



STARRUS ECO HOLDINGS LTD t/a GREENSTAR

DEEP WATER QUAY, SLIGO

TRADE EFFLUENT ASSESSMENT



Innovation Centre  
Green Road  
Carlow

Tel: 059 91 33084  
Fax: 059 91 40499  
Email: [info@iece.ie](mailto:info@iece.ie)  
Web: [www.iece.ie](http://www.iece.ie)



*Integrated Engineering Consulting*  
An Associate Company of VA Consulting Engineers & Geotechnical & Environmental Services Ltd



**STARRUS ECO HOLDINGS LTD t/a GREENSTAR**

**DEEP WATER QUAY, SLIGO**

**TRADE EFFLUENT ASSESSMENT**

*For inspection purposes only.  
Consent of copyright owner required for any other use.*

Client :-  
Starrus Eco Holdings Ltd t/a Greenstar  
Ballyogan Business Park  
Ballyogan Road  
Sandyford  
Dublin 18

IE Consulting  
Innovation Centre  
Green Road  
Carlow

Document No: IE1045-1330  
Issue No: 01-ISSUE  
Project No: IE1045  
Date: 7<sup>th</sup> August 2015  
Revision: 5.0  
Prepared By: N O'Malley BEng(Hons) MIEI  
Checked By: P McShane BEng(Hons) MIEI



**Copyright © IE Consulting 2015**

## Table of Contents

1	Introduction .....	2
2	General Information .....	3
3	Location of Activity .....	3
4	Relevant Planning Authority .....	3
5	Relevant Sanitary Authority .....	3
6	Description of the Activity .....	4
6.1	General Activity Description .....	4
6.2	Emissions to Waters .....	4
7	Background .....	4
8	Surface Water Contamination .....	5
9	Characterisation of Trade Effluent .....	5
10	Proposed Discharge To Irish Water Sewerage System .....	7
11	Surface Water Runoff Volumes in Excess of Proposed Maximum Daily Volume .....	7
Appendix A	Drawing Number IE1045-001	
	Drawing Number IE1045-002-A	
Appendix B	Greenfield Runoff Calculation	

For inspection purposes only.  
Consent of copyright owner required for any other use.

## 1 Introduction

IE Consulting was requested by Starrus Eco Holdings Ltd t/a Greenstar, to undertake an assessment of trade effluent generated from surface water runoff from within their existing waste transfer facility at Deep Water Quay, Sligo.

This facility is currently licensed by the Environmental Protection Agency (EPA) under waste licence number W0058-01.

The requirement to undertake a Trade Effluent Assessment arises from a recent Compliance Investigation undertaken by the EPA as duplicated below:-

### **CI Action : Drainage at the Baled MSW Storage Area**

#### **Action Description**

Leachate was noted on the ground at the Baled MSW Storage Area during the Site Visit on 27/03/2015. It appears that this storage area drains to the site storm water drainage system (for discharge at the SE2 Storm Water Emission point), however site drainage maps were not available at the time of the inspection. Action Required: The baled and wrapped MSW must be stored on impermeable hardstand which drains to the effluent drainage system. MSW should not be stored in areas that drain to the site storm water drainage system. The licensee is required to prepare up to date Site Drainage Drawings for the Starrus Eco Holdings Ltd facility. The drawing should be submitted to the Agency by 29/05/2015.

#### **Task Type**

CI Action

#### **Status**

Open

#### **Category**

Request for Information

#### **Sub-Category**

Additional Information Required

#### **Due Date**

29/05/2015

#### **Messages**

*No messages exist for Action Drainage at the Baled MSW Storage Area for CI C1000995*

This report presents the findings of a Trade Effluent Assessment that has been undertaken for the above facility.

