TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

3 AIR QUALITY

3.1 Introduction

3.1.1 This section presents the assessment on the potential air quality impacts associated with the construction and operation of the Project. The air quality impact assessment has been conducted in accordance with the requirement in Annexes 4 and 12 of the *Technical Memorandum on Environmental Impact Assessment Process* (EIAO-TM) and the requirements in Section 3.4.3 and Appendix B of the EIA Study Brief (ESB-363/2023).

3.2 Environmental Legislation, Standards and Guidelines

3.2.1 The criteria for evaluating air quality impacts and the guidelines for air quality assessment are laid down in Annexes 4 and 12 of the EIAO-TM.

3.2.2 The *Air Pollution Control Ordinance (APCO) (Cap. 311)* provides the statutory framework for controlling air pollutants from a variety of sources. The *Hong Kong Air Quality Objectives* (AQOs) which stipulate the maximum allowable concentrations over specific periods for typical pollutants, should be met. The prevailing AQOs are summarised in **Table 3.1**.

Table 3.1 Hong Kong Air Quality Objectives

Pollutants	Averaging Time	Concentration Limit (μg/m^3) (1)	Number of Exceedance Allowed per Year
Sulphur Dioxide (SO_2)	10-minute	500	3
	24-hour	40	3
Respirable Suspended Particulates (RSP or PM_{10}) (2)	24-hour	75	9
	Annual (4)	30	N/A
Fine Suspended Particulates (FSP or $PM_{2.5}$) (3)	24-hour	37.5	18
	Annual (4)	15	N/A
Nitrogen Dioxide (NO_2)	1-hour	200	18
	24-hour	120	9
	Annual (4)	40	N/A
Ozone	8-hour	160	9
	Peak season	100	N/A
Carbon Monoxide (CO)	1-hour	30,000	0
	8-hour	10,000	0
	24-hour	4,000	0
Lead (Pb)	Annual (4)	0.5	N/A

Notes:
(1) All measurements of the concentration of gaseous air pollutants, i.e., sulphur dioxide, nitrogen dioxide, ozone and carbon monoxide, are to be adjusted to a reference temperature of 293 K and a reference pressure of 101.325 kPa.

(2) Respirable suspended particulates means suspended particles in air with a nominal aerodynamic diameter of 10 μm or less.
(3) Fine suspended particulates means suspended particles in air with a nominal aerodynamic diameter of 2.5 μm or less.
(4) Arithmetic mean.

3.2.3 Annex 4 of EIAO-TM stipulates that a limit of 5 odour units (OU) based on an averaging time of 5 seconds shall not be exceeded for odour prediction assessment at any air sensitive receiver (ASR).

Air Pollution Control (Construction Dust)) Regulation

3.2.4 Notifiable and regulatory works are under the control of *Air Pollution Control (Construction Dust) Regulation*. This Project is expected to include notifiable works (e.g. site formation, demolition, and foundation and superstructure construction, etc.) and regulatory works (e.g. dusty material handling and excavation, etc.). Contractors and site agents are required to inform Environmental Protection Department (EPD) and adopt dust control measures to minimise dust and gaseous emissions, while carrying out construction works, to the acceptable level.

Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation

3.2.5 *Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation* comes into effect on 1 June 2015. Under the Regulation, non-road mobile machinery (NRMMs), except those exempted, are required to comply with the prescribed emission standards. From 1 September 2015, all regulated machines sold or leased for use in Hong Kong must be approved or exempted with a proper label in a prescribed format issued by EPD. Starting from 1 December 2015, only approved or exempted NRMMs with a proper label are allowed to be used in specified activities and locations including construction sites. The contractor is required to ensure the adopted machines or non-road vehicles under the Project could meet the prescribed emission standards and requirement.

Air Pollution Control (Fuel Restriction) Regulations

3.2.6 *Air Pollution Control (Fuel Restriction) Regulations* was enacted in 1990 to impose legal control on the types of fuel allowed for use and their sulphur contents in commercial and industrial processes to reduce SO_2 emissions. Since 1 April 2025, liquid fuel with a sulphur content not exceeding 0.001% by weight such as Ultra Low Sulphur Diesel shall be used, unless a valid certificate of compliance with emission limits issued by a competent examiner.

Development Bureau (DEVB)Technical Circular (Works)

3.2.7 *Development Bureau Technical Circular (Works) No. 13/2020 Timely Application of Temporary Electricity and Water Supply for Public Works Contracts and Wider Use of Electric Vehicles in Public Works Contracts* is one of the environmental guidelines on timely application of temporary electricity and wider use of electric vehicles (EVs) in public works contract. The Project team should timely apply for the temporary electricity and water supply with a target that the necessary cables/water mains laying works could be completed before the commencement of works contract. The Project team should also specify the use of EV(s) and installation of a designated medium-speed charger for each EV in each public contract.

3.2.8 *Development Bureau Technical Circular (Works) No. 1/2015 Emissions Control of NRMM in Capital Works Contracts of Public Works* requires that no exempted generators, air compressors, excavators and crawler cranes shall be allowed in the new capital works contracts of public works (including design and build contracts) with an estimated contract value exceeding $200 million, unless is at the discretion of the Architect/Engineer considering no feasible alternative.

3.3 Description of the Environment

3.3.1 The Project Site is surrounded by indigenous villages to its north and south. Tam Mei Barracks (TMB) is located to its north, while Ngau Tam Mei Water Treatment Works (NTMWTW) is located to its immediate east. To its further north and south are dominated by hill and mountainous terrain. The Project Site is predominantly a rural area, mainly with low-rise private residential buildings, scattered village houses and industrial use. The local air quality is dominated by vehicular exhaust emissions from San Tin Highway, Castle Peak Road, San Tam Road and other local access roads.

3.3.2 Existing odour emission sources within the 500 m assessment area include four livestock farms, one lard boiling factory (LBF), Ngau Tam Mei Animal Waste Composting Plant (NTM AWCP), and a sewage treatment plant at Tam Mei Barracks (TMB STP).

3.3.3 The nearest EPD air quality monitoring station is Yuen Long monitoring station. The monitoring data recorded at EPD's Yuen Long air quality monitoring station has shown general decreasing trend of pollutants' concentration in the past five years. The recent five years (2019 – 2023) average concentrations of air pollutants relevant to the Project are summarised in **Table 3.2**.

