ATTACHMENT I1 – AIR QUALITY IMPACT

Of the potential polluting substances emitted to air listed in the Schedule to the Environmental Protection Agency (Licensing) (Amendment) Regulations 2004, the only pollutant of concern arising from the ongoing soil waste recovery activities at Huntstown Quarry is dust.

The principal air quality impact associated with the planned intensification and relocation of construction and demolition waste recovery activities will be an increased risk of fugitive dust emissions. Additional emissions are likely to arise during dry periods from

(i) site establishment / construction related activities at the relocated facility, principally associated with three activities - earthworks (site establishment), construction (processing) and trackout (haulage).

(ii) increased handling, processing and stockpiling of C&D waste and processed materials (recycled aggregate)

(iii) increased vehicle movements over unpaved sections of haul road.

The air quality impact assessment presented in the EIS concludes that as

- the existing C&D waste recovery facility at the central Quarry is well screened by quarry faces;
- the replacement C&D facility is well separated from human and ecological receptors and site establishment and construction works are of limited duration;
- future C&D waste processing activities will be undertaken within a covered structure and will be screened by raising existing berms and retaining semi-mature trees around the site perimeter;
- there will be continued implementation / intensification of established mitigation measures to control dust rise and limit dust emissions and these will also be extended to the replacement facility in time;
- emissions are / will ultimately be controlled and enforced by way of the EPA waste licence, and
- none of the habitats present within the potential zone of influence are considered to be particularly sensitive,

there will be no significant dust emission / deposition impact on human or ecological receptors arising from the intensification and relocation of C&D waste recovery activities at Huntstown and their incorporation into the licensed waste facility.

Details of the existing environmental air quality around the waste recovery facility at Huntstown Quarry and an assessment of the impacts of emissions to air are provided in Chapter 8 of the Environmental Impact Statement which accompanies this waste licence review application.

ATTACHMENT I2 – SURFACE WATER IMPACT

Published mapping indicates that the Huntstown Quarry complex straddles two river catchments, that of the Ward River to the north and the Tolka River to the south. In reality land drainage works and surface water management systems at Huntstown will have slightly altered the boundary between the Ward and Tolka catchments and all land within the existing licensed facility and proposed amended boundary thereto lies within the Ward catchment, with off-site discharges from the North Quarry, West Quarry, Central Quarry and the site of the replacement C&D recovery facility all being directed to the Ballystrahan Stream which flows northwards from the north-east boundary of the Roadstone property holding toward the Ward River.

The Ward River and the Ballystrahan stream are currently classified as being of 'Poor' status as a result of urban wastewater discharges and siltation by agriculture. Off-site discharges from the established soil waste recovery activities and from the wider quarry complex are currently routed through settlement ponds, grit traps and hydrocarbon interceptors and are regulated by way of the existing EPA waste licence (Ref. W0277) and a discharge licence from Fingal County Council (Ref. No WPW/F/008-01) respectively. Discharge compliance is generally good, although there are occasional exceedances of water quality emission thresholds.

The potential impacts of increasing the rate of established C&D waste recovery activities at the Central Quarry and relocating these to the new facility in the north-eastern corner of the Roadstone landholding have been assessed and it is considered that in the absence of mitigation measures, the proposed development could have the potential to negatively impact surface water, specifically by increasing the risk of

- off-site discharges from site establishment works, specifically the construction of a hardstanding area, waste processing shed, surface water management infrastructure and upgraded internal access road;
- contaminated C&D waste materials being imported, handled and stored at the facility,
- greater surface water run-off from the covered structure which will house C&D waste processing activity;
- fuel or chemical spillages occurring or
- discharges to the Ballystrahan Stream (or Ward River catchment) having high levels of suspended solids, organic contaminants or nutrients.

Surface water run-off from waste recovery activities will be directed to / collect at existing temporary sumps located on quarry floors. These will effectively function as primary settlement ponds and any waters collecting in them will be pumped (with minimum agitation) to constructed ponds at a higher level (original ground level). Water will be retained in these settlement ponds for sufficient time to allow any remaining sediments / suspended solids to fall out of solution. Thereafter run-off will be passed through a grit trap / hydrocarbon interceptor and past the designated licence control / monitoring points before being discharged off-site to the Ballystrahan Stream.

It is envisaged that, as part of the planned intensification and relocation of C&D waste recovery activity at Huntstown, a wide range of established surface water management and best practice mitigation measures will continue to be implemented and extended to the new replacement facility. Of the existing measures, the most critical are as follows:

- implementation of site management protocols in respect of plant refuelling and maintenance activity to prevent possible accidental discharge of fuel or chemicals;
- implementation of detailed C&D waste acceptance and handling procedure to prevent intake of mixed or contaminated wastes;
- continued monitoring of surface water and discharge quality to monitor compliance / detect potential adverse impacts;

Further detail on these and other established measures are provided in the Environmental Impact Statement which accompanies this licence review application.

