

## BESPOKE PERMIT APPLICATION – DISCHARGE FLOW ESTIMATE

**Project:** London Southend Airport  
**Purpose:** Surface De-icer Drainage Discharge Permit Application  
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**Author:** Mark Barrell, Engineer, Capita Symonds  
**Checked:** David Sullivan, Director, Capita Symonds

### ESTIMATE OF DISCHARGE OF RUNOFF FROM PROPOSED SURFACE DE-ICING OPERATIONS AT LONDON SOUTHEND AIRPORT (LSA)

The following de-icer and discharge estimates are based on a rate of application and a given catchment area. The discharge is weather dependant and should a rainfall event immediately follow de-icing operations the amount of runoff will increase.

The rates of application of de-icing chemicals as used by LSA are as follows<sup>1</sup>:

- For anti-icing – 245 litres per hectare
- For de-icing (thin ice) – 490 litres per hectare
- For de-icing (25mm thick ice) – 1470 litres per hectare

Cryotech E36 is a 50% aqueous potassium acetate solution, by weight, with corrosion inhibitors.

For the purposes of this permit application, the worst case will be when used to melt 25mm thick ice. It is assumed that there is a uniform depth of ice over the catchment area. Consideration has been given to the likely limiting effects of the drainage system when estimating discharge values.

#### **Outfall EB1**

Catchment area	=	1.43 Ha
De-icer amount	=	2,102 litres
Snow/slush melted	=	357,500 litres
Discharge	=	7.1 l/s

Discharge from this outfall is limited to 7.1 l/s as part of the runway extension drainage system.

#### **Outfall EB2**

Catchment area	=	2.84 Ha
De-icer amount	=	4,175 litres
Snow/slush melted	=	710,000 litres
Discharge	=	112.4 l/s

<sup>1</sup> Source, [http://www.cryotech.com/websites/cryotech/images/docs/products/runway/e36\\_fs.pdf](http://www.cryotech.com/websites/cryotech/images/docs/products/runway/e36_fs.pdf), Cryotech E36 Factsheet dated 2011, retrieved 03.01.2014.

Discharge from this outfall is limited by a 375mm dia pipe (from Wallingford tables, assumed self cleansing pipe gradient).

## Outfall PB1

Catchment area	=	7.34 Ha
De-icer amount	=	10,790 litres
Snow/slush melted	=	1,835,000 litres
Discharge	=	220.4 l/s

Discharge from this outfall is limited by a 525mm dia pipe (from Wallingford tables, assumed self cleansing pipe gradient).

## Outfall PB2

Catchment area	=	9.36 Ha
De-icer amount	=	13,760 litres
Snow/slush melted	=	2,340,000 litres
Discharge	=	40.1 l/s

Discharge from this outfall is limited by a 225mm dia pipe (from Wallingford tables, assumed self cleansing pipe gradient).