Table 3.2 Average Concentrations of Pollutants in the Recent Five Years (Year 2019 – 2023) at Yuen Long EPD Air Quality Monitoring Station

			Concentration in µg/m^3					
Pollutant	**Averaging Time**		**AQO**	**Year 2019**	**Year 2020**	**Year 2021**	**Year 2022**	**Year 2023**
Sulphur Dioxide (SO_2)	10-min	4th Highest	500	42	26	24	21	20
	24-hr	4th Highest	40	11	10	14	7	10
Respirable Suspended Particulates (PM_{10})	24-hr	10th Highest	75	**83**	**77**	73	56	59
	Annual		30	**37**	30	30	25	26
Fine Suspended Particulates ($PM_{2.5}$)	24-hr	19th Highest	37.5	**38**	33	36	**38**	34
	Annual		15	**20**	**16**	**17**	**16**	**16**
Nitrogen Dioxide (NO_2)	1-hr	19th Highest	200	161	135	148	122	130
	24-hr	10th Highest	120	86	64	78	68	67
	Annual		40	**44**	32	40	37	37

Remark:
(1) Underlined and **bolded** value indicates exceedance in relevant criterion.

3.3.4 Apart from the air quality monitoring data, EPD has released a set of background levels from "Pollutants in the Atmosphere and their Transport over Hong Kong", PATH model (PATHv3.0). As the first population intake of the Project is expected in Year 2033, relevant dataset for Year 2030 was extracted from the PATH model and are presented in **Table 3.3**. With reference to the predictions by the PATH model, the future air pollutant concentrations in these areas are well below the prevailing AQOs.

Table 3.3 Background Air Pollutants in Year 2030 Extracted from PATH Model (PATHv3.0)

Pollutant	Averaging Time		AQOs ($\mu g/m^3$)	Future Background Concentration in $\mu g/m^3$ at Grids						
				(28,49)	(28,50)	(28,51)	(29,50)	(29,51)	(30,50)	(30,51)
SO_2	10-min	4th Highest	500	25	24	24	24	24	25	25
	24-hr	4th Highest	40	7	7	7	7	7	7	7
RSP	24-hr	10th Highest	75	51	54	54	54	53	53	51
	Annual		30	20	21	21	21	20	20	20
FSP	24-hr	19th Highest	37.5	30	32	32	33	32	32	31
	Annual		15	12	13	13	13	13	13	12
NO_2	1-hr	19th Highest	200	66	71	74	62	65	55	59
	24-hr	10th Highest	120	25	26	25	22	22	20	21
	Annual		40	13	15	15	12	13	11	12

3.4 Identification of Air Sensitive Receivers

3.4.1 In accordance with Annex 12 of the EIAO-TM, any domestic premises, hotel, hostel, hospital, clinic, nursery, temporary housing accommodation, school, educational institution, office, factory, shop, shopping centre, place of public worship, library, court of law, sports stadium or performing arts centre shall be considered as ASR. Any other premises or places with which, in terms of duration or number of people affected, have a similar sensitivity to the air pollutants as the aforelisted premises and places shall also be considered to be a sensitive receiver.

3.4.2 As stated in Section 3.4.3.2 of EIA Study Brief, the assessment area for air quality assessment shall be defined by a distance of 500 m from the boundary of the Project Site and works of the Project and is presented in **Figure 3.1**.

3.4.3 For identification of the representative ASRs within the assessment area that would likely be affected by the potential impacts during the construction and operation of the Project, a review has been conducted based on relevant available information including topographic maps, Recommended Outline Development Plan (RODP) for the Project, Outline Zoning Plans and other published plans in the vicinity of the Project Site. The representative ASRs within the assessment area are presented in **Table 3.4** and illustrated in **Figure 3.2**.

Table 3.4 Representative Air Sensitive Receivers for Air Quality Impact Assessment

ASR ID	Site ID	Description	Land Use	Assessment Height (mAG)	Approximate Distance to Project Site (m)	Potentially Affected by		
						Construction	Operation	Operation (Odour)
Existing ASRs								
A1	-	Yau Mei San Tsuen	R	1.5 - 10	15	√	√	
A2	-	La Maison Vineyard	R	1.5 - 10	<5	√	√	√
A3	-	La Maison Vineyard	R	1.5 - 10	5	√	√	√
A4	-	Wai Tsai Tsuen	R	1.5 - 10	25	√	√	√
A5	-	Wai Tsai Tsuen	R	1.5 - 10	10	√	√	√
A6	-	Elegant Park	R	1.5 - 10	5	√	√	√
A7	-	Wai Tsai Tsuen	R	1.5 - 10	20	√	√	
A8	-	The Vineyard	R	1.5 - 10	10	√	√	
A9	-	The Vineyard	R	1.5 - 10	30	√	√	
A10	-	Greenacres Villa	R	1.5 - 15	10	√	√	
A11	-	Tam Mei Barracks	O	1.5 - 5	40	√	√	
A12	-	Tam Mei Barracks	O	1.5 - 10	25	√	√	
A13	-	Village House	R	1.5 - 10	30	√	√	
A14	-	Village House	R	1.5 - 10	35	√	√	
A15	-	Village House	R	1.5 - 10	<5	√	√	
A16	-	Village House	R	1.5 - 10	<5	√	√	
A17	-	Village House	R	1.5 - 10	110	√	√	
A18	-	Village House	R	1.5 - 10	70	√	√	
A19	-	Village House	R	1.5 - 10	40	√	√	
A20	-	Village House	R	1.5 - 10	55	√	√	
A21	-	Village House	R	1.5 - 10	30	√	√	
A22	-	Village House	R	1.5 - 10	35	√	√	
A23	-	Village House	R	1.5 - 10	5	√	√	
A24	-	Village House	R	1.5 - 10	20	√	√	
A25	-	Hongtai Home for the Aged	R	1.5 - 10	10	√	√	
A26	-	Sheung Chuk Yuen	R	1.5 - 10	10	√	√	
A27	-	Sheung Chuk Yuen	R	1.5 - 10	10	√	√	
A28	-	Sheung Chuk Yuen	R	1.5 - 10	10	√	√	
A29	-	Sheung Chuk Yuen	R	1.5 - 10	10	√	√	