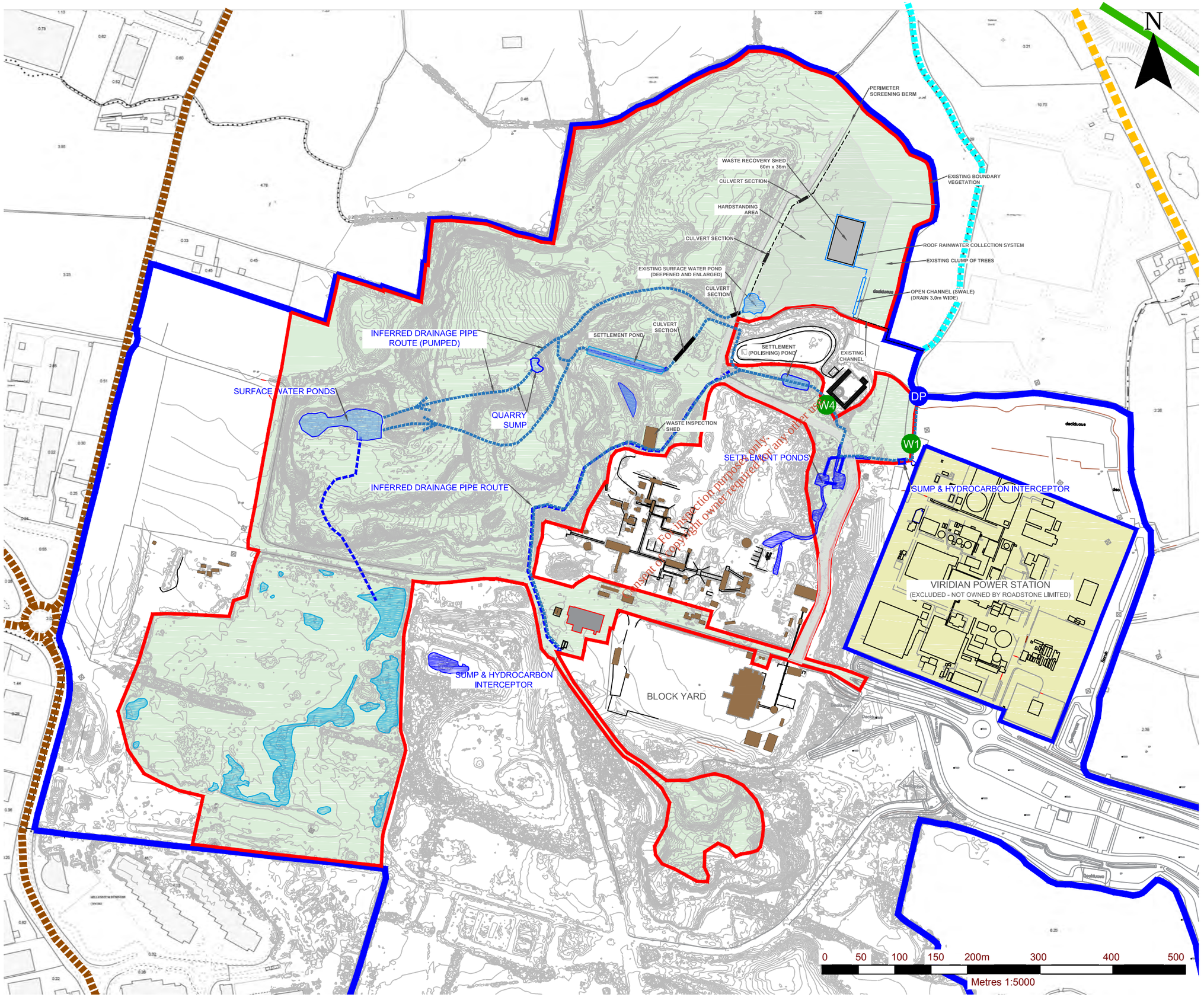
A number of additional or specific mitigation measures will also be implemented as follows

- Temporary surface water management infrastructure (settlement ponds) will be provided to manage run-off during the construction / establishment phase for the proposed replacement C&D facility;

- Materials used to construct the external hardstanding area will continue to allow rainwater to percolate to the underlying groundwater table and prevent the build-up / generation of mud / wet fines. Heavily trafficked hardstand areas will be regularly maintained regularly as required;
- Stormwater runoff from the roof of the proposed recovery shed at the relocated recovery facility collected by gullies and a sub-surface drainage system around the shed will be discharged to an open channel grassed channel (swale) leading to a former natural stream which runs east toward the Ballystrahan Stream. As roof-run-off from the proposed shed will be uncontaminated, there is no requirement to provide any treatment prior to its discharge off-site;
- Flood attenuation for roof run-off will be provided by fitting a flow control device / hydrobrake at the downstream end of the swale (and immediately upstream of the channel leading to the Ballystrahan Stream) in order to limit the maximum stormwater run-off to the existing greenfield rate.
- Surface water runoff from the access road and hardstanding areas will be collected by open collector channels and directed to an enlarged pond in the south-western corner of the proposed new C&D waste recovery facility. It is envisaged that the water collecting in the pond will be pumped intermittently as required from there to the existing network of settlement / holding ponds across the quarry complex. The pump will float at the pond and its level controlled by way of an automatic float level switch.
- The surface water run-off from the replacement facility will ultimately be pumped from the settlement / holding ponds and passed through the existing polishing pond (reed-bed) and hydrocarbon interceptor / grit trap before being discharged to the Ballystrahan Stream.
- Existing water treatment systems at the quarry complex will continue to be upgraded, as necessary (with provision of additional settlement pond capacity as required) in order to ensure that suspended solids in all off-site discharges are compliant with Emission Limit values set out in the EPA Waste Licence and / or Local Authority Discharge Licence;

Established surface water monitoring regimes will remain in place for the duration of the C&D waste recovery activities at the licensed facility, until such time as all waste recovery activities cease.

Details of the existing (baseline) surface water environment and an assessment of the impact of the proposed intensification of C&D waste recovery activities at the existing facility at the Central Quarry and the relocation of the facility to the north-eastern corner of the quarry complex are provided in Chapter 6 of the Environmental Impact Statement which accompanies this waste licence review application. Where appropriate, mitigation measures have been proposed and/or incorporated into the design / operation of the facility in order to minimize any potential adverse impacts.



