

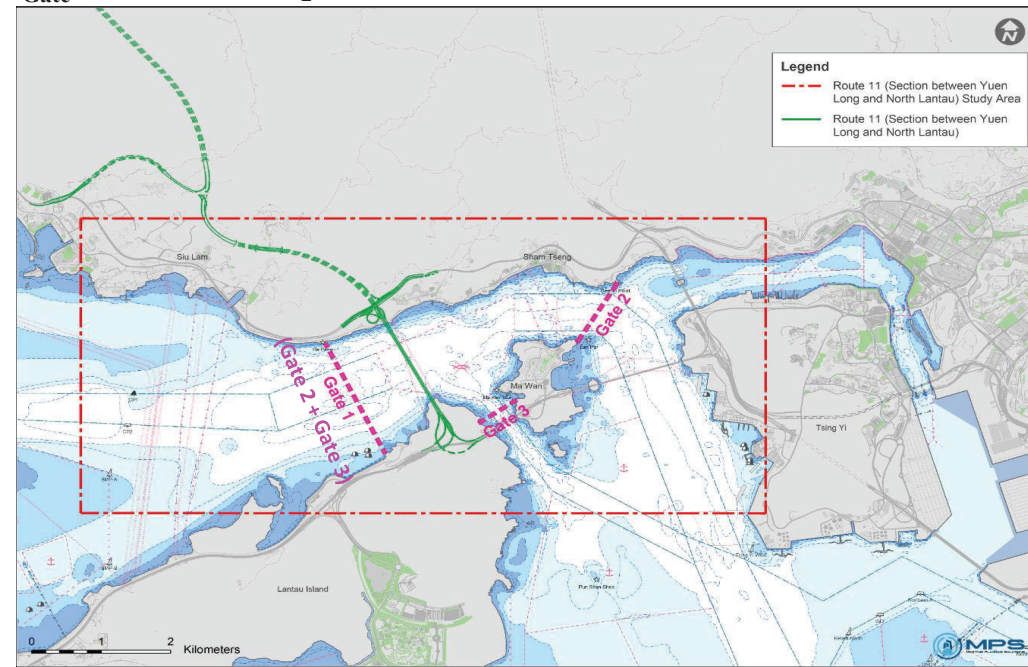
Annex I

Marine Emission Rate for Tsing Lung Tau Fairway in Year 2048

Local Ferries_Gate 2

Marine Traffic Information

Assessment Year 2048
 Assessed Vessel Type Local Ferries
 Gate 2



Marine Traffic Information from Marine Traffic Consultants

Location	Monthly Vessel Count in Dec ^[1]	Travelling Speed (knots) ^[2]	Length of Sailing Route (m) ^[3]
Gate 2	87	10	2,400

Notes

[1] Monthly Vessel Count is advised by Marine Traffic Consultant and accepted by Marine Department.

[2] Average speed of 10 knot is provided by Marine Traffic Consultant.

[3] Possible maximum length of sailing route is estimated for conservative assessment.

Marine Emission Inventory

Total Emission Rate

Group ^[1]	Vessel Type	Emission Rate per Trip (g/s) ^[3]		
		NO _x	RSP	FSP
1	Local Ferry	0.430	0.010	0.010

Engine in Operation

Engine	On (1) or Off (0) ^[2]
ME	1
AE	1

Notes:

- [1] The vessel type is grouped according to the modelling parameter (i.e. stack height, exit temperature, exit velocity etc). Vessel types with the identical modelling parameters will be grouped.
- [2] Main and auxiliary engine are assumed in operation during maneuvering for conservative assessment with reference to Table 3-25 of Study on Marine Vessels Emission Inventory Final Report (HKUST, February 2012). The emission rate per trip considers the emission from the engine in operation as indicated in the table "Engine in Operation", and the calculation is documented in the "Technical Notes on Marine Emission for So Kwun Wat and Tsing Lung Tau Areas" submitted to EPD.
- [3] The emission rate per trip is calculated based on the following equation. Breakdown is provided and documented in "Technical Notes on Marine Emission for So Kwun Wat and Tsing Lung Tau Areas" submitted to EPD and emission rates are evenly apportioned into point sources in the model as shown in subsequent pages of this Appendix.

$$\text{Engine Emission Rate per Trip} = (i)\text{Time-in-mode} \times (ii)\text{Engine Load Factors} \times (iii)\text{Engine Power} \times (iv)\text{Emission Factor, where}$$
 - (i) Time-in-mode is calculated from the average speed and possible maximum length of sailing route within assessment area provided by Marine Traffic Consultant.
 - (ii) Engine Load Factors are made reference to Table 4-9 and Table 4-10 of Study on Marine Vessels Emission Inventory Final Report (HKUST, February 2012).
 - (iii) The average engine powers are based on desktop review. The average main and auxiliary engine power are 1400kW and 188kW respectively.
 - (iv) The emission factor is made reference to Study on Marine Vessels Emission Inventory Final Report (HKUST, February 2012) Table 4-17. Under the Air Pollution Control (Fuel for Vessels) Regulation, all vessels assumed to use MGO due to requirement to fuel switch to compliant fuel (sulphur content <=0.5%) within Hong Kong waters.