## 2 General Information

- Name & Address of Licensee  
**Starrus Eco Holdings  
Deep Water Quay  
Sligo**
- Environmental Licences or Permits  
**This facility is currently  
licensed under Waste  
Licence No. W0058-01**

## 3 Location of Activity

- Address & Location of Activity  
**Deep Water Quay  
Sligo**
- Contact Name, Telephone & Email.  
**Malcolm Dowling  
Environmental Compliance  
Manager  
01-2947969  
086-3887976**  
  
**Mr Barry Gallagher  
Site Manager  
Tel: 071 914 3037  
Mob: 087 262 0737  
Email:  
[barry.Gallagher@greenstar.ie](mailto:barry.Gallagher@greenstar.ie)**

For inspection purposes only.  
Consent of copyright owner required for any other use.

- Location Map of Site  
**A location map of the site  
is contained in Appendix A**
- National Grid Reference (ITM)  
**E568134 N836919**

## 4 Relevant Planning Authority

- Relevant Planning Authority  
**Sligo County Council**

## 5 Relevant Sanitary Authority

- Relevant Sanitary Authority  
**Irish Water**

## 6 Description of the Activity

### 6.1 General Activity Description

The facility is a non-hazardous waste materials recovery and transfer operation. The site encompasses a total area of approximately 9,268m<sup>2</sup>, which comprises approximately 2420m<sup>2</sup> of roofed transfer shed building, 2373m<sup>2</sup> of open yard Baled MSW storage area, 2960m<sup>2</sup> of open access yard, 1210m<sup>2</sup> of civic amenity area and 305m<sup>2</sup> of open grassed area. Apart from grassed area, the entire site, including the floors of the transfer shed building and the open yard areas, are paved with concrete. There is a weighbridge adjacent to the north-western boundary of the site and an office building at the north-west corner of the site. The existing site layout is shown on Drawing Number *IE1045-001-A, Appendix A*.

Mixed and sourced separated Household, Commercial and Industrial (C&I) and Construction and Demolition (C&D) wastes are processed on-site to recover materials that are suitable for recycling and to minimise the quantity of treated waste disposed to residual landfill. The facility is licensed to accept a maximum of 100,000 tonnes of waste annually.

### 6.2 Emissions to Waters

All stormwater runoff generated from roof areas and open yard areas discharges to the existing on-site surface water drainage system. Stormwater runoff is conveyed via the on-site surface water drainage system and discharged to the Garavogue Estuary. There are two stormwater discharge locations, one of which was recently discovered following a CCTV assessment of the drainage system. The two points of discharge are show on *Drawing Number IE1045-002-A, Appendix A*.

All foul waters generated from within the facility are discharged to the on-site foul water drainage system. Foul waters are conveyed via the on-site foul water drainage system and discharged to an existing sanitary authority foul water sewer located adjacent to the Deep Water Quay access road. The foul water discharge location from the site is shown on *Drawing Number IE1045-002-A, Appendix A*.

## 7 Background

A waste licence was granted to the facility on 5 July 2001 to Waste Disposal (Sligo) Limited. Up until 2010, there were two discharges from the facility to the Garavogue River:

- SE-1 comprising foul water generated by floor run-off (in the waste transfer building) and sanitary discharges; and
- SE-2 serving roofed and open yard areas. Discharge continues at this point and is preceded by a silt trap and petrol/oil interceptor.

In mid-2010, the SE-1 discharge to the river ceased and the wastewater was discharged instead into a sewer for treatment at the recently commissioned Sligo and environs waste water treatment plant. This was agreed by the Agency and Sligo County Council and the Licence was subsequently amended under Section 42B of the Waste Management Acts (as amended). Discharge to sewer is now formalised in Schedule F.2. of the Licence. Greenstar is now seeking to increase the permitted discharge rate at this point.

## 8 Surface Water Contamination

The on-site stormwater drainage system comprises a number of stormwater drains, manholes, gullies and interceptors, as shown on *Drawing Number IE1045-002-A, Appendix A*. Stormwater discharge from the site consists of roof water and hardstanding yard water run-off, as shown on the above drawing.

