3.0 Discussion/Conclusion

3.0.1 Monitoring of surface water discharge at Rehab Glassco was carried out by Patel Tonra Ltd on the 15th July 2013 (Quarter 3, 2013) for the purpose of reporting to Kildare County Council (under WFP-KE-08-0357-01) and the EPA (under Waste Licence Application W0279-01).

3.0.2 Surface water discharge monitoring results were compared against Emission Limit Values specified in Waste Facility Permit WFP-KE-08-0357-01 and other relevant limit values specified in surface water regulations (detailed in Section **1.6**).

3.0.3 There were no exceedances of Emission Limit Values specified in Waste Facility Permit WFP-KE-08-0357-01.

3.0.4 BOD results marginally exceeded Salmonid Water Regulations limit values.

3.0.5 The conductivity reading was markedly high in SW-2; although it is noted that no limit value is specified for this parameter. Conductivity reflects the mineral salt content of water, and can be an indicator of the level of dissolved solids.

3.0.6 Previous results for monitoring at SW-1[3, 4] indicated elevated levels of BOD (240 mg/l) and suspended solids (183 mg/l) for sampling by Rehab Glassco in July 2012. Results for July 2013 showed a marked improvement.

3.0.7 The following is recommended:

- Ongoing spot sampling of surface water discharge on a quarterly basis (if results are consistently within acceptable limits, this frequency may be reduced to bi-annual or annual subject to agreement by the Regulator).
- As a once-off screening exercise, it is recommended that the next surface water discharge monitoring round should screen for a wider list of parameters[5]. If screening indicates an issue with any of these parameters, they should duly be included in the ongoing surface water discharge monitoring programme.

[3] Remedial Environmental Impact Statement (Patel Tonra Ltd., March 2013).

[4] In the Waste Licence Application (July 2011) and REIS, SW-1 was referred to as the combined emission to surface water. Drainage arrangements have since been clarified, such that there are two separate emissions to surface water from the site – now referred to as SW-1 (from Intercpetor#1) and SW-2 (from Interceptor#2). This is detailed in *EPA Waste Licence Application W0279-01: Response to Notice in accordance with Article 14(2)(b)(ii) of Waste Management (Licensing) Regulations*.

[5] See extract from EPA BAT Notes for Waste Transfer Facilities (Dec. 2011) in **Appendix 5**.

Appendix 1: Field Monitoring Records

Sampling Sheet for Water Samples

Q3, 2013

patel tonra ltd
environmental solutions

Client: Rehab Glassco	**Site:** Osberstown, Naas	**Project No.:** RG0201
Date: Mon., 15th July, 2013	**Time:** 3pm	**Consultant:** LOD

Sampling Point	Temp. (°C)	pH	Cond (µS/cm)	DO (mg/l)	Odour	Visual
SW-1[1]	17.6	7.8	390	1.0	None	Clear, small amount of black sediment (from pipework?)
SW-2[2]	18.2	8.1	1890	1.4	None	Brown-orange tint

[1] **OUTPUT FROM INTERCEPTOR#1 -** Original site, at side of Drying Plant. 3 manhole covers: 1st is input to 'interceptor'; 2nd is 'interceptor' pipe with sponge at base; 3rd is output. Sample taken from 3rd manhole. Direct sample.

[2] **OUTPUT FROM INTERCEPTOR#2 -** 'new' part of site. Sampled from manhole prior to underground attenuation pond. Sampled via baler.

Appendix 2: Calibration Records for pH/Conductivity/DO meters

CALIBRATION OF ENVIRONMENTAL MONITORING METERS

INSTRUMENT DETAILS

	pH	Conductivity	DO
Type:	pH meter	Electrical Conductivity with Temperature	Dissolved Oxygen meter
Make:	Eutech	Eutech	Jenway
Model:	Eco Testr pH2	EC Testr 11 Dual Range	970
ID/Serial No.:	109/03	1348404 058/01	20271
Supplier:	Lennox	Lennox	Lennox
Date of Purchase:	08/10/09	11/11/09	09/08/11

CALIBRATION STANDARD DETAILS

	pH	Conductivity	DO
Type:	pH 7.00 Buffer	Conductivity Standard	Zero Oxygen Solution
Standard:	pH 7.00[1]	1413 µS/cm[2]	0% DO
@ Temperature:	20°C	25°C	
Product Code:	SB-027-1611	SCW-028-1610	983030
Batch Code:	S090916A	S091119A	

[1]: +/- 0.01

[2]: +/- 1% (1398-1427µS/cm)

CALIBRATION DETAILS

	pH	Conductivity	DO
Completed By:	L. O'DONNELL		
Date:	8th July 2013		
Time:		8:50am.	
Reading:	pH 7.0	Cond. 1420	DO 0%
Temperature:	Temp. 20°.	Temp. 19°.	Temp. 20.
Sign:			

Patel Tonra Ltd., Environmental Solutions
3f Fingal Bay Business Park, Balbriggan, Co. Dublin
Tel: 01 8020520
Web: www.pateltonra.com

patel tonra ltd
environmental solutions

Appendix 3: Chain of Custody Records

Please note that sample IDs for SW-1 and SW-2 were incorrectly stated on the Chain of Custody (**Appendix 3**) and Laboratory Results (**Appendix 4**). Sample results are correctly referenced against SW-1 and SW-2 in **Table 2.1**, following clarification of drainage/surface water emission arrangements post-sampling.

CHAIN OF CUSTODY

CLIENT: PATEL TONRA LTD.	If Electronic File Required please select file format below	SAMPLER: LOD	
ADDRESS: 3F FINGAL BAY BUS. PK., BALBRIGGAN CO DUBLIN	EQUIS	MOBILE: 086 8333724	
PROJECT MANAGER (PM): L. O'DONNELL	CROSSTAB	EMAIL REPORT TO: louise.odonnell@pateltonra.com	
MOBILE: 086-8333724	CLIENT	cc REPORT TO:	
PROJECT ID: RG 0201	AGS (please also fill in AGS SAMP_TYPE & SAMP_REF below)	INVOICE TO: (if different to report)	
SITE: REHAB GLASSCO. NAAS		QUOTE NUMBER:	P.O No:

Jones Environmental Laboratory

Chain of Custody sheet page ..... of .....

TURNAROUND - please tick

10 DAY	✓	4 DAY		Other	
5 DAY		3 DAY			

All waters - tick for samples to be tested shaken or settled

FOR LABORATORY USE ONLY

AVERAGE COOL BOX TEMP.(if required):

SAMPLE RECIEPT CONDITION:

ANALYSIS REQUIRED including SUITE names

Asbestos risk

MATRIX:- S=Soil, GW=GroundWater, SW=SurfaceWater, L/E=Leachate/Effluent, OW=OtherWater, P=Product/Oil)

Sample ID	Shaken	Settled	S/GW/SW /L/E/OW/P	Date	Time	Depth in Metres	Preservation	Asbestos risk: High	Medium	Low	BOD	SUSPENDED SOLIDS	MIN. OILS
RG 0201 - (INTERCEPTOR DISCHARGE) SW-1	✓		SW	2/7/13	15	330					✓	✓	
RG0201 - SW-2	✓		"	"	"	"					✓	✓	

SOILS -We are MCERTS accredited for samples predominantly made up of sand, loam and clay (no other matrices). Please request an MCERTS report if required.

WATERS - we are accredited for surface and groundwaters (leachates and effluents are accredited for some tests, please see UKAS schedule). Please tick whether analysis is required on settled or shaken

RELINQUISHED BY:		RECIEVED BY:		METHOD of SHIPMENT
Name: L. O'Donnell	Date: 1/7/13	Name: delivered to DM.	Date:	Consignment note No:
Of: PL	Time: 4.35pm	Of:	Time:	Courier Company:

Health & Safety instructions including known hazards (eg suspected asbestos). Please let us know if samples are heavily contaminated, High PAHs expected, provide PID readings if available

Jones Environmental Forensics Ltd.
Unit 3 Deeside Point, Zone 3 Deeside Industrial Park, Deeside, CH5 2UA Tel: 0044 1244 833 780

JEL 46973

Appendix 4: Laboratory Results

Please note that sample IDs for SW-1 and SW-2 were incorrectly stated on the Chain of Custody (**Appendix 3**) and Laboratory Results (**Appendix 4**). Sample results are correctly referenced against SW-1 and SW-2 in **Table 2.1**, following clarification of drainage/surface water emission arrangements post-sampling.

Jones Environmental Laboratory

Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

Tel: +44 (0) 1244 833780
Fax: +44 (0) 1244 833781

Patel Tonra Ltd
3F Fingal Bay Business Park
Balbriggan
Co Dublin
Ireland

No.4225

Attention :	Louise O'Donnell
Date :	25th July, 2013
Your reference :	RG0201
Our reference :	Test Report 13/6491 Batch 1
Location :	REHAB GLASS CO NAAS
Date samples received :	16th July, 2013
Status :	Final report
Issue :	1

Two samples were received for analysis on 16th July, 2013. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Compiled By:

Phil Sommerton B.Sc
Project Manager

Bob Millward B.Sc FRSC
Principal Chemist

Jones Environmental Laboratory

Client Name: Patel Tonra Ltd

Reference: RG0201

Location: REHAB GLASS CO NAAS

Contact: Louise O'Donnell

JE Job No.: 13/6491

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle

$H=H_2SO_4$, Z=ZnAc, N=NaOH, $HN=HN0_3$

Please see attached notes for all abbreviations and acronyms

J E Sample No.	1-3	4									**LOD**	**Units**	**Method No.**
Sample ID	RG0201-SW1-(INTERCEPTOR DISCHARGE)	RG0201-SW2											
Depth													
COC No / misc													
Containers	V BOD G	P											
Sample Date	15/07/2013	15/07/2013											
Sample Type	Surface Water	Surface Water											
Batch Number	1	1											
Date of Receipt	16/07/2013	16/07/2013											
Mineral Oil #	<10	<10									<10	ug/l	TM5/PM30
BOD (Settled) #	6	7									<1	mg/l	TM58/PM0
Total Suspended Solids #	17	20									<10	mg/l	TM37/PM0

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 13/6491

SOILS

Please note we are only MCERTS accredited for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. If we are instructed to keep samples, a storage charge of £1 (1.5 Euros) per sample per month will be applied until we are asked to dispose of them.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

WATERS

Please note we are not a Drinking Water Inspectorate (DWI) Approved Laboratory . It is important that detection limits are carefully considered when requesting water analysis.

UKAS accreditation applies to surface water and groundwater and one other matrix which is analysis specific, any other liquids are outside our scope of accreditation

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

NOTE

Data is only accredited when all the requirements of our Quality System have been met. In certain circumstances where the requirements have not been met, the laboratory may issue the data in an interim report but will remove the accreditation, in this instance results should be considered indicative only. Where possible samples will be re-extracted and a final report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

ABBREVIATIONS and ACRONYMS USED

#	UKAS accredited.
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance.
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to a Jones Environmental approved laboratory.
CO	Suspected carry over
OC	Outside Calibration Range
NFD	No Fibres Detected

JE Job No 13/6491

Test Method No.	Description	Prep Method No. (if appropriate)	Description	UKAS	MCERTS (soils only)	Analysis done on As Received (AR) or Air Dried (AD)	Reported on dry weight basis
TM5	EPH by GC-FID, modified USEPA 8015	PM30	Magnetic stirrer extraction	Yes			
TM37	Total Suspended Solids- gravimetric	PM0	No Preparation	Yes			
TM58	BOD using DO meter	PM0	No Preparation	Yes			

Appendix 5: Extract from EPA BAT Notes for Waste Transfer Facilities (Dec. 2011) re. Discharges to Surface Water

6. BAT ASSOCIATED EMISSION LEVELS

6.1 EMISSION LEVELS FOR DISCHARGES TO WATER

The following table sets out emission levels that are achievable using BAT for wastewater treatment. However establishing emission limit values within a licence for direct discharges to surface water from wastewater treatment plant and storm water discharges must ensure that the quality of the receiving water is not impaired or that the current Environmental Quality Standards (EQS) are not exceeded.

Compliance with the Water Framework Directive (2000/60/EC) is required where relevant.

Table 6.1: BAT-Associated Emission Level for Direct Discharges to Surface Water *

Constituent Group or Parameter Note 1	Emission Levels	Percentage Reduction Note 3
pH	6 - 9	–
BOD_5 (at 20°C without nitrification)	25mg/l	>90%
Chemical Oxygen Demand (COD)	125mg/l	>75%
Suspended Solids	35mg/l	>90%
Total Ammonia (as N)	10mg/l	–
Total Nitrogen (as N) Note 2 & 4	15mg/l	>80%
Total Phosphorus (as P) Note 4	2mg/l	>80%
Metals	Note 5	–
Priority Substances (as per Water Framework Directive)	Note 5	–
Other	Note 5 & 6	–

* All values refer to daily averages based on a 24-hour flow proportional composite sample, except where stated to the contrary and for pH, which refers to continuous values. Levels apply to effluent prior to dilution by uncontaminated streams, e.g., storm water, cooling water, etc.

* Temperature measured downstream of a point of thermal discharge must not exceed the unaffected temperature by more than 1.5°C in salmonid waters and 3°C in cyprinid waters (Freshwater Fish Directive 79/659/EEC).

Note 1: Trigger levels may be put on surface water discharge from settling ponds for parameters such as pH, TOC and conductivity in an EPA licence.

Note 2: Total Nitrogen means the sum of Kjeldahl Nitrogen, Nitrate N and Nitrite N.

Note 3: Reduction in relation to influent load.

Note 4: Limits will depend on the sensitivity of the receiving waterbody.

Note 5: BAT associated emissions levels are highly dependent on production process, wastewater matrix and treatment. These parameters shall be considered on a site-specific basis when setting emission limit values.

Note 6: Any relevant polluting substances as specified in Schedule to S.I. No. 394 of 2004: EPA (Licensing) (Amendment) Regulations, 2004.

6.2 EMISSION LEVELS FOR DISCHARGES 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.

6.3 EMISSION LEVELS FOR DISCHARGES TO AIR

6.3.1 Establishing Emission Limit Values

Establishing emission limit values within a licence for discharges to air must ensure that the quality of the receiving environment is not impaired and that the current Air Quality Standards (AQS) are not exceeded. This will provide for the protection of health, vegetation and ecosystems.

6.3.2 Fugitive Air Emissions

Emissions to air from waste transfer stations and materials recovery facilities generally occur as *fugitive emissions* from vehicle and waste/materials movements on site.

Table 6.2: Fugitive Air Emissions

Constituent Group or Parameter	Concentration/Trigger Levels
Total Dust Deposition	240 - 350 mg/m^2/day

6.3.3 Odour Emissions

Activities at the installation shall be carried out in a manner such that emissions of odours do not result in significant impairment of, and/or significant interference with amenities or the environment beyond the installation boundary. For information on odour refer to the Environmental Protection Agency's publication *Odour impacts and odour emission control measures for intensive agriculture* (2001) and any other relevant guidance issued by the EPA.

Figure 1: Monitoring Locations Drawing

REV.	DATE.	AMENDMENT.	INITIALS.

CLIENT: REHAB GLASSCO

PROJECT:
EPA WASTE LICENCE APPLICATION
OSBERSTOWN BUSINESS PARK, NAAS.

DRAWING:
EXISTING DRAINAGE LAYOUT

SCALE.	DATE.	DRAWN BY.
1:1000	APRIL 2011	B.P.

DRAWING NO. WLA-06

REVISION NO.

DRAWING STATUS:	
PRELIMINARY	X
FOR INFORMATION	
FOR APPROVAL	
FOR CONSTRUCTION	

BRIAN PYPER AND ASSOCIATES
PROJECT DESIGN AND MANAGEMENT SERVICES
DASH HOUSE, 34 SHORE ROAD,
HOLYWOOD, CO. DOWN, BT18 9HX
TEL: 00 44 (0) 28 9039 3395 FAX: 00 44 (0) 28 9039 3396
E-MAIL: bpyper@gmail.com

0 10m 20m 30m 40m

N

HALVERSTOWN ROAD

EXISTING HOUSE

SITE 17

SITE 12

SITE 3

SITE 8

SITE 6&7

SMH CL=80.95 IL=79.50

SMH CL=80.30 IL=79.10

SMH CL=81.15 IL=76.65

SMH CL=80.32 IL=79.00

INTERCEPTOR#2

SW2

Rod. Eye CL=81.35 IL=80.20

SMH CL=80.80 IL=79.78

SMH CL=80.55 IL=79.58

Rod. Eye CL=80.20 IL=79.45

HYDRO-VALVE

CMH CL 80.30 IL 77.90

Rod. Eye CL=80.35 IL=79.60

1500 DIA. CULVERT

WAYLEAVE – NEWBRIDGE RISING MAIN

FMH CL 82.00 IL 79.65

SMH CL 81.10 IL 79.70

SMH CL 81.00 IL 79.50

INTERCEPTOR#1

SW1

SMH CL 81.00 IL 79.30

CL 81.00 IL 77.20

SILT TRAP

SMH CL 81.00 IL 80.05

SMH CL 81.00 IL 79.80

CMH CL 81.20 IL 78.10

300 DIA

375 DIA

225 DIA

150 DIA

RG

KEY:

- CMH — STORM CULVET / MANHOLE
- SMH — STORM DRAIN / MANHOLE
- FMH — FOUL SEWER / MANHOLE
- STORM DRAINAGE ATTENUATION (UNDERGROUND HYDRO CHAMBERS)
- RG — ROAD GULLEY
- DIRECTION OF SURFACE FALL

tank

tank

admin. building

Osberstown WWTW
(Kildare Co Co)

Engineering a Sustainable Future

ORS Consulting Engineers / ORS Building / Marlinstown Office Park / Mullingar, Co. Westmeath / Ireland

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Environmental Noise Survey

Rehab Glassco,
Unit 4 Oberstown Industrial Park,
Caragh Road,
Naas,
Co. Kildare

July 2013

Client	Revision	Date	Compiled	Checked	Approved
Rehab Glassco	D3	03/07/2013	DH	DC	
Unit 4 Oberstown Industrial Park, Caragh Road, Naas, Co. Kildare					

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0 Executive Summary

An Environmental noise survey was conducted on the 1st and 2nd of July 2103 at the Rehab Glassco facility at 1 noise sensitive location outside the boundary of the facility, the location of which is highlighted on the enclosed site layout drawing.

Noise arose on the site from the ingress and egress of vehicles, movement of plant about the site and process noise from the recycling plant. Other contributing sources included traffic movements on the local road, R409 and the M7 motorway. Noise arose from the adjacent site which included vehicle movements and truck engines running constant.

Noise levels were compared to those recommended limits as set out EPA document **Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)** which states that ambient/daily noise levels should not exceed 55dB LAeq, with evening noise levels not exceeding 50dB LAeq and night time noise levels not exceeding 45dB LAeq at noise sensitive locations.

Noise levels for Day and Evening Times at the Noise Sensitive Location are within acceptable limits as set out in NG4, however there is a slight exceedance during the night-time monitoring period which can be attributable to external noise sources which are discussed further in this report.

1 Scope

ORS Environmental Consultants were commissioned by Rehab Glassco to conduct a Daytime, evening and Night-time broadband; one-third octave noise for predetermined locations in Oberstown Industrial Park, Caragh Road, Naas, Co. Kildare. All tests were carried out during day-time, evening and night-time operations at the facility. Rehab Glassco is a facility which recycles glass products.

Monitoring at NSL 1 was carried out on the 1st and 2nd of July 2013, including day, evening and night-time monitoring.

2 Monitoring Locations

Environmental noise monitoring was carried out at one noise sensitive location (NSL 1). The survey was conducted when the plant was in full operation i.e. normal activities taking place, however with the drying plant only operating between the hours of 7am and 7pm. The hours of waste acceptance (the hours during which the facility accepts waste) are: Monday to Saturday (including bank holidays): 07:00 (7am) to 19:00 (7pm); Sunday: closed.

The hours of operation (the hours during which the facility is operational) are: Monday to Friday (including bank holidays): 24-hours; Saturday: 07:00 (7am) to 23:00 (11pm); Sunday: closed.

The monitoring locations are detailed below in Table 1 and presented in the attached map in Appendix B.

Table 1: Noise Monitoring Location

Monitoring Location	Description
NSL 1	This monitoring point is located to the North of the site, outside of the site next to the boundary to the nearest dwelling. The monitor was positioned facing the Rehab Glassco Facility.
	*All monitoring locations are located at least 2m from any reflective surfaces

3 Activities on Site

Activities which took place at the plant during the monitoring periods included the delivery of glass products to be recycled, running of primary machinery such as hoppers, crushers and dryers which are housed internally. Other activities on site included plant machinery (i.e. Fork-lifts & Loaders), operating around the yard.

4 Durations & Measurements of Surveying

The day-time monitoring was carried out between the daytime hours of 09:00 and 19.00 on the 1st July 2013. The evening and night-time monitoring was conducted on the 1st and 2nd July 2013 between the hours of 19:00 and 23:00 for evening measurements and between 23.00 and 02.00 for night time measurements. The following measurement was carried out at each location:

- Day, evening and Night-time Broadband measurements LAeq, LA10, and LA90, over a 15 minute period as set out in "**Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)"** as a minimum survey duration.
- 1/3 octave band frequency analysis.

5 Weather Conditions

While every effort was made to carry out the survey in accordance with the requirements of Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4), regarding weather conditions, it should be noted that this is not always possible.

Ideally, measurements should be taken in 'neutral' weather conditions. This means in the absence of wind and precipitation, and ideally in conditions of standard temperature and pressure. Clearly, these conditions very rarely apply. The noise monitor was fitted with a windshield throughout the survey. An average wind speed of less than 5m/sec is the preferred limit when noise measurements are being taken, with 7m/sec an upper limit. On the days in question the wind speed was within limits. In as far as possible, care was be taken to avoid measurements so close to objects as to give rise to wind-derived noises, e.g. trees, pylons, etc.

Wind speed and wind direction have the potential to affect noise propagation and hence the noise measurements. The prevailing weather conditions at the time of measurement was noted and recorded in the survey report. Prior to each monitoring period a measurement of wind strength and direction was taken using a portable anemometer. A wind speed of 1-2m/s was measured coming from Northerly direction.

6 Instrumentation & Methodology

Measurements were made using a Bruel & Kjaer 2250 integrating sound level meter (SLM) with selective 1:1 or 1:3 octave band filters. Calibration was carried out on site using a Bruel & Kjaer acoustic calibrator at 94dB (A). The meter was calibrated before and after the monitoring round. Factory calibration certificates for the SLM and the acoustic calibrator, detailing equipment serial numbers, calibration traceability and recalibration dates are presented in Appendix C of this report. A "Windshield" was also fitted to the sound meter at all stages of monitoring.

The sound level meter was mounted at 1.5m above ground level. A sample period for the noise measurements was selected to be 15 minute intervals.

7 Glossary of Terms

Ambient noise: The total encompassing sound in a given situation at a given time usually composed of sound from many sources, near and far.

Background Noise Level: The A-weighted sound pressure level of the residual noise at the assessment position that is exceeded for 90 per cent of a given time interval, T. (L_{A90}, T).

Criterion Noise Level: The long-term mean value of the noise level that must not be exceeded. This is generally stipulated in the waste permit and it may be applied to a noise source, a boundary of the activity or to noise sensitive locations in the vicinity of the facility.

1/3 Octave Band Analysis: Frequency analysis of sound such that the frequency spectrum is subdivided into bands of one–third of an octave each. An octave is taken to be a frequency interval, the upper limit of which is twice the lower limit (the unit of frequency is the Hertz, Hz).

dB (decibel): The scale in which sound pressure level is expressed. It is defined as 20 times the logarithm of the ratio between the RMS pressure of the sound field and the reference pressure of 20 micro-pascals (20 µPa).

dBA or dB(A): An 'A-weighted decibel' - a measure of the overall noise level of sound across the audible frequency range (20 Hz – 20 kHz) with A-frequency weighting (i.e. 'A'–weighting) to compensate for the varying sensitivity of the human ear to sound at different frequencies.

Facade Level: Noise levels at locations 1m from the facade of a building are described by the term *Facade Levels* and are subject to higher noise levels than those in open areas (free-field conditions) due to reflection effects.

Free-field Conditions: These are conditions in which the radiation from sound sources is unaffected by the presence of any reflecting boundaries. In practice, it is a field in which the effects of the boundaries are negligible over the frequency range of interest. In environmental noise, true free-field measurement conditions are seldom achieved and generally the microphone will be positioned at a height between 1.2 and 1.5 metres above ground level. To minimise the influence of reflections, measurements are generally made at least 3.5 metres from any reflecting surface other than the ground.

Hz (Hertz): The unit of sound frequency in cycles per second.

Impulsive Noise: A noise that is of short duration (typically less than one second), the sound pressure level of which is significantly higher than the background. In determining whether a tonal adjustment applies, reference must be made to ISO 1996-2 (1987) - Section 4.1.

Impulse Exponential – Time-Weighting: This is a time-weighting which is available on some sound level meters and it represents an arbitrary compromise in an attempt to provide a means to measure the sound level of short-duration impulsive sounds. Impulse time-weighting has a design goal exponential-time constant of 35 ms for sound signals that increase with increasing time and 1.5 seconds for sound signals that decrease with increasing time.

LAeq,T: The equivalent steady sound level in dB containing the same acoustic energy as the actual fluctuating sound level over the given period T.

LAmax: The maximum RMS, A-Weighted sound pressure level occurring within a specified time period; the time weighting fast or slow is usually specified.

Noise: Any sound, that has the potential to cause disturbance, discomfort or psychological stress to a subject exposed to it, or any sound, that could to cause actual physiological harm to a subject exposed to it, or physical damage to any structure exposed to it, is known as noise.

Noise Sensitive Location: Any dwelling house, hotel or hostel, health building, educational establishment, place of worship or entertainment, or any other facility or other area of high amenity which for its proper enjoyment requires the absence of noise at nuisance levels.

Rating level (LAr,T) : The specific noise level, plus any adjustment for the characteristic features of the noise.

Residual noise: The ambient noise remaining at a given position in a given situation when the specific source is suppressed to a degree such that it does not contribute to the ambient noise (residual noise level is measured in terms of LAeq, T).

Root Mean Square (RMS): The RMS value of a set of numbers is the square root of the average of their squares.

Sound Exposure Level (SEL or LAE): Is the measure of the A-Weighted sound energy used to describe noise events such as the passing of a train or aircraft; it is the A-weighted sound pressure level if occurring over a period of 1 second, would contain the same amount of A-weighted sound energy as the event.

Specific noise level: A component of the ambient noise which can be specifically identified by acoustical means and may be associated with a specific source. In BS 4142, there is more precise definition as follows: 'the equivalent continuous A-weighted sound pressure level at the assessment position produced by the specific noise source over a given reference time interval (LAeq, T)'.

Time-weighting: One of the averaging times (Fast, Slow or Impulse) used for the measurement of RMS sound pressure level in sound level meters.

Tonal Noise: Noise which contains a clearly audible tone, i.e. a distinguishable, discrete or continuous note (whine, hiss screech or hum etc.). In determining whether a tonal adjustment applies, reference must be made to ISO 1996-2 (1987) - Section 4.

8 Noise Measurement Data

Table 3: Daytime Monitoring Data 1st July 2013			
Monitoring Location	**Time**	**$L_{Aeq,15min}$ dB(A)**	**NG4 Limit dB(A)**
NSL 1	11.14-11.29	51	55
NSL 1	11.31-11.46	50	55
NSL 1	11.49-12.04	53	55
NSL 1	18.02-18.17	50	55
NSL 1	18.18-18.33	49	55
NSL 1	18.34-18.49	50	55

Table 4: Evening Monitoring Data 1st July 2013			
Monitoring Location	**Time**	**$L_{Aeq,15min}$ dB(A)**	**NG4 Limit dB(A)**
NSL 1	19.02-19.17	47	50
NSL 1	19.18-19.33	46	50
NSL 1	19.34-19.49	46	50

Table 5: Night Monitoring Data 2nd July 2013			
Monitoring Location	**Time**	**$L_{Aeq,15min}$ dB(A)**	**NG4 Limit dB(A)**
NSL 1	01.36-01.51	46	45
NSL 1	01.52-02.07	46	45

		Table 6: 1/3 Octave Band Analysis (12.50Hz – 400.00Hz)											1st July (Day)			
Monitoring Location	**12.50 Hz**	**16.00 Hz**	**20.00 Hz**	**25.00 Hz**	**31.50 Hz**	**40.00 Hz**	**50.00 Hz**	**63.00 Hz**	**80.00 Hz**	**100.00 Hz**	**125.00 Hz**	**160.00 Hz**	**200.00 Hz**	**250.00 Hz**	**315.00 Hz**	**400.00 Hz**
NSL 1 11.14-11.29	-6	19	14	21	23	29	29	29	31	32	28	28	28	29	32	35
NSL 1 11.31-11.46	-6	19	12	14	25	26	29	30	29	33	28	27	32	28	29	31
NSL 1 11.49-12.04	-5	20	11	12	21	23	28	29	29	28	32	33	30	31	31	33
NSL 1 18.02-18.17	-6	19	9	13	20	23	28	28	27	31	26	24	26	26	27	30
NSL 1 18.18-18.33	-6	19	10	12	20	22	28	28	27	25	24	25	25	25	27	30
NSL 1 18.34-18.49	-6	19	8	11	20	22	28	31	28	34	27	27	33	34	35	36

		Table 6: 1/3 Octave Band Analysis (500.00Hz – 16000.00Hz)											1st July (Day)			
Monitoring Location	**500.00 Hz**	**630.00 Hz**	**800.00 Hz**	**1000.00 Hz**	**1250.00 Hz**	**1600.00 Hz**	**2000.00 Hz**	**2500.00 Hz**	**3150.00 Hz**	**4000.00 Hz**	**5000.00 Hz**	**6300.00 Hz**	**8000.00 Hz**	**10000.00 Hz**	**12500.00 Hz**	**16000.00 Hz**
NSL 1 11.14-11.29	37	39	40	40	45	43	35	55	51	31	32	33	28	18	12	7
NSL 1 11.31-11.46	34	37	39	40	40	44	41	35	34	30	27	25	19	11	5	3
NSL 1 11.49-12.04	37	41	43	46	45	48	44	40	36	34	33	30	24	12	7	3
NSL 1 18.02-18.17	34	37	40	42	40	43	39	34	33	34	36	34	31	18	11	6
NSL 1 18.18-18.33	33	36	39	40	40	42	39	35	32	28	27	28	24	20	13	6
NSL 1 18.34-18.49	37	39	42	43	41	39	37	33	28	30	33	30	24	13	7	3

		Table 7: 1/3 Octave Band Analysis (12.50Hz – 400.00Hz)											1st July(Evening)			
Monitoring Location	**12.50 Hz**	**16.00 Hz**	**20.00 Hz**	**25.00 Hz**	**31.50 Hz**	**40.00 Hz**	**50.00 Hz**	**63.00 Hz**	**80.00 Hz**	**100.00 Hz**	**125.00 Hz**	**160.00 Hz**	**200.00 Hz**	**250.00 Hz**	**315.00 Hz**	**400.00 Hz**
NSL 1 19.02 – 19.17	-6	19	8	8	21	20	27	30	28	27	26	27	25	25	27	30
NSL 1 19.18 – 19.33	-6	19	8	6	21	19	25	24	25	25	22	21	21	23	25	28
NSL 1 19.34 – 19.49	-7	19	8	7	23	19	26	27	27	27	22	22	23	24	25	27

		Table 7: 1/3 Octave Band Analysis (500.00Hz – 16000.00Hz)										1st July(Evening)			
Monitoring Location	**500.00 Hz**	**630.00 Hz**	**800.00 Hz**	**1000.00 Hz**	**1250.00 Hz**	**1600.00 Hz**	**2000.00 Hz**	**2500.00 Hz**	**3150.00 Hz**	**4000.00 Hz**	**5000.00 Hz**	**6300.00 Hz**	**8000.00 Hz**	**10000.00 Hz**	**12500.00 Hz**	**16000.00 Hz**
NSL 1 19.02 – 19.17	34	37	39	41	39	36	34	29	27	28	34	29	25	9	4	3
NSL 1 19.18 – 19.33	32	35	38	39	37	36	32	27	25	28	30	25	21	7	4	2
NSL 1 19.34 – 19.49	30	33	35	37	37	38	37	34	29	30	33	30	25	12	5	3

		Table 8: 1/3 Octave Band Analysis (12.50Hz – 400.00Hz)										2nd July(Night)			
Monitoring Location	**12.50 Hz**	**16.00 Hz**	**20.00 Hz**	**25.00 Hz**	**31.50 Hz**	**40.00 Hz**	**50.00 Hz**	**63.00 Hz**	**80.00 Hz**	**100.00 Hz**	**125.00 Hz**	**160.00 Hz**	**200.00 Hz**	**250.00 Hz**	**315.00 Hz**	**400.00 Hz**
NSL 1 01.36 – 01.51	-6	19	8	8	26	23	25	26	23	25	24	22	24	26	28	31
NSL 1 01.52 – 02.07	-7	19	8	6	26	22	25	26	23	26	25	23	24	25	29	32

		Table 8: 1/3 Octave Band Analysis (500.00Hz – 16000.00Hz)										2nd July(Night)			
Monitoring Location	**500.00 Hz**	**630.00 Hz**	**800.00 Hz**	**1000.00 Hz**	**1250.00 Hz**	**1600.00 Hz**	**2000.00 Hz**	**2500.00 Hz**	**3150.00 Hz**	**4000.00 Hz**	**5000.00 Hz**	**6300.00 Hz**	**8000.00 Hz**	**10000.00 Hz**	**12500.00 Hz**	**16000.00 Hz**
NSL 1 01.36 – 01.51	34	36	39	39	37	34	31	28	26	24	21	17	14	10	7	5
NSL 1 01.52 – 02.07	35	37	39	40	37	34	30	27	27	26	24	23	20	17	14	10

9 Interferences

Below is a comprehensive breakdown of all the noise interference and sources that occurred at NSL 1 during each monitoring period.