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 0000717 (C)** ORDNANCE SURVEY & GOVERNMENT OF IRELAND

LEGEND

- ROADSTONE LIMITED LAND INTEREST **(c. 200.3 ha)**
- APPLICATION AREA **(c. 55.0 ha)**
- N2 DUAL CARRIAGEWAY
- NORTH ROAD (R135)
- LOCAL ROAD
- BALLYSTRAHAN STREAM
- W1 SURFACE WATER MONITORING LOCATIONS
- DP DISCHARGE POINT
- EPHEMERAL PONDS IN WEST QUARRY

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

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

DRAWING I2-1

Scale 1:5,000 @ A3
Date JUNE 2017

0180.00166.0.FIG_I2-1.Surface Water Management System.dwg

ATTACHMENT I2 : SURFACE WATER QUALITY DATA

There are currently four monitored discharge points at and adjacent to the Huntstown Quarry complex:

- A discharge to the south (from the southern quarry and surrounding areas), into the River Tolka catchment (Discharge Licence WPW/F/075), designated W3. This discharge is not within the catchment for the existing licensed waste recovery facility operation (or proposed amendment thereto)and, as such is not considered further.
- A discharge from the Central Quarry (where the existing C&D waste recovery facility is located) northwards to the Ward catchment, designated W2. Downstream of the monitoring point, this discharge mixes with that from the aggregate processing area / concrete production plant and that from the existing soil recovery facility at the North Quarry..
- A discharge from the settlement pond which receives influent groundwater and rainwater from the soil recovery facility at the North Quarry and West Quarry, designated W4. This settlement pond will also receive discharge from the relocated C&D waste recovery facility once it is established and is the discharge of most direct long-term relevance to the current waste licence review application.
- A combined discharge further downstream from W4 which receives waters from the North Quarry and wastewaters from aggregate processing / concrete production area. This combined discharge ultimately discharges to the Ward River catchment at a discharge point designated W1. This discharge is also of relevance to the application under review.
- A discharge from Huntstown Power Station, which discharges to the Ballystrahan Stream.

Locations of surface water monitoring points are identified on Figure I2-1.

Surface water quality has been monitored in compliance with conditions attaching to the existing EPA waste licence and Local Authority discharge licence. The water quality is monitored at four locations for compliance monitoring and details of the monitoring programme since the Waste Licence was issued are summarised in Table I2-1 below.

Table I2-1
Surface Water Compliance Monitoring (October 2015 to April 2016)

Name	Location	Purpose of Monitoring	Number of Samples
N.v-notch (W1)	Weir for discharge to Ballystrahan Stream	Discharge licence	14
Upstream (DL)	Upstream of discharge point	Discharge licence	4
Downstream (DL)	Downstream of discharge point	Discharge licence	4
W4	Pumped water from N. Quarry after the settlement lagoon	Waste Licence	2

Results of recent water quality monitoring for the Discharge Licence and Waste Licence at each of the monitoring locations are set out in Table I2-2, Table I2-3 and Table I2-4. Detailed water quality test results recorded at the northern v-notch weir at Huntstown are provided separately in the Environmental Impact Statement accompanying this waste licence review application.

Table I2-2
Water Quality Results for Discharge to Ballystrahan Stream (W1)

Parameter	Unit	Discharge Licence Limit (W1)	Waste Licence Emission Limit (W4)	Number of Samples	Discharge to Ballystrahan Stream (W1)- (N. v-notch weir)		
					Min.	Avg.	Max.
Parameter	*Units*	*MAC Value*	*MAC Value*	*No.*	*Minimum*	*Average*	*Maximum*
pH	pH Units	6.0-9.0	6.0-9.0	19	7.7	7.9	8.1
Temperature °C	°C	25	25	19	5	11	18
BOD	mg/l	5	5	19	<2	<2	<2
Suspended Solids	mg/l	20	15	19	1	15	39
Ammoniacal Nitrogen	mg/l	-	-	18	0.08	0.14	0.26
Orthophosphate as P	mg/l	-	0.5	16	<0.33	<0.33	<0.33
COD	mg/l	30	-	8	4	7	10
Detergents as MBAS	mg/l	10	-	8	<0.05	0.09	0.28
Dissolved Oxygen	mg/l		-	8	8.3	9.15	9.9
Mineral Oil	mg/l	10	-	8	0.01	0.016	0.023
Phosphate as P	mg/l	1		6	0.33	0.50	1
Sulphate	mg/l	300		8	221	241	280
Ammonia as NH4	mg/l	1	0.5	7	<0.1	<0.1	<0.1
Zinc	mg/l	-	-	3	0.01	0.01	0.01
Cadmium	mg/l	-	-	3	<0.03	<0.03	<0.03
Copper	mg/l	-	-	3	<0.05	<0.05	<0.05
Iron	mg/l	-	-	3	<0.05	<0.05	<0.05
Lead	mg/l	-	-	3	0.2	0.24	0.26
Magnesium	mg/l	-	-	3	17	19	22
Manganese	mg/l	-	-	3	<0.03	<0.03	<0.03
Nickel	mg/l	-	-	3	<0.01	<0.01	<0.01
Dissolved Solids	mg/l	-	-	3	415	448	468
DRO	mg/l	-	-	2	0.021	0.023	0.025
TPH	mg/l	-	-	2	0.03	0.039	0.048

Table I2-3
Water Quality Results Upstream of Discharge to Ballystrahan Stream

Parameter	Unit	Emission Limit	Upstream of Discharge to Ballystrahan Stream			
		mg/l	18/11/2015	13/01/2016	26/02/2016	31/03/2016
pH	pH Units	6.0-9.0	8.1	7.7	7.6	7.9
Temperature	°C	25	11	9	10	12
BOD	mg/l	5	3	<2	<2	<2
Suspended Solids	mg/l	20	79	2	<1	12
Ammonia as NH_4	mg/l	1	<0.10	<0.10	0.62	0.23
Mineral Oil	mg/l	10	0.03	<0.010	<0.010	<0.010

Table I2-4
Water Quality Results Downstream of Discharge to Ballystrahan Stream

Parameter	Unit	Emission Limit	Downstream of Discharge to Ballystrahan Stream			
		mg/l	18/11/2015	13/01/2016	26/02/2016	31/03/2016
pH	pH Units	6.0-9.0	8.1	7.9	7.9	7.9
Temperature oC	°C	25	11	6	8	10
BOD	mg/l	5	<2	<2	<2	<2
Suspended Solids	mg/l	20	11	9	13	7
Ammonia as NH4	mg/l	1	<0.10	<0.10	<0.10	<0.10
Mineral Oil	mg/l	10	0.011	<0.010	<0.010	<0.010

The off-site discharge at monitoring / control point W1 (v-notch weir) is generally of good quality except for suspended solids. The level of suspended solids at the weir exceeded the Discharge Licence Limit of 20mg/l on four occasions (of nineteen monitored). As previously noted, the off-site discharge at W1 includes run-off from other areas within the quarry complex at Huntstown (other than just the established soil recovery facility at the North Quarry) which also generate suspended solids.

