

The Environmental Protection Agency,  
Office of Environmental Enforcement,  
Headquarters,  
PO Box 3000,  
Johnstown Castle Estate,  
Co. Wexford.

31<sup>st</sup> March 2016.

**Re: 2015 Annual Environmental Report for W0277-01, Huntstown Waste Recovery Facility**

**The licence holder shall submit to the EPA an Annual Environmental Report before 31<sup>st</sup> March of the following year.**

To whom it may concern,

In compliance with waste licence W0277-01, please find enclosed the following details:

- (1) Emissions from the facility
- (2) Waste management record
- (3) Resource consumption summary
- (4) Complaints summary
- (5) Schedule of environmental Objectives and Targets
- (6) Environmental management programme- report for previous year
- (7) Environmental management programme- report for current year
- (8) Pollutant release and Transfer Register- report for current year
- (9) Pollutant release and Transfer Register- - report for previous year
- (10) Noise monitoring report summary
- (11) Dust monitoring report summary
- (12) Tank and pipeline testing and inspection report.
- (13) Reported incidents summary
- (14) Bird survey report
- (15) Energy efficiency audit summary.
- (16) Reports on final provision made under this licence, management and staffing structure of the facility and a programme for public information.
- (17) Review of Closure, restoration & aftercare management Plan.
- (18) Statement of measures in relation to prevention of environmental damage and remedial actions (Environmental Liabilities)
- (19) Environmental Liabilities Risk Assessment Review (every three years or more frequently as dictated by relevant on-site change including financial provisions).
- (20) Any other items specified by the agency

This is a summary of the activities for W0277-01, week beginning 1<sup>st</sup> January 2015 to 31<sup>st</sup> December 2015 for the recycling facility at Huntstown, Finglas, Dublin 11.

Regards,

Leonard Grogan,  
Recycling Manager.

- (1) **Emissions from the facility**  
Please find attached.
- (2) **Waste management record**  
Please find attached a summary of our waste intake. Please also find included soil sampling for the relevant period. All records of loads received are stored on site for inspection.
- (3) **Resource consumption summary**  
38,367 litres of gas oil were consumed in Huntstown clay recovery facility in 2015.
- (4) **Complaints summary**  
Roadstone Huntstown received no complaints in 2015.
- (5) **Schedule of Environmental Objectives and Targets**  
Please find attached.
- (6) **Environmental Management Programme – report for previous year**  
N/A
- (7) **Environmental Management Programme – report for current year**  
Please find attached
- (8) **Pollutant Release and Transfer Register –report for previous year**  
N/A
- (9) **Pollutant Release and Transfer Register – report for previous year**  
This is covered in the PRTR report which has been submitted with this report covered in section 6.
- (10) **Noise monitoring report summary**  
Please find attached..
- (11) **Dust monitoring report summary**  
Please find attached.
- (12) **Tank and pipeline testing and inspection report**  
Please find attached.
- (13) **Reported incidents summary**  
N/A
- (14) **Bird survey report**  
Please find attached.
- (15) **Energy efficiency audit summary.**  
On file in location
- (16) **Reports on financial provision made under this licence, management and staffing structure of the facility, and a programme for public information.**  
A report on financial provisions is contained within the ELRA. Please also find included a copy of Roadstone Ltd.'s insurance as well as a bank letter confirming our financial stability. Roadstone is part of the CRH group of companies and is clearly in a strong position to offer a 'Parent Company Guarantee' to cover any possible financial risks that may occur.
- (17) **Review of Closure, restoration & aftercare management Plan.**  
Please find attached.
- (18) **Statement of measures in relation to prevention of environmental damage and remedial actions.**  
Please find attached.

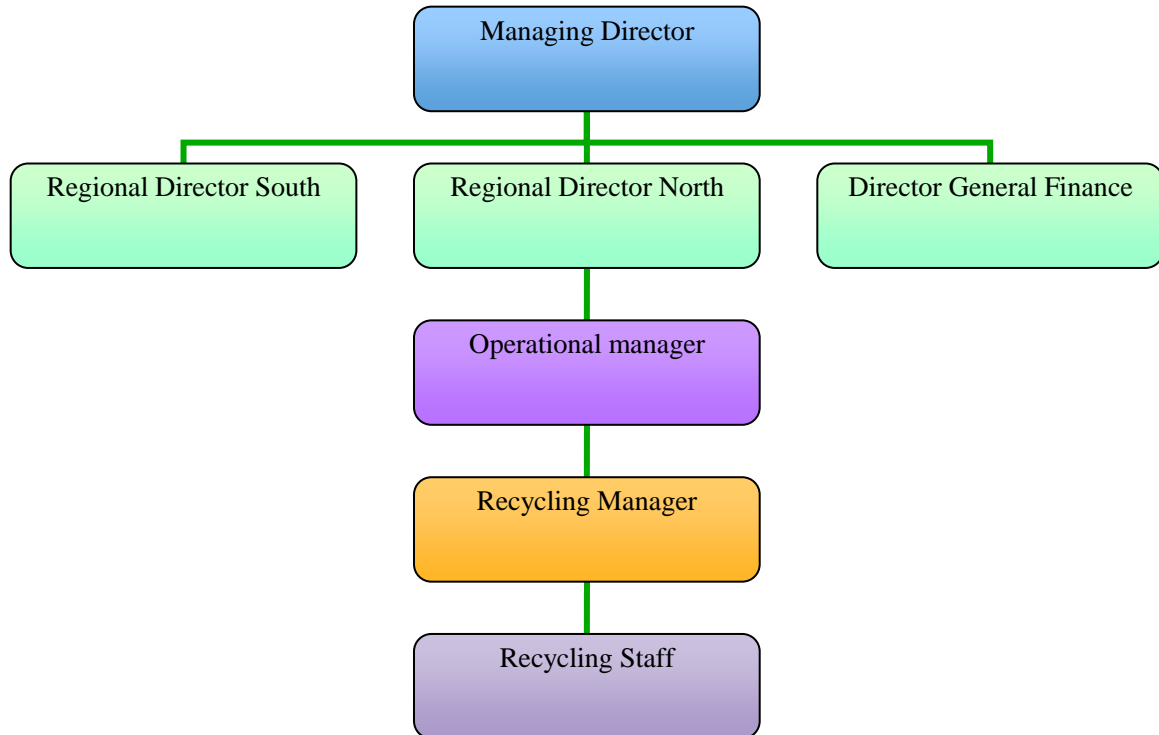
Roadstone Ltd  
Fortunestown,  
Tallaght,  
Dublin 24

A.E.R. W0277-01



- (19) **Environmental Liabilities Risk Assessment Review.**  
Please find attached.
  
- (20) **Any other items specified by the agency.**  
Please find attached.

## Section 1: The management and staffing structure of the facility



The diagram illustrates a section of the overall organisation to highlight the management and reporting structure of the recycling department. The recycling staff include as follows:

- Weighbridge staff,
- Sales staff,
- Loading shovel staff
- Contract crushing staff

The public can, by appointment, call in to the weighbridge office to view information about the facility. Some information is available on Roadstone's website.



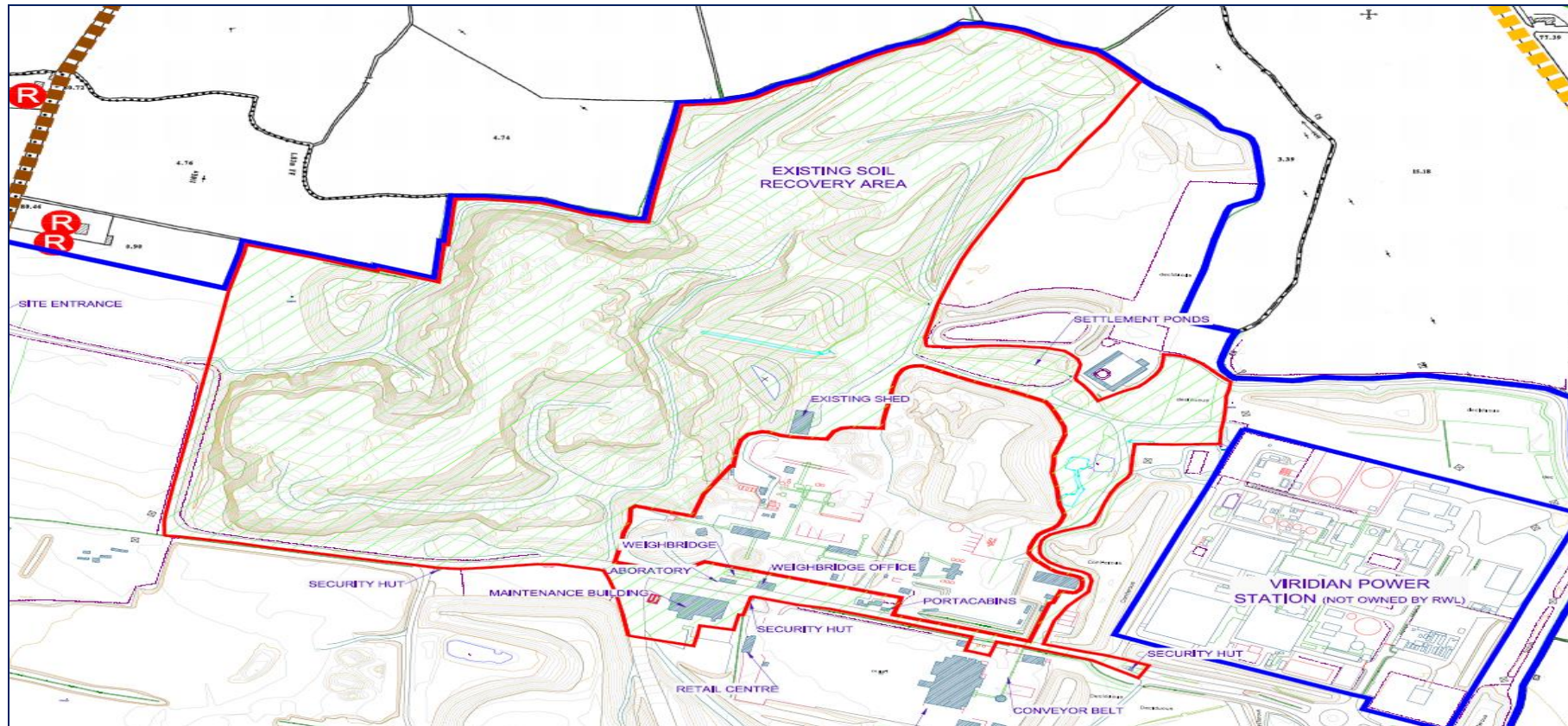
## **Section 2:**

### **Summary of waste intake and Soil sample Results:**

- Soil Intake for 2015 = 175,886 tons
- C&D Intake for 2015 = Nil ton



**Section 3:  
Figure 2.6 from EIS**



Roadstone Ltd  
Fortunestown,  
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## **Section 4:**

### **Soil Analyses:**







**Section 5:  
 Env. Management Programme 2015**

<b>Roadstone Wood Group</b>	
<b>Environmental Management Program</b> <b>Year: 2015</b> <b>Location: Huntstown Recycling Facility</b>	<b>Doc.No: EMS/08</b>
	<b>Page 9 of 125</b>
	<b>Revision: 0</b>
	<b>Date: March 2015</b>
	<b>Approved By: Colin Doyle</b>

<u>Target</u>	<u>Improvement</u>	<u>Cost</u>	<u>Resp.</u>	<u>Completion Date</u>
Improve dust supression	Tar haul roads from weighbridge to tip	€80,000	LG	2015

**Section 6:  
 PRTR Returns:**

[ PRTR# : Y0098 | Facility Name : Huntstown Quarry | Filename : Copy of Y0098\_2015.xls | Return Year : 2015 ]



[Guidance to completing the PRTR workbook](#)

**PRTR Returns Workbook**

Version 1.1.19

<b>REFERENCE YEAR</b>	2015
-----------------------	------

**1. FACILITY IDENTIFICATION**

Parent Company Name	Roadstone Wood Ltd
Facility Name	Huntstown Quarry
PRTR Identification Number	Y0098
Licence Number	

Classes of Activity

No.	class_name
-	Refer to PRTR class activities below

Address 1	North Road
Address 2	Finglas
Address 3	Dublin11
Address 4	
	Dublin
Country	Ireland
Coordinates of Location	-6.33164428699996 53.4124147380001
River Basin District	IEEA
NACE Code	0811
Main Economic Activity	Quarrying of ornamental and building stone, limestone, gypsum, chalk and slate
<b>AER Returns Contact Name</b>	Colin Doyle
<b>AER Returns Contact Email Address</b>	cdoyle@roadstone.ie
<b>AER Returns Contact Position</b>	Environmental Officer
<b>AER Returns Contact Telephone Number</b>	014041394
<b>AER Returns Contact Mobile Phone Number</b>	0872924666
<b>AER Returns Contact Fax Number</b>	
<b>Production Volume</b>	0.0
<b>Production Volume Units</b>	
<b>Number of Installations</b>	0
<b>Number of Operating Hours in Year</b>	0
<b>Number of Employees</b>	8
<b>User Feedback/Comments</b>	
<b>Web Address</b>	

**2. PRTR CLASS ACTIVITIES**

<b>Activity Number</b>	▼	<b>Activity Name</b>	▼
3(b)		Opencast mining and quarrying	

**3. SOLVENTS REGULATIONS (S.I. No. 543 of 2002)**

Is it applicable?	No
Have you been granted an exemption ?	
If applicable which activity class applies (as per Schedule 2 of the regulations) ?	
Is the reduction scheme compliance route being used ?	

**4. WASTE IMPORTED/ACCEPTED ONTO SITE**

[Guidance on waste imported/accepted onto site](#)

Do you import/accept waste onto your site for on-site treatment (either recovery or disposal activities) ?	Yes
--	-----

This question is only applicable if you are an IPPC or Quarry site



## Section 7: Emissions

### 4.1 RELEASES TO AIR

[Link to previous years emissions data](#)

| PRTR#: Y0098 | Facility Name : Huntstown Quarry | Filename : Copy of Y0098\_2015.xls | Return Year : 2015 |

20/04/2016 09:18

#### SECTION A : SECTOR SPECIFIC PRTR POLLUTANTS

POLLUTANT		METHOD			ADD EMISSION POINT	QUANTITY		
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
02	Carbon monoxide (CO)	C	OTH		0.0	9049.4	0.0	9049.4
03	Carbon dioxide (CO2)	C	OTH		0.0	2667040.0	0.0	2667040.0
01	Methane (CH4)	C	OTH		0.0	46.4	0.0	46.4
08	Nitrogen oxides (NOx/NO2)	C	OTH		0.0	27676.0	0.0	27676.0
11	Sulphur oxides (SOx/SO2)	C	OTH		0.0	2700.8	0.0	2700.8
86	Particulate matter (PM10)	C	OTH		0.0	7121.1	0.0	7121.1
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0

ADD NEW ROW    DELETE ROW \*    \* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

#### SECTION B : REMAINING PRTR POLLUTANTS

POLLUTANT		METHOD			ADD EMISSION POINT	QUANTITY		
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
06	Ammonia (NH3)	C	OTH		0.0	6.8	0.0	6.8
05	Nitrous oxide (N2O)	C	OTH		0.0	113.9	0.0	113.9
07	Non-methane volatile organic compounds (NMVOC)	C	OTH		0.0	0.0	0.0	2856.9
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0

ADD NEW ROW    DELETE ROW \*    \* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

#### SECTION C : REMAINING POLLUTANT EMISSIONS (As required in your Licence)

POLLUTANT		METHOD			ADD EMISSION POINT	QUANTITY		
Pollutant No.	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
					0.0	0.0	0.0	0.0



**4.2 RELEASES TO WATERS**

[Link to previous years emissions data](#)

| PRTR#: Y0098 | Facility Name : Huntstown Quarry | Filename : Copy of Y0098\_2015.xls | Return Year : 2015 |

20/04/2016 09:18

**SECTION A : SECTOR SPECIFIC PRTR POLLUTANTS**

Data on ambient monitoring of storm/surface water or groundwater, conducted as part of your licence requirements, should NOT be submitted under AER / PRTR Reporting as this o

RELEASES TO WATERS					Please enter all quantities in this section in KGs			
POLLUTANT					ADD EMISSION POINT	QUANTITY		
No. Annex II	Name	M/C/E	Method Used		Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
			Method Code	Designation or Description				
					0.0	0.0	0.0	0.0

ADD NEW ROW    DELETE ROW \*    \* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

**SECTION B : REMAINING PRTR POLLUTANTS**

RELEASES TO WATERS					Please enter all quantities in this section in KGs			
POLLUTANT					ADD EMISSION POINT	QUANTITY		
No. Annex II	Name	M/C/E	Method Used		Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
			Method Code	Designation or Description				
					0.0	0.0	0.0	0.0

ADD NEW ROW    DELETE ROW \*    \* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

**SECTION C : REMAINING POLLUTANT EMISSIONS (as required in your Licence)**

RELEASES TO WATERS					Please enter all quantities in this section in KGs			
POLLUTANT					ADD EMISSION POINT	QUANTITY		
Pollutant No.	Name	M/C/E	Method Used		Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
			Method Code	Designation or Description				
					0.0	0.0	0.0	0.0



4.3 RELEASES TO WASTEWATER OR SEWER

[Link to previous years emissions data](#)

| PRTR# : Y0098 | Facility Name : Huntstown Quarry | Filename : Copy of Y0098\_2015.xls | Return Yr : 20/04/2016 09:18

SECTION A : PRTR POLLUTANTS

OFFSITE TRANSFER OF POLLUTANTS DESTINED FOR WASTE-WATER TREATMENT OR SEWER					Please enter all quantities in this section in KGs			
POLLUTANT		METHOD			ADD EMISSION POINT	QUANTITY		
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
						0.0	0.0	0.0

ADD NEW ROW    DELETE ROW \*    \* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

SECTION B : REMAINING POLLUTANT EMISSIONS (as required in your Licence)

OFFSITE TRANSFER OF POLLUTANTS DESTINED FOR WASTE-WATER TREATMENT OR SEWER					Please enter all quantities in this section in KGs			
POLLUTANT		METHOD			ADD EMISSION POINT	QUANTITY		
Pollutant No.	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
						0.0	0.0	0.0

4.4 RELEASES TO LAND

[Link to previous years emissions data](#)

| PRTR# : Y0098 | Facility Name : Huntstown Quarry | Filename : Copy of Y0098\_2015.xls | Return Year : 2015 |

20/04/2016 09:18

SECTION A : PRTR POLLUTANTS

RELEASES TO LAND					Please enter all quantities in this section in KGs			
POLLUTANT		METHOD			ADD EMISSION POINT	QUANTITY		
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
						0.0	0.0	0.0

ADD NEW ROW    DELETE ROW \*    \* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

SECTION B : REMAINING POLLUTANT EMISSIONS (as required in your Licence)

RELEASES TO LAND					Please enter all quantities in this section in KGs			
POLLUTANT		METHOD			ADD EMISSION POINT	QUANTITY		
Pollutant No.	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
						0.0	0.0	0.0



**5. ONSITE TREATMENT & OFFSITE TRANSFERS OF WASTE**

| PRTR#: Y0098 | Facility Name: Huntstown Quarry | Filename: Copy of Y0098\_2015.xls | Return Year: 2015 |

20/04/2016 09:18

**Please enter all quantities on this sheet in Tonnes**

0

Transfer Destination	European Waste Code	Hazardous	Quantity (Tonnes per Year)	Description of Waste	Waste Treatment Operation	Method Used		Location of Treatment	Haz Waste: Name and Licence/Permit No of Next Destination Facility Non Haz Waste: Name and Licence/Permit No of Recover/Disposer	Haz Waste: Address of Next Destination Facility Non Haz Waste: Address of Recover/Disposer	Name and License / Permit No. and Address of Final Recoverer / Disposer (HAZARDOUS WASTE ONLY)	Actual Address of Final Destination i.e. Final Recovery / Disposal Site (HAZARDOUS WASTE ONLY)
						M/C/E	Method Used					
Within the Country	13 02 08	Yes	36.44	other engine, gear and lubricating oils	R9	C	Volume Calculation	Offsite in Ireland	ENVA,184-1	Kilminam Industrial Estate,Portlaoise,,Co. Laoise,Ireland	ENVA,184-1,Kilmanim Industrial Estate,Portlaoise,,Co. Laoise,Ireland	Kilmanim Industrial Estate,Portlaoise,,Co. Laoise,Ireland

Roadstone Ltd  
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Tallaght,  
Dublin 24

A.E.R. W0277-01



## **Section 8:**

### **Noise Monitoring report**

Roadstone Ltd  
Fortunestown,  
Tallaght,  
Dublin 24

A.E.R. W0277-01



BHP/CEM/23/A

Analysing  
Testing  
Consulting  
Calibrating

**TEST REPORT 117929**

**Client:**

Roadstone Wood Ltd  
Fortunestown  
Tallaght  
Dublin 24

BHP Ref No.: 15/06/610  
Order No.:  
Date Received: 18<sup>th</sup> June 2015  
Date Tested: 18<sup>th</sup> June 2015 and 26<sup>th</sup>  
August 2015  
Test Specification: Noise Monitoring



BHP  
New Road  
Thomondgate  
Limerick  
Ireland  
Tel +353 61 455399  
Fax + 353 61 455447  
E Mail bhpцем2@bhp.ie

**FAO: Colin Doyle**

*Item: Noise survey at Noise Sensitive Locations at the Roadstone operation located at Huntstown, Finglas, Co. Dublin.*

For and on behalf of BHP Ltd.

A handwritten signature in black ink, appearing to read 'Graeme Thornton'.

**Graeme Thornton**  
**Date Issued: 31<sup>st</sup> August 2015**  
**Supplement to report No. N/A**

Test results relate only to this item. This test report shall not be duplicated except in full and with the permission of the test laboratory.

BHP CEM Laboratory



## **Contents**

1.0 Scope

2.0 Survey Approach

3.0 Date of sampling

4.1 Results

4.2 Noise levels

5.1 Interpretation of results

5.2 Noise Levels

6.0 Conclusions

Appendix A: Map showing noise monitoring locations Appendix

B: Photographs indicating noise monitoring locations Appendix

## 1.0 Scope of survey

At the request of Roadstone Wood Ltd., BHP undertook noise monitoring at their operation in Huntstown, Finglas, Co. Dublin. The purpose of this survey was to provide Roadstone with the noise data and analysis required as part of their planning requirements.

This report deals with four nominated noise locations at the operation in Huntstown, Finglas, Co. Dublin.

## 2.0 Survey approach

Two sound level meters (SLM's) were used in the survey, a Cirrus 171C type 1 (serial number G068852) and a cirrus 831A type 1 (serial number B15782FF). The SLM's were calibrated at the start of the survey with a CRL 511E calibrator (serial number 039592). The same calibrator was used to check the SLM at the end of the survey, to inspect the microphone drift.

Monitoring and the interpretation of acquired data is to the following standards:

- British Standard: BS 7445 Part 1: 1991 (ISO 1996-1: 1982) Description and measurement of Environmental Noise. Part 1. Guide to quantities and procedures.
- British Standard: BS 7445 Part 2: 1991 (ISO 1996-2: 1987) Description and measurement of Environmental Noise. Part 2. Guide to the acquisition of data pertinent to land use.
- British Standard: BS 7445 Part 3: 1991 (ISO 1996-3: 1987) Description and measurement of Environmental Noise. Part 3. Guide to application to noise limits.

60-minute daytime levels were measured at four locations. The locations are identified on the map included in Appendix A.

Appendix B contains photographs of the noise monitoring equipment at the monitoring points.

## 3.0 Date of survey

The daytime monitoring survey was carried out on the 18<sup>th</sup> June 2015 and the night time survey was carried out on the 26<sup>th</sup> August 2015 by Graeme Thornton.

## 4.0 Results

### 4.1 Noise levels:

Levels are presented on the following pages.