Noise Sources/Interferences – NSL	
Date	
1st July 2013 11.14-11.29	• Lorries reversing and Tipping Glass within the Rehab Compound. • Birdsong • Turning Car next to monitoring location
1st July 2013 11.31-11.46	• Lorries reversing and Tipping Glass within the Rehab Compound. • Birdsong • A number of lorries were noted to enter the adjacent site and were left idling for long periods. • Road noise from the nearby R409 to the East, Local road to the North of the Site and the M7
1st July 2013 11.49-12.04	• Lorries reversing and Tipping Glass within the Rehab Compound. • Children playing • Road noise from the nearby R409 to the East, Local road to the North of the Site and the M7
1st July 2013 18.02-18.17	• Birdsong • Distant traffic noise (M7) • Vehicle movement at adjacent site (tractor unit)
1st July 2013 18.18-18.33	• Distant traffic noise (M7) • Lorries reversing and Tipping Glass within the Rehab Compound. • Vehicle movement at adjacent site
1st July 2013 18.34-18.49	• Distant traffic noise (M7) • Lorries reversing and Tipping Glass within the Rehab Compound.

	• Vehicle movement at adjacent site • Birdsong • Low flying aeroplane
1st July 2013 19.02 – 19.17	• Road noise from the nearby R409 to the East, Local road to the North of the Site and the M7 • Lorries reversing and Tipping Glass within the Rehab Compound. • Vehicle movement at adjacent site • Birdsong
1st July 2013 19.18 – 19.33	• Constant road traffic noise • Lorries reversing and Tipping Glass within the Rehab Compound. • Birdsong
1st July 2013 19.34 – 19.49	• Constant road traffic noise • Lorries reversing and Tipping Glass within the Rehab Compound. • Vehicle movement at adjacent site (tractor unit) • Birdsong • Barking Dog
2nd July 2013 01.36 – 01.51	• Constant distant traffic noise • Vehicle movement at adjacent site (air brakes and reversing sirens) • Lorry Horn
2nd July 2013 01.52 – 02.07	• Constant distant traffic noise • Vehicle movement at adjacent site (air brakes and reversing sirens) • Repeating car horn

10 Evaluation of Measurement Data

Tables 3 to 8 summarises the monitoring data for each period of noise monitoring which was carried out on site. From this monitoring the noise levels recorded ranged from 49dB (A) to 53dB (A) during the day, 46dB (A) to 47dB (A) during the evening and 46dB (A) during the night-time period.

These, in the main, were considered to comply with the recommended Noise Level limits as set out in EPA document **Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4) 2012.**

On review of the one-third octave band analysis tonal noise qualities were recorded at 16Hz. The 16Hz level recorded maybe attributable to the truck engines running constant on the adjacent site which was quite prominent during the monitoring period. The frequency of 16Hz in which tonal noise was detected is below 20Hz and therefore is not audible to the human ear.

11 Previous Noise Surveys

A noise survey was undertaken as part of a remedial EIS application on the 13th and 14/15th November 2012 consisting of Day, evening and night-time monitoring which highlighted an exceedance in recommended noise levels at NSL 1 as shown below. It should be noted that full operations were ongoing on site, including the Drying Plant at 24-hour operation, during this monitoring round.

The noise levels recorded from this period at NSL 1 were 57dB (A) during the day, 55dB (A) during the evening and 54dB (A) during the night-time period (November 2012).

As a result of this exceedance and following consultation with the client (Rehab Glassco) it was decided to conduct another noise survey while all operations were ceased on site, with this survey carried out on the 8th of February 2013 the results of which are outlined below.

The noise levels at NSL 1 were 50dB (A) during the day, 45dB (A) during the evening and 46dB (A) during the night-time period (February 2013).

The results for July monitoring period would reflect those encountered during the noise monitoring which was carried out at NSL 1 in February 2013 when all operations on site were halted. The measured noise levels (July 2013) were 51dB (A) during the day, 47dB (A) during the evening and 46dB (A) during the night-time period.

The data from all 3 noise surveys are highlighted below for comparison purposes.

Location	Day dB(L_{Aeq})			Evening dB(L_{Aeq})			Night dB (L_{Aeq})		
	Nov 12	**Feb 13**	**July 13**	**Nov 12**	**Feb 13**	**July 13**	**Nov 12**	**Feb 13**	**July 13**
NSL 1	57	50	51	55	45	47	54	46	46
	Typical Limits								
	55			50			45		

12 Conclusion

As can be seen there is a significant reduction in noise levels experienced at NSL 1 from that originally recorded in November 2012. The day and evening noise levels are in compliance with recommended noise limits as set out in NG4 with only a marginal exceedance during the night-time.

At the monitoring location, noise from the Rehab Glassco facility is barely audible and intermittent. Since the first monitoring round was undertaken in November 2012, Rehab Glassco have made efforts to minimise the generation of any excess noise emanating from the site through a combination of mitigation measures including revised work / operation practices and boundary screening.

Given the above results it can be concluded that any exceedance in noise limits is attributable to external influences such as the constant traffic noise associated with the R409, M7, Local Road and the adjacent 24hr Warehousing Facility and not the Rehab Glassco facility.

Appendix A – Noise Measurement Graphs

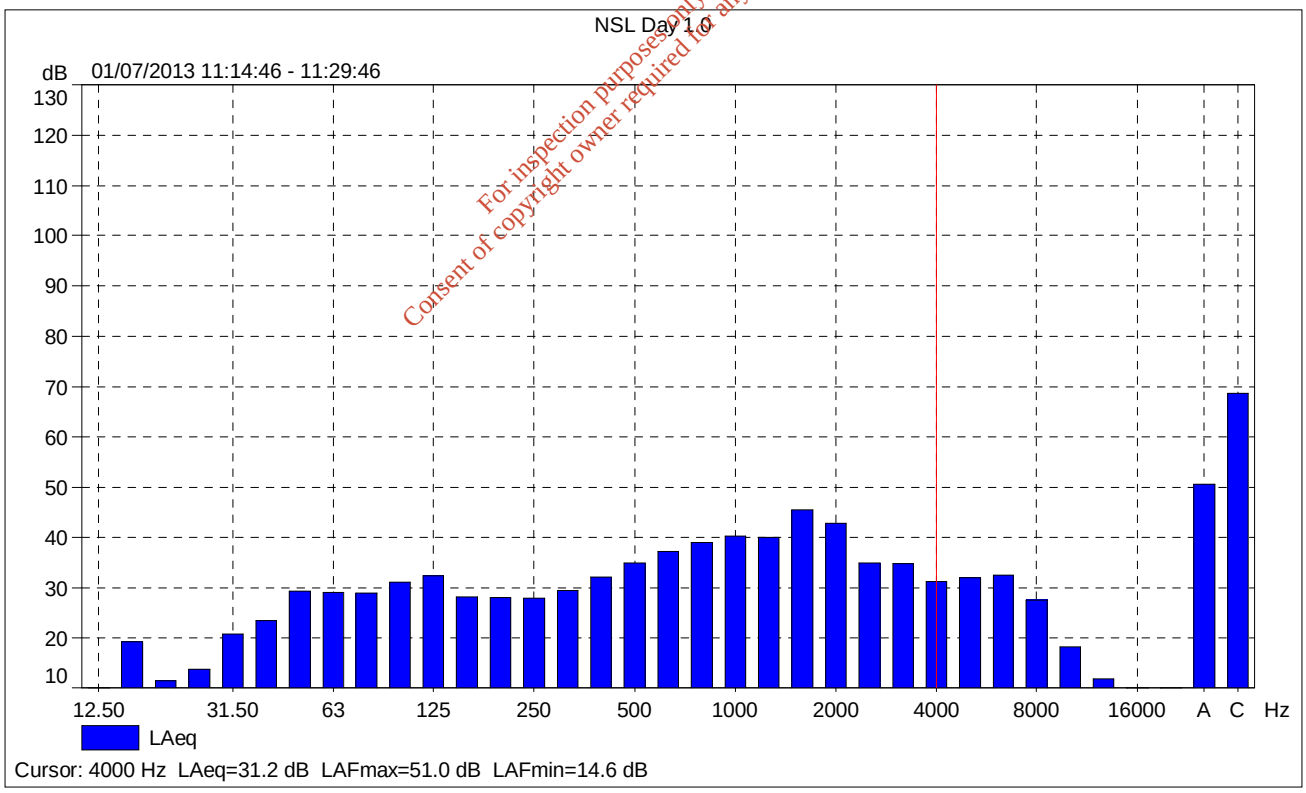
NSL Day 1.0

Instrument:		2250-L
Application:		BZ7132 Version 3.0.1
Start Time:		07/01/2013 11:14:46
End Time:		07/01/2013 11:29:46
Elapsed Time:		00:15:00
Bandwidth:		1/3-octave
Max Input Level:		140.68

	Time	Frequency
Broadband (excl. Peak):	FSI	AC
Broadband Peak:		C
Spectrum:	FS	A

Instrument Serial Number:		2602719
Microphone Serial Number:		2600864
Input:		
Windscreen Correction:		UA-0237
Sound Field Correction:		Free-field

Calibration Time:		07/01/2013 11:12:48
Calibration Type:		External reference
Sensitivity:		51.5917204320431 mV/Pa



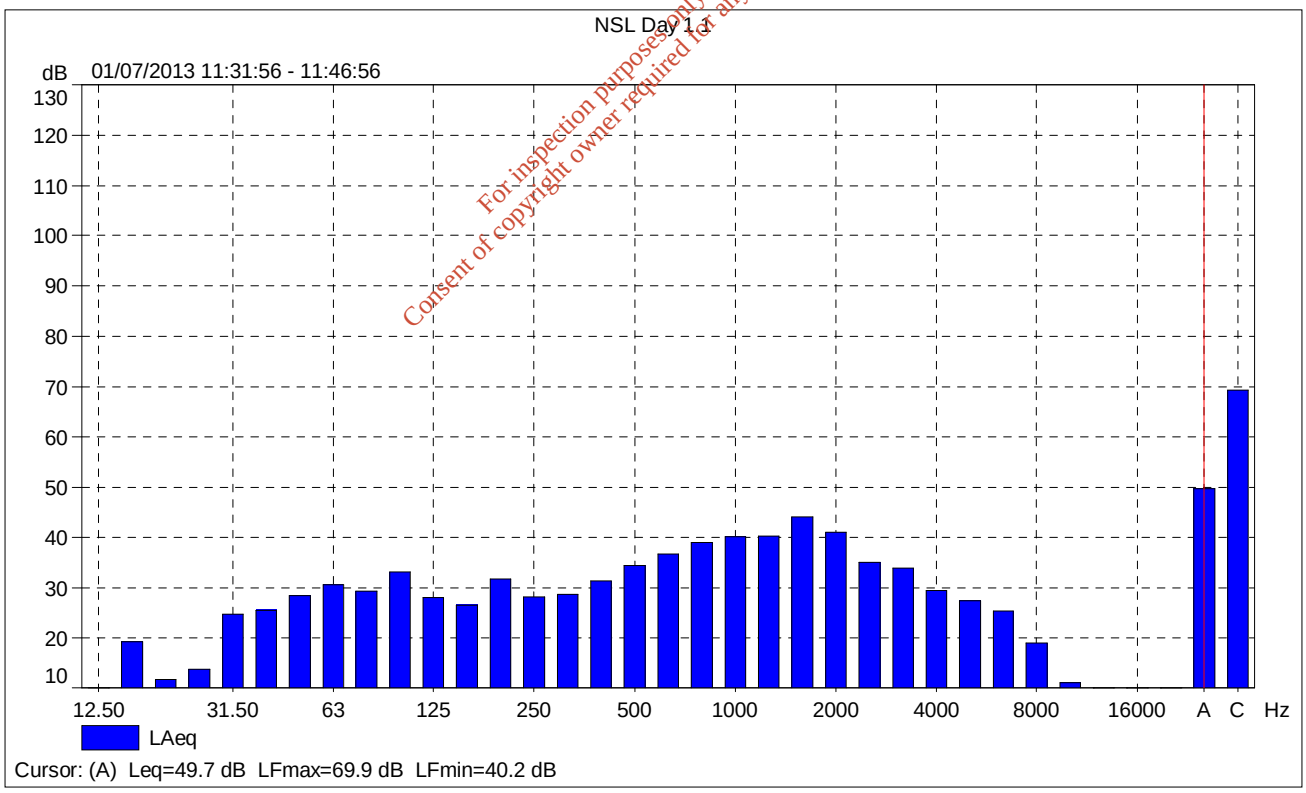
NSL Day 1.1

Instrument:		2250-L
Application:		BZ7132 Version 3.0.1
Start Time:		07/01/2013 11:31:56
End Time:		07/01/2013 11:46:56
Elapsed Time:		00:15:00
Bandwidth:		1/3-octave
Max Input Level:		140.68

	Time	Frequency
Broadband (excl. Peak):	FSI	AC
Broadband Peak:		C
Spectrum:	FS	A

Instrument Serial Number:		2602719
Microphone Serial Number:		2600864
Input:		
Windscreen Correction:		UA-0237
Sound Field Correction:		Free-field

Calibration Time:		07/01/2013 11:12:48
Calibration Type:		External reference
Sensitivity:		51.5917204320431 mV/Pa



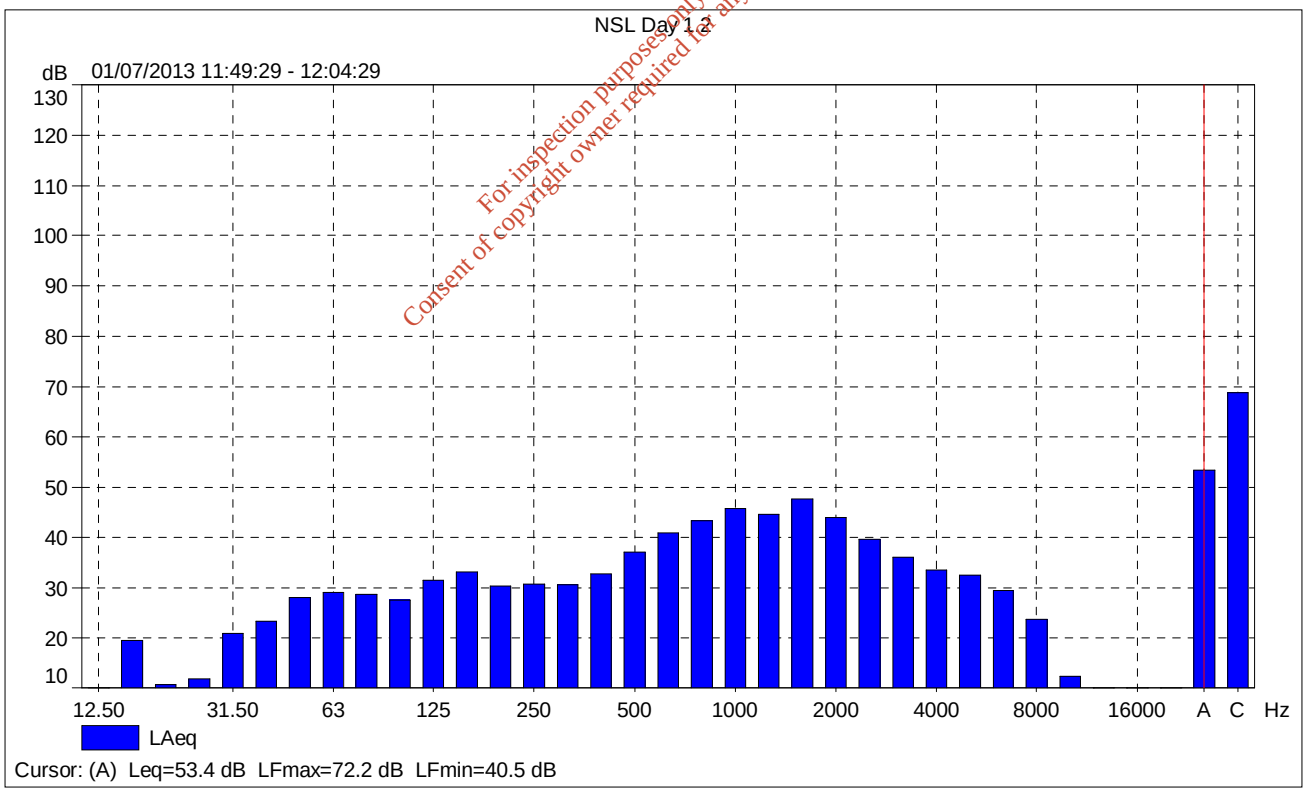
NSL Day 1.2

Instrument:		2250-L
Application:		BZ7132 Version 3.0.1
Start Time:		07/01/2013 11:49:29
End Time:		07/01/2013 12:04:29
Elapsed Time:		00:15:00
Bandwidth:		1/3-octave
Max Input Level:		140.68

	Time	Frequency
Broadband (excl. Peak):	FSI	AC
Broadband Peak:		C
Spectrum:	FS	A

Instrument Serial Number:		2602719
Microphone Serial Number:		2600864
Input:		
Windscreen Correction:		UA-0237
Sound Field Correction:		Free-field

Calibration Time:		07/01/2013 11:12:48
Calibration Type:		External reference
Sensitivity:		51.5917204320431 mV/Pa



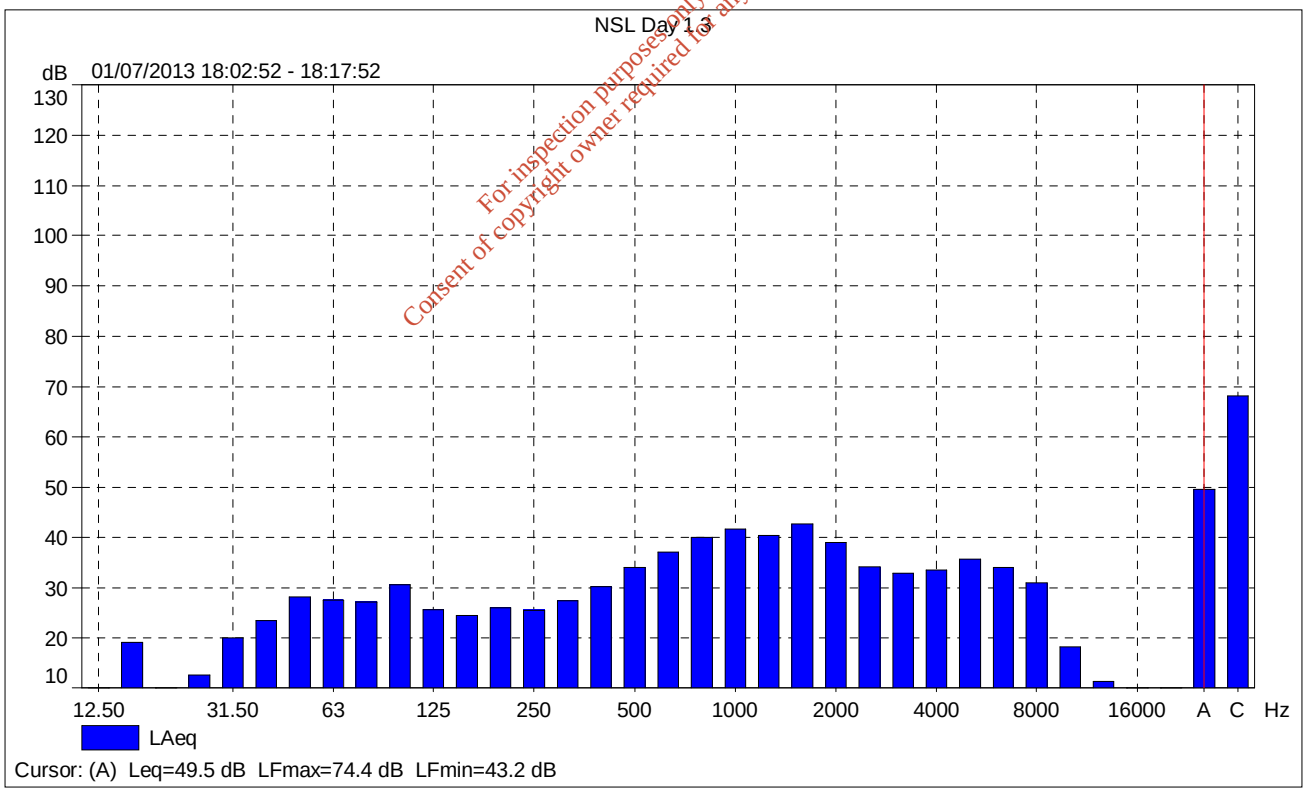
NSL Day 1.3

Instrument:		2250-L
Application:		BZ7132 Version 3.0.1
Start Time:		07/01/2013 18:02:52
End Time:		07/01/2013 18:17:52
Elapsed Time:		00:15:00
Bandwidth:		1/3-octave
Max Input Level:		140.68

	Time	Frequency
Broadband (excl. Peak):	FSI	AC
Broadband Peak:		C
Spectrum:	FS	A

Instrument Serial Number:		2602719
Microphone Serial Number:		2600864
Input:		
Windscreen Correction:		UA-0237
Sound Field Correction:		Free-field

Calibration Time:		07/01/2013 18:02:10
Calibration Type:		External reference
Sensitivity:		51.6095422208309 mV/Pa



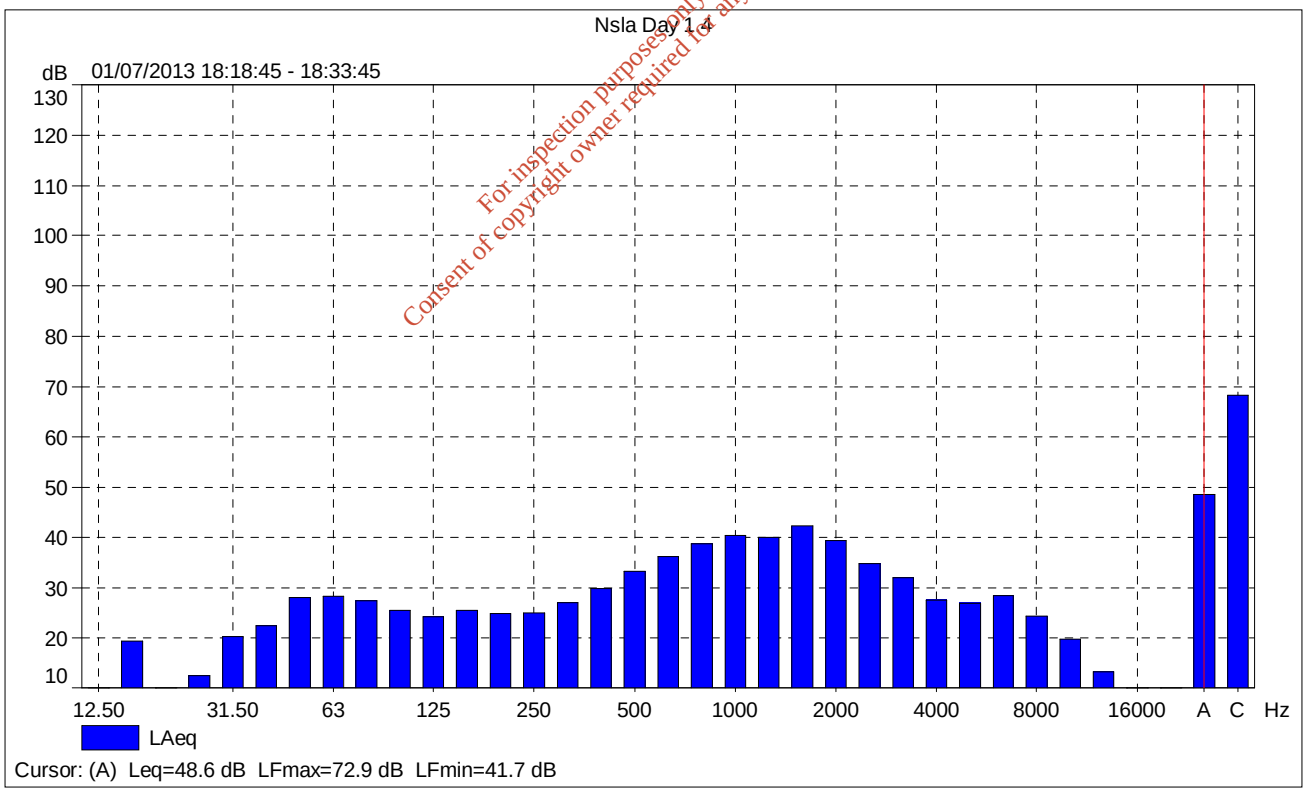
Nsla Day 1.4

Instrument:		2250-L
Application:		BZ7132 Version 3.0.1
Start Time:		07/01/2013 18:18:45
End Time:		07/01/2013 18:33:45
Elapsed Time:		00:15:00
Bandwidth:		1/3-octave
Max Input Level:		140.68

	Time	Frequency
Broadband (excl. Peak):	FSI	AC
Broadband Peak:		C
Spectrum:	FS	A

Instrument Serial Number:		2602719
Microphone Serial Number:		2600864
Input:		
Windscreen Correction:		UA-0237
Sound Field Correction:		Free-field

Calibration Time:		07/01/2013 18:02:10
Calibration Type:		External reference
Sensitivity:		51.6095422208309 mV/Pa



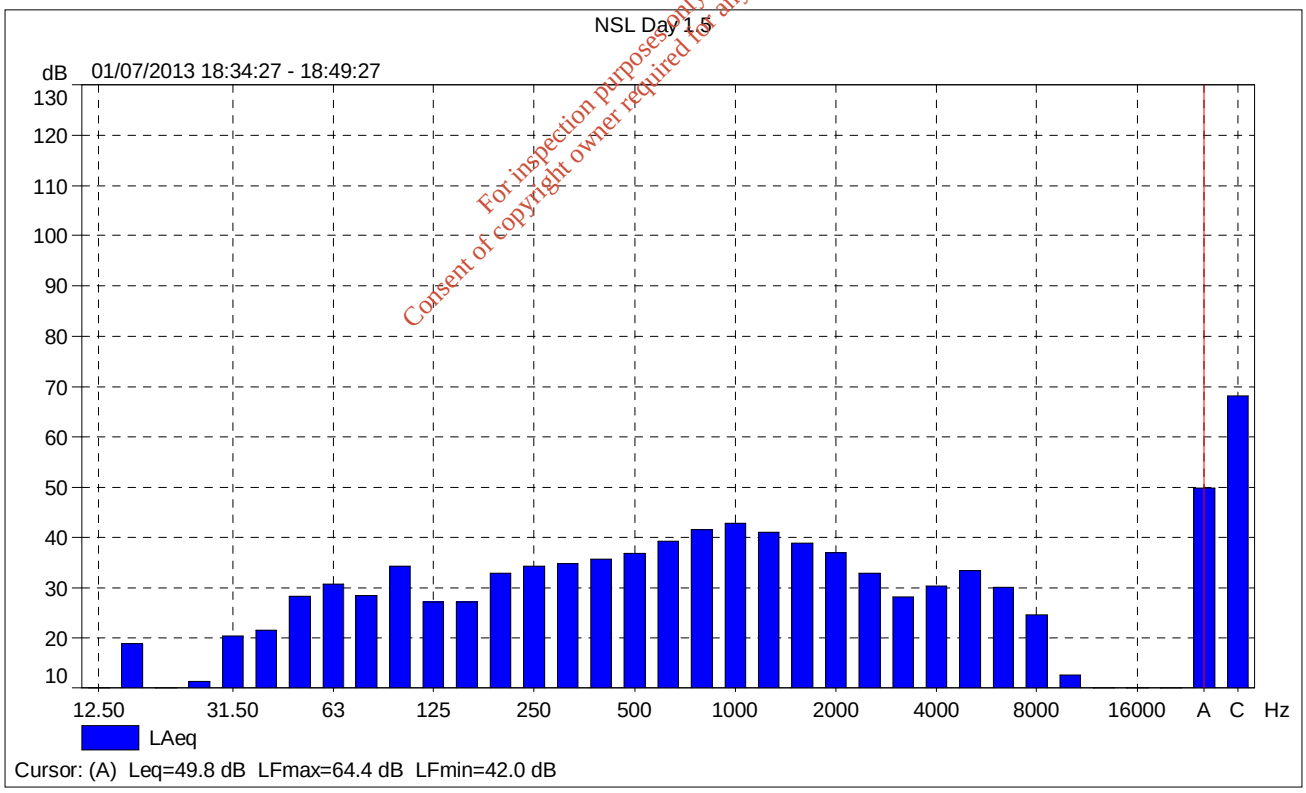
NSL Day 1.5

Instrument:		2250-L
Application:		BZ7132 Version 3.0.1
Start Time:		07/01/2013 18:34:27
End Time:		07/01/2013 18:49:27
Elapsed Time:		00:15:00
Bandwidth:		1/3-octave
Max Input Level:		140.68