The recorded water quality upstream and downstream of the discharge point at the v-notch weir (W1) presented in Table I2-3 and Table I2-4 respectively indicates that the receiving waters of the Ballystrahan Stream are generally of reasonable quality, with low suspended solids downstream of the discharge point. The sample upstream of the discharge point taken on 18/11/2015 indicates high suspended solids which is not present in the sample downstream of the same date. There are also some hydrocarbons recorded in the sample on the same date which are present upstream and downstream of the discharge point.

Waste Licence Emission monitoring point W4 is for water discharges solely from the location of ongoing soil recovery activities at the North Quarry. Monitoring results for this location from March 2016 to December 2016 are presented in Table I2-5 below. The water quality is within the Emission Limit Values (ELV's) set by the existing EPA Waste Licence except for exceedance of the limit for suspended solids recorded for samples taken on 10/04/16, 5/05/16 and 27/11/16. It should however be noted that, in general, test results for suspended solids were generally less than half of the permitted limit value.

Table I2-5
Water Quality Results for Waste Licence Emission Monitoring Point W4

	Ammoniacal Nitrogen	BOD	pH	Orthophosphate as P	Suspended Solids	Temperature °C
MAC Values	***0.5***	***5***	***6.0-9.0***	***1***	***15***	***25***
07/04/2016	<0.08	<2	7.9	<1	10	<0.33
14/04/2016	0.12	<2	7.7	<0.33	41	11
18/04/2016	<0.08	<2	7.6	<0.33	8	10
05/05/2016	<0.10	<2	7.6	<0.33	16	13
12/05/2016	<0.08	<2	7.7	<0.33	4	14
16/05/2016	<0.08	<2	7.9	<0.33	12	3
26/05/2016	<0.08	<2	8.0	<0.33	2	13
09/06/2016	<0.08	<2	7.9	<0.33	5	17
21/06/2016	<0.08	<2	8.0	<0.33	<1	14
30/06/2016	<0.08	<2	7.7	<0.33	<1	N/A
07/07/2016	<0.08	<2	7.9	<0.33	4	18
04/08/2016	<0.08	<2	8.1	<0.33	4	18
11/08/2016	<0.08	<2	8.1	<0.33	<1	17
18/08/2016	<0.08	<2	8	<0.33	1	19
29/08/2016	<0.08	<2	7.6	<0.33	<1	19
08/09/2016	<0.08	<2	7.6	<0.33	<1	17
15/09/2016	<0.08	<2	7.9	<0.33	5	17
22/09/2016	<0.08	<2	7.8	<0.33	2	12
29/09/2016	<0.08	<2	7.8	<0.33	3	14
13/10/2016	<0.08	<2	7.9	<0.01	8	11
19/10/2016	<0.08	<2	7.8	<0.01	2	10
24/10/2016	<0.08	<2	7.8	0.03	3	12
03/11/2016	<0.08	<2	8.0	<0.33	7	11

	Ammoniacal Nitrogen	BOD	pH	Orthophosphate as P	Suspended Solids	Temperature °C
MAC Values	***0.5***	***5***	***6.0-9.0***	***1***	***15***	***25***
10/11/2016	<0.08	<2	7.9	<0.33	7	8
17/11/2016	0.08	<2	7.6	<0.33	27	7
24/11/2016	<0.08	<2	7.7	<0.33	3	N/A
29/11/2016	<0.08	<2	7.7	<0.33	2	5
07/12/2016	<0.08	<2	8.0	<0.01	5	10
15/12/2016	<0.08	<2	8.0	<0.01	10	7
20/12/2016	<0.08	<2	8.0	<0.01	9	5

ATTACHMENT I3 – ASSESSMENT OF SEWAGE DISCHARGE IMPACT

As there is no public sewer serving the licensed waste recovery facility or any other established operations at Huntstown Quarry, there will be no off-site discharge of any effluent or wastewater to a sewer as a result of the proposed intensification and relocation of C&D waste recovery activities. As such, no environmental impact can or will occur from off-site sewer discharges.

ATTACHMENT I4 – ASSESSMENT OF GROUND / GROUNDWATER IMPACT

The bedrock formations underlying the application site and the wider Huntstown Quarry complex are predominantly classified as Locally Important (LI) karstified aquifers. Maps published by the EPA indicate that the licensed site is located in an area with high to extreme groundwater vulnerability status. This reflects the potential for rapid groundwater movement through thin (or non-existent) soil cover into the underlying (poor) bedrock aquifer.

Previous sampling and testing of groundwater from monitoring wells across the Huntstown Quarry complex indicates that groundwater quality at the licensed site (and proposed extension thereto) is generally good and that the established quarrying and waste recovery operations have no significant impact on local groundwater quality.

The potential impacts the proposed intensification of C&D waste recovery activities at the existing facility at the Central Quarry and the relocation of the facility to the north-eastern corner of the Huntstown Quarry complex have been assessed and it is considered that in the absence of mitigation measures, the proposed development could have the potential to negatively impact groundwater quality, specifically by increasing the risk of

- contaminated C&D waste materials being placed at the site
- fuel or chemical spillages occurring or

The existing office and canteen facilities at Huntstown Quarry are available for the use of current (and any additional / future) staff assigned to the waste recovery facility. Sewage from these facilities is treated at a septic tank and percolation area located in the centre of the quarry complex.