Modelling Parameters

Gate	Group	Source ID	Type	X	Y	Base Elevation	Release Height [1]	Exit Temperature [1]	Exit velocity [1]	Internal diameter [1]	Emission Rate per Trip		
				(m)	(m)						(mpd)	(m)	(K)
				(g/s)	(g/s)	(g/s)							
2	1	G2_LF1_001	POINTHOR	822589.5	824408.8	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_002	POINTHOR	822541.5	824393.3	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_003	POINTHOR	822493.6	824377.7	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_004	POINTHOR	822445.6	824362.2	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_005	POINTHOR	822397.7	824346.7	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_006	POINTHOR	822349.7	824331.1	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_007	POINTHOR	822301.8	824315.6	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_008	POINTHOR	822253.8	824300.1	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_009	POINTHOR	822205.9	824284.5	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_010	POINTHOR	822157.9	824269	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_011	POINTHOR	822110.2	824252.8	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_012	POINTHOR	822062.4	824236.7	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_013	POINTHOR	822014.6	824220.5	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_014	POINTHOR	821966.8	824204.4	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_015	POINTHOR	821919.1	824188.2	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_016	POINTHOR	821870.9	824173.6	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_017	POINTHOR	821822.6	824159.3	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_018	POINTHOR	821774.3	824145.1	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_019	POINTHOR	821726	824130.8	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_020	POINTHOR	821678.8	824112.8	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_021	POINTHOR	821631.7	824094.5	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_022	POINTHOR	821584.6	824076.2	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_023	POINTHOR	821537.5	824057.9	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_024	POINTHOR	821490.4	824039.5	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_025	POINTHOR	821443.3	824021.2	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_026	POINTHOR	821393.9	824013.3	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_027	POINTHOR	821344.3	824006	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_028	POINTHOR	821296.8	823989.2	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_029	POINTHOR	821249.2	823972.3	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_030	POINTHOR	821201.7	823955.4	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_031	POINTHOR	821152.4	823948.1	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_032	POINTHOR	821102.4	823945.3	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_033	POINTHOR	821052.4	823942.5	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_034	POINTHOR	823091.4	824191.5	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_035	POINTHOR	823048.6	824163.4	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_036	POINTHOR	823005.9	824135.3	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_037	POINTHOR	822963.2	824107.2	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_038	POINTHOR	822920.5	824079.1	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_039	POINTHOR	822877.8	824051	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_040	POINTHOR	822835	824022.9	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_041	POINTHOR	822792.3	823994.8	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_042	POINTHOR	822749.6	823966.7	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_043	POINTHOR	822706.9	823938.6	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_044	POINTHOR	822664.2	823910.5	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05

Modelling Parameters

Gate	Group	Source ID	Type	X	Y	Base Elevation	Release Height ^[1]	Exit Temperature ^[1]	Exit velocity ^[1]	Internal diameter ^[1]	Emission Rate per Trip		
				(m)	(m)		(m)	(K)	(m/s)		NOx	RSP	FSP
				(g/s)	(g/s)		(g/s)						
2	1	G2_LF1_045	POINTHOR	822621.4	823882.3	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_046	POINTHOR	822578.7	823854.2	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_047	POINTHOR	822536	823826.1	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_048	POINTHOR	822493.3	823798	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_049	POINTHOR	822450.5	823769.9	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_050	POINTHOR	822407.8	823741.8	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_051	POINTHOR	822365.1	823713.7	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_052	POINTHOR	822322.4	823685.6	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_053	POINTHOR	822279.7	823657.5	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_054	POINTHOR	822236.9	823629.4	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_055	POINTHOR	822194.2	823601.3	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_056	POINTHOR	822148.8	823579.2	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_057	POINTHOR	822101.9	823560.1	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_058	POINTHOR	822055.1	823541	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_059	POINTHOR	822008.3	823521.8	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_060	POINTHOR	821961.5	823502.7	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_061	POINTHOR	821914.7	823483.6	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_062	POINTHOR	821867.9	823464.4	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_063	POINTHOR	821821.1	823445.3	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_064	POINTHOR	821774.3	823426.1	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_065	POINTHOR	821727.4	823407	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_066	POINTHOR	821680.6	823387.9	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_067	POINTHOR	821633.8	823368.7	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_068	POINTHOR	821587	823349.6	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_069	POINTHOR	821540.2	823330.5	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_070	POINTHOR	821493.4	823311.3	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_071	POINTHOR	821446.5	823292.2	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_072	POINTHOR	821399.7	823273.1	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_073	POINTHOR	821352.9	823253.9	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_074	POINTHOR	821306.1	823234.8	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_075	POINTHOR	821259.3	823215.7	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_076	POINTHOR	821212.5	823196.5	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_077	POINTHOR	821165.7	823177.4	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_078	POINTHOR	821118.8	823158.3	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_079	POINTHOR	823119	823619.1	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_080	POINTHOR	823081.5	823583.3	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_081	POINTHOR	823044	823547.6	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_082	POINTHOR	823006.6	823511.9	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_083	POINTHOR	822969.1	823476.2	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_084	POINTHOR	822931.6	823440.4	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_085	POINTHOR	822894.1	823404.7	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_086	POINTHOR	822856.7	823369	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_087	POINTHOR	822819.2	823333.3	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_088	POINTHOR	822781.7	823297.5	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05

Modelling Parameters

Gate	Group	Source ID	Type	X	Y	Base Elevation	Release Height [1]	Exit Temperature [1]	Exit velocity [1]	Internal diameter [1]	Emission Rate per Trip		
				(m)	(m)						(mpd)	(m)	(K)
2	1	G2_LF1_089	POINTHOR	822744.3	823261.8	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_090	POINTHOR	822706.8	823226.1	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_091	POINTHOR	822669.3	823190.4	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_092	POINTHOR	822631.8	823154.6	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_093	POINTHOR	822594.4	823118.9	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_094	POINTHOR	822556.9	823083.2	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_095	POINTHOR	822519.4	823047.5	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_096	POINTHOR	822481.9	823011.7	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_097	POINTHOR	822444.5	822976	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_098	POINTHOR	822407	822940.3	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_099	POINTHOR	822369.5	822904.6	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_100	POINTHOR	822332	822868.9	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_101	POINTHOR	822289.2	822842.2	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_102	POINTHOR	822243.1	822821.3	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_103	POINTHOR	822196.9	822800.3	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_104	POINTHOR	822150.8	822779.4	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_105	POINTHOR	822104.6	822758.5	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_106	POINTHOR	822058.5	822737.6	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_107	POINTHOR	822012.3	822716.7	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_108	POINTHOR	821966.2	822695.7	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_109	POINTHOR	821920	822674.8	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_110	POINTHOR	821873.9	822653.9	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_111	POINTHOR	821827.7	822633	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_112	POINTHOR	821781.6	822612	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_113	POINTHOR	821735.4	822591.1	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_114	POINTHOR	821689.3	822570.2	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_115	POINTHOR	821643.1	822549.3	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_116	POINTHOR	821597	822528.4	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_117	POINTHOR	821550.8	822507.4	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_118	POINTHOR	821504.7	822486.5	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_119	POINTHOR	821458.5	822465.6	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_120	POINTHOR	821412.4	822444.7	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05
2	1	G2_LF1_121	POINTHOR	821366.2	822423.8	0	1.3	773	8	0.7	3.55E-03	8.53E-05	7.98E-05

Notes:

[1] Modelling parameters are referred to Approved EIA of Proposed Road Improvement Works in West Kowloon Reclamation Development – Phase 1 – Investigation, Design and Construction (AEIAR-179/2013) and Expansion of Hong Kong Airport into a Three-Runway System (AEIAR-185/2014).