	Time	Frequency
Broadband (excl. Peak):	FSI	AC
Broadband Peak:		C
Spectrum:	FS	A

Instrument Serial Number:		2602719
Microphone Serial Number:		2600864
Input:		
Windscreen Correction:		UA-0237
Sound Field Correction:		Free-field

Calibration Time:		07/01/2013 18:02:10
Calibration Type:		External reference
Sensitivity:		51.6095422208309 mV/Pa



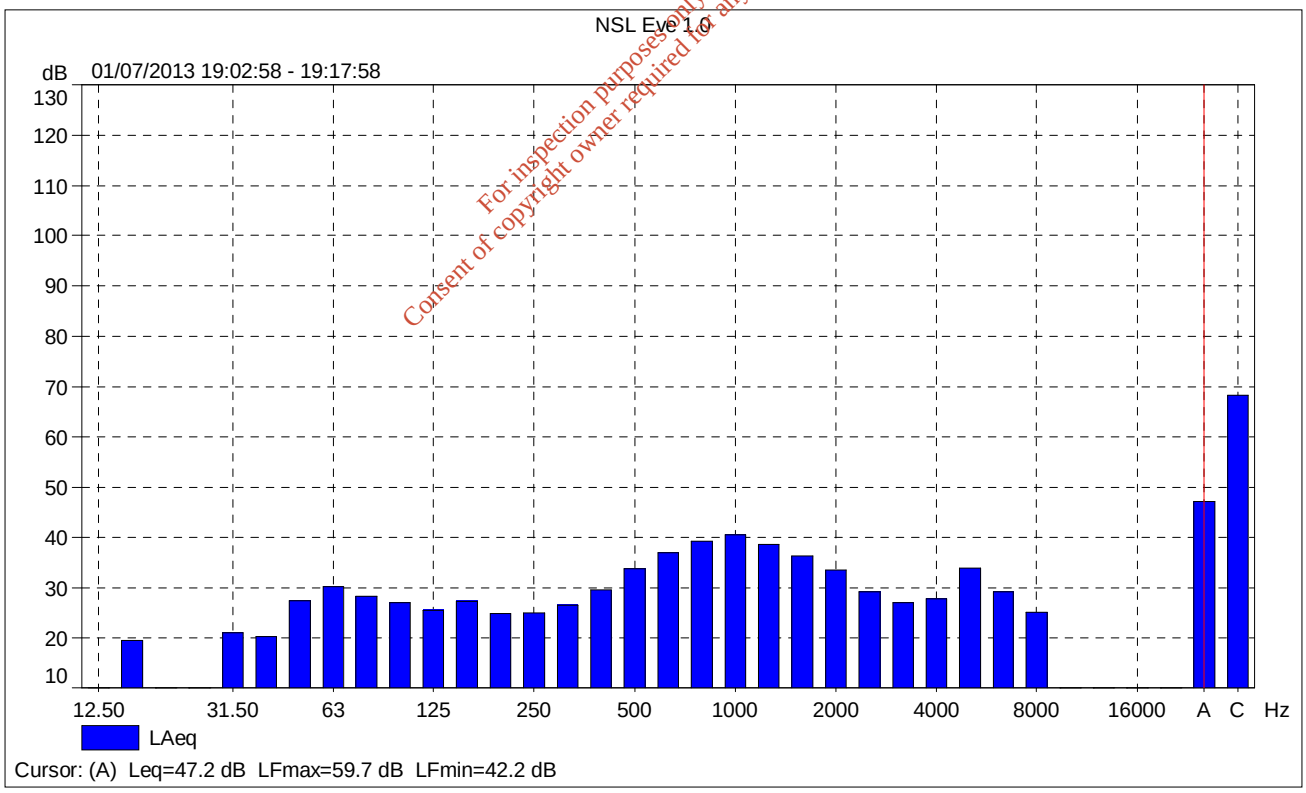
NSL Eve 1.0

Instrument:		2250-L
Application:		BZ7132 Version 3.0.1
Start Time:		07/01/2013 19:02:58
End Time:		07/01/2013 19:17:58
Elapsed Time:		00:15:00
Bandwidth:		1/3-octave
Max Input Level:		140.68

	Time	Frequency
Broadband (excl. Peak):	FSI	AC
Broadband Peak:		C
Spectrum:	FS	A

Instrument Serial Number:		2602719
Microphone Serial Number:		2600864
Input:		
Windscreen Correction:		UA-0237
Sound Field Correction:		Free-field

Calibration Time:		07/01/2013 18:02:10
Calibration Type:		External reference
Sensitivity:		51.6095422208309 mV/Pa



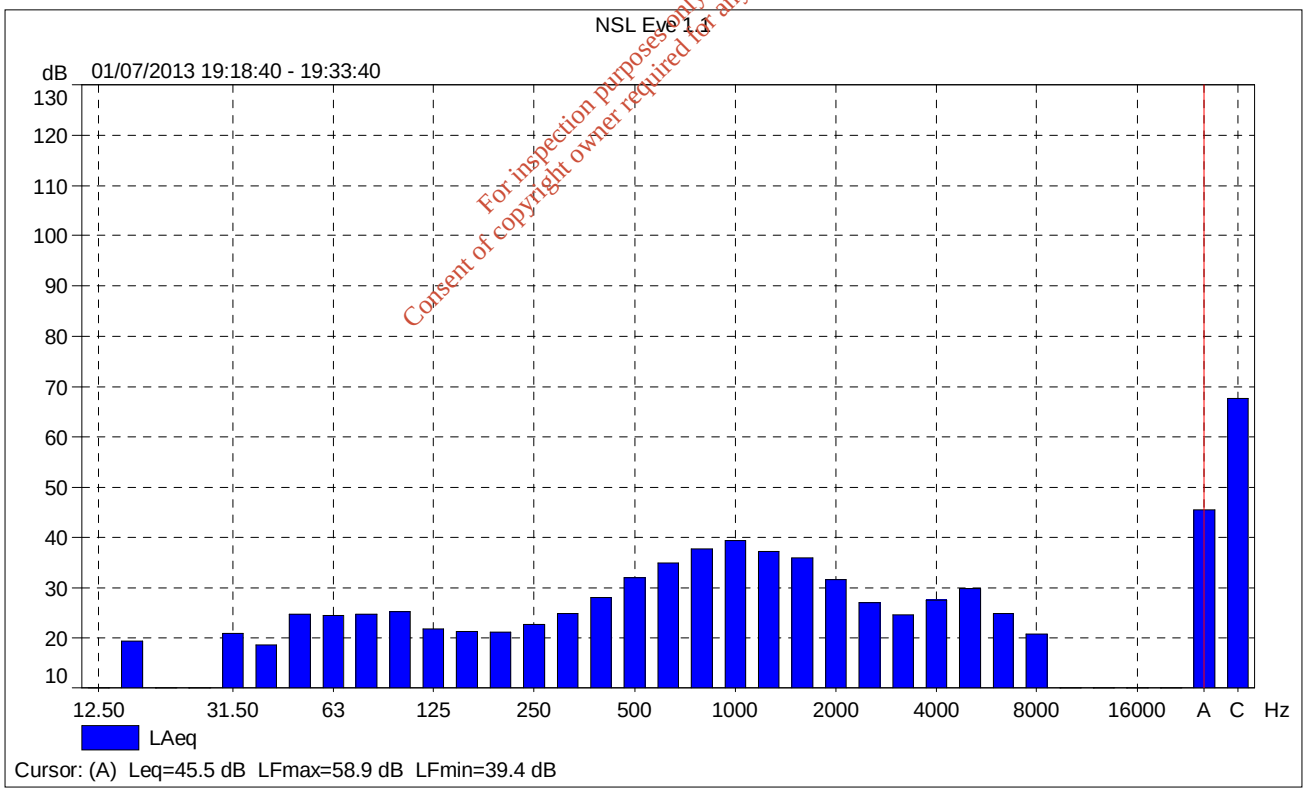
NSL Eve 1.1

Instrument:		2250-L
Application:		BZ7132 Version 3.0.1
Start Time:		07/01/2013 19:18:40
End Time:		07/01/2013 19:33:40
Elapsed Time:		00:15:00
Bandwidth:		1/3-octave
Max Input Level:		140.68

	Time	Frequency
Broadband (excl. Peak):	FSI	AC
Broadband Peak:		C
Spectrum:	FS	A

Instrument Serial Number:		2602719
Microphone Serial Number:		2600864
Input:		
Windscreen Correction:		UA-0237
Sound Field Correction:		Free-field

Calibration Time:		07/01/2013 18:02:10
Calibration Type:		External reference
Sensitivity:		51.6095422208309 mV/Pa



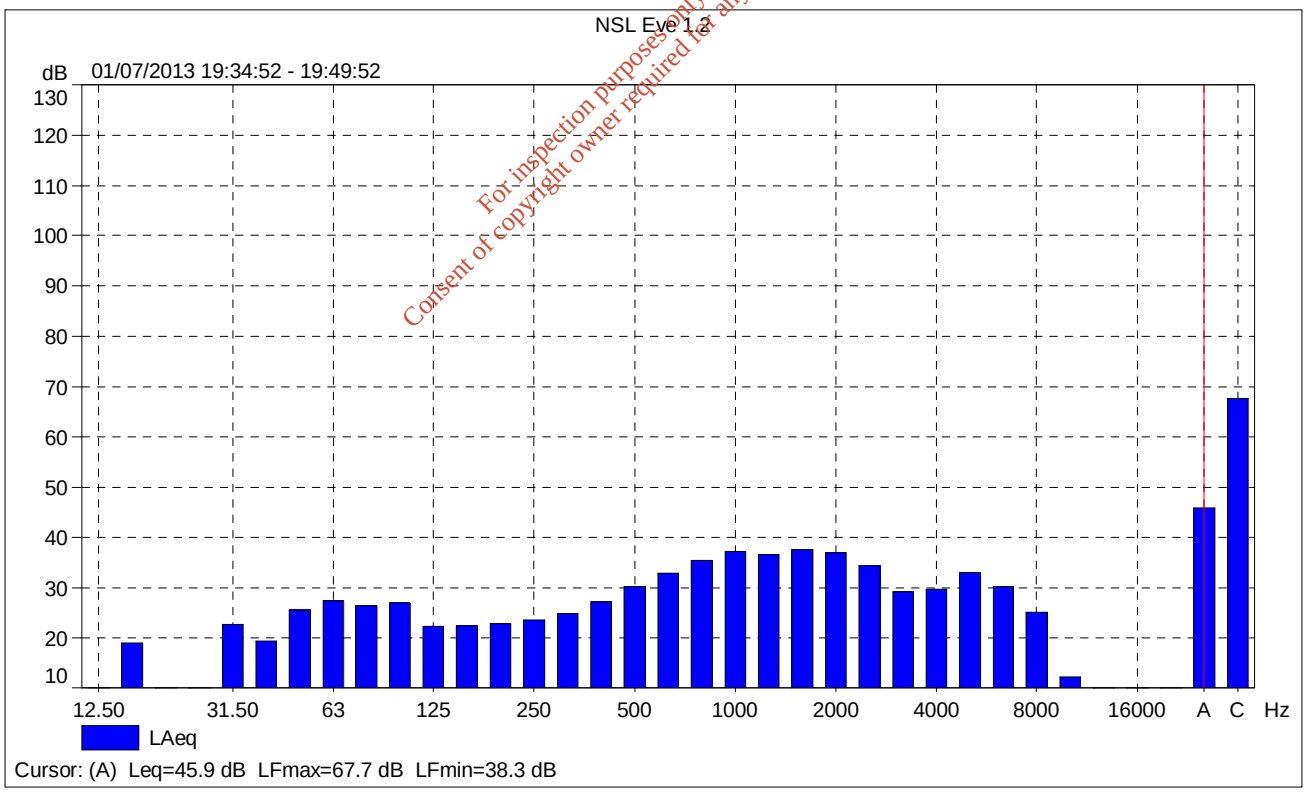
NSL Eve 1.2

Instrument:		2250-L
Application:		BZ7132 Version 3.0.1
Start Time:		07/01/2013 19:34:52
End Time:		07/01/2013 19:49:52
Elapsed Time:		00:15:00
Bandwidth:		1/3-octave
Max Input Level:		140.68

	Time	Frequency
Broadband (excl. Peak):	FSI	AC
Broadband Peak:		C
Spectrum:	FS	A

Instrument Serial Number:		2602719
Microphone Serial Number:		2600864
Input:		
Windscreen Correction:		UA-0237
Sound Field Correction:		Free-field

Calibration Time:		07/01/2013 18:02:10
Calibration Type:		External reference
Sensitivity:		51.6095422208309 mV/Pa



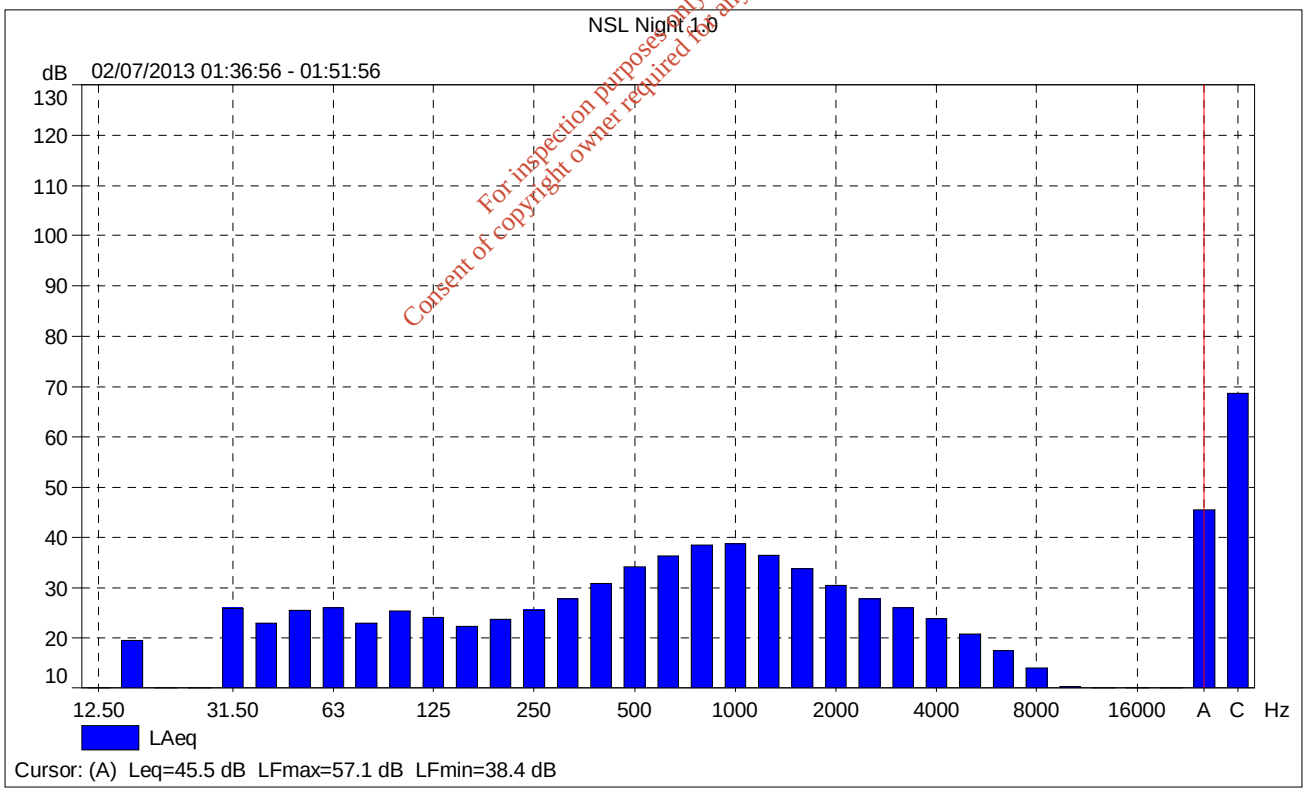
NSL Night 1.0

Instrument:		2250-L
Application:		BZ7132 Version 3.0.1
Start Time:		07/02/2013 01:36:56
End Time:		07/02/2013 01:51:56
Elapsed Time:		00:15:00
Bandwidth:		1/3-octave
Max Input Level:		140.67

	Time	Frequency
Broadband (excl. Peak):	FSI	AC
Broadband Peak:		C
Spectrum:	FS	A

Instrument Serial Number:		2602719
Microphone Serial Number:		2600864
Input:		
Windscreen Correction:		UA-0237
Sound Field Correction:		Free-field

Calibration Time:		07/02/2013 01:35:00
Calibration Type:		External reference
Sensitivity:		51.6773238778114 mV/Pa



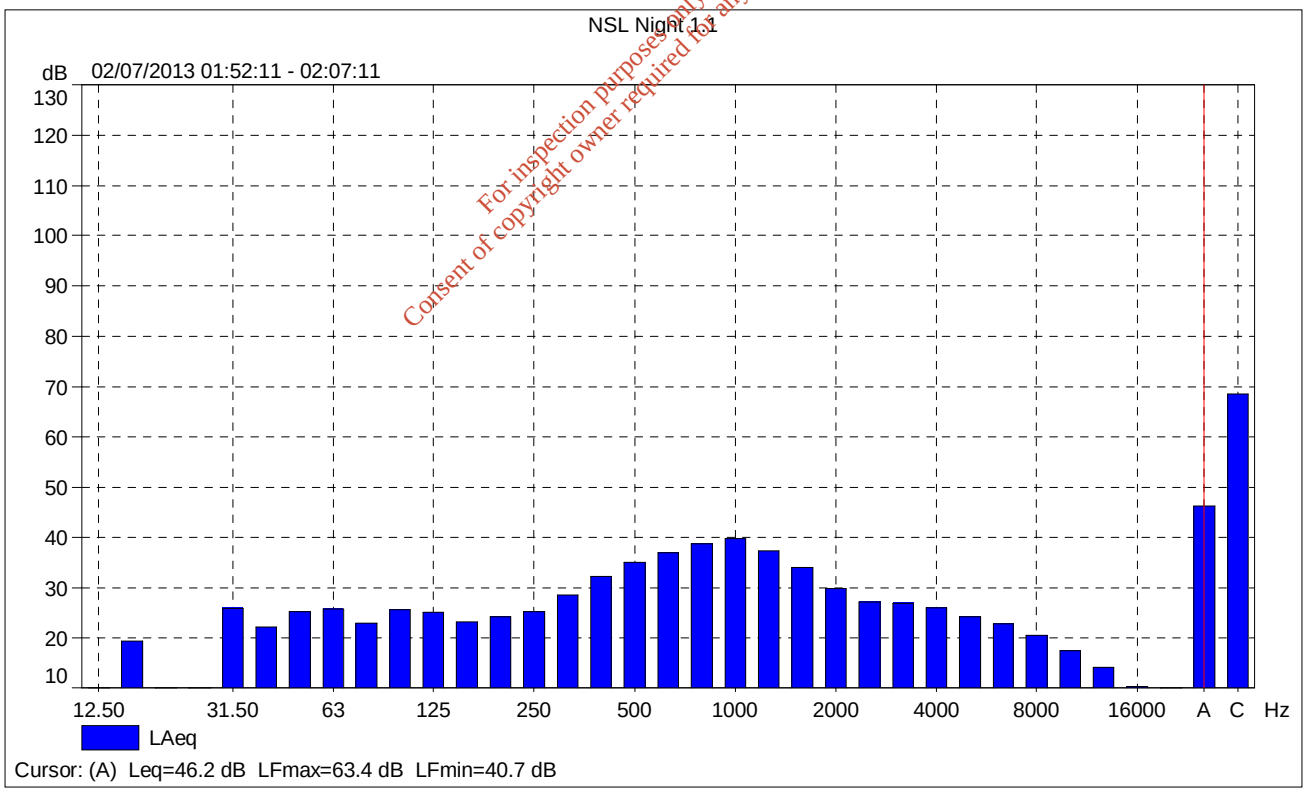
NSL Night 1.1

Instrument:		2250-L
Application:		BZ7132 Version 3.0.1
Start Time:		07/02/2013 01:52:11
End Time:		07/02/2013 02:07:11
Elapsed Time:		00:15:00
Bandwidth:		1/3-octave
Max Input Level:		140.67

	Time	Frequency
Broadband (excl. Peak):	FSI	AC
Broadband Peak:		C
Spectrum:	FS	A

Instrument Serial Number:		2602719
Microphone Serial Number:		2600864
Input:		
Windscreen Correction:		UA-0237
Sound Field Correction:		Free-field

Calibration Time:		07/02/2013 01:35:00
Calibration Type:		External reference
Sensitivity:		51.6773238778114 mV/Pa



Appendix B – Noise Monitoring Locations

A3

REVISION DATE 31/05/11

REVISION 1

FORM NO FRM-010

R409

PIRVATE DWELLING

NSL 1

REHAB GLASSCO SITE BOUNDARY

REHAB GLASSCO MAIN BUILDING

LEGEND	
	BOUNDARY LINE
Nx	NOISE MONITORING LOCATIONS
NSL	NOISE SENSITIVE LOCATIONS
Dx	DUST MONITORING LOCATIONS
SWx	SURFACEWATER MONITORING LOCATIONS
BHx	GROUNDWATER MONITORING LOCATIONS
	EXISTING WELL/BOREHOLE
Vx	VIBRATION MONITORING LOCATIONS
Ax	AIR MONITORING LOCATIONS
	EXISTING SURFACE WATER PIPES
	EXISTING FOUL SEWER PIPES
	EXISTING WATERMAIN
	EXISTING MANHOLE
F	FOUL SEWER
S	SURFACE WATER
	EXISTING BUILDING
	PROPOSED BUILDING
	NORTH POINT

SITE LAYOUT - NTS

ISSUE

ON ORIGINAL

0 10 20 30 40 50mm

REV NO:	DATE:	REVISION NOTE:	DWN BY:	CKD BY:
D1	06/12/12	ISSUED TO CLIENT	DH	DC

SITE LOCATION

Datum: Irish Grid System: Malin Head ITM

CLIENT:	REHAB GLASSCO
PROJECT:	ENVIRONMENTAL NOISE MONITORING AT REHAB GALSSCO SITE, NAAS
TITLE:	SITE LAYOUT NOISE MONITORING LOCATIONS

DRAWN:	CHECKED:	APPROVED:	DRAWING NO:	REV:
DH	DC		101_169_201	D1
DATE: 06/12/12	SCALE: NTS			

ORS Consulting Engineers
ORS Building, Mullingar, Co. Westmeath
T: +353 (0) 44 934 2518 F: +353 (0) 44 934 4573
E: info@ors.ie W: www.ors.ie
ISO 9001:2008 QUALITY ASSURED COMPANY

Appendix C – Calibration Certificates

Brüel & Kjær

The Calibration Laboratory
Skodsborgvej 307, DK-2850 Nærum, Denmark

ilac-MRA DANAK CAL. Reg.nr. 307

CERTIFICATE OF CALIBRATION

No: C1207320 Page 1 of 4

CALIBRATION OF

Calibrator:	Brüel & Kjær Type 4231	No: 2605825 Id: -
½ Inch adaptor:	Brüel & Kjær Type UC-0210	
Pattern Approval:	None	

CUSTOMER

ORS Consulting Engineers
Marlinstown Office Park
Mullingar
Co. Westmeath, Ireland

CALIBRATION CONDITIONS

Preconditioning:	4 hours at 23°C ± 3°C
Environment conditions:	Pressure: 101.13 kPa. Humidity: 50 % RH. Temperature: 22.9 °C.

SPECIFICATIONS

The Calibrator Brüel & Kjær Type 4231 has been calibrated in accordance with the requirements as specified in IEC60942:2003 Annex B Class 1. The accreditation assures the traceability to the international units system SI.

PROCEDURE

The measurements have been performed with the assistance of Brüel & Kjær acoustic calibrator calibration application software Type 7794 (version 2.4) by using procedure P_4231_D04.

RESULTS

Calibration Mode: **Calibration as received.**

The reported expanded uncertainty is based on the standard uncertainty multiplied by a coverage factor $k = 2$ providing a level of confidence of approximately 95 %. The uncertainty evaluation has been carried out in accordance with EA-4/02 from elements originating from the standards, calibration method, effect of environmental conditions and any short time contribution from the device under calibration.

Date of calibration: 2012-10-01

Susanne Nygaard
Calibration Technician

Date of issue: 2012-10-01

Erik Bruus
Approved Signatory

Brüel & Kjær

The Calibration Laboratory
Skodsborgvej 307, DK-2850 Nærum, Denmark

1. Visual Inspection

OK.

2. Measured Values

All stated values are valid at the following environmental reference conditions:

Pressure	101.3 kPa
Temperature	23.0 °C
Relative Humidity	50.0 %

2.1 Sound Pressure Levels

The sound pressure level is measured using the sound calibration comparison method.

Nominal Level [dB]	Accept Limit Lower [dB]	Accept Limit Upper [dB]	Measured Level [dB]	Measurement Uncertainty [dB]
94.00	93.89	94.11	93.96	0.09
114.00	113.89	114.11	113.97	0.09

2.2 Frequency

Nominal Level [Hz]	Accept Limit Lower [Hz]	Accept Limit Upper [Hz]	Measured Frequency [Hz]	Measurement Uncertainty [Hz]
1000	990.10	1009.90	999.98	0.10

2.3 Total Distortion

Distortion mode: [X] TD [ ] THD

Calibration Level [dB]	Accept Limit [%]	Measured Distortion [%]	Measurement Uncertainty [%]
94	2.25	0.56	0.25
114	2.25	0.35	0.25

Note: Acceptance limits are reduced by measurement uncertainty to assure that measured value expanded by the actual expanded uncertainty does not exceed the specified limits as stated in the standard.

Brüel & Kjær

The Calibration Laboratory
Skodsborgvej 307, DK-2850 Nærum, Denmark

3. Calibration Equipment

	Instrument	Inventory No.
Reference Sound Source	Brüel & Kjær, Type 4228	124228022
PULSE Analyzer	Brüel & Kjær, Type 3560-C	123560010
Transfer Microphone	Brüel & Kjær, Type 4192-L-001	154192013

4. Comments

The sound calibrator has been shown to conform to the class 1 requirements for periodic testing, described in Annex B of IEC 60942:2003 for the sound pressure level(s) and frequency(ies) stated, for the environmental conditions under which the tests were performed. However, as public evidence was not available, from a testing organization responsible for pattern approval, to demonstrate that the model of sound calibrator conformed to the requirements for pattern evaluation described in Annex A of IEC 60942:2003, no general statement or conclusion can be made about conformance of the sound calibrator to the requirements of IEC 60942:2003.

Brüel & Kjær

The Calibration Laboratory
Skodsborgvej 307, DK-2850 Nærum, Denmark

DANAK

The Danish Accreditation and Metrology Fund - DANAK - is managing the Danish accreditation scheme based on a contract with the Danish Safety Technology Authority under the Danish Ministry of Economics and Business Affairs who is responsible for the legislation on accreditation in Denmark.

The fundamental criteria for accreditation are described in DS/EN ISO/IEC 17025: "General requirements for the competence of testing and calibration laboratories", and in DS/EN ISO/IEC 15189 "Medical laboratories – Particular requirements for quality and competence" respectively. DANAK uses guidance documents to clarify the requirements in the standards, where this is considered to be necessary. These will mainly be drawn up by the "European co-operation for Accreditation (EA)" or the "International Laboratory Accreditation Co-operation (ILAC)" with a view to obtaining uniform criteria for accreditation worldwide. In addition, the Danish Safety Technology Authority issues Technical Regulations prepared by DANAK with specific requirements for accreditation that are not contained in the standards.

In order for a laboratory to be accredited it is, among other things, required:

- *that the laboratory and its personnel are free from any commercial, financial or other pressures, which might influence their impartiality;*
- *that the laboratory operates a documented management system, and has a management that ensures that the system is followed and maintained;*
- *that the laboratory has at its disposal all items of equipment, facilities and premises required for correct performance of the service that it is accredited to perform;*
- *that the laboratory has at its disposal personnel with technical competence and practical experience in performing the services that they are accredited to perform;*
- *that the laboratory has procedures for traceability and uncertainty calculations;*
- *that accredited testing, calibration or medical examination are performed in accordance with fully validated and documented methods;*
- *that accredited services are performed and reported in confidentiality with the customer and in compliance with the customer's request;*
- *that the laboratory keeps records which contain sufficient information to permit repetition of the accredited test, calibration or medical examination;*
- *that the laboratory is subject to surveillance by DANAK on a regular basis;*

Reports carrying DANAK's accreditation mark are used when reporting accredited services and show that these have been performed in accordance with the rules for accreditation.

Brüel & Kjær

The Calibration Laboratory
Skodsborgvej 307, DK-2850 Nærum, Denmark

ilac-MRA DANAK CAL. Reg.nr. 307

CERTIFICATE OF CALIBRATION

No: C1107125 Page 1 of 10

CALIBRATION OF

Sound Level Meter:	Brüel & Kjær Type 2250 Light	No: 2602719	Id: -
Microphone:	Brüel & Kjær Type 4950	No: 2600864	
Preamplifier:	Brüel & Kjær Type ZC-0032	No: 6365	
Supplied Calibrator:	Brüel & Kjær Type 4231	No: 2605825	
Software version:	BZ7131 Version 3.0.1	Pattern Approval:	PENDING
Instruction manual:	BE-1774-11		

CUSTOMER

ORS Consulting Engineers
Marlinstown Office Park
Mullingar
Co. Westmeath, Ireland

CALIBRATION CONDITIONS

Preconditioning: 4 hours at 23°C ± 3°C

Environment conditions: *See actual values in **Environmental conditions** sections.*

SPECIFICATIONS

The Sound Level Meter Brüel & Kjær Type 2250 Light has been calibrated in accordance with the requirements as specified in IEC61672-1:2002 class 1. Procedures from IEC 61672-3:2006 were used to perform the periodic tests.

PROCEDURE

The measurements have been performed with the assistance of Brüel & Kjær Sound Level Meter Calibration System 3630 with application software type 7763 (version 4.5 - DB: 4.50) by using procedure 2250-L-4950.

RESULTS

Calibration Mode: **Calibration as received.**

The reported expanded uncertainty is based on the standard uncertainty multiplied by a coverage factor $k = 2$ providing a level of confidence of approximately 95 %. The uncertainty evaluation has been carried out in accordance with EA-4/02 from elements originating from the standards, calibration method, effect of environmental conditions and any short time contribution from the device under calibration.

