

ATTACHMENT E2 – EMISSIONS TO SURFACE WATER

Surface Water Environment

The Huntstown Quarry complex straddles two river catchments, that of the Ward River to the north and the Tolka River to the south, with approximately equal areas of the overall Roadstone landholding in each catchment. The existing (licensed) inert soil recovery facility is located in the North Quarry, in the northern part of the Roadstone property holding, and lies entirely within the Ward River catchment. Although much of the existing West Quarry is also indicated to lie within the Ward River catchment, mapping indicates that a small area at its southern end lies within the Tolka catchment.

Due to the disturbed nature of the ground around the West Quarry, it is not possible to establish the natural catchment boundary on the ground. In reality development and land drainage works and surface water management systems at the quarry complex have slightly altered the boundary between the Ward and Tolka catchments at Huntstown. Of particular relevance in this case is that any excess or ponded surface water from the West Quarry is occasionally pumped northwards, across an internal haul road, to sumps in the floor of the North Quarry, which has the effect of placing the entire West Quarry within the Ward River catchment.

The only surface water drainage infrastructure at the quarry complex occurs around the central infrastructure area where aggregate processing and concrete production activities are currently concentrated. Rain falling across the remainder of the existing waste recovery facility either

- runs over unsealed ground into the existing North Quarry void and a small pond 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 / floor.

Surface Water Drainage System

Surface water bodies at the existing recovery facility / application site are man-made and comprise sumps on the quarry floors, settlement ponds and channels for water management, and semi-permanent ponds.

At the present time, groundwater levels at the North Quarry are lowered by means of sumps in the quarry floor. Surface water run-off and dewatered groundwater collecting in these sumps are pumped to the ground surface via an existing pipe network. They are then passed through settlement ponds prior to being discharged to the Ballystrahan Stream and Ward River catchment. Off-site discharge from the waste recovery facility is currently regulated by way of the EPA waste licence (Ref. W0277-01). Discharges are monitored at a control point designated 'W4', which is located immediately downstream of the settlement pond and interceptor which receive only influent groundwater and rainwater from the North Quarry. The location of this monitoring point is shown in Drawing E2-1. It is anticipated that this dedicated discharge control point will remain in place should approval be granted for increased waste intake at the recovery facility.

There is no groundwater inflow to the West Quarry. Most rain falling across the West Quarry percolates through the ground to the underlying groundwater table, the upper level of which has been depressed by dewatering at the adjacent quarries. Any surface water run-off at the West Quarry tends to collect in ponds developed in slight topographic lows or closed depressions above bedrock. It is most likely that these ponds are self-sealed with fine silt and/or sediment. Water from the ponds percolates slowly to the rock beneath them or evaporates and is occasionally removed by pumping. The area of the ponds changes depending on rainfall and evaporation rates and some ponds can dry out completely.

In addition to discharges from the existing (licensed) recovery facility at the North Quarry, Roadstone also discharges process water from aggregate and concrete production activities at the central infrastructure area, via a series of existing settlement ponds, to a combined discharge to the Ballystrahan Stream and ultimately to the Ward River. This discharge point, which lies downstream of monitoring point 'W4', is designated 'W1'. An effluent discharge licence in respect of combine waters from the North Quarry and concrete production facility (Ref. WPW/F008-01) was issued by Fingal County Council in November 2011. A copy of the discharge licence in respect of this discharge is attached.

The Ward River and its tributary the Ballystrahan stream are classified as being of 'Poor' status (www.epa.ie). The River Ward itself has a median Q-rating of 3 (unsatisfactory). Siltation by agriculture and urban wastewater discharges are believed to be the principal contributors to reduced water quality in the catchment. Details of surface water management systems at the existing waste recover facility are provided in Attachment D1 of this waste licence review application and Chapter 2 of the Environmental Impact Statement which accompanies it.