Surface water run-off from the hardstanding open yard Baled MSW storage area (2373m<sup>2</sup>) and the civic amenity area (1210m<sup>2</sup>) has the potential to contain elevated levels of BOD, COD and Suspended Solids, and hence the characterisation of the surface water run-off generated from these hardstanding areas is deemed a 'Trade Effluent' as opposed to a relatively clean surface water run-off. This means the surface water generated trade effluent is not suitable for direct discharge to a surface watercourse without having been treated and the receiving watercourse having adequate assimilative capacity. It is therefore proposed to dispose of the surface water generated trade effluent directly to the sewerage system.

The characterisation and expected volumes of trade effluent that would be generated from the civic amenity and open yard Baled MSW storage areas are summarised below.

Please note that it is not proposed to discharge any clean surface water run-off (roof areas, car-park areas etc.) to the foul sewerage system. All clean surface water run-off generated at the site enters the on-site surface water drainage system and passes through an interceptor before discharge to the Garavogue Estuary.

## 9 Characterisation of Trade Effluent

The volume of trade effluent that may be generated from the hardstanding areas will depend on the depths of rainfall. *Figure 1* below illustrates the proposed areas to drain directly to the sewerage system which has a total area of 3583m<sup>2</sup>.

Recent laboratory analysis of typical surface water run-off from existing hardstanding areas at this facility has determined the following average concentrations of COD, BOD and Suspended Solids:-

COD – <7 mg/l

BOD – 1 mg/l

Suspended Solids – 81mg/l

Based on the above concentrations, the total daily volume of COD, BOD and Suspended Solids that would be generated in consideration of various daily rainfall amounts is summarised in *Tables 1-3* below:-

<b>Parameter – COD</b>				
<b>Daily Rainfall Amount (mm)</b>	<b>Daily Volume of Run-off (m<sup>3</sup>)</b>	<b>Average Concentration of Run-Off (mg/l)</b>	<b>Average Concentration of Run-Off (Kg/m<sup>3</sup>)</b>	<b>Total Daily Volume (kg)</b>
1	3.6	<7	<0.007	<b>0.021</b>
10	35.8	<7	<0.007	<b>0.215</b>
20	71.7	<7	<0.007	<b>0.430</b>
30	107.5	<7	<0.007	<b>0.645</b>
40	143.3	<7	<0.007	<b>0.860</b>

**Table 1 – COD Concentration**

\* Note assumed a COD concentration of 6m/l.

<b>Parameter – BOD</b>				
<b>Daily Rainfall Amount (mm)</b>	<b>Daily Volume of Run-off (m<sup>3</sup>)</b>	<b>Average Concentration of Run-Off (mg/l)</b>	<b>Average Concentration of Run-Off (Kg/m<sup>3</sup>)</b>	<b>Total Daily Volume (kg)</b>
1	3.6	1	0.001	<b>0.004</b>
10	35.8	1	0.001	<b>0.036</b>
20	71.7	1	0.001	<b>0.072</b>
30	107.5	1	0.001	<b>0.107</b>
40	143.3	1	0.001	<b>0.143</b>

**Table 2 – BOD Concentration**



<b>Parameter – Suspended Solids</b>				
<b>Daily Rainfall Amount (mm)</b>	<b>Daily Volume of Run-off (m<sup>3</sup>)</b>	<b>Average Concentration of Run-Off (mg/l)</b>	<b>Average Concentration of Run-Off (Kg/m<sup>3</sup>)</b>	<b>Total Daily Volume (kg)</b>
1	3.6	81	0.081	<b>0.290</b>
10	35.8	81	0.081	<b>2.902</b>
20	71.7	81	0.081	<b>5.804</b>
30	107.5	81	0.081	<b>8.707</b>
40	143.3	81	0.081	<b>11.609</b>