ASR ID	Site ID	Description	Land Use	Assessment Height (mAG)	Approximate Distance to Project Site (m)	Potentially Affected by		
						Construction	Operation	Operation (Odour)
A30	-	Kadoorie Villas	R	1.5 - 10	45	√	√	
A31	-	Kadoorie Villas	R	1.5 - 10	15	√	√	
A32	-	Kadoorie Villas	R	1.5 - 10	20	√	√	
A33	-	Ian Court	R	1.5 - 10	35	√	√	
A34	-	Wa On Villa	R	1.5 - 10	10	√	√	
A35	-	Long Ha	R	1.5 - 10	80	√	√	
A36	-	Meister House	R	1.5 - 10	30	√	√	
A37	-	Ha San Wai	R	1.5 - 10	45	√	√	
A38	-	Ha San Wai	R	1.5 - 10	20	√	√	
A39	-	EMINENT EIS International Preschool	E	1.5 - 5	20	√	√	
A40	-	San Wai Tsuen	R	1.5 - 10	30	√	√	
A41	-	Tai Yuen Villa	R	1.5 - 10	35	√	√	
A42	-	Tai Yuen Villa	R	1.5 - 10	50	√	√	
A43	-	Merry Garden	R	1.5 - 10	260	√	√	
A44	-	Villa Camellia	R	1.5 - 10	180	√	√	
A45	-	Chuk Yuen Tsuen	R	1.5 - 10	120	√	√	
A46	-	Chuk Yuen Tsuen	R	1.5 - 10	115	√	√	
A47	-	Palm Springs	R	1.5 - 10	150	√	√	
A48	-	Palm Springs	R	1.5 - 10	415	√	√	
A49	-	Maple Gardens	R	1.5 - 10	340	√	√	
A50	-	Casa Paradizo	R	1.5 - 10	75	√	√	
A51	-	Green Crest	R	1.5 - 10	120	√	√	
A52	-	La Grande Vineyard	R	1.5 - 10	275	√	√	
A53	-	Tam Mei Barracks	O	1.5 - 10	255	√	√	
A54	-	Village House	R	1.5 - 5	175	√	√	
A55	-	Wah On Villa	R	1.5 - 10	150	√	√	
A56	-	San Wai Tsuen	R	1.5 - 10	215	√	√	
Planned ASRs within Project Site								
P1	E.2	Proposed School	E	1.5 - 40	Within Project Site	√	√	
P2	E.2	Proposed School	E	1.5 - 40	Within Project Site	√	√	
P3	E.2	Proposed School	E	1.5 - 40	Within Project Site	√	√	

ASR ID	Site ID	Description	Land Use	Assessment Height (mAG)	Approximate Distance to Project Site (m)	Potentially Affected by		
						Construction	Operation	Operation (Odour)
P4	E.2	Proposed School	E	1.5 - 40	Within Project Site	√	√	
P5	E.2	Proposed School	E	1.5 - 40	Within Project Site	√	√	
P6	E.2	Proposed School	E	1.5 - 40	Within Project Site	√	√	
P7	E.2	Proposed School	E	1.5 - 40	Within Project Site	√	√	
P8	E.1	Proposed School	E	1.5 - 40	Within Project Site		√	√
P9	E.1	Proposed School	E	1.5 - 40	Within Project Site		√	
P10	E.1	Proposed School	E	1.5 - 40	Within Project Site		√	√
P11	E.1	Proposed School	E	1.5 - 40	Within Project Site		√	
P12	RSc.1	Proposed Residential	R	1.5 - 180	Within Project Site	√	√	√
P13	RSc.1	Proposed Residential	R	1.5 - 180	Within Project Site	√	√	
P14	R.1	Proposed Residential	R	1.5 - 180	Within Project Site		√	
P15	R.1	Proposed Residential	R	1.5 - 180	Within Project Site		√	√
P16	R.1	Proposed Residential	R	1.5 - 180	Within Project Site		√	√
P17	R.1	Proposed Residential	R	1.5 - 180	Within Project Site		√	√
P18	R.1	Proposed Residential	R	1.5 - 180	Within Project Site		√	
P19	R.1	Proposed Residential	R	1.5 - 180	Within Project Site		√	
P20	R.1	Proposed Residential	R	1.5 - 180	Within Project Site		√	√
P21	R.1	Proposed Residential	R	1.5 - 180	Within Project Site		√	
P22	RSc.1	Proposed Residential	R	1.5 - 180	Within Project Site	√	√	
P23	R.2	Proposed Residential	R	1.5 - 180	Within Project Site		√	√
P24	R.2	Proposed Residential	R	1.5 - 180	Within Project Site		√	√

ASR ID	Site ID	Description	Land Use	Assessment Height (mAG)	Approximate Distance to Project Site (m)	Potentially Affected by		
						Construction	Operation	Operation (Odour)
P25	R.2	Proposed Residential	R	1.5 - 180	Within Project Site		√	√
P26	R.2	Proposed Residential	R	1.5 - 180	Within Project Site		√	√
P27	R.2	Proposed Residential	R	1.5 - 180	Within Project Site		√	√
P28	R.2	Proposed Residential	R	1.5 - 200	Within Project Site		√	√
P29	R.2	Proposed Residential	R	1.5 - 200	Within Project Site		√	√
P30	R.2	Proposed Residential	R	1.5 - 200	Within Project Site		√	√
P31	R.2	Proposed Residential	R	1.5 - 200	Within Project Site		√	
P32	R.2	Proposed Residential	R	1.5 - 200	Within Project Site		√	√
P33	R.2	Proposed Residential	R	1.5 - 200	Within Project Site		√	
P34	R.2	Proposed Residential	R	1.5 - 200	Within Project Site		√	√
P35	R.2	Proposed Residential	R	1.5 - 180	Within Project Site		√	
P36	OU(RDC RD).1	Proposed Residential and Commercial Development atop Ngau Tam Mei Depot	R/C	1.5 - 200	Within Project Site		√	
P37	OU(RDC RD).1	Proposed Residential and Commercial Development atop Ngau Tam Mei Depot	R/C	1.5 - 200	Within Project Site		√	√
P38	OU(RDC RD).1	Proposed Residential and Commercial Development atop Ngau Tam Mei Depot	R/C	1.5 - 200	Within Project Site		√	√
P39	OU(RDC RD).1	Proposed Residential and Commercial Development atop Ngau Tam Mei Depot	R/C	1.5 - 200	Within Project Site		√	√

ASR ID	Site ID	Description	Land Use	Assessment Height (mAG)	Approximate Distance to Project Site (m)	Potentially Affected by		
						Construction	Operation	Operation (Odour)
P40	OU(RDC RD).1	Proposed Residential and Commercial Development atop Ngau Tam Mei Depot	R/C	1.5 - 220	Within Project Site		√	√
P41	OU(RDC RD).1	Proposed Residential and Commercial Development atop Ngau Tam Mei Depot	R/C	1.5 - 220	Within Project Site		√	√
P42	OU(RDC RD).1	Proposed Residential and Commercial Development atop Ngau Tam Mei Depot	R/C	1.5 - 220	Within Project Site		√	√
P43	OU(RDC RD).1	Proposed Residential and Commercial Development atop Ngau Tam Mei Depot	R/C	1.5 - 220	Within Project Site		√	√
P44	OU(RDC RD).1	Proposed Residential and Commercial Development atop Ngau Tam Mei Depot	R/C	1.5 - 220	Within Project Site		√	√
P45	OU(RDC RD).1	Proposed Residential and Commercial Development atop Ngau Tam Mei Depot	R/C	1.5 - 220	Within Project Site		√	√
P46	OU(RDC RD).1	Proposed Residential and Commercial Development atop Ngau Tam Mei Depot	R/C	1.5 - 220	Within Project Site		√	√
P47	OU(RDC RD).1	Proposed Residential and Commercial Development atop Ngau Tam Mei Depot	R/C	1.5 - 220	Within Project Site		√	√
P48	OU(RDC RD).1	Proposed Residential and Commercial	R/C	1.5 - 220	Within Project Site		√	√