Calculation of Multiplying Factor for Total Vessel Count**Monthly Vessel Count for Year 2048**

Marine Gate	Monthly Vessel Count in Dec ^[1]
Gate 2	87

Notes:

[1] The marine traffic data for December is provided by Marine Traffic Consultant.

Monthly Profile of Marine Traffic for Year 2019

Month	Monthly Multiplying Factor
Jan-19	1.00
Feb-19	0.90
Mar-19	1.00
Apr-19	0.97
May-19	1.00
Jun-19	0.97
Jul-19	1.00
Aug-19	1.00
Sep-19	0.97
Oct-19	1.00
Nov-19	0.97
Dec-19	1.00

Notes:

[1] No monthly profile is available from Marine Traffic Consultant and port statistics. Same number of vessel count each day is assumed.

Hourly Multiplying Factor derived from Marine Traffic in December 2048

Hour		Gate 2	
Start	End	No. of Marine Vessels ^[1]	Hourly Multiplying Factor
0	1	0	0.0%
1	2	0	0.0%
2	3	0	0.0%
3	4	2	2.3%
4	5	0	0.0%
5	6	0	0.0%
6	7	0	0.0%
7	8	2	2.3%
8	9	2	2.3%
9	10	14	16.1%
10	11	6	6.9%
11	12	3	3.4%
12	13	15	17.2%
13	14	5	5.7%
14	15	4	4.6%
15	16	10	11.5%
16	17	3	3.4%
17	18	4	4.6%
18	19	5	5.7%
19	20	2	2.3%
20	21	4	4.6%
21	22	1	1.1%
22	23	1	1.1%
23	24	4	4.6%

Notes:

[1] The number of hourly marine vessels for Dec 2048 is provided by Marine Traffic Consultant. It contains the total number of marine vessels for the 31 days in December in Year 2048 for each hour. For example, from Hour 0 to Hour 1 (i.e. first hour of 1 Dec + first hour of 2 Dec, 1st hour of 31 Dec), there are total 0 marine vessels for the first hour during the whole December.

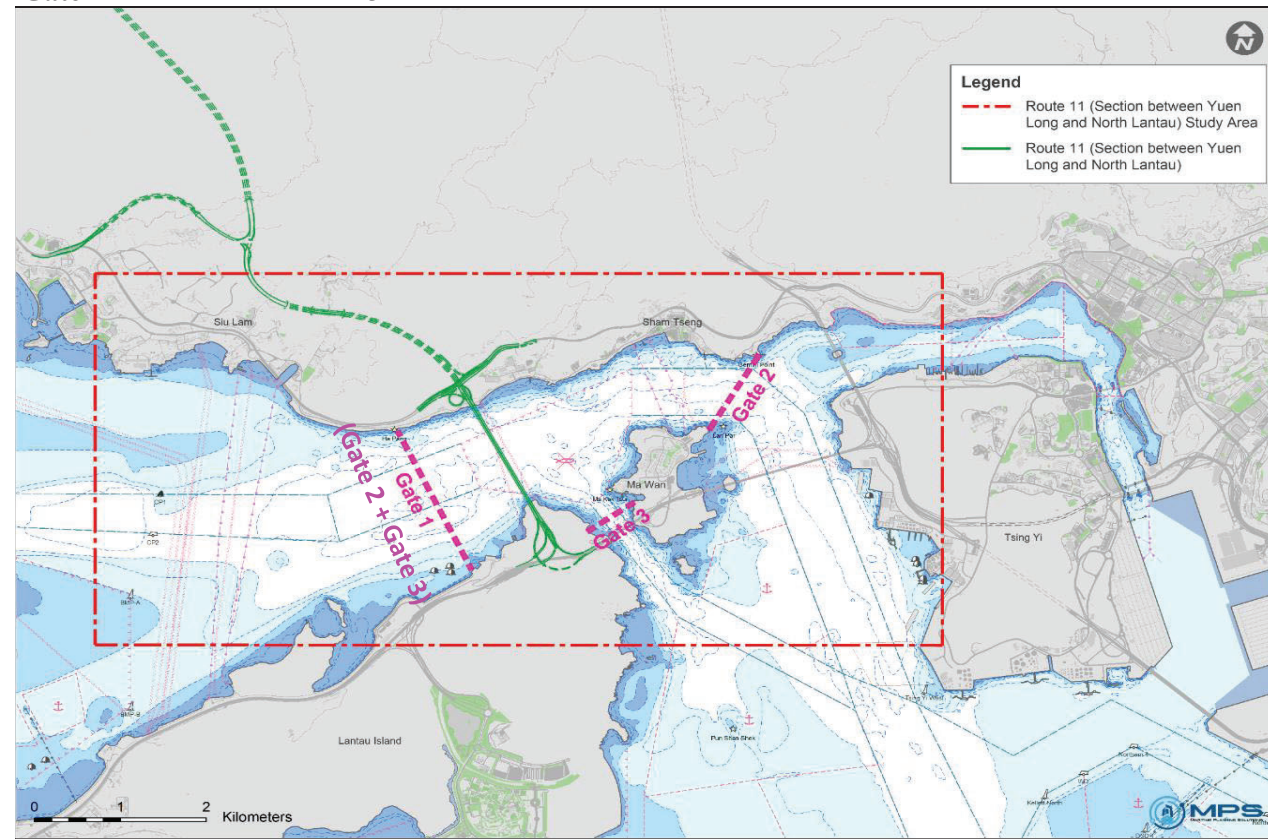
Annex II

Marine Emission Rate for Tsing Lung Tau Fairway in Year 2048

Local Ferries_Gate 3

Marine Traffic Information

Assessment Year 2048
 Assessed Vessel Type Local Ferries
 Gate 3



Marine Traffic Information from Marine Traffic Consultants

Location	Monthly Vessel Count in Dec ^[1]	Travelling Speed (knots) ^[2]	Length of Sailing Route (m) ^[3]
Gate 3	38	9	3,600

- Notes:**
- [1] Monthly Vessel Count is advised by Marine Traffic Consultant and accepted by Marine Department.
 - [2] Average speed of 10 knot is provided by Marine Traffic Consultant.
 - [3] Possible maximum length of sailing route is estimated for conservative assessment.

