

Appendix 5A

Air Pollution Emission Rates

Environmental Impact Assessment Report Relocation of Yiu Lian Floating Dock No. 3

Hyder Consulting Ltd Incorporated in Hong Kong with limited liability—COI Number 126012 October 2006

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Appendix 5A – Emission rates

Emission Rates of NO ₂	
General Equation:	
Emission rate = emission factor x conversion factor	
Dock No. 1	
Generators EG1 & EG2	
Rated output of the diesel generator (EG1 & EG2)	650 kW
NO2 Emission Rate (USEPA AP-42, 5th Edition, Table 3.4.1)	
Uncontrolled NO _x emission factor	0.024 lb/hp-hr
Uncontrolled NO _x emission factor	14.592 g/kW-hr
Uncontrolled NO_2 emission rate (20% of NO_x)	0.5269 g/s
<u> Dоск No. 3</u>	
Generators G1, G2 & G3	
Rated output of the diesel generator (G1, G2 & G3)	485 kW
NO ₂ Emission Rate (USEPA AP-42, 5th Edition, Table 3.4.1)	
Uncontrolled NO _x emission factor	0.024 lb/hp-hr
Uncontrolled NO _x emission factor	14.592 g/kW-hr
Uncontrolled NO_2 emission rate (20% of NO_x)	0.3932 g/s
Generator G4	
Rated output of the diesel generator (G4)	160 kW
NO ₂ Emission Rate (USEPA AP-42, 5th Edition, Table 3.3.1)	
Uncontrolled NO _x emission factor	0.031 lb/hp-hr
Uncontrolled NO _x emission factor	18.848 g/kW-hr
Uncontrolled NO_2 emission rate (20% of NO_x)	0.1675 g/s

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229 kW
0.031 lb/hp-hr
18.848 g/kW-hr
0.2398 g/s

Note:

1) To convert from lb/hp-hr to kg/kw-hr, multiply by 0.608.

Emission Rates of SO₂

Maximum Sulphur Content in fuel	0.5 % by weight
Assume density of fuel	0.85 kg/L
Molar mass of sulphur	32 g/mol
Molar mass of SO ₂	64 g/mol

<u> Dоск No. 1</u>

Generators EG1 & EG2

Fuel consumption rate	174.9 L/hr
	148.7 kg/hr
Mass of sulphur burnt	0.743 kg/hr
No. of mole of sulphur burnt	23.2 mol/hr
No. of mole of SO_2 formed	23.2 mol/hr
SO ₂ emission rate	1,487.7 g/hr
	0.4130 a/s

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<u> Dоск No. 3</u>

Generators G1, G2 & G3

Fuel consumption rate	137.6 L/hr
	117.0 kg/hr
Mass of sulphur burnt	0.585 kg/hr
No. of mole of sulphur burnt	18.3 mol/hr
No. of mole of SO_2 formed	18.3 mol/hr
SO ₂ emission rate	1,169.6 g/hr
	0.3249 g/s
Generator G4	
Fuel consumption rate	43.1 L/hr
	36.6 kg/hr
Mass of sulphur burnt	0.183 kg/hr
No. of mole of sulphur burnt	5.7 mol/hr
No. of mole of SO_2 formed	5.7 mol/hr
SO ₂ emission rate	366.1 g/hr
	0.1018g/s
Generator G5	
Fuel consumption rate	53.1 L/hr
	45.1 kg/hr
Mass of sulphur burnt	0.226 kg/hr
No. of mole of sulphur burnt	7.1 mol/hr
No. of mole of SO_2 formed	7.1 mol/hr
SO ₂ emission rate	451.4 g/hr
	0.1254 g/s

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