ASR ID	Site ID	Description	Land Use	Assessment Height (mAG)	Approximate Distance to Project Site (m)	Potentially Affected by		
						Construction	Operation	Operation (Odour)
		Development atop Ngau Tam Mei Depot						
P49	OU(RDC RD).1	Proposed Residential and Commercial Development atop Ngau Tam Mei Depot	R/C	1.5 - 220	Within Project Site		√	
P50	OU(RDC RD).1	Proposed Residential and Commercial Development atop Ngau Tam Mei Depot	R/C	1.5 - 200	Within Project Site		√	√
	OU(RDP OS).1	Proposed Open Space atop Ngau Tam Mei Depot	Rec					
P51	OU(RDC RD).1	Proposed Residential and Commercial Development atop Ngau Tam Mei Depot	R/C	1.5 - 200	Within Project Site		√	
P52	OU(RDC RD).1	Proposed Residential and Commercial Development atop Ngau Tam Mei Depot	R/C	1.5 - 200	Within Project Site		√	√
P53	R.3	Proposed Residential	R	1.5 - 180	Within Project Site	√	√	√
P54	R.3	Proposed Residential	R	1.5 - 180	Within Project Site	√	√	√
P55	R.3	Proposed Residential	R	1.5 - 180	Within Project Site	√	√	
P56	R.3	Proposed Residential	R	1.5 - 180	Within Project Site	√	√	√
P57	R.3	Proposed Residential	R	1.5 - 180	Within Project Site	√	√	√
P58	R.3	Proposed Residential	R	1.5 - 180	Within Project Site	√	√	√
P59	R.3	Proposed Residential	R	1.5 - 180	Within Project Site	√	√	√
P60	R.4	Proposed Residential	R	1.5 - 180	Within Project Site	√	√	√

ASR ID	Site ID	Description	Land Use	Assessment Height (mAG)	Approximate Distance to Project Site (m)	Potentially Affected by		
						Construction	Operation	Operation (Odour)
	OU(RDPOS).1	Proposed Open Space atop Ngau Tam Mei Depot	Rec					
P61	R.4	Proposed Residential	R	1.5 - 180	Within Project Site	√	√	
P62	R.4	Proposed Residential	R	1.5 - 180	Within Project Site	√	√	√
P63	G.5	Proposed Ambulance Depot cum Fire Station	G/IC	1.5 - 140	Within Project Site	√	√	√
P64	G.5	Proposed Ambulance Depot cum Fire Station	G/IC	1.5 - 140	Within Project Site	√	√	√
P65	G.5	Proposed Ambulance Depot cum Fire Station	G/IC	1.5 - 140	Within Project Site	√	√	√
P66	G.5	Proposed Ambulance Depot cum Fire Station	G/IC	1.5 - 140	Within Project Site	√	√	√
P67	R.4	Proposed Residential	R	1.5 - 180	Within Project Site	√	√	√
P68	R.4	Proposed Residential	R	1.5 - 180	Within Project Site	√	√	
P69	R.4	Proposed Residential	R	1.5 - 180	Within Project Site	√	√	√
P70	R.4	Proposed Residential	R	1.5 - 180	Within Project Site	√	√	
P71	G.6	Proposed UniTown	E	1.5 - 100	Within Project Site	√	√	√
P72	G.6	Proposed UniTown	E	1.5 - 100	Within Project Site	√	√	√
P73	G.6	Proposed UniTown	E	1.5 - 100	Within Project Site	√	√	√
P74	G.6	Proposed UniTown	E	1.5 - 100	Within Project Site	√	√	√
P75	G.6	Proposed UniTown	E	1.5 - 100	Within Project Site	√	√	
P76	G.6	Proposed UniTown	E	1.5 - 100	Within Project Site	√	√	√
P77	G.6	Proposed UniTown	E	1.5 - 100	Within Project Site	√	√	√
P78	G.6	Proposed UniTown	E	1.5 - 100	Within Project Site	√	√	√

ASR ID	Site ID	Description	Land Use	Assessment Height (mAG)	Approximate Distance to Project Site (m)	Potentially Affected by		
						Construction	Operation	Operation (Odour)
P79	G.6	Proposed UniTown	E	1.5 - 100	Within Project Site	√	√	√
P80	G.11	Proposed UniTown	E	1.5 - 100	Within Project Site	√	√	√
P81	G.11	Proposed UniTown	E	1.5 - 100	Within Project Site	√	√	
P82	G.11	Proposed UniTown	E	1.5 - 100	Within Project Site	√	√	
P83	G.11	Proposed UniTown	E	1.5 - 100	Within Project Site	√	√	√
P84	G.11	Proposed UniTown	E	1.5 - 100	Within Project Site	√	√	
P85	G.11	Proposed UniTown	E	1.5 - 100	Within Project Site	√	√	
P86	G.11	Proposed UniTown	E	1.5 - 100	Within Project Site	√	√	
P87	G.11	Proposed UniTown	E	1.5 - 100	Within Project Site	√	√	
P88	G.11	Proposed UniTown	E	1.5 - 100	Within Project Site	√	√	
P89	G.11	Proposed UniTown	E	1.5 - 100	Within Project Site	√	√	
P90	G.11	Proposed UniTown	E	1.5 - 100	Within Project Site	√	√	
P91	G.11	Proposed UniTown	E	1.5 - 100	Within Project Site	√	√	
P92	G.11	Proposed UniTown	E	1.5 - 100	Within Project Site	√	√	
P93	G.11	Proposed UniTown	E	1.5 - 100	Within Project Site	√	√	
P94	G.11	Proposed UniTown	E	1.5 - 100	Within Project Site	√	√	
P95	G.11	Proposed UniTown	E	1.5 - 100	Within Project Site	√	√	
P96	G.11	Proposed UniTown	E	1.5 - 100	Within Project Site	√	√	
P97	G.11	Proposed UniTown	E	1.5 - 100	Within Project Site	√	√	
P98	G.13	Proposed GIC	G/IC	1.5 - 40	Within Project Site	√	√	√
P99	G.13	Proposed GIC	G/IC	1.5 - 40	Within Project Site	√	√	√