Date of calibration: 2011-09-08

Date of issue: 2011-09-08

Steen Vodstrup Andersen
Calibration Technician

Nils Johansen
Approved Signatory

Brüel & Kjær

The Calibration Laboratory
Skodsborgvej 307, DK-2850 Nærum, Denmark

1. Calibration Note

n/a

2. Summary

4.1. Preliminary inspection	Passed
4.2. Environmental conditions, Prior to calibration	Passed
4.3. Reference information	Passed
4.4. Indication at the calibration check frequency	Passed
4.5. Self-generated noise, Microphone installed	Passed
4.6. Acoustical signal tests of a frequency weighting, C weighting	Passed
4.7. Self-generated noise, Electrical	Passed
4.8. Electrical signal tests of frequency weightings, A weighting	Passed
4.9. Electrical signal tests of frequency weightings, C weighting	Passed
4.10. Electrical signal tests of frequency weightings, Z weighting	Passed
4.11. Frequency and time weightings at 1 kHz	Passed
4.12. Level linearity on the reference level range, Upper	Passed
4.13. Level linearity on the reference level range, Lower	Passed
4.14. Toneburst response, Time-weighting Fast	Passed
4.15. Toneburst response, Time-weighting Slow	Passed
4.16. Toneburst response, LAE	Passed
4.17. Peak C sound level, 8 kHz	Passed
4.18. Peak C sound level, 500 Hz	Passed
4.19. Overload indication	Passed
4.20. Environmental conditions, Following calibration	Passed

The sound level meter submitted for periodic testing successfully completed the class 1 tests of IEC 61672-3:2006, for the environmental conditions under which the tests were performed.
However, no general statement or conclusion can be made about conformance of the sound level meter to the full requirements of IEC 61672-1:2002 because evidence was not publicly available, from an independent testing organization responsible pattern approvals, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2002 and because the periodic test of IEC 61672-3:2006 cover only a limited subset of the specifications in IEC 61672-1:2002.

Brüel & Kjær

The Calibration Laboratory
Skodsborgvej 307, DK-2850 Nærum, Denmark

3. Instruments

	Instrument	Inventory No.
Generator	Brüel & Kjær, Type 3560	123560014
AmplifierDivider	Brüel & Kjær, Type 3111	123111004
Calibrator	Brüel & Kjær, Type 4226	124226018
Adaptor	Brüel & Kjær, Type WA-0302-B 15 pF	150503009
Voltmeter	Agilent, Type 34970A	142101028

Brüel & Kjær

The Calibration Laboratory
Skodsborgvej 307, DK-2850 Nærum, Denmark

4. Measurements

4.1. Preliminary inspection

Visually inspect instrument, and operate all relevant controls. (section 5)

Routine Passed

4.2. Environmental conditions, Prior to calibration

Actual environmental conditions prior to calibration. (section 7)

	Measured	
	[Deg / kPa / %RH]	
Air temperature	22.30	
Air pressure	99.57	
Relative humidity	53.00	

4.3. Reference information

Information about reference range, level and channel. (section 19.h + 19.m)

	Value	
	[dB]	
Reference sound pressure level	94	
Reference level range	140	
Channel number	1	

4.4. Indication at the calibration check frequency

Measure and adjust sound level meter using the supplied calibrator. (section 9 + 19.m)

	Measured	Uncertainty	
	[dB / Hz]	[dB / Hz]	
Initial indication (supplied calibrator)	93.89	0.14	
Calibration check frequency (supplied calibrator)	1000.00	1.00	
Adjusted indication (supplied calibrator)	93.85	0.14	

4.5. Self-generated noise, Microphone installed

Self-generated noise measured with microphone submitted for periodic testing. Averaging time is 30 seconds. An anechoic chamber is used to isolate environmental noise. (section 10.1)

	Max	Measured	Deviation	Uncertainty	
	[dB]	[dB]	[dB]	[dB]	
A weighted	17.40	16.16	-1.24	1.00	
Monitor Level	20.40	11.40	-9.00	1.00	

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4.6. Acoustical signal tests of a frequency weighting, C weighting

Frequency weightings measured acoustically with a calibrated multi-frequency sound calibrator. Averaging time is 10 seconds, and the result is the average of 2 measurements. (section 11)

	Coupler Pressure Lc	Mic. Correction C4226	Body Influence	Expected	Measured	Corr. Measured	Accept - Limit	Accept + Limit	Deviation	Uncertainty	
	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	
1000Hz, Ref. (1st)	94.30	0.15	-0.09	94.24	94.18	94.18	-1.1	1.1	-0.06	0.20	
1000Hz, Ref. (2nd)	94.30	0.15	-0.09	94.24	94.18	94.18	-1.1	1.1	-0.06	0.20	
1000Hz, Ref. (Average)	94.30	0.15	-0.09	94.24	94.18	94.18	-1.1	1.1	-0.06	0.20	
125.89Hz (1st)	94.28	0.00	0.00	94.11	94.25	94.25	-1.5	1.5	0.14	0.20	
125.89Hz (2nd)	94.28	0.00	0.00	94.11	94.25	94.25	-1.5	1.5	0.14	0.20	
125.89Hz (Average)	94.28	0.00	0.00	94.11	94.25	94.25	-1.5	1.5	0.14	0.20	
3981.1Hz (1st)	94.23	1.15	-0.06	92.37	92.17	92.17	-1.6	1.6	-0.20	0.30	
3981.1Hz (2nd)	94.23	1.15	-0.06	92.37	92.18	92.18	-1.6	1.6	-0.19	0.30	
3981.1Hz (Average)	94.23	1.15	-0.06	92.37	92.18	92.18	-1.6	1.6	-0.19	0.30	
7943.3Hz (1st)	93.98	3.85	-0.17	87.33	86.98	86.98	-3.1	2.1	-0.35	0.40	
7943.3Hz (2nd)	93.98	3.85	-0.17	87.33	86.99	86.99	-3.1	2.1	-0.34	0.40	
7943.3Hz (Average)	93.98	3.85	-0.17	87.33	86.98	86.98	-3.1	2.1	-0.35	0.40	

4.7. Self-generated noise, Electrical

Self-generated noise measured in most sensitive range, with electrical substitution for microphone, according to manufactures specifications.

Exceedance of the measured level above the corresponding level given in the instruction manual does not, by itself, mean that the performance of the sound level meter is no longer acceptable for many practical applications. (section 10.2)

	Max	Measured	Uncertainty	
	[dB]	[dB]	[dB]	
A weighted	13.70	12.86	0.30	
C weighted	15.00	13.37	0.30	
Z weighted	20.40	18.91	0.30	

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4.8. Electrical signal tests of frequency weightings, A weighting

Frequency response measured with electrical signal relative to level at 1 kHz in reference range. (section 12)

	Input Level	Expected	Measured	Acoustical Resp.	Body Influence	Corr. Measured	Accept - Limit	Accept + Limit	Deviation	Uncertainty
	[dBV]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]
1000Hz, Ref.	-24.68	95.00	95.00	-0.04	-0.09	94.87	-1.1	1.1	-0.13	0.12
63.096Hz	1.52	95.00	95.01	0.21	0.00	95.22	-1.5	1.5	0.22	0.12
125.89Hz	-8.58	95.00	95.01	0.10	0.00	95.11	-1.5	1.5	0.11	0.12
251.19Hz	-16.08	95.00	94.97	0.01	0.06	95.04	-1.4	1.4	0.04	0.12
501.19Hz	-21.48	95.00	94.97	-0.03	0.22	95.16	-1.4	1.4	0.16	0.12
1995.3Hz	-25.88	95.00	95.00	-0.04	-0.01	94.95	-1.6	1.6	-0.05	0.12
3981.1Hz	-25.68	95.00	94.91	-0.02	-0.06	94.83	-1.6	1.6	-0.17	0.12
7943.3Hz	-23.58	95.00	94.69	0.02	-0.17	94.54	-3.1	2.1	-0.46	0.12
15849Hz	-18.08	95.00	95.59	0.06	-0.01	95.64	-17.0	3.5	0.64	0.12

4.9. Electrical signal tests of frequency weightings, C weighting

Frequency response measured with electrical signal relative to level at 1 kHz in reference range. (section 12)

	Input Level	Expected	Measured	Acoustical Resp.	Body Influence	Corr. Measured	Accept - Limit	Accept + Limit	Deviation	Uncertainty
	[dBV]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]
1000Hz, Ref.	-24.68	95.00	95.00	-0.04	-0.09	94.87	-1.1	1.1	-0.13	0.12
63.096Hz	-23.88	95.00	94.97	0.21	0.00	95.18	-1.5	1.5	0.18	0.12
125.89Hz	-24.48	95.00	95.03	0.10	0.00	95.13	-1.5	1.5	0.13	0.12
251.19Hz	-24.68	95.00	95.00	0.01	0.06	95.07	-1.4	1.4	0.07	0.12
501.19Hz	-24.68	95.00	95.04	-0.03	0.22	95.23	-1.4	1.4	0.23	0.12
1995.3Hz	-24.48	95.00	95.03	-0.04	-0.01	94.98	-1.6	1.6	-0.02	0.12
3981.1Hz	-23.88	95.00	94.92	-0.02	-0.06	94.84	-1.6	1.6	-0.16	0.12
7943.3Hz	-21.68	95.00	94.69	0.02	-0.17	94.54	-3.1	2.1	-0.46	0.12
15849Hz	-16.18	95.00	95.56	0.06	-0.01	95.61	-17.0	3.5	0.61	0.12

4.10. Electrical signal tests of frequency weightings, Z weighting

Frequency response measured with electrical signal relative to level at 1 kHz in reference range. (section 12)

	Input Level	Expected	Measured	Acoustical Resp.	Body Influence	Corr. Measured	Accept - Limit	Accept + Limit	Deviation	Uncertainty
	[dBV]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]
1000Hz, Ref.	-24.68	95.00	95.00	-0.04	-0.09	94.87	-1.1	1.1	-0.13	0.12
63.096Hz	-24.68	95.00	94.98	0.21	0.00	95.19	-1.5	1.5	0.19	0.12
125.89Hz	-24.68	95.00	95.00	0.10	0.00	95.10	-1.5	1.5	0.10	0.12
251.19Hz	-24.68	95.00	95.00	0.01	0.06	95.07	-1.4	1.4	0.07	0.12
501.19Hz	-24.68	95.00	95.00	-0.03	0.22	95.19	-1.4	1.4	0.19	0.12
1995.3Hz	-24.68	95.00	95.00	-0.04	-0.01	94.95	-1.6	1.6	-0.05	0.12
3981.1Hz	-24.68	95.00	94.94	-0.02	-0.06	94.86	-1.6	1.6	-0.14	0.12
7943.3Hz	-24.68	95.00	94.70	0.02	-0.17	94.55	-3.1	2.1	-0.45	0.12
15849Hz	-24.68	95.00	95.62	0.06	-0.01	95.67	-17.0	3.5	0.67	0.12

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4.11. Frequency and time weightings at 1 kHz

Frequency and time weighting measured at 1 kHz with electrical signal in reference range. Measured relative to A-weighted and Fast response. (section 13)

	Expected	Measured	Accept - Limit	Accept + Limit	Deviation	Uncertainty	
	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	
LAF, Ref.	94.00	94.00	-0.4	0.4	0.00	0.12	
LCF	94.00	94.00	-0.4	0.4	0.00	0.12	
LZF	94.00	94.00	-0.4	0.4	0.00	0.12	
LAS	94.00	93.99	-0.4	0.4	-0.01	0.12	
LAeq	94.00	93.99	-0.4	0.4	-0.01	0.12	

4.12. Level linearity on the reference level range, Upper

Level linearity in reference range, measured at 8 kHz until overload. (section 14)

	Expected	Measured	Accept - Limit	Accept + Limit	Deviation	Uncertainty	
	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	
94 dB	94.00	94.00	-1.1	1.1	0.00	0.12	
99 dB	99.00	99.00	-1.1	1.1	0.00	0.12	
104 dB	104.00	104.00	-1.1	1.1	0.00	0.12	
109 dB	109.00	109.01	-1.1	1.1	0.01	0.12	
114 dB	114.00	114.02	-1.1	1.1	0.02	0.12	
119 dB	119.00	119.02	-1.1	1.1	0.02	0.12	
124 dB	124.00	124.02	-1.1	1.1	0.02	0.12	
129 dB	129.00	129.03	-1.1	1.1	0.03	0.12	
134 dB	134.00	134.02	-1.1	1.1	0.02	0.12	
135 dB	135.00	135.02	-1.1	1.1	0.02	0.12	
136 dB	136.00	136.02	-1.1	1.1	0.02	0.12	
137 dB	137.00	137.02	-1.1	1.1	0.02	0.12	
138 dB	138.00	138.02	-1.1	1.1	0.02	0.12	
139 dB	139.00	139.02	-1.1	1.1	0.02	0.12	

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4.13. Level linearity on the reference level range, Lower

Level linearity in reference range, measured at 8 kHz down to lower limit, or until underrange. (section 14)

	Expected	Measured	Accept - Limit	Accept + Limit	Deviation	Uncertainty	
	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	
94 dB	94.00	94.00	-1.1	1.1	0.00	0.12	
89 dB	89.00	88.99	-1.1	1.1	-0.01	0.12	
84 dB	84.00	84.00	-1.1	1.1	0.00	0.12	
79 dB	79.00	78.99	-1.1	1.1	-0.01	0.12	
74 dB	74.00	73.99	-1.1	1.1	-0.01	0.12	
69 dB	69.00	68.99	-1.1	1.1	-0.01	0.12	
64 dB	64.00	63.98	-1.1	1.1	-0.02	0.12	
59 dB	59.00	58.98	-1.1	1.1	-0.02	0.12	
54 dB	54.00	53.99	-1.1	1.1	-0.01	0.12	
49 dB	49.00	48.99	-1.1	1.1	-0.01	0.12	
44 dB	44.00	44.00	-1.1	1.1	0.00	0.12	
39 dB	39.00	39.02	-1.1	1.1	0.02	0.30	
34 dB	34.00	34.04	-1.1	1.1	0.04	0.30	
29 dB	29.00	29.11	-1.1	1.1	0.11	0.30	
28 dB	28.00	28.17	-1.1	1.1	0.17	0.30	
27 dB	27.00	27.19	-1.1	1.1	0.19	0.30	
26 dB	26.00	26.24	-1.1	1.1	0.24	0.30	
25 dB	25.00	25.29	-1.1	1.1	0.29	0.30	

4.14. Toneburst response, Time-weighting Fast

Response to 4 kHz toneburst measured in reference range, relative to continuous signal. (section 16)

	Expected	Measured	Accept - Limit	Accept + Limit	Deviation	Uncertainty	
	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	
Continuous, Ref.	138.00	138.00	-0.8	0.8	0.00	0.11	
200 ms Burst	137.00	136.99	-0.8	0.8	-0.01	0.11	
2 ms Burst	120.00	119.93	-1.8	1.3	-0.07	0.11	
0.25 ms Burst	111.00	110.87	-3.3	1.3	-0.13	0.11	

4.15. Toneburst response, Time-weighting Slow

Response to 4 kHz toneburst measured in reference range, relative to continuous signal. (section 16)

	Expected	Measured	Accept - Limit	Accept + Limit	Deviation	Uncertainty	
	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	
Continuous, Ref.	138.00	138.01	-0.8	0.8	0.01	0.11	
200 ms Burst	130.61	130.58	-0.8	0.8	-0.03	0.11	
2 ms Burst	111.01	110.97	-3.3	1.3	-0.04	0.11	

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4.16. Toneburst response, LAE

Response to 4 kHz toneburst measured in reference range, relative to continuous signal. (section 16)

	Expected	Measured	Accept - Limit	Accept + Limit	Deviation	Uncertainty	
	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	
Continuous, Ref.	138.00	138.00	-0.8	0.8	0.00	0.11	
200 ms Burst	131.00	130.98	-0.8	0.8	-0.02	0.11	
2 ms Burst	111.00	110.96	-1.8	1.3	-0.04	0.11	
0.25 ms Burst	102.00	101.86	-3.3	1.3	-0.14	0.11	

4.17. Peak C sound level, 8 kHz

Peak-response to a 8 kHz single- cycle sine measured in least-sensitive range, relative to continuous signal. (section 17)

	Expected	Measured	Accept - Limit	Accept + Limit	Deviation	Uncertainty	
	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	
Continuous, Ref.	135.00	135.00	-0.4	0.4	0.00	0.11	
Single Sine	138.40	138.64	-2.4	2.4	0.24	0.40	

4.18. Peak C sound level, 500 Hz

Peak-response to a 500 Hz half-cycle sine measured in least-sensitive range, relative to continuous signal. (section 17)

	Expected	Measured	Accept - Limit	Accept + Limit	Deviation	Uncertainty	
	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	
Continuous, Ref.	135.00	135.00	-0.4	0.4	0.00	0.11	
Half-sine, Positive	137.40	137.11	-1.4	1.4	-0.29	0.40	
Half-sine, Negative	137.40	137.11	-1.4	1.4	-0.29	0.40	

4.19. Overload indication

Overload indication in the least sensitive range determined with a 4 kHz positive/negative half-cycle signal. (section 18)

	Measured	Accept - Limit	Accept + Limit	Deviation	Uncertainty	
	[dB]	[dB]	[dB]	[dB]	[dB]	
Continuous	140.00	-0.4	0.4	0.00	0.20	
Half-sine, Positive	141.10	-10.0	10.0	1.10	0.20	
Half-sine, Negative	141.20	-10.0	10.0	1.20	0.20	
Difference	141.20	-1.8	1.8	0.10	0.30	

4.20. Environmental conditions, Following calibration

Actual environmental conditions following calibration. (section 7)

	Measured	
	[Deg / kPa / %RH]	
Air temperature	22.90	
Air pressure	99.50	
Relative humidity	51.00	

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DANAK

The Danish Accreditation and Metrology Fund - DANAK - is managing the Danish accreditation scheme based on a contract with the Danish Safety Technology Authority under the Danish Ministry of Economics and Business Affairs who is responsible for the legislation on accreditation in Denmark.

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- *that the laboratory and its personnel are free from any commercial, financial or other pressures, which might influence their impartiality;*
- *that the laboratory operates a documented management system, and has a management that ensures that the system is followed and maintained;*
- *that the laboratory has at its disposal all items of equipment, facilities and premises required for correct performance of the service that it is accredited to perform;*
- *that the laboratory has at its disposal personnel with technical competence and practical experience in performing the services that they are accredited to perform;*
- *that the laboratory has procedures for traceability and uncertainty calculations;*
- *that accredited testing, calibration or medical examination are performed in accordance with fully validated and documented methods;*
- *that accredited services are performed and reported in confidentiality with the customer and in compliance with the customer's request;*
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Rehab Glassco Ltd.

Closure Plan, Environmental Liability Risk Assessment (ELRA) and Financial Provision for Glass and Can Recycling Facility (EPA Waste Licence Application W0279-01)

September 2013

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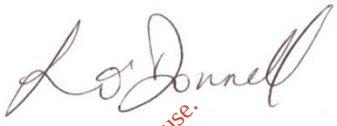
Report Issue Form

IF-11B
Revision: 02 (21st July 2011)

Client Name:	Rehab Glassco Ltd.
Client Address:	Unit 4, Osberstown Industrial Park, Caragh Road, Naas, Co. Kildare, Ireland
Report Title:	Closure Plan, Environmental Liability Risk Assessment (ELRA) and Financial Provision for Glass and Can Recycling Facility (EPA Waste Licence Application W0279-01)
Project Code:	RG0201

Project Manager (Name):	Louise O'Donnell
Project Manager (Sign):	
Project Manager (Date):	5th September 2013

Approved by Project Director (Name):	Vip Patel
Approved by Project Director (Sign):	
Approved by Project Director (Date):	5th September 2013

Issue No.	Date	Status
01	05/09/2013	Final version. Issue to Client and EPA.

Notes/Comments:

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1.0 Introduction

1.1 About this Report

1.1.1 Patel Tonra Ltd., Environmental Solutions was commissioned by Rehab Glassco Ltd. (also referred to as 'Rehab Glassco' hereinafter) to assess the company's obligations for a glass recycling facility at Unit 4, Osberstown Industrial Park, Caragh Road, Naas, Co. Kildare, in relation to:

- Environmental Liability Risk Assessment (ELRA),
- Closure, Restoration and Aftercare Management Plan (CRAMP), and
- Financial Provision (FP)

1.1.2 The report was commissioned in response to an 'Article 14' notice[1] from the Environmental Protection Agency ('the Agency'), dated 2nd July 2013, as detailed in **Section 1.5**.

1.1.3 The Rehab Glassco Ltd. facility is the subject of a Waste Licence Application to the EPA (submitted July 2011), EPA Ref. W0279-01.

1.1.4 The report is based on information pertaining to the development set out in the Waste Licence Application (July 2011) and Remedial Environmental Impact Statement (REIS) (March 2013).

1.1.5 The approach adopted herein is based on EPA guidance currently in force[2]; however it was noted that a draft guidance document, '*Guidance on assessing and costing environmental liabilities (Draft)*', dated July 2013, was in circulation at the time of writing and it is also referenced herein.

1.2 Description of the Facility

1.2.1 The site is a fully operational, state-of-the-art glass recycling facility. The facility plays a critical role in the recycling and recovery of glass in the context of the Irish waste management sector; the operation of this facility makes a substantive contribution towards meeting Ireland's recycling and recovery targets for glass.

1.2.2 The facility currently operates under a Waste Facility Permit (register number WFP-KE-08-0357-01) issued by Kildare County Council in 2008. On the basis of increased tonnage inputs in 2011, it was deemed necessary to make an application to the Environmental Protection Agency (EPA) for a Waste Licence. An application for a Waste Licence was lodged with the EPA on 26th July 2011. The EPA reference number is W0279-01.

1.2.3 Rehab Glassco offers a nationwide collection and recycling service for all types of waste glass and cans. The recycling facility at Osberstown (Naas) uses advanced technology to sort glass into three separate colours, processes colour-segregated glass and produces a glass cullet product, which is dispatched off-site for use in the manufacture of new glass bottles and jars.

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[1] Notice in accordance with Article 14(2)(b)(ii) of the Waste Management (Licensing) Regulations

[2] EPA (2006) *Guidance on Environmental Liability Risk Assessment, Residuals Management Plans and Financial Provision*

1.3 ELRA and CRAMP Requirements

Background

CRAMP = Closure, Restoration & Aftercare Management Plan
CP = Closure Plan
ELRA = Environmental Liabilities Risk Assessment
FP = Financial Provision

1.3.1 CRAMP, ELRA and FP are mutually dependent.[3]

1.3.2 Both the IPPC Directive, which was transposed into law under the Protection of The Environment Act of 2003, and the Landfill Directive make reference to the requirements to ensure that closure is adequately addressed. The IPPC Directive states that "the necessary measures are taken upon definitive cessation of activities to avoid any pollution risk and return the site of the operation to a satisfactory state." [4]

CRAMP/ELRA: EPA Guidance

1.3.3 The EPA published *Guidance on Environmental Liability Risk Assessment, Residuals Management Plans and Financial Provision* in 2006. This guidance document presents a systematic approach to the assessment and management of Environmental Liabilities in order to comply with IPPC and Waste Licence conditions for Environmental Risk Assessment (ELRA), Residual Management Planning (RMP) and Financial Provision (FP).

1.3.4 A systematic step-wise approach is outlined in the EPA guidance document, as follows:

- Step 1: Initial Screening and Operational Risk Assessment
- Step 2: Preparation of a Closure, Restoration and Aftercare Management Plan (CRAMP) for known Liabilities
- Step 3: Environmental Liability Risk Assessment (ELRA) for unknown Liabilities
- Step 4: Identification of Financial Provision (FP) and Instruments

1.3.5 The following ELRA risks must be included at a minimum (if applicable):

- Leaks from above ground and below ground storage tanks
- Spillages from bund
- Leaks from process and effluent bunds
- Leaks from pipes
- Fire and failure/overspill from fire water storage at the facility
- Failures in landfill liner
- Escapes of landfill gas
- Tank overflows

[3] EPA (2006) *Guidance on Environmental Liability Risk Assessment, Residuals Management Plans and Financial Provision*, Page 8

[4] EPA (2006) *Guidance on Environmental Liability Risk Assessment, Residuals Management Plans and Financial Provision*, Page 17

- Mobile tanker spills on site
- Leaks from underground sumps

1.3.6 A closure plan should contain all of the following elements:[5]

Table 1.1: Closure Plan Requirements

Closure Plan Section	Section Contents
Introduction	▪ Facility and Licence Details ▪ Facility Closure Scenarios Covered in the Plan
Site Evaluation	▪ Facility Description & History ▪ Facility Compliance Status ▪ Facility Processes and Activities ▪ Inventory of Site Buildings, Plant, Raw Materials and Wastes
Closure Considerations	▪ Clean or Non Clean Closure Declaration ▪ Plant or Equipment Decontamination Requirements ▪ Plant Disposal or Recovery ▪ Waste Disposal or Recovery ▪ Soil or Spoil Removal
Criteria for Successful Closure	▪ Addressing of Site Environmental Liabilities at Closure
Closure Plan Costing	▪ Decontamination Costs ▪ Plant & Waste Disposal Costs ▪ On-going monitoring ▪ Facility Security and Staffing ▪ Other Costs
Closure Plan Update & Review	▪ Proposed Frequency of Review ▪ Proposed Scope of Review
Closure Plan Implementation	▪ EPA Notification ▪ Local or other Statutory Authority notifications ▪ Test Programme (If Applicable) ▪ Full or Partial Closure considerations
Closure Plan Validation	▪ Closure Validation Audit ▪ Closure Validation Audit Report ▪ Closure Validation Certificate

[5] EPA (2006) *Guidance on Environmental Liability Risk Assessment, Residuals Management Plans and Financial Provision,* Table 3.2, Page 20

1.4 Known and Unknown Liabilities

1.4.1 Environmental liabilities can be subdivided into two main types: known and unknown liabilities. The quantification and costing of these liabilities is conducted separately and different financial instruments are appropriate for each type of liability. **Table 1.2** outlines how these different liabilities are defined, quantified and should be provided for financially.[6]

Table 1.2: Outline of Environmental Liability Assessment

Liability Type	Definition	Quantification Method	Financial Instrument
Known Liability	Planned/anticipated liabilities associated with facility closure, restoration and aftercare management	Closure Restoration Aftercare Management Plan (CRAMP)	Cash based (Cash, Trust, Fund, Escrow, etc.)
Unknown Liability	The risk of environmental liabilities occurring due to unexpected events (e.g. leaking chemical storage tank resulting in groundwater contamination)	Environmental Liability Risk Assessment (ELRA)	Risk transfer instruments (insurance, bonds etc.) or combinations of these instruments

1.5 Article 14 Requirements

1.5.1 The EPA issued a notice in accordance with Article 14(2)(b)(ii) of the Waste Management (Licensing) Regulations on 2nd July 2013. Item #7 related to Liability, Closure and Financial Provision, as follows:

In accordance with section 53(1) of the Waste Management Acts 1996 to 2013, please furnish particulars in respect of the ability of Rehab Glassco Ltd to meet the financial commitments of liabilities that will be entered into or incurred in carrying on the proposed activity and provide evidence that Rehab Glassco Ltd will be in position to make financial provision that is adequate to discharge these financial commitments. Specifically:

(a) Prepare a fully detailed and costed Closure, Restoration and Aftercare Management Plan (CRAMP) for the facility[7], to include as a minimum the following:

- A scope statement for the plan.
- The criteria which define the successful closure and restoration of the facility or part thereof, and which ensure minimum impact to the environment.
- A programme to achieve the stated criteria.
- Where relevant, a test programme to demonstrate the successful implementation of the plan.

[6] EPA (2006) *Guidance on Environmental Liability Risk Assessment, Residuals Management Plans and Financial Provision*, Page 8

[7] Addressed in **Chapter 3** of this report.

- Details of the long-term supervision, monitoring, control, maintenance and reporting requirements for the restored facility.
- Details of the costings for the plan and the financial provisions to underwrite those costs.

(b) Prepare a fully detailed and costed Environmental Liabilities Risk Assessment (ELRA) [8] *which addresses the liabilities and potential liabilities from past and proposed activities, including those liabilities and costs identified in the CRAMP. Provide evidence that the assessment was prepared or reviewed, and was found to be complete and accurate, by an independent and appropriately qualified consultant or expert.* [9]

(c) Provide a proposal for financial provision to cover any liabilities associated with the operation and identified in the ELRA (including closure, restoration and aftercare and unanticipated accidents, incidents and liabilities). Provide evidence that Rehab Glassco Ltd will be in a position to put such financial provision in place in the event that a waste licence is granted and prior to development works commencing. [10]

The preparation of the CRAMP and ELRA and evaluation of the amount and form of financial provision should have regard to Environmental Protection Agency guidance including Guidance on Environmental Liability Risk Assessment, Residuals Management Plans and Financial Provision (2006). [11]

[8] Addressed in **Chapter 4** of this report.

[9] This report has been prepared by Patel Tonra Ltd., Environmental Solutions, using the prescribed EPA guidance, and using the methodology detailed in the report.

[10] Addressed in **Chapter 5** of this report.

[11] The EPA guidance note, and methodology outlined therein, has been robustly referenced throughout this report.

2.0 Initial Screening and Operational Risk Assessment

2.1 Introduction

2.1.1 This section outlines the initial screening and operational risk assessment outlined in EPA (2006) *Guidance on Environmental Liability Risk Assessment, Residuals Management Plans and Financial Provision*.

2.1.2 The facility is required to be classified as a Category 1, Category 2 or Category 3 site, based on the assessed (i) Complexity, (ii) Environmental Sensitivity, and (iii) Compliance Record.

2.2 Complexity

2.2.1 As per the Third and Fourth Schedules of the Waste Management Acts (WMA) 1996 to 2010, the following classes of activities were included in the Waste Licence Application for the Rehab Glassco facility:

- **D 15** - Storage pending any of the operations numbered D 1 to D 14 (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).
- **R 4** - Recycling/reclamation of metals and metal compounds.
- **R 5** - Recycling/reclamation of other inorganic materials, which includes soil cleaning resulting in recovery of the soil and recycling of inorganic construction materials. (Principal Activity)
- **R 12** - Exchange of waste for submission to any of the operations numbered R 1 to R 11 (if there is no other R code appropriate, this can include preliminary operations prior to recovery including pre-processing such as, amongst others, dismantling, sorting, crushing, compacting, pelletising, drying, shredding, conditioning, repackaging, separating, blending or mixing prior to submission to any of the operations numbered R1 to R11).
- **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).

2.2.2 The corresponding Complexity Bands for each of the above classes of activities are as follows; see **Table 2.1**.

Table 2.1: Complexity Bands for Stated Classes of Activity

Description of Activity	Class of Activity WMA 1996-2010	Class of Activity WMA 1996	Complexity Band
Storage pending any of the operations numbered D 1 to D 14 (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).	D 15	D 13	G3
Recycling/reclamation of metals and metal compounds.	R 4	R 3	G1
Recycling/reclamation of other inorganic materials, which includes soil cleaning resulting in recovery of the soil and recycling of inorganic construction materials. (Principal Activity)	R 5	R 4	G2
Exchange of waste for submission to any of the operations numbered R 1 to R 11 (if there is no other R code appropriate, this can include preliminary operations prior to recovery including pre-processing such as, amongst others, dismantling, sorting, crushing, compacting, pelletising, drying, shredding, conditioning, repackaging, separating, blending or mixing prior to submission to any of the operations numbered R1 to R11).	R 12	R 12	G2
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).	R 13	R 13	G3

2.2.3 In accordance with the guidance note[12], as there is more than one licensed activity at the facility, the highest Complexity Band is applied, i.e. G3.