**Day-time Measurements - Noise Locations – Huntstown, Finglas, Co. Dublin. (18<sup>th</sup> June 2015)**

Location	Sampling Interval	Duration (mins)	L <sub>AEQ</sub> dB	L <sub>A10</sub> dB	L <sub>A90</sub> dB	Wind speed m/s	Sampling notes
N1	12.06-13.06hrs	60	59	61	52	1.5-3 W	The quarry is not audible. Occasional trucks are entering the site at 55dB. Airplanes are taking off at up to 70dB. The M50 is constant at 51-53dB. Wind noise in the trees is occasionally up to 55dB
N2	13.18-14.18hrs	60	58	61	54	1.5-2 W	The quarry noise is at 53-55dB with drilling increasing the noise level to 59-64dB. Birdsong is occasionally at 55-58dB. Aeroplanes are at 65dB occasionally. The location fails due to the drilling noise and the direct line of site from the monitoring location to the drilling rig.
N3	12.13-13.13hrs	60	56	60	47	0.5-1.5 W	The quarry is not audible. Noise from the adjacent facility is at 50-52dB. Aeroplanes are taking off occasionally at 66dB. The background noise level is at 47dB with wind noise and birdsong.
N4	13.32-14.32hrs	60	60	64	46	1.5-2 W	The quarry is not audible. Aeroplanes are taking off occasionally at up to 76dB. Distant traffic noise is at 47-48dB and constant. Birdsong is occasionally up to 48dB.

**Night-time Measurements - Noise Locations – Huntstown, Finglas, Co. Dublin. (26<sup>th</sup> August 2015)**

Location	Sampling Interval	Duration (mins)	L <sub>AEQ</sub> dB	L <sub>A10</sub> dB	L <sub>A90</sub> dB	Wind speed m/s	Sampling notes
N1	21.45-22.00hrs	15	54	54	49	1.5-2 SW	The quarry is not operational or audible. The M50 is constant at 50-51dB. The occasional plane is taking off at up to 68dB. Occasional cars on the adjacent road are up to 70dB.

## 5.0 Interpretation of results

### 5.1 Noise levels;

The noise limits for the Roadstone operation in Huntstown Quarry, Finglas, Co. Dublin are as follows:

Daytime Limit       $L_{Aeq}$  55dB

Night time Limit     $L_{Aeq}$  45dB

#### 5.1.1 Day-time levels :

As can be seen in section 4.1,  $L_{Aeq}$  levels at the noise monitoring locations are over the limit at all the locations.

From on-site observations it can be seen that the main noise sources for the noise levels at N1, N3 and N4 are the M50 or planes from Dublin airport. These are not considered exceedances of the limits by the quarry operations.

N2 was impacted by airplanes but the main noise source was the drilling rig working in the quarry pit. There was direct line of site from the monitoring location to the drilling rig. This was the main reason for the exceedance at this location. This is considered an exceedance of the site limits by the quarry.

#### 5.1.2 Night-time levels :

As can be seen in section 4.1,  $L_{Aeq}$  levels at N1 are over the limit. The exceedance of the noise limit at this location is due to noise sources not related to the quarry. This is not considered an exceedance of the limit by the quarry.

## 6.0 Conclusions

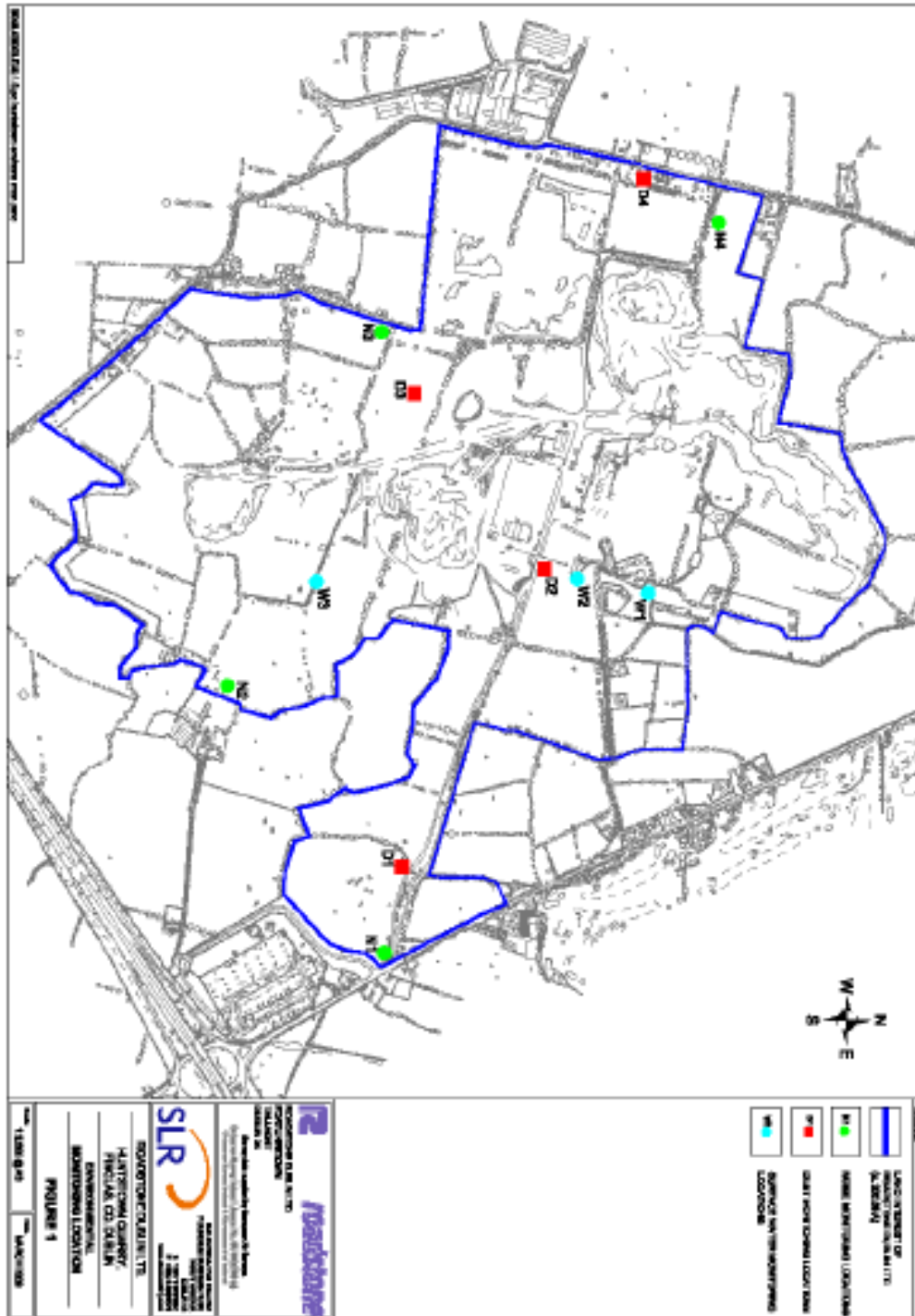
The noise contribution from quarrying activity did not exceed the daytime limit of 55dB at all locations except N2.

The noise contribution from quarrying activity did not exceed the night time limit of 45dB at N1.

There was no evidence of tonal or impulsive qualities to the recorded noise from the quarry at the nominated locations.

Appendix A :Site map showing noise monitoring locations

Site map showing noise monitoring locations  
 Huntstown, Finglas, Co.Dublin.





## Appendix B

### Photographs of Noise Monitoring equipment on-site during monitoring



**Noise monitoring equipment at Monitoring Location N1**



**Noise monitoring equipment at Monitoring Location N2**



**Noise monitoring equipment at Monitoring Location N3**



**Noise monitoring equipment at Monitoring Location N4**

Roadstone Ltd  
Fortunestown,  
Tallaght,  
Dublin 24

A.E.R. W0277-01



**Section 9:  
Dust Monitoring Report**





BHP/CL/02C

**TEST REPORT NO.: 116849.1**

Analyzing  
 Testing  
 Consulting  
 Calibrating



**Client:** Roadstone Wood Ltd  
 Fortunestown  
 Tallaght  
 Dublin 24

**BHP Ref. No.:** 15/03/306  
**Order No.:**  
**Date Received:** 11/03/15  
**Date Completed:** N/A\*\*  
**Test Specification:** Nil  
**Item :** See below

BHP  
 New Road  
 Thomondgate  
 Limerick  
 Ireland  
 Tel +353 61 455300  
 Fax + 353 61 455447  
 E Mail bhpoem2@bhp.ie

**FTAO:** Colin Doyle  
**Site:** Huntstown  
**Sample ref:** Monthly GW1 11/03/15

Test	Units	Results	Limits	Date Analysed	Standard Reference*
Total Petroleum Hydrocarbons	mg/L	N/A**	-	N/A**	GC-FID
Petroleum Range Organics	mg/L	N/A**	-	N/A**	GC-FID
Diesel Range Organics	mg/L	N/A**	-	N/A**	GC-FID

**Additional information :** \*Documented in-house methods based on stated standard references  
 \*\*Location inaccessible

**For and on behalf of BHP laboratories :**

**John O' Halloran**  
**Issue Date:** 20/03/15

This Test Report shall not be duplicated except in full and then only with the permission of the test laboratory

Roadstone Ltd  
Fortunestown,  
Tallaght,  
Dublin 24

A.E.R. W0277-01



Roadstone Ltd  
Fortunestown,  
Tallaght,  
Dublin 24

A.E.R. W0277-01



**Section 10:**  
**Groundwater monitoring report summary**



BHP/CL/02C

**TEST REPORT NO.: 116849.1**

Analysing  
 Testing  
 Consulting  
 Calibrating

**Client:** Roadstone Wood Ltd  
 Fortunestown  
 Tallaght  
 Dublin 24

**BHP Ref. No.:** 15/03/306  
**Order No.:**  
**Date Received:** 11/03/15  
**Date Completed:** N/A\*\*  
**Test Specification:** Nil  
**Item :** See below



BHP  
 New Road  
 Thomondgate  
 Limerick  
 Ireland  
 Tel +353 61 455309  
 Fax + 353 61 455447  
 E Mail bhpoem2@bhp.ie

**FTAO:** Colin Doyle  
**Site:** Huntstown  
**Sample ref:** Monthly GW1 11/03/15

Test	Units	Results	Limits	Date Analysed	Standard Reference <sup>±</sup>
Water Level	m	N/A**	-	N/A**	Measurement
pH	-	N/A**	-	N/A**	APHA - 4500 - H <sup>+</sup> - B
Ammonia (as NH <sub>3</sub> -N)	mg/L	N/A**	-	N/A**	APHA - 4500 - NH <sub>3</sub> - D
Conductivity	µS/cm	N/A**	-	N/A**	APHA - 2510 - B
Nitrate (as N)	mg/L	N/A**	-	N/A**	APHA - 4110 - B
Nitrite (as NO <sub>2</sub> )	mg/L	N/A**	-	N/A**	APHA - 4110 - B
OrthoPhosphate (as P)	mg/L	N/A**	-	N/A**	APHA - 4500 - P - E
Total Coliforms	MPN/100 mL	N/A**	-	N/A**	ISO 9308-2:2012
Temperature	°C	N/A**	-	N/A**	APHA - 2550 - B

**Additional information :** \*Documented in-house methods based on stated standard references  
 \*\*Location inaccessible

**For and on behalf of BHP laboratories :**

**John O' Halloran**  
**Issue Date: 20/03/15**

This Test Report shall not be duplicated except in full and then only with the permission of the test laboratory



BHP/CL/02C

**TEST REPORT NO.: 116849.1**

Analysing  
 Testing  
 Consulting  
 Calibrating

**Client:** Roadstone Wood Ltd  
 Fortunestown  
 Tallaght  
 Dublin 24

**BHP Ref. No.:** 15/03/306  
**Order No.:**  
**Date Received:** 11/03/15  
**Date Completed:** N/A\*\*  
**Test Specification:** Nil  
**Item :** See below



BHP  
 New Road  
 Thomondgate  
 Limerick  
 Ireland  
 Tel +353 61 455309  
 Fax + 353 61 455447  
 E Mail bhpoem2@bhp.ie

**FTAO:** Colin Doyle  
**Site:** Huntstown  
**Sample ref:** Monthly GW1 11/03/15

Test	Units	Results	Limits	Date Analysed	Standard Reference <sup>±</sup>
Total Petroleum Hydrocarbons	mg/L	N/A**	-	N/A**	GC-FID
Petroleum Range Organics	mg/L	N/A**	-	N/A**	GC-FID
Diesel Range Organics	mg/L	N/A**	-	N/A**	GC-FID

**Additional information :** \*Documented in-house methods based on stated standard references  
 \*\*Location inaccessible

**For and on behalf of BHP laboratories :**

**John O' Halloran**  
**Issue Date: 20/03/15**

This Test Report shall not be duplicated except in full and then only with the permission of the test laboratory



BHP/CL/02C

**TEST REPORT NO.: 116849.2**

Analysing  
 Testing  
 Consulting  
 Calibrating



**Client:** Roadstone Wood Ltd  
 Fortunestown  
 Tallaght  
 Dublin 24

**BHP Ref. No.:** 15/03/307  
**Order No.:**  
**Date Received:** 11/03/15  
**Date Completed:** 18/03/15  
**Test Specification:** Nil  
**Item :** See below

BHP  
 New Road  
 Thomondgate  
 Limeick  
 Ireland  
 Tel +353 81 455309  
 Fax + 353 81 455447  
 E Mail bhpcem2@bhp.ie

**FTAO:** Colin Doyle  
**Site:** Huntstown  
**Sample ref:** Monthly GW2 11/03/15

Test	Units	Results	Limits	Date Analysed	Standard Reference <sup>±</sup>
Water Level	m	12.69	-	11/03/2015	Measurement
pH	-	7.80	-	11/03/2015	APHA - 4500 - H' - B
Ammonia (as NH <sub>3</sub> -N)	mg/L	0.21	-	12/03/2015	APHA - 4500 - NH <sub>3</sub> - D
Conductivity	µS/cm	573	-	11/03/2015	APHA - 2510 - B
Nitrate (as N)	mg/L	0.5	-	12/03/2015	APHA - 4110 - B
Nitrite (as NO <sub>2</sub> )	mg/L	<0.01	-	12/03/2015	APHA - 4110 - B
OrthoPhosphate (as P)	mg/L	0.07	-	12/03/2015	APHA - 4500 - P - E
Total Coliforms	MPN/100 mL	16.1	-	11/03/2015	ISO 9308-2:2012
Temperature	°C	9.9	-	11/03/2015	APHA - 2550 - B

**Additional information :** \*Documented in-house methods based on stated standard references

**For and on behalf of BHP laboratories :**

**John O' Halloran**  
**Issue Date:** 20/03/15

This Test Report shall not be duplicated except in full and then only with the permission of the test laboratory



BHP/CL/02C

**TEST REPORT NO.: 116849.2**

Analyzing  
 Testing  
 Consulting  
 Calibrating

Client: Roadstone Wood Ltd  
 Fortunestown  
 Tallaght  
 Dublin 24

BHP Ref. No.: 15/03/307  
 Order No.:  
 Date Received: 11/03/15  
 Date Completed: 18/03/15  
 Test Specification: Nil  
 Item :See below



BHP  
 New Road  
 Thomondgate  
 Umeelick  
 Ireland  
 Tel +353 61 455300  
 Fax + 353 61 455447  
 E Mail bhposm2@bhp.ie

FTAO: Colin Doyle  
 Site: Huntstown  
 Sample ref: Monthly GW2 11/03/15

Test	Units	Results	Limits	Date Analysed	Standard Reference*
Total Petroleum Hydrocarbons	mg/L	<0.01	-	18/03/2015	GC-FID
Petroleum Range Organics	mg/L	<0.05	-	18/03/2015	GC-FID
Diesel Range Organics	mg/L	<0.01	-	18/03/2015	GC-FID

Additional information : \*Documented in-house methods based on stated standard references

For and on behalf of BHP laboratories :

John O' Halloran  
 Issue Date: 20/03/15

This Test Report shall not be duplicated except in full and then only with the permission of the test laboratory



BHP/CL/02C

**TEST REPORT NO.: 116849.3**

Analysing  
 Testing  
 Consulting  
 Calibrating



**Client:** Roadstone Wood Ltd  
 Fortunestown  
 Tallaght  
 Dublin 24

**BHP Ref. No.:** 15/03/308  
**Order No.:**  
**Date Received:** 11/03/15  
**Date Completed:** 18/03/15  
**Test Specification:** Nil  
**Item :** See below

BHP  
 New Road  
 Thomondgate  
 Limerick  
 Ireland  
 Tel +353 61 455309  
 Fax + 353 61 455447  
 E Mail bhpcem2@bhp.ie

**FTAO:** Colin Doyle  
**Site:** Huntstown  
**Sample ref:** Monthly GW3 11/03/15

Test	Units	Results	Limits	Date Analysed	Standard Reference*
Water Level	m	25.56	-	11/03/2015	Measurement
pH	-	7.65	-	11/03/2015	APHA - 4500 - H <sup>+</sup> - B
Ammonia (as NH <sub>3</sub> -N)	mg/L	0.17	-	12/03/2015	APHA - 4500 - NH <sub>3</sub> - D
Conductivity	µS/cm	707	-	11/03/2015	APHA - 2510 - B
Nitrate (as N)	mg/L	1.5	-	12/03/2015	APHA - 4110 - B
Nitrite (as NO <sub>2</sub> )	mg/L	<0.01	-	12/03/2015	APHA - 4110 - B
OrthoPhosphate (as P)	mg/L	0.05	-	12/03/2015	APHA - 4500 - P - E
Total Coliforms	MPN/100 mL	<1	-	11/03/2015	ISO 9308-2:2012
Temperature	°C	9.8	-	11/03/2015	APHA - 2550 - B

**Additional information :** \*Documented in-house methods based on stated standard references

For and on behalf of BHP laboratories :

**John O' Halloran**  
**Issue Date:** 20/03/15

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BHP/CL/02C

**TEST REPORT NO.: 116849.3**

Analysing  
 Testing  
 Consulting  
 Calibrating

**Client:** Roadstone Wood Ltd  
 Fortunestown  
 Tallaght  
 Dublin 24

**BHP Ref. No.:** 15/03/308  
**Order No.:**  
**Date Received:** 11/03/15  
**Date Completed:** 18/03/15  
**Test Specification:** Nil  
**Item :** See below



BHP  
 New Road  
 Thomondgate  
 Limeick  
 Ireland  
 Tel +353 61 455399  
 Fax + 353 61 455447  
 E Mail bhpcem2@bhp.ie

**FTAO:** Colin Doyle  
**Site:** Huntstown  
**Sample ref:** Monthly GW3 11/03/15

Test	Units	Results	Limits	Date Analysed	Standard Reference*
Total Petroleum Hydrocarbons	mg/L	<0.01	-	18/03/2015	GC-FID
Petroleum Range Organics	mg/L	<0.05	-	18/03/2015	GC-FID
Diesel Range Organics	mg/L	<0.01	-	18/03/2015	GC-FID

**Additional information :** \*Documented in-house methods based on stated standard references

**For and on behalf of BHP laboratories :**

**John O' Halloran**  
**Issue Date:** 20/03/15

This Test Report shall not be duplicated except in full and then only with the permission of the test laboratory



BHP/CL/02C

**TEST REPORT NO.: 116849.4**

Analysing  
 Testing  
 Consulting  
 Calibrating

**Client:** Roadstone Wood Ltd  
 Fortunestown  
 Tallaght  
 Dublin 24

**BHP Ref. No.:** 15/03/309  
**Order No.:**  
**Date Received:** 11/03/15  
**Date Completed:** 18/03/15  
**Test Specification:** Nil  
**Item :** See below



BHP  
 New Road  
 Thomondgate  
 Limerick  
 Ireland  
 Tel +353 61 455309  
 Fax + 353 61 455447  
 E Mail bhpcem2@bhp.ie

**FTAO:** Colin Doyle  
**Site:** Huntstown  
**Sample ref:** Monthly GW5 11/03/15

Test	Units	Results	Limits	Date Analysed	Standard Reference <sup>±</sup>
Water Level	m	2.67	-	11/03/2015	Measurement
pH	-	7.73	-	11/03/2015	APHA - 4500 - H' - B
Ammonia (as NH <sub>3</sub> -N)	mg/L	0.1	-	12/03/2015	APHA - 4500 - NH <sub>3</sub> - D
Conductivity	µS/cm	496	-	11/03/2015	APHA - 2510 - B
Nitrate (as N)	mg/L	0.3	-	12/03/2015	APHA - 4110 - B
Nitrite (as NO <sub>2</sub> )	mg/L	<0.01	-	12/03/2015	APHA - 4110 - B
OrthoPhosphate (as P)	mg/L	0.05	-	12/03/2015	APHA - 4500 - P - E
Total Coliforms	MPN/100 mL	<1	-	11/03/2015	ISO 9308-2:2012
Temperature	°C	9.9	-	11/03/2015	APHA - 2550 - B

**Additional information :** \*Documented in-house methods based on stated standard references

**For and on behalf of BHP laboratories :**

**John O' Halloran**  
**Issue Date:** 20/03/15

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BHP/CL/02C

**TEST REPORT NO.: 116849.4**

**Client:** Roadstone Wood Ltd  
 Fortunestown  
 Tallaght  
 Dublin 24

**BHP Ref. No.:** 15/03/309  
**Order No.:**  
**Date Received:** 11/03/15  
**Date Completed:** 18/03/15  
**Test Specification:** Nil  
**Item :** See below

**FTAO:** Colin Doyle  
**Site:** Huntstown  
**Sample ref:** Monthly GW5 11/03/15

Analysing  
 Testing  
 Consulting  
 Calibrating



**BHP**  
 New Road  
 Thomondgate  
 Limerick  
 Ireland  
 Tel +353 61 455300  
 Fax + 353 61 455447  
 E Mail bhpcem2@bhp.ie

Test	Units	Results	Limits	Date Analysed	Standard Reference <sup>±</sup>
Total Petroleum Hydrocarbons	mg/L	<0.01	-	18/03/2015	GC-FID
Petroleum Range Organics	mg/L	<0.05	-	18/03/2015	GC-FID
Diesel Range Organics	mg/L	<0.01	-	18/03/2015	GC-FID

**Additional information :** \*Documented in-house methods based on stated standard references

**For and on behalf of BHP laboratories :**

**John O' Halloran**  
**Issue Date:** 20/03/15

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Roadstone Ltd  
Fortunestown,  
Tallaght,  
Dublin 24

A.E.R. W0277-01



**Section 11:**  
**Surface water results**



BHP/CL/02C

**TEST REPORT NO.: 116214.1**

**Client: Roadstone Wood Ltd  
 Fortunestown  
 Tallaght  
 Dublin 24**

**BHP Ref. No.: 15/01/304  
 Order No.:  
 Date Received: 15/01/15  
 Date Completed: 26/01/15  
 Test Specification: NII  
 Item : See below**

**FTAO: Colin Doyle  
 Site: Huntstown  
 Sample ref: Monthly SW Stream 15/01/15**

Analyzing  
 Testing  
 Consulting  
 Calibrating



BHP  
 New Road  
 Thomondgate  
 Limerick  
 Ireland  
 Tel: +353 61 455300  
 Fax: +353 61 455447  
 E-Mail: bhpwm2@bhp.ie

Test	Units	Results	Limits	Date Analysed	Standard Reference*
C.O.D.	mg/L	12	-	16/01/2015	APHA - 5220 - D
pH	-	8.07	-	15/01/2015	APHA - 4500 - H <sup>+</sup> - B
Ammonia (as NH <sub>3</sub> -N)	mg/L	0.07	-	19/01/2015	APHA - 4500 - NH <sub>3</sub> - D
Ammonium (as NH <sub>4</sub> - N)	mg/L	0.07	-	19/01/2015	APHA - 4500 - NH <sub>3</sub> - D
Sulphate (as SO <sub>4</sub> )	mg/L	239.6	-	22/01/2015	APHA - 4110 - B
Phosphate (as PO <sub>4</sub> - P)	mg/L	<0.1	-	16/01/2015	APHA - 4110 - B
Total Suspended Solids	mg/L	5.3	-	16/01/2015	APHA - 2540 - B
B.O.D.	mg/L	1.9	-	16/01/2015	APHA - 5210 - B
Temperature	°C	4.5	-	15/01/2015	APHA - 2550 - B
Dissolved Oxygen	%	75.0	-	15/01/2015	APHA - 4500 - O - G
Detergents (as MBAS)	mg/L	0.6858	-	21/01/2015	APHA - 5540 - C
Mineral Oils (as Diesel)	mg/L	<0.1	-	26/01/2015	GC-FID