ASR ID	Site ID	Description	Land Use	Assessment Height (mAG)	Approximate Distance to Project Site (m)	Potentially Affected by		
						Construction	Operation	Operation (Odour)
P100	G.13	Proposed GIC	G/IC	1.5 - 40	Within Project Site	√	√	√
P101	G.13	Proposed GIC	G/IC	1.5 - 40	Within Project Site	√	√	√
P102	G.13	Proposed GIC	G/IC	1.5 - 40	Within Project Site	√	√	√
P103	G.8	Proposed Integrated Hospital	G/IC	1.5 - 140	Within Project Site	√	√	√
P104	G.8	Proposed Integrated Hospital	G/IC	1.5 - 140	Within Project Site	√	√	√
P105	G.8	Proposed Integrated Hospital	G/IC	1.5 - 140	Within Project Site	√	√	√
P106	G.8	Proposed Integrated Hospital	G/IC	1.5 - 140	Within Project Site	√	√	√
P107	G.8	Proposed Integrated Hospital	G/IC	1.5 - 140	Within Project Site	√	√	
P108	G.8	Proposed Integrated Hospital	G/IC	1.5 - 140	Within Project Site	√	√	√
P109	G.8	Proposed Integrated Hospital	G/IC	1.5 - 140	Within Project Site	√	√	
P110	G.8	Proposed Integrated Hospital	G/IC	1.5 - 140	Within Project Site	√	√	√
P111	G.8	Proposed Integrated Hospital	G/IC	1.5 - 140	Within Project Site	√	√	√
P112	G.8	Proposed Integrated Hospital	G/IC	1.5 - 140	Within Project Site	√	√	
P113	G.8	Proposed Integrated Hospital	G/IC	1.5 - 140	Within Project Site	√	√	
P114	G.8	Proposed Integrated Hospital	G/IC	1.5 - 140	Within Project Site	√	√	
P115	G.8	Proposed Integrated Hospital	G/IC	1.5 - 140	Within Project Site	√	√	
P116	G.8	Proposed Integrated Hospital	G/IC	1.5 - 140	Within Project Site	√	√	√
P117	G.8	Proposed Integrated Hospital	G/IC	1.5 - 140	Within Project Site	√	√	√
P118	G.11	Proposed UniTown	E	1.5 - 140	Within Project Site	√	√	√
P119	G.11	Proposed UniTown	E	1.5 - 140	Within Project Site	√	√	√
P120	G.11	Proposed UniTown	E	1.5 - 140	Within Project Site	√	√	√

ASR ID	Site ID	Description	Land Use	Assessment Height (mAG)	Approximate Distance to Project Site (m)	Potentially Affected by		
						Construction	Operation	Operation (Odour)
P121	G.11	Proposed UniTown	E	1.5 - 140	Within Project Site	√	√	√
P122	G.11	Proposed UniTown	E	1.5 - 140	Within Project Site	√	√	√
P123	G.11	Proposed UniTown	E	1.5 - 140	Within Project Site	√	√	
P124	G.11	Proposed UniTown	E	1.5 - 140	Within Project Site	√	√	
P125	G.11	Proposed UniTown	E	1.5 - 140	Within Project Site	√	√	
P126	G.11	Proposed UniTown	E	1.5 - 140	Within Project Site	√	√	
P127	G.11	Proposed UniTown	E	1.5 - 140	Within Project Site	√	√	
P128	G.11	Proposed UniTown	E	1.5 - 140	Within Project Site	√	√	
P129	G.10	Proposed UniTown	E	1.5 - 40	Within Project Site	√	√	√
P130	G.10	Proposed UniTown	E	1.5 - 40	Within Project Site	√	√	√
P131	G.10	Proposed UniTown	E	1.5 - 40	Within Project Site	√	√	√
P132	G.10	Proposed UniTown	E	1.5 - 40	Within Project Site	√	√	
P133	G.10	Proposed UniTown	E	1.5 - 40	Within Project Site	√	√	
P134	G.10	Proposed UniTown	E	1.5 - 40	Within Project Site	√	√	
P135	G.10	Proposed UniTown	E	1.5 - 40	Within Project Site	√	√	
P136	G.10	Proposed UniTown	E	1.5 - 40	Within Project Site	√	√	√
P137	G.10	Proposed UniTown	E	1.5 - 40	Within Project Site	√	√	√
P138	G.12	Proposed UniTown	E	1.5 - 140	Within Project Site	√	√	
P139	G.12	Proposed UniTown	E	1.5 - 140	Within Project Site	√	√	
P140	G.12	Proposed UniTown	E	1.5 - 140	Within Project Site	√	√	
P141	G.12	Proposed UniTown	E	1.5 - 140	Within Project Site	√	√	

ASR ID	Site ID	Description	Land Use	Assessment Height (mAG)	Approximate Distance to Project Site (m)	Potentially Affected by		
						Construction	Operation	Operation (Odour)
P142	G.12	Proposed UniTown	E	1.5 - 140	Within Project Site	√	√	
P143	G.12	Proposed UniTown	E	1.5 - 140	Within Project Site	√	√	
P144	G.12	Proposed UniTown	E	1.5 - 140	Within Project Site	√	√	
P145	G.12	Proposed UniTown	E	1.5 - 140	Within Project Site	√	√	
P146	G.12	Proposed UniTown	E	1.5 - 140	Within Project Site	√	√	
P147	G.12	Proposed UniTown	E	1.5 - 140	Within Project Site	√	√	
P148	G.12	Proposed UniTown	E	1.5 - 140	Within Project Site	√	√	
P149	G.12	Proposed UniTown	E	1.5 - 140	Within Project Site	√	√	
P150	G.12	Proposed UniTown	E	1.5 - 140	Within Project Site	√	√	
P151	G.12	Proposed UniTown	E	1.5 - 140	Within Project Site	√	√	
P152	G.12	Proposed UniTown	E	1.5 - 140	Within Project Site	√	√	
P153	G.12	Proposed UniTown	E	1.5 - 140	Within Project Site	√	√	
P154	G.12	Proposed UniTown	E	1.5 - 140	Within Project Site	√	√	
P155	G.12	Proposed UniTown	E	1.5 - 140	Within Project Site	√	√	
P156	G.12	Proposed UniTown	E	1.5 - 140	Within Project Site	√	√	
P157	G.12	Proposed UniTown	E	1.5 - 140	Within Project Site	√	√	
P158	G.12	Proposed UniTown	E	1.5 - 140	Within Project Site	√	√	
P159	G.12	Proposed UniTown	E	1.5 - 140	Within Project Site	√	√	
P160	G.12	Proposed UniTown	E	1.5 - 140	Within Project Site	√	√	
P161	G.12	Proposed UniTown	E	1.5 - 140	Within Project Site	√	√	
P162	G.12	Proposed UniTown	E	1.5 - 140	Within Project Site	√	√	