2.2.4 The G3 complexity band is assigned a score of 3.

[12] EPA (2006) *Guidance on Environmental Liability Risk Assessment, Residuals Management Plans and Financial Provision*, Page 11

2.3 Environmental Sensitivity

2.3.1 A sub-matrix for environmental sensitivity is outlined in the guidance note[13], which considers six key potential environmental receptors and assigns individual scores that are added together to arrive at a total environmental attribute score; see **Table 2.2**.

Table 2.2: Environmental Sensitivity Scoring

Environmental Attribute[14]	Description	Environmental Attribute Score
Human occupation	1 No. residential property to the west of the Rehab Glassco Ltd. site. The house is approximately 40m from the Rehab Glassco boundary (at the closest point).	5
Groundwater protection - aquifer	The GSI National Draft Bedrock Aquifer Map identifies a *Regionally Important* aquifer underlying the subject site (category Rkd; Regionally Important Aquifer - Karstified (diffuse))	2
Groundwater protection - vulnerability	Groundwater vulnerability for the area underlying the subject site is classified by the GSI as 'moderate'	1
Sensitivity of receiving waters	The river status of the Liffey (at the river section closest to the subject site, ref. EA_Liffey168_Liffey1_Lower_3) is 'Moderate'. Equated to Class B.	2
Air quality and topography	Simple terrain	0
Protected sites and species	The subject site is approximately 0.24km distant (at the closest point) from a proposed National Heritage Area, 'the Liffey at Osberstown'	1
Sensitive agricultural receptors	Agricultural activities within 50m-150m of the facility	1
TOTAL SCORE		**12**
ENVIRONMENTAL SENSITIVITY CLASSIFICATION		**2**

[13] EPA (2006) *Guidance on Environmental Liability Risk Assessment, Residuals Management Plans and Financial Provision*, Page 11

[14] *Note 1: Ref. Table 2.2 Environmental Sensitivity Sub-Matrix Scoring, Pg. 13, Guidance on Environmental Liability Risk Assessment, Residuals Management Plans and Financial Provision*

2.4 Compliance Record

2.4.1 The facility is a newly-licensed facility and therefore a score of 1 applies.

2.4.2 It is noted the facility has operated under Kildare County Council Waste Facility Permit (ref. WFP-KE-08-0357-01) since 2008. There have been no enforcement/ environmental compliance issues arising.

2.5 Risk Category

2.5.1 The overall Risk Category for the Rehab Glassco facility can be assessed as follows (see **Table 2.3**), based on information presented in the previous sections.

Table 2.3: Risk Category Assessment

	Score
Complexity Classification	3
Environmental Sensitivity Classification	2
Compliance Record Score	1
OVERALL RISK SCORE = Complexity x Environmental Sensitivity x Compliance Record	**6**
RISK CATEGORY	**Category 2**

2.5.2 In accordance with EPA guidance[15], a Category 2 facility requires a Closure Plan [Restoration, Aftercare Management Plan not required].

2.5.3 It is noted that the 'new draft guidance note'[16] removes the screening approach as set out in this chapter. It notes that restoration/aftercare and restoration/aftercare plans are necessary where there are environmental liabilities remaining following closure, e.g. contaminated soil and groundwater, landfills, extractive waste facilities, mines, quarries and soil recovery facilities. Under this scenario also, it is confirmed that a Closure Plan would be required for the Rehab Glassco facility [Restoration, Aftercare Management Plan not required].

[15] EPA (2006) *Guidance on Environmental Liability Risk Assessment, Residuals Management Plans and Financial Provision*, Page 19

[16] EPA (July 2013) *Guidance on assessing and costing environmental liabilities (Draft)*

3.0 Closure Plan

3.1 Introduction and Scope

3.1.1 This chapter details the contents of the Closure Plan, as required by the EPA Guidance Note, and summarised in **Table 1.1**.[17]

Facility and Licence Details

3.1.2 The report has been prepared on behalf of Rehab Glassco Ltd. for its glass and can recycling facility at Unit 4, Osberstown Industrial Park, Caragh Road, Naas, Co. Kildare.

3.1.3 The facility currently operates under a Waste Facility Permit (register number WFP-KE-08-0357-01) issued by Kildare County Council in 2008.

3.1.4 On the basis of increased tonnage inputs in 2011, it was deemed necessary to make an application to the Environmental Protection Agency (EPA) for a Waste Licence. An application for a Waste Licence was lodged with the EPA on 26th July 2011. The EPA reference number is W0279-01; the application is under assessment at the time of writing.

3.1.5 A Remedial Environmental Impact Statement (REIS) was prepared to accompany an application for Substitute Consent to An Bord Pleanála for the purpose of regularising the existing Rehab Glassco glass recycling facility and ancillary activities. The Substitute Consent application (and accompanying REIS) was lodged with An Bord Pleanála on 6th March 2013; the application is under assessment at the time of writing. The REIS was also submitted to the Agency under W0279-01.

3.1.6 This report references relevant information from the REIS (March 2013) and the Waste Licence Application (July 2011).

Scope Statement

3.1.7 This Closure Plan considers all requirements relating to the closure and decommissioning of the glass and recycling facility at Unit 4, Osberstown Industrial Park, Caragh Road, Naas, Co. Kildare. As the facility is located within an industrial park, all related on-site built infrastructure of a permanent nature (main processing building, drying plant building and vehicle maintenance building), hard-standing areas, surface water and wastewater drainage arrangements will remain *in-situ* post closure.

3.1.8 As **Chapter 2**, Initial Screening and Operational Risk Assessment, the Rehab Glassco facility has been identified as a 'Category 2' facility, which therefore requires a Closure Plan [Restoration, Aftercare Management Plan not required].

[17] Where additional Closure Plan items are identified in the EPA draft guidance document, '*Guidance on assessing and costing environmental liabilities (Draft)*' (July 2013), every effort has been made to address these additional requirements also.

Facility Closure Scenarios Covered in the Plan

3.1.9 The Plan makes provision for the following closure scenarios:

- Planned closure, enacted by the Operator in accordance with a phased and timely closure programme.
- Unplanned closure, which could necessitate a fast-response closure programme by the Operator or another party.

3.1.10 Closure of this facility will attain 'clean closure' status, as detailed in **Section 3.3**.

3.2 Site Evaluation

Site Description[18]

3.2.1 The site is located at Unit 4, Osberstown Industrial Park, Caragh Road, Naas, Co. Kildare, Ireland, approximately 2.5km west of the town of Naas. The site is in close proximity to the M7 motorway; access to the Industrial Park is via the R409.

3.2.2 The site is located within an industrial park (currently not fully occupied). The adjoining land uses are as follows (as at October 2012):

- North-eastern site boundary:
  - Kildare County Council Osberstown Wastewater Treatment Plant.
- South-eastern site boundary:
  - 'Double L' [business name], Units 6 & 7, Osberstown Industrial Park, comprising industrial unit, public display area, car park and external storage area. The business involves the storage, display and sale of concrete and granite products.
- South-western site boundary:
  - Vacant lot at Unit 3, Osberstown Industrial Park.
  - The industrial park road runs along this boundary.
  - Elsatrans Ltd., a freight and logistics company, is located at Unit 12, Osberstown Industrial Park.
  - There is a storage shed situated on lands adjacent to Unit 12.
  - There is a residential property to the west of the Rehab Glassco Ltd. site. The house is approximately 40m from the Rehab Glassco boundary (at the closest point).
- North-western site boundary: vacant site in the industrial park (Unit 14-15).

3.2.3 The site is designated 'NE 1: Industry/Warehousing' under the Kildare County Development Plan 2011–2017.

3.2.4 The River Liffey flows in a west-east direction and is located approximately 120m to the north of the subject site (at the closest point).

3.2.5 There is a proposed Natural Heritage Area (pNHA) (site name: 'Liffey at Osberstown', Ref. 001395) approximately 0.24km north-east of the subject site (from the closest boundary location). There are no other designated sites within 1km of the subject site.

[18] REIS (Patel Tonra Ltd., 2013)

Facility Description and History

3.2.6 Rehab Glassco offers a nationwide collection and recycling service for glass and cans. Materials are collected from pubs, hotels, restaurants, sports clubs, financial institutions, office blocks, apartments and housing developments, council bring sites, civic amenity centres, industrial units and waste companies.

3.2.7 The following materials are processed at the Osberstown (Naas) facility[19]:

- Bottles and jars
- Aluminium and steel cans

3.2.8 The facility has the capability of sorting mixed glass into colour-separated glass cullet.

3.2.9 There is no public access to the facility (the site does not operate as a 'bring centre' or public collection point for recyclables).

Opening Hours

3.2.10 The hours of waste acceptance[20] are:

- Monday to Saturday (including bank holidays): 07:00 (7am) to 19:00 (7pm)
- Sunday: closed

3.2.11 The hours of operation[21] are:

- Monday to Friday (including bank holidays): 24-hours
- Saturday: 07:00 (7am) to 23:00 (11pm)
- Sunday: closed
- The operation of the Drying Plant will be restricted to 07:00 to 19:00 hrs, Monday to Saturday[22].

[19] Glass accounts for approximately 97% of the total input.

[20] Hours of Waste Acceptance: The hours during which the facility accepts waste.

[21] Hours of Operation: The hours during which the facility is operational.

[22] Commitment made in response document to An Bord Pleanála, Tom Phillips & Assoc. (on behalf of Rehab Glassco Ltd.), 9th July 2013. Further detailed in Response to EPA Notice in accordance with Article 14(2)(b)(ii) of Waste Management (Licensing) Regulations.

Input Quantities

3.2.12 The volume of material accepted at the facility increased significantly between 2010 and 2011 (see **Table 3.1**) as a result of the closure of a related glass recycling facility in Ballymount, South Dublin. Rehab Recycle (part of The Rehab Group) previously operated a glass recycling facility in Ballymount, South Dublin under Waste Facility Permit (No. WPR 004/2); the Ballymount facility closed in February 2011. From February 2011 onwards, all material was directed to the Osberstown (Naas) facility.

3.2.13 The increase in tonnage input to the Osberstown facility triggered the requirement for a Waste Licence Application to the EPA, which was submitted on 26th July 2011. The input tonnages for the Osberstown (Naas) facility for 2008 to 2012 are provided in Table **3.1**.

Table 3.1: Input tonnages to the glass recycling facility at Osberstown (Naas), 2008-2012

Year	Input tonnage
2008	34,028
2009	58,230
2010	55,367
2011	90,920
2012	96,565
Application tonnage, per annum	97,000

3.2.14 Rehab Glassco seeks to accept up to 97,000 tonnes per annum, in accordance with the REIS (March 2013).

Site description

3.2.15 The physical elements of the facility are as follows (see attached drawing):

- The site area is 21,300m^2.
- Main Process building – a portal frame structure; floor area: 734m^2, dimensions: 41.26m x 17.79m, 12m maximum height. The purpose-designed Main Process building contains the recycling plant for the segregation and processing of glass (and small volumes of other recyclables) for recovery purposes. This is the principal activity carried out on site. Offices, staff canteen and toilets are also contained within the Main Process building. See **Photograph 1**.
- Drying Plant building - a steel-framed, fabric-covered structure; floor area: 314m^2, dimensions: 19.46m x 16.14m, 8.34m maximum height. The Drying Plant building houses a rotating drying unit, with associated conveyor, bagging and ancillary equipment. This building is used to manufacture a specified product from reject glass for remanufacturing uses. See **Photograph 2**.
- Vehicle Maintenance building - a steel-framed, fabric-covered structure; floor area: 241m^2, dimensions: 19.4m x 12.4m, 7.0m maximum height. The building is used for maintenance of Rehab Glassco vehicles only (no third party vehicles). See **Photograph 3**.

- Outdoor storage areas, including storage bays and an open storage area for recycling bins/banks, pallets, etc. in the northern corner of the site. There are approximately 19 No. outdoor storage bays, ranging in area from 70m^2 to 1000m^2. They are constructed of permanent pre-cast concrete wall panels or moveable pre-cast concrete blocks. The maximum height of the wall is approx. 3.6m above ground level and material is stored to a maximum of 3m above ground level. See **Photograph 4**.
- Vehicle parking (approximately 34 No. car parking spaces and approx. 11 No. truck parking spaces) and internal access routes, completed in concrete hardstanding. See **Photograph 5**. A wayleave associated with the Newbridge Rising Main runs along the north-eastern boundary of the site (plastic matting system applied as surface treatment to permit access, if required). See **Photograph 6**.
- Ancillary activities and infrastructure, including weighbridge, truck wash, foul and surface water management infrastructure (including interceptors and underground attenuation tank), fuel storage (gas and diesel), security gates and boundary fencing/landscaping.
- All of the above features are existing and operational at the time of writing.

Site History

3.2.16 The development of the site has been in accordance with its planning history, as detailed in **Table 3.2**. Prior to the Rehab Glassco[23] development, the site was greenfield; it was developed by Rehab Glassco in two major phases, i.e. initially the eastern portion of the site; followed by the western portion.

Table 3.2: Planning history (Kildare County Council) for Site 4, Osberstown Industrial Park, Caragh Road, Naas, Co. Kildare[24]

Ref.	Applicant Name	Development Description	Application Date	Grant Date
11508	Rehab Glassco Ltd	For retention of free standing maintenance building with steel framed, fabric covered structure for company vehicle maintenance	18/05/2011	26/05/2012
101195	Rehab Glassco Ltd	For retention of free-standing plant with steel framed, fabric covered structure for glass recycling	25/11/2010	15/04/2011
10984	Rehab Glassco Ltd	For a new free standing plant with steel framed, fabric covered structure for glass recycling	24/09/2010	Application invalidated
10652	Rehab Glassco Ltd	For retention of change of use to office space from industrial space and retention of relocated and amended external staircase	28/06/2010	24/09/2010

[23] Previously Glassco Recycling Ltd.
[24] Source: Kildare County Council planning website

Ref.	Applicant Name	Development Description	Application Date	Grant Date
0948	Glassco Recycling Ltd	To extend the site of an existing glass recycling plant to provide additional vehicle parking and external storage areas on land adjoining sites 4 and 5	22/01/2009	18/08/2009
061710	Glassco Recycling Ltd	Construction of glass recycling plant	11/08/2006	29/03/2007

Facility Compliance Status

3.2.17 An application for a Waste Licence was lodged with the EPA on 26th July 2011. The EPA reference number is W0279-01; the application is under assessment at the time of writing.

3.2.18 The facility currently operates under a Waste Facility Permit (register number WFP-KE-08-0357-01) issued by Kildare County Council. Kildare County Council notes that the facility is compliant with its Facility Permit[25].

3.2.19 The Rehab Glassco facility has been the subject of a range of environmental monitoring, under the terms of its Waste Facility Permit, and as part of the Waste Licence Application and REIS.

Environmental Pathways and Sensitivity

3.2.20 This ELRA/Closure Plan study (in line with the REIS) considers the following environmental pathways:

- Emissions to air
- Emissions to surface water
- Emissions to sewer
- Noise emissions
- Nuisance impacts
- Ground/groundwater contamination

3.2.21 Environmental sensitivity is considered in **Section 2.3**.

[25] Correspondence from Kildare County Council to An Bord Pleanála 4th June 2013: "*The Environment section has no comments to add to the application for substitute consent for Rehab Glassco. Rehab Glassco Ltd has a Waste Facility Permit – WFP-KE-08-0357-01 from Kildare County Council. Environmental officers from KCC inspect the permitted site regularly. The permitted site is found to be in compliance with the Waste Facility Permit.*"

Facility Processes and Activities

3.2.22 The classes of activity proposed under the Rehab Glassco Waste Licence Application are as follows:

3.2.23 In accordance with the Third and Fourth Schedules to the Waste Management Acts 1996 to 2011[26], the principal waste activity is Fourth Schedule, Recovery Operations, Class ***R 5****: Recycling/reclamation of other inorganic materials, which includes soil cleaning resulting in recovery of the soil and recycling of inorganic construction materials.* This activity at Rehab Glassco relates to the separation and recycling of glass.

3.2.24 Metals are also recovered at the facility (e.g. drinks cans, food tins); therefore Fourth Schedule, Recovery Operations, Class ***R 4****: Recycling/reclamation of metals and metal compounds*, is relevant.

3.2.25 In relation to the operation of the Drying Plant at Rehab Glassco, the following class of activity is relevant: ***R 12****: Exchange of waste for submission to any of the operations numbered R 1 to R 11 (if there is no other R code appropriate, this can include preliminary operations prior to recovery including pre-processing such as, amongst others, dismantling, sorting, crushing, compacting, pelletising, drying, shredding, conditioning, repackaging, separating, blending or mixing prior to submission to any of the operations numbered R1 to R11)*.

3.2.26 Small amounts of residual material will be temporarily stored on-site pending off-site recovery or disposal at an appropriately licensed/permitted waste facility; therefore the following classes are relevant:

- Third Schedule, Disposal Operations, Class **D 15**: Storage pending any of the operations numbered D 1 to D 14 (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).
- Fourth Schedule, Recovery Operations, 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).

[26] Including amendments by the European Communities (Waste Directive) Regulations, 2011

Inventory of Site Buildings, Plant, Raw Materials and Wastes

Site Buildings

Table 3.3: Inventory of Site Buildings

Building	Size/ dimensions	Description and use
Main Process building	▪ Floor area: 734m^2 ▪ Dimensions: 41.26m x 17.79m, 12m maximum height	▪ Portal frame structure ▪ The purpose-designed Main Process building contains the recycling plant for the segregation and processing of glass (and small volumes of other recyclables) for recovery purposes. This is the principal activity carried out on site. ▪ Offices, staff canteen and toilets are also contained within the Main Process building. ▪ See **Photograph 1**.
Drying Plant building	▪ Floor area: 314m^2 ▪ Dimensions: 19.46m x 16.14m, 8.34m maximum height	▪ Steel-framed, fabric-covered structure. ▪ The Drying Plant building houses a rotating drying unit, with associated conveyor, bagging and ancillary equipment. This building is used to manufacture a specified product from reject glass for remanufacturing uses. ▪ See **Photograph 2**.
Vehicle Maintenance building	▪ Floor area: 241m^2 ▪ Dimensions: 19.4m x 12.4m, 7.0m maximum height	▪ Steel-framed, fabric-covered structure. ▪ The building is used for maintenance of Rehab Glassco vehicles only (no third party vehicles). ▪ See **Photograph 3**.

Plant

Table 3.4: Plant Inventory

Plant Item	Location	Number in use
Conveyor belt	Main Plant	15
Electro-magnet feeders	Main Plant	13
Unbalanced feeders	Main Plant	10
Screens	Main Plant	5
Bucket elevators	Main Plant	6
Hoppers	Main Plant	2
Suction system	Main Plant	1
Eddie currents	Main Plant	3
Over-band magnets	Main Plant	2
Fixed magnets	Main Plant	2
Compressors	Main Plant	3
Roller crusher	Main Plant	1
Optical separators	Main Plant	10
Organic separators	Main Plant	4
Can shredder	Main Plant	1
Can baler	Main Plant	1
Conveyor belt	Drying Plant	6
Screw conveyor	Drying Plant	4
Electro-magnet feeders	Drying Plant	2
Unbalanced feeders	Drying Plant	1
Screens	Drying Plant	3
Bucket elevators	Drying Plant	2
Hoppers	Drying Plant	2
Suction system	Drying Plant	3
Filter-house	Drying Plant	1
Fixed magnets	Drying Plant	1
Hammer crusher	Drying Plant	1
Drum dryer	Drying Plant	2
LPG burner	Drying Plant	2
Turn-table	Drying Plant	1
Bag-weigher	Drying Plant	1
Bag sealer	Drying Plant	2
Forklift trucks	Yard	2
JCB shovel	Yard	1
Volvo shovel	Yard	1

Raw Materials

Table 3.5: Raw Materials Inventory

Raw Material	Description and use	Storage Arrangements	Approx. quantities per annum	Max. storage capacity
Glass– bottles and jars	Primary raw materials for the process.	Outdoor storage bays	97,000 t	2,500 t
Reject Glass	Secondary raw material for the drying process	Outdoor storage bays/stockpiles	25,000 t	10,000 t
Mixed plate glass	Brokered material	Outdoor storage bay	800 t	100 t
Cans	Primary raw materials for the process.	Outdoor storage bays	3,000 t	100 t
Gas	Fuel source for the Drying Plant operation.	30-tonne gas storage tank Dimensions approx. 7.4m long x 3.8m diameter	400,000 ltr	60,000 ltr
Diesel	Used to fuel site vehicles	Stored in 2 No. on-site tanks (10,000-litre and 5,000-litre tanks)	90,000 ltr	15,000 ltr
Oils, lubricants, etc.	Associated with vehicle maintenance and garaging activities	Stored on drip trays/spill pallets in the Garage Building[27]	1435 ltr engine oil 205 ltr antifreeze 205 ltr hydraulic oil	410 ltr x 2
Water	Used in the (pilot) pelletising process within the Drying Plant building	Mains water only	2000 ltr	None
Sodium silicate	Used as a binding agent in the (pilot) pelletising process within the Drying Plant building.	Stored in IBC containers in the Drying Plant building	2000 ltr	20 t

[27] **Fosse 4 Drum Spill Pallet**
Description: 4 Drum Spill Pallet
Structure: 100% polyethylene with some chemical compatibility
Containment Volume: 410 Litres
Dimensions: 128cm x 128cm x 28cm
Product Weight: 44kg

Products

Table 3.5: Inventory of Products

Products	Description and use	Storage Arrangements	Approx. quantities per annum	Max. storage capacity
Glass cullet	Glass cullet for remanufacture of glass products off-site	Outdoor storage bays	97,000 t	1000 t
Cans	Crushed and palletised for off-site use	Outdoor storage bays	2,000 t	60 t
Glass fines	Water filtration/shot blast	25kg bags/1 tonne bags	3,000 t	200 t
Processed ceramics	Manufacturing of fire places	Outdoor storage bays	200 t	100 t

Wastes

Table 3.6: Inventory of Wastes

Type	Description and source	Storage Arrangements	Approx. quantities per annum	Max. storage capacity
Residual process waste	Residual from Main Process and the Drying Plant operations	Bay 1	1,500 t	40 t
Non-process wastes - office	General municipal-type waste; office paper waste	Wheelie bins	1 t	0.1 t (100 kg)
Non-process wastes - garage	Waste from garaging activities, e.g. waste oil, oily rags, used filters	Wheelie bins Bunded pallet tray	1.4 t 400 ltr waste oils	0.07 t (70 kg) 400 ltr
Other bulky/ misc. waste	e.g. waste pallets, scrap metal, concrete blocks, plastic piping, litter on site or deposited in the yard	Dedicated yard area north western part of the site	60 t	60 t

3.2.27 Records of all wastes removed from site are retained by Rehab Glassco. Only appropriately licensed/permitted waste contractors and facilities are used.

3.3 Closure Considerations

Clean or Non Clean Closure Declaration

3.3.1 The EPA defines 'clean' and 'non-clean' closure as follows:

- Clean Closure – upon cessation of operations and subsequent decommissioning at the facility, there are no remaining environmental liabilities
- Non-Clean Closure – upon cessation of operations and subsequent decommissioning – there are remaining liabilities, which require a restoration and aftercare management plan

3.3.2 The closure of the Rehab Glassco facility will result in 'clean closure'.

Plant or Equipment Decontamination Requirements

3.3.3 It is anticipated that the following plant/equipment will require decontamination:

Drying Plant:

- Gas Boiler and associated drying unit/drum
- All pipework associated with air emissions abatement system and stack
- Bag filters/housing and associated ancillary equipment

Ancillary Plant:

- Gas storage tank (30 tonne)
- Fuel tank (10,000 litre)
- Fuel tank (5,000 litre)
- Garage bunds and drip/spill control trays
- Any containers or drums of liquid/oils/lubes/chemicals, residual, partial or full units

Plant or Equipment Decommissioning Requirements

3.3.4 It is anticipated that the following plant/equipment will require decommissioning and or dismantling:

Main Plant:

- Plant inventory as identified in **Table 3.4** associated with the Main Plant.
- Main plant and Electrical control unit

Drying Plant:

- Plant inventory as identified in **Table 3.4** associated with the Drying Plant
- Gas Boiler & associated drying unit/drum
- All pipework associated with air emissions abatement system and stack
- Bag filters/housing and associated ancillary equipment
- Any containers or drums of liquid/oils/lubes/chemicals, residual, partial or full units
- Main plant and Electrical control unit

Ancillary Plant:

- Gas storage tank (30 tonne)
- Fuel tank (10,000 litre)
- Fuel tank (5,000 litre)

- Garage bunds and drip/spill control trays
- Any containers or drums of liquid/oils/lubes/chemicals, residual, partial or full units

Waste Disposal or Recovery

Input and Output Material

3.3.5 Strict waste acceptance procedures will be applied during the lifetime of the facility to ensure that only conforming wastes are accepted at the facility. No significant waste volumes are anticipated under the planned closure scenario, in that all input glass/cans will be processed through the plant, with product sent for onward use in the reprocessing sector.

3.3.6 The Closure Plan cost model (**Appendix 1**) is presented on the basis that the material accepted at Rehab Glassco (both input and output glass and cans) has a considerable net value (even allowing for transportation and residual waste management costs). A net zero-cost/revenue is assumed as the 'upper range' in the cost model, which is deemed to be a 'worst-case' position; the 'lower range' indicates current market value (as a revenue stream), as identified by Rehab Glassco. The market value for glass and cans will be re-assessed in line with future reviews of the Closure Plan.

Decontaminated Material

3.3.7 It is anticipated that a minimum amount of residual material isolated from the plant and the distribution pipework will be generated during the decontamination process. This material will require specific disposal via the appropriate and correct disposal routes through authorised waste contractors. The cost of removing decontaminated material has been considered in the Closure Plan cost model (**Appendix 1**).

Decommissioned Plant and Equipment

3.3.8 It is anticipated that the majority of plant and equipment identified in **Table 3.4** and **Section 3.3** above, will be sold for reuse, or recycled. If any plant/equipment is found to be in an unsuitable condition for reuse and has to be scrapped for recycling and/or minimum disposal, this may attract a cost, which has been reflected in the Closure Plan cost model (upper range cost) (**Appendix 1**).

3.3.9 It is envisaged that the contract price for the decontamination, decommissioning and dismantling works will take into consideration the recycling, scrap and disposal value/costs of the plant and equipment as part of the total contract price for the job.

Demolition

3.3.10 On-site storage bays will be deconstructed and materials moved off-site for re-use, recovery or disposal, as appropriate.

Soil or Spoil Removal; Contaminated Land

3.3.11 It is not anticipated that soil/spoil will be generated at part of site closure activities. No contaminated ground or spoil that requires specialist treatment on cessation of activities at the facility is anticipated. No residual materials will remain.

Closure Programme

3.3.12 The following closure programme is anticipated (see **Appendix 1**):

1. All input and output material appropriately removed off-site.
2. All wastes, including residual materials (non-hazardous and hazardous) are appropriately removed off-site.
3. Main Process building - plant and equipment safely decommissioned and removed off-site, as appropriate; building decontaminated, emptied of all contents and left in a safe and secure fashion; offices cleared and cleaned, including all furniture and WEEE.
4. Drying Plant building – boiler decommissioned; decontamination of plant and equipment; deconstruction/demolition of building.
5. Vehicle Maintenance building - decontamination of plant and equipment; deconstruction/demolition of building.
6. Decommissioning of fuel storage areas and associated pipework (diesel tanks and gas tank).
7. On-site storage bays will be deconstructed/demolished, and materials moved off-site for re-use, recovery or disposal, as appropriate. Hardstanding areas swept, washed and left in good condition. Surface water drainage and surface water management infrastructure (including interceptors) checked and verified as fit-for-purpose (cleaned if required).
8. Environmental monitoring and reporting to EPA, including Verification Audit independently completed on behalf of the operator; surrender of EPA licence

3.4 Criteria for Successful Closure

Addressing of Site Environmental Liabilities at Closure

3.4.1 Rehab Glassco has established the following criteria for the successful closure of the facility:

- All input and output material and wastes have been appropriately removed off-site.
- All plant and equipment have been safely decommissioned and removed off-site, as appropriate.
- The Main Process, Drying Plant and Vehicle Maintenance buildings have been emptied of all contents and left in a safe and secure fashion.
- Appropriate site security measures are in place.
- Hard-standing areas, surface water drainage and surface water management infrastructure (including interceptors) has been appropriately cleaned and in good working order.
- EPA requirements addressed.

3.5 Closure Plan Costing

3.5.1 The Closure Plan has been costed with reference to unit costs provided in the new EPA draft guidance note[28]. Reference was made to information contained in the planning and licensing applications and accompanying REIS, and additional information provided by the Operator as part of this study.

3.5.2 The following closure cost items have been considered:

- Plant and equipment decontamination costs
- Plant and equipment decommissioning
- Plant and equipment reuse, recovery or disposal costs
- Demolition costs
- Waste recovery/disposal costs
- Environmental monitoring costs
- Facility Security and Staffing
- Validation costs
- Management and utility costs
- Other costs, as appropriate

3.6 Closure Plan Update & Review

Proposed Scope and Frequency of Review

3.6.1 It is proposed that the Closure Plan will be reviewed in line with licence/EPA requirements, or in the event of a significant amendment to site activities.

3.7 Closure Plan Implementation

EPA Notification

3.7.1 Immediate notice will be given to the EPA pending any decision to close the facility or any part of the operation.

Local or other Statutory Authority notifications

3.7.2 Following consultation with the EPA, Kildare County Council and other interested parties, as appropriate, will be notified of Rehab Glassco's intention to close the facility.

Test Programme (If Applicable)

3.7.3 A test programme is not anticipated as being required as part of the implementation of the Rehab Glassco Closure Plan. Environmental monitoring will be conducted, as appropriate, as detailed in **Section 3.8**.

Full or Partial Closure considerations

3.7.4 Full closure is anticipated; however individual closure tasks/items could be implemented independently, if the need arises, e.g. closure/decommissioning of non-core operations/infrastructure.

[28] EPA (July 2013) *Guidance on Assessing and Costing Environmental Liabilities (Draft)*, Appendix D

3.8 Closure Plan Validation

Closure Validation Audit

3.8.1 An environmental exit assessment of the facility will be carried out following the announcement of closure and prior to actual decommissioning and closure operations taking place. The examination will devise an accurate inventory of all plant, equipment and wastes on site. This inventory will be used as a benchmark against which successful decommissioning will be assessed.

3.8.2 The audit will include planned requirements for environmental monitoring in relation to: dust, noise, emissions to surface water (as a minimum).

Closure Validation Audit Report

3.8.3 An independent validation report will be commissioned through a competent organisation, which will also supervise, certify and report on the decommissioning and closure plan implementation process and progress to Rehab Glassco.

Closure Validation Certificate

3.8.4 Rehab Glassco will liaise with the EPA in terms of surrender of its Waste Licence, and ensure that the EPA is satisfied with final closure arrangements.

