Technical Appendix 9.6 - Surface Water Database & Discharge Calculations

Sample Details			LIMITS re EIA (Ref. NRA) Indicative Limits Re.: Bathing, Drinking Surface Water reg's.								
Sample ID				SW1	SW1	SW2	SW3	SW3-B	SW3-C	SW4	SW5
Project COC Reference				3006-028 (COC1)		3006-28 (COC4)	3006-28 (COC4)			3006-028-(COC5)	
Sample Type		*Medum*		Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water
Date Sampled		*dd/mm/yyyy*		09/05/2019	25-07-19	04/07/2019	04/07/2019	04/07/2019	04/07/2019	25/07/2019	25-07-19
Grid Reference for Sampling Location		*Irish Grid TM65*		IH 04505 82563	IH 04505 82563	IH 04014 81478	IH 01814 82729	IH 01843 82727	IH 01833 82744	IH 05273 83092	IH 04425 83099
Field Data Discharge Data											
Surface Water Feature		*Type*		Stream	Stream	Stream	Stream	Stream	Stream	Stream	Stream
Description of sample location		*Type*		Bridge, 2 no. concrete culvert ID c. 0.86m	Bridge, 2 no. concrete culvert ID c. 0.86m	Stream - lake discharge point	Stream - c. 10m after streams SW3-B and SW3-B join	Stream	Stream	Stream - lake discharge point	Bridge, 1 no. concrete culvert ID c. 0.86m
Width of Water Body		*m*				2	0.4	0.4	0.4	0.3	
Radius (r)		*m*		0.43	0.43						0.43
Depth (d)		*m*		0.2	0.3	0.2	0.2	0.15	0.1	0.2	0.05
Radius - Depth (r-d)	**r - d**	*m*		0.23	0.13						0.38
AB	**√(r)^2 - (r-d)^2**	*m*		0.36	0.41						0.20
θ	**2cos^-1[(r-d)/r]**	*Deg*		115.33	144.81						55.81
Area ABC	**0.5(AB)*(r-d)**	*m2*		0.0418	0.0266						0.0382
Area DBC	**Area ABC * 2**	*m2*		0.0836	0.0533						0.0765
Area CDEB	**(θ/360) × π r2.**	*m2*		0.1860	0.2335						0.0900
Area DEB (A)	**Area CDEB - Area DBC**	*m2*		0.1024	0.1802						0.0135
Number of Culverts		*No.*		2	2						1
Friction Loss Correction		*%*		0.85	0.85						0.85
Section Area (A)	**Includes condition**	*m2*		0.2049	0.3605						0.0135
Flow Velocity (V) - Approximate	**[Measured on site]**	*m/sec*		0.5	0.5						0.5
Discharge Rate (Q)	**A * V**	*m3/sec*		0.1024	0.1802						0.0068
Discharge Rate (Q)	**Qm^3 * 1000**	*l/sec*		102.4	180.2						6.8
Discharge Rate (Q)	**Includes condition**	*l/sec*		87.1	153.2	20	6	4	2	4	5.8
Field Data Qulaity Data											
Clarity				Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear
Colour				Slightly Yellow / Green	Light Brown	Slightly Yellow / Green	Slightly Brownish Yellow	Slightly Brownish Yellow	Slightly Brownish Yellow	Light Brown	Light Brown
Odour				None	None	None	None	None	None	None	None
pH		*pH Units*	>6 & <9	9.1		6.52	7.15	7.64	7.31	8.8	8.45
Conductivity		*mS/cm*	2.5	0.061		0.06	0.063	0.059	0.053	0.067	0.06
Temperature		*deg. C*	21.5	9.7		14.6	14.9	14.2	14.4	18.8	17.3
Dissolved Oxygen		*%*		96.8		93.5	100.7			96.6	89.2
Dissolved Oxygen		*mg/l*	50% Samples >9	10.95		9.42	10.2			9.01	8.56
Laboratory data											
Conductivity @ 20 deg.C		*mS/cm*	2.5	0.0474		0.0484	0.0506			0.0409	
pH		*pH Units*	>6 & <9	6.33		6.92	7.16			7.21	
Carbon, Organic (diss.filt)		*mg/l*		4.64		8.17	8.57			6.25	
Ammoniacal Nitrogen as N (low level)		*mg/l*	0.02	0.0443		0.0293	0.0365			0.0168	
BOD, unfiltered		*mg/l*	3	<1		<1	<1			2.05	
Nitrate as NO3		*mg/l*		<0.3		<0.3	<0.3			<0.3	
Nitrite as NO2		*mg/l*	0.05	<0.05		<0.05	<0.05			<0.05	
Nitrogen, Kjeldahl		*mg/l*		<1		<1	<1			<1	
Nitrogen, Total		*mg/l*		<1		<1	<1			<1	
Phosphate (Ortho as P)		*mg/l*		<0.02		<0.02	<0.02			<0.02	
Suspended solids, Total		*mg/l*	25	<2		<2	<2			<2	
Total Oxidised Nitrogen as N		*mg/l*		<0.1		<0.1	<0.1			<0.1	
Turbidity		*ntu*		1		1.29	2.08			1.11	
Copper (diss.filt)		*µg/l*	5	<0.3		<0.3	<0.3			<0.3	
Phosphorus (diss.filt)		*µg/l*		<10		<10	<10			<10	
Zinc (diss.filt)		*µg/l*		1.74		1.65	4.53			2.41	
Copper (tot.unfilt)		*µg/l*	2000	<1		<1	<1			<1	
Hardness, Total as CaCO3 unfiltered		*mg/l*		7.69		10.6	9.76			9.2	
Phosphorus (tot.unfilt)		*µg/l*		<20		<20	<20			<20	
Zinc (tot.unfilt)		*µg/l*	30	5.68		<5	<5			6.82	
TPH / Oil & Greases		*mg/l*	No Impact on Fish	<1		<1	<1			<1	

Note/s:

The below diagram presents symbols assigned to values re culvert discharge calculations.