ASR ID	Site ID	Description	Land Use	Assessment Height (mAG)	Approximate Distance to Project Site (m)	Potentially Affected by		
						Construction	Operation	Operation (Odour)
P163	G.12	Proposed UniTown	E	1.5 - 140	Within Project Site	√	√	
P164	G.12	Proposed UniTown	E	1.5 - 140	Within Project Site	√	√	
P165	G.12	Proposed UniTown	E	1.5 - 140	Within Project Site	√	√	
P166	G.12	Proposed UniTown	E	1.5 - 140	Within Project Site	√	√	
P167	G.12	Proposed UniTown	E	1.5 - 140	Within Project Site	√	√	
P168	G.12	Proposed UniTown	E	1.5 - 140	Within Project Site	√	√	
P169	G.12	Proposed UniTown	E	1.5 - 140	Within Project Site	√	√	
P170	G.12	Proposed UniTown	E	1.5 - 140	Within Project Site	√	√	
P171	G.12	Proposed UniTown	E	1.5 - 140	Within Project Site	√	√	
P172	G.12	Proposed UniTown	E	1.5 - 140	Within Project Site	√	√	
P173	G.12	Proposed UniTown	E	1.5 - 140	Within Project Site	√	√	
P174	G.12	Proposed UniTown	E	1.5 - 140	Within Project Site	√	√	
P175	G.12	Proposed UniTown	E	1.5 - 140	Within Project Site	√	√	
P176	G.12	Proposed UniTown	E	1.5 - 140	Within Project Site	√	√	
P177	G.12	Proposed UniTown	E	1.5 - 140	Within Project Site	√	√	
P178	G.2	Proposed GIC	G/IC	1.5 - 15	Within Project Site	√	√	
P179	G.2	Proposed GIC	G/IC	1.5 - 15	Within Project Site	√	√	
P180	G.2	Proposed GIC	G/IC	1.5 - 15	Within Project Site	√	√	
P181	G.2	Proposed GIC	G/IC	1.5 - 15	Within Project Site	√	√	
Planned ASRs in San Tin Technopole								
ST1	-	Planned School	E	1.5 - 30	10		√	
ST2	-	Planned School	E	1.5 - 30	25		√	
ST3	-	Planned School	E	1.5 - 30	45		√	

ASR ID	Site ID	Description	Land Use	Assessment Height (mAG)	Approximate Distance to Project Site (m)	Potentially Affected by		
						Construction	Operation	Operation (Odour)
ST4	-	Planned School	E	1.5 - 30	75		√	
ST5	-	Planned Residential	R	1.5 - 150	100		√	
ST6	-	Planned Residential	R	1.5 - 150	95		√	
ST7	-	Planned Residential	R	1.5 - 180	10		√	
ST8	-	Planned Residential	R	1.5 - 180	5		√	
ST9	-	Planned Residential	R	1.5 - 180	5		√	

Remarks:
[1] E= Education, G/IC = Government, Institution or Community, H = Hospital, O = Others, R = Residential, R/C = Residential/Commercial, Rec = Recreational, mAG = metres above ground
[2] "√" in the relevant column(s) of the table shows the assessment(s) conducted for the ASR.
[3] No air sensitive use, including openable window, fresh air intake of central air conditioning and recreational use in open space, is identified below the lowest assessment height of ASRs and the full range of assessment heights have been covered.

3.4.4 According to **Table 3.4**, all existing ASRs are considered to be potentially affected by both construction and operational impacts. Specifically, ASRs A2 – A6 are considered to be potentially affected by odour impact during operational phase due to their proximity to the proposed sewage pumping station (SPS) as shown in **Figure 3.4**. Given the proposed SPS is out of 500 m from the other existing odour sources, adverse cumulative odour impact is not expected on other existing ASRs. The potential odour impact from the proposed SPS to the other existing ASRs is considered negligible and therefore were not considered in the odour impact assessment. For instance, ASR A6 is located at approximately 200 m from the SPS and the maximum odour concentration from the proposed SPS is about 0.3 OU/m^3. Since all other existing ASRs are situated at more than 200 m away from the proposed SPS, their potential odour impact from the proposed SPS is expected to be even lower and thus were excluded from the odour impact assessment.

3.4.5 For planned ASRs, those with population intake in years 2033 and 2034 (as described in **Section 3.5.2**) would be potentially affected by the Project's construction air quality impacts from years 2034 to 2036. While all planned ASRs are considered to be potentially affected by operational impact, some planned ASRs, as shown in **Figure 3.4**, are selected as representative ASRs for odour impact assessment during the operational phase. The planned ASRs that are at the sites in proximity to the odour sources are considered representative for assessing potential odour impact, while only some planned ASRs are selected to represent the sites which are farther away from the odour sources. As shown in the odour contours, the selected representative ASRs for odour assessment effectively cover all areas of the predicted odour exceedance zones, and therefore are considered adequate for evaluating potential odour impacts.

3.4.6 Planned ASRs ST1 – ST9, located in San Tin Technopole (STT), are considered only for impact assessment during operational phase. Due to the significant separation (more than 440 m) and intervening hilly terrain between the Project Site and STT,

construction impacts are considered negligible. Although the proposed road connection to/from STT is near to these ASRs, its construction is expected to be completed by Year 2034, earlier than the population intake of ASRs ST1-ST6 in Year 2038 and that of ST7-ST9 in Year 2039. Additionally, these ASRs are not expected to be affected by odour impact during operational phase, given their separation distance of over 500 m from any proposed or existing odour sources.

3.5 Identification of Environmental Impact

Construction Phase

3.5.1 Major construction works for the Project would include site formation, and development and construction of two Designated Projects (DPs) which include:

- DP1 – Construction and operation of District Distributor Road (Road D1) and associated road works at San Tin Highway; and
- DP2 – Part of revitalisation of Ngau Tam Mei Drainage Channel and river diversion works located less than 300 m from the nearest boundary of an existing conservation area.

3.5.2 Based on the tentative construction programme, the Project will be developed in three stages, namely Phase 1, Phase 2 and Phase 3. The construction works of Phase 1 include site clearance and site formation for dedicated rehousing estate (DRE) site "RSc.1", Integrated Hospital "G.8" and its associated connection roads, electricity substation (ESS) "G.9", part of UniTown "G.11", and SPS site "G.1". The construction works for this phase will commence in Q1 Year 2027, with population intake for the DRE site in Year 2033. Phase 2 construction works will commence in Year Q3 2028, comprising site clearance and site formation for remaining UniTown and G/IC sites, school sites "E.1" and "E.2", residential sites "R.3" and "R.4", revitalisation of Ngau Tam Mei Drainage Channel (NTMDC), open space and amenity area, and majority of road network, with the population intake in Q2 Year 2034. Phase 3 construction works include site formation for residential sites R.1 and R.2, and remaining open space, roadworks and landscape works, riverside and site formation works and will commence in Q3 Year 2030 with population intake in Q2 Year 2036. The tentative typical working hours would be 7:00 a.m. to 7:00 p.m. on weekdays. The detailed population intake schedule and construction programme are presented in **Appendix 2.1** and **Appendix 2.2** respectively.

3.5.3 According to the construction programme, road works and infrastructure works for Road D1 and revitalisation works of NTMDC will commence in Year 2028 and end in Year 2034. The NTMDC will be revitalised with a green and ecologically friendly approach for integration with the overall land use planning, which will include widening to increase the hydraulic capacity of the river and improve flood resilience and climate change adaptation in the area. While the detailed design of the revitalisation measures is not currently available at this stage, potential odour impact from the construction of the revitalised channel has been evaluated.