**Additional Information :** \*Documented in-house methods based on stated standard references

**For and on behalf of BHP laboratories :**

**John O' Halloran  
 Issue Date: 09/02/15**

This Test Report shall not be duplicated except in full and then only with the permission of the test laboratory



BHP/CL/02C

**TEST REPORT NO.: 116214.2**

Analytical  
 Testing  
 Consulting  
 Calibrating



**Client:** Roadstone Wood Ltd  
 Fortunestown  
 Tallaght  
 Dublin 24

**BHP Ref. No.:** 15/01/305  
**Order No.:**  
**Date Received:** 15/01/15  
**Date Completed:** 26/01/15  
**Test Specification:** Nil  
**Item :** See below

BHP  
 New Road  
 Thomondgate  
 Limerick  
 Ireland  
 Tel: +353 61 455300  
 Fax: +353 61 455447  
 E-Mail: bhpwm2@bhp.ie

**FTAO:** Colin Doyle  
**Site:** Huntstown  
**Sample ref:** Monthly SW North Sump 11/12/14

Test	Units	Results	Limits	Date Analysed	Standard Reference*
C.O.D.	mg/L	16	30	16/01/2015	APHA - 5220 - D
pH	-	7.98	6 - 9	15/01/2015	APHA - 4500 - H <sup>+</sup> - B
Ammonia (as NH <sub>3</sub> -N)	mg/L	0.11	1	19/01/2015	APHA - 4500 - NH <sub>3</sub> - D
Ammonium (as NH <sub>4</sub> - N)	mg/L	0.11	1	19/01/2015	APHA - 4500 - NH <sub>3</sub> - D
Sulphate (as SO <sub>4</sub> )	mg/L	238.2	300	22/01/2015	APHA - 4110 - B
Phosphate (as PO <sub>4</sub> - P)	mg/L	<0.1	0.1	16/01/2015	APHA - 4110 - B
Total Suspended Solids	mg/L	5.0	20	16/01/2015	APHA - 2540 - B
B.O.D.	mg/L	1.0	5	16/01/2015	APHA - 5210 - B
Temperature	°C	5.0	25	15/01/2015	APHA - 2550 - B
Dissolved Oxygen	%	79	-	15/01/2015	APHA - 4500 - O - G
Detergents (as MBAS)	mg/L	1.3983	10	21/01/2015	APHA - 5540 - C
Mineral Oils (as Diesel)	mg/L	<0.1	10	26/01/2015	GC-FID

**Additional Information :** \*Documented in-house methods based on stated standard references

**For and on behalf of BHP laboratories :**

**John O' Halloran**  
**Issue Date:** 09/02/15

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BHP/CL/02C

**TEST REPORT NO.: 116214.3**

Analyzing  
 Testing  
 Consulting  
 Calibrating



**Client:** Roadstone Wood Ltd  
 Fortunestown  
 Tallaght  
 Dublin 24

**BHP Ref. No.:** 15/01/306  
**Order No.:**  
**Date Received:** 15/01/15  
**Date Completed:** 26/01/15  
**Test Specification:** Nil  
**Item :** See below

**BHP**  
 New Road  
 Thomondgate  
 Limerick  
 Ireland  
 Tel: +353 61 455300  
 Fax: +353 61 455447  
 E-Mail: bhpwm2@bhp.ie

**FTAO:** Colin Doyle  
**Site:** Huntstown  
**Sample ref:** Monthly SW South Sump 11/12/14

Test	Units	Results	Limits	Date Analysed	Standard Reference*
C.O.D.	mg/L	9.5	30	16/01/2015	APHA - 5220 - D
pH	-	8.07	6 - 9	15/01/2015	APHA - 4500 - H <sup>+</sup> - B
Ammonia (as NH <sub>3</sub> -N)	mg/L	0.13	1	19/01/2015	APHA - 4500 - NH <sub>3</sub> - D
Ammonium (as NH <sub>4</sub> - N)	mg/L	0.13	1	19/01/2015	APHA - 4500 - NH <sub>3</sub> - D
Sulphate (as SO <sub>4</sub> )	mg/L	179.6	300	22/01/2015	APHA - 4110 - B
Phosphate (as PO <sub>4</sub> - P)	mg/L	<0.1	0.1	16/01/2015	APHA - 4110 - B
Total Suspended Solids	mg/L	17.3	20	16/01/2015	APHA - 2540 - B
B.O.D.	mg/L	1.3	3	16/01/2015	APHA - 5210 - B
Temperature	°C	5.5	25	15/01/2015	APHA - 2550 - B
Dissolved Oxygen	%	77	-	15/01/2015	APHA - 4500 - O - G
Detergents (as MBAS)	mg/L	4.6745	10	21/01/2015	APHA - 5540 - C
Mineral Oils (as Diesel)	mg/L	<0.1	10	26/01/2015	GC-FID

**Additional information :** \*Documented in-house methods based on stated standard references

**For and on behalf of BHP laboratories :**

**John O' Halloran**  
**Issue Date:** 09/02/15

This Test Report shall not be duplicated except in full and then only with the permission of the test laboratory



BHP/CL/02C

**TEST REPORT NO.: 116678.1**

Analyzing  
 Testing  
 Consulting  
 Calibrating



**Client:** Roadstone Wood Ltd  
 Fortunestown  
 Tallaght  
 Dublin 24

**BHP Ref. No.:** 15/02/734  
**Order No.:**  
**Date Received:** 26/02/15  
**Date Completed:** 13/03/15  
**Test Specification:** NII  
**Item :** See below

BHP  
 New Road  
 Thomondgate  
 Limerick  
 Ireland  
 Tel +353 61 455300  
 Fax +353 61 455447  
 E Mail bhpcorn2@bhp.ie

**FTAO:** Colin Doyle  
**Site:** Huntstown  
**Sample ref:** Monthly SW North Sump 26/02/15

Test	Units	Results	Limits	Date Analysed	Standard Reference*
C.O.D.	mg/L	7.0	30	27/02/2015	APHA - 5220 - D
pH	-	7.96	6 - 9	26/02/2015	APHA - 4500 - H <sup>+</sup> - B
Ammonia (as NH <sub>3</sub> -N)	mg/L	0.07	1	02/03/2015	APHA - 4500 - NH <sub>3</sub> - D
Ammonium (as NH <sub>4</sub> - N)	mg/L	0.07	1	02/03/2015	APHA - 4500 - NH <sub>3</sub> - D
Sulphate (as SO <sub>4</sub> )	mg/L	226.9	300	13/03/2015	APHA - 4110 - B
Phosphate (as PO <sub>4</sub> - P)	mg/L	<0.1	0.1	26/02/2015	APHA - 4110 - B
Total Suspended Solids	mg/L	<1	20	02/03/2015	APHA - 2540 - B
B.O.D.	mg/L	2.5	5	27/02/2015	APHA - 5210 - B
Temperature	°C	7.9	25	26/02/2015	APHA - 2550 - B
Dissolved Oxygen	%	44	-	26/02/2015	APHA - 4500 - O - G
Detergents (as MBAS)	mg/L	0.0443	10	27/02/2015	APHA - 5540 - C
Mineral Oils (as Diesel)	mg/L	<0.1	10	03/03/2015	GC-FID

**Additional Information :** \*Documented in-house methods based on stated standard references

**For and on behalf of BHP laboratories :**

*John O'Halloran*

**John O' Halloran**  
**Issue Date: 18/03/15**

This Test Report shall not be duplicated except in full and then only with the permission of the test laboratory





BHP/CL/02C

**TEST REPORT NO.: 116678.2**

Analyzing  
 Testing  
 Consulting  
 Calibrating



**Client:** Roadstone Wood Ltd  
 Fortunestown  
 Tallaght  
 Dublin 24

**BHP Ref. No.:** 15/02/735  
**Order No.:**  
**Date Received:** 26/02/15  
**Date Completed:** 13/03/15  
**Test Specification:** Nil  
**Item :** See below

BHP  
 New Road  
 Thomondgate  
 Limerick  
 Ireland  
 Tel +353 81 488300  
 Fax + 353 81 488447  
 E Mail bhpcem2@bhp.ie

**FTAO:** Colin Doyle  
**Site:** Huntstown  
**Sample ref:** Monthly SW South Sump 26/02/15

Test	Units	Results	Limits	Date Analysed	Standard Reference*
C.O.D.	mg/L	4.0	30	27/02/2015	APHA - 5220 - D
pH	-	7.99	6 - 9	26/02/2015	APHA - 4500 - H <sup>+</sup> - B
Ammonia (as NH <sub>3</sub> -N)	mg/L	0.07	1	02/03/2015	APHA - 4500 - NH <sub>3</sub> - D
Ammonium (as NH <sub>4</sub> - N)	mg/L	0.07	1	02/03/2015	APHA - 4500 - NH <sub>3</sub> - D
Sulphate (as SO <sub>4</sub> )	mg/L	156.2	300	13/03/2015	APHA - 4110 - B
Phosphate (as PO <sub>4</sub> - P)	mg/L	<0.1	0.1	26/02/2015	APHA - 4110 - B
Total Suspended Solids	mg/L	39	20	02/03/2015	APHA - 2540 - B
B.O.D.	mg/L	1.2	5	27/02/2015	APHA - 5210 - B
Temperature	°C	8.8	25	26/02/2015	APHA - 2550 - B
Dissolved Oxygen	%	42	-	26/02/2015	APHA - 4500 - O - G
Detergents (as MBAS)	mg/L	<0.001	10	27/02/2015	APHA - 5540 - C
Mineral Oils (as Diesel)	mg/L	0.364	10	03/03/2015	GC-FID

**Additional Information :** \*Documented in-house methods based on stated standard references

**For and on behalf of BHP laboratories :**

**John O' Halloran**  
**Issue Date:** 18/03/15

This Test Report shall not be duplicated except in full and then only with the permission of the test laboratory



BHP/CL/02C

**TEST REPORT NO.: 116678.3**

Analyzing  
 Testing  
 Consulting  
 Calibrating



**Client: Roadstone Wood Ltd  
 Fortunestown  
 Tallaght  
 Dublin 24**

**BHP Ref. No.: 15/02/736  
 Order No.:  
 Date Received: 26/02/15  
 Date Completed: 13/03/15  
 Test Specification: Nil  
 Item : See below**

BHP  
 New Road  
 Thomondgate  
 Limerick  
 Ireland  
 Tel +353 61 455300  
 Fax +353 61 455447  
 E-Mail bhpwm2@bhp.ie

**FTAO: Colin Doyle  
 Site: Huntstown  
 Sample ref: Monthly SW Stream 26/02/15**

Test	Units	Results	Limits	Date Analysed	Standard Reference*
C.O.D.	mg/L	14	30	27/02/2015	APHA - 5220 - D
pH	-	8.10	6 - 9	26/02/2015	APHA - 4500 - H <sup>+</sup> - B
Ammonia (as NH <sub>3</sub> -N)	mg/L	0.08	1	02/03/2015	APHA - 4500 - NH <sub>3</sub> - D
Ammonium (as NH <sub>4</sub> - N)	mg/L	0.08	1	02/03/2015	APHA - 4500 - NH <sub>3</sub> - D
Sulphate (as SO <sub>4</sub> )	mg/L	226.8	300	13/03/2015	APHA - 4110 - B
Phosphate (as PO <sub>4</sub> - P)	mg/L	1.6	0.1	26/02/2015	APHA - 4110 - B
Total Suspended Solids	mg/L	10.6	20	02/03/2015	APHA - 2540 - B
B.O.D.	mg/L	1.8	5	27/02/2015	APHA - 5210 - B
Temperature	°C	6.8	25	26/02/2015	APHA - 2550 - B
Dissolved Oxygen	%	45	-	26/02/2015	APHA - 4500 - O - G
Detergents (as MBAS)	mg/L	<0.001	10	27/02/2015	APHA - 5540 - C
Mineral Oils (as Diesel)	mg/L	0.23	10	03/03/2015	GC-FID

**Additional Information :** \*Documented in-house methods based on stated standard references

**For and on behalf of BHP laboratories :**

**John O' Halloran  
 Issue Date: 18/03/15**

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BHP/CL/02C

**TEST REPORT NO.: 116850.1**

Analysing  
 Testing  
 Consulting  
 Calibrating



**Client:** Roadstone Wood Ltd  
 Fortunestown  
 Tallaght  
 Dublin 24

**BHP Ref. No.:** 15/03/310  
**Order No.:**  
**Date Received:** 11/03/15  
**Date Completed:** 18/03/15  
**Test Specification:** Nil  
**Item :** See below

BHP  
 New Road  
 Thomondgate  
 Limerick  
 Ireland  
 Tel +353 61 455300  
 Fax +353 61 455447  
 E Mail bhpcom2@bhp.ie

**FTAO:** Colin Doyle  
**Site:** Huntstown  
**Sample ref:** Monthly SW North Sump 11/03/15

Test	Units	Results	Limits	Date Analysed	Standard Reference*
C.O.D.	mg/L	9.0	30	12/03/2015	APHA - 5220 - D
pH	-	8.12	6 - 9	11/03/2015	APHA - 4500 - H <sup>+</sup> - B
Ammonia (as NH <sub>3</sub> -N)	mg/L	0.04	1	12/03/2015	APHA - 4500 - NH <sub>3</sub> - D
Ammonium (as NH <sub>4</sub> - N)	mg/L	0.04	1	12/03/2015	APHA - 4500 - NH <sub>3</sub> - D
Sulphate (as SO <sub>4</sub> )	mg/L	228.4	300	13/03/2015	APHA - 4110 - B
Phosphate (as PO <sub>4</sub> - P)	mg/L	<0.1	0.1	12/03/2015	APHA - 4110 - B
Total Suspended Solids	mg/L	6.0	20	12/03/2015	APHA - 2540 - B
B.O.D.	mg/L	1.1	5	12/03/2015	APHA - 5210 - B
Temperature	°C	8.9	25	11/03/2015	APHA - 2550 - B
Dissolved Oxygen	%	41	-	11/03/2015	APHA - 4500 - O - G
Detergents (as MBAS)	mg/L	0.099	10	12/03/2015	APHA - 5540 - C
Mineral Oils (as Diesel)	mg/L	<0.1	10	18/03/2015	GC-FID

**Additional Information :** \*Documented in-house methods based on stated standard references

For and on behalf of BHP laboratories :

**John O' Halloran**  
**Issue Date:** 20/03/15

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BHP/CL/02C

**TEST REPORT NO.: 116850.2**

Analyzing  
 Testing  
 Consulting  
 Calibrating



**Client:** Roadstone Wood Ltd  
 Fortunestown  
 Tallaght  
 Dublin 24

**BHP Ref. No.:** 15/03/311  
**Order No.:**  
**Date Received:** 11/03/15  
**Date Completed:** 18/03/15  
**Test Specification:** Nil  
**Item :** See below

BHP  
 New Road  
 Thomondgate  
 Limerick  
 Ireland  
 Tel +353 61 455300  
 Fax +353 61 455447  
 E Mail bhpown@bhp.ie

**FTAO:** Colin Doyle  
**Site:** Huntstown  
**Sample ref:** Monthly SW South Sump 11/03/15

Test	Units	Results	Limits	Date Analysed	Standard Reference*
C.O.D.	mg/L	78	30	12/03/2015	APHA - 5220 - D
pH	-	8.03	6 - 9	11/03/2015	APHA - 4500 - H <sup>+</sup> - B
Ammonia (as NH <sub>3</sub> -N)	mg/L	0.06	1	12/03/2015	APHA - 4500 - NH <sub>3</sub> - D
Ammonium (as NH <sub>4</sub> - N)	mg/L	0.06	1	12/03/2015	APHA - 4500 - NH <sub>3</sub> - D
Sulphate (as SO <sub>4</sub> )	mg/L	143.4	300	13/03/2015	APHA - 4110 - B
Phosphate (as PO <sub>4</sub> - P)	mg/L	<0.1	0.1	12/03/2015	APHA - 4110 - B
Total Suspended Solids	mg/L	29	20	12/03/2015	APHA - 2540 - B
B.O.D.	mg/L	1.0	5	12/03/2015	APHA - 5210 - B
Temperature	°C	9.7	25	11/03/2015	APHA - 2550 - B
Dissolved Oxygen	%	39	-	11/03/2015	APHA - 4500 - O - G
Detergents (as MBAS)	mg/L	0.012	10	12/03/2015	APHA - 5540 - C
Mineral Oils (as Diesel)	mg/L	<0.1	10	18/03/2015	GC-FID

**Additional Information :** \*Documented in-house methods based on stated standard references

**For and on behalf of BHP laboratories :**

**John O' Halloran**  
**Issue Date:** 20/03/15

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BHP/CL/02C

**TEST REPORT NO.: 116850.3**

Analyzing  
 Testing  
 Consulting  
 Calibrating

**Client:** Roadstone Wood Ltd  
 Fortunestown  
 Tallaght  
 Dublin 24

**BHP Ref. No.:** 15/03/312  
**Order No.:**  
**Date Received:** 11/03/15  
**Date Completed:** 18/03/15  
**Test Specification:** Nil  
**Item :** See below



BHP  
 New Road  
 Thomondgate  
 Limerick  
 Ireland  
 Tel: +353 61 455300  
 Fax: +353 61 455447  
 E Mail: bhpcem@bhp.ie

**FTAO:** Colin Doyle  
**Site:** Huntstown  
**Sample ref:** Monthly SW Stream 11/03/15

Test	Units	Results	Limits	Date Analysed	Standard Reference*
C.O.D.	mg/L	12	30	12/03/2015	APHA - 5220 - D
pH	-	8.07	6 - 9	11/03/2015	APHA - 4500 - H <sup>+</sup> - B
Ammonia (as NH <sub>3</sub> -N)	mg/L	0.08	1	12/03/2015	APHA - 4500 - NH <sub>3</sub> - D
Ammonium (as NH <sub>4</sub> - N)	mg/L	0.08	1	12/03/2015	APHA - 4500 - NH <sub>3</sub> - D
Sulphate (as SO <sub>4</sub> )	mg/L	228.5	300	13/03/2015	APHA - 4110 - B
Phosphate (as PO <sub>4</sub> - P)	mg/L	<0.1	0.1	12/03/2015	APHA - 4110 - B
Total Suspended Solids	mg/L	5.7	20	12/03/2015	APHA - 2540 - B
B.O.D.	mg/L	1.5	5	12/03/2015	APHA - 5210 - B
Temperature	°C	8.1	25	11/03/2015	APHA - 2550 - B
Dissolved Oxygen	%	39	-	11/03/2015	APHA - 4500 - O - G
Detergents (as MBAS)	mg/L	0.022	10	12/03/2015	APHA - 5540 - C
Mineral Oils (as Diesel)	mg/L	<0.1	10	18/03/2015	GC-FID

**Additional Information :** \*Documented in-house methods based on stated standard references

**For and on behalf of BHP laboratories :**

**John O' Halloran**  
**Issue Date:** 20/03/15

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**April 2015**

**ANALYSIS OF AQUEOUS SAMPLES.**

Date Sampled:10/04/2015  
 Date Rec'd :13/04/2015  
 Date Analysis  
 Commenced:13/04/2015  
 Our Ref. :WS-38516 & 15-32263  
 Certificate No. L/15/0705

Determinand	Sample ID	Upstream North	Downstream North	MAC Values
	Lab ID	121016	121017	
Ammonia as NH4	n/a	0.56	<0.10	5 6.0-9.0 20 25 0.010
BOD	n/a	<2	<2	
pH	**	7.7	7.8	
Suspended Solids	n/a	4	1	
Temperature °C	on-site	14	13	
Mineral Oil #	++	<0.010	<0.010	

**ANALYSIS OF AQUEOUS SAMPLES.**

Date Sampled:10/04/2015  
 Date Rec'd :13/04/2015  
 Date Analysis Commenced:13/04/2015  
 Our Ref. :WS-38516 & 15-32263  
 Certificate No. L/15/0705

Determinand	Sample ID	V Notch North	MAC Values
	Lab ID	121018	
Ammonia as NH4	n/a	<0.10	5 6.0-9.0 15 25
BOD	n/a	<2	
pH	**	7.8	
Suspended Solids	n/a	1	
Temperature °C	on-site	13	



**ANALYSIS OF AQUEOUS SAMPLES.**

Date Sampled:21/05/2015  
 Date Rec'd :21/05/2015  
 Date Analysis Commenced:21/05/2015  
 Our Ref. :WS-38812, 15-35911 & 15-35911-1  
 Certificate No. L/15/1022

Determinand	Sample ID	Upstream North	Downstream North	MAC Values
	Lab ID	121919	121920	
Ammonia as NH <sub>4</sub>	n/a	<0.10	<0.10	0.5
BOD	n/a	<2	<2	5
pH	**	8.2	8.1	6.0-9.0
Suspended Solids	n/a	9	14	20
Temperature °C	on-site	15	15	25
Mineral Oil #	++	0.027	0.038	10

**ANALYSIS OF AQUEOUS SAMPLES.**

Date Sampled:21/05/2015  
 Date Rec'd :21/05/2015  
 Date Analysis Commenced:21/05/2015  
 Our Ref. :WS-38812, 15-35911 & 15-35911-1  
 Certificate No. L/15/1022

Determinand	Sample ID	V Notch South	MAC Values
	Lab ID	121921	
Ammonia as NH <sub>4</sub>	n/a	<0.10	1
Ammoniacal Nitrogen	n/a	<0.08	1
BOD	n/a	<2	3
COD	n/a	<4	30
Detergents as MBAS	n/a	0.14	10
pH	**	8.0	6.0-9.0
Phosphate as P (low level)	n/a	0.02	0.1
Sulphate	**	151	300
Suspended Solids	n/a	3	20
Temperature °C	on-site	14	25
Mineral Oil #	++	0.024	10



**ANALYSIS OF AQUEOUS SAMPLES.**

Date Sampled:24/06/2015  
 Date Rec'd :24/06/2015  
 Date Analysis Commenced:24/06/2015  
 Our Ref. :WS-39001 & 15-39014  
 Certificate No. L/15/1169A

Determinand	Sample ID	Upstream North	Downstream North	MAC Values
	Lab ID	122520	122521	
Ammonia as NH4	n/a	<0.10	<0.10	0.5
BOD	n/a	5	<2	5
pH	**	8.0	8.0	6.0-9.0
Suspended Solids	n/a	63	8	20
Temperature °C	on-site	18	18	25
Mineral Oil #	++	<0.01	<0.01	10

**ANALYSIS OF AQUEOUS SAMPLES.**

Date Sampled:24/06/2015  
 Date Rec'd :24/06/2015  
 Date Analysis Commenced:24/06/2015  
 Our Ref. :WS-39001 & 15-39014  
 Certificate No. L/15/1169A

Determinand	Sample ID	V Notch South	MAC Values
	Lab ID	122522	
Ammonia as NH4	n/a	<0.10	1
Ammoniacal Nitrogen	n/a	<0.08	1
BOD	n/a	<2	3
COD	n/a	2	30
Detergents as MBAS	n/a	0.11	10
pH	**	8.0	6.0-9.0
Phosphate as P (low level)	n/a	<0.03	0.1
Sulphate	**	125	300
Suspended Solids	n/a	7	20
Temperature °C	on-site	18	25
Mineral Oil #	++	<0.01	10





**ANALYSIS OF AQUEOUS SAMPLES.**

Date Sampled:20/07/2015  
 Date Rec'd :20/07/2015  
 Date Analysis Commenced:20/07/2015  
 Our Ref. :WS-39148 & 15-40850  
 Certificate No. L/15/1373

Determinand	Sample ID	Surface - Water South	MAC
	Lab ID	South 123022	Values
Ammonia as NH4	n/a	<0.10	1
Ammoniacal Nitrogen	n/a	<0.08	1
BOD	n/a	<2	3
COD	n/a	6	30
Detergents as MBAS	n/a	0.07	10
pH	**	8.0	6.0-9.0
Phosphate as P (low level)	n/a	<0.01	0.1
Sulphate	**	145	300
Suspended Solids	n/a	1	20
Temperature °C	on-site	17	25
Mineral Oil #	++	<0.01	10