Marine Emission Inventory

Total Emission Rate

Group ^[1]	Vessel Type	Emission Rate per Trip (g/s) ^[3]		
		NO _x	RSP	FSP
1	Local Ferry	0.7160	0.0172	0.0161

Engine in Operation

Engine	On (1) or Off (0) ^[2]
ME	1
AE	1

Notes:

[1] The vessel type is grouped according to the modelling parameter (i.e. stack height, exit temperature, exit velocity etc). Vessel types with the identical modelling parameters will be grouped.

[2] Main and auxiliary engine are assumed in operation during maneuvering for conservative assessment with reference to Table 3-25 of Study on Marine Vessels Emission Inventory Final Report (HKUST, February 2012). The emission rate per trip considers the emission from the engine in operation as indicated in the table "Engine in Operation", and the calculation is documented in the "Technical Notes on Marine Emission for So Kwun Wat and Tsing Lung Tau Areas" submitted to EPD.

[3] The emission rate per trip is calculated based on the following equation. Breakdown is provided and documented in "Technical Notes on Marine Emission for So Kwun Wat and Tsing Lung Tau Areas" submitted to EPD and emission rates are evenly apportioned into point sources in the model as shown in subsequent pages of this Appendix.

Engine Emission Rate per Trip = (i)Time-in-mode x (ii)Engine Load Factors x (iii) Engine Power x (iv) Emission Factor, where

(i) Time-in-mode is calculated from the average speed and possible maximum length of sailing route within assessment area provided by Marine Traffic Consultant.

(ii) Engine Load Factors are made reference to Table 4-9 and Table 4-10 of Study on Marine Vessels Emission Inventory Final Report (HKUST, February 2012).

(iii) The average engine powers are based on desktop review. The average main and auxiliary engine power are 1400kW and 188kW respectively.

(iv) The emission factor is made reference to Study on Marine Vessels Emission Inventory Final Report (HKUST, February 2012) Table 4-17. Under the Air Pollution Control (Fuel for Vessels) Regulation, all vessels assumed to use MGO due to requirement to fuel switch to compliant fuel (sulphur content <=0.5%) within Hong Kong waters.

Modelling Parameters

Gate	Group	Source ID	Type	X	Y	Base Elevation	Release Height ^[1]	Exit Temperature ^[1]	Exit velocity ^[1]	Internal diameter ^[1]	Emission Rate per Trip		
				(m)	(m)	(mpd)	(m)	(K)	(m/s)	(m)	NO _x (g/s)	RSP (g/s)	FSP (g/s)
3	1	G3_LF1_001	POINTHOR	824110.1	822432.3	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_002	POINTHOR	824075	822470.8	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_003	POINTHOR	824039.9	822509.2	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_004	POINTHOR	824004.9	822547.7	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_005	POINTHOR	823969.8	822586.1	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_006	POINTHOR	823934.8	822624.6	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_007	POINTHOR	823899.7	822663	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_008	POINTHOR	823864.6	822701.4	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_009	POINTHOR	823829.6	822739.9	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_010	POINTHOR	823794.5	822778.3	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_011	POINTHOR	823759.5	822816.8	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_012	POINTHOR	823724.4	822855.2	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_013	POINTHOR	823689.4	822893.7	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_014	POINTHOR	823654.3	822932.1	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_015	POINTHOR	823619.2	822970.6	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_016	POINTHOR	823584.2	823009	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_017	POINTHOR	823549.1	823047.4	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_018	POINTHOR	823514.1	823085.9	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_019	POINTHOR	823479	823124.3	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_020	POINTHOR	823443.9	823162.8	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_021	POINTHOR	823404.9	823195.7	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_022	POINTHOR	823361.3	823222	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_023	POINTHOR	823317.6	823248.3	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_024	POINTHOR	823273.9	823274.7	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05

Modelling Parameters

Gate	Group	Source ID	Type	X	Y	Base Elevation	Release Height [1]	Exit Temperature [1]	Exit velocity [1]	Internal diameter [1]	Emission Rate per Trip		
				(m)	(m)	(mpd)	(m)	(K)	(m/s)	(m)	NO _x	RSP	FSP
				(g/s)	(g/s)	(g/s)							
3	1	G3_LF1_025	POINTHOR	823230.2	823301	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_026	POINTHOR	823186.5	823327.3	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_027	POINTHOR	823142.8	823353.6	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_028	POINTHOR	823099.2	823380	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_029	POINTHOR	823055.5	823406.3	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_030	POINTHOR	823011.8	823432.6	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_031	POINTHOR	822968.1	823458.9	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_032	POINTHOR	822924.4	823485.3	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_033	POINTHOR	822880.7	823511.6	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_034	POINTHOR	822837.1	823537.9	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_035	POINTHOR	822793.4	823564.2	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_036	POINTHOR	822748.4	823587.2	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_037	POINTHOR	822700.3	823602.1	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_038	POINTHOR	822652.1	823617	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_039	POINTHOR	822604	823631.9	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_040	POINTHOR	822555.9	823646.8	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_041	POINTHOR	822507.8	823661.7	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_042	POINTHOR	822459.6	823676.6	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_043	POINTHOR	822411.5	823691.5	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_044	POINTHOR	822363.4	823706.4	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_045	POINTHOR	822315.3	823721.3	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_046	POINTHOR	822267.2	823736.2	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_047	POINTHOR	822219	823751.1	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_048	POINTHOR	822170.9	823766	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_049	POINTHOR	822122.8	823780.9	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_050	POINTHOR	822074.7	823795.8	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_051	POINTHOR	822026.5	823810.7	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_052	POINTHOR	821978.4	823825.6	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_053	POINTHOR	821930.3	823840.5	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_054	POINTHOR	821881.6	823852.1	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_055	POINTHOR	821831.7	823857.2	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_056	POINTHOR	821781.9	823862.3	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_057	POINTHOR	821732	823867.4	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_058	POINTHOR	821682.2	823872.4	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_059	POINTHOR	821632.3	823877.5	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_060	POINTHOR	821582.5	823882.6	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_061	POINTHOR	821532.6	823887.7	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_062	POINTHOR	821482.7	823892.8	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_063	POINTHOR	821432.9	823897.8	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_064	POINTHOR	821383	823902.9	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_065	POINTHOR	821333.2	823908	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_066	POINTHOR	821283.3	823913.1	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_067	POINTHOR	821233.5	823918.2	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_068	POINTHOR	821183.6	823923.2	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_069	POINTHOR	821133.7	823928.3	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_070	POINTHOR	821083.9	823933.4	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05