3.9 Closure Plan Summary

Table 3.7: Closure Plan Summary

Item	Details
Activity name and address	Glass and can recycling facility Unit 4, Osberstown Industrial Park Caragh Road Naas Co. Kildare Ireland
Name of the operator	Rehab Glassco Ltd.
Licence/permit number	W0279-01 (licence application under assessment by EPA at the time of writing). Currently operating under Kildare County Council Waste Facility Permit (register number WFP-KE-08-0357-01).
Name and address of person/organisation who prepared the plan	Patel Tonra Ltd., Environmental Solutions 3f Fingal Bay Business Park Balbriggan Co. Dublin

Item	Details
Classes of activity licensed/permitted and carried out	▪ **D 15** - Storage pending any of the operations numbered D 1 to D 14 (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). ▪ **R 4** - Recycling/reclamation of metals and metal compounds. ▪ **R 5** - Recycling/reclamation of other inorganic materials, which includes soil cleaning resulting in recovery of the soil and recycling of inorganic construction materials. (Principal Activity) ▪ **R 12** - Exchange of waste for submission to any of the operations numbered R 1 to R 11 (if there is no other R code appropriate, this can include preliminary operations prior to recovery including pre-processing such as, amongst others, dismantling, sorting, crushing, compacting, pelletising, drying, shredding, conditioning, repackaging, separating, blending or mixing prior to submission to any of the operations numbered R1 to R11). ▪ **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).
Risk category, e.g. RBME or DREAM	Not yet determined
Scope: closure plan only or restoration/aftercare plan also	Closure Plan only
Overall closure costs	See **Appendix 1**
Details of any previous closure plans	No previous closure plans
Financial provision mechanism	To be agreed with the Agency, in accordance with guidance.
Review period for the closure and restoration/aftercare plans	To be determined, in line with licence requirements.

4.0 Environmental Liabilities Risk Assessment (ELRA)

4.1 Introduction

4.1.1 Environmental liability risk assessment (ELRA) considers the risk of unplanned events occurring during the operation of a facility that could result in unknown liabilities materialising.

4.1.2 As discussed in **Section 2.2**, the Rehab Glassco facility is classified as a Category 2 facility; therefore the generic approach for Category 2 facilities, as outlined in *Guidance on Environmental Liability Risk Assessment, Residuals Management Plans and Financial Provision* has been followed.

4.1.3 The scope of the ELRA covers environmental risks associated with the proposed integrated waste management facility, which could potentially lead to environmental liability.

4.2 Risk Identification

4.2.1 ELRA risks were identified by Patel Tonra Ltd., Environmental Solutions, based on their detailed understanding of the project elements included in the proposed integrated waste management facility at Rehab Glassco. Subsequently, a risk management workshop was chaired by Patel Tonra Ltd. (Vip Patel and Louise O'Donnell) on 12th August 2013. The following Rehab Glassco representatives were in attendance:

- Zeki Mustafa, Managing Director
- David Farrelly, Operations Manager
- Brian Pyper, Consulting Engineer

4.2.2 Risks were identified on a process-based approach, i.e. all proposed activities were examined in relation to potential environmental risks.

4.3 Risk Classification

4.3.1 Risk Classification Tables were applied, as per the EPA ELRA guidance document[29]. 'Occurrence' and 'Severity' were rated for each identified risk. 'Occurrence' is the probability of an event occurring. 'Severity' is the magnitude of impact if the event occurs.

4.4 Assessment of Risks

4.4.1 A Risk Register was prepared, on the basis of the severity and occurrence ratings. The Risk Register is included in **Appendix 2**.

[29] EPA (2006) *Guidance on Environmental Liability Risk Assessment, Residuals Management Plans and Financial Provision*, Page 29

4.4.2 Risks were tabulated in a Risk Matrix, as per **Appendix 3**. The Risk Matrix shows that there are no risks in the red zone requiring priority attention. There are no risks in the yellow/amber zone (these would indicate risks that require mitigation or management action. All risks are located in the light green zone, indicating a need for continuing awareness and monitoring on a regular basis.

4.5 Risk Prevention/Mitigation

4.5.1 In assigning the 'occurrence' rating, due regard was given to mitigation measures/operational controls outlined in the REIS and Waste Licence Application. 'Severity' was assigned on a worst-case basis.

4.6 Risk Management Programme

4.6.1 Risks/potential environmental impacts have been identified and mitigation measures proposed in the EIS/Waste Licence Application for the proposed integrated waste management facility. A risk management programme will be further explored at the post-licensing stage, and in line with Rehab Glassco's Environmental Management System.

4.7 Quantification of Unknown Environmental Liabilities

4.7.1 An ELRA financial model is included in **Appendix 4**.

4.7.2 The ELRA has been costed on the basis of the level of severity of risks, and apply financial cost bands as per EPA guidance[30].

4.7.3 The financial model is based on the application of a median probability and median cost range to each risk, as detailed in the EPA Guidance.

4.8 Review of Risk Assessment

4.8.1 It is proposed that the ELRA will be reviewed and updated in its entirety every 5 years, or sooner, if required.

4.8.2 ELRA will be reviewed in the event of a significant amendment to site activities.

4.8.3 The ELRA status shall be reported annually as part of the Annual Environmental Report.

[30] EPA (2006) *Guidance on Environmental Liability Risk Assessment, Residuals Management Plans and Financial Provision*, Appendix D4

5.0 Financial Provision (FP)

5.1 Introduction

5.1.1 The main objective of Financial Provision[31] is to ensure that sufficient financial resources are available to cover:

- Known environmental liabilities that will arise at the time of facility closure;
- Known environmental liabilities that are associated with the aftercare and maintenance of the facility until such time as the facility is considered to no longer pose a risk to the environment;
- Unknown environmental liabilities that may occur during the operating life of the facility.

5.1.2 Financial provision encompasses two aspects:

- Quantifying the financial amount of the environmental liabilities (known and unknown)
- Selecting appropriate financial instrument(s) to underwrite the liabilities.

5.2 Calculation of FP

5.2.1 The amount of financial provision required for the Rehab Glassco glass and can recycling facility (EPA application ref. W0129-03) has been determined using the Closure Plan and ELRA assessment protocol outlined in this document.

5.2.2 **Appendix 5** summarises the financial provisions proposed for known and unknown liabilities relating to facility.

5.3 FP Instruments

5.3.1 The type of financial provision will be agreed with the Agency, in accordance with guidance, as follows[32]:

Liability Type	Method of Quantification	Financial Instrument
Known Liability – Closure, Restoration and Aftercare Management	Outlined in **Chapter 3**	Cash-based deposit/trust fund/Escrow (accessible by EPA and by the Operator only with EPA consent)
Unknown Liability	Outlined in **Chapter 4**	Bonds/insurance/letters of credit

[31] EPA (2006) *Guidance on Environmental Liability Risk Assessment, Residuals Management Plans and Financial Provision*, Page 37

[32] EPA (2006) *Guidance on Environmental Liability Risk Assessment, Residuals Management Plans and Financial Provision*, Page 38-39

Appendix 1: Closure Plan Costing Estimates

Rehab Glassco Ltd. Glass Recycling Facility
EPA Waste Licence Application W0279-01

Closure Costs

#	Item	Unit costs				No. units	Units	Estimated cost			Rehab Glassco Analysis
		Upper range	Notes	Lower range	Typical/ Median			Upper range	Lower range	Typical/ Median	
1	**Removal of input and output materials off-site**										
1.1	All input material appropriately removed off-site	€ -	PTL Analysis for lower range taken from RG analysis (€31.95 + €35.00 - €35.00). Upper range is zero.	-€ 31.95	-€ 16	12,700	tons	€ -	-€ 405,765	-€ 202,883	Raw glass - Average selling price guide across 3 colours for period January 2012 - July 2013 per MRW £27.16/€31.95 excluding any available subsidies. Allow for 10% drop in average price. Allow for attached subsidy of €35.00 per ton. Allow for haulage to alternative UK destination of €35.00 per ton. **(€31.95 - €3.20 + €35.00 - €35.00 = €28.75 Net Revenue per ton). 2 semi processed material (reject reject etc) - landfill cover cost €80/t**
1.2	All output material appropriately removed off-site: Drying plant output	€ -	PTL analysis as above for lower range. Upper range zero.	-€ 31.95	-€ 16	200	tons	€ -	-€ 6,390	-€ 3,195	As above
1.3	All output material appropriately removed off-site: Glass cullet output	€ -	PTL analysis as per RG (€45.00) for lower range. Upper range as zero.	-€ 45.00	-€ 23	1,000	tons	€ -	-€ 45,000	-€ 22,500	Average sales price of €45/t + subsidy of €35/t
1.4	All output material appropriately removed off-site: Steel packaging output	€ -	PTL analysis as per RG (€161 - €25.00 + €86.53) for the lower range. Upper range as zero.	-€ 222.53	-€ 111	60	tons	€ -	-€ 13,352	-€ 6,676	Average selling price guide for steel packaging January 2012 - July 2013 £137.00/€161.00. Allow for 10% drop in average price and cost of haulage to alternative Irish destination of €25.00 per ton + subsidy of **(€161.00 - €16.10 - €25.00 = €95.75 Net Revenue per ton)** + 86.53/t subsidy
1.5	All output material appropriately removed off-site: Aluminium packaging output	€ -	PTL analysis as per RG (€965 - €25 + €68.14) for the lower range. Upper range as zero.	-€ 1,008.14	-€ 504	60	tons	€ -	-€ 60,488	-€ 30,244	Average selling price guide for aluminium packaging July 2013 £820.00/€965.00 excluding any available subsidies. Allow for 20% drop in average price and haulage to alternative Irish destination of €25.00 per ton **(€965.00 - €193.00 - €25.00 = €747.00 Net Revenue per ton) + 68.14/t subsidy**
1.6	All output material appropriately removed off-site: Ceremic & Porcelain	€ -	PTL analysis as per RG (€8.00 + €4.20) for the lower range. Upper range is zero.	-€ 12.20	-€ 6	10	tons	€ -	-€ 122	-€ 61	Average invoiced value January 2012 - July 2013 €8.00 per ton + 4.20/t subsidy
2	**Removal of wastes off-site**										
2.1	All non-hazardous wastes appropriately removed off-site, including residual process waste, office waste, bulky waste (old bottle banks, pallets, pipes, etc.)	€ 650		€ 550	€ 600	5	skip (RoRo)	€ 3,250	€ 2,750	€ 3,000	
2.2	All hazardous wastes appropriately removed off-site, including garage waste	€ 1,500		€ 1,000	€ 1,250	1	skip (small)	€ 1,500	€ 1,000	€ 1,250	
3	**Main Process Building - decommissioning (remains in-situ on closure)**										
3.1	Main Process Building: Plant & equipment decommissioning and removal off-site (scrap or resale)	€ 150,000	Analysis from RG	-€ 100,000	€ 25,000	1	unit	€ 150,000	-€ 100,000	€ 25,000	Equipment value estd. €1m, scrap value €100k, decomissioning works €150k based on recent experience with decomissioning ballymount plant and sale of same
3.2	Main Process building: decontamination/cleaning	€ 1,600		€ 1,050	€ 1,325	4	per day	€ 6,400	€ 4,200	€ 5,300	
3.3	Main Process building - office area: clear and clean all office, mess, administration, lab. areas. WEEE to be removed by suitable contractor	€ 1,600		€ 1,050	€ 1,325	1	per day	€ 1,600	€ 1,050	€ 1,325	
4	**Drying Plant building - decommissioning (remains in-situ on closure)**										
4.1	Drying plant building: decommission boiler	€ 3,000		2,000	€ 2,500	1	unit	€ 3,000	€ 2,000	€ 2,500	
4.2	Drying plant building: Decontamination	€ 2,380		€ 1,880	€ 2,130	2	per day	€ 4,760	€ 3,760	€ 4,260	
4.3	Drying plant building: Plant & equipment decommissioning and removal off-site (scrap or resale)	€ 2,100		€ -	€ 1,050	5	per day	€ 10,500	€ -	€ 5,250	
5	**Vehicle Maintenance building - decommissioning (remains in-situ on closure)**										
5.1	Garage building - Decontamination	€ 2,380		€ 1,880	€ 2,130	1	per day	€ 2,380	€ 1,880	€ 2,130	
5.2	Garage building - Plant & equipment decommissioning and removal off-site (scrap or resale)	€ 2,100		€ -	€ 1,050	2	per day	€ 4,200	€ -	€ 2,100	
6	**Fuel storage areas**										
6.1	Fuel tanks x 2 - emptying, decommissioning and removal	€ 1,235		€ -	€ 618	2	Item	€ 2,470	€ -	€ 1,235	
6.2	Gas tank and pipelines - degassing of tank, decommissioning and removal	€ -		€ -	€ -	1	Item	€ -	€ -	€ -	
7	**Outdoor storage/hardstanding areas and drainage**										
7.1	On-site storage bay/bunkers (19 No.) - dismantling and removal of materials off-site	€ -		€ -	€ -	1	Item	€ -	€ -	€ -	
7.2	Hardstanding areas - sweeping and cleaning	€ 490		€ 335	€ 413	2	per day	€ 980	€ 670	€ 825	
7.3	Cleaning of silt traps, interceptors and SW system; off-site removal of sludge	€ 1,670		€ 1,100	€ 1,385	1	Item	€ 1,670	€ 1,100	€ 1,385	
8	**Monitoring and EPA requirements**										
8.1	Verification Audit / Certification & Report to EPA	€ 10,000		€ 5,000	€ 7,500	1	Item	€ 10,000	€ 5,000	€ 7,500	
8.2	Environmental monitoring	€ 1,500		€ 3,500	€ 2,500	1	Item	€ 1,500	€ 3,500	€ 2,500	
8.3	Surrender of EPA licence	€ 10,000		€ 6,000	€ 8,000	1	Item	€ 10,000	€ 6,000	€ 8,000	
	Subtotal							€ 214,210	-€ 598,207	-€ 191,999	
	Contingency						15%	€ 32,132	-€ 89,731	-€ 28,800	
	Total (excl. VAT)							**€ 246,342**	**-€ 687,938**	**-€ 220,798**	
	TOTAL CLOSURE COSTS									**0**	

Appendix 2: Risk Register

Rehab Glassco Ltd. Glass Recycling Facility
EPA Waste Licence Application W0279-01

Risk Register

Risk ID	Activity/Process	Potential Environmental Risk	Potential Environmental Impact	Likelihood/ Occurrence Rating [Note i]	Consequence/ Severity Rating [Note ii]	Risk Score
W0279-01 Risk#01	Main process operation and ancillary processes (including traffic movements)	Fire	Firewater discharge to surface water	2	3	6
W0279-01 Risk#02	Main process operation and ancillary processes (including traffic movements)	Fire	Firewater discharge to ground	2	2	4
W0279-01 Risk#03	Main process operation and ancillary processes (including traffic movements)	Fire	Release of pollutants/smoke to air	2	3	6
W0279-01 Risk#04	Main process operation and ancillary processes	Process explosion	Release of pollutants to air	2	3	6
W0279-01 Risk#05	Main Process	Hazardous material e.g. oils, grease, lubes, chemical spillage	Release of pollutants to surface water	1	2	2
W0279-01 Risk#06	Main Process	Failure of building infrastructure e.g. walls, roof, doors	Release of pollutants to air	2	1	2
W0279-01 Risk#07	Drying Plant	Failure of air/ pollution abatement process/system	Release of pollutants to air	4	3	12
W0279-01 Risk#08	Drying Plant	Poor boiler combustion	Release of pollutants to air	3	2	6
W0279-01 Risk#09	Drying Plant	Failure of waste handling /ancillary equipment e.g. conveyor, chutes, storage units/containers	Release of pollutants & dust to air	4	3	12
W0279-01 Risk#10	Drying Plant	Failure of building infrastructure e.g. walls, roof fabric, doors	Release of pollutants to air	4	3	12
W0279-01 Risk#11	Vehicle maintenance	Spillage of hazardous material e.g. oils, grease, lubes, chemical spillage	Release of pollutants to surface water	2	3	6
W0279-01 Risk#12	Vehicle maintenance	Spillage of hazardous material e.g. oils, grease, lubes, chemical spillage	Ground contamination	2	1	2
W0279-01 Risk#13	Vehicle maintenance building	Failure of building infrastructure e.g. walls, roof fabric, doors	Release of pollutants to air	2	1	2
W0279-01 Risk#14	Vehicle maintenance building	Failure of vehicle exhaust management system	Release of pollutants to air	2	2	4
W0279-01 Risk#15	Material storage (outdoor areas)	Polluting matter entering SW system	Release of pollutants to surface water	5	3	15
W0279-01 Risk#16	Liquid fuel storage	Tank failure	Release of pollutants to surface water	2	4	8
W0279-01 Risk#17	Liquid fuel storage	Tank failure	Ground contamination	2	2	4
W0279-01 Risk#18	Liquid fuel deliveries & refuelling	Fuel spillage	Release of pollutants to surface water	2	4	8
W0279-01 Risk#19	Liquid fuel deliveries & refuelling	Fuel spillage	Release of pollutants to ground	2	2	4
W0279-01 Risk#20	Gas storage	Tank/distribution pipe work failure	Release of pollutants to air	2	2	4
W0279-01 Risk#21	Gas delivery & refuelling	Gas escape/leakage during delivery/unloading	Release of pollutants to air	2	2	4
W0279-01 Risk#22	On-site traffic (incl. delivery vehicles, collection vehicles, front end loaders, forklifts, cars)	Rupture/failure of fuel tank	Release of fuel to surface water	2	2	4

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EPA Waste Licence Application W0279-01

Risk Register

Risk ID	Activity/Process	Potential Environmental Risk	Potential Environmental Impact	Likelihood/ Occurrence Rating	Consequence/ Severity Rating	Risk Score
				[Note i]	[Note ii]	
W0279-01 Risk#23	On-site traffic (incl. delivery vehicles, collection vehicles, front end loaders, forklifts, cars)	Rupture/failure of fuel tank	Ground contamination	2	1	2
W0279-01 Risk#24	Surface water management	Failure of interceptor/SW management infrastructure	Release of pollutants to surface water	3	4	12
W0279-01 Risk#25	Surface water management	Failure of interceptor/SW management infrastructure	Ground contamination	3	2	6
W0279-01 Risk#26	Storm water management	Failure/inadequate storm water storage capacity/underground hydro chamber & valve	Release of pollutants to surface water	4	4	16
W0279-01 Risk#27	Stormwater management	Failure/inadequate stormwater storage capacity/underground hydro chamber & valve	Release of pollutants to ground	4	3	12
W0279-01 Risk#28	Foul water management	Failure of foul water management system	Release of pollutants to surface water	1	2	2
W0279-01 Risk#29	Foul water management	Failure of foul water management system	Release of pollutants to ground	1	2	2
W0279-01 Risk#30	Newbridge Rising Main (on-site wayleave)	Breach/failure of pipeline	Release of pollutants to surface water	1	5	5
W0279-01 Risk#31	Newbridge Rising Main (on-site wayleave)	Breach/failure of pipeline	Release of pollutants to ground	1	5	5

Likelihood/ Occurrence Rating

Note i:

Rating	Category	Description
1	Very Low	Very low chance (0-5%) of hazard occurring in 30 yr period
2	Low	Low chance (5-10%) of hazard occurring in 30 yr period
3	Medium	Medium chance (10-20%) of hazard occurring in 30 yr period
4	High	High chance (20-50%) of hazard occurring in 30 yr period
5	Very High	Greater than 50% chance of hazard occurring in 30 yr period

Consequence/ Severity Rating

Note ii:

Rating	Category	Description
1	Trivial	No damage or negligible change to the environment
2	Minor	Minor impact/localised or nuisance
3	Moderate	Moderate damage to environment
4	Major	Severe damage to local environment
5	Massive	Massive damage to a large area, irreversible in medium term

Appendix 3: Risk Matrix

Rehab Glassco Ltd. Glass Recycling Facility
EPA Waste Licence Application W0279-01

Risk Matrix

			Risk ID (W0279-01 Risk#)				
Occurrence	V. High	5			#15		
	High	4			#07, #09, #10, #27	#26	
	Medium	3		#08, #25		#24	
	Low	2	#06, #23	#02, #14, #17, #19, #20, #21, #22	#01, #03, #04, #11	#16, #18	
	V. Low	1	#12, #13	#05, #28, #29			#30, #31
			Trivial	**Minor**	**Moderate**	**Major**	**Massive**
			1	**2**	**3**	**4**	**5**
			Severity				

Appendix 4: ELRA Financial Model

Rehab Glassco Ltd. Glass Recycling Facility
EPA Waste Licence Application W0279-01

Environmental Liabilities Risk Assessment (ELRA)

A	B	C	D	E	F	G	H	I	J	K	L
Risk ID	Activity/Process	Potential Environmental Risk	Potential Environmental Impact	Occurrence Rating [Note i]	Severity Rating [Note ii]	Likelihood of Occurrence Range (%) [Note iii]	Cost Range [Note iv] Min	Cost Range [Note iv] Max	Median Probability [Median of G]	Median Cost Range [Median of H]	Most Likely Scenario Cost [J x K]
W0279-01 Risk#01	Main process operation and ancillary processes (including traffic movements)	Fire	Firewater discharge to surface water	2	3	5-10	€10,000	€50,000	7.5%	€ 30,000	€ 2,250
W0279-01 Risk#02	Main process operation and ancillary processes (including traffic movements)	Fire	Firewater discharge to ground	2	2	5-10	€1,000	€10,000	7.5%	€ 5,500	€ 413
W0279-01 Risk#03	Main process operation and ancillary processes (including traffic movements)	Fire	Release of pollutants/smoke to air	2	3	5-10	€10,000	€50,000	7.5%	€ 30,000	€ 2,250
W0279-01 Risk#04	Main process operation and ancillary processes	Process explosion	Release of pollutants to air	2	3	5-10	€10,000	€50,000	7.5%	€ 30,000	€ 2,250
W0279-01 Risk#05	Main Process	Hazardous material e.g. oils, grease, lubes, chemical spillage	Release of pollutants to surface water	1	2	0-5	€1,000	€10,000	2.5%	€ 5,500	€ 138
W0279-01 Risk#06	Main Process	Failure of building infrastructure e.g. walls, roof, doors	Release of pollutants to air	2	1	5-10	€0	€1,000	7.5%	€ 500	€ 38
W0279-01 Risk#07	Drying Plant	Failure of air/ pollution abatement process/system	Release of pollutants to air	4	3	20-50	€10,000	€50,000	35.0%	€ 30,000	€ 10,500
W0279-01 Risk#08	Drying Plant	Poor boiler combustion	Release of pollutants to air	3	2	10-20	€1,000	€10,000	15.0%	€ 5,500	€ 825
W0279-01 Risk#09	Drying Plant	Failure of waste handling /ancillary equipment e.g. conveyor, chutes, storage	Release of pollutants & dust to air	4	3	20-50	€10,000	€50,000	35.0%	€ 30,000	€ 10,500
W0279-01 Risk#10	Drying Plant	Failure of building infrastructure e.g. walls, roof fabric, doors	Release of pollutants to air	4	3	20-50	€10,000	€50,000	35.0%	€ 30,000	€ 10,500
W0279-01 Risk#11	Vehicle maintenance	Spillage of hazardous material e.g. oils, grease, lubes, chemical spillage	Release of pollutants to surface water	2	3	5-10	€10,000	€50,000	7.5%	€ 30,000	€ 2,250
W0279-01 Risk#12	Vehicle maintenance	Spillage of hazardous material e.g. oils, grease, lubes, chemical spillage	Ground contamination	2	1	5-10	€0	€1,000	7.5%	€ 500	€ 38
W0279-01 Risk#13	Vehicle maintenance building	Failure of building infrastructure e.g. walls, roof fabric, doors	Release of pollutants to air	2	1	5-10	€0	€1,000	7.5%	€ 500	€ 38
W0279-01 Risk#14	Vehicle maintenance building	Failure of vehicle exhaust management system	Release of pollutants to air	2	2	5-10	€1,000	€10,000	7.5%	€ 5,500	€ 413
W0279-01 Risk#15	Material storage (outdoor areas)	Polluting matter entering SW system	Release of pollutants to surface water	5	3	>50	€10,000	€50,000	75.0%	€ 30,000	€ 22,500

Rehab Glassco Ltd. Glass Recycling Facility
EPA Waste Licence Application W0279-01

Environmental Liabilities Risk Assessment (ELRA)

A	B	C	D	E	F	G	H	I	J	K	L
Risk ID	Activity/Process	Potential Environmental Risk	Potential Environmental Impact	Occurrence Rating [Note i]	Severity Rating [Note ii]	Likelihood of Occurrence Range (%) [Note iii]	Cost Range [Note iv] Min	Cost Range [Note iv] Max	Median Probability [Median of G]	Median Cost Range [Median of H]	Most Likely Scenario Cost [J x K]
W0279-01 Risk#16	Liquid fuel storage	Tank failure	Release of pollutants to surface water	2	4	5-10	€50,000	€100,000	7.5%	€ 75,000	€ 5,625
W0279-01 Risk#17	Liquid fuel storage	Tank failure	Ground contamination	2	2	5-10	€1,000	€10,000	7.5%	€ 5,500	€ 413
W0279-01 Risk#18	Liquid fuel deliveries & refuelling	Fuel spillage	Release of pollutants to surface water	2	4	5-10	€50,000	€100,000	7.5%	€ 75,000	€ 5,625
W0279-01 Risk#19	Liquid fuel deliveries & refuelling	Fuel spillage	Release of pollutants to ground	2	2	5-10	€1,000	€10,000	7.5%	€ 5,500	€ 413
W0279-01 Risk#20	Gas storage	Tank/distribution pipe work failure	Release of pollutants to air	2	2	5-10	€1,000	€10,000	7.5%	€ 5,500	€ 413
W0279-01 Risk#21	Gas delivery & refuelling	Gas escape/leakage during delivery/unloading	Release of pollutants to air	2	2	5-10	€1,000	€10,000	7.5%	€ 5,500	€ 413
W0279-01 Risk#22	On-site traffic (incl. delivery vehicles, collection vehicles, front end loaders, forklifts, cars)	Rupture/failure of fuel tank	Release of fuel to surface water	2	2	5-10	€1,000	€10,000	7.5%	€ 5,500	€ 413
W0279-01 Risk#23	On-site traffic (incl. delivery vehicles, collection vehicles, front end loaders, forklifts, cars)	Rupture/failure of fuel tank	Ground contamination	2	1	5-10	€0	€1,000	7.5%	€ 500	€ 38
W0279-01 Risk#24	Surface water management	Failure of interceptor/SW management infrastructure	Release of pollutants to surface water	3	4	10-20	€50,000	€100,000	15.0%	€ 75,000	€ 11,250
W0279-01 Risk#25	Surface water management	Failure of interceptor/SW management infrastructure	Ground contamination	3	2	10-20	€1,000	€10,000	15.0%	€ 5,500	€ 825
W0279-01 Risk#26	Storm water management	Failure/inadequate storm water storage capacity/underground hydro chamber & valve	Release of pollutants to surface water	4	4	20-50	€50,000	€100,000	35.0%	€ 75,000	€ 26,250
W0279-01 Risk#27	Stormwater management	Failure/inadequate stormwater storage capacity/underground hydro chamber & valve	Release of pollutants to ground	4	3	20-50	€10,000	€50,000	35.0%	€ 30,000	€ 10,500
W0279-01 Risk#28	Foul water management	Failure of foul water management system	Release of pollutants to surface water	1	2	0-5	€1,000	€10,000	2.5%	€ 5,500	€ 138
W0279-01 Risk#29	Foul water management	Failure of foul water management system	Release of pollutants to ground	1	2	0-5	€1,000	€10,000	2.5%	€ 5,500	€ 138

Rehab Glassco Ltd. Glass Recycling Facility
EPA Waste Licence Application W0279-01

Environmental Liabilities Risk Assessment (ELRA)

A	B	C	D	E	F	G	H	I	J	K	L
Risk ID	Activity/Process	Potential Environmental Risk	Potential Environmental Impact	Occurrence Rating [Note i]	Severity Rating [Note ii]	Likelihood of Occurrence Range (%) [Note iii]	Cost Range [Note iv] Min	Cost Range [Note iv] Max	Median Probability [Median of G]	Median Cost Range [Median of H]	Most Likely Scenario Cost [J x K]
W0279-01 Risk#30	Newbridge Rising Main (on-site wayleave)	Breach/failure of pipeline	Release of pollutants to surface water	1	5	0-5	€100,000	€1,000,000	2.5%	€ 550,000	€ 13,750
W0279-01 Risk#31	Newbridge Rising Main (on-site wayleave)	Breach/failure of pipeline	Release of pollutants to ground	1	5	0-5	€100,000	€1,000,000	2.5%	€ 550,000	€ 13,750
											€ 154,850

Occurrence Rating

Note i:

Rating	Category	Description	Likelihood of Occurrence (%) Note iii:
1	Very Low	Very low chance (0-5%) of hazard occurring in 30 yr period	0-5
2	Low	Low chance (5-10%) of hazard occurring in 30 yr period	5-10
3	Medium	Medium chance (10-20%) of hazard occurring in 30 yr period	10-20
4	High	High chance (20-50%) of hazard occurring in 30 yr period	20-50
5	Very High	Greater than 50% chance of hazard occurring in 30 yr period	>50

Severity Rating

Note ii:

Rating	Category	Description	Cost Range Note iv: Cost of Remediation Lower	Upper
1	Trivial	No damage or negligible change to the environment	€0	€1,000
2	Minor	Minor impact/localised or nuisance	€1,000	€10,000
3	Moderate	Moderate damage to environment	€10,000	€50,000
4	Major	Severe damage to local environment	€50,000	€100,000
5	Massive	Massive damage to a large area, irreversible in medium term	€100,000	€1,000,000

Appendix 5: Financial Provision Calculations

Rehab Glassco Ltd. Glass Recycling Facility
EPA Waste Licence Application W0279-01

Summary Financial Provision

Liability Type	Amount	Financial Instrument
Known Liability – Closure, Restoration and Aftercare Management	**€0**	Cash-based deposit/trust fund/Escrow (accessible by EPA and by Rehab Glassco only with EPA consent)
Unknown Liability (ELRA)	**€154,850**	Bonds/insurance
TOTAL	**€154,850**	

Appendix 6: Site Photographs

(Extracted from REIS, March 2013)

Photograph 1: Main Process Building (including offices)

Photograph 2: Drying Plant Building

Photograph 3: Vehicle Maintenance Building

Photograph 4: Input and Output Storage Bays, Concrete Hardstanding

Photograph 5: Designated parking area

Photograph 6: Plastic Ground Matting System at Wayleave

Appendix 7: Site Layout Drawing

REV.	DATE.	AMENDMENT.	INITIALS.
01	AUG 13	MINOR REVISONS TO LAYOUT	B.P.

CLIENT: REHAB GLASSCO

PROJECT:
EPA WASTE LICENCE APPLICATION
OSBERSTOWN BUSINESS PARK, NAAS.

DRAWING:
SITE PLAN

SCALE.	DATE.	DRAWN BY.
1:1000	APRIL 2011	B.P.