Identification of Key Air Pollutants from Construction Activities

3.5.4 Most of the construction activities would involve excavation, spoil handling and backfilling of different scale. These dusty construction activities and wind erosion of exposed sandfill areas would cause potential fugitive emission in particulates.

3.5.5 Vehicular emissions from induced construction traffic for the transportation of spoils/excavated materials would cause potential gaseous and particulates emission.

On-site use of diesel-powered engines is also the potential source for gaseous pollutants, such as NOx, SO_2, CO and smoke. The emissions from the NRMM are regulated under the *Air Pollution Control (NRMM) (Emission) Regulation*. Fuel with sulphur content not exceeding 0.001% by weight will be used to minimise SO_2 emission in accordance with the *Air Pollution Control (Fuel Restriction) Regulations*.

Concurrent Projects

3.5.6 Concurrent projects are summarised in **Table 2.7** in **Section 2** with their locations shown in **Figure 2.5**, and are described in detail in below sections.

3.5.7 The construction of NTM Station and Ngau Tam Mei Depot (NTD) under Northern Link (NOL) Main Line by MTR Corporation Limited (MTRCL), which lie within the Project Site, will commence in Q4 Year 2026 for completion by Q1 Year 2031 according to the approved NOL EIA report (Register No.: AEIAR-259/2024) (hereinafter referred to as "NOL Main Line EIA report"), which is about the same time as the construction for all phases of this Project.

3.5.8 Northern Metropolis Highway (NMH) – San Tin Section is under planning. No details on the construction program and construction methods are available at the time of preparing this EIA Report. Further review of the cumulative construction air quality impact will be conducted in a separate EIA study of NMH to ensure that no adverse cumulative construction air quality impact would be resulted.

3.5.9 According to the approved NTMWTW Extension EIA report (Register No: AEIAR-262/2024), its construction works will commence in Year 2025 and complete by Year 2030, which is about the same time as the construction for all phases of this Project.

3.5.10 As mentioned in **Section 2.10**, Retrofitting of Noise Barriers on San Tin Highway by Highways Department is currently under planning without a confirmed implementation schedule during the preparation of this EIA Report. Thus, the cumulative construction air quality impact of this concurrent project is not included in the assessment.

3.5.11 Site Formation and Infrastructure Works for Public Housing Development at Sha Po, Yuen Long by Civil Engineering and Development Department (CEDD) will start construction tentatively in Year 2025 and end by Year 2031. The main works site of this concurrent project involving large-scale air emissions such as site clearance and site formation for the housing development which is located more than 500 m away from the Project. Only some minor associated road and infrastructure works, such as junction improvement works and ancillary works, fall within the 500 m assessment area of this Project.

3.5.12 First Phase Development the New Territories North – San Tin / Lok Ma Chau Development Node – Investigation (also known as San Tin Technopole) by CEDD covering a development area of 626 ha is located at the heart of the Northern Metropolis and in proximity to Shenzhen's innovation and technology (I&T) Zone. According to its approved EIA report (Register No.: AEIAR-261/2024), the major construction works from STT within 500 m assessment area of the Project would commence in end 2024 and complete by 2034, which overlaps with Phase 1, Phase 2 and part of Phase 3 of the Project.

3.5.13 The proposed Residential Development at Various Lots in D.D. 104 and the Adjoining Government Land in Yuen Long, N.T. (Approved Planning Application No. Y/YL-MP/10) will be located to the west of the Project Site. As there is no confirmed implementation programme of this development during the preparation of this EIA Report, the cumulative construction air quality impact of this concurrent project is not

included in the assessment. Nevertheless, given that this concurrent project is classified as a DP under Item P.1, Part I, Schedule 2 of the EIAO (i.e. a residential or recreational development, other than New Territories exempted houses within Deep Bay Buffer Zone 1 or 2), the project proponent of the concurrent project will be required to conduct an EIA study to assess the potential air quality impact during the construction phase of the concurrent project. Thus, the cumulative construction air quality impact of this concurrent project is not included in the assessment.

3.5.14 The proposed Low-rise and Low-density Residential Development at Various Lots and their Adjoining Government Land in D.D. 104, East of Kam Pok Road, Mai Po, Yuen Long, N.T. (Approved Planning Application No. A/YL-MP/287) is within the 500 m assessment area of the Project, and is located approximately 280 m from the nearest Project Site. The associated environmental impacts arising from this project were assessed in the approved EIA report (Register No.: AEIAR-205/2017). Since there is no confirmed implementation schedule available during the preparation of this EIA Report, the cumulative construction air quality impact of this concurrent project is not included in the assessment.

Operational Phase

Vehicular Emission from Proposed District Distributor Road (Road D1) and Other Roads

3.5.15 District Distributor Road D1 and associated road works at San Tin Highway, as well as the associated connecting local roads are proposed under the Project to support the developments of the Project. The locations of these roads are illustrated in **Figure 2.2**, and the traffic forecast is presented in **Appendix 3.1**. Potential vehicular emission would arise from these proposed roads and affect both existing and planned ASRs.

3.5.16 Vehicular emission from existing roads within 500 m assessment area also contributes to the ambient air quality. Major roads within 500 m assessment area include San Tin Highway, Castle Peak Road – Tam Mi and San Tam Road, etc.. These open road emissions have also been considered in the modelling assessment.

Vehicular Emission associated with Concerned Facilities

3.5.17 Facilities with frequent operation associated with vehicles also contribute to ambient air quality by vehicular running, idling and start emission within the facilities of concern. There is one Transport Interchange Hub (TIH) and one Public Transport Terminus (PTT) proposed under the RODP to provide a convenient and pleasant setting for multi-modal transport interchange activities beginning operation in Year 2036, and one planned TIH in STT beginning operation in Year 2039. The locations of the TIHs and PTT are illustrated in **Appendix 3.2**. These facilities have been considered in the modelling assessment using precise approach.

3.5.18 Two existing heavy goods vehicle (HGV)/coach parking sites were identified within the 500 m assessment area, namely Fan Keung Kee Transport and Mitsubishi Fuso Depot. **Appendix 3.2** presents the locations of these HGV/coach parking sites and their trip frequencies. 24-hour site surveys were conducted for these sites on a normal working day and found that HGV and coach access were infrequent. Therefore, start emissions of all vehicle types (except single and double deck franchised buses) from these parking sites were considered using broad-brush approach in which the emissions were allocated along the concerned roads around these HGV/coach parking sites.