Surface Water Management during Quarry Backfilling

During the quarry backfilling operations, the upper surface of the imported soil is graded so as to ensure that surface water run-off falling over the quarry footprint falls to sumps at temporary low points at the quarry floor or within the backfilled material. Any groundwater daylighting in the quarry faces during the backfilling phase will also be permitted to flow into the quarry and to run over filled ground to the sumps.

These temporary sumps effectively function as primary settlement ponds and water collecting in them is pumped (causing minimum agitation to ponded water) to the existing drainage channel / watercourse on the eastern side of the North Quarry. Water pumped to this channel is routed via an existing settlement pond and retained there for sufficient time to allow sediments / suspended solids to fall out of solution. Thereafter it passes through existing treatment infrastructure (silt trap and hydrocarbon interceptor) prior to mixing with other (quarry) discharge further downstream and ultimately being discharged to the Ballystrahan Stream as it flows northwards toward the Ward River.

The configuration of the existing surface water management system is indicated on the site infrastructure layout in Drawing D2-1. In order to minimise the risk of pollution to surface waters arising as a result of waste recovery and backfilling activities at Huntstown Quarry, a number of mitigation measures are implemented to protect surface water, prevent possible accidental discharge of fuel or chemicals and detect / monitor potential adverse impacts. These measures, which will give effect to the requirements of the European Communities Environmental Objectives (Surface Water) Regulations 2009 (S.I. No. 272 of 2009), are identified under a range of headings below:

Minimising Soil Erosion

- Imported material is placed and compacted as soon as possible after importation in order to minimise erosion and inclusion of particulates (silt and clay) and suspended solids in surface water run-off.
- Final restoration and seeding will take place at the earliest opportunity. If stockpiles (eg. topsoil) are left in place over extended time periods, they will be seeded with grass to minimise soil erosion.
- The slope of the topsoil and overburden storage areas will be designed to ensure short-term stability and to minimise surface erosion.

Inspection of Imported Material

- Loads of imported material are screened and inspected in line with an approved waste acceptance plan to confirm they are inert prior to deposition at the facility. Additional precautionary measures associated with the acceptance and handling of inert soil waste are detailed in the following sections of the Environmental Impact Statement:
 - Chapter 2, Paragraphs 2.64 to 2.72 (Waste Acceptance and Handling)
 - Appendix 2.1 (Waste Handling and Acceptance Plan)

Contingency arrangements for uncontrolled spillages / leakages are outlined in Section 3 of the contingency plan provided in Attachment J of this waste licence review application.

Handling of Fuels and Chemicals

- All petroleum based products and chemicals are stored in containers and drums stored over bunded pallets (and concrete slabs) in the existing maintenance shed;
- Emergency response kits / spill kits are available on-site to stop the migration of spillages / leaks of petroleum based products, should they occur;
- Refuelling of vehicles is undertaken at a surfaced (concreted) area alongside a bunded fuel tank 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 is undertaken at existing on-site maintenance sheds or off-site, as appropriate, to minimise the risk of uncontrolled release of polluting liquids;
- Soil and stone waste is vetted, inspected and tested to confirm it is inert prior to importation and deposition at the recovery facility. Waste handling procedures provide for classification, compliance and verification testing of waste;
- All surface water run-off collected in sumps at the North Quarry and West Quarry goes to a settlement pond prior to discharge off-site to surface watercourses in order to reduce the concentration of suspended solids;
- All fuel, chemicals, petroleum based products, mechanical and electrical equipment shall be removed prior to closure of the site.

Traffic Movement

- A site specific traffic management system has been put in place to reduce the potential conflicts between vehicles, both at the recovery facility and in the wider quarry complex where vehicles transit to the recovery facility, thereby reducing the risk of an accidental vehicle collision;
- The speed limit is enforced to further reduce the likelihood and significance of collisions between vehicles;
- All plant is regularly maintained and inspected daily for leaks of fuels, lubricating oil or other contaminating liquids/liquors.