DRAWING NO. WLA-04

REVISION NO. 01

DRAWING STATUS:	
PRELIMINARY	X
FOR INFORMATION	
FOR APPROVAL	
FOR CONSTRUCTION	

BRIAN PYPER AND ASSOCIATES
PROJECT DESIGN AND MANAGEMENT SERVICES
DASH HOUSE, 34 SHORE ROAD,
HOLYWOOD, CO. DOWN, BT18 9HX
TEL: 00 44 (0) 28 9039 3395 FAX: 00 44 (0) 28 9039 3396
E-MAIL: bpyper@gmail.com

N

0 10m 20m 30m 40m

HALVERSTOWN ROAD

EXISTING HOUSE

Trees

SITE 17

SITE 12

SITE 3

SITE 8

SITE 6&7

Noise Barrier

Storage Bays

GAS

Container Storage
(blinded hardcore)

WAYLEAVE – NEWBRIDGE RISING MAIN

Shrubs

Truck Parking

(concrete)

Vehicle Maintenance Building

1

2

Drying Plant

ESB Sub Station

Facility Notice Board

Car Parking

Site Entrance

Weighbridge

Offices, Canteen, WCs, etc.

Ref. Point (wall intersection)
N 220379
E 286767

Truck Wash

Main Process (Sorting) Plant

one way system

(unsurfaced)

KEY:
ONE WAY SYSTEM
1 FUEL STORAGE TANK No. 1
2 FUEL STORAGE TANK No. 2
BIRD CONTROL HAWK KITE
WAYLEAVE
SITE BOUNDARY

tank

tank

admin. building

Osberstown WWTW
(Kildare Co Co)

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The Secretary
An Bord Pleanála
64 Marlborough Street
Dublin 1

Tuesday, 9 July 2013

[By Hand]

Dear Sir

RE: GLASS RECYCLING FACILITY, UNIT 4, OSBERSTOWN INDUSTRIAL PARK, CARAGH ROAD, NAAS, CO. KILDARE

ABP REF: SU 09.SU0015 (KCC REG. REF. 11/508)

1.0 INTRODUCTION

Rehab Glassco Limited has retained Tom Phillips + Associates to respond to the issues raised in the Submission made to An Bord Pleanála by Mr. Michael Culhane in addition to the Report to the Board made by Kildare County Council in accordance with Section 177 of the *Planning and Development Act 2000-2011*.

This Response has been prepared in association with Patel Tonra Limited, Environmental Solutions and Brian Pyper and Associates, Consulting Engineers.

The following specialist reports have been appended to this Response document:

- *Report on the Control of Birds*, by Bird Control Ireland Ltd, dated 2 July 2013;
- *Environmental Noise Survey*, by ORS Consulting Engineers, dated July 2013;
- *Response to Kildare County Council's Observations Relating to the REIS Roads and Traffic Chapter 4*, by Atkins, dated July 2013.

These Reports address specific issues raised in the Culhane Submission and in Kildare County Council's Report.

2.0 RESPONSE TO SUBMISSION BY MR MICHAEL CULHANE

The issues raised in this Submission can be broadly summarised as follows:

- Operation of Facility
- Plant Capacity
- Bird Nuisance
- Cessation of Operation
- Dust Management
- Noise Management
- Consultation for REIS
- Health and Safety

The Applicant's Response to each of these issues is set out below.

2.1 Operation of Facility

Rehab Glassco had, in good faith, secured planning permission from Kildare County Council for the primary glass recycling use on the site and for all other development as necessary. The current requirement to seek Substitute Consent has arisen as a result of a change in legal interpretation of the term 'recovery' in the context of Environmental Impact Assessment, together with legislative changes in relation to retention permission. Rehab Glassco became aware of this change when it applied for a Waste Licence from the EPA, the purpose of which was to regularise the waste tonnage limit of the plant after two separate companies merged. As soon as Rehab Glassco became aware of this situation, it took immediate action to resolve its planning status.

No attempt was ever made to mislead the relevant authorities about the nature or extent of activities carried out on site. In addition, the operation of the site has not been subject to any enforcement action by either KCC or the EPA in respect of planning or environmental activities on the site.

For the record, the planning conditions attaching to the 'parent' permission, or subsequent amending permissions, did not place any limitation on the tonnage or volume of material being recycled at the facility nor was any tonnage specified in the plans and particulars that accompanied that planning application. The planning permissions also did not specify operating hours for the facility.

2.2 Plant Capacity

Rehab Glassco has confirmed that the plant is operating under the manufacturer's design capacity. Plant downtime is kept to a minimum, by the stocking of essential spare parts and the availability of engineers and specialist fitters /mechanics to work during non-operational times. A maintenance program ensures that essential equipment is serviced on a daily basis with a rotating maintenance schedule for all other machinery.

2.3 Bird Nuisance

The issue of potential bird nuisance was considered in Chapter 13 of the REIS, with specific reference to birds removing glass and tin-foil material from the Rehab Glassco facility and depositing it off-site. The REIS specified remedial and mitigation measures in relation to the control of this activity (Section 13.3).

Since the publication of the REIS, further work has been completed at the facility by Bird Control Ireland, as detailed in the *Report on the Control of Birds*, by Bird Control Ireland Ltd, dated 2 July 2013, provided in Appendix A of this document.

Bird Control Ireland has designed and is implementing an intensive bird management programme at the facility. This new programme will include the use of flying live hawks to harass the local scavenging bird population (commenced 4th July 2013). Other methods include the use of visual and acoustic measures such as the use of a Scarecrow Patrol Two-Bird Dispersal System and a Bird Control Hawk Kite. The effectiveness of the programme will be monitored on an on-going basis and the bird control measures will be adjusted as required in order to ensure the birds in the area do not become accustomed to any one bird control measure.

2.4 Cessation of Operation

The Culhane Submission seeks that the facility should cease working temporarily pending the determination of the Substitute Consent process. We note that the Substitute Consent legislation allows the Board to issue a Direction to cease activity or operations where the Board is of the opinion that "*the continuation of all or part of the activity or operations is likely to cause significant adverse effects on the environment or adverse effects on the integrity of a European site*".

The Remedial Environmental Impact Statement demonstrates that the current operation of the glass plant does not result in "*significant adverse effects on the environment*" and the Appropriate Assessment Screening Report submitted as part of the Substitute Consent Application (Appendix 8.1 of the REIS) and the Appropriate Assessment Screening Report submitted by Kildare County Council, in its Submission, both conclude that the operation of the facility does not result in "*adverse effects on the integrity of a European Site*".

We contend that the environmental assessments carried out do not provide grounds to support a Direction to cease activities or operations at the site.

2.5 Dust Management

The emissions from the Drying Plant have been considered in Chapter 5 of the submitted REIS. Rehab Glassco commissioned air emissions monitoring at the emissions point source at the Drying Plant building. Monitoring was completed on 23 January 2013; all monitoring procedures were carried out to standard methods and EPA Guidance AG2 requirements. As stated in Section 5.2.23 of the REIS, no Emission Limit Values (ELVs) have yet been prescribed in relation to emissions from the Drying Plant; however monitoring results would indicate that particulate levels are within acceptable limits.

The REIS specified remedial and mitigation measures in relation to dust (Sections 5.6 and 5.8, respectively).

Section 5.6.2 of the REIS stipulated:

> *"Repeat dust monitoring is proposed at the three dust monitoring locations identified in Section 5.2. Monitoring will be completed between May and September 2013."*

The Applicant has scheduled repeat dust monitoring at the facility during July-August 2013.

Operational dust management techniques are being implementing at the facility on an ongoing basis, including use of a water bowser.

We note that KCC's Report includes proposed Condition No. 6, which requires the provision of a Dust Management Plan.

2.6 Noise and Hours of Operation

The potential impact of noise emissions associated with the facility was addressed comprehensively in Chapter 6 of the Remedial Environmental Impact Statement (REIS). The REIS included a detailed noise assessment, completed in 2012-2013, as well as a summary of historical noise results for previous noise surveys completed at the facility. The REIS specified a number of remedial and mitigation measures for noise (Sections 6.6 and 6.8, respectively).

Section 6.6.3 of the REIS noted that the Drying Plant (thought to be a major contributor to noise levels at NSL1, the closest residential receptor) would not operate between 19:00hrs and 07:00hrs, if further noise monitoring indicated noise levels in excess of guideline limit values.

In an effort to alleviate concerns relating to noise emissions associated with the facility, the Applicant has elected to cease operation of the Drying Plant between 19:00hrs and 07:00hrs. Further to this, there is no operational requirement for the Drying Plant to process material between 19:00hrs and 07:00hrs.

Noise monitoring was commissioned by the Applicant to confirm that noise emissions associated with the operation of the facility were acceptable under this scenario, i.e., with the Main Process operating 24-hours (weekdays) and the Drying Plant operating from 07:00hrs to 19:00hrs.

Noise monitoring (daytime, evening and night-time) was completed by ORS Consulting Engineers on the 1st-2nd July 2013. Monitoring results indicated that noise levels at the closest noise sensitive receptor (NSL1) were within guideline limit values[1] for daytime and evening noise measurements. There was a slight exceedance (1dB) during the night-time monitoring period, which can be attributable to external noise sources (discussed further in the monitoring report). The noise monitoring report is included as Appendix B.

The Applicant has committed to the ongoing restriction of the operation of the Drying Plant to daytime hours only, i.e. 07:00hrs to 19:00hrs[2] and is happy to accept a condition in this regard, on the basis that the facility (except the Drying Plant) continues to operate on a 24 hours basis.

2.7 Consultation for the REIS

Patel Tonra. Ltd, on behalf of Rehab Glassco Ltd., carried out comprehensive consultation on the REIS with Mr Culhane and other interested parties, as detailed in Section 1.3 of the REIS.

Rehab Glassco has engaged directly with Mr Culhane on an ongoing basis in relation to the operation of the facility (as evidenced in the appended email correspondence to Mr Culhane's Submission). The issues considered include noise disturbance, bird nuisance, visual amenity and emissions from the Drying Plant. Rehab Glassco have continuously made improvements and taken steps to address these issues as they arose. The REIS submitted with the Substitute Consent Application identifies further mitigation measures as necessary, which have been incorporated into the site to address the issues raised.

2.8 Health and Safety

Whilst not a planning issue, Rehab Glassco complies with all relevant aspects of health and safety legislation and operates its plant accordingly.

[1] EPA (2012) Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4).

[2] With the exception of the Drying Plant (to operate 7am -7pm), opening hours remain as stated in the REIS:

- The hours of waste acceptance (the hours during which the facility accepts waste) are: Monday to Saturday (including bank holidays): 07:00 (7am) to 19:00 (7pm); Sunday: closed.
- The hours of operation (the hours during which the facility is operational) are: Monday to Friday (including bank holidays): 24-hours; Saturday: 07:00 (7am) to 23:00 (11pm); Sunday: closed.

3.0 RESPONSE TO REPORT FROM KILDARE COUNTY COUNCIL

As per Section 177 of the *Planning and Development Acts 2000-2011*, Kildare County Council submitted a Report to the Board, having considered the Substitute Consent Application.

The Report includes the following documents:

- Planning Report
- Appropriate Assessment Screening Report
- Assessment of the Remedial Environmental Impact Statement
- Water Services Department Report, and
- Transport Department Report

3.1 Planning History/ Compliance History

We note that Kildare County Council's Report confirms that the Applicant sought permission for the glass recycling facility in good faith and that the invalid status of the previous planning permissions arose as a result of case law at the European Court of Justice.

Importantly, the KCC Planning Report also notes that there is no history of planning enforcement on the subject site:

> *"No warning letters or enforcement notice proceedings have taken place on the subject site or in the immediate vicinity."* (KCC Planning Report, pg. 7.)

Furthermore, although the KCC Environment Department's Internal Report is not attached to the KCC Planning Report, the Planning Report summarises that report as follows:

> *"The Environment section has no comments to add to the application for substitute consent for Rehab Glassco. Rehab Glassco Ltd has a Waste Facility Permit – WFP-KE_08-0357-01 from Kildare County Council. Environmental officers from KCC inspect the permitted site regularly. The permitted site is found to be in compliance with the Waste Facility Permit."* (KCC Planning Report, pg. 6.)

The operators have always sought to ensure that the activities on-site comply with the statutory planning and waste licencing framework.

3.2 Kildare Planning Report Supports Development Subject to Conditions

We note that Kildare County Council assessed the REIS and states that:

> *"It is considered that the development will be consistent with the provisions of the County Development Plan 2011 and is at an acceptable zoned location. The development also provides a significant economic stimulus with 85 jobs being provided.*
>
> *An assessment of the Remedial Environmental Impact Statement has been carried out and it is considered that the subject development and the processes involved do not have a detrimental environmental impact on the environment subject to appropriate remedial/mitigation measures being implemented.*
>
> *All reports received to date have indicated no objection to the proposed development subject to conditions and a number of observations raised by the Transportation section."* (pg. 12–13.)

The Applicant welcomes the Planning Authority's positive assessment and concurs that the REIS demonstrates that, subject to appropriate remedial/mitigation measures, the glass recycling facility can operate within the appropriate environmental criteria.

3.3 Planning Authority Recommendation to Grant Substitute Consent Subject to Conditions

The KCC Planning Report recommends a grant of substitute consent, subject to conditions.

At the outset, it is important to note that, as stated in the REIS, an application for a Waste Licence for the subject facility was lodged with the EPA on 26 July 2011. The Waste Licence Application has not yet been determined. In consultation with the EPA, a copy of the REIS was submitted to the EPA on 29 May 2013, along with a number of clarifications, in line with the contents of the REIS. Thus, where a difference is noted between the information contained in the Waste Licence Application to the EPA and the REIS prepared as part of the Substitute Consent Application, the REIS provides the more up-to-date information. The EPA reference number is W0279-01 and all documentation is available at www.epa.ie.

The suggested conditions proposed by Kildare County Council have been examined by the Applicant and the Design Team, who have the following comments:

3.3.1 Condition No. 1 – Standard Condition

The Applicant is happy to accept the wording of Condition No. 1.

3.3.2 Condition No. 2 – Hours of Acceptance of Material

Condition No. 2 requires that no material shall be accepted into or removed from the facility between 7pm and 7am Monday to Saturday, nor at any time on Sunday.

This Condition is acceptable to the Applicant.

The original Waste Licence Application to the EPA submitted on 26 July 2011 suggested that the hours of acceptance of material at the facility would be 7 am to 10 pm. However, the Applicant and its Consultants have kept the EPA informed of the planning process. Furthermore, the proposed hours of waste acceptance and operating hours have been amended in the Waste Licence Application (by letter from Patel Tonra Limited to the EPA, on behalf of Rehab Glassco, dated 29 May 2013) to bring them in line with the REIS. Therefore, the Waste Licence Application now includes proposed hours of acceptance of material of 7am to 7pm Monday to Saturday, in accordance with Condition No. 2 recommended by Kildare County Council.

3.3.3 Condition No. 3 Noise

Condition 3a Noise Restrictions

The proposed Condition recommends limits on noise levels, with more significant restrictions outside of the 0800 to 1800 hours period (Monday to Friday).

The Applicant notes that the proposed Condition is using a different noise measurement standard than that proposed in the relevant EPA guidance: EPA (2012) *Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)*.

The EPA guidance references a typical limit value for noise from licensed sites of 55dB LAr,T for daytime hours, 07:00 to 19:00hrs. Furthermore, the Guidance Note references an Evening (19:00 to 23:00hrs) limit value of 50dB LAr,T, and a Night-time (23:00 to 07:00hrs) limit value of 45dB LAeq,T.

The proposed hours of acceptance and hours of operation reflect the information contained in the EPA Guidance:

- The hours of waste acceptance (the hours during which the facility accepts waste) are: Monday to Saturday (including bank holidays): 07:00 (7am) to 19:00 (7pm); Sunday: closed. (This complies with the proposed condition No. 2 above.)
- The operating hours of the Drying Plant are now proposed to be restricted to 07:00 (7am) to 19:00 (7pm), as a result of the results of the noise monitoring carried out.
- The hours of operation (the hours during which the facility, except the Drying Plant, is operational) are: Monday to Friday (including bank holidays): 24-hours; Saturday: 07:00 (7am) to 23:00 (11pm); Sunday: closed. The noise monitoring to date demonstrates that the plant, except for the Drying Plant, can operate in accordance with the EPA guidance on noise.

We request that this condition be amended to reflect current EPA guidance.

(LAr,T = the Rated Noise Level, equal to the LAeq during a specified time interval (T), plus specified adjustments for tonal character and/or impulsiveness of the sound.
LAeq,T = the equivalent continuous sound level. It is a type of average and is used to describe a fluctuating noise in terms of a single noise level over the sample period (T))

Condition No. 3b Monitoring Procedures

The KCC proposed condition references an ISO recommendation.

It is suggested that sound measurement should be completed in accordance with EPA (2012) *Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)* (or as may be amended), which in turn references relevant ISO and other standards.

Further information in respect of the Noise Monitoring Completed to date is provided in Appendix B of this report.

3.3.4 Condition No. 4 – Height of Stored Material

The REIS prescribes "*operational management and control to ensure that stockpile height does not exceed 3m*".

The Applicant is happy to accept the above Condition.

3.3.5 Condition No. 5 – Landscaping

The proposed condition refers to a scheme being submitted for the agreement of the Planning Authority prior to commencement. We note that the Applicant has implemented a comprehensive landscaping scheme at the site, particularly at the site boundaries. This landscaping was described in detail in Chapter 7 of the REIS.

We suggest this Condition should be amended to reflect the presence of the existing landscaping on-site and Chapter 7 of the REIS. The Applicant is happy to accept a condition requiring the maintenance of landscaping as required on the site.

3.3.6 Condition No. 6 – Dust Management

The Applicant is happy to accept this condition.

3.3.7 Condition No. 7 – Advertising Signage

The Applicant is happy to accept this condition.

3.3.8 Condition No. 8 – Water Services

Condition No. 8 of the KCC Planning Report states:

> *"As per up to date Water Services report when received."*

The Water Services Report dated 30 May 2013, states there is no objection subject to 7 No. Conditions.

The Applicant is happy to accept Conditions Nos. 1-6 inclusive, as proposed in the Water Services Report. The Applicant is also happy to accept Condition No. 7 of the Water Services Report, although it is requested that a minor change be made to this proposed Condition, which currently states:

> *"A 10m/20m wayleave shall be secured over the existing public foul sewer rising main and the 1500mm surface water culvert. Reason: in order to protect existing services."*

The Applicant notes that the public foul sewer rising main (the Newbridge Rising Main) is secured by an existing wayleave (approximately 22m in width, of which 14m width is within the Rehab Glassco site, reference: REIS, Section 10.2.19), which is shown on the relevant drawings submitted with the Substitute Consent Application.

The project Engineers, who were involved in the original development of the business park, Brian Pyper and Associates, note that the 1500mm surface water/storm culvert has never required a wayleave previously as it was constructed as part of the site development works to the overall business park.

It is further noted that Condition No. 6 of the Water Services Department's proposed conditions allows for the proposed construction of an attenuation pond immediately adjacent to the 1500mm surface water culvert, subject to agreement with the Planning Authority of the detailed design and method statement:

> *"Prior to Commencement of the development the applicant shall agree with the Planning Authority the detailed design and method statement of construction of the proposed attenuation pond immediately adjacent to the 1500mm surface water culvert. Reason: the order to protect existing services."*

The Applicant welcomes the wording of Condition No. 6 (of the Water Services Department's proposed conditions), which allows the construction of the attenuation pond, as proposed in the Application.

However, the Applicant requests that the wording of Condition No. 7 (of the Water Services Department's proposed conditions) is amended to clarify that the retention of the existing wayleave for the public foul sewer rising main is required, in addition to a 10m wayleave for the 1500mm surface water culvert. (It is possible to accommodate a 10m wayleave for the 1500mm surface water culvert within the existing site layout.)

3.3.9 Condition No. 9 – Transport

Condition No. 9 states:

> *"As per up to date Transport report when received."*

The Transport Department Report, dated 4 June 2013, is attached to the KCC Planning Report. This Transportation Department Report makes "observations" on the information supplied in Chapter 4 of the REIS. These do not appear to be intended as Conditions *per se*. Atkins Consulting Engineers, the authors of the Roads and Traffic Section of the REIS have responded to the issues raised in the Report, which is provided in Appendix C.

3.3.10 Development Contributions Levies

The Applicant notes that Kildare County Council has confirmed that "*the development contributions have been paid in full*". As such, no further development contributions should arise in respect of this proposal.

3.3.11 Appropriate Assessment Screening Report

The KCC Appropriate Assessment Screening Report notes that the development has:

- No impacts on sites designated for freshwater habitats or species;
- No impacts on sites designated for wetland habitats – bogs, fens, marshes and heath;
- No impacts on designated terrestrial habitats; and
- No impacts on birds in SPAs.

Thus, significant impacts on habitats and bird species are ruled out. This conclusion concurs with the Appropriate Assessment Screening Report carried out by the Applicant as part of the Substitute Consent Application.

4.0 CONCLUSION

We submit that the issues raised in Mr Culhane's Submission have been comprehensively addressed in the REIS and the attached reports.

The Kildare County Council Planning Report recommends that the Planning Authority has no objection to the development, subject to conditions. The Applicant is in general happy to accept the conditions proposed, subject to modifications outlined in the report above.

We trust the above is in order, should you require any clarification please don't hesitate to contact the undersigned.

Yours faithfully

John Gannon
Director
Tom Phillips + Associates

Bird Control Ireland Ltd.

Littlebridge Inches, Cappoquin, Co. Waterford, Ireland

Mr Zeki Mustafa
Managing Director
Rehab Glassco Ltd
Unit 4 Osberstown Industrial Park
Caragh Road
Naas
Co Kildare

2ND July, 2013

Dear Zeki,

During visits to Rehab Glassco a variety of birds were seen,

- Rook, Jackdaw, Hooded Crow and Magpie were seen on site.
- Some Herring Gulls were seen on the wing over the site.
- Birds seem to be attracted to organic materials in glass product and perhaps also the glass particles themselves.

Comments

BCI Ltd have visited the site on a number of occasions since 2010. An automatic bio acoustic bird distress call system, Scarecrow One Shot, has been fitted as well as a bird scaring kite.
A new program of bird scaring is now proposed whereby the bird numbers can be reduced if a program of harassment is conducted using visual, acoustic and predator conditioning.

Bird Control Visits

Bird control visits help to reinforce the visual and acoustic devices that have been installed. While distress calls and kites are effective they can suffer from habituation over time. The appearance of a live predator helps to maintain the effectiveness of the bird scaring equipment while regular monitoring allows us to prevent some problems and at worst react in timely fashion.

Littlebridge Inches, Cappoquin, Co. Waterford, Ireland

The inclusion of the hawk kites is important as these will be visual cues to which the birds are conditioned to respond to in association with Distress Calls, Hawks and firearms.

A sound modified shotgun will be used to cull some corvids and further build an association of danger with the methods employed. This device is very quiet and should not cause nuisance to persons on site.

The birds have formed a habit over a number of years at this site. Therefore an initial phase of intensive activity will be required.

Ideally the bird controller should attend site three times per week for the first four weeks. A review is then conducted and the visit rate reduced to twice a week for another four weeks if appropriate.

The visit rate will eventually be reduced to once per week with a provision for extra visits at times of high bird pressure.. Such times may be when young corvids fledge their nests (June & July) or during periods of sustained hard weather.

Rehab Glassco will need to nominate one person to aid in the bird control effort since equipment will need to be moved in between visits.

A typical site visit would be as follows;

- Liaison with site staff and training in equipment usage
- The entire site will be inspected.
- Areas that have bird activity will be identified
- Actions and efforts to control birds will be recorded.
- A Hawk / falcon will be worked around the facility
- Move hawk kites or other visual equipment to alternative locations.
- Use portable bird distress calls.
- Use sound modified shotgun.
- Bird Control Ireland will issue recommendations as appropriate
- Bird Control Ireland will maintain a Bird Control Manual. All activities will be recorded in the manual.
- Each visit will be for a period not exceeding two hours.
- An annual report will be submitted reporting Bird Activity, Activities, Control efforts, Results, Recommendations.
- BCI Ltd will liaise with National Parks and Wildlife Service where appropriate.

Littlebridge Inches, Cappoquin, Co. Waterford, Ireland

Equipment to be used on site:

Scarecrow Patrol Two – Bird Dispersal System

Hand held portable bird dispersal system complete with inbuilt siren live announcement facility and shower proof carry bag, no accessories, adaptor or add-ons necessary.

Calls - Starling, Rook, Magpie, Jackdaw and Carrion Crow, Herring, Common and Black Headed Gulls, Lapwing

Bird Control Hawk Kite

A self-launching falcon kite. The falcon shape elicits a good response from the birds particularly since the kite is constantly moving.

The kite is flown using a flexible telescopic pole that keeps the kite aloft. During periods of no wind, the kite rests beside the pole, then launches in the lightest wind.

Limitation: The kite should be withdrawn in winds over 30mph.

To be effective the device should be moved everyday thus presenting a new picture to the scavengers daily.

One person should be tasked with looking after the Hawk Kite.

The challenge in maintaining the effectiveness of the above methods over time remains, because these are in reality hollow threats.

Littlebridge Inches, Cappoquin, Co. Waterford, Ireland

Hawk Flying

The periodic introduction of a real hawk will reinforce site efforts and remind any investigating birds the a real predator is hunting this area, thus making them easier to clear.

Our trained operators will fly Harris Hawks around the yard, while using distress calls and kites to reinforce site activities.

As part of the visit Bird Control Ireland will provide a manual for maintenance of all bird control records.

Yours sincerely,

Jeremy Nicholson

Attachment A: Non-technical Summary (NTS)

A.a NTS: Contents

A.a.1 This non-technical summary (NTS) comprises the following:

- A.a: Contents
- A.b to A.l: Non-technical summary of each section of the Waste Licence Application
- A.m: Selected Waste Licence Application drawings to accompany the non-technical summary, to identify and describe the activity.

A.a.2 The NTS was revised in May 2013 in response to a Remedial Environmental Impact Statement (REIS), which was prepared for the subject facility (Patel Tonra Ltd., March 2013). A comparison study for the purposes of outlining any changes to the original Waste Licence Application (July 2011) resulting from the REIS was completed. The REIS and the comparison study were submitted to the Agency in May 2013.

A.a.3 The NTS was revised in September 2013 as a result of a response to a notice in accordance with Article 14(2)(b)(ii) of the Waste Management (Licensing) Regulations (EPA, 2nd July 2013).

A.b NTS: Section B - General

A.b.1 This Waste Licence application is being made by Rehab Glassco Ltd. (also referred to as 'Rehab Glassco' hereinafter) for a glass and can recycling facility at Unit 4, Osberstown Industrial Park, Caragh Road, Naas, Co. Kildare, Ireland. The site is a fully operational, state-of-the-art glass and can recycling facility. The facility is a key piece of waste management infrastructure in Ireland and accounts for approximately 80% of Ireland's glass recycling.

A.b.2 The application has been prepared by Patel Tonra Ltd., Environmental Solutions on behalf of Rehab Glassco.

A.b.3 The facility currently operates under a Waste Facility Permit issued by Kildare County Council; Waste Permit Register number WFP-KE-08-0357-01. Due to increased tonnage inputs in 2011, the EPA confirmed the requirement to apply for a Waste Licence for the facility.

A.b.4 Rehab Glassco Ltd. was formed as a result of the acquisition of Glassco Recycling Ltd. by The Rehab Group in December 2009. Rehab Recycle (part of The Rehab Group) operated a glass recycling facility in Ballymount, South Dublin under Waste Facility Permit (No. WPR 004/2); the Ballymount facility closed in February 2011. From February 2011 onwards, all material was directed to the Osberstown (Naas) facility.

A.b.5 The Osberstown (Naas) facility has been operated as a glass recycling facility by Rehab Glassco/Glassco Recycling Ltd. since 2008, under permit from Kildare County Council (No. WFP-KE-08-0357-01).

A.b.6 A copy of the newspaper page containing the Waste Licence Application advertisement is attached with this application. A site notice is affixed adjacent to the facility entrance.

Substitute Consent and Remedial Environmental Impact Statement (REIS)

A.b.7 Rehab Glassco Ltd. sought leave to apply for substitute consent for its facility at Osberstown Industrial Park on 8th February 2012. 'Substitute consent' means substitute consent granted under section 177K of the Planning and Development (Amendment) Act 2010. An Bord Pleanála (ABP) granted Rehab Glassco Ltd. leave to apply for substitute consent on 17th September 2012.

A.b.8 The ABP decision determined that the development is one where an environmental impact assessment is required. The notice directed that the application for substitute consent must include a Remedial Environmental Impact Statement (REIS).

A.b.9 A REIS considers the significant environmental effects (if any) of a development which have occurred, which are occurring or which can reasonably be expected to occur. If significant adverse effects are identified, remedial measures must be undertaken or proposed to be undertaken to remedy those effects. Timeframes for remedial measures must be stated.

A.b.10 Correspondence was issued to 14 No. statutory agencies and other bodies regarding scoping of the REIS and inviting comments on same. Written correspondence was also delivered to 4 No. residential properties located within 250m of the Rehab Glassco site to advise residents of the substitute consent application, REIS and affording residents an opportunity to make observations on the application or the operation of the facility. Residents were also invited to meet with the Applicant/consultant team for further information.

A.b.11 An application for Substitute Consent, accompanied by a Remedial Environmental Impact Statement (REIS), was submitted to An Bord Pleanála for the Rehab Glassco facility in March 2013 (An Bord Pleanála case reference: PL09.SU0015).[1] The application was for the purpose of regularising the existing glass recycling facility and ancillary activities at Unit 4, Osberstown Industrial Park, Caragh Road, Naas, Co. Kildare.

A.b.12 The REIS outlines the physical elements of the facility as follows:

- The site area is 21,300m^2.
- Main Process building – a portal frame structure; floor area: 734m^2, dimensions: 41.26m x 17.79m, 12m maximum height. The purpose-designed Main Process building contains the recycling plant for the segregation and processing of glass (and small volumes of other recyclables) for recovery purposes. This is the principal activity carried out on site. Offices, staff canteen and toilets are also contained within the Main Process building.

[1] Further documentation was provided to An Bord Pleanála in July 2013 in relation to the application for Substitute Consent.

- Drying Plant building - a steel-framed, fabric-covered structure; floor area: 314m^2, dimensions: 19.46m x 16.14m, 8.34m maximum height. The Drying Plant building houses a rotating drying unit, with associated conveyor, bagging and ancillary equipment. This building is used to manufacture a specified product from reject glass for remanufacturing uses
- Vehicle Maintenance building - a steel-framed, fabric-covered structure; floor area: 241m^2, dimensions: 19.4m x 12.4m, 7.0m maximum height. The building is used for maintenance of Rehab Glassco vehicles only (no third party vehicles).
- Outdoor storage areas, including storage bays and an open storage area for recycling bins/banks, pallets, etc. in the northern corner of the site. There are approximately 19 No. outdoor storage bays, ranging in area from 70m^2 to 1000m^2. They are constructed of permanent pre-cast concrete wall panels or moveable pre-cast concrete blocks. The maximum height of the wall is approx. 3.6m above ground level and material is stored to a maximum of 3m above ground level.
- Vehicle parking (approximately 34 No. car parking spaces and approx. 11 No. truck parking spaces) and internal access routes, completed in concrete hardstanding. A wayleave associated with the Newbridge Rising Main runs along the north-eastern boundary of the site (plastic matting system applied as surface treatment to permit access, if required).
- Ancillary activities and infrastructure, including weighbridge, truck wash, foul and surface water management infrastructure (including interceptors and underground attenuation tank), fuel storage (gas and diesel), security gates and boundary fencing/landscaping.
- All of the above features are existing and operational at the time of writing.