**ANALYSIS OF AQUEOUS SAMPLES.**

Date Sampled:26/08/2015  
 Date Rec'd :27/08/2015  
 Date Analysis Commenced:27/08/2015  
 Our Ref. :WS-39368 & 15-43972  
 Certificate No. L/15/1565

Determinand	Sample ID	Upstream North	Downstream North	MAC Values
	Lab ID	123677	123678	
Ammonia as NH4	n/a	<0.10	<0.10	0.5
BOD	n/a	<2	<2	5
pH	**	8.1	8.0	6.0-9.0
Suspended Solids	n/a	11	11	20
Temperature °C	on-site	17	17	25
Mineral Oil #	++	<0.010	<0.010	10

**ANALYSIS OF AQUEOUS SAMPLES.**

Date Sampled:26/08/2015  
 Date Rec'd :27/08/2015  
 Date Analysis Commenced:27/08/2015  
 Our Ref. :WS-39368 & 15-43972  
 Certificate No. L/15/1565

Determinand	Sample ID	V Notch South	MAC Values
	Lab ID	123679	
Ammonia as NH4	n/a	<0.10	1
Ammoniacal Nitrogen	n/a	<0.08	1
BOD	n/a	<2	3
COD	n/a	<4	30
Detergents as MBAS	n/a	<0.05	10
pH	**	8.0	6.0-9.0
Phosphate as P (low level)	n/a	<0.01	0.1
Sulphate	**	239	300
Suspended Solids	n/a	2	20
Temperature °C	on-site	15	25
Mineral Oil #	++	<0.010	10

**ANALYSIS OF AQUEOUS SAMPLES.**

Date Sampled:29/09/2015

Date Rec'd :30/09/2015

Date Analysis Commenced:  
 30/09/2015

Our Ref. :WS-39573 & 15-46651

Certificate No. L/15/1784

Determinand	Sample ID Lab ID	Upstream North 124478	Downstream North 124479	MAC Values
Ammonia as NH <sub>4</sub>	n/a	0.17	<0.10	0.5
BOD	n/a	3	2	5
pH	**	7.9	8.0	6.0-9.0
Suspended Solids	n/a	<1	4	20
Temperature °C	on-site	18	16	25
Mineral Oil #	++	<0.010	<0.010	10

**ANALYSIS OF AQUEOUS SAMPLES.**

Date Sampled:29/09/2015

Date Rec'd :30/09/2015

Date Analysis Commenced: 30/09/2015

Our Ref. :WS-39573 & 15-46651

Certificate No. L/15/1784

Determinand	Sample ID Lab ID	V Notch South 124480	MAC Values
Ammonia as NH <sub>4</sub>	n/a	<0.10	1
Ammoniacal Nitrogen	n/a	<0.08	1
BOD	n/a	2	3
COD	n/a	<4	30
Detergents as MBAS	n/a	<0.05	10
pH	**	7.9	6.0-9.0
Phosphate as P (low level)	n/a	<0.01	0.1
Sulphate	**	154	300
Suspended Solids	n/a	<1	20
Temperature °C	on-site	15	25
Mineral Oil #	++	<0.010	10

**ANALYSIS OF AQUEOUS SAMPLES.**

Date Sampled: 18/11/2015  
 Date Rec'd : 18/11/2015  
 Date Analysis Commenced:  
 18/11/2015  
 Our Ref. : WS-39907 & 15-51097  
 Certificate No. L/15/2093

Determinand	Sample ID	Upstream North	Downstream North	MAC Values
	Lab ID	125544	125545	
Ammonia as NH <sub>4</sub>	n/a	<0.10	<0.10	0.5
BOD	n/a	3	<2	5
pH	**	8.1	8.1	6.0-9.0
Suspended Solids	n/a	<b>79</b>	11	20
Temperature °C	on-site	11	11	25
Mineral Oil #	++	0.030	0.011	10

**ANALYSIS OF AQUEOUS SAMPLES.**

Date  
 Sampled: 18/11/2015  
 Date Rec'd  
 : 18/11/2015  
 Date Analysis Commenced: 18/11/2015  
 Our Ref. : WS-39907 & 15-51097  
 Certificate No. L/15/2093

Determinand	Sample ID	V Notch South	MAC Values
	Lab ID	125546	
Ammonia as NH <sub>4</sub>	n/a	<0.10	1
Ammoniacal Nitrogen	n/a	<0.08	1
BOD	n/a	<2	3
COD	n/a	4	30
Detergents as MBAS	n/a	<0.05	10
pH	**	7.9	6.0-9.0
Phosphate as P (low level)	n/a	<0.01	0.1
Sulphate	**	209	300
Suspended Solids	n/a	<b>26</b>	20
Temperature °C	on-site	not recorded	25
Mineral Oil #	++	0.016	10

Roadstone Ltd  
Fortunestown,  
Tallaght,  
Dublin 24

A.E.R. W0277-01



**Section 12:**  
**Tank and pipeline inspection report**



Environmental  
Efficiency

Bray (Co. Wicklow) 01 276 1428  
Lisburn (Co. Antrim) 028 9262 6733  
Birmingham (U.K.) 0121 673 1804

## Bund Integrity Assessment

Roadstone Ltd.

Site/Quarry: Huntstown

Document Number 1690-01 v1.00

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Email: [energy@enviro-consult.com](mailto:energy@enviro-consult.com) [www.enviro-consult.com](http://www.enviro-consult.com)

Registered Office: Parnell House, 19 Quinsboro Road, Bray, Co. Wicklow A98 XV04. Registered Number 243 412

Directors: Robert B. Sutcliffe, Ronan T. Sutcliffe

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- ▶ Air, Noise & Water Monitoring
- ▶ Bund Testing
- ▶ Environmental Management Systems to ISO 14001
- ▶ Air & Noise Modelling
- ▶ Energy & Water use reduction
- ▶ IPC/IED/Waste Licence Compliance
- ▶ EIS & Planning
- ▶ Occupational Dust & Noise

Affiliations & Accreditations

- ▶ ISO9001:2008 Registration No. 2015/2170
- ▶ ISO14001:2004 Registration No. 2012/1427
- ▶ MCERTS Certified personnel for stack testing
- ▶ Member of Royal Society for Prevention of Accidents
- ▶ EMPI Membership





Roadstone Ltd.

Bund Integrity Assessment

QF 1. v2 Document Lead Sheet

Document Title	Bund Integrity Assessment
Project No.	1690
Document No.	1690-01
Client	Roadstone Wood Ltd
Site	Huntstown

Issue	Status	Date	Author	Signed for and on behalf of	
				Environmental Efficiency	Client
1.00	Approved	6 Oct 2015	RBS		

SR02 v1.11

EEC Document Author: Bob Sutcliffe, CEng, MIEI

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History

Issue 1.00 Issued



### 1. Summary

Bund ref.	Bund integrity Result	Bund adequate size	Bund suitable construct'n	Bund protected from rain	Refuelling area has interceptor	Essential Action Required	Good practice recommendations
Green Gas Oil	Pass visual	Yes	Yes	No	Yes	None	Roof bund or mark maximum level rain water
Red Diesel	Pass visual	Yes	Yes	No	Yes	None	Roof bund or mark maximum level rain water



## 2. Bund inspection results

### 2.1 Green gas oil tank bund

**Table 2-1 Bund integrity assessment**

Aspect	Value/Finding	Comment
Date of Assessment	9-Oct 15	
Bund type	Local	
Bund construction	Steel	
Capacity	Sufficient	
Defects	None	
Assessment result	Pass	

**Table 2-2 Good practice**

Aspect	Value/Finding	Comment
Bund protected from rain?	No (Fail)	Best practice is to protect from rain.
Maximum quantity of rainwater marked?	No (Fail)	Best practice is to mark maximum allowable level of rain water.
Is rainwater discharged by gravity?	Yes (Fail)	Outlet plug observed.  Best practice is not for gravity discharge.
Is rainwater discharge point securely locked?	No (Fail)	Best practice is to securely lock access to discharge point.
Are tank filling points within bund?	Yes (Pass)	Best practice is for tank filling points to be within the bund.
Do pipes pass through bund wall?	N/A as bund of steel construction	Only applicable for masonry bunds
Is bund protected from vehicle strikes?	N/A as bund of steel construction	Only applicable for block and plastic bunds.

**Table 2-3 Interceptor**

Aspect	Value/Finding	Comment
Associated refuelling area?	Yes	
Impermeable ground?	Yes	
Interceptor?	Yes	
Defects	None	

Essential action

- None

Good practice

- Roof bund or mark maximum level rain water



**Figure 1 Bund identification**

**2.2 Red diesel tank bund**

**Table 2-4 Bund integrity assessment**

Aspect	Value/Finding	Comment
Date of Assessment	9-Oct 15	
Bund type	Local	
Bund construction	Steel	
Capacity	Sufficient	
Defects	None	
Assessment result	Pass	

**Table 2-5 Good practice**

Aspect	Value/Finding	Comment
Bund protected from rain?	No (Fail)	Best practice is to protect from rain.
Maximum quantity of rainwater marked?	No (Fail)	Best practice is to mark maximum allowable level of rain water.
Is rainwater discharged by gravity?	Yes (Fail)	Outlet plug observed.  Best practice is not for gravity discharge.
Is rainwater discharge point securely locked?	No (Fail)	Best practice is to securely lock access to discharge point.
Are tank filling points within bund?	Yes (Pass)	Best practice is for tank filling points to be within the bund.
Do pipes pass through bund wall?	N/A as bund of steel construction	Only applicable for masonry bunds
Is bund protected from vehicle strikes?	N/A as bund of steel construction	Only applicable for block and plastic bunds.

**Table 2-6 Interceptor**

Aspect	Value/Finding	Comment
Associated refuelling area?	Yes	
Impermeable ground?	Yes	
Interceptor?	Yes	
Defects	None	

Essential action

- None

Good practice

- Roof bund or mark maximum level rain water



**Figure 2 Bund identification**

Roadstone Ltd  
Fortunestown,  
Tallaght,  
Dublin 24

A.E.R. W0277-01



## **Section 13:**

### **Bird survey report:**

Roadstone Ltd  
Fortunestown,  
Tallaght,  
Dublin 24

A.E.R. W0277-01



Roadstone Ltd  
Fortunestown,  
Tallaght,  
Dublin 24

A.E.R. W0277-01



**Huntstown Quarry  
Inert Waste Recovery Facility  
Finglas, Dublin 11**

**Breeding Bird Survey 2015**



**SLR Ref: 501.00180.00111**

**June 2015**

**Version No: 1**



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## 1.0 INTRODUCTION

### 1.1 Background

This report presents the results of the 2015 breeding bird survey conducted at the site of the planned Inert Waste Recovery Facility at Huntstown Quarry, Finglas, Dublin 11.

It has been prepared by SLR Consulting Ireland (SLR) on behalf of Roadstone Limited in pursuant of Condition 6.14 of Waste Licence Ref. No W0277-01 issued by the Environmental Protection Agency (EPA, or 'the Agency') under Section 40(1) of the Waste Management Act 1996 (as amended) on 11<sup>th</sup> February 2015. The waste licence provides for recovery of inert soil and stones through deposition on land at the former North Quarry within the Huntstown Quarry complex.

Condition 6.14 of Waste Licence W0277-01 states:

*"The licensee shall carry out an annual breeding bird survey, unless otherwise required by the Agency. The survey shall record the number of birds of conservation concern utilising the site. The results of this assessment shall be reported as part of the Annual Environmental Report.*

### 1.2 Aims and Objectives

The aim of the survey undertaken at the waste recovery facility is to provide information on the status of breeding birds at this site in accordance with Condition 6.14 of Waste Licence W0277-01.

The objectives of the survey are as following:

- to provide data on the activity levels of birds of conservation concern utilising the site;
- to provide data on the assemblage of species present within and immediately adjacent to the site; and
- to evaluate the number of pairs of target species breeding within and immediately adjacent to the site.

## 2.0 SITE DESCRIPTION

Huntstown Quarry is a large operational limestone quarry that has been worked since the early 1970s. The quarry complex comprises

- four main extraction areas (i.e. north quarry, central quarry, south quarry and western quarry);
- a central area that holds ancillary infrastructure servicing the quarrying operations (including offices, workshops and concrete and asphalt production plants);
- main access road and internal haul routes;
- remnant former fields and
- areas of overburden stripped from the extraction areas and used in construction of perimeter screening bunds.

The Huntstown Inert Waste Recovery Facility is located in the northern part of the Huntstown Quarry complex, covering an area of approximately 33.8 hectares (ha) out of a total landholding of 211 ha. The site comprises the worked out North Quarry and associated perimeter screening and overburden mounds.

The site comprises a mosaic of habitats including

- exposed calcareous rock faces;
- areas of open standing water formed on the floor of the quarry;
- dry grassland and
- re-colonising bare ground.

The surrounding land-use is a mixture of urban and commercial development, with associated infrastructure including the M50 Motorway, Dublin Airport and mixed agricultural land with fields often bounded by hedgerows. The landscape is typical of a rural-urban fringe.

### 3.0 METHODOLOGY

#### 3.1 Study Area

The study area for the breeding bird survey was the site of the Huntstown Inert Waste Recovery Facility (36.1 ha) and the immediate surrounding area extending up to 100m from the boundary of the site (Figure 1).

#### 3.2 Target Species

Target species are considered to include any species as listed under Annex I of Council Directive 2009/147/EC on the Conservation of Wild Birds (The Birds Directive); any red listed<sup>1</sup> and/or amber listed<sup>2</sup> Birds of Conservation Concern in Ireland (BoCCI).

#### 3.3 Walkover Survey

Walkover surveys, based on the *Common Bird Census* methodology<sup>3</sup>, were undertaken by an experienced ecologist from SLR on 19<sup>th</sup> March 2015 and 19<sup>th</sup> May 2015.

During each survey visit, the entire study area was walked, approaching to within at least 50m of all points to ensure adequate coverage, but at the same time being careful to avoid double-counting. All bird registrations, and their behaviours, were recorded on field maps using standard British Trust for Ornithology (BTO) codes.

Where possible, estimates were made of the number of breeding territories of target species based on the following:

- a nest, eggs or young were located;
- they were observed displaying or singing in suitable breeding habitat,
- birds were observed in territory disputes, or
- birds were recorded in the same location during each survey visit.

Other records were considered to be of non-breeding birds, i.e. feeding or on passage to other areas.

#### 3.4 Survey Dates, Times and Weather Conditions

All survey visits were carried out during the bird breeding season and in good weather conditions. Details of survey dates, times and weather conditions are provided in Table 1.

Table 1: Survey Dates, Times and Weather Conditions

Date	Start Time	Duration (hrs)	Cloud Cover	Wind Direction	Wind Speed	Temp (°C)	Precipitation
19/03/2015	11:30	2	7/8 - 8/8	W	2	12	None
19/05/2015	12:00	2	6/8	NW	2 - 5	13	None

<sup>1</sup> Red list species are those that are Globally Threatened according to IUCN criteria; those whose population or range has declined rapidly in recent years; and those that have declined historically and not shown a substantial recovery.

<sup>2</sup> Amber list species are those with an unfavourable conservation status in Europe; those whose population or range has declined moderately in recent years; those whose populations has declined historically but made a substantial recovery; rare breeders; and those with international important or localised populations.

<sup>3</sup> Gilbert, G., Gibbons, D.W. & Evans, J. (1998) *Bird Monitoring Methods*. RSPB, Sandy, Bedfordshire.

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Fortunestown,  
Tallaght,  
Dublin 24

A.E.R. W0277-01



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Huntstown Inert Waste Recovery Facility, Huntstown Quarry, Finglas, Dublin 11  
Breeding Bird Survey 2015 June 2015

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### **3.5 Survey Limitations**

The entire site was accessible without restriction and no limitations to the survey were encountered.

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#### 4.0 RESULTS

##### 4.1 Walkover Surveys

During the walkover surveys, a total of twenty-four bird species were recorded during the breeding bird survey at the site of the planned Inert Waste Recovery Facility at Huntstown and in the area immediately surrounding it, including six target species.

During each survey visit most species occurred in relatively low numbers, with the exception of jackdaw (*Corvus monedula*) that was by far the most abundant species recorded in the study area. A full list of species recorded and notes on their occurrence is presented in Appendix A.

##### 4.2 Target Species

Of the six target species recorded during the 2015 survey, it is considered that only meadow pipit (*Anthus pratensis*) is likely to have bred within the site of the planned Waste Recovery Facility.

Table 2 presents a summary of the six target species recorded during the survey visits, with full details for each individual species presented in Appendix A. Figure 2 illustrates the location where these species were recorded and approximate territories for the relevant species where appropriate.

**Table 2: Species of Conservation Concern**

Species	Conservation Status	Status within the Developable Area
Goldcrest	Amber List	Solitary individual calling in south west corner of quarry void. No evidence to suggest breeding at the site.
Herring Gull	Red List	A solitary individual recorded in flight over the southern part of the site. No evidence to suggest breeding at the site.
Lesser Black-backed Gull	Amber List	Recorded in flight over the southern part of the site. No evidence to suggest breeding at the site.
Meadow Pipit	Red List	Recorded in the northern part of the site along overburden storage areas supporting dry grassland where they are likely to have bred.
Starling	Amber List	Recorded within the wider surrounding area with a maximum flock of five recorded feeding in a field under permanent pasture to the east of the site. Likely to be breeding within wider surrounding area.
Swallow	Amber List	Recorded in flight over ponded areas in the quarry void. No evidence to suggest breeding at the site.



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Breeding Bird Survey 2015		June 2015

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## **5.0 SUMMARY AND CONCLUSIONS**

The 2015 breeding bird survey conducted by SLR at the site of the planned Inert Waste Recovery Facility at Huntstown North Quarry recorded a total of 24 species of birds at and within the site and the area immediately surrounding it.

The majority of species either occurred in numbers that were not significant at the regional or local level and/or are species of low or no conservation concern.

However the site was found to support six species of conservation concern and which were identified as target species. Of these species only meadow pipit is likely to breed on the site where suitable habitat exists particularly in the northern part of the site, where dry grassland is present.





## **6.0 CLOSURE**

This report has been prepared by SLR Consulting Ireland (SLR) with all reasonable skill, care and diligence, and taking account of the manpower and resources devoted to it by agreement with the Client. Information reported herein is based on the interpretation of data collected and has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of Roadstone Limited; no warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

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**DRAWINGS**

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## APPENDIX A

### Species List

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**APPENDIX A**

Common Name	Scientific Name	Status	Total Counts		Notes
			Mar	May	
Blackbird	<i>Turdus merula</i>	Green List	5	2	Recorded throughout study area and likely to have bred at and within the wider surrounding area of this site.
Blue Tit	<i>Cyanistes caeruleus</i>	Green List	4	-	Recorded predominantly in the hedgerows and scrub along the western boundary of the site where it is likely have bred.
Buzzard	<i>Buteo buteo</i>	Green List	-	1	A solitary recently fledged young observed on top of rock face in south west corner of quarry void after being mobbed by gulls. Likely to have bred in close proximity to where recorded.
Chaffinch	<i>Fringilla coelebs</i>	Green List	-	2	Infrequently recorded in the hedgerows along the northern boundary of the site where it is likely to have bred.
Collard Dove	<i>Streptopelia decaocto</i>	Green List	1	-	A solitary individual recorded in western part of site. No evidence to suggest breeding at the site.
Duncock	<i>Prunella modularis</i>	Green List	2	-	Infrequently recorded in scrub on overburden storage areas in the north east of the site where it is likely to have bred.
Garden Warbler	<i>Sylvia borin</i>	Green List	1	1	Solitary individuals recorded in the hedgerow along the north western boundary of the site where it is likely to have bred.
Goldcrest	<i>Regulus regulus</i>	Amber List	-	1	Solitary individual calling in south west corner of quarry void. No evidence to suggest breeding at the site.
Goldfinch	<i>Carduelis carduelis</i>	Green List	1	2	Infrequently recorded as individuals. Likely to have bred in the wider surrounding area.
Great Tit	<i>Parus major</i>	Green List	3	1	Infrequently recorded along the boundaries of the site. Likely to have bred along the boundaries of the site and within the wider surrounding area.

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**APPENDIX A**

Common Name	Scientific Name	Status	Total Counts		Notes
			Mar	May	
Heron	<i>Ardea cinerea</i>	Green List	-	1	Observed in flight over ponded area in south of quarry pond. No evidence to suggest breeding at this site.
Herring Gull	<i>Larus argentatus</i>	Red List	-	1	A solitary individual recorded in flight over the southern part of the site. No evidence to suggest breeding at the site.
Hooded Crow	<i>Corvus cornix</i>	Green List	7	1	Regularly recorded feeding at the site. No evidence to suggest breeding at the site.
Jackdaw	<i>Corvus monedula</i>	Green List	49	35	Regularly recorded in and around the quarry void in small flocks up to 10 birds. Considered likely to be using the rock faces for breeding.
Lesser Black-backed Gull	<i>Larus fuscus</i>	Amber List	-	2	Recorded in flight over the southern part of the site. No evidence to suggest breeding at the site.
Magpie	<i>Pica pica</i>	Green List	-	4	Recorded in the northern part of the site and in the wider surrounding area. Likely to have bred at the site and in the wider surrounding area.
Meadow Pipit	<i>Anthus pratensis</i>	Red List	9	1	Recorded in the northern part of the site along overburden storage areas supporting dry grassland where they are likely to have bred.
Pied Wagtail	<i>Motacilla alba</i>	Green List	-	1	A solitary individual recorded around the disturbed margins of a field pond to the east of the site. No evidence to suggest breeding at the site.
Robin	<i>Erithacus rubecula</i>	Green List	9	5	Recorded throughout the site where it is likely to have bred.
Rook	<i>Corvus frugilegus</i>	Green List	-	10	All birds recorded in one flock feeding on an adjacent field under permanent pasture. No evidence to suggest breeding at the site.

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**APPENDIX A**

Common Name	Scientific Name	Status	Total Counts		Notes
			Mar	May	
Starling	<i>Sturnus vulgaris</i>	Amber List	2	5	Recorded within the wider surrounding area with a maximum flock of five recorded feeding in a field under permanent pasture to the east of the site. Likely to be breeding within wider surrounding area.
Swallow	<i>Hirundo rustica</i>	Amber List	-	2	Recorded in flight over ponded areas in the quarry void. No evidence to suggest breeding at the site.
Woodpigeon	<i>Columba palumbus</i>	Green List	5	5	Recorded generally in flight over site. Likely to be breeding in wider surrounding area.
Wren	<i>Troglodytes troglodytes</i>	Green List	7	4	Regularly recorded throughout the site and considered likely to have bred within the site and wider surrounding area.