Monitoring

- Surface water monitoring has been implemented around the quarry complex and existing recovery facility in accordance with planning consents and existing waste licence requirements. Monitoring will continue around the recovery facility / application site in order to monitor any potential impact of the waste recovery operations on the local surface water regime.
- Surface water monitoring is being undertaken in accordance with Schedule C.1.2 of the existing Waste Licence at control point 'W4' on a weekly / quarterly / bi-annual basis (dependent on the quality parameter).
- The results of all surface water monitoring undertaken will be recorded and submitted to the EPA in an Annual Environmental Report for its record and review;
- It is currently envisaged that the surface water monitoring regime will remain in place for the duration of the quarry backfilling and restoration works. Sampling and monitoring will continue as long as backfilling activities continue and for a short period thereafter.

The establishment and operation of settlement ponds (as proposed) will reduce the suspended solids content of surface water run-off (prior to discharge) and will ensure that discharged waters are of the appropriate water quality standard. All surface water discharges from the proposed recovery facility to the Ballystrahan Stream will comply with the emission limits set by the existing EPA waste licence (or any amendment thereto).

In the longer term, toward the end of the quarry backfilling works, ground contours within and around the backfilled quarry void will be modified as necessary to ensure that any surface water run-off across the infilled quarries will be intercepted and/or channelled eastwards toward the existing (natural / modified) surface water drainage network and the tributary stream of the Ward River which runs northward out of the Roadstone landholding.

Surface Water Management at Waste Inspection / Quarantine Area

Any suspect non inert / contaminated soil waste imported to the waste recovery facility is transferred to a covered shed beyond the south-eastern corner of the North Quarry. As the floor of the shed is sealed by a concrete slab, and as no rainfall will come into contact with consignments of suspected contaminated waste, there is no requirement to install drainage infrastructure for the separate collection and storage of potentially contaminated surface water run-off at the waste inspection and quarantine facility.

TABLE E.1(i): EMISSIONS TO SURFACE WATERS
(One page for each emission)

Emission Point: W4

Emission Point Ref. N ^o :	W4
Source of Emission:	Dewatered groundwater and surface water run-off pumped from floor of North Quarry / existing waste recovery facility
Location :	Immediately east of an existing settlement pond at original ground level on the eastern side of the North Quarry
Grid Ref. (10 digit, 5E,5N):	711077E 7418250N (ITM Co-ordinates)
Name of receiving waters:	Ballystrahan Stream Identified as a tributary to Ward River
Flow rate in receiving waters:	Discharge to Ballystrahan Stream Unknown Dry Weather Flow 0.011m ³ .sec ⁻¹ 95%ile flow
Available waste assimilative capacity:	Refer to Table E.1 (ii)

Emission Details:

(i) Estimated volume to be emitted			
Normal / day	800 m ³ /day	Maximum/day	1,800 m ³ /day (Existing Waste Licence)
Maximum rate/hour	75m ³ /hr (Existing Waste Licence)		

Emission Point: W1

Emission Point Ref. N ^o :	W1
Source of Emission:	Surface water run-off from central infrastructure area (principally aggregate processing / concrete production area – outside of waste licence area) AND treated surface water run-off from the floor of the North Quarry / existing waste recovery facility
Location :	Immediately east of an central infrastructure area and was access road leading to waste recovery facility at North Quarry
Grid Ref. (10 digit, 5E,5N):	711193E 741771N (ITM Co-ordinates)
Name of receiving waters:	Ballystrahan Stream Identified as a tributary to Ward River
Flow rate in receiving waters:	Discharge to Ballystrahan Stream Unknown Dry Weather Flow 0.011m ³ .sec ⁻¹ 95%ile flow
Available waste assimilative capacity:	Refer to Table E.1 (ii)

Emission Details:

(i) Estimated volume to be emitted			
Normal / day	800 m ³ /day	Maximum/day	1,800 m ³ /day (Existing Waste Licence)
Maximum rate/hour	75m ³ /hr (Existing Waste Licence)		

TABLE E.1(ii): EMISSIONS TO SURFACE WATERS - Characteristics of the emission (1 table per emission point)

Emission point reference number : SW4 (Waste Licence W0277-01)

Parameter	Prior to treatment				As discharged				% Efficiency
	Max. hourly average (mg/l)	Max. daily average (mg/l)	kg/day	kg/year	Max. hourly average (mg/l)	Max. daily average (mg/l)	Max. ¹ (kg/day)	Max. ¹ (kg/year)	
Total Suspended Solids	<u>Not Monitored</u>	<u>Not Monitored</u>			15mg/l	15mg/l	12kg/day	4,380kg/yr	N/A
pH	<u>Not Monitored</u>	<u>Not Monitored</u>			9	9			
Biochemical Oxygen Demand	<u>Not Monitored</u>	<u>Not Monitored</u>			5mg/l	5mg/l	4kg/day	1,460kg/yr	N/A
Orthophosphate (as P)	<u>Not Monitored</u>	<u>Not Monitored</u>			0.5 mg/l	0.5mg/l	0.4kg/day	146kg/yr	N/A
Ammonia (as N)	<u>Not Monitored</u>	<u>Not Monitored</u>			0.5mg/l N	0.5mg/l N	0.4kg/day	146kg/yr	N/A

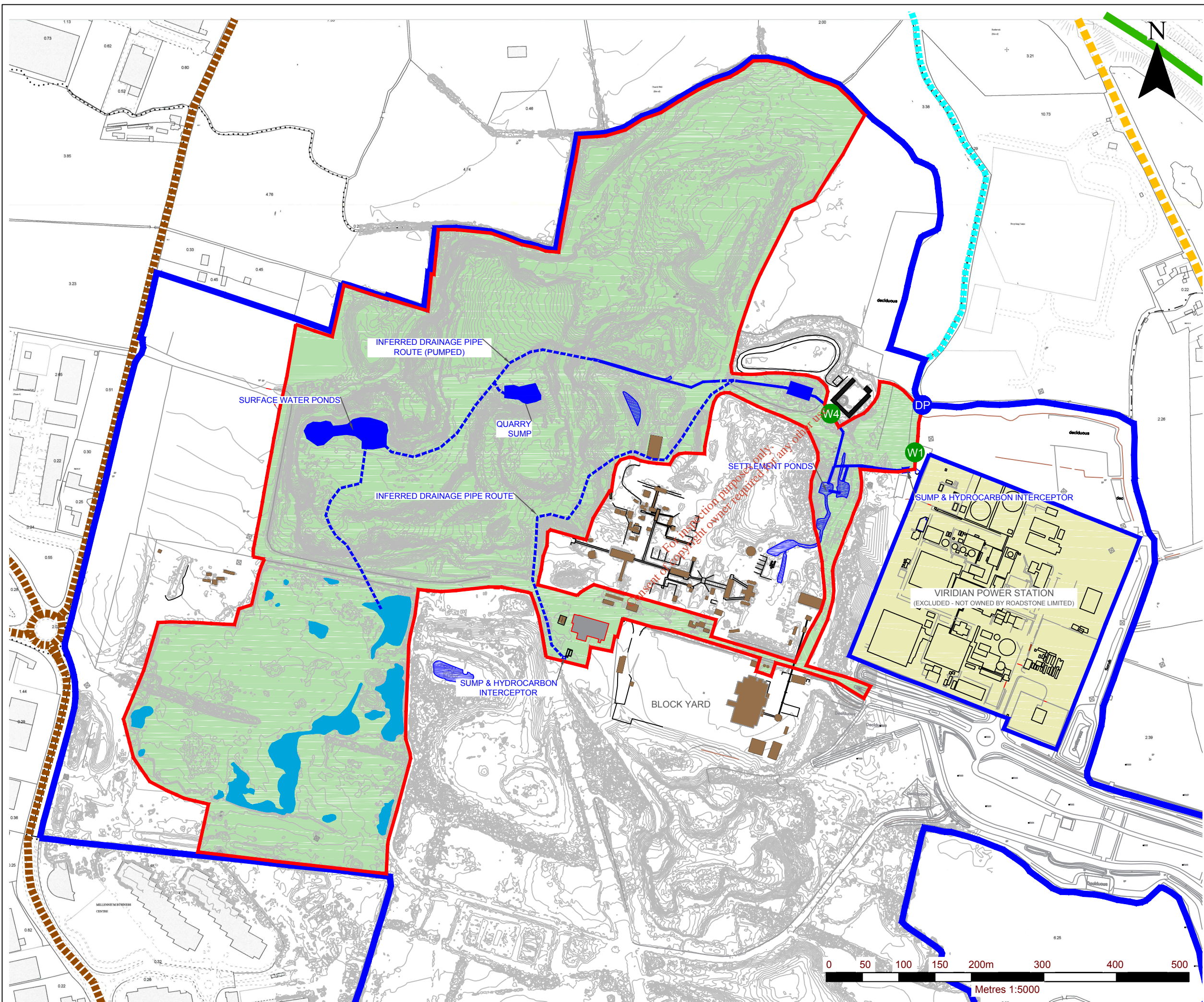
¹ Based on average daily flow rate of 800m³/day