Modelling Parameters

Gate	Group	Source ID	Type	X	Y	Base Elevation	Release Height ^[1]	Exit Temperature ^[1]	Exit velocity ^[1]	Internal diameter ^[1]	Emission Rate per Trip				
				(m)	(m)		(mpd)	(m)	(K)		(m/s)	(m)	NOx	RSP	FSP
				(g/s)	(g/s)		(g/s)								
3	1	G3_LF1_071	POINTHOR	821034	823938.5	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05		
3	1	G3_LF1_072	POINTHOR	824016.8	822432.6	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05		
3	1	G3_LF1_073	POINTHOR	823982	822471.4	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05		
3	1	G3_LF1_074	POINTHOR	823947.3	822510.1	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05		
3	1	G3_LF1_075	POINTHOR	823912.5	822548.9	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05		
3	1	G3_LF1_076	POINTHOR	823877.7	822587.7	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05		
3	1	G3_LF1_077	POINTHOR	823843	822626.4	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05		
3	1	G3_LF1_078	POINTHOR	823808.2	822665.2	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05		
3	1	G3_LF1_079	POINTHOR	823773.5	822703.9	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05		
3	1	G3_LF1_080	POINTHOR	823738.7	822742.7	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05		
3	1	G3_LF1_081	POINTHOR	823704	822781.5	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05		
3	1	G3_LF1_082	POINTHOR	823669.2	822820.2	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05		
3	1	G3_LF1_083	POINTHOR	823634.4	822859	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05		
3	1	G3_LF1_084	POINTHOR	823599.7	822897.7	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05		
3	1	G3_LF1_085	POINTHOR	823558.7	822928.7	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05		
3	1	G3_LF1_086	POINTHOR	823517.7	822959.5	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05		
3	1	G3_LF1_087	POINTHOR	823476.6	822990.3	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05		
3	1	G3_LF1_088	POINTHOR	823435.5	823021.1	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05		
3	1	G3_LF1_089	POINTHOR	823394.4	823051.9	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05		
3	1	G3_LF1_090	POINTHOR	823353.4	823082.7	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05		
3	1	G3_LF1_091	POINTHOR	823312.3	823113.5	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05		
3	1	G3_LF1_092	POINTHOR	823271.2	823144.3	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05		
3	1	G3_LF1_093	POINTHOR	823230.1	823175.1	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05		
3	1	G3_LF1_094	POINTHOR	823189.1	823205.9	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05		
3	1	G3_LF1_095	POINTHOR	823144.8	823229.2	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05		
3	1	G3_LF1_096	POINTHOR	823096.3	823242.9	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05		
3	1	G3_LF1_097	POINTHOR	823047.9	823256.6	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05		
3	1	G3_LF1_098	POINTHOR	822999.5	823270.3	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05		
3	1	G3_LF1_099	POINTHOR	822951	823284	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05		
3	1	G3_LF1_100	POINTHOR	822902.6	823297.7	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05		
3	1	G3_LF1_101	POINTHOR	822854.2	823311.4	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05		
3	1	G3_LF1_102	POINTHOR	822805.7	823325.1	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05		
3	1	G3_LF1_103	POINTHOR	822757.3	823338.8	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05		
3	1	G3_LF1_104	POINTHOR	822708.9	823352.5	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05		
3	1	G3_LF1_105	POINTHOR	822660.4	823366.2	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05		
3	1	G3_LF1_106	POINTHOR	822612	823379.9	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05		
3	1	G3_LF1_107	POINTHOR	822563.6	823393.6	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05		
3	1	G3_LF1_108	POINTHOR	822515.2	823407.4	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05		
3	1	G3_LF1_109	POINTHOR	822466.7	823420.1	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05		
3	1	G3_LF1_110	POINTHOR	822417.5	823409.9	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05		
3	1	G3_LF1_111	POINTHOR	822368.4	823399.7	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05		
3	1	G3_LF1_112	POINTHOR	822319.2	823389.5	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05		
3	1	G3_LF1_113	POINTHOR	822270	823379.3	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05		
3	1	G3_LF1_114	POINTHOR	822220.8	823369.1	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05		
3	1	G3_LF1_115	POINTHOR	822171.7	823358.9	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05		
3	1	G3_LF1_116	POINTHOR	822122.5	823348.7	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05		

Modelling Parameters

Gate	Group	Source ID	Type	X	Y	Base Elevation	Release Height ^[1]	Exit Temperature ^[1]	Exit velocity ^[1]	Internal diameter ^[1]	Emission Rate per Trip		
				(m)	(m)	(mpd)	(m)	(K)	(m/s)	(m)	NOx	RSP	FSP
				(g/s)	(g/s)	(g/s)							
3	1	G3_LF1_117	POINTHOR	822073.3	823338.4	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_118	POINTHOR	822024.1	823328.2	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_119	POINTHOR	821975	823318	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_120	POINTHOR	821925.8	823307.8	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_121	POINTHOR	821876.6	823297.6	0	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_122	POINTHOR	821827.4	823287.4	1	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_123	POINTHOR	821778.3	823277.2	2	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_124	POINTHOR	821729.1	823267	3	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_125	POINTHOR	821679.9	823256.8	4	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_126	POINTHOR	821630.7	823246.6	5	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_127	POINTHOR	821581.6	823236.3	6	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_128	POINTHOR	821532.4	823226.1	7	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_129	POINTHOR	821483.2	823215.9	8	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_130	POINTHOR	821434	823205.7	9	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_131	POINTHOR	821384.8	823195.5	10	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_132	POINTHOR	821335.7	823185.3	11	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_133	POINTHOR	821286.5	823175.1	12	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_134	POINTHOR	821237.3	823164.9	13	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_135	POINTHOR	821188.1	823154.7	14	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_136	POINTHOR	821139	823144.5	15	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_137	POINTHOR	823900.2	822434.5	16	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_138	POINTHOR	823867.4	822475.1	17	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_139	POINTHOR	823834.6	822515.7	18	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_140	POINTHOR	823801.7	822556.4	19	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_141	POINTHOR	823768.9	822597	20	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_142	POINTHOR	823736	822637.7	21	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_143	POINTHOR	823703.2	822678.3	22	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_144	POINTHOR	823670.4	822719	23	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_145	POINTHOR	823637.5	822759.6	24	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_146	POINTHOR	823596.8	822790.7	25	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_147	POINTHOR	823555.2	822820.6	26	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_148	POINTHOR	823513.6	822850.6	27	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_149	POINTHOR	823472	822880.5	28	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_150	POINTHOR	823430.3	822910.4	29	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_151	POINTHOR	823388.7	822940.3	30	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_152	POINTHOR	823344.9	822966.2	31	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_153	POINTHOR	823299.8	822989.6	32	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_154	POINTHOR	823254.6	823012.9	33	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_155	POINTHOR	823209.5	823036.2	34	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05