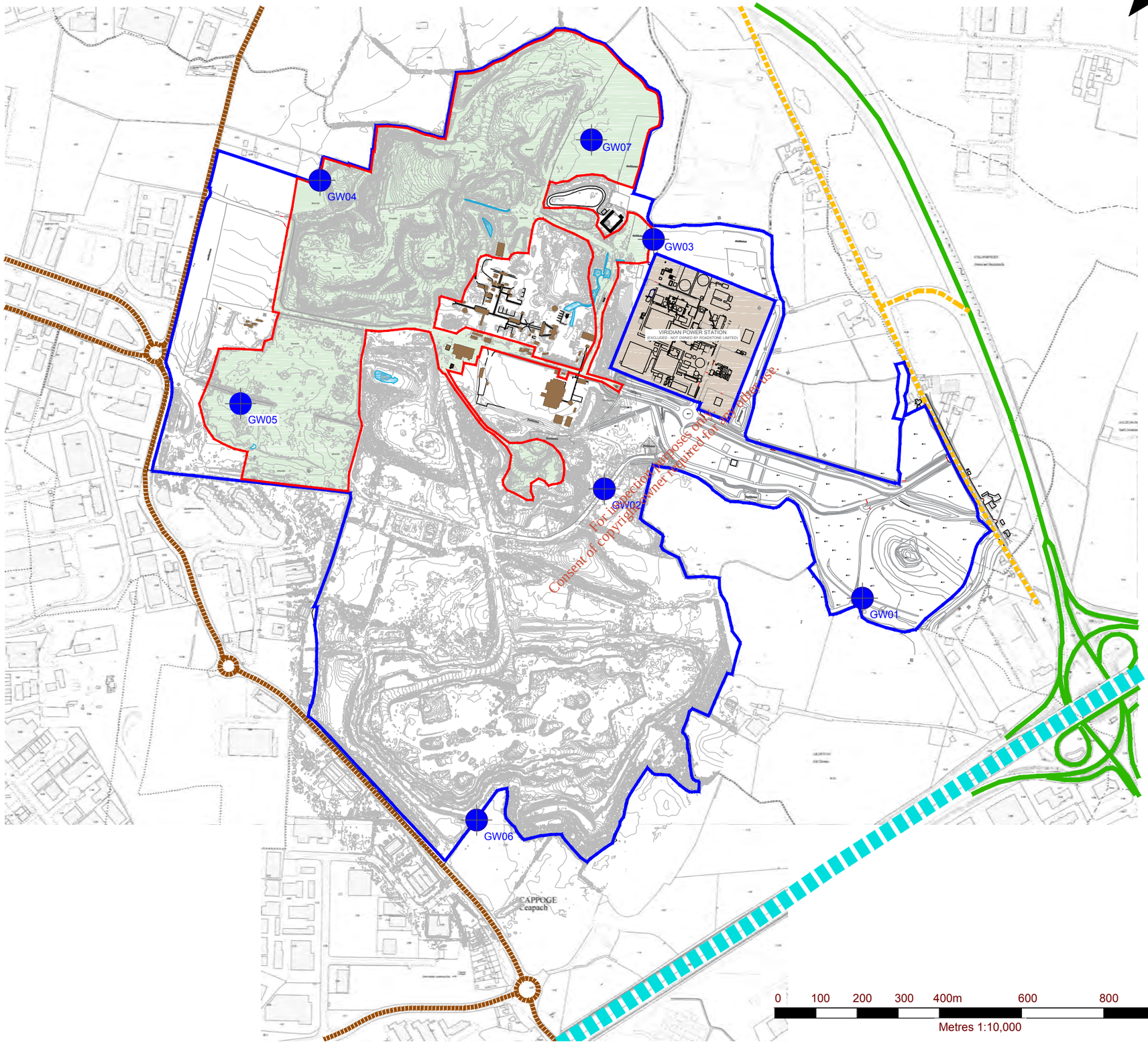
It is envisaged that, as part of the planned intensification and relocation of C&D waste recovery activity at Huntstown, a wide range of established water management and best practice mitigation measures will continue to be implemented and extended to the new replacement facility. Of the existing measures, the most important are as follows:

- implementation of site management protocols in respect of plant refuelling and maintenance activity to prevent possible accidental discharge of fuel or chemicals;
- implementation of detailed C&D waste acceptance and handling procedure to prevent intake of mixed or contaminated wastes;
- development and ongoing review of contingency plans / emergency response plans to be implemented in the event of an accidental spill or leak of dangerous substances;
- development and implementation of a traffic management plan in order to reduce potential conflicts between vehicles, thereby reducing the risk of an accidental vehicle collision;
- continued monitoring of surface water and discharge quality to monitor compliance / detect potential adverse impacts.

The intensification and relocation of C&D waste recovery activity at Huntstown will not have any adverse long term impact on the local groundwater flow regime nor will it reduce groundwater recharge nor lead to a reduction in groundwater levels at off-site supply wells.

Established surface water monitoring regimes will remain in place for the duration of the C&D waste recovery activities at the licensed facility, until such time as all waste recovery activities cease.

Details of the existing (baseline) groundwater environment and an assessment of the impact of the proposed intensification of C&D waste recovery activities at the existing facility at the Central Quarry and the relocation of the facility to the north-eastern corner of the quarry complex are provided in Chapter 6 of the Environmental Impact Statement which accompanies this waste licence review application. Where appropriate, mitigation measures have been proposed and/or incorporated into the design / operation of the facility in order to minimize any potential adverse impacts.



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 0000717 (C)** ORDNANCE SURVEY & GOVERNMENT OF IRELAND

LEGEND

- ROADSTONE LIMITED LAND INTEREST **(c. 200.3 ha)**
- APPLICATION AREA **(c. 55.0 ha)**
- N2 DUAL CARRIAGEWAY
- NORTH ROAD (R135)
- LOCAL ROAD
- M50 MOTORWAY
- GROUNDWATER MONITORING WELL LOCATION (GW02)

LOCATION	EASTING	NORTHING
GW1	711715	740933
GW2	711087	741196
GW3	711207	741803
GW4	710395	741947
GW5	710203	741403
GW6	710777	740391
GW7	711056	742045

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ROADSTONE LIMITED
WASTE LICENCE REVIEW APPLICATION

HUNTSTOWN C&D WASTE RECOVERY FACILITY
NORTH ROAD, FINGLAS, DUBLIN 11

GROUNDWATER MONITORING LOCATIONS

DRAWING I4-1

Scale: 1:10,000 @ A3

Date: JUNE 2017

0180.00166.0.FIG_I4-1.Groundwater Monitoring Locations.dwg

ATTACHMENT I4 : GROUNDWATER QUALITY DATA

The results of historical groundwater sample testing at monitoring wells at Huntstown Quarry are presented in Table I4-1 below.