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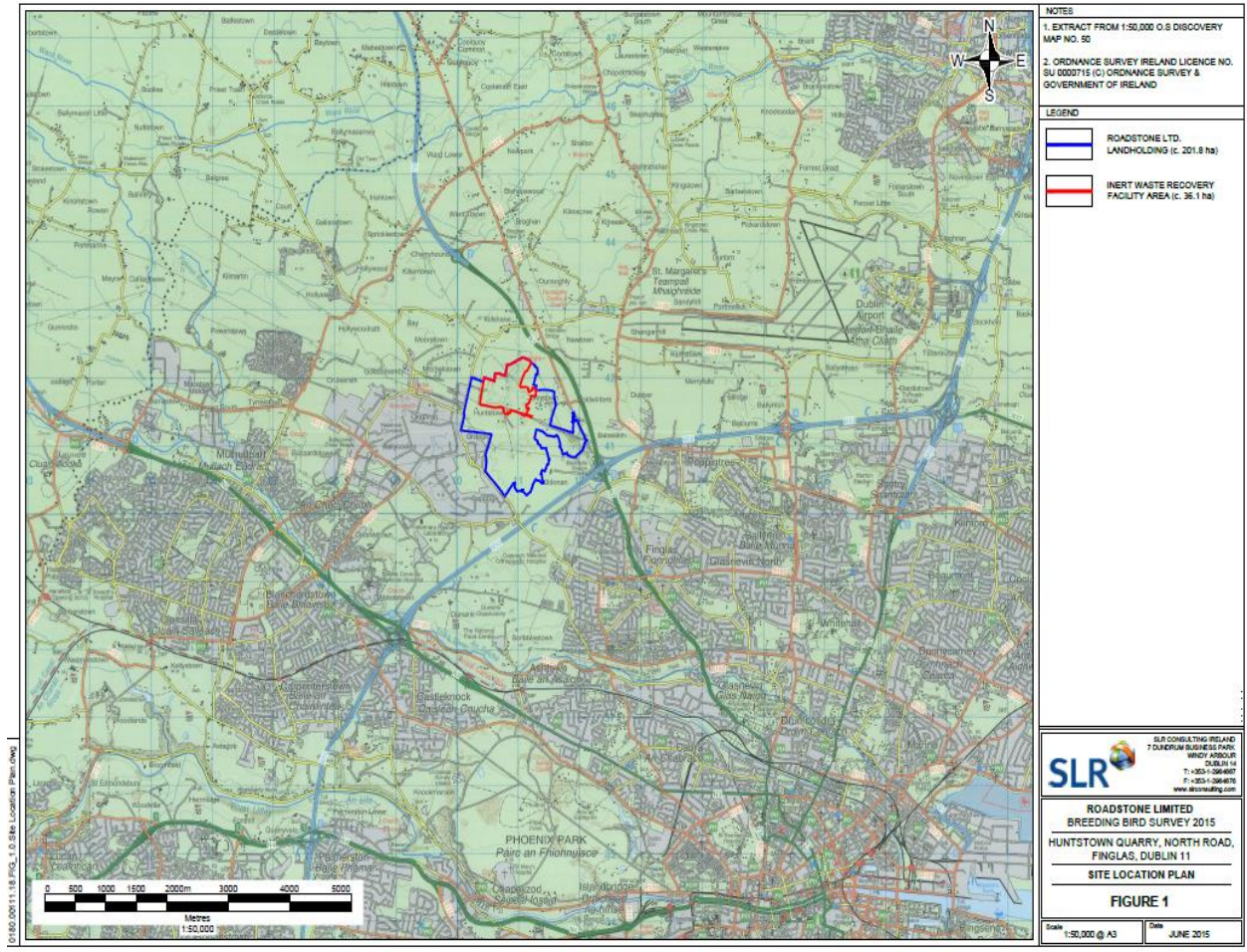
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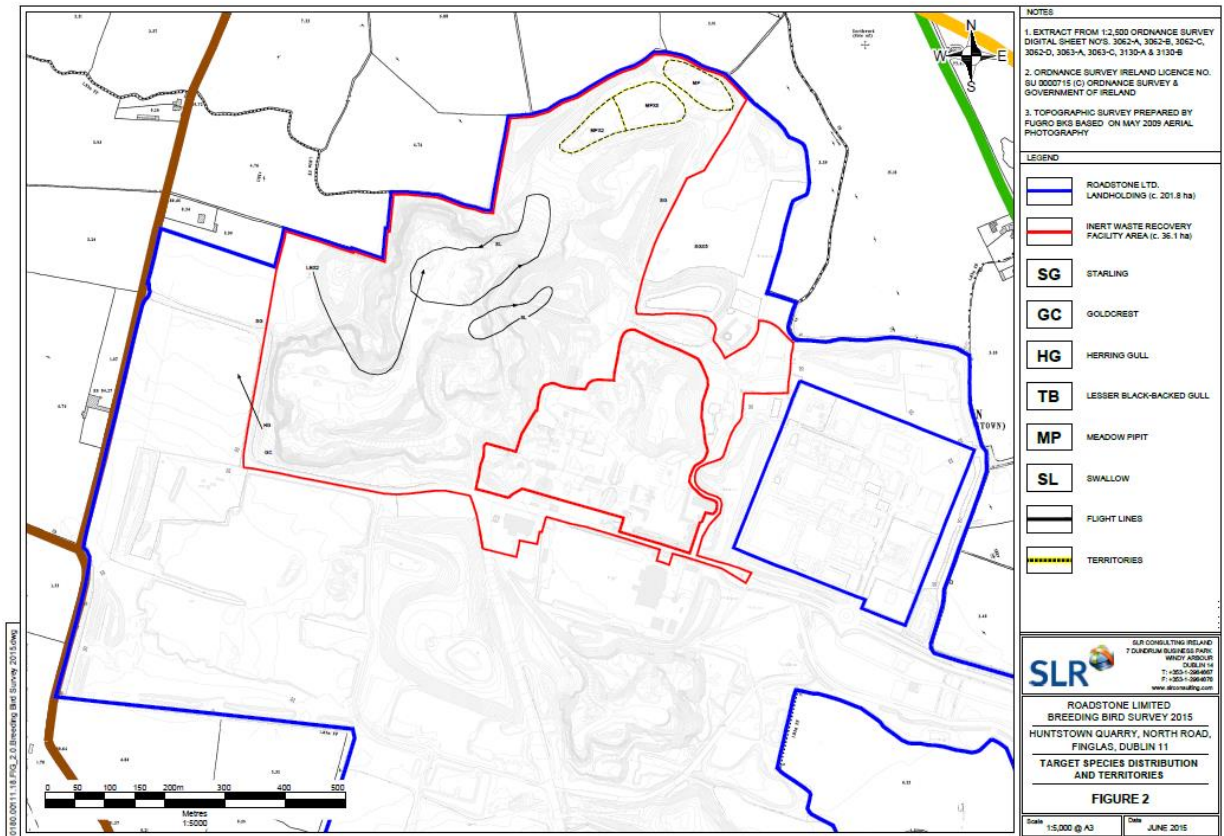
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## **Section 14: Financial Provisions**





**XL Group**  
Insurance  
Reinsurance

**XL Insurance Company SE**  
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**Certificate of Employers and Public/Products Liability**

**Name of Insured** Roadstone Ltd

**Address** 42 Fitzwilliam Square  
Dublin 2  
Ireland

**Insurers** XL Insurance Company SE  
XL House  
70 Gracechurch Street  
London  
EC3V 0XL

**Policy Number** GB00002926L114A (Employers Liability)  
GB00002928L114A (Public/Products Liability)  
GB00010400L114A (Public/Products Liability Excess)

**Period Liability** 1<sup>st</sup> February 2014 to 31<sup>st</sup> January 2015

**Business:** Activities of the Insured as advised to the Company

**Limits of Indemnity** Employers Liability €22,700,000 each and every event unlimited per Policy Year  
Public Liability €13,000,000 each and every event unlimited per Policy Year  
Products Liability €13,000,000 each and every event and in the aggregate per Policy Year  
Further Excess Layers are in place with other Insurers  
Financial Loss €800,000 in the aggregate per Policy Year

**Noting the Interest of** South Dublin County Council

**Clauses (PL/Products)** Indemnity to Principals  
Contractual Liability  
Cross Liabilities

**Excesses** €10,000 Property Damage  
€35,000 Financial Loss



**SIGNED**

For and on behalf of XL Insurance Company SE

Subject to the terms and conditions of the policies currently in force, issued by XL Insurance Company SE and corresponding with the aforementioned policy numbers.

DATED 10th December 2014

XL Insurance Company SE., Registered office: XL House, 70 Gracechurch Street, London, EC3V 0XL.  
Registered No. SE000080 England

**Bank of Ireland**   
Corporate Banking

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[www.bankofireland.com/corporatebanking](http://www.bankofireland.com/corporatebanking)

**Date: 21 March 2013**

*In reply to your recent enquiry the following information is given in strict confidence for your private use only, and without responsibility on part of this Bank or the writer, and where the information has been obtained from another bank or informant, without responsibility on the part of themselves or of their officials.*

**Subject: Roadstone Wood Ltd**

Subject is a subsidiary of a publicly quoted limited company whose financial information is freely available. We would consider their management capable and trustworthy and would consider them good in the way of business generally and in our opinion they would not undertake any commitment that they could not fulfil.

## Section 15: CRAMP



**Huntstown Inert Waste Recovery Facility  
North Quarry, Huntstown  
Finglas, Dublin 11**

**CLOSURE, RESTORATION AND  
AFTERCARE MANAGEMENT PLAN (CRAMP)**



**September 2015  
SLR Ref: 501.00180.00111 CRAMP Rev 2**

SLR Consulting Ireland, 7 Dundrum Business Park, Windy Arbour, Dublin 14, Ireland  
T: +353 1 296 4667 F: +353 1 296 4676 [www.slrconsulting.com](http://www.slrconsulting.com)

Directors: E. O'Donnell, N. O'Sullivan, T. Paul, N. Perrett, Brian M. O'Riordan, G. Egan, M. Wright, L. Roberts, Brian O. Seamus R. O'Donnell

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## EXECUTIVE SUMMARY

### *Activity Details*

Name	Huntstown Soil Recovery Facility
Address	North Quarry, Huntstown, Finglas, Dublin 11
Licence No.	W0277-01
Activities Licensed	<p><i>Class R5 (P):</i> Recycling / reclamation of other inorganic materials, which includes soil cleaning resulting in recovery of the soil and recycling of inorganic construction materials (Principal Activity).</p> <p><i>Class R3 :</i> Recycling / reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes) which includes gasification and pyrolysis using the components as chemicals.</p> <p><i>Class R13 :</i> Storage of waste pending any of the operations numbered R1 to R12 (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).</p>

### *Report Preparation*

This closure and restoration / aftercare management plan has been independently prepared on behalf of Roadstone Ltd. by SLR Consulting Ireland, of 7 Dundrum Business Park, Wind Arbour, Dublin 14.

### *Comparison with Previous Plans*

This plan updates a draft closure and restoration / aftercare management plan previously submitted to the EPA by Roadstone Ltd. in December 2013 in support of its waste licence application. However, no financial provision was formally agreed with the EPA on foot of the draft plan at that time.

### *Overview of the Plan*

This closure and restoration / aftercare management plan has had regard to the requirements outlined in Condition 10.3 of the Waste Licence and was prepared in accordance with the EPA publication, *Guidance on Assessing and Costing Environmental Liabilities (2014)*.

### *Scope*

The closure plan envisages that the licensed waste facility will achieve a clean closure, such that, on cessation of waste recovery operations, plant and equipment are decommissioned, decontaminated and/or removed from the facility in order to ensure that the facility presents no environmental liabilities or risk of long-term environmental pollution.

### *Cost Summary*

As a result of this assessment, the total combined cost of the facility closure, restoration and aftercare management is calculated at €1,534,502.50 (including 15% contingency) of which €913,387.50 is for closure and €621,115 is for aftercare.



***Financial Provision***

Arising out of this assessment, Roadstone Ltd. is prepared to make the required financial provision in respect of closure and aftercare costs by means of a financial bond submitted under separate cover to the EPA.

***Review***

This Closure Plan will be reviewed annually and updated where necessary to take account of any facility or process changes, technology changes and costing changes (inflation). Details of the review shall be included in the Annual Environmental Report (AER) submission to the EPA.

## 1.0 INTRODUCTION

### 1.1 Huntstown Inert Waste Recovery Facility

The Environmental Protection Agency (hereinafter '*the Agency*' or '*EPA*') issued a waste licence to Roadstone Ltd. (hereinafter '*Roadstone*') in respect of an inert waste recovery facility at Huntstown North Quarry, Finglas, Dublin 11 on 11<sup>th</sup> February 2015 (Ref. W0277-01). The principal waste activity at the site will be backfilling of the existing quarry void using imported inert soil and stone. It is anticipated that waste activities will commence on-site in the late spring / early summer of 2015.

The waste licence provides for

- Backfilling of up to 7,295,000 tonnes (approximately 3,840,000m<sup>3</sup>) of naturally occurring waste materials, principally excess inert soil, stones and/or broken rock excavated on construction and development sites, to re-use in backfilling and restoring a large quarry void created by extraction of bedrock;
- Separation of any non-inert construction and demolition waste (principally metal, timber, PVC pipes and plastic) unintentionally imported to site and its temporary storage at a dedicated inspection and quarantine facility, prior to removal off-site to appropriately licensed waste disposal or recovery facilities;
- Restoration of the backfilled void (including placement of cover soils and seeding) and return to natural grassland habitat and
- Environmental monitoring of noise, dust, surface water and groundwater for the duration of the proposed site restoration works and for a short aftercare period.

### 1.2 Site Description

The licensed inert waste recovery facility is located entirely within the townlands of Huntstown and Kilshane, Co. Dublin, approximately 2.5km north-west of the Dublin suburb of Finglas and 2km north-west of the interchange between the N2 Dual Carriageway and the M50 Motorway. The plan extent of the lands owned by Roadstone Ltd. is outlined in blue on a map of the local area reproduced in Figure 1.

The waste licence facility is located entirely within a large active quarry complex and adjoining concrete and asphalt production facilities operated by Roadstone Ltd. The waste facility covers an area of approximately 38.1 hectares (87.0 acres) and comprises a largely worked-out limestone quarry with perimeter screening / overburden mounds, together with adjoining, established site infrastructure required to operate the inert waste / soil recovery facility. The existing site layout, together with additional infrastructure required to support waste recovery activities, is shown in Figure 2.

The total volume of inert soil waste to be recovered at the licensed facility at Huntstown is 3,840,000m<sup>3</sup>, (equivalent to approximately 7,295,000 tonnes). It is estimated that 50,000m<sup>3</sup> (approximately 95,000 tonnes) of topsoil is available at on-site perimeter screening berms for incorporation into the final restored landform, following backfilling of the worked out quarry, leaving approximately 3,790,000m<sup>3</sup> of material to be imported to the recovery facility from off-site locations. The area of the main quarry void to be backfilled has a plan footprint of approximately 12 hectares.

Ground levels across the licensed facility have been significantly disturbed by quarrying activities. The original ground levels around the worked-out quarry vary between approximately 62mOD and 66mOD (Malin) along the eastern face and between 80mOD and 85mOD along the western face. Existing ground levels immediately behind the quarry faces are locally 5m to 10m higher than surrounding ground due to the presence of perimeter screening mounds. The existing quarry void covers an area of approximately 11.2 hectares (27.0 acres) within the overall licensed area.

The existing floor level in the quarry lies at approximately 38mOD to 39mOD and its depth from the original (surrounding) ground level therefore varies from 24m to 28m along its eastern face and 42m to 47m along its western face.

Some restoration work was undertaken at the northern end of the waste licence area in the period from late 2002 to the end of 2003. At that time, a large volume of inert excavation spoil arising from construction of the Dublin Port Tunnel was imported to site and used to backfill the quarry void in that area. Since that time there has been only minor progress in the site restoration works. The future restoration and backfilling work in this area will proceed in accordance with the terms of the waste licence issued by the Agency.

### **1.3 Planning Status - Former / Existing / Planned Activities**

Excavation and blasting of limestone has been carried out across the Huntstown Quarry Complex for the past four decades, following grant of planning permission in or around 1973. A 10 year planning permission (Ref. No. 93A/1134 and P08F.092622) was granted in 1994 to continue quarrying and for production of related concrete materials. Planning permission for the existing construction and demolition waste recycling facility in the centre of the quarry complex was granted in 2002 (Ref. No. F02A/0602 and PL08F.200623). Planning permission was granted in 2004 for continuation of quarrying for a 10 year period (Ref. No. F03A/1430 and PL08F.206789).

The proposal to backfill the North Quarry with in-situ and imported inert soil and stones was part of the quarry restoration works which were previously notified and agreed with Fingal County Council in 2002 in accordance with Condition No. 17 of 1994 planning permission. These works were commenced in the 2002-2003 period, but progressed only intermittently after that time. Quarry backfilling works were previously controlled by a series of waste permits issued by Fingal County Council.

In August 2014, planning permission was secured for continuation of quarrying for a 20 year period (Fingal County Council Ref. No FW12A-0022, An Bord Pleanála Ref. No. 06F.241693). The overall development proposal, which was subject to EIA, included provision for ultimate backfilling and restoration of the North Quarry area. As backfilling with inert waste soil is technically designated a waste activity under national waste management legislation, it was also necessary to obtain an EPA waste licence in respect of this activity.

Roadstone discharges dewatered groundwater and surface water run-off from the North Quarry, together with process water from aggregate washing and concrete production activities, via a series of existing settlement ponds to tributary streams of the Ward River. Discharge for non-waste activities are controlled by way of a licence issued by Fingal County Council in November 2011 (Ref WPW-F008-01). This superseded an earlier discharge licence issued by Dublin County Council in January 1987 (Ref. WPW/1/87).

### **1.4 Classes of Licensed Waste Activities**

The waste licence issued to Roadstone by the Environmental Protection Agency (EPA) provides for the following licensed activities (as per the Fourth Schedule of the Waste Management Acts 1996-2014).

- Class R5 : Recycling / reclamation of other inorganic materials, which includes soil cleaning resulting in recovery of the soil and recycling of inorganic construction materials (Principal Activity).
- Class R3 : Recycling / reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes) which includes gasification and pyrolysis using the components as chemicals and
- Class R13 : Storage of waste pending any of the operations numbered R1 to R12.



## 1.5 Licence Requirements

This Closure, Restoration and Aftercare Management Plan (CRAMP) is prepared in compliance with Condition 10.2 of the waste licence for an inert soil waste recovery facility at Huntstown North Quarry, Finglas, Dublin 11 (Ref. W0277-01).

### 10.2 Closure, Restoration and Aftercare Management Plan (CRAMP)

- 10.2.1 *The licensee shall prepare, prior to the commencement of the activity and to the satisfaction of the Agency, a revised, fully detailed and costed revised plan for the closure, restoration and aftercare of the facility or part thereof.*
- 10.2.2 *The plan shall be reviewed annually and proposed amendments thereto notified to the Agency for agreement as part of the AER. No amendments may be implemented without the agreement of the Agency.*
- 10.2.3 *The licensee shall have regard to the Environmental Protection Agency Guidance on Assessing and Costing Environmental Liabilities (2014) when implementing Condition 10.2.1 and 10.2.2 above.*

## 1.6 Scope of this CRAMP

In preparing this plan, regard has been had to requirements outlined in Condition 10.3 of the Waste Licence which include

- *A scope statement for the plan;*
- *The criteria that define the successful decommissioning of the activity or part thereof, which ensures minimum impact on the environment;*
- *A programme to achieve the stated criteria;*
- *Where relevant, a test programme to demonstrate the successful implementation of the CRAMP;*
- *Details of the costings for the plan and the financial provisions to underwrite those costs.*

The objective of this CRAMP is to ensure that on completion / cessation of the inert soil waste recovery activities at Huntstown, the formed quarry void will be substantially re-integrated into the surrounding pastoral landscape, with much of the land restored to natural grassland habitat.

The scope of this CRAMP comprises:

- a Site Evaluation, which presents details of its planning history and an inventory of existing mobile plant and fixed infrastructure;
- the Closure Considerations and Criteria for successful closure;
- an outline Closure Plan Costing and measures for the Closure Plan update, review, implementation and validation; and
- the Facility Restoration and Aftercare proposals, including a restoration and aftercare management costing.

The CRAMP has also been prepared in accordance with the recent EPA publication, *Guidance on Assessing and Costing Environmental Liabilities (2014)*.

## **2.0 SITE EVALUATION**

### **2.1 Operator Performance**

#### **2.1.1 Environmental Management Systems**

Roadstone implements an Environmental Management System (EMS) at all its facilities in respect of its core quarrying and construction material production activities. In recent years it has extended the scope of the EMS to encompass inert soil / C&D waste recovery activities. A part of its EMS, Roadstone has developed standard procedures to address waste acceptance and handling activities, as well as an emergency response plan.

#### **2.1.2 Compliance History**

As previously noted, the excavation and blasting of limestone has been undertaken at the Huntstown Quarry Complex for the past four decades, following grant of planning permission in or around 1973.

Neither Roadstone Ltd. nor any of its predecessor companies (which includes Roadstone Dublin, Roadstone Provinces and John A. Wood), has ever been convicted of any offence under the Waste Management Acts 1996-2014, the Environmental Protection Agency Act 2003 or the Air Pollution Act 1987.

The Huntstown quarry complex has largely operated in compliance with all permits and planning consents and Roadstone has not been subject to enforcement action by the Local Authority. A number of complaints and warning letters in respect of compliance with planning conditions were received by the company between 2007 and 2010 were subsequently addressed and/or resolved by the company.

#### **2.1.3 Incident History**

A fuel leak / spill occurred during filling of diesel tanks in early 2013, overflowed at a downstream interceptor and impacted a lagoon to the south of the central infrastructure area (outside the proposed waste licence area). A specialist contractor was called to site to remove spilled fuel in lagoons or sumps of ponding at the ground surface. It also pumped out the ground around the fuel tank and interceptor outflow pipe.

Subsequent groundwater sampling and testing and a follow up site inspection and audit undertaken by AWN Consulting revealed that, following the site clean-up, there was no evidence of ground, surface water or groundwater contamination by hydrocarbons. A qualitative risk assessment undertaken by AWN also indicated that the spill presented a low risk to groundwater quality directly beneath the site and negligible risk to water supply boreholes, surface water bodies and site based personnel or visitors.

#### **2.1.4 Environmental Monitoring**

Environmental monitoring of surface water, groundwater, noise and dust is undertaken at designated locations across the licensed facility, at the locations indicated in Figure 3.

There is an established programme of environmental monitoring in connection with ongoing rock extraction, aggregate processing and concrete / asphalt production activity across the Huntstown Quarry Complex. This environmental monitoring programme complies with the requirements of existing planning permissions, waste permits and discharge licences issued by Fingal County Council in respect of established activities.

##### **Surface Water**

The inert soil recovery facility to be located in the North Quarry lies in the northern part of the Roadstone landholding, entirely within, albeit at the edge of the Ward River catchment. There is no surface water watercourse located within the licensed facility and the nearest

watercourses are artificial (man made) ditches and/or small tributary streams on the eastern side which flow north to the Ward River, which flows approximately 4km north of the facility.

Groundwater levels at the North Quarry are lowered by means of sumps in the quarry floor. Surface water falling across the quarry and dewatered groundwater are collected in a pond on the eastern side of the quarry floor and pumped to a drainage channel / watercourse at original ground surface level via an existing pipe network. Water pumped to this channel is routed via settlement lagoons to discharge to a tributary stream of the Ward River which runs northwards out of the licensed site.

Surface water sampling and testing is undertaken immediately downstream of the existing settlement lagoons, beyond the eastern face of the North Quarry (at location W4), and upstream of its discharge to the tributary stream of the Ward River (at location W1), as indicated in Figure 3. Surface water samples are tested for a wide range of physical and chemical parameters in order to assess water quality and detect possible contamination. Most recent monitoring (for 2014) indicates that water discharge quality complies with requirements of the existing discharge licence.

#### *Groundwater*

There are 6 No. groundwater monitoring wells installed across the Huntstown Quarry Complex. Of these, 2 No. (GW03 and GW04) are located in close proximity to the waste licence boundary, while 2 No. others (GW02 and GW05) occur at a short distance to the south.

The available groundwater quality data for groundwater at Huntstown indicates that it is of good status, with virtually all parameters analysed having ion concentrations lower than the Interim Guideline Values (IGV) set out in the EPA Publication 'Towards setting Guideline values for the Protection of Groundwater in Ireland'. The guideline value for chloride has been exceeded on occasion, but this may be due to proximity to seawater at the coast (12km away). All samples exceeded the guideline for hardness, which is not unusual for groundwater samples from limestone bedrock. Occasional recorded exceedances of guideline values for orthophosphate may be the result of fertiliser application on adjoining agricultural lands.

A septic tank installed to the east of the site offices and north of the existing blockyard currently services toilets, wash hand basins and sink units at the site. The treated effluent from the septic tanks discharges to groundwater via a percolation area. Much of the water demand in Huntstown and the surrounding area is met by a Local Authority mains supply.

#### *Dust*

Planning permissions for the ongoing rock extraction, aggregate processing and concrete / asphalt production activities at Huntstown specify an emission limit value for dust deposition (at the site boundary) of 350 mg/m<sup>2</sup>/day (30 day composite sample) when measured using the conventional 'Bergerhoff' method.

Atmospheric emissions related to site activities are primarily associated with dust emissions associated with aggregate processing and exhaust emissions from traffic to and from the R135 Regional Road (the former N2) and heavy good vehicle (HGV) / truck movements on unpaved roads around the quarry complex.

Dust emissions are monitored using Bergerhoff dust gauges at four locations (D1, D3 and D4) around the licensed facility and at one location within the central infrastructure area (D2), all shown on Figure 3. Monitoring gauges are located closest to emission sources and/or potentially sensitive receptors beyond the Licensee's property boundary.