**Table 3 – Suspended Solids Concentration**

## 10 Proposed Discharge To Irish Water Sewerage System.

The current EPA Waste Licence for the Greenstar Deepwater Quay facility permits a maximum daily discharge of 4.5m<sup>3</sup> to the sanitary authority sewerage system. At present the majority of discharge to the foul sewerage system comprises domestic type wastewater generated from on-site toilet and canteen facilities and trade effluent generated from within the on-site main waste transfer building. It is proposed to discharge trade effluent generated from external hardstanding open yard Baled MSW storage area and civic amenity area to the sanitary authority sewerage system. Following discussions with Irish Water it was agreed that the trade effluent generated could be discharged at the Greenfield Runoff Rate of 1.69l/s for the site, further details are provided in *Appendix B*. The maximum daily discharge volume is 146m<sup>3</sup>, which equates to a maximum daily discharge volume of COD, BOD and Suspended Solids of 0.876kg, 0.146kg and 11.826kg respectively. The total daily discharge volume to the local authority foul water sewerage system would therefore be 4.5m<sup>3</sup> (existing) + 146m<sup>3</sup> (proposed) = **150.5m<sup>3</sup>**.

## 11 Surface Water Runoff Volumes in Excess of Proposed Maximum Daily Volume

It is acknowledged that the volume of surface water run-off, and hence trade effluent, generated from the open yard Baled MSW storage area will be dependent on daily rainfall amounts. The proposed maximum daily discharge volume of 146m<sup>3</sup> of trade effluent generally equates to a daily rainfall amount of 40.75mm, which is equivalent to Greenfield Runoff Rate for the site. In order to adequately manage surface water / trade effluent volumes in excess of the proposed daily discharge volume it is proposed

to provide an on-site surface water / trade effluent attenuation system. The attenuation system will be fitted with a hydraulic flow restrictor device which will limit outflow from the attenuation system to a maximum of 146m<sup>3</sup> per day.

For inspection purposes only.  
Consent of copyright owner required for any other use.

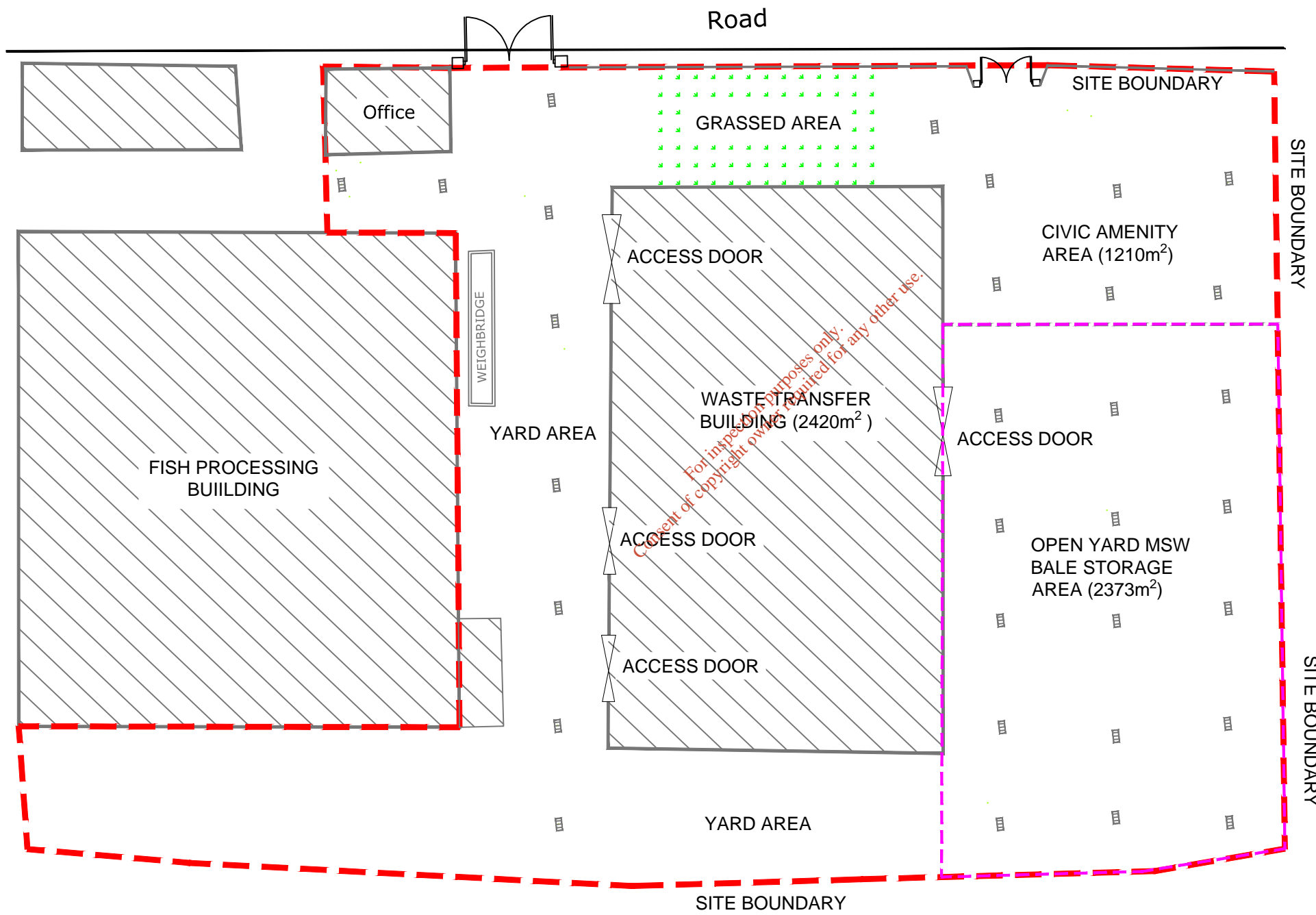
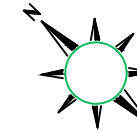
## ***APPENDIX A***