Emission point reference number : SW1 (FCC Discharge Permit WPW/F/008-01)

Parameter	Prior to treatment				As discharged				% Efficiency
	Max. hourly average (mg/l)	Max. daily average (mg/l)	kg/day	kg/year	Max. hourly average (mg/l)	Max. daily average (mg/l)	Max. ¹ (kg/day)	Max. ¹ (kg/year)	
Total Suspended Solids	<u>Not Monitored</u>	<u>Not Monitored</u>			30mg/l	30mg/l	24kg/day	8,760kg/yr	N/A
pH	<u>Not Monitored</u>	<u>Not Monitored</u>			9	9			
Biochemical Oxygen Demand	<u>Not Monitored</u>	<u>Not Monitored</u>			5mg/l	5mg/l	4kg/day	1,460kg/yr	N/A
Chemical Oxygen Demand	<u>Not Monitored</u>	<u>Not Monitored</u>			30mg/l O ₂	30mg/l O ₂	24kg/day O ₂	8,760kg/yr O ₂	N/A
Phosphate (as PO ₄ ⁻ P)	<u>Not Monitored</u>	<u>Not Monitored</u>			1mg/l P	1mg/l P	0.8kg/day P	292kg/yr N	N/A
Ammonium (as N)	<u>Not Monitored</u>	<u>Not Monitored</u>			1mg/l N	1mg/l N	0.8kg/day P	292kg/yr N	N/A
Sulphate (as SO ₄)	<u>Not Monitored</u>	<u>Not Monitored</u>			300mg/l	300mg/l	240kg/day	87,600kg/yr	N/A
Mineral Oil	<u>Not Monitored</u>	<u>Not Monitored</u>			10mg/l	10mg/l	8kg/day	1470kg/yr	N/A
Detergents	<u>Not Monitored</u>	<u>Not Monitored</u>			10mg/l	10mg/l	8kg/day	14691kg/yr	N/A

¹ Based on average daily flow rate of 800m³/day

0180.00152.0.FIG_E2-1_Surface Water Management System.dwg



NOTES
 1. EXTRACT FROM 1:2,500 ORDNANCE SURVEY DIGITAL SHEET NO'S. 3062-A, 3062-B, 3062-C, 3062-D, 3063-A, 3063-C, 3130-A & 3130-B.
 2. ORDNANCE SURVEY IRELAND LICENCE NO. SU 0000716 (C) ORDNANCE SURVEY & GOVERNMENT OF IRELAND