Dust deposition monitoring undertaken in 2014 indicated that dust deposition levels around the Huntstown Complex were generally low, with average measured dust deposition levels around the perimeter comfortably within the prescribed emission limit value of 350mg/m<sup>2</sup>/day.



### *Noise*

Planning permissions for associated established activities within Roadstone's landholding specify noise emission limit values of 55 dB(A)  $L_{Aeq}$  at the property boundary during day-time hours, with a reduced limit of 45 dB(A)  $L_{Aeq}$  during night-time hours.

Noise emissions are monitored on a quarterly (i.e. three monthly) basis at 4 No. locations across the Huntstown complex (designated N1 to N4), all of which are located beyond the licensed site boundary.

Noise surveys undertaken around the Roadstone landholding indicates that in 2013 and 2014, noise levels were elevated about the permissible limits on account of high background noise levels associated with high volume of traffic along the nearby M50 Motorway and N2 Dual Carriageway as well as frequent overhead plane movements in and out of Dublin Airport.

The principal noise impact associated with the operation of the inert soil waste recovery facility will be the increased noise generated by moving HGV trucks and/or earthworks equipment during daytime hours (07:00 to 19:00 hrs). No recovery operations or traffic movements will be undertaken at the recovery facility during either evening time (19:00 to 23:00 hrs) or night-time hours (23:00 to 07:00 hrs).

## **2.2 Environmental Pathways and Sensitivity**

### **2.2.1 Geology**

Topsoil was previously stripped from the site in order to facilitate the development of the North Quarry and is currently stockpiled in mounds across and around the existing site. Soil mapping suggests that the lands surrounding the Huntstown Quarry complex comprise well-drained soils which are suitable for a wide range of agricultural activity, generally grassland or tillage and some poorly drained soil which have more restricted uses, principally as seasonal grassland.

Site inspections indicate that the subsoil profile comprises a significant amount of Made Ground (soil disturbed or placed by human activity) over limited thickness of glacial till and/or rock. There is no evidence of soil contamination at the site.

Most of the Made Ground arises from historical and ongoing extractive activity, principally overburden removal and stockpiling or installation of fixed plant and infrastructure. The effect of this is that few areas of undisturbed soil or subsoil remain across the Huntstown Quarry complex.

The most recent geological map of the local area published by the Geological Survey of Ireland (GSI) indicates that rock around the licensed facility comprises limestones of the Lucan, Feltrim, Malahide and Tober Colleen Formations.

The GSI maps indicate that the geological contact between the Waulsortian Limestones of the Feltrim Limestone Formation and the Tober Colleen Formation is exposed in the roadway leading into the Central Quarry, to the south of the licensed facility and it has identified this feature for future designation as a Natural Heritage Area (NHA) on geomorphological / geological grounds.

### **2.2.2 Hydrology**

The inert soil recovery facility to be located in the North Quarry lies entirely within the Ward River catchment. Rain falling across the licensed facility either

- runs over unsealed ground into the existing quarry void and the sump on the eastern side of the quarry floor
- percolates down through the existing soil / rock at the ground surface as recharge to groundwater, at which point it joins groundwater flow toward the quarry face
- collects in surface water drainage infrastructure installed across the central infrastructure area where aggregate processing and concrete production activities are currently concentrated.

Groundwater levels at the North Quarry are lowered by means of sumps in the quarry floor. Surface water falling across the quarry and dewatered groundwater are collected in the sump on the eastern side of the quarry floor and pumped to an existing drainage channel at original ground surface level via an existing pipe network. Water pumped to this channel is routed via existing settlement lagoons to discharge to a tributary stream which runs northwards out of Roadstone's property, toward the Ward River. This discharge is currently regulated by way of a discharge licence issued by Fingal County Council (Ref. WPW/F/008-01).

The northern portion of the Ward River (known as the Ballystrahan sub-catchment) is classified in the latest EPA assessment of Ireland's rivers (for years 2010-2012) as being of 'poor' status. The Ward River has a median quality which is generally deemed to be unsatisfactory. Siltation by agriculture and urban wastewater discharges are likely to be the principal contributors to reduced water quality in the stream.

### **2.2.3 Hydrogeology**

Bedrock aquifer maps indicate that the Huntstown Quarry complex straddles bedrock formations which are generally considered to be locally important karstified aquifers. Of the three bedrock formations exposed at Huntstown, both the Waulsortian and Malahide Formations are classified by the GSI as locally important aquifers, while the Tober Colleen Formation is classified a poor aquifer.

While there is groundwater seepage into the North Quarry, volumes vary seasonally and are typically low to moderate.

Groundwater vulnerability maps published by the EPA on its website ([www.epa.ie](http://www.epa.ie)) indicate that the licensed site is located in an area with high to extreme groundwater vulnerability status where rock is close to the surface. Groundwater vulnerability reflects the potential for rapid groundwater movement through subsoil deposits into the underlying bedrock aquifer. It is generally high or extreme where subsoil deposits are thin or absent and provide little or no attenuation for potential pollutants or contaminants.

Recent groundwater sampling and testing indicate that groundwater quality at the site is generally good, with established on-site activities shown to have had no significant impact on existing groundwater quality.

### **2.2.4 Sensitive Receptors**

The principal sensitive receptors in the vicinity of the licensed facility comprise a number of private residential properties along the western property boundary, along Kilshane Road.

The receptor locations considered for ecological exposure are those which might be adversely affected by any form of environmental emission. For the purposes of assessment, the most sensitive ecological receptor is deemed to be the locally important aquifers beneath the site. Other receptors could include the tributary to the Ward River. There are no designated nature conservation sites within 2km radius of the licensed facility.

### **2.2.5 Pathways**

The only surface water emission / monitoring point at the licensed facility is the discharge point downstream of the settlement ponds and hydrocarbon interceptor located above the

eastern face of the North Quarry. All surface water run-off across the licensed facility is collected and passed through the existing settlement ponds and drainage infrastructure prior to its ultimate discharge to the Ballystrahan stream, a tributary of the Ward River. The quality of this run-off can be adversely impacted if it comes into contact with loose sediment, hazardous materials or contaminated ground. Water quality is a key indicator of environmental performance and as such, the surface water management infrastructure is a critical environmental pathway for the licensed facility.

As noted previously, some rainfall across the licensed site percolates down through the existing unsaturated zone (in soil / rock close to the ground surface) and recharges to the underlying locally important aquifer. In the event that there is some surface contamination of near-surface soil or ground, this recharge can introduce contaminants to the groundwater body and have an adverse impact on its quality and resource potential. As such, groundwater recharge through the ground is another critical environmental pathway for the licensed facility.

Most noise and dust emissions from the waste recovery facility will be generated by HGV truck movements and by earthworks equipment (bulldozer) engaged in haulage and backfilling activities. There are no fixed (point) noise or dust emission sources at the facility. Air borne emissions of dust and noise transmission from the waste recovery facility have the potential to impact on the occupants of the nearest residential properties.

### **2.3 Site Processes and Activities**

As previously indicated, a significant proportion of the licensed facility has been excavated out and is to be infilled under the terms of the waste licence. The quarry void is still being dewatered of any incipient rainfall or groundwater inflows.

Rock excavated at Huntstown Quarry is used to produce concrete, blocks and asphalt products at the central infrastructure area adjacent to, and surrounded by, the licensed waste facility.

Although the extent of the licensed waste facility seeks to avoid conflict with other on-site activities (including concrete, asphalt and block production areas), it includes access roadways and all shared infrastructure necessary for the soil waste recovery activities (including offices, wheelwash, weighbridge, maintenance garage, hardstand areas etc.).

When operational, the waste recovery activity will provide for

- Importation and acceptance of inert soil, stones and/or broken rock
- Placement and compaction of the imported materials in backfilling and restoring the quarry void;
- Separation of any non-inert construction and demolition waste (principally metal, timber, PVC pipes and plastic) unintentionally imported to site;
- Transfer of any separated waste streams to the waste inspection and quarantine facility for temporary storage pending inspection, testing and potential removal to off-site waste disposal or recovery facilities;
- Stockpiling and storage of imported topsoil and/or subsoil pending re-use as cover material in the final phase of restoration;
- Environmental monitoring of noise, dust, surface water and groundwater for the duration of the proposed site restoration works and for a short aftercare period.



## 2.4 Site Inventory / Infrastructure

The established site facilities, mobile plant and fixed infrastructure at the waste recovery facility at Huntstown are listed below. Most of the site facilities and infrastructure are shared with the adjoining / co-located construction material production facility and have been in place for many years. The locations of the principal site facilities are shown on Figure 2.

- Buildings: site office, staff welfare facilities, canteen, plant maintenance building; waste quarantine shed, laboratory, weighbridge office.
- Site Security: security barriers at the existing site access point are manned by security staff on a 24 hour, 7 day a week basis.
- Fixed Infrastructure: paved / unpaved internal road network; paved employee and visitor parking areas, hardstanding, wheelwash; weighbridge, fuel / oil storage facilities, conveyor belt.
- Services: overhead electricity wires, water supply pipes (connected to local authority watermain), septic tank and associated sewerage pipework serving welfare facilities;
- Surface Water: sumps, pipelines, drains, settlement ponds and hydrocarbon interceptor;
- Plant and Machinery: re-fuelling plant; mechanical excavators; bulldozers; pumps.

Assuming co-located production activities continue following cessation of waste recovery activities at Huntstown, much of this infrastructure (either existing or replaced) will remain in place and continue to be used after that time.

## 2.5 Inventory of Raw Materials, Product and Waste

Table 1 overleaf provides an inventory of the raw materials, products and waste stored at the recovery facility. Most of the materials stored are oils, fuels and lubricants required for ongoing maintenance and repair of plant and equipment used in recovery activities.

**Table 1**  
**Inventory of Raw Materials, Products and Waste**

Type	Storage Area	Storage Type	Maximum Storage Capacity	Measurement Unit
Road Diesel	External Tanks	Bunded Tank	40,000	Litres
Marked Diesel (Gasoil)	External Tanks	Bunded Tank	53,000	Litres
Diesel Engine Lubricant	Back Room in Maintenance Shed	Double Skinned Steel Tank	2,730 (600 gallon)	Litres
Hydraulic Oil	Back Room in Maintenance Shed	Double Skinned Steel Tank	2,730 (600 gallon)	Litres
Transmission Fluid	Back Room in Maintenance Shed	Double Skinned Steel Tank	1,365 (300 gallon)	Litres
Waste Oil	Back Room in Maintenance Shed	Double Skinned Steel Tank	2,730 (600 gallon)	Litres
Hydrocarbon Fluids and Gels	Maintenance Shed	Bunded Area or Bunded Tanks	200 litres	Litres



### **3.0 FACILITY CLOSURE**

#### **3.1 Closure Considerations**

This closure plan envisages that the licensed waste facility will achieve a clean closure, such that, on cessation of waste recovery operations, plant and equipment are decommissioned, decontaminated and/or removed from the facility in order to ensure that the facility presents no risk of environmental pollution.

On suspension or unplanned cessation of waste recovery activities,

- the landform within the quarry void will be graded, rolled and compacted to create a uniform stable surface (flat or at shallow slope angle);
- any temporary settlement ponds at the base of the filling area will be dewatered and infilled with inert soil and stone;
- all mobile plant and equipment associated with the backfilling, placement and compaction of backfilled materials will be removed off-site;
- any dedicated water pumping and transmission infrastructure (flexible piping carrying surface water run-off and dewatered groundwater) will be maintained in place and operated for a 36 month period following facility closure;
- the dedicated silt trap / hydrocarbon interceptor tank will be emptied and decontaminated; deposited silts will be removed from the wheelwash and the septic tank will be desludged. All wastes arising will be transferred off-site to appropriately licensed waste disposal or recovery facilities;
- any unused oil and fuel storage tanks will be emptied and decontaminated. Unused oil and fuel will be removed off-site and used elsewhere;
- any unused oils, greases, lubricants, chemicals stored in the maintenance shed will be removed off-site and re-used elsewhere. Other hazardous materials will be removed to appropriately licensed waste disposal or recovery facilities;
- any materials which are stored on site and found to exceed inert waste acceptance criteria will be transferred off-site by licensed waste contractors to a suitably licensed waste disposal or recovery facility;
- environmental monitoring will continue over the period of the closure works (note however that provision will be made for monitoring over a 36 month period following facility closure.
- attendance by security staff (with a patrolling vehicle) at the facility for a 36 month period following facility closure.

As much of the storage and maintenance infrastructure within the recovery facility is shared with the adjoining stone, concrete and asphalt production activities, any storage tanks, drums, IBCs etc. holding fuel, oil or compounds (and related wastes) which could be required for the continued operation of those facilities will be retained and will not be decommissioned, demolished or removed off site.

#### **3.2 Criteria for Successful Closure**

The principal objective of the closure plan is to achieve clean closure of the site, with no residual risk of environmental pollution, particularly to soil or groundwater.

The principal criteria against which successful closure will be gauged are as follows:

- the existing landform within the quarry void will be uniformly graded and stable;
- all dedicated mobile plant and equipment associated with the recovery activity (specifically backfilling, soil placement and compaction) will have been decontaminated and/or removed off site;



- any potential pollutants and/or wastes associated with the recovery activity will have been removed off site.

### **3.3 Closure Plan Costing**

The expected costs (present-day values), associated with the future closure of the waste recovery facility at the North Quarry at Huntstown, are outlined in Table 2 below. Note that the costs provided for assume a worst case scenario, where there is unexpected shut down of the facility, with no on-site activities or resources to cover facility closure or environmental protection costs.

**Table 2**  
**Waste Recovery Facility Closure Costs**

ACTIVITY	QUANTITY	UNITS	RATE (€)	COST (€)	SOURCE
Remove all mobile plant (mechanical excavator and bulldozer) off site	Item	Sum	3,000	3,000	McCabes Mile River Ltd
Decommission waste recovery infrastructure					
Test sediments in settlement ponds / silt trap	8	No.	250	2,000	Chemtest
Excavate settlement pond sediments	1,000	m <sup>3</sup>	5	5,000	NRA Rates
Remove sediments to landfill facility (as cover)	1,000	m <sup>3</sup>	40	40,000	Greenstar
Empty hydrocarbon interceptor and tanker off-site (assume 5 tonnes sludge)	Item	Sum	2,000	2,000	Enva
Emptying and cleaning of oil and fuel storage tank (assume 5 tonnes sludge) and transfer of bottom sludge to off-site disposal/ recovery facility	Item	Sum	3,200	3,200	Enva
Removal of oils and lubricants from garage, workshop and external tanks and recovery at off-site facility	10	Tonnes	150	1,500	Rilta
Removal of other (solid / liquid) chemical wastes from laboratory / workshop and disposal or recovery off-site	5	Tonnes	150	750	Rilta
De-silting of wheelwash and disposal of silt at off-site landfill facility (assume 5 tonnes solid waste)	Item	Sum	2,000	2,000	Enva
Emptying of septic tank and disposal of solid waste (10 tonnes) at off-site facility	Item	Sum	1000	1,000	Enva

SLR Consulting Ireland

ACTIVITY	QUANTITY	UNITS	RATE (€)	COST (€)	SOURCE
Re-profile and grade upper surface of in-situ soils to create stable landform and facilitate surface water drainage	120,000	m <sup>2</sup>	0.65	78,000	NRA / Landscape Contractors* / McCabes Mile River Ltd
Continued pumping of surface water run-off and dewatered groundwater from part backfilled quarry to settlement ponds / interceptor (upper bound energy consumption of 200,000 kWh/yr for 3 years)	600,000	kWh	0.125c / kWh	75,000	Electric Ireland
Off-site transfer and recovery / disposal of non-inert material	250	m <sup>3</sup>	100	25,000	Rilta
Environmental Monitoring of Noise, Dust, Water (Quarterly for 3 year period, incl. closure works)	12	No.	1,500	18,000	SLR IE
24 hour manned security cover (during works and/or following unexpected closure or abandonment)	Month	36	13,500	486,000	TOP Security
Provision of security patrolling vehicle	Month	36	800	28,800	TOP Security
Provision of utilities to security office (light / heat / water)	Month	36	500	18,000	Electric Ireland / Irish Water
Closure Validation Report	Item	Sum	5,000	5,000	SLR IE
<b>Total Site Closure Cost (excl. VAT)</b>				<b>€794,250</b>	
15% Contingency (to address unforeseen issues / liabilities)				119,137.50	
<b>Total Site Closure Cost (excl. VAT)</b>				<b>€913,387.50</b>	

\* O'Brien Landscaping / Redlough Landscapes

### **3.4 Closure Plan Update and Review**

As required by the waste licence conditions, this Closure Plan will be reviewed annually and updated where necessary to take account of any facility or process changes, technology changes and costing changes (inflation). Details of the review will be included in the Annual Environmental Report (AER) submission to the EPA.

### **3.5 Closure Plan Implementation**

Quarry backfilling activity is currently projected to be complete within the life of the existing planning permission (i.e. 20 years). If an average importation rate of 400,000 tonnes / year, is assumed, the expected operational life of the waste recovery facility at Huntstown is 18 years. In reality, the timeline for backfilling the quarry void is very dependent on the availability of inert soil and stone generated by off-site construction activity locally and will be subject to ongoing review and change.

The EPA will be given 2 months notice of any proposed temporary closure or suspension of activities and 6 months notice of the intended final closure date. Notice will be provided in accordance with prevailing guidance and it is anticipated that there will also be ongoing discussions with the EPA in respect of required closure procedures.

### **3.6 Closure Plan Validation**

A validation report (including a Certificate of Completion in respect of the Closure Plan) will be submitted to the Agency within 3 months of completion of the works provided for above.

The validation audit will be undertaken by an independent, external environmental Consultant. The final validation report will include:

- an assessment of how the objectives of the Closure Plan have been achieved;
- final 'as-closed' drawings and photographs of the facility;
- results of short-term environmental monitoring undertaken over the closure works period (note however that provision is made for an extended monitoring period thereafter);
- a Certificate of Completion for the CRAMP.



## **4.0 FACILITY RESTORATION AND AFTERCARE**

### **4.1 Facility Restoration**

The waste recovery activities at Huntstown primarily provide for the backfilling of a large void created by extraction of bedrock at the site using imported inert soil and stone and some in-situ stockpiled soil. Backfilling of the quarry void will facilitate restoration of the North Quarry to natural grassland habitat.

The operational life of the recovery facility is anticipated to be approximately 18-20 years and is ultimately contingent on the availability of inert soil waste from local development projects. On planned completion of the final phase of backfilling, much of the work required to achieve the final closure and restoration of the waste facility will already have been completed. It is expected that the final restoration of the waste recovery areas to natural grassland habitat will be completed within a period of 12 months following closure.

In addition to the closure tasks identified previously, the following works will be undertaken during the restoration and aftercare phase

- Progressive decommissioning of any site infrastructure used solely for waste recovery activities;
- Break up of any dedicated hard standing or paved surfaces using a hydraulic breaker;
- Classification testing of construction and demolition wastes;
- Removal of construction and demolition wastes off-site to appropriate construction and demolition waste recovery facility;
- Final grading of the backfilled materials within the quarry void to create the approved restoration landform / slope;
- On-going water management of surface water run-off;
- Backfilling of settlement ponds and decommissioning of all dedicated on-site drainage infrastructure;
- Topsoiling and seeding of the final landform / slope to facilitate development of natural grassland habitat;
- Additional planting around the infilled quarry void to separate the restored area from continuing concrete and asphalt production activities.
- Attendance by security staff (with a patrolling vehicle) at the facility for the duration of the aftercare works.

Further details on the proposed final earthworks and tree planting are provided below.

### **4.2 Backfilling / Earthworks / Grass Seeding**

The backfilling of the former quarry area will proceed upwards, either continually at varying rates or on an intermittent (campaign) basis, as waste material is generated by local development works. In addition to imported materials, small volumes of soil stockpiled in existing berms around the quarry void will also be used to backfill the former quarry.

The quarry void will be backfilled in several phases working upwards from the existing quarry floor at approximately 38mOD to 39mOD. Final formation levels on completion of the backfilling and restoration works will vary on account of the sloped nature of the restored landform, from approximately 85mOD on the eastern side up to 85mOD on the western side.

During site restoration works, the upper surface of the backfilled materials will be graded so as to ensure surface water run-off falls to sumps at temporary low points within the final worked-out quarry. Water will be pumped from these temporary sumps as and when

required to existing channels and settlement ponds / treatment infrastructure at the original ground surface. Treated effluent will be discharged off-site to a tributary stream of the Ward River.

Temporary access ramps into and out of active backfilling areas will be at a gradient of approximately 1v:10h. Temporary side slopes in soil will be constructed at gradients no greater (steeper) than 1v:1.5h in order to ensure stability. On completion, final gradients across the restored ground surface will be relatively shallow, typically of the order of 1v:8v or less.

Topsoil and subsoil will be imported to the site on a continual basis and will not be used immediately in general backfilling of the worked-out quarry. The topsoil and subsoil will be stockpiled separately pending re-use toward the latter stages of the quarry backfilling works, when the top surface of backfilled ground approaches the finished ground levels envisaged by the restoration scheme.

The licence area will be restored on completion of backfilling operations and will merge better into the surrounding suburban landscape. On attaining the planned final level, the final landform will be graded, rolled and compacted as provided for in the closure plan. Thereafter a cover layer of subsoil and topsoil will be placed and graded across the backfilled site. It is likely that this cover will comprise up to 300mm of topsoil over subsoil, such that total thickness of topsoil and subsoil will be at least 1m.

The upper (ground) surface will then be rolled and seeded with grass in order to promote stability, minimise soil erosion and dust generation and establish a natural grassland habitat. The proposed restoration scheme also envisages that hedgerows will be planted across the restored area in an effort to re-establish some of the former field boundaries which pre-dated the development of a quarry in the area.

It is envisaged that the final restoration works across the waste recovery site will be completed within 9 to 12 months of facility closure and final cessation of waste recovery activities. Following seeding, the restored surface will be inspected at intervals in order to identify areas of bare soil or poorly established vegetation growth. In these areas, additional seeding will be undertaken as necessary to improve vegetation coverage.

In order to ensure that there is no long-term conflict with established / ongoing production activities following completion of restoration works, the restored area will be largely be left as managed grassland and/or natural habitat.

#### **4.3 Aftercare Management**

On completion of facility closure and restoration works, provision will also be made for subsequent short-term environmental monitoring of air, surface water and groundwater to confirm that there is no evidence of soil or groundwater contamination. Established in-situ groundwater monitoring wells will be maintained and will continue in service.

It is expected that following the aftercare phase, there should be no constraints on future land use associated with soil or groundwater contamination or on future use of any structures remaining in-situ.

The process of surrendering the waste licence to the EPA will progress following the aftercare period in order to remove the legal encumbrance on title deeds to the restored lands and shared infrastructure areas.

#### **4.3.1 Short-Term Aftercare Management**

The restoration aftercare management plan for the Huntstown waste recovery facility will comprise three principal short-term activities:

##### *Environmental Monitoring*

As previously stated, short-term environmental monitoring of air, surface water and groundwater (for up to 5 years) will be undertaken by the Licensee to ensure that no surface / groundwater contamination is present / emerging following closure of the waste recovery facility and completion of the restoration works.

##### *Maintenance of Planted Hedgerows*

Following establishment of the hedgerow planting, it is envisaged that a programme of established maintenance will be required for a period of up to 24 months after the initial planting. This will be undertaken by a landscaping contractor and will include activities such as weed control, formative pruning and/or removal of deadwood, watering (as and if required) and adjustment of ties and stakes.

##### *Maintenance of Grass Sward*

The aftercare of the grass sward will be as per grass supplier's instructions, consistent with the intended creation of a natural grassland habitat within the restored area. Initial maintenance following restoration after each phase of backfilling (principally cutting) will be overseen by the waste facility manager at Huntstown or by other designated Roadstone staff nominated by the manager.

After final restoration works have been completed and the aftercare period has elapsed, the land will be left as a natural grassland habitat.

#### **4.3.2 Long Term Aftercare Management**

Given the inert nature of the soil and stone material used to backfill the quarry area and the proposed return of the backfilled areas to natural grassland habitat, it is considered that no long-term aftercare monitoring and maintenance will be required for the waste recovery facility at Huntstown.