***Drawing Number IE1045-001-A***

***Drawing Number IE1045-002-A***

*For inspection purposes only.  
Consent of copyright owner required for any other use.*

GARAVOGUE ESTUARY



For inspection purposes only. Consent of copyright owner required for any other use.

EXISTING SITE LAYOUT  
SCALE NTS

NOTES:-

1. DO NOT SCALE FROM THIS DRAWING

rev.	date	amendment	drn	ckd
A	19.06.15	CLIENT ISSUE	NOM	PMS



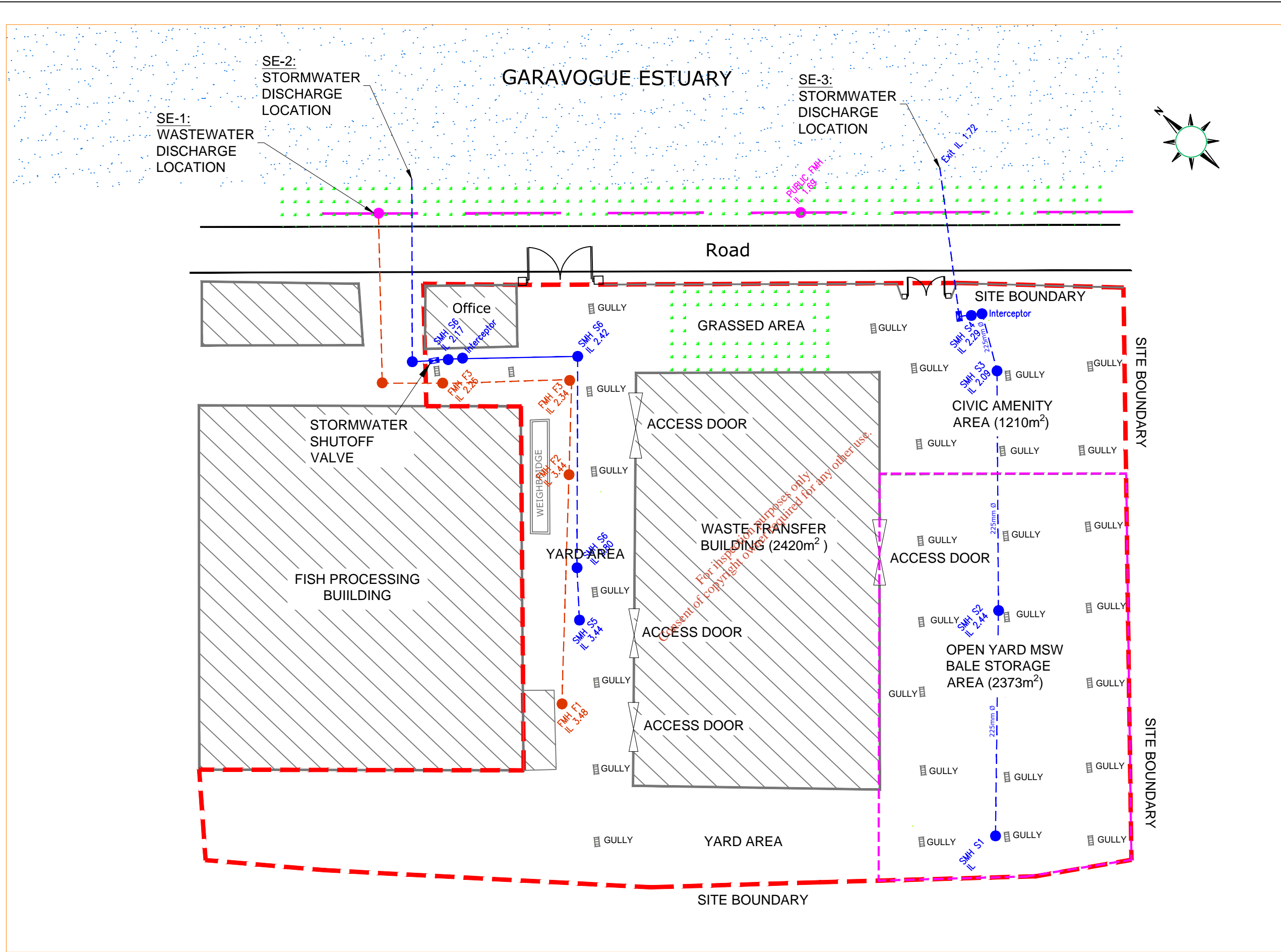
GREENSTAR FACILITY  
DEEP WATER QUAY  
SLIGO

STORMWATER TRADE EFFLUENT ASSESSMENT  
EXISTING SITE LAYOUT



INNOVATION CENTRE TELEPHONE: 059 91 33084  
GREEN ROAD FAX: 059 91 40499  
CARLOW EMAIL: info@iece.ie

DRAWING STATUS:		SCALE:	NTS	A3
INFORMATION		DATUM:	ORDNANCE	
DRAWING NUMBER:		DRAWN:	NOM	
REV		CHECKED:	PMS	
IE1045-001		APPROVED:	-	
DATE:		DATE:	19.06.15	



NOTES:-

1. DO NOT SCALE FROM THIS DRAWING

rev.	date	amendment	drn	ckd
A	22.06.15	CLIENT ISSUE	NOM	PMS



GREENSTAR FACILITY  
DEEP WATER QUAY  
SLIGO

STORMWATER TRADE EFFLUENT ASSESSMENT  
EXISTING DRAINAGE LAYOUT

IE CONSULTING  
WATER-ENVIRONMENTAL-CIVIL

INNOVATION CENTRE  
GREEN ROAD  
CARLOW

TELEPHONE: 059 91 33084  
FAX: 059 91 40499  
EMAIL: info@iece.ie

EXISTING DRAINAGE LAYOUT  
SCALE NTS

DRAWING STATUS:		SCALE:	NTS	A3
INFORMATION		DATUM:	ORDNANCE	
DRAWING NUMBER:		DRAWN:	NOM	
IE1045-002		CHECKED:	PMS	
REV		APPROVED:	-	
A		DATE:	22.06.15	

## ***APPENDIX B***

### ***Greenfield Runoff Calculation***

*For inspection purposes only.  
Consent of copyright owner required for any other use.*