LEGEND

- ROADSTONE LIMITED LAND INTEREST (c. 200.3 ha)
- APPLICATION AREA (c. 48.65 ha)
- N2 DUAL CARRIAGEWAY
- NORTH ROAD (R135)
- LOCAL ROAD
- BALLYSTRAHAN STREAM
- SURFACE WATER MONITORING LOCATIONS
- DISCHARGE POINT
- EPHEMERAL PONDS IN WEST QUARRY

EMISSION	EASTING	NORTHING
DP	711204	741838
W1	711193	741771
W4	711077	741825

SLR global environmental solutions

SLR CONSULTING IRELAND
 7 DUNDUM BUSINESS PARK
 WINDY ARBOUR
 DUBLIN 14
 T: +353-1-2964667
 F: +353-1-2964676
 www.slrconsulting.com

ROADSTONE LIMITED
 WASTE LICENCE REVIEW APPLICATION
HUNTSTOWN WASTE RECOVERY FACILITY
 NORTH ROAD, FINGLAS, DUBLIN 11
SURFACE WATER EMISSION LOCATIONS

DRAWING E2-1

Scale: 1:5,000 @ A3
 Date: SEPTEMBER 2016

COMHAIRLE CONTAE FHINE GALL

FINGAL COUNTY COUNCIL

LICENCE TO DISCHARGE TRADE EFFLUENT TO WATERS

To: Roadstone Wood Ltd.,
Fortunestown,
Tallaght,
Dublin 24.

Ref. Number in Register: **WPW/F/008 - 01**

Fingal County Council (hereinafter referred to as "the Council") in exercise of the powers conferred on it by the Local Government (Water Pollution) Acts 1977 and 1990, hereby grants a Licence, Reference Number WPW/F/008 - 01 to Roadstone Wood Ltd., (hereinafter referred to as "Licensee") to discharge trade effluent to waters from their premises at Huntstown Quarry, Ashbourne Road, Finglas, Dublin 11, subject to the following conditions:-

1. The temperature of the treated effluent shall not exceed **25 degrees Centigrade**, or **ambient temperature** if it exceeds **25 degrees Centigrade**.
2. The **pH** of the treated effluent shall lie in the range **6.0 to 9.0**.
The **pH** of the receiving waters shall not be altered by more than **+/- 0.5 pH** units by the effluent discharge.
3. Over any 24 hour period, the mean concentration of **biochemical oxygen demand (B.O.D.)** in the effluent shall not exceed **5 mg/litre O₂** and the maximum concentration of **B.O.D.** shall not exceed **7 mg/litre O₂**. The total quantity of biochemical oxygen demand discharged in this period shall not exceed **9.0 Kgs**.
4. Over any 24 hour period, the mean concentration of **chemical oxygen demand (C.O.D.)** in the effluent shall not exceed **30 mg/litre** and the maximum concentration of **C.O.D.** shall not exceed **50 mg/litre**. The total quantity of chemical oxygen demand discharged in this period shall not exceed **54.0 Kgs**.
5. Over any 24 hour period, the mean concentration of suspended solids in the effluent shall not exceed **20 mg/litre** and the maximum concentration of **suspended solids** shall not exceed **30 mg/litre**. The total quantity of suspended solids discharged in this period shall not exceed **36.0 Kgs**.
6. The concentration of mineral oils in the effluent shall not exceed **10.0 mg/l**.
The total quantity of mineral oils discharged per day shall not exceed **18.0 Kgs**.

Petroleum hydrocarbons shall not be present in the effluent which would :

- (a) Form a visible film on the receiving water surface or form coatings on the substratum.
- (b) Impart a detectable hydrocarbon taste to edible finfish and/or shellfish.
- (c) Cause deleterious effects on aquatic life.