Modelling Parameters

Gate	Group	Source ID	Type	X	Y	Base Elevation	Release Height [1]	Exit Temperature [1]	Exit velocity [1]	Internal diameter [1]	Emission Rate per Trip		
				(m)	(m)	(mpd)	(m)	(K)	(m/s)	(m)	NO _x	RSP	FSP
				(g/s)	(g/s)	(g/s)							
3	1	G3_LF1_156	POINTHOR	823164.3	823059.5	35	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_157	POINTHOR	823118.8	823081.9	36	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_158	POINTHOR	823073.3	823104.3	37	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_159	POINTHOR	823027.7	823126.7	38	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_160	POINTHOR	822982.2	823149.1	39	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_161	POINTHOR	822936.7	823171.5	40	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_162	POINTHOR	822891.1	823194	41	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_163	POINTHOR	822842.6	823206.7	42	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_164	POINTHOR	822793.6	823218	43	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_165	POINTHOR	822744.7	823229.3	44	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_166	POINTHOR	822695.7	823240.6	45	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_167	POINTHOR	822646.7	823251.9	46	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_168	POINTHOR	822606.9	823238	47	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_169	POINTHOR	822578.1	823194	48	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_170	POINTHOR	822549.4	823149.9	49	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_171	POINTHOR	822520.6	823105.9	50	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_172	POINTHOR	822491.8	823061.8	51	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_173	POINTHOR	822463	823017.7	52	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_174	POINTHOR	822434.2	822973.7	53	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_175	POINTHOR	822405.4	822929.6	54	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_176	POINTHOR	822370.4	822893.1	55	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_177	POINTHOR	822326.1	822868.2	56	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_178	POINTHOR	822281.7	822843.2	57	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_179	POINTHOR	822237.3	822818.2	58	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_180	POINTHOR	822193	822793.2	59	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_181	POINTHOR	822148.6	822768.3	60	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_182	POINTHOR	822104.2	822743.3	61	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_183	POINTHOR	822059.8	822718.3	62	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_184	POINTHOR	822015.5	822693.4	63	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_185	POINTHOR	821971.1	822668.4	64	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_186	POINTHOR	821926.7	822643.4	65	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_187	POINTHOR	821882.3	822618.4	66	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_188	POINTHOR	821837.9	822593.5	67	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_189	POINTHOR	821792.1	822572.3	68	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_190	POINTHOR	821744.5	822555.4	69	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_191	POINTHOR	821696.9	822538.6	70	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_192	POINTHOR	821649.4	822521.8	71	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_193	POINTHOR	821601.8	822505	72	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_194	POINTHOR	821554.2	822488.2	73	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_195	POINTHOR	821506.6	822471.4	74	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_196	POINTHOR	821459	822454.6	75	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_197	POINTHOR	821411.4	822437.8	76	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05
3	1	G3_LF1_198	POINTHOR	821363.9	822421	77	1.3	773	8	0.7	3.62E-03	8.68E-05	8.12E-05

Notes:

[1] Modelling parameters are referred to Approved EIA of Proposed Road Improvement Works in West Kowloon Reclamation Development – Phase 1 – Investigation, Design and Construction (AEIAR-179/2013) and Expansion of Hong Kong Airport into a Three-Runway System (AEIAR-185/2014).

Calculation of Multiplying Factor for Total Vessel Count**Monthly Vessel Count for Year 2048**

Marine Gate	Monthly Vessel Count in Dec ^[1]
Gate 3	38

Notes:

[1] The marine traffic data for December is provided by Marine Traffic Consultant.

Monthly Profile of Marine Traffic for Year 2019

Month	Monthly Multiplying Factor
Jan-19	1.00
Feb-19	0.90
Mar-19	1.00
Apr-19	0.97
May-19	1.00
Jun-19	0.97
Jul-19	1.00
Aug-19	1.00
Sep-19	0.97
Oct-19	1.00
Nov-19	0.97
Dec-19	1.00

Notes:

[1] No monthly profile is available from Marine Traffic Consultant and port statistics. Same number of vessel count each day is assumed.