Project: Greenstar Deepwater Quay, Sligo		Project No: IE1045
Element: Greenfield Runoff Rate		Calc Sheet No: 1 of 1
Drawing Ref:	Produced By: N O'Malley	Date: 05.08.15
	Checked By: P McShane	
<b>Calculations</b>		
<b>Design Parameters</b>		
<b>Location Of Catchment</b> (Pick from List)	Ireland ▼	11
<b>Regional Co-efficient</b> (This value is Calculated)	C	0.0172
<b>Catchment Area</b>	AREA	0.500 km <sup>2</sup>
<b>Stream Frequency</b>	STMFRQ	0
<b>Soil Run Off Potential</b>	SOIL	0.3 SOIL Maps
<b>Res. Soil Moisture Deficit</b> (This value is Calculated)	RSMD	56.08 mm
<b>Main Stream Slope</b>	S1085	0 m/km
<b>Proportion Of Catchment Draining Through Lakes</b>	LAKE	0
<b>Standard Average Annual Rainfall</b>	SAAR	1501 FSU Website
Mean Annual Flood (Qbar) Based on 50ha Catchment as Detailed in the Greater Dublin Strategic Drainage Study		
$Qbar = 0.00066(AREA^{0.92} \cdot SAAR^{1.22} \cdot SOIL^{2.0})$		
<b>Qbar =</b>	<b>0.2355</b>	m <sup>3</sup> /s
<b>Permissible Discharge</b>	= (Qbar / 50) x Site Area	Site Area = 0.358 ha
<b>Permissible Discharge</b>	=	0.0017 m <sup>3</sup> /s
	=	1.69 l/s





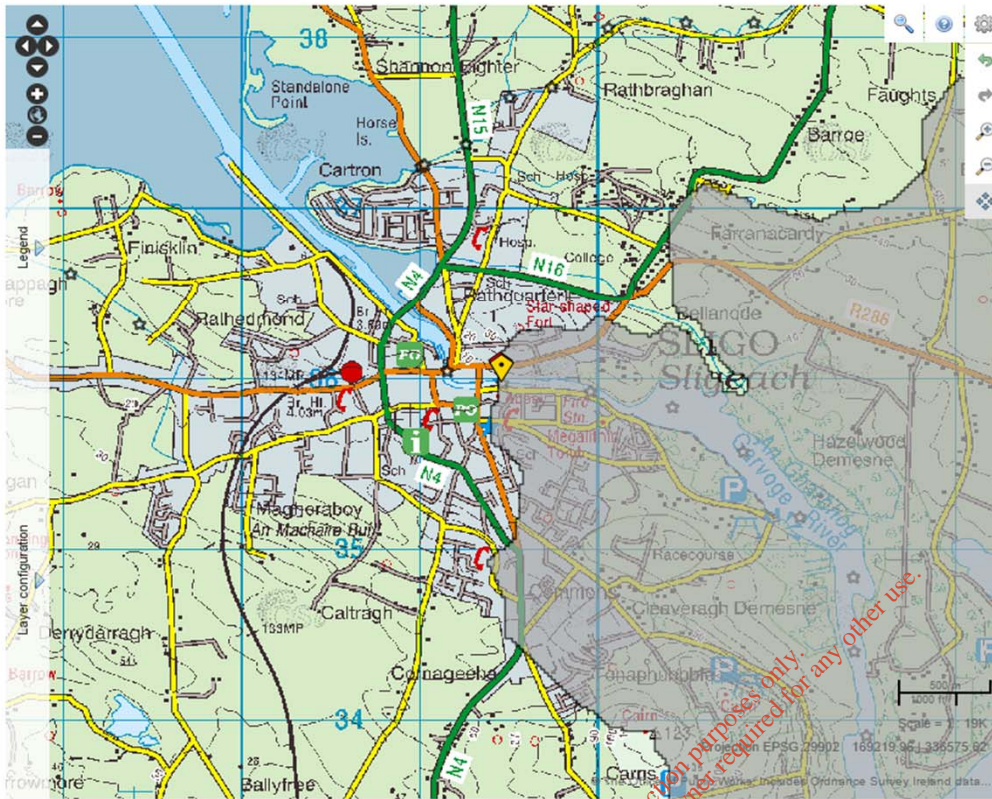
Current session: Killeshin\_01 (Pending)