Table I4-1
Groundwater Quality (August 2010)

	GW01	GW02	GW03	GW04	GW05	GW06	IGV*
pH	7.34	6.84	7.46	7.32	6.86	7.12	6.5 -9.5
Conductivity	114	229	376	512	681	354	1000
Sodium	24.52	17.89	28.62	25.42	16.89	18.45	150
Potassium	3.54	2.99	4.01	3.12	1.58	2.57	5
Calcium	80.7	75.45	92.52	85.42	68.57	78.45	200
Magnesium	17.54	15.42	20.27	19.85	14.56	20.12	50
Chloride	19.23	24.68	43.11	27.49	19.51	34.16	30
Sulphate	48.96	12.09	17.24	36.11	24.66	18.71	200
Total Alkalinity	301	292	351	332	247	313	NAC
Total Hardness	340	352	440	494	220	252	200
Nitrate	18.66	12.45	24.77	16.62	9.32	6.44	25
Nitrite	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.1
Ammoniacal Nitrogen	0.02	0.01	0.04	0.02	0.01	<0.01	0.15
Iron	0.006	<0.001	0.052	<0.001	<0.001	0.067	0.2
Manganese	0.001	<0.001	0.013	<0.001	<0.001	0.021	0.05
Orthophosphate	0.1	0.09	0.06	0.02	<0.01	0.01	0.08
Total Organic Carbon	4.1	4.4	1.5	0.5	3.2	9.9	NAC

Shaded — Maximum admissible concentration exceeded

IGV — Interim Guideline Value for groundwater, as set out in the EPA Publication 'Towards setting Guideline values for the Protection of Groundwater in Ireland'.

Table I4-2
Summary GW Quality Data (2015-2016 for three samples)

Parameter	Unit	Limit (IGV)	GW01			GW02			GW03			GW04			GW05		
			Max.	Avg.	Min.	Max.	Avg.	Min.	Max.	Avg.	Min.	Max.	Avg.	Min.	Max.	Avg.	Min.
Ammoniacal Nitrogen	mg/l	0.15	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	0.34	0	0.23	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
Conductivity	uS/cm @ 20°C	1000	1043	883	728	1316	938	651	933	844	704	844	822	778	516	498	481
Diesel Range Organics	mg/l	---	0.059	0.043	0.026	0.025	0.015	0.010	0.023	0.014	0.010	0.028	0.016	0.010	0.032	0.022	0.010
Nitrate	mg/l	25	1	0.7	0.5	1	0.8	0.5	1	0.7	0.5	4	3.3	3	<0.5	<0.5	<0.5
Nitrite	mg/l	0.1	<0.20	<0.2	<0.20	<0.20	<0.2	<0.20	<0.20	<0.2	<0.20	<0.20	<0.2	<0.20	<0.20	<0.2	<0.20
Orthophosphate as P	mg/l	0.03	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
pH	pH Units	6.5 -9.5	7.3	7.2	7.1	7.3	7.2	7.1	7.4	7.3	7.1	7.4	7.2	7	7.6	7.6	7.6
PRO	mg/l	----	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
TPH	mg/l	0.01	0.067	0.039	0.01	0.052	0.024	0.01	0.045	0.022	0.01	0.067	0.029	0.01	0.068	0.034	0.01
Faecal Coliforms	cfu/100ml	0	6	3	0	25	9	0	0	0	0	0	0	0	4	1	0
Total Coliforms	cfu/100ml	0	15	10	8	>100	72	16	4	3	3	8	3	0	6	3	2

ATTACHMENT I5 – GROUND / GROUNDWATER CONTAMINATION

The bedrock formations underlying the application site and the wider Huntstown Quarry complex are predominantly classified as Locally Important (LI) karstified aquifers. Maps published by the EPA indicate that the site is located in an area with high to extreme groundwater vulnerability status. This reflects the potential for rapid groundwater movement through thin (or non-existent) soil cover into the underlying (poor) bedrock aquifer.

Previous sampling and testing of groundwater from monitoring wells across the Huntstown Quarry complex indicates that groundwater quality at the licensed site is generally good and that the established operations have no significant impact on local groundwater quality. As such, no provision is required (or made) for remediation works in respect of ground and/or groundwater at the licensed site or proposed extension thereto as part of this waste licence review application.

Details of the existing (baseline) ground / groundwater environment are provided in Chapters 5 and 6 of the Environmental Impact Statement which accompanies this waste licence review application.