Hourly Multiplying Factor derived from Marine Traffic in December 2048

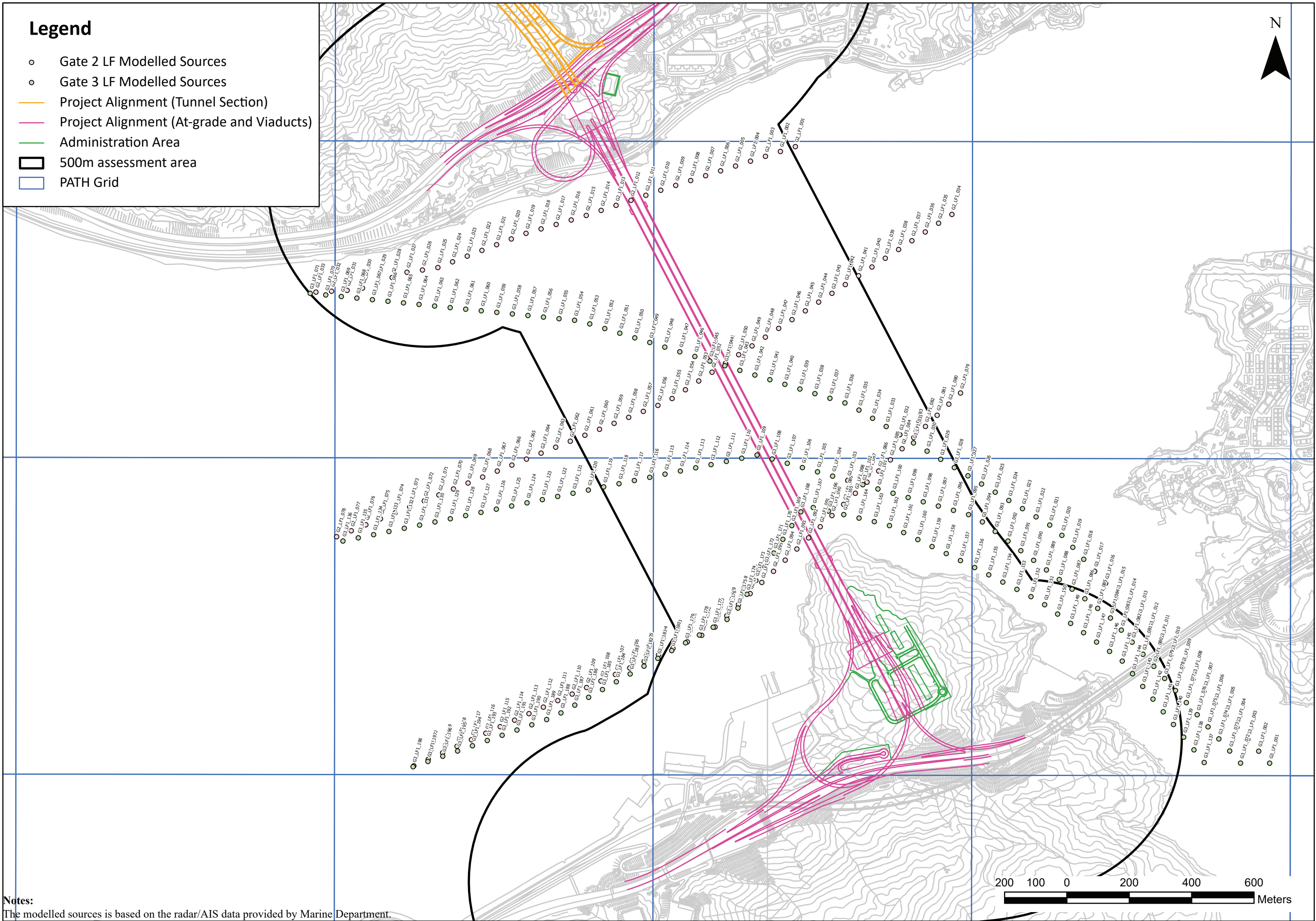
Hour		Gate 3	
Start	End	No. of Marine Vessels ^[1]	Hourly Multiplying Factor
0	1	1	2.6%
1	2	0	0.0%
2	3	0	0.0%
3	4	0	0.0%
4	5	0	0.0%
5	6	2	5.3%
6	7	0	0.0%
7	8	2	5.3%
8	9	0	0.0%
9	10	1	2.6%
10	11	1	2.6%
11	12	4	10.5%
12	13	0	0.0%
13	14	3	7.9%
14	15	4	10.5%
15	16	3	7.9%
16	17	1	2.6%
17	18	1	2.6%
18	19	7	18.4%
19	20	3	7.9%
20	21	4	10.5%
21	22	0	0.0%
22	23	0	0.0%
23	24	1	2.6%

Notes:

[1] The number of hourly marine vessels for Dec 2048 is provided by Marine Traffic Consultant. It contains the total number of marine vessels for the 31 days in December in Year 2048 for each hour. For example, from Hour 0 to Hour 1 (i.e. first hour of 1 Dec + first hour of 2 Dec, 1st hour of 31 Dec), there are total 1 marine vessels for the first hour during the whole December.

Legend

- Gate 2 LF Modelled Sources
- Gate 3 LF Modelled Sources
- Project Alignment (Tunnel Section)
- Project Alignment (At-grade and Viaducts)
- Administration Area
- ▭ 500m assessment area
- ▭ PATH Grid

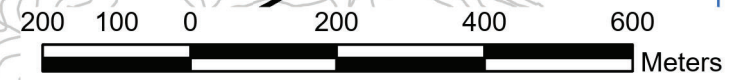
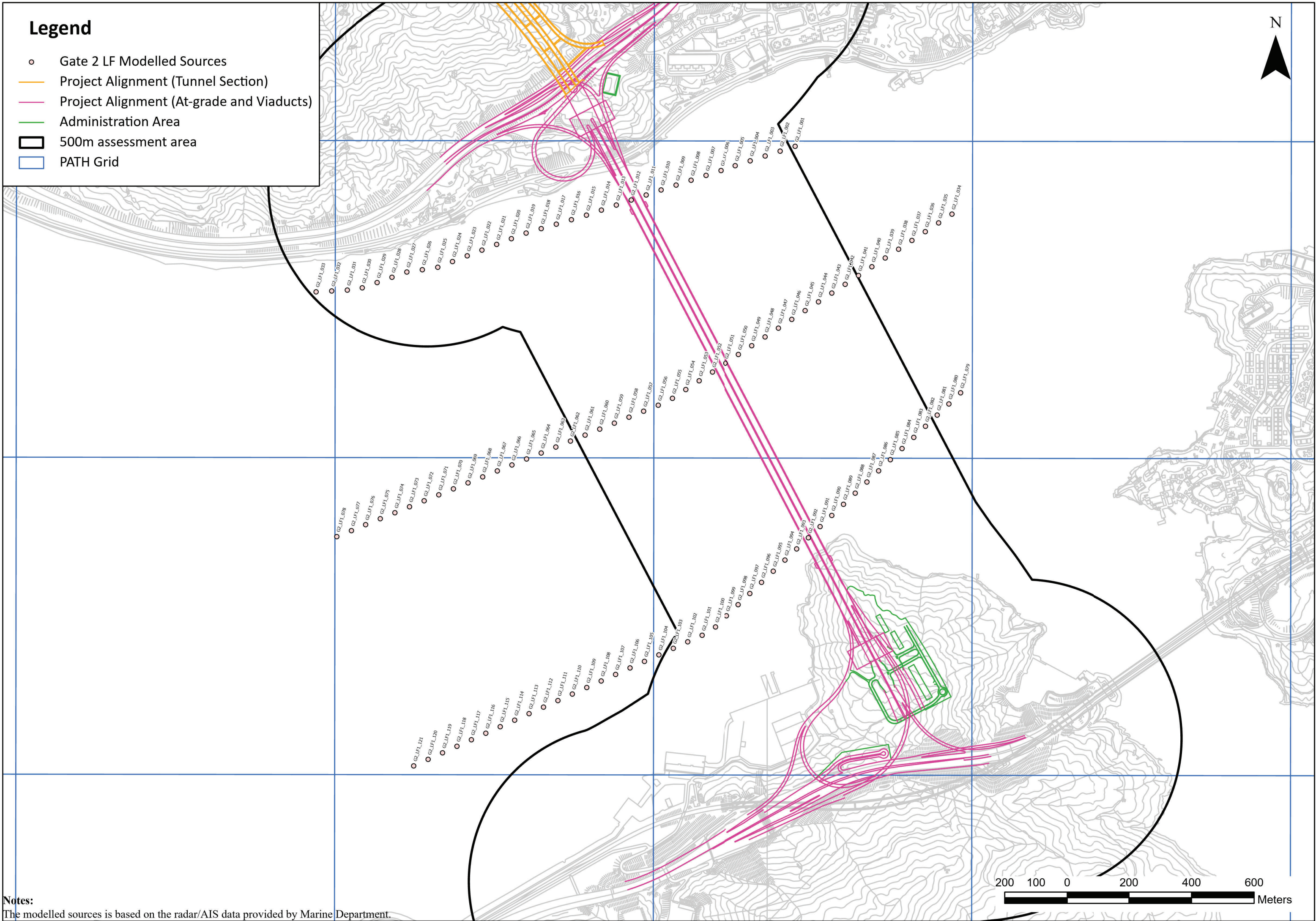