Rainfall DDF

Flood frequencies

Hydrograph widths

IBIDEM



**Subject site**

Clicked coordinates:  
[169458.2154, 335990.9345]

**Subject site properties**

Location Number	35_4183_6
Contributing Catchment Area	368.704 km <sup>2</sup>
BFISOIL	0.6906
SAAR	<b>1500.6 mm</b>
FARL	0.791
DRAIN	1.432 km/km <sup>2</sup>
S1085	2.3318 m/km
ARTDRAIN2	0.1599
URBEXT	0.007
Centroid distance	18.8434 km
Coordinates	[169463.9981, 335973.0003]

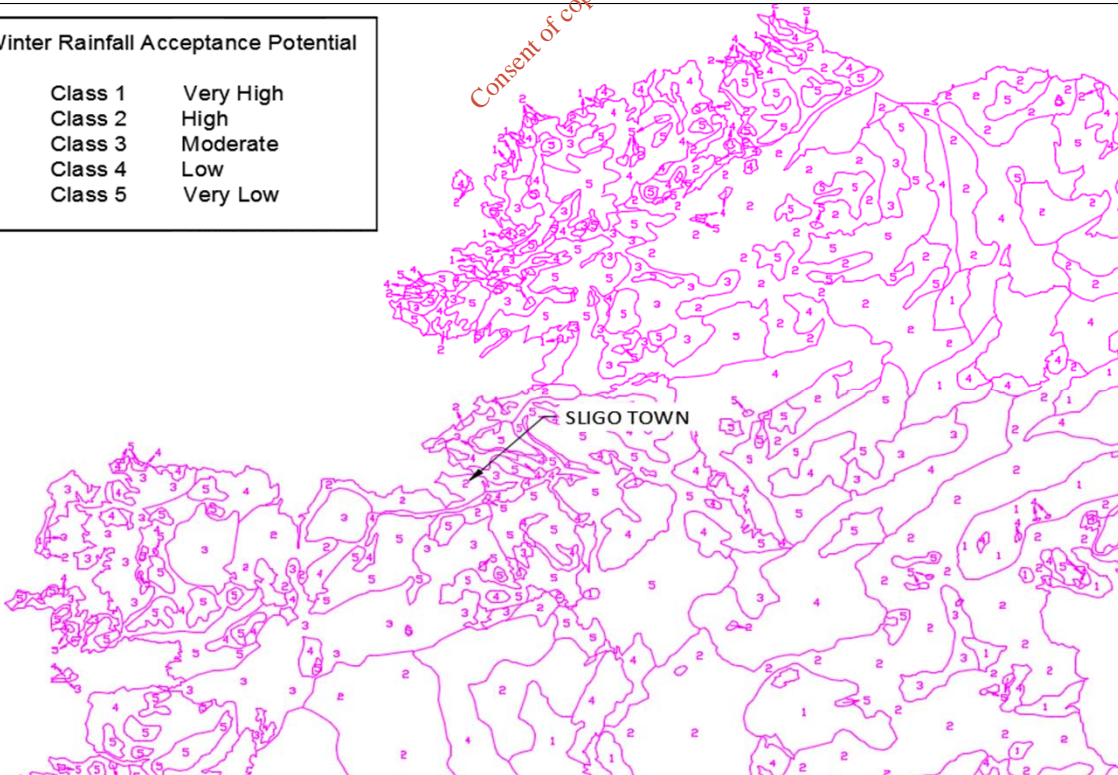
**QMED values**

PCD estimate	51.9418m <sup>3</sup> /s
PCD urban estimate	52.4815m <sup>3</sup> /s

For inspection purposes only. Consent of copyright owner required for any other use.

**Winter Rainfall Acceptance Potential**

- Class 1 Very High
- Class 2 High
- Class 3 Moderate
- Class 4 Low
- Class 5 Very Low



$$SOIL = 0.15(S1) + 0.3(S2) + 0.40(S3) + 0.45(S4) + 0.5(S5)$$