ATTACHMENT I6 – ASSESSMENT OF NOISE IMPACT

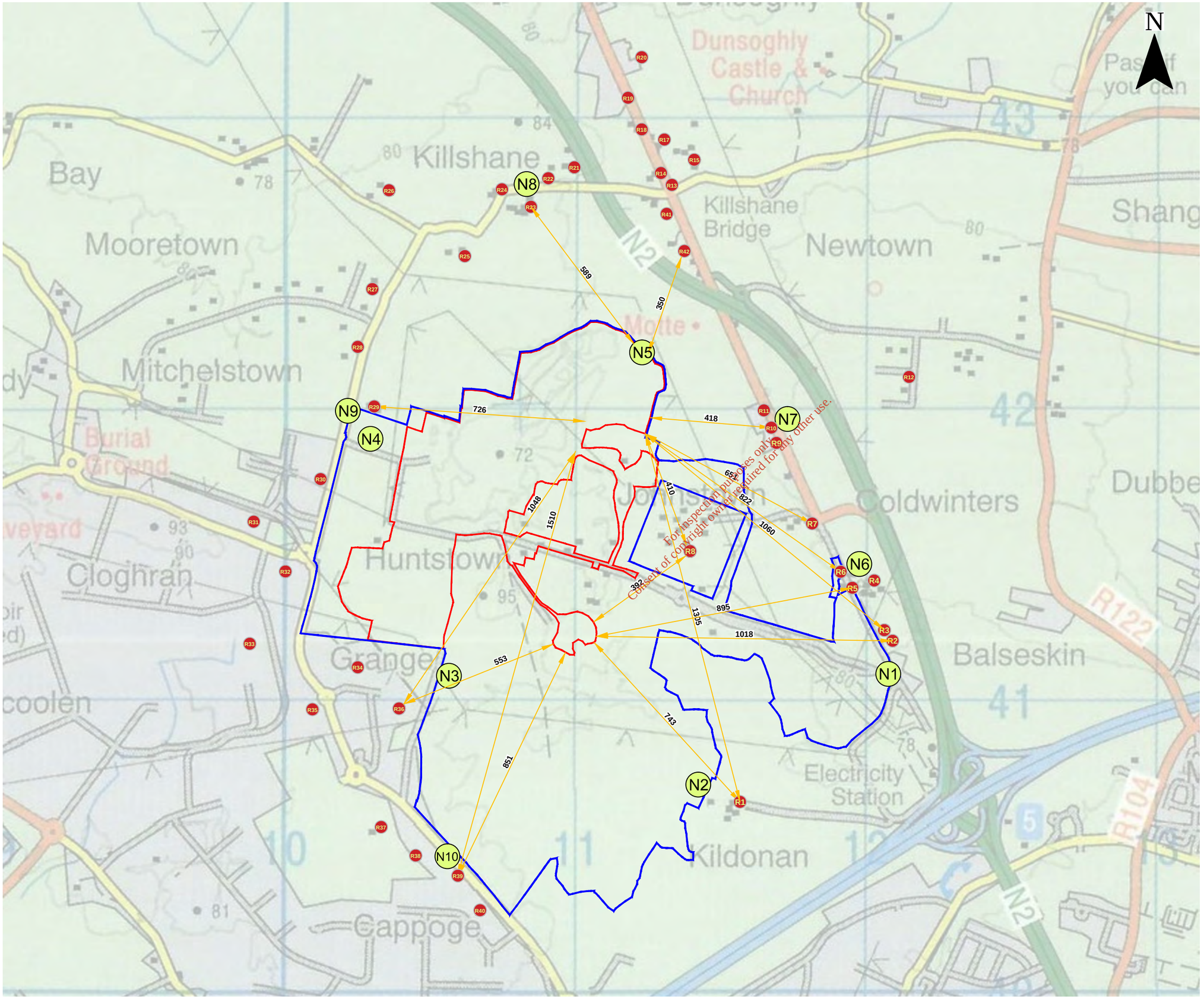
Noise monitoring in and around the licensed / application site and the wider Huntstown Quarry complex indicates that noise levels in the surrounding area are elevated and that average ambient noise levels typically range between 60dBA L_{Aeq} and 75dBA L_{Aeq}, depending on location and proximity to the N2 Dual Carriageway or M50 motorway or the frequency of overhead aircraft movements along the flight path leading in and out of Dublin Airport. The recorded noise levels are consistent with daytime levels in busy urban areas close to heavily trafficked roads.

Noise prediction assessments indicate that there will be minimal, if any, increase in noise levels arising at nearby residences under a worst case scenario when a crushing / screening plant and a front end loader are operating simultaneously 100% of the time at the boundary of the application site (rather than intermittently and some distance inside it, as will most likely be the case in reality).

The resultant predicted (maximum) future noise levels at nearby sensitive receptors are comparable to, and only slightly elevated above, existing ambient levels, making it highly unlikely that any adverse noise impacts will be noticed or experienced by nearby residents. It is therefore considered that mitigation measures to reduce the noise impacts of plant associated with the planned recovery facility are not strictly necessary.

Notwithstanding this, a number of measures will continue to be implemented at both the existing and planned relocated C&D waste recovery facility to further mitigate any potential noise impacts. These include retention / build-up of existing perimeter screening berms, maintenance of plant, fitting of plant silencers, maintenance of road surfaces, control of traffic speed and management of loading / unloading activities within the recovery facility.

Further information on baseline noise levels and an assessment of predicted ambient noise levels arising from the proposed intensification of C&D waste recovery activities at the existing facility at the Central Quarry and the relocation of the facility to the north-eastern corner of the quarry complex are provided in Chapter 9 of the Environmental Impact Statement which accompanies this waste licence review application.



NOTES

1. EXTRACT FROM 1:50,000 O.S DISCOVERY MAP **NO. 50**

2. ORDNANCE SURVEY IRELAND LICENCE NO. **SU 0000717 (C)** ORDNANCE SURVEY & GOVERNMENT OF IRELAND

LEGEND

- ROADSTONE LIMITED LAND INTEREST **(c. 200.3 ha)**
- APPLICATION AREA **(c. 55.0 ha)**
- N5 — NOISE MONITORING LOCATIONS
- R5 — NOISE RECEPTOR LOCATIONS

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ROADSTONE LIMITED

WASTE LICENCE REVIEW APPLICATION

HUNTSTOWN C&D WASTE RECOVERY FACILITY

NORTH ROAD, FINGLAS, DUBLIN 11

NOISE MONITORING LOCATIONS

DRAWING I6-1

Scale	Date
1:12,500 @ A3	JUNE 2017

0180.00166.0.FIG_I6-1.Noise Monitoring Locations R1.dwg

ATTACHMENT I6 : NOISE IMPACT ASSESSMENT
(Refer to Drawing I6-1)

Table (i) Existing C&D Facility

Receptor	Average L_{Aeq} at 10m dB(A)		Reflection dB(A)	Screening dB(A)	Activity Distance (m)		Noise Attenuation with Distance dB(A)	Activity L_{Aeq} dB(A)		Operational Noise Levels dB(A)
	C&D Crushing / Screening Plant Unit	HGV			C&D Crushing / Screening Plant Unit	HGV		C&D Crushing / Screening Plant Unit	HGV	
R1	88	77	+3	−20	640	640	37	34	23	34
R2	88	77	+3	−20	920	920	40	31	20	31
R3	88	77	+3	−20	920	920	40	31	20	31
R4	88	77	+3	−20	810	810	39	32	21	32
R5	88	77	+3	−20	810	810	39	32	21	32
R6	88	77	+3	−20	810	810	39	32	21	32
R8	88	77	+3	-20	324	324	31	40	29	40
R36	88	77	+3	−20	502	502	34	37	26	37
R39	88	77	+3	−20	735	735	38	33	22	33