Notes:
The modelled sources is based on the radar/AIS data provided by Marine Department.



Legend

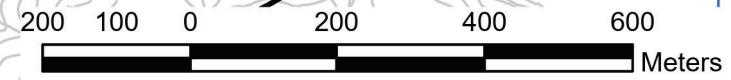
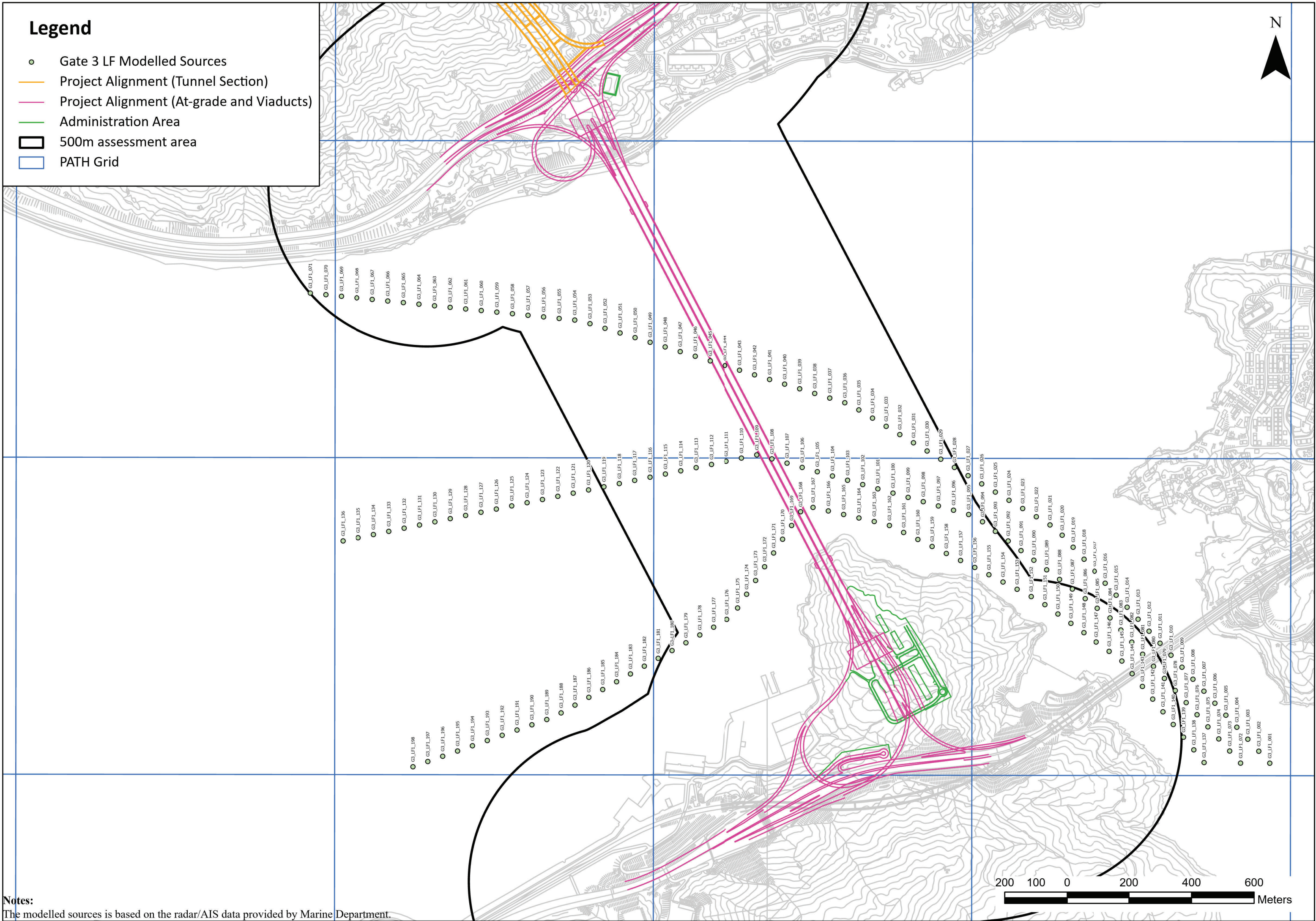
- Gate 2 LF Modelled Sources
- Project Alignment (Tunnel Section)
- Project Alignment (At-grade and Viaducts)
- Administration Area
- ▭ 500m assessment area
- ▭ PATH Grid



Notes:
The modelled sources is based on the radar/AIS data provided by Marine Department.

Legend

- Gate 3 LF Modelled Sources
- Project Alignment (Tunnel Section)
- Project Alignment (At-grade and Viaducts)
- Administration Area
- ▭ 500m assessment area
- ▭ PATH Grid



Notes:
The modelled sources is based on the radar/AIS data provided by Marine Department.