Type of Waste Activity

A.b.13 In accordance with the Third and Fourth Schedules to the Waste Management Acts 1996 to 2011[2], the principal waste activity is Fourth Schedule, Recovery Operations, Class ***R 5****: Recycling/reclamation of other inorganic materials, which includes soil cleaning resulting in recovery of the soil and recycling of inorganic construction materials.* This activity at Rehab Glassco relates to the separation and recycling of glass.

A.b.14 Metals are also recovered at the facility (e.g. drinks cans, food tins); therefore Fourth Schedule, Recovery Operations, Class ***R 4****: Recycling/reclamation of metals and metal compounds*, is relevant.

A.b.15 In relation to the operation of the Drying Plant at Rehab Glassco, the following class of activity is relevant: ***R 12****: Exchange of waste for submission to any of the operations numbered R 1 to R 11 (if there is no other R code appropriate, this can include preliminary operations prior to recovery including pre-processing such as, amongst others, dismantling, sorting, crushing, compacting, pelletising, drying, shredding, conditioning, repackaging, separating, blending or mixing prior to submission to any of the operations numbered R1 to R11)*.

[2] Including amendments by the European Communities (Waste Directive) Regulations, 2011

A.b.16 Small amounts of residual material will be temporarily stored on-site pending off-site recovery or disposal at an appropriately licensed/permitted waste facility; therefore the following classes are relevant:

- Third Schedule, Disposal Operations, Class ***D 15***: *Storage pending any of the operations numbered D 1 to D 14 (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)*.
- Fourth Schedule, Recovery Operations, 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)*.

A.b.17 The activity is not for the purposes of an establishment to which the European Communities (Control of Major Accident Hazards involving Dangerous substances) Regulations, 2000 (S.I. No. 476 of 2000), apply.

A.c NTS: Section C - Management of the Facility

A.c.1 Rehab Glassco offers unparalleled experience in glass collection and recycling services in Ireland. The site has been an operational glass recycling facility since 2008, under the conditions of a Waste Facility Permit from Kildare County Council. Prior to the formation of Rehab Glassco, Glassco Recycling Ltd. operated in the glass recycling sector for 11 years, and Rehab Recycle operated in the glass recycling sector for 15 years.

A.c.2 An organisational chart for the facility is included in Attachment **C**.

A.c.3 Rehab Glassco is currently implementing an Environmental Management System at the facility.

Hours of Operation

A.c.4 The hours of waste acceptance[3] are:

- Monday to Saturday (including bank holidays): 07:00 (7am) to 19:00 (7pm)
- Sunday: closed

A.c.5 The hours of operation[4] are:

- Monday to Friday (including bank holidays): 24-hours
- Saturday: 07:00 (7am) to 23:00 (11pm)
- Drying Plant: 07:00 (7am) to 19:00 (7pm) (Monday to Saturday)
- Sunday: closed

[3] **Hours of Waste Acceptance:** The hours during which the facility accepts waste.
[4] **Hours of Operation:** The hours during which the facility is operational.

A.c.6 Shift patterns for plant operatives operate on the following basis (approximate):

- Shift #1: 7am to 3pm
- Shift #2: 3pm to 10pm
- Shift #3: 10pm to 7am

A.c.7 No construction/development works are proposed as part of this application.

A.c.8 No other relevant hours of operation are anticipated.

A.d NTS: Section D - Infrastructure & Operation

A.d.1 The facility has completed a range of infrastructural works in line with the requirements of the Waste Facility Permit issued by Kildare County Council (WFP-KE-08-0357-01). Site infrastructure is shown on Drawing **WLA-04**.

Site security arrangements including gates and fencing

A.d.2 Site security gates and fencing are in place at the site. Additional tree plant and the installation of a noise barrier have been recently completed at the western boundary. The site currently operates a CCTV security system. The site is manned overnight for operational purposes and site personnel are available to deal with any emergencies and or security breaches. All site buildings are lockable.

Designs for site roads

A.d.3 The site is located within the existing Osberstown Industrial Park, Naas, Co. Kildare, which has a well developed road network, therefore there is no requirement for new access roads to the site. Traffic movement is controlled by a designated one-way system on site.

Design of hardstanding areas

A.d.4 The site is overlaid by concrete hardstanding, with the exception of a designated wayleave 20m in width along the northern site boundary, which is dedicated for the Newbridge rising main.

Plant

A.d.5 The primary items of plant relate to: (i) the Main Process Building, and (ii) Drying Plant. No additional plant is proposed for the purposes of this Waste Licence Application. The Main Process Building includes the following plant and equipment:

- Screens
- Crushers
- Magnetic separation units
- Eddy current separators
- Air classifiers
- Optical sorting equipment
- Conveyor systems
- Process control system

- Fire detection and alarm system

A.d.6 The Drying Plant building houses a rotating drying unit, with associated conveyor, bagging and ancillary equipment. Pelletising of glass fines (pilot process), a complementary glass recovery process within the Drying Plant building, is an additional unit operation.

A.d.7 There is currently a single weighbridge on site, which will be maintained for ongoing use. The weighbridge software is of bespoke design, commissioned by Rehab Glassco to meet their specific business requirements.

Wheelwash

A.d.8 A wheel cleaning system and a truck wash facility is currently in place on site. Vehicle washing and wheelwash facilities are provided using a power-washing system on site, if required; however, the majority of vehicles which enter/exit the site arrive on the public road network onto a fully concreted site and the risk of carrying mud/dirt off-site is insignificant.

Laboratory facilities

A.d.9 No on-site laboratory for environmental analysis is proposed. Any samples collected as part of the environmental monitoring programme will be analysed by an independent accredited laboratory. There is currently a quality control laboratory on site for the control of the processed glass cullet product.

Design and location of fuel storage areas

A.d.10 There are currently two diesel storage tanks on site: Tank#1 is a 10,000-litre capacity diesel storage tank, located at the Vehicle Maintenance building; Tank#2 is a 5,000-litre capacity diesel storage tank, located adjacent to the Drying Plant. Tank#1 is used for truck refuelling and Tank#2 to fuel site machinery. Both tanks are self-bunded.

A.d.11 There is a gas storage tank in the north of the site. The dimensions of the tank are approximately 7.4m long x 3.8m diameter.

Waste Quarantine and Inspection Areas

A.d.12 There is an established waste inspection and quarantine procedure in place at the facility.

Traffic Control

A.d.13 There is a one-way traffic management system in place on site, as indicated by directional signage. All incoming and outgoing vehicles must report to the weighbridge. All drivers are required to drive with due consideration for site safety. There are designated parking areas on site.

Sewage and Surface Water Drainage Infrastructure

A.d.14 A purpose-designed surface water management system has been installed at the facility, to include an engineered surface water drainage network, a silt trap and 2 No. interceptors.

All other services

A.d.15 Electricity is supplied to the facility by a sub-station on site supplying 1,000 KVA. The site is fully equipped with a modern telecommunications system, including broadband, internet access, email, telephone and fax.

Plant sheds, garages and equipment compound

A.d.16 In addition to the Main Process Building and the Drying Plant, there is an on-site garage building used for the purpose of standard vehicle maintenance for Rehab Glassco vehicles.

Site Accommodation

A.d.17 Site offices, including the weighbridge office, are contained within the Main Process Building.

Fire Control System, including water supply

A.d.18 A fire detection and alarm system is installed at the premises.

Facility Operation

A.d.19 There are two unit operations on site: (i) main glass/can processing, and (ii) drying plant operation.

A.e NTS: Section E - Emissions

Emissions to Atmosphere

A.e.1 There is one air emission point source – the source of this emission point relates to the drying unit in the Drying Plant building. Air dispersion modelling for this emission point was completed in August 2013.

A.e.2 There are potential fugitive emissions to air from dust and vehicle emissions; however management and control procedures will be implemented to mitigate against such impacts.

Emissions to Surface Waters

A.e.3 There are two on-site interceptors, with a discharge point from each interceptor; both points discharge to a storm culvert, which runs adjacent to the north-eastern site boundary.

Emissions to Sewers

A.e.4 Toilet and washing facilities from the Office/Administration building are the only emissions to sewer.

Emissions to Groundwater

A.e.5 There will be no direct discharges to groundwater or any groundwater abstractions as part of the development.

Noise Emissions

A.e.6 Potential noise emissions are associated with plant and equipment, vehicle movements and loading/unloading operations.

Environmental Nuisances

Bird Control

A.e.7 Remedial and ongoing mitigation measures relating to bird control are outlined in the REIS[5].

Dust Control

A.e.8 Remedial and ongoing mitigation measures relating to dust management are outlined in the REIS.

Fire Control

A.e.9 Emergency response procedures will be prepared and submitted to the EPA as part of the Environmental Management Programme.

Litter Control

A.e.10 Remedial and ongoing mitigation measures relating to litter control are outlined in the REIS.

Traffic

A.e.11 Access to the site will be controlled; the general public does not have access to the facility. There are designated staff, visitor and truck parking areas. On-site traffic flow patterns/routes, based on a one-way system, are specified. No traffic queuing is permitted outside the facility.

Vermin Control

A.e.12 Rehab Glassco retains the services of a pest control contractor and bait boxes are in place at a number of locations on site.

A.f NTS: Section F - Control & Monitoring

Treatment, Abatement and Control Systems

A.f.1 Remedial and mitigation measures for dust are outlined in the REIS (see also **Section A.i.1**).

A.f.2 A fire detection and alarm system is installed at the premises.

A.f.3 A purpose-designed surface water management system has been installed at the facility.

Air Monitoring and Sampling Points

A.f.4 The air emission point at the Drying Plant has been subject to monitoring, as detailed in the REIS. It is proposed that this will be an ongoing monitoring location. Air dispersion modelling for this emission point was completed in August 2013.

A.f.5 The Waste Licence application also specifies proposed dust monitoring locations.

[5] UPDATE: Additional bird control measures are being implemented at the facility on an ongoing basis.

Surface Water Monitoring and Sampling Points

A.f.6 Two surface water emission monitoring points are proposed.

Noise Monitoring and Sampling Points

A.f.7 Annual noise monitoring is proposed at the nearest residential noise sensitive receptor.

A.g NTS: Section G - Resources Use & Energy Efficiency

A.g.1 The input material to the facility is glass and cans. Input glass may be colour-segregated or mixed-colour. Material is subject to a range of sorting/processing techniques. There is no washing of material. No chemicals/additives are applied. The process aims to maximise the recovery of glass and cans.

A.g.2 The (pilot) pelletising process within the Drying Plant building uses small volumes of water and sodium silicate as a binding agent (no resulting water output).

A.g.3 All office space heating is powered by electricity (storage heaters). Diesel is stored in 2 No. on-site tanks; diesel is used to fuel site vehicles. A gas storage tank has been installed on site and is used as a fuel source for the Drying Plant operation. Oils, lubricants, etc. associated with vehicle maintenance and garaging activities are stored in the Garage Building. Water is used for drinking water and sanitary purposes.

A.g.4 Rehab Glassco has invested in state-of-the-art sorting equipment for its plant at Osberstown. The equipment was procured with due regard for energy efficiency specifications. The main switch room is fitted with power factor correction which regulates power supply to the facility to maximise efficiency and minimise any losses.

A.g.5 Energy use is monitored and measured and opportunities for improved energy performance are examined on an ongoing basis. Records of resource and energy use will be maintained on site and reported to the EPA as required.

A.h NTS: Section H - Materials Handling

Waste Types and Quantities

A.h.1 Rehab Glassco offers a nationwide collection and recycling service for glass and cans. Materials are collected from pubs, hotels, restaurants, sports clubs, financial institutions, office blocks, apartments and housing developments, council bring sites, civic amenity centres, industrial units and waste companies.

A.h.2 The following materials are accepted for recycling:

- bottles and jars
- aluminium and steel cans
- mixed plate glass

A.h.3 The facility has the capability of sorting mixed glass into colour-separated glass cullet.

A.h.4 The Waste Licence application seeks an input tonnage of 97,000 tonnes per annum.

Waste Acceptance Procedures

A.h.5 Incoming loads are weighed in and full details recorded on the weighbridge software. The weighbridge operator directs the incoming vehicle to the appropriate storage bay for unloading. Waste sources and inputs to the Rehab Glassco facility are controlled. All waste loads arriving at the facility are tipped and visually inspected prior to processing. Any contaminated/unsuitable loads may be recorded as a 'rejected load' and returned to source or removed to an appropriately licensed/permitted site, with the Agency's consent.

A.h.6 Any loads which may require to be further inspected or quarantined will be appropriately cordoned off in a storage bay pending further investigation and the material will be dealt with in the appropriate manner. Any smaller non-conforming items within an incoming loaded may be removed to the residual waste storage area or mobile hopper bins, pending removal off-site to an appropriately licensed/permitted facility.

Waste Handling

Main Process

A.h.7 The Rehab Glassco glass processing and cleaning plant is a state-of-the-art facility, relying on proven technology which includes sophisticated optical technology, screening systems and air classification to separate various mixes and colours of glass-based material into furnace-ready clean cullet for remanufacture into glass products. The process also uses manual pre-sort and quality control techniques to separate out certain contaminants at the early stages of the process.

Drying Plant

A.h.8 The on-site Drying Plant is used to treat certain residual glass materials from the Main Process on site. The Drying Plant operation includes magnetic extraction, manual pre-sort, drying, screening, crushing and separation of the clean glass into various size fractions. Material is fed via a hopper and passes under an over-band magnet to a manual picking line. Acceptable material passes from the picking line to the rotating drying unit, which operates at approximately 200-250°C.

A.h.9 The glass output from the drying unit is screened into the following fractions: >8mm fraction, which is transferred onwards to the main processing plant for re-processing; the <8mm fraction is crushed and screened to form various grades of glass fines and is marketed as a saleable product.

Pelletising of glass fines (pilot process)

A.h.10 The very fine-grained glass residue (<1mm), which is light and dusty in nature, is pelletised to form a marketable product. The process involves the addition of small volumes of water and sodium silicate (binding agent) to the glass dust fraction, within an enclosed mixing unit. The output from the process is pellets or granules of the fine-grained glass dust fraction. The product is a furnace-ready raw material for the glass manufacturing industry. This operation is housed within the Drying Plant building.

Waste Arisings

A.h.11 Small amounts of residual waste arise from the Main Process and the Drying Plant operations. Residue consigned to landfill is minimised through the operation of the Drying Plant. Overall waste residue is estimated at approximately <1% of input, by weight.

A.h.12 Non-process wastes generated at the facility include: general municipal-type waste, office paper waste and waste from garaging activities. Records of all wastes removed from site are retained by Rehab Glassco. Only appropriately licensed/permitted waste contractors and facilities are used.

Re-use and Recycling

A.h.13 The facility produces glass cullet, which is a market-ready raw material used to manufacture new glass products; this is known as 'closed-loop' recycling. The environmental benefits of closed-loop glass recycling are well documented, including substantial energy savings, with positive climate change implications, and avoiding the need for quarrying and related emissions associated with using virgin raw materials for glass manufacturing.

A.h.14 The Rehab Glassco facility plays a critical role in the recycling and recovery of glass in the context of the Irish waste management sector. The operation of this facility makes a substantive contribution towards meeting Ireland's recycling and recovery targets for glass: it accounts for approximately 80% of the country's glass recycling.

A.i NTS: Section I - Existing Environment & Impact of the Facility

Assessment of atmospheric emissions

A.i.1 The following remedial/mitigation measures were identified in the REIS:

Remedial Measures

The following remedial measures have recently been put in place:

- A new water bowser was purchased by the operator as a dust management technique (in particular for concrete hardstanding areas) and its use on site commenced in February 2013.
- The primary dust suppression system (e.g. at conveyors, material drop points/chutes/hoppers) in the Drying Plant building was modified at the end of December 2012, to include the installation of a new fan which provided additional extraction capacity, and new dust hoods at critical points.

The following additional (dust management) remediation measures are proposed:

- The primary conveying system and storage bin transfer chutes and openings [for end product] in the Drying Plant will be fully enclosed/contained and connected to the dust suppression system to prevent the release of fine, dusty material to air. This should be identified, reviewed and remedied within three months of the relevant authorisations being received from the Planning Authority.
- Housekeeping in the Drying Plant building will be improved, including the clean-up of spillage of material/product (effective immediately).

- Pilot operations at the pelletising unit (housed in the Drying Plant) will be reviewed for dust containment and dust management measures. The pelletiser unit should be contained, insofar as possible, with exhaust emissions managed through the existing bag-house filtration system (or modified/enhanced, as required). These works will be completed within three months of the relevant authorisations being received from the Planning Authority. Works will be overseen by a competent person.
- The operation, robustness and effectiveness of the dust extraction/filtration system at the Drying Plant will be reviewed by a competent person. A documented evaluation report will be retained as part of site records. This assessment will be completed within six months of the relevant authorisations being received from the Planning Authority.
- Repeat dust monitoring is proposed at the three dust monitoring locations identified in REIS Section 5.2. Monitoring will be completed between May and September 2013. Repeat monitoring is required to determine if there are consistently high dust levels associated with site activities.[6]
- Should repeat dust monitoring demonstrate a persistent dust nuisance, the Drying Plant building will be contained. The operator will assess feasibility options for total enclosure of the building, and consider the following: heavy-duty plastic strip curtains, fast-opening roller shutter doors, or alternative, at the Drying Plant building entrance. This will mitigate against dust emissions from the building to the environment. If dust levels associated with the operation of the Drying Plant remain high, a whole-building system, e.g. negative air pressure system, or equivalent, will be investigated.

Mitigation Measures

The following dust mitigation measures are ongoing/proposed:

- Continued annual dust monitoring in line with regulatory requirements will be undertaken[7]. Results will be reported to the regulator. Any exceedance of prescribed limit values will be recorded as an incident, with an appropriate level of response identified.
- Continued annual monitoring of point source emissions from the Drying Plant, in line with regulatory requirements. Emission Limit Values will be agreed with the Regulator. Any exceedance of prescribed limit values will be recorded as an incident, with an appropriate level of response identified.
- All emissions from the Drying Plant will be managed through the plant's primary and secondary (whole-building) air suppression and filtration system, which includes a combination of cyclone filters and bag-house filtration systems. An ongoing filter checking, maintenance and replacement programme will be implemented, with filters replaced regularly (and annually, as a minimum). Records of the maintenance/replacement programme will be retained on site.
- Fine product (i.e. output from the Drying Plant <0.2mm), which is light and has the potential to become wind-blown, will be stored in sealed bags and covered/wrapped, as appropriate.

[6] UPDATE: Repeat dust monitoring was completed by ORS Consulting Engineers in July-August 2013. Results indicate an ongoing issue in relation to dust levels on site. It is recommended that remedial/mitigation measures outlined in the Remedial EIS (March 2013) are implemented in full.

[7] More frequent monitoring may be appropriate, in the short-term, to evaluate the effectiveness of remedial measures.

- The height of outdoor stockpiles will be restricted to a maximum of 3m.
- The continued use of the water bowser during spells of dry weather, or as otherwise may be required, as a dust control measure.
- Regular sweeping of the yard/hardstanding areas using a mechanical sweeper will be undertaken.
- Regular and routine housekeeping measures will be undertaken on site, i.e. dust cleaning/wiping and sweeping.

Assessment of impacts of surface water discharges on the receiving waters

A.i.2 The following remedial/mitigation measures were identified in the REIS:

Remedial Measures

Current attenuation capacity for the site is inadequate and the installation of additional attenuation capacity is in line with regional drainage policies[8]. It is proposed that a storm-water attenuation pond is constructed in the north-east of the site, as shown in Drawing REIS-10.2. Engineering design calculations for the attenuation pond are included in the REIS. The construction of the new storm-water attenuation pond should be completed within three months of the relevant authorisations being received from the Planning Authority. Mitigation measures relating to the construction of the attenuation pond area are discussed in REIS Section 10.8.

Storage of bulk, uncontained input materials and product will be restricted to hardstanding areas only. Stockpiled input material, which had previously been stored outside of the hardstanding areas, in the south-east of the site was moved to the processing area/and or the concrete hardstanding area during Quarters 3-4, 2012. During 2012, measures have been taken to reduce the amount of material retained in the stockpile area, and to reduce the length of storage time on site. Stockpile areas require ongoing management and control, as detailed in the mitigation measures in REIS Section 10.8.

In response to elevated levels of suspended solids and BOD detected in the interceptor discharge sample[9], an additional silt trap will be installed at the interceptor, prior to discharge to surface water. The installation of the new silt trap will be completed within one month of the relevant authorisations being received from the Planning Authority. Repeat sampling of discharge to surface water is recommended as soon as possible. Ongoing monitoring at this point is detailed as a mitigation measure in REIS Section 10.8.

Litter management and housekeeping issues (which impact on the stream/ditch at the north-eastern site boundary) are discussed in RIES Chapter 13.

[8] The Greater Dublin Strategic Drainage Study (GDSDS)

[9] UPDATE: Monitoring of emissions to surface water was completed by Patel Tonra Ltd. in July 2013. There were no exceedances of Emission Limit Values specified in Waste Facility Permit WFP-KE-08-0357-01.

Mitigation Measures

The following mitigation measures have been implemented, and are required to be maintained on an ongoing basis:

- Control of surface water emission at one discharge point only[10], via the site drainage system, 2 No. interceptors and silt trap at the vehicle washing/power-wash area. Drains, silt traps and interceptors are subject to ongoing inspection, cleaning and maintenance.
- Emissions to surface water at the discharge point are sampled on a bi-annual basis (with a weekly visual inspection), in accordance with Waste Facility Permit regulatory requirements.
- There are currently two fuel storage tanks on site (see Drawing REIS-2.1). Both tanks are bunded/double skinned.[11] Inspections and conformance records will be retained on-site.
- Bunded drip trays are in place in the Vehicle Maintenance building and all hazardous liquids will be stored thereon.
- Temporary ground covers only [no permanent fixtures] are used on the wayleave area (Newbridge Rising Main) on the north-eastern boundary, to permit access by the authorities, if required.
- Storage of bulk, uncontained input materials and product is on hardstanding areas only (ongoing operational requirement as good site practice). Storage outside of the hardstanding areas is only permissible for bagged/contained materials.
- The height of stockpiles will be restricted to 3m maximum to ensure the consistent movement of material through the process, thereby avoiding the on-site storage of material for prolonged periods.
- Non-conforming input wastes and waste residues are contained in appropriate waste receptacles, e.g. bins, skips or specialist containers.
- A documented emergency response system is in place.
- Any environmental incidents are logged and reported to the regulator, as required.
- Use of the bowser as a dust mitigation measure is considered in REIS Chapter 5.

The additional mitigation measures proposed are as follows:

- It is recommended that construction works associated with the storm-water attenuation pond works are supervised by a competent engineer. Works to be completed in line with Eastern Regional Fisheries Board guidelines[12], to include the following precautionary measures:
    - Fuels, oils, greases and hydraulic fluids must be stored in bunded compounds well away from the watercourse. Refuelling of machinery, etc., should be carried out in bunded areas.

[10] UPDATE: Drainage arrangements have been clarified, such that there are 2 No. separate discharge points from the site, both of which emit to a storm culvert, which runs adjacent to the north-eastern site boundary.

[11] Both tanks are self-bunded.

[12] *Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites*

- Runoff from any machine service and concrete mixing areas must not enter the watercourse.
- Stockpile areas for sands and gravel should be kept to minimum size, well away from the watercourse.
- Watercourse banks should be left intact if possible. If they have to be disturbed, all practicable measures should be taken to prevent soils from entering the watercourse.

- To avoid soils washing into the stream/ditch along the north-eastern site boundary (during the operational phase), a suitable level of planting is recommended to ensure the stability of the bank. This is further discussed in REIS Chapter 8, Flora and Fauna.
- Litter management procedures and litter picks will be strictly enforced, with particular reference to the potential for site-generated litter and glass residue to enter the stream/ditch on the north-eastern boundary. This is further discussed in REIS Chapter 13.
- Emergency spill kits will be positioned at areas of risk. Staff will be trained on environmental emergency response/use of spill kits.
- Future renovation/re-fit works will consider the potential for rainwater harvesting, as a resource-saving and environmental good practice measure.

Assessment of impact on receiving sewer

A.i.3 No significant wastewater impacts are anticipated.

Assessment of impact to groundwater and soils

A.i.4 The following remedial/mitigation measures were identified in the REIS:

Remedial Measures

No significant adverse effects on soils, geology or groundwater associated with the subject site have been identified. No remedial measures are required.

Mitigation Measures

There are currently two fuel storage tanks on site. Both tanks are bunded/double skinned.[13] The vehicle maintenance building is equipped with spill control equipment, drip trays and bunded pallets. This equipment will be maintained on site and replaced as necessary.

In relation to proposed remedial measures to construct a surface/storm water attenuation pond (Section REIS 10.6), mitigation measures outlined in REIS Section 10.8 should be applied. In addition, and with reference to soils, geology and hydrogeology, any material removed off-site will be diverted to a suitable licensed or permitted facility, with transportation by a Waste Collection Permit holder. Where works involve topsoil stripping, material will be removed and stored in a manner to protect the soil structure for alternative use on site or off-site. Measures will be taken to ensure soil stability and prevent soil erosion. The completed depth of the pond will be approximately 1.2m, which will not impact on groundwater.

[13] Both tanks are self-bunded.

Dust management and control measures during construction works are considered in REIS Chapter 5, Air and Climate. Mitigation measures for outdoor storage of input material and processed materials are proposed in relation to surface water/drainage, as detailed in REIS Chapter 10, which will have consequential benefits in terms of protection of ground underlying waste storage areas. Surface water management controls, as detailed in REIS Chapter 10, would also serve to mitigate potential surface water contaminants entering groundwater.

As a waste management activity, the facility will be subject to ongoing waste permitting/licensing requirements.

Ground and/or groundwater contamination

A.i.5 There is no known ground and/or groundwater contamination, historical or current, on or under the site.

Noise Impact

A.i.6 The following remedial/mitigation measures were identified in the REIS:

Remedial Measures

A noise barrier/screen was installed at the western site boundary (in proximity to the nearest residential neighbour) in January 2013. A noise barrier/screen has also been installed at the loading bay of the Main Process building. This is likely to provide a degree of localised noise attenuation.

Point noise sources at the plant will be considered in terms of noise insulation, maintenance and proper use of plant and equipment, Best Available Techniques (BAT) for plant and equipment (choosing inherently quiet plant & machinery), relocation on site of noisy activities, plant or layout changes, screening of noise-generating plant and building doors/openings. These measures will be undertaken within two months of the relevant authorisations being received from the planning authority.

Further noise monitoring will be conducted within three months of the relevant authorisations being received from the planning authority. If monitoring results indicate that noise levels exceed 'Evening' and 'Night-time' by EPA NG4, it is proposed that operations at the Drying Plant (thought to be a major contributor to noise levels at NSL1, the closest residential receptor) will be restricted to meet these requirements, i.e. the Drying Plant will not operate between 19:00hrs and 07:00hrs.[14]

Mitigation Measures

No material will be accepted into or removed from the facility between the hours of 7pm and 7am; therefore there is no related HGV noise at this time.

Noise monitoring will be conducted annually (as a minimum), or as per waste regulatory requirements. Any incidents will be reported to the regulator, with corrective actions identified, as appropriate.

[14] UPDATE: Further noise monitoring was completed by ORS Consulting Engineers in July 2013. The operation of the Drying Plant is restricted to daytime hours only.

Any noise complaints will be recorded and investigated.

An ongoing plant and equipment maintenance procedure will be implemented to minimise noise levels. Any new equipment acquired will conform to EU noise standards.

Assessment of Ecological Impacts & Mitigation Measures

A.i.7 The following remedial/mitigation measures were identified in the REIS:

Remedial Measures

No remedial measures specified.

Mitigation Measures

Mitigation of surface drainage water has been built into the site in the form of oil separators and the attenuation tank and if the former are cleaned regularly they will prevent any oil pollution reaching the drain. It is understood that a storm water attenuation pond is to be constructed in the north-east of the site; no impacts on flora and fauna are anticipated.

Vegetation in the drain will re-establish itself naturally but the banks will be strengthened by the proposed planting of willows which will have a positive impact on birdlife and insect life. Purple willows *Salix purpurea* are suggested as they are small trees unlikely to fall over and create soil disturbance.

A.j NTS: Section J - Accident Prevention & Emergency Response

A.j.1 Rehab Glassco has documented and implemented Emergency Response Procedure Guidelines. All staff receive Health & Safety induction training and are fully equipped with PPE. A fire detection and alarm system is installed at the premises.

A.j.2 Diesel is stored in self-bunded tanks. Potentially contaminating material stored in the garage building is retained on spill pallets. The surface water drainage system includes two interceptors.

A.k NTS: Section K - Remediation, Decommissioning, Restoration and Aftercare

A.k.1 If the decommissioning of part or all of the Rehab Glassco facility should be required, a phased decommissioning process will be carried out. After all material has been removed a programme of environmental monitoring and a site audit will be carried out to ensure that the local environment has not been adversely affected by the closure of the facility and that no residual material remains on the site.

A.k.2 It is not envisaged that the activities at the Rehab Glassco facility will have an adverse impact on the site, which will result in detailed aftercare management of the site being required.

A.k.3 Detailed assessments of Environmental Liability Risk Assessment (ELRA) and Closure, Restoration and Aftercare Management Plan (CRAMP) requirements, and related Financial Provision (FP), were completed on behalf of the Operator in August 2013. A report was submitted to the EPA as part of 'Article 14' reporting requirements.

A.l NTS: Section L - Statutory Requirements

A.l.1 Section 40(4) of the Waste Management Acts 1996 to 2011 requires that the Agency shall not grant a waste licence unless it is satisfied that its requirements are met. Attachment L of the Waste Licence Application provides information to show that these criteria have been met.

A.l.2 Remedial/mitigation measures outlined in the REIS to be implemented in full (and subject to Substitute Consent planning application). Environmental monitoring is proposed for air/dust, noise and surface water to ensure that relevant emission limit values are not exceeded.

A.l.3 The Rehab Glassco activity is deemed to be consistent with the objectives of Kildare Waste Management Plan.

A.l.4 Rehab Glassco (and previously Glassco Recycling) has been the holder of a Waste Facility Permit for the facility since 2008.

A.l.5 The Applicant has not been convicted of any offences pertaining to the Waste Management, EPA, Air or Water Pollution Acts.

A.l.6 The Applicant holds the requisite technical knowledge and qualifications to carry on the proposed activity in an appropriate manner.

A.l.7 The Applicant is in a position to meet financial commitments/liabilities which may be associated with the activity.

A.l.8 The Rehab Glassco facility focuses on the recycling of glass and cans, i.e. a *recovery operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes*, in line with the priority order waste hierarchy.

A.l.9 The Rehab Glassco facility plays a critical role in the recycling and recovery of glass and cans in the context of the Irish waste management sector. The facility is strategically located with reference to key waste generation points in the country, with excellent motorway access to all parts of Ireland. The facility is designed and operated to ensure a high level of protection for the environment and public health.

A.m Selected Waste Licence Application Drawings to Accompany the Non-technical Summary

- Drawing WLA-01_Rev00: Site Location Map
- Drawing WLA-04_Rev01: Site Plan
- Drawing WLA-07_Rev01: Unit Operations
- Drawing WLA-14_Rev01: Monitoring Locations