Table (ii) Proposed Replacement C&D Facility

Receptor	Average L_{Aeq} at 10m dB(A)		Reflection dB(A)	Screening dB(A)	Activity Distance (m)	Noise Attenuation with Distance dB(A)	Activity L_{Aeq} dB(A)		Operational Noise Level dB(A)
	C&D Crushing / Screening Plant Unit	HGV					C&D Crushing / Screening Plant Unit	HGV	
R1	88	77	+3	−20	1305	42	29	19	29
R2	88	77	+3	−22	1060	40	29	40	40
R3	88	77	+3	−22	1060	40	29	40	40
R4	88	77	+3	−22	822	38	31	42	42
R5	88	77	+3	−22	822	38	31	42	42
R6	88	77	+3	−22	822	38	31	42	42
R7	88	77	+3	−22	651	36	33	44	44
R8	88	77	+3	−22	410	32	37	48	48
R9	88	77	+3	−22	418	32	37	48	48
R10	88	77	+3	−22	418	32	37	48	48
R11	88	77	+3	−22	418	32	37	48	48
R21	88	77	+3	−20	589	35	36	25	36

Receptor	Average L_{Aeq} at 10m dB(A)		Reflection dB(A)	Screening dB(A)	Activity Distance (m)	Noise Attenuation with Distance dB(A)	Activity L_{Aeq} dB(A)		Operational Noise Level dB(A)
	C&D Crushing / Screening Plant Unit	HGV					C&D Crushing / Screening Plant Unit	HGV	
R22	88	77	+3	−20	589	35	36	25	36
R23	88	77	+3	−20	589	35	36	25	36
R24	88	77	+3	−20	589	35	36	25	36
R25	88	77	+3	−20	589	35	36	25	36
R29	88	77	+3	−20	726	37	34	23	34
R36	88	77	+3	−20	1048	40	31	20	31
R39	88	77	+3	−20	1510	43	28	17	28
R42	88	77	+3	−20	350	30	41	30	41

Table (iii) Construction of the C&D Facility

Receptor	Average L_{Aeq} at 10m dB(A)		Reflection dB(A)	Screening dB(A)	Activity Distance (m)	Noise Attenuation with Distance dB(A)	Activity L_{Aeq} dB(A)		Operational Noise Level dB(A)
	Excavator	Crane					Excavator	Crane	
R1	79	70	+3	−20	1305	42	20	11	21
R2	79	70	+3	0	1060	40	42	33	43
R3	79	70	+3	0	1060	40	42	33	43
R4	79	70	+3	0	822	38	44	35	45
R5	79	70	+3	0	822	38	44	35	45
R6	79	70	+3	0	822	38	44	35	45
R7	79	70	+3	0	651	36	46	37	47
R8	79	70	+3	0	410	32	50	41	51
R9	79	70	+3	0	418	32	50	41	51
R10	79	70	+3	0	418	32	50	41	51
R11	79	70	+3	0	418	32	50	41	51
R21	79	70	+3	−20	589	35	27	18	28

Receptor	Average L_{Aeq} at 10m dB(A)		Reflection dB(A)	Screening dB(A)	Activity Distance (m)	Noise Attenuation with Distance dB(A)	Activity L_{Aeq} dB(A)		Operational Noise Level dB(A)
	Excavator	Crane					Excavator	Crane	
R22	79	70	+3	−20	589	35	27	18	28
R23	79	70	+3	−20	589	35	27	18	28
R24	79	70	+3	−20	589	35	27	18	28
R25	79	70	+3	−20	589	35	27	18	28
R29	79	70	+3	−20	726	37	25	16	26
R36	79	70	+3	−20	1048	40	22	13	23
R39	79	70	+3	−20	1510	43	19	10	11
R42	79	70	+3	−20	350	30	32	23	33

ATTACHMENT I7 – ASSESSMENT OF ECOLOGICAL IMPACTS

There are no designated or proposed Special Areas of Conservation (SACs) or Special Protection Areas (SPAs) within or contiguous to the existing licensed waste recovery facility or proposed extension thereto or Roadstone's wider landholding at Huntstown.

No designated sites will be directly or indirectly impacted by the proposed intensification of C&D waste recovery activities at the existing facility at the Central Quarry and the relocation of the facility to the north-eastern corner of the quarry complex, nor will it have any implications on protected or important species.

The continuance and intensification of C&D waste recovery activities at the Central Quarry will not have any effects on any important ecological habitats and/or species. Provided appropriate mitigation measures are implemented for the protection of breeding birds, there will be no effects on, or legal implications for, any protected species.

Upon the cessation of C&D waste recovery operations at the Central Quarry, any remaining stockpiles of unprocessed C&D waste will be processed and gradually sold / exported off-site as recycled secondary aggregate. No formal restoration works will be undertaken given the planned and consented commencement of further quarry development at this location in the near future.

Dry calcareous grassland, a habitat considered to be important at the local (county) scale, occurs in the vicinity of the application site, to the east of the Central Quarry. The proposed increase in C&D waste processing and the planned relocation of the recovery facility within the quarry complex will not result in the direct or indirect loss, damage or fragmentation to this habitat, nor is it predicted to generate dust at emission levels where there would be any measureable impact on the species composition and structure within it.

On cessation of C&D waste recovery activity at the proposed new relocated facility, any remaining stockpiles of unprocessed C&D waste will be processed and in a similar way, will be gradually sold as recycled secondary aggregate. All infrastructure associated with the facility will be removed and it is envisaged that the site with then be restored back to agricultural grassland.

Details of the existing (baseline) ecological environment and an assessment of the impact of the proposed intensification of C&D waste recovery activities at the existing facility at the Central Quarry and the relocation of the facility to the north-eastern corner of the quarry complex is provided in Chapter 4 of the Environmental Impact Statement which accompanies this waste licence review application.