7. The concentration of detergents in the effluent shall not exceed **10.0 mg/l**.
The total quantity of detergents discharged per day shall not exceed **18.0 Kgs**.
8. The concentration of **Ammonium (as N)** in the effluent shall not exceed **1 mg/l as N**.
The total quantity of **Ammonium** discharged per day shall not exceed **1.8 Kg as N**.
9. The concentration of **Phosphates (as PO₄-P)** in the effluent shall not exceed **1 mg/l as P**.
The total quantity of **Phosphates** discharged per day shall not exceed **1.8 Kg as P**.
10. The concentration of **Sulphates (as SO₄)** in the effluent shall not exceed **300 mg/l**.
The total quantity of **Sulphates** discharged per day shall not exceed **540.0 Kgs as SO₄**.
11. Over any 24 period, the maximum volume of effluent discharged shall not exceed **1,800 cubic metres**.
12. Materials classifiable as Hazardous Waste under the Waste Management Acts, shall not be discharged to waters.
13. Other wastewaters (including firewater, accidental spillages etc.) arising on the site shall not be discharged to waters without prior authorisation of Fingal County Council.
14. The effluent discharged shall be of the same nature and composition as described and conditioned in this licence. The effluent shall contain no other substances in such a concentration, nor to be discharged in such a manner as to be harmful or detrimental to public health or to domestic, commercial, industrial agricultural or recreational uses of the receiving waters.
15. All storage tanks for fuel and/or chemicals shall be surrounded by a bund capable of retaining 110% of the volume of the largest single tank within the banded area. The intake and outlet for the tanks shall be positioned inside the bund. Provision shall be made to remove and dispose of the rainwater so as to ensure the specified volume is always available within the bund. The bund shall be constructed and maintained by the Licensee to specifications agreed with Fingal County Council.
16. The Licensee shall keep records, in such form as required, of volume, rate of discharge, nature and composition of the trade effluent discharged and these shall be available at all reasonable times for inspection by duly authorised persons as defined in Section 28(9) of the Local Government (Water Pollution) Acts 1977 & 1990. Copies of such records shall be sent to the Council on demand.
17. A record or log-book of cleaning, maintenance and performance of each settling tank shall be kept and made available for inspection at all times by duly authorised persons as defined in Section 28(9) of the Local Government (Water Pollution) Acts 1977 & 1990.
18. The Licensee shall display in a prominent position a notice to the effect that in the event of an accidental discharge, spillage or deposit of any polluting matter which enters or is likely to enter any waters or a sewer, the person responsible shall notify the Council as soon as practicable after the occurrence and the and that failure to do so is an offence under Section 14, Local Government (Water Pollution) Acts 1977 & 1990.

19. A fee of **€205.00** per sample collected by the Fingal County Council representative for compliance monitoring is payable to Fingal County Council, this charge covers the cost of sample collection and chemical analysis and is payable on demand.
20. The Licensee shall monitor the discharge of treated effluent to ensure compliance with the conditions of this licence. Representative samples of the **treated final effluent and the upstream and downstream receiving waters** shall be taken by the Licensee and tested for the chemical and physical characteristics conditioned in this licence using standard methods. The frequency of sampling shall be as necessary but shall not be less than **12 times per year (monthly)**.

The costs of all such tests shall be borne by the Licensee.
21. The applicant shall permit authorised persons as defined in Section 28(9) of the Local Government (Water Pollution) Acts 1977 & 1990 as Amended, to inspect, examine and test, at all reasonable times, any works and apparatus installed in connection with the trade effluent and to take samples of the trade effluent.
22. The Licensee shall submit monitoring results to Fingal County Council on an annual basis, but not later than **January 15th** for the previous year.
23. Failure to comply with any of these conditions will result in prosecution under section 16(9) of the Local Government (Water Pollution) Acts 1977 & 1990. A conviction could result in substantial fines (up to €5,000) and/or imprisonment.


Authorised Officer

Dated this 24th day of NOV. 2011