#### **4.4 Final Restoration and Aftercare Management Costs**

The expected cost, associated with the site restoration and aftercare management, are outlined in Table 3 overleaf.



**Table 3**  
**Restoration and Aftercare Costs (based on 5 Year Aftercare Period)**

ACTIVITY	QUANTITY	UNITS	RATE (€)	COST (€)	SOURCE
Breaking up of pavement and hard-standing surfaces (using hydraulic breaker),	200	m <sup>3</sup>	15	3,000	McCabes Mile River Ltd.
Validation testing to classify C&D waste	20	sample	150	3,000	SLR IE
Transfer C&D waste to off-site recovery facility (incl. haulage)	500	tonne	9	4,500	McCabes Mile River Ltd
5 year environmental monitoring (at quarterly intervals)	20	No.	1,500	30,000	SLR IE
Backfill settlement ponds	5,000	m <sup>3</sup>	5	25,000	NRA Rates
Final placement of topsoil (assumed to be previously imported and stockpiled on site) (up to 300mm)	12	ha	9,000	108,000	Landscape Contractors*
Surface water management costs (pumping from temporary sumps to settlement ponds for 1 year)	Item	Sum	36,000	36,000	McCabes Mile River Ltd.
Decommission / remove pumping equipment and flexible pipeline infrastructure (total length 2,000m)	Item	Sum	4,000	4,000	McCabes Mile River Ltd.
Empty interceptor and tanker waste off-site	Item	Sum	1,000	1,000	Envva
Surface preparation, grass seeding, ground repair and spraying	12	ha	6,000	72,000	Landscape Contractors*
Post and wire perimeter fencing (3,600m at €5/m)	3,600	m	5	18,000	Landscape Contractors*
Hedgerow Planting (Ground preparation, supply of plants and planting works)	3,600	m	5	18,000	Landscape Contractors*
24 months establishment maintenance for grassland / hedgerows	2	years	15,000	30,000	Landscape Contractors*
Preparation of Waste Licence Surrender application	Item	Sum	4,000	4,000	SLR IE
Surrender of Waste Licence to EPA	Item	Sum	6,000	6,000	EPA
24 hour manned security cover (during restoration works)	Month	12	13,500	162,000	TOP Security

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CRAMP – Huntstown Inert Waste Recovery Facility

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ACTIVITY	QUANTITY	UNITS	RATE (€)	COST (€)	SOURCE
Provision of security patrolling vehicle	Month	12	800	9,600	TOP Security
Provision of utilities to security office (light / heat / water)	Month	12	500	6,000	ESB / Irish Water
<b>Total Restoration and Aftercare Cost (excl. VAT)</b>				<b>€540,100</b>	
15% Contingency (to address unforeseen issues / liabilities)				81,015	
<b>Total Restoration and Aftercare Cost (excl. VAT)</b>				<b>€621,115</b>	

• O'Brien Landscaping / Redlough Landscapes

SLR Consulting Ireland

#### **4.4.1 Closure Plan Costs**

The anticipated cost of the planned facility closure following completion of projected soil intake is **€913,387.50** (present day value and incl 15% contingency), as outlined in Table 2 of this plan. As previously indicated, the plan envisages that the proposed waste recovery facility will achieve a clean closure, such that, following cessation of inert soil waste intake and recovery activities and the subsequent decommissioning / removal of plant and waste infrastructure from the facility, no remaining environmental liabilities will attach to restored areas of the site and/or areas where the principal waste recovery activities are located.

#### **4.4.2 Site Restoration and Aftercare Management Costs**

The anticipated costs of the site restoration and aftercare management, outlined in Table 3 of this plan, comes to a total of **€621,115** (present day value and incl. 15% contingency). These costs are based on a projected 5 year aftercare management period, with no provision for long-term aftercare monitoring and maintenance thereafter.

#### **4.5 Financial Provision**

Subject to Agency approval and agreement, Roadstone Ltd. will make financial provision for the closure and restoration of the waste recovery facility at Huntstown by lodging an insurance company bond with the Agency, coupled with an agreement which will empower it to apply such security (or part thereof as may be required) to ensure the satisfactory completion of site restoration and aftercare works at Huntstown.

The initial amount of the bond will be agreed with the Agency on the basis of the assessments provided in this plan and will be adjusted as necessary each year thereafter to take account of ongoing review and revisions of the CRAMP.



## **5.0 REPORT CLOSURE**

This report has been prepared by SLR Consulting Ireland (SLR) with all reasonable skill, care and diligence, and taking account of the manpower and resources devoted to it by agreement with the client. Information reported herein is based on the interpretation of data collected and has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of Roadstone Ltd. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

**FIGURES**

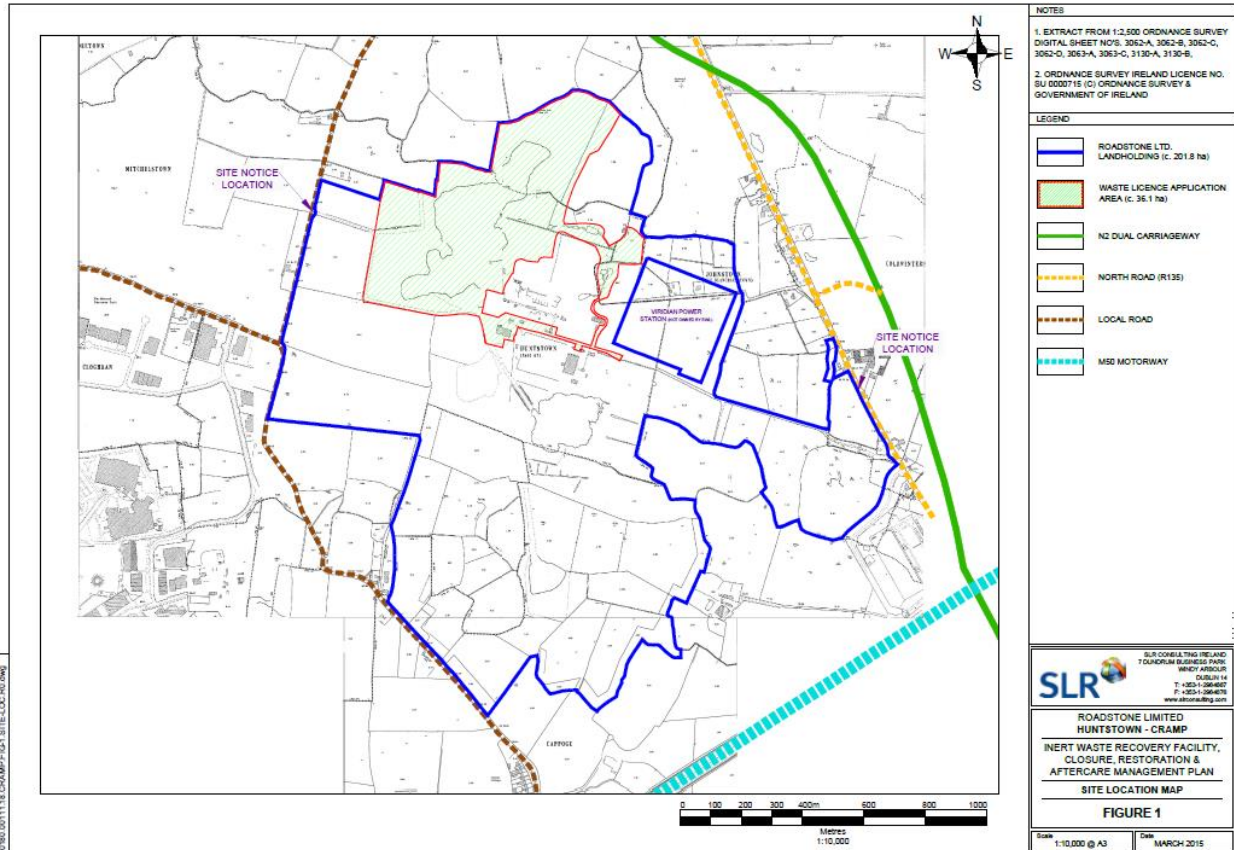
**Figure 1  
Site Location Map**

**Figure 2  
Existing Site Layout**

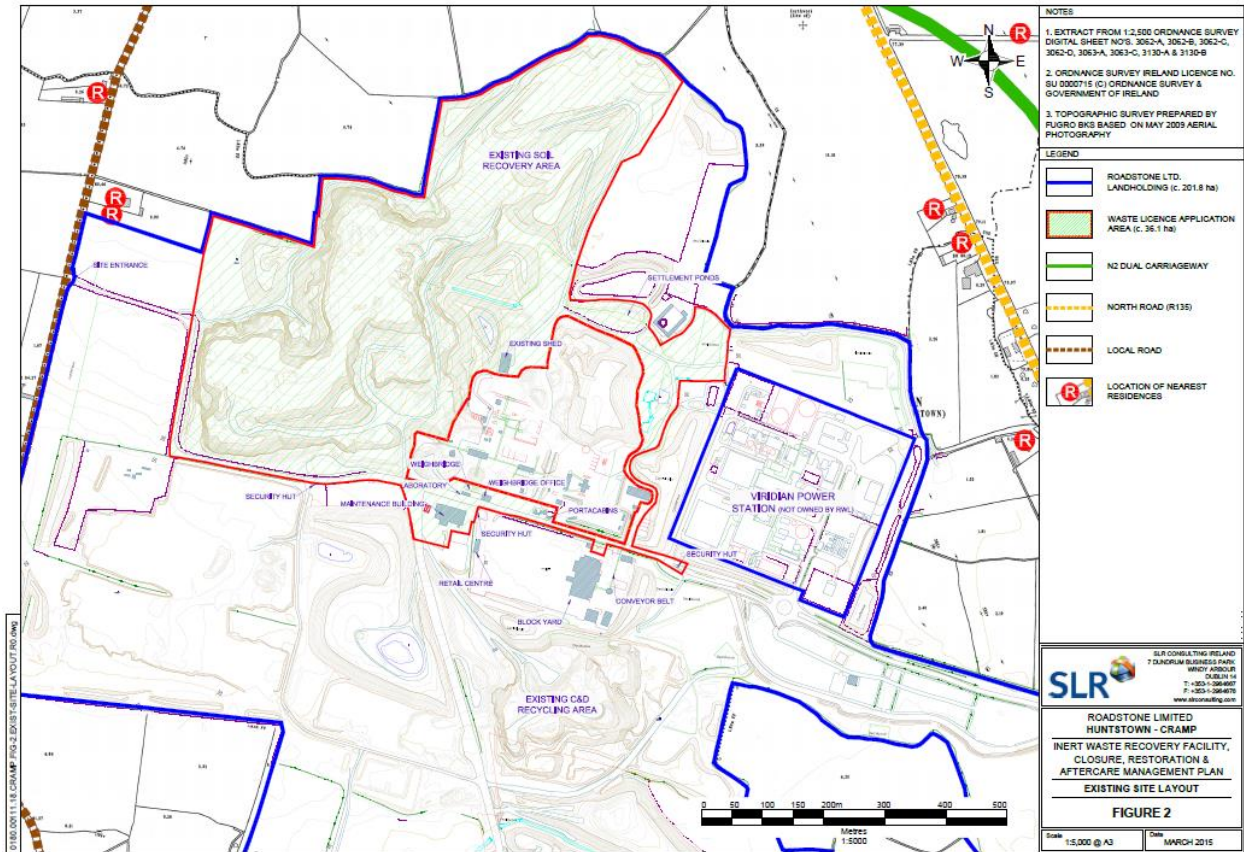
**Figure 3  
Environmental Monitoring Locations**

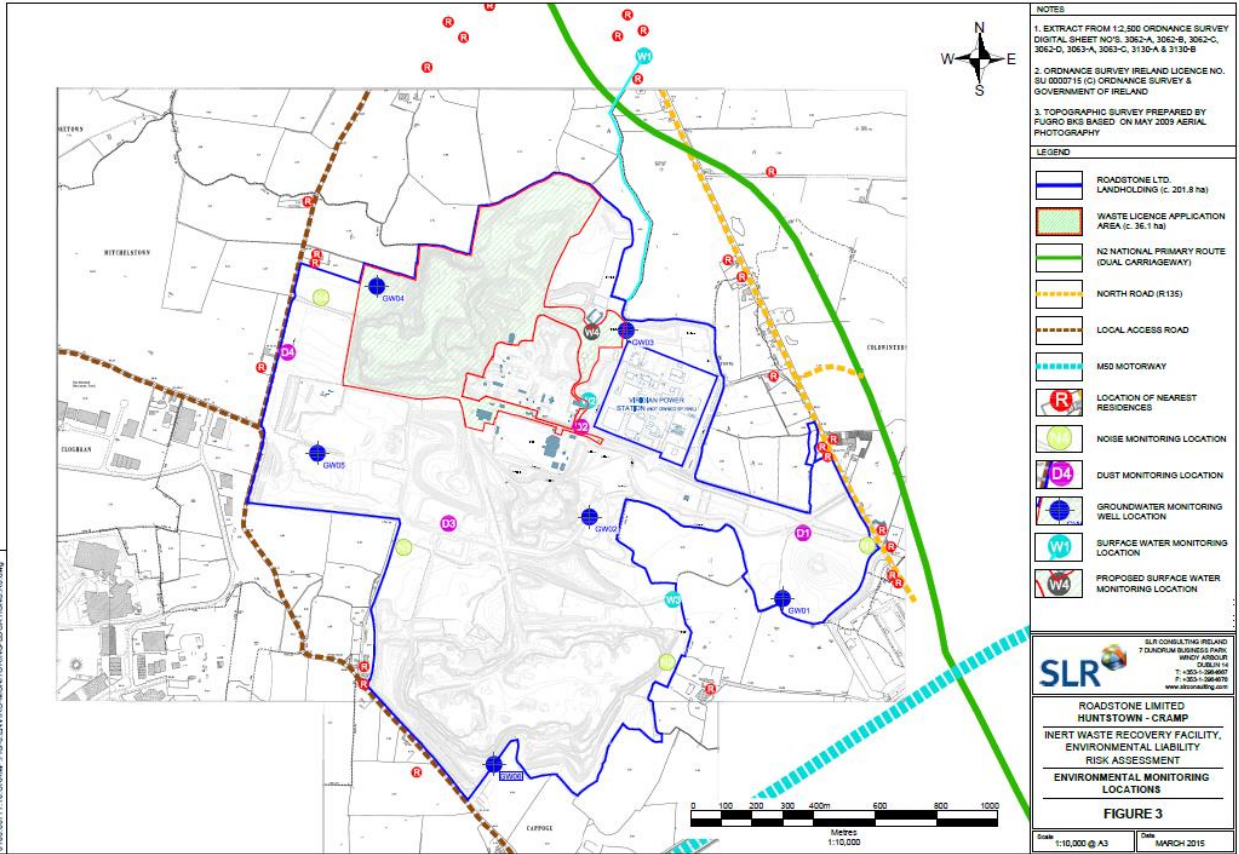
**Figure 4  
Restoration Proposals**

**Figure 5  
Restored Cross Sections**

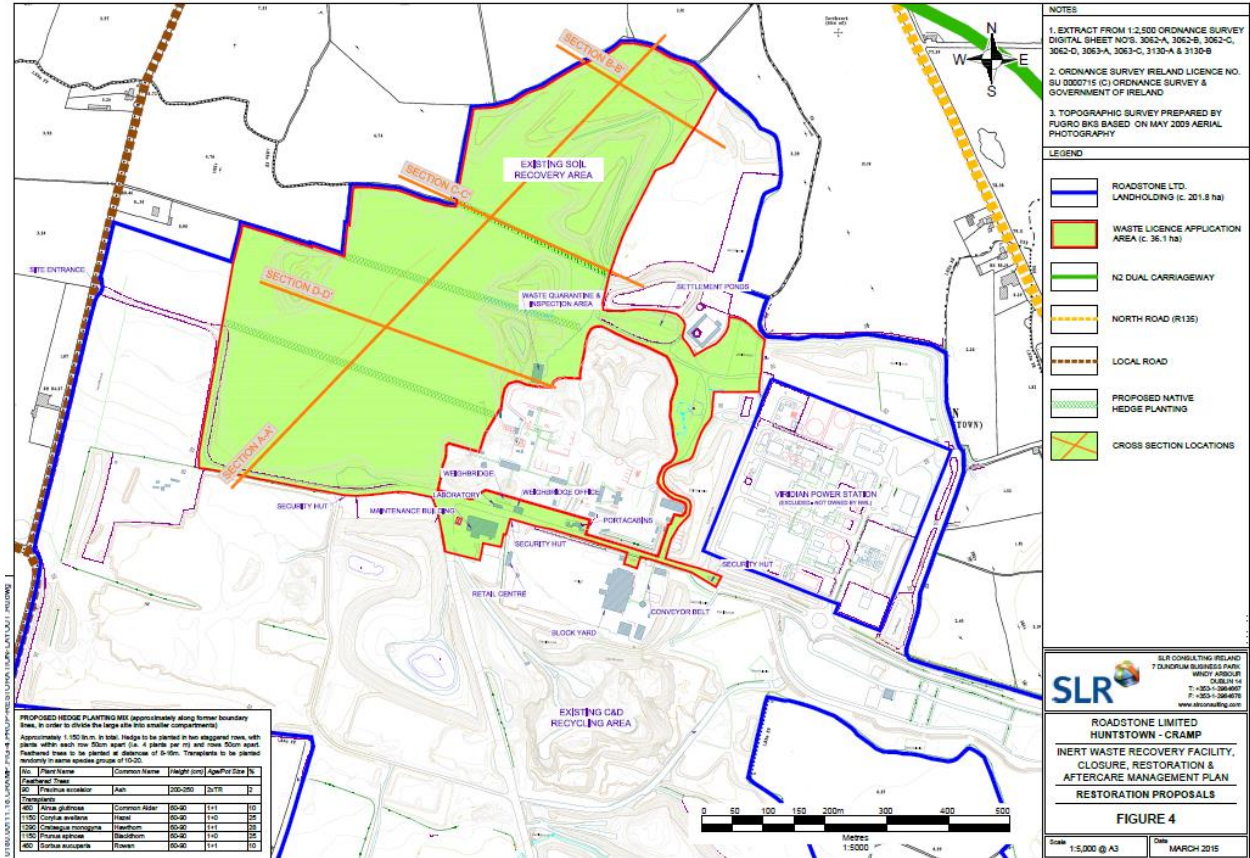


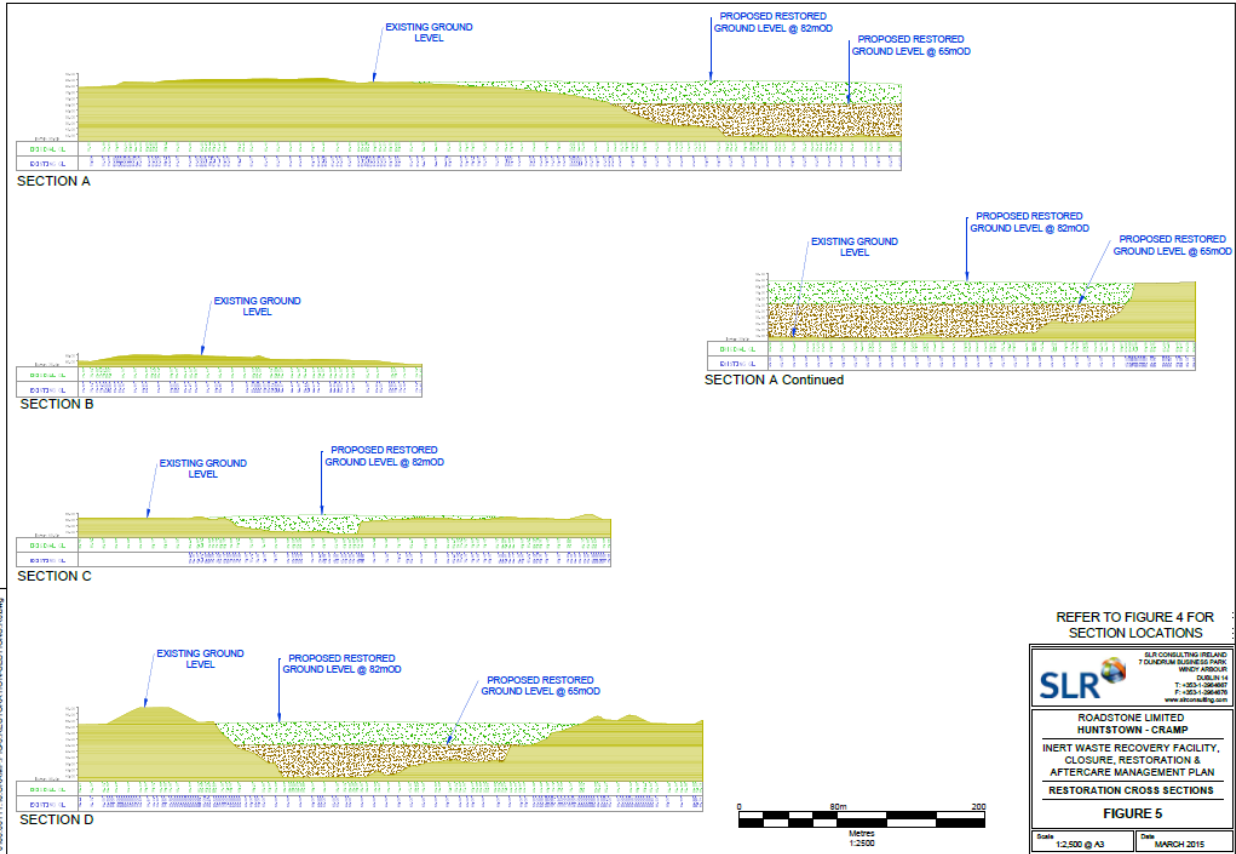












# **Section 16: Environmental Liabilities Risk Assessment Review**

**Waste Licence Compliance  
(W0277-01)**

**Inert Waste Recovery Facility  
Huntstown  
Finglas  
Dublin 11**



## **Environmental Liabilities Risk Assessment**

**Final Report**

28 August 2015

Ms. Lisa Maher, Inspector  
Office of Environmental Enforcement  
Environmental Protection Agency Regional Office  
McCumiskey House  
Richview  
Clonskeagh  
Dublin D14 YR62

Our Ref : 501.00180.00111  
Your Ref : W0277-01

Dear Ms Maher

**Re: Roadstone Ltd. Soil Waste Recovery Facility Huntstown, Finglas, Dublin 11  
Reply to Comments in Respect of ELRA Submission : (Ref. No. W0277-01)**

This letter is submitted in response to comments issued by the EPA Office of Environmental Enforcement (OEE) via EDEN on 20 August last in respect of an Environmental Liability Risk Assessment (ELRA) previously submitted to it in respect of the licensed inert soil recovery facility on lands owned by Roadstone Ltd. at Huntstown Quarry, Finglas, Dublin 11.

This response, prepared by SLR Consulting Ireland, presents and addresses the queries and comments in the same order as they are raised in the EPA's communication to Roadstone Limited of 20 August.

**Comment 1 : Two storage tanks are present at the facility (53,000 litre marked diesel (gasoline) tank and 40,000 litre road diesel tank). Confirm if these tanks are bunded?**

Both of these fuels storage tanks are fully bunded to 110% of the storage volume by a steel bund.

**Comment 2 : Confirm the maximum volume of other hazardous material stored onsite (i.e. the maximum quantities which could be lost during an incident) and confirm if these materials are stored and handled in a bunded area?**

The hazardous materials stored within the licensed waste site are listed in Table A below. All of these materials are stored and handled within the maintenance building within a bunded structures.area. :

**Table A  
Inventory of Hazardous Materials Stred at Huntstown Waste Recovery Facility**

Type	Storage Area	Storage Type	Maximum Storage Capacity	Measurement Unit
Road Diesel	External Tanks	Bunded Tank	40,000	Litres
Marked Diesel (Gasoil)	External Tanks	Bunded Tank	53,000	Litres
Diesel Engine Lubricant	Back Room in Maintenance Shed	Double Skinned Steel Tank	2,730 (600 gallon)	Litres

Type	Storage Area	Storage Type	Maximum Storage Capacity	Measurement Unit
Hydraulic Oil	Back Room in Maintenance Shed	Double Skinned Steel Tank	2,730 (600 gallon)	Litres
Transmission Fluid	Back Room in Maintenance Shed	Double Skinned Steel Tank	1,365 (300 gallon)	Litres
Waste Oil	Back Room in Maintenance Shed	Double Skinned Steel Tank	2,730 (600 gallon)	Litres
Hydrocarbon Fluids and Gels	Maintenance Shed	Bunded Area or Bunded Tanks	200 litres	Litres

**Comment 3 : Provide a site layout which shows the locations of all the potential contamination sources identified within the submission (i.e. tanks, material storage areas, refuelling areas, etc.) and which outlines the potential pathways (i.e. surface water drainage arrangements – interceptors, settlement lagoons, surface water discharge point and the quarry void) and receptors impacted (i.e. the receiving waterbodies). Ensure the location of hardstand areas is also outlined.**

The storage locations for all the hazardous materials and potential contamination sources at the licensed site are shown in Figure A which accompanies this response. As can be seen, the refuelling and plant maintenance / service areas and the storage facilities for all associated potentially contaminating fuels, lubricants, oils and fluids are located in a single area immediately inside the southern boundary of the licensed site. This entire area is underlain by concrete pavement as also indicated in Figure A.

Any surface water run-off around the fuel storage tanks will fall over the paved ground surface to be captured by a sump located adjacent to the storage tanks. It will then flow under gravity in a pipe leading to an existing 10,000 litre hydrocarbon interceptor located immediately downgradient and, from there, via a dedicated pipe directly to the settlement pond behind the eastern quarry face, at the northern end of the licenced area, refer to Figure B.

Surface water run-off across all other paved and hardstand areas within the licensed area (shown in Figure A) will flow over ground, down to the floor of the North Quarry, where it collects at a low point in a large sump excavated into the limestone rock. Run-off (and any dewatered groundwater) collected in this sump will then be pumped in a number of lifts back up to the original ground surface level, to the settlement pond behind the eastern quarry face.

All water exiting the settlement pond will flow south along an existing drainage channel, to another network of settlement ponds, located further downstream and east of the Huntstown Power Station. After flowing through this system, the run-off will head north to pass through a 10,000 litre hydrocarbon interceptor immediately prior to being discharged to the Ballystrahan Stream. Monitoring of surface water discharge to the Ballystrahan Stream over recent years confirms that it is in compliance with discharge limits set by the Local Authority discharge licence (Ref. WPW/F/00008-01).

It is planned that monitoring of discharge from the dedicated settlement pond which accepts inflow from the North Quarry will be commenced once infilling / backfilling of the quarry using imported inert soil commences.

The location of all interceptors, sumps, settlement ponds, drains / drainage channels, the existing discharge point and surface water monitoring points (existing and proposed) around the licenced site is shown on Figure B.

The principal receptors which could potentially be adversely impacted by a fuel spill at the licenced area include

- the underlying bedrock aquifer
- site operatives and visitors and
- the Ballystrahan Stream.

**Comment 4 : Detail the surface water protection measures in place at the site.**

Surface water protection measures in place around the licensed site are outlined in the response to Comment 3 presented above. More general surface water protection measures outlined in the EIS which accompanied the waste licence application include

- all plant will be regularly maintained and inspected daily for leaks of fuels, lubricating oil or other contaminating liquids/liquors;
- refuelling of vehicles will either be undertaken at a surfaced (paved) area from a fuel tank that is bunded or from a mobile double skinned fuel bowser in order to minimise the risk of uncontrolled release of polluting liquids / liquors;
- maintenance of plant and machinery will be undertaken within existing site maintenance sheds or off-site, as appropriate, to minimise the risk of uncontrolled release of polluting liquids;
- spill kits are available on-site to stop the migration of spillages, should they occur;
- an emergency response protocol has been developed as part of the Licensee's Environmental Management System (EMS). Site based staff are regularly reminded and updated about this during environmental / safety briefings;
- any ponded areas on the quarry / infilled floor area will be drained prior to being backfilled with soil in order to minimise mobilisation of fines;
- the source of all imported soil waste loads will be verified prior to acceptance at the facility
- all imported waste loads will be subject to visual and olfactory inspection to confirm they are inert prior to being unloaded at the facility;
- all surface water run-off collected in sumps will be passed through via settlement ponds and/or interceptor tanks prior to discharge to surface watercourses (primarily in order to reduce concentration of suspended solids and hydrocarbons).
- a traffic management system will be put in place to reduce the potential conflicts between vehicles, thereby reducing the risk of a collision;
- a site speed limit is prescribed in order to further reduce the likelihood and significance of any potential collision.

Most of the above listed measures have been incorporated into conditions in respect of facility management, site infrastructure, waste handling, emissions, monitoring and control attaching to the waste licence issued in respect of the facility. All licence conditions will be adhered to in the management and operation of the recovery facility.

**Comment 5 : Regarding the historic incident detailed in Section 2.2.3 of the submission, clarify if this incident involved any part of the waste licensed area?**

The fuel spill highlighted in Section 2.2.3 occurred at the paved refuelling area at the southern end of the licenced area. There was no direct impact to the ground or groundwater underlying the licensed site or to the Ballystrahan Stream arising out of this incident.

**Comment 6 : The scenario assumes that 80% of any fuel release will run-off over the ground and that 20% will percolate to ground. Provide justification for this assumption.**

The loss or uncontrolled release of a large volume of fuel, as assumed in the worst case scenario, will occur above ground. As the area around the fuel storage is generally paved and in good condition, it was considered that **at least** 80% of the fuel release would run over ground as the paved surface would largely impede any percolation or recharge to groundwater.

Although it is likely that a higher proportion could run-off over the ground surface to the surface water drainage network / system, it was considered prudent in costing up a worst case scenario to recognise that there could also be some infiltration to ground via unpaved ground (hardstanding) surrounding this area and to incorporate some financial provision for remediation of ground and/or groundwater contamination.

In light of Agency feedback, it is assumed for worst case scenario costing that 100% of released fuel will be captured in the surface water drainage regime, though some contingency costing will also be made for investigation and treatment of potential ground / groundwater contamination.



**Comment 7 : The scenario costed assumes that the spilled hydrocarbons were retained on-site at the settlement ponds immediately upstream of the hydrocarbon interceptor and were prevented from discharging from the site. The ELRA must consider that it is not only about the containment systems onsite but must also consider what would occur if these were to fail and the associated environmental impact to the receiving media. Therefore, the cost for losses to surface water must be considered. In this regard, outline the pathway and receptors that would be impacted in this scenario and the associated costs.**

For a worst case scenario, assuming that the on-site emergency response and drainage infrastructure failed to fully contain the released fuel oil on-site, allowance is also made for an escape of some fuel oil off-site and an assessment has been made of the potential environmental impact on off-site receptors. An assessment of the volume of fuel oil that could escape the site is presented in Table B below.

**Table B  
 Calculation of Fuel Volumes**

Description	Litres of Fuel Remaining
Volume of Fuel Released	53,000
Volume of Fuel Reaching Surface Water Drainage System (100%)	53,000
Assume 50% of fuel escapes from on-site drainage infrastructure between storage tanks and discharge point	26,500
Fuel discharged off site, past discharge point	26,500

The total volume of fuel oil released in a worst case scenario is taken to be 53,000 litres (or 53m<sup>3</sup>). In light of Agency feedback and for scenario planning purposes, it is assumed that 50% of this fuel volume could escape on-site drainage infrastructure (26,500 litres or 26.5m<sup>3</sup>) including the upstream interceptor, sumps, drainage channels, settlement pond and interceptor immediately upstream of the discharge point. Therefore, in a worst case scenario, it is assumed that 26,500 litres (26.5m<sup>3</sup>) of fuel oil could escape off-site from the hydrocarbon interceptor immediately upstream of the discharge point.

Based on the assumption that 26,500 litres of fuel oil could escape from the site, a Conceptual Site Model (CSM) has been developed to assess the potential environmental impact associated with this scenario. The CSM is presented in Table C below.

Risk can be defined as “the chance of a defined hazard occurring and achieving its potential”. Reference to documentation (CLR 11)<sup>1</sup> by the Environment Agency in the UK indicates that there must be a pollutant linkage between the source of pollution and the receptor, in order for harm to human beings or the environment to occur. The pollutant linkage comprises:

- A **Source** of pollution (contaminant);
- A **Pathway** for the pollutant to move from source to receptor and
- A **Receptor** (target), which is affected by the pollutant. The EPA advises that key receptors include human beings, groundwater, surface water, air quality, protected ecological sites and sensitive agricultural receptors.

The CSM is based on the ‘source-pathway-receptor’ pollution linkage concept. For a potential risk to arise each stage of the pollution, linkage must be present.

### Sources

The following potential source has been considered in the assessment:

- Release of 26,500 litres of fuel oil from the site.

<sup>1</sup> Environment Agency (UK). Model Procedures for the Management of Land Contamination (CLR 11)



### **Receptors**

Based on the scenario outlined above, the following receptors may be adversely affected by the potential contaminant source(s) noted above:

- Surface water – Ballystrahan Stream and River Ward;
- Livestock – grazing cattle;
- Human health – direct contact and/or ingestion.

Any fuel escaping the licensed area will exit at the existing discharge point DPI. Water discharged at DPI typically comprises incident rainwater and influent groundwater from the North Quarry. Estimates of average daily discharge at this location range from 1,870m<sup>3</sup>/d to 3,710 m<sup>3</sup>/d compared to a potential release of 25.6m<sup>3</sup> of fuel.

Downstream of the interceptor, treated water discharges to a drain and to the Ballystrahan Stream. This stream merges with the Ward River over 5km to the north-east of the discharge point. The northern portion of the Ward River (known as the Ballystrahan sub-catchment) is classified in the latest assessment of Ireland's rivers (EPA, 2010) as being at 'Poor Status'. The River Ward itself has a median Q-rating of 2-3 (unsatisfactory). Siltation by agriculture and urban wastewater discharges are believed to be the principal contributors to reduced water quality in the river.

The Ward River eventually discharges at the Malahide Estuary, a designated Special Area of Conservation (SAC) and Special Protection Area (SPA) a further 7.5km downstream. The transitional waters of this estuary are currently classified as 'Potentially Eutrophic' principally on account of agricultural and industrial / wastewater discharges.

In view of the significant separation distance (12.5km) between the SAC / SPA and the licensed area, the volume of potential fuel discharge off-site (relative to overall quarry discharge volume and baseline flow) and the current 'Poor' status of both the Ward River and Malahide Estuary, it is considered unlikely that the SAC / SPA will be impacted by any spillage originating at the licensed area. For the purposes of this CSM therefore, the SAC / SPA is not identified as a receptor.

The area surrounding the licensed area is served by Local Authority mains water supply. There is no known abstraction of potable water (for human consumption) from the Ballystrahan Stream. There is also unlikely to be any from the Ward River, given its current 'Poor Status' classification.

### **Pathways**

Pathways are the means by which a receptor is likely to come into contact with a source. In a worst case scenario, assuming failure of all on-site mitigation measures and emergency response systems, it is projected that any fuel released from the storage tanks could migrate off-site to the Ballystrahan Stream, and in turn to the Ward River. The main pathways that could link potential sources with receptors identified are considered to be:

- Lateral migration of fuel along the channel of the Ballystrahan Stream and Ward River;
- Lateral migration of fuel to downstream agricultural areas, and;
- Direct contact with, or ingestion of, impacted surface water by livestock or public.

**Pollutant Linkage Assessment**

The purpose of the Pollutant Linkage Assessment is to determine which of the source-pathway-receptor relationships could potentially be complete in the event of a spill and therefore likely to pose a significant risk to identified receptors. Table C below details the initial source-pathway-receptor assessment for the potential sources at the licensed area. The qualitative risk assessment has considered the following risk levels:

**Table C  
 Conceptual Site Model**

Potential Contaminants/ Sources	Migration/Pathways	Receptors	Risk Assessment
Release of 26,500 litres of fuel oil from the site	Migration of fuel oil via discharge point to drain	Ballystrahan Stream and River Ward	<b>Moderate - High</b> Fuel oil could impact on sediments on the river banks and reduce surface water quality
	Migration of fuel oil downstream via surface water bodies, direct contact	Agricultural Livestock	<b>Low - Moderate</b> Agricultural livestock on farmland downstream of the discharge point could come into direct contact with fuel oil on surface water or on river bank.
	Migration of fuel oil downstream via surface water bodies, direct contact	Members of Public	<b>Low</b> Members of the public are not known to use the surface water bodies for drinking or recreational purposes.

In a worst case scenario, any off-site fuel release would give rise to remediation costs as a result of potential adverse impacts on the Ballystrahan Stream and the Ward River, where the environmental risks are considered to be Moderate to High. These costs are principally associated with engaging a remediation contractor to install and maintain booms across the river and to excavate and remove any of impacted sediment on the river bank. Verification sampling of river bank sediments has also been allowed for.

**RESPONSE TO COMMENTS IN RESPECT OF COSTINGS IN TABLE 1**

**The Agency does not consider that the amount provided for in Table 5-1 Quantification and Costing of Plausible Worst Case Scenario, is adequate to cover an incident of this nature. The following points from Table 5-1 require clarification/revision (Rows are referenced for ease of identification). Row 1 : 2 No. days for onsite spill containment and clean-up by an emergency response contractor is considered too low. Following consultation with emergency response contractors, revise the number of days required.**

In light of Agency feedback, the number of days allowed for spill containment has been increased to 5 days.

**Row 3 : the number of soil samples tested (20 No.) is considered too low. Revise the number of soil samples required.**

In light of Agency feedback, the number of soil samples tested has been increased to 50. It is noted that a high unit rate has been provided for laboratory testing. It is likely that there is scope for the suite of soil quality test parameters to be reduced, with a consequent cost reduction.

**Row 5 and 6 : The frequency (two-monthly) and duration (1 year) of sampling and testing of groundwater is considered too low. Revise the frequency to at least monthly and revise the duration to > 1 year, and having regard for the duration of operation of the pump and treat system (see Row 14 below). Sampling and testing of groundwater should continue for a specified time after removal of the pump and treat system to verify successful remediation.**

In light of the Agency feedback, provision is made for an extension of the environmental monitoring period to five years and for sampling and testing of groundwater at the following frequencies:

- Year 1 -- monthly (12 No. / year)
- Year 2 -- bimonthly (6 No / year)
- Year 3-5 -- quarterly (4 No / year for 3 years).

This results in a total of 30 No. monitoring rounds over a 5 year period.

**Row 7 and 9 : In total 1,000 tonnes of material is going to be excavated and removed off site for treatment. This tonnage is considered low. Of this 600 tonnes, 200 tonnes is classified as hazardous and 400 tonnes is classified as non-hazardous. Provide justification for these tonnages and the 200:400 tonne split. Consideration should be given to the likely presence of captured fuel and absorbents in this material and that all oil wastes have hazardous List of Waste (LoW) entries (Chapter 13).**

In light of Agency feedback, the assumed total tonnage of impacted solid material to excavated and removed off-site is increased from 1,000 tonnes to 3,000 tonnes. The equivalent impacted volume of soil is approximately 1,700m<sup>3</sup>. This is considered to be sufficient to provide for the excavation of all relatively impermeable clay impacted soils along the sides and floors of drainage channels and settlement ponds. For costing purposes, all 3,000 tonnes of assumed impacted materials are conservatively assumed to be hazardous.

**Row 7, 8, 9, 10 : The unit rates (Haz - €120 + €15 and Non-Haz - €60 & €15) specified are considered too low as this is required to cover the cost of excavation, transportation and treatment/disposal of the contaminated material. Ensure these costs are fully described and include a full breakdown of costs.**

In light of Agency feedback, and as previously indicated, for costing purposes, all excavated soils and sludges are conservatively assumed to be classified as hazardous. It is also conservatively assumed that all excavated contaminated soils will be disposed to landfill and accordingly the unit rate for excavation and disposal has been increased to €150/tonne in Table 5.1. This provides for both the gate fee at a landfill facility and a unit rate (of the order of €3 per tonne (equivalent to €6/m<sup>3</sup>) for excavation.

The unit rates for transport indicated in Table 5.1 provide for transfer of impacted material from the licensed area to Dublin Port for export to an international facility.

**Row 11 : The unit rate (€2) specified is considered too low for the importation and placement of uncontaminated soil for backfilling excavated voids. Provide justification for this unit rate with quotations.**

There was an error in the task description in Table 5-1 in that the rate of €2 essentially only provides for the handling and placement of uncontaminated site-won subsoil to backfill the excavated voids – it does not provide for the importation of such soils for backfilling purposes. It is expected that there will be sufficient subsoil / topsoil available on-site to facilitate this activity, be it from berms or mounds formed as the ground was stripped to facilitate quarry development or imported to the recovery facility and stockpiled in the course of backfilling operations. Equivalent rates of between €1.40/m<sup>3</sup> and €3.0/m<sup>3</sup> (or between €0.90 and €1.90 / tonne) were provided by two local landscaping Contractors, Redlough Landscapes and O'Brien Landscaping.

On further review, in response to Agency feedback, we have identified that the NRA cost database from 2006 indicates rates for backfilling of soft spots below cuttings or embankments ranged from €5/m<sup>3</sup> to €20/m<sup>3</sup> (equivalent to between €3.10 and €12.50 / tonne). In view of the fact that these rates applied around the peak of the recent economic boom, these rates are likely to be considerably lower, and a unit rate of €8 per tonne is considered sufficient for this task.

**Row 12 : A total of 500m<sup>3</sup> of captured fuel/contaminated water in the settlement ponds is costed for removal and treatment. The scenario costed and assumptions detail a spillage of 53,000 litres with**

**80% (i.e. 42,420 litres) run-off over the ground surface and full containment in the settlement ponds onsite and 20% (10,600 litres) percolating to ground. The quantity of captured fuel / contaminated water in the settlement ponds is too low and is not supported by the proposed assumptions/scenario. Revise this quantity accordingly. Regard shall be had to bullet point No. 7 above. The unit rate (€120) specified is considered too low as this is required to cover the cost of removal, transportation and treatment/disposal of the captured fuel/contaminated water. Ensure these costs are fully described and include a full breakdown of costs.**

The volume of contaminated liquid to be treated in response to the worst case fuel spillage scenario was conservatively taken to be 10 times the total spill volume (ie. 500,000 litres or 500m<sup>3</sup>). The area of the dedicated settlement pond (too the north of the licensed area) to which any fuel spill would fall / flow is estimated to cover an area of approximately 560m<sup>2</sup> (35m long by 16m wide). Survey information indicates that this pond is relatively shallow (between 1m and 1.5m deep).

In light of Agency feedback, the quantum assumed for removal and treatment of impacted waters at an off-site facility has been increased to 600m<sup>3</sup>. This provides for drainage of the full volume of the settlement pond plus all released fuel and effectively assumes a water depth of around 1m at the time of any contamination incident. The unit rate assumed for removal and treatment of contaminated waters has also been increased to €150 per tonne.

**Row 13 : Provide justification for the unit rate (€2) specified for drain jetting. The unit rate specified appears low.**

The rate previously provided for drain jetting was taken from a previously approved ELRA. It is noted that this rate is within the range of rates (€1.90/m to €2.50/m) advised on the EPA publication '*Guidance on assessing and costing environmental liabilities- Unit cost rates for verification*'. In view of the Agency's comment above, the unit rate for this activity has been increased to €2.50/m. Allowance has also been made for a CCTV survey to confirm the integrity of the drainage system and to locate any localised fuel leaks or contamination which might have occurred along it. A unit rate of €2.50/m has been adopted in respect of this survey.

**Row 14 : Given the high to extreme groundwater vulnerability, the locally important aquifer beneath the site and the potential for private drinking water abstractions in the area. Provide justification for the duration of operation of the pump and treat system for 1 year only.**

The published geological memoir for the eastern region of Ireland indicates that groundwater is generally within 10m of the surface and has an annual fluctuation of less than 5m. Groundwater levels recorded from 2010 to 2011 at Huntstown, indicate that the depth to groundwater is approximately 40m below the existing ground surface. Existing groundwater monitoring data indicates that groundwater dewatering activities at the existing quarry have lowered groundwater levels over a significant area. Based on the distance-drawdown method, it has been estimated that a reduction of 2m in groundwater levels extends c.1.1 km from both the South and North Quarries at Huntstown. Beyond this distance, the water level drawdown will merge with the natural seasonal fluctuation in groundwater levels.

The increased depth to groundwater at Huntstown reduces the vulnerability of the underlying aquifer to a fuel spillage at the surface. Vertical migration of any fuels to the underlying groundwater table will be limited to migration within vertical fractures in the bedrock, which will impede the movement of the fuel spillages. Groundwater levels will remain lowered and so any fuel spill at the Huntstown facility will be contained within the cone of depression created by the existing dewatering regime and contaminant flow will not migrate off site or can be contained on site.

Given the depth to the groundwater table and the presence of the cone of depression, it is considered that no significant impact on the aquifer could arise in the event of a fuel spillage. Private drinking water supplies will not be impacted, as any impact from a fuel spillage will not spread laterally off-site due to the existence of the cone of depression.

In light of this, it is considered reasonable to provide for one year of pumping and treating of any limited groundwater impact which might occur in the event of an uncontrolled spill. A network of groundwater monitoring boreholes are already in place around the perimeter of the Huntstown complex and these can be monitored as required to confirm that no fuel / contaminant migration off-site arises.

**VAT is not required to be included. Revise Table 5-1 accordingly.**

The Agency's comment on VAT is noted and accordingly, VAT has been removed from the quantification and build up of cost provision on Table 5.1 of the amended ELRA.

**No costing has been provided for the installation of a lined holding area for the storage of contaminated material. Detail how it is proposed to contain contaminated material on site prior to dispatch.**

Provision has been made in the scenario costing presented in Table 5.1 for construction of a temporary bunded lined contaminated soil holding area. For costing purposes, a facility providing for temporary storage of up to 1000m<sup>3</sup> (or 1500 tonnes) of excavated contaminated material is assumed. The construction cost, based on a relatively conservative design and SLR experience, is estimated to be of the order of €50,000 (or €50/m<sup>3</sup>).

**Contingency is specified at a rate of 15%. The Agency considers that this value is underestimated. Provide justification of the chosen rate of 15%.**

Provision for 15% contingency was advocated in the 2013 Draft EPA Guidance on Assessing and Costing Environmental Liabilities. However, it is noted that the actual (final) guidance document published in 2014 has recommended allowing for a contingency of 20%. In light of this, the contingency rate has been adjusted upward to 20% as required.

**Examine the implications of the Environmental Liabilities Directive relating to any potential impacts to private drinking water sources (groundwater and surface water abstractions) in the area (i.e. providing alternative drinking water sources).**

Local enquiry has identified only one private groundwater well in the vicinity of the Huntstown Quarry complex, that of the Byrne household located to the south-east of the licensed area.

The GSI national well database records indicate that there are 12 wells or drill holes within 1km of the Huntstown Quarry complex. Of these, only 2 appear to be wells used for groundwater abstraction: one is in the Waulsortian Limestone Formation to the west of the site, and one, also in Waulsortian Formation is to the south of the site.

There is no known abstraction of potable water (for human consumption) from the Ballystrahan Stream. There is also unlikely to be any from the Ward River, given its current 'Poor Status' classification.

As previously noted, existing dewatering operations at Huntstown Quarry have lowered groundwater levels over a significant area and created a cone of depression. As groundwater levels are expected to remain lowered by the pumping regime at the quarry, any fuel spill will be contained within the cone of depression. The existence of the cone of depression will prevent any fuel spillage that does hit the groundwater table from migrating off-site.

In light of the above, it is considered that there will be no potential impacts on any surface water or groundwater abstractions beyond the Licensee's property in the event of a fuel spill at the quarry / licensed area.

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We trust that we have adequately addressed the issues raised in your communication dated 20<sup>th</sup> August last and that you can now approve the ELRA so that the necessary financial provisions can be put in place. Should you wish to discuss any of the points raised in this response in more detail, please contact the undersigned.

Yours sincerely,  
**For SLR Consulting (Ireland)**



Derek Luby  
Technical Director

cc. Shane Geraghty - Roadstone Ltd.