Industrial Emission

3.5.19 There is no existing major point source within 4 km from the Project Site. An Integrated Hospital is proposed at Site G.8 under the RODP. To support its daily operation, chimney emission is expected. A chimney for conducting pyrolysis / carbonisation of horse stable waste in the existing NTM AWCP regulated under *SP* (specified process) *License for Gas Works (Carbonization and Gasification of Plant Biomass)*. The facility will be upgraded to NTM Animal Waste Treatment Plant (AWTP) according to Environmental Review Report (ERR) of AWTP, and is expected to increase treatment capacity of the mentioned works, which is also regulated under SP License and may induce potential air quality impact. A chimney for lard boiling operations in the existing LBF may also induce potential air quality impact. The location of the existing and planned industrial emission sources is presented in **Figure 3.3**, and the detailed calculation is presented **Appendix 3.4**. Apart from the abovementioned sources, no other industrial chimneys were identified within the assessment area according to the findings of a site survey carried out in February 2025, a review of topographic maps, as well as SP License search using the EPD Hong Kong Environmental Database.

Concurrent Projects

3.5.20 The NOL Main Line will provide mass transit for the population in the Development Area. As an electric-powered railway, the NOL Main Line will be air-emission free during normal operation. Exhaust form ventilation facilities will be carefully positioned to avoid causing any nuisance to the ambient. The air quality impact during operational phase is thus considered negligible and has not been assessed.

3.5.21 According to the approved NOL Main Line EIA report, train inspection/maintenance/repairing services will be provided at NTD, which would not cause any emission of air pollutants. During the operation of NOL Main Line, electrified equipment for maintenance will be deployed as far as practicable, and NRMM, if any, to be used in the Depot would comply with the prescribed emission standard (i.e. approved NRMM) with relevant labels under the requirements of the *Air Pollution Control (NRMM) (Emission) Regulation*, such that limited air emission is anticipated, while exempted NRMM will also be avoided as far as practicable. Therefore, no air quality issue is envisaged from the operation of the NOL Main Line and the potential air quality impact is therefore not assessed.

3.5.22 Some planned roads under STT lie within the 500 m assessment area of the Project. Furthermore, the traffic induced by the population in STT would travel along San Tin Highway and the planned NMH, which runs near the Development Area and would cause indirect air quality impact on the existing and planned ASRs. The potential air quality impact due to these planned roads and induced traffic has been incorporated into the modelling assessment.

Identification of Key Air Pollutants of Emission during Operational Phase

3.5.23 Vehicular emission will be the dominant source of air pollutants. The key air pollutants associated with vehicular emission during operational phase include NOx, RSP and FSP. Additionally, SO_2 associated with the industrial emissions such as operation of the Proposed Integrated Hospital and the existing LBF is also considered as a key air pollutant.

Operational Phase (Odour Impact)

Existing Livestock Farms

3.5.24 There are a total of three chicken farms and one pig farm currently in operation within the assessment area. However, one chicken farm located within the Project Site with rearing capacity of 19,000 will be removed during the construction phase of the Project, while the pig farm with livestock capacity of 1,500 located within the project boundary of STT is anticipated to be removed during the construction phase of STT (i.e. Year 2026 – Year 2034). Hence, both of them would be removed before the population intake of this Project and were not considered as odour emission sources.

3.5.25 The remaining two chicken farms, (i.e. AFCD Livestock Keeping Licence Nos. LK1106 and LK723), were considered to be the potential odour emission sources within the assessment area and were included in the modelling for odour assessment. The general information of the chicken farms is shown in **Table 3.5** while their locations are illustrated in **Figure 3.4**. Based on the available correspondence with EPD, no substantiated complaint on odour nuisance related to the operation of these chicken farms was received by EPD in the past 10 years.

Table 3.5 General Information of Chicken Farms

AFCD Livestock Keeping Licence No.	Max. Allowable Livestock No.	Approximate Horizontal Distance to the Development Area, m
LK1106	39,000	65
LK723	25,000	135

Existing Lard Boiling Factory

3.5.26 The LBF, with an approximate horizontal distance to the Development Area of about 45 m, is located at Wang Ping Shan South Road as shown in **Figure 3.4**. The LBF renders lard from raw pig fat obtained from local meat stalls, and the rendered lard is delivered for further processing into biodiesel. The LBF was considered to be a potential odour source within the assessment area and therefore was included in the modelling assessment. Based on the available correspondence with EPD, there have been 25 substantiated complaints on odour nuisance related to the operation of LBF recorded in the past 5 years.

Existing Sewage Treatment Plant at Tam Mei Barracks

3.5.27 The TMB is located to the north of the Development Area. An STP serving the TMB was identified near its perimeter, and is adjacent to the Development Area with an approximate horizontal distance of less than 5 m (**Figure 3.4** refers). The layout of the STP is shown in **Appendix 3.6**. Since access to TMB is restricted, site visit was conducted at the perimeter to confirm the operation of the STP and it was observed that the STP was still in operation and therefore, its potential odour impact was assessed and included in the modelling assessment.

Existing Ngau Tam Mei Animal Waste Composting Plant

3.5.28 The NTM AWCP is located to the south of the Development Area as shown in **Figure 3.4.** The AWCP is designed to treat horse stable waste, which comprises of horse manure, straw or paper bedding materials and horse feed, etc. These wastes are converted into organic compost for landscaping, horticultural and agricultural uses. According to monthly odour monitoring reports provided by EPD's Organic Waste Infrastructure Group, there was only very limited (1 time with slight odour under

downwind conditions at 2 locations out of the whole year monitoring) odour detected outside the AWCP. According to the available correspondence with EPD, no substantiated complaint for odour nuisance related to the operation of AWCP was received by EPD in the past 10 years.

3.5.29 As advised by EPD, the AWCP would be upgraded by the project proponent of the AWCP to AWTP using improved technologies. With reference to the ERR of the AWTP upgrading works, the AWTP would be increasing its treatment efficiency and capacity in order to divert all horse stable waste from landfills in line with the Government's long term vision of "zero landfill" and achieving "carbon neutrality", with target completion of upgrading in late 2028. In addition, according to the ERR, the managing party of the AWTP would further enhance the existing mitigation measures (e.g. enclosing odourous areas and facilities under negative pressure) to prevent odourous air leakage from the AWTP, and provision of odour removal equipment with odour removal efficiency of a least 99.5% to treat the potential odourous air before discharge to ambient. As such, the ERR concluded that there will be no adverse odour impacts on the ASRs arising from the operation of the AWTP, and therefore the odour impact from AWTP on the representative ASRs of the Project is considered negligible.

3.5.30 Considering that the committed upgrading works including the associated effective mitigation measures, any potential future odour impact to the Project should be effectively addressed.

Proposed Sewage Pumping Station

3.5.31 The SPS is proposed at Site G.1 with a design capacity of 44,875 m^3/day to serve the Development Area. The location of the SPS is shown in **Figure 3.4.** All potential odour sources of the SPS would be fully enclosed by reinforced concrete structure. Negative pressure would also be maintained to prevent odourous air from escaping the buildings. The odourous air inside the SPS would be conveyed to the deodorisers (DOs) with odour removal efficiency of at least 95% and at least 99.5% removal for hydrogen sulphide (H_2S) before discharging to the ambient. The odour emission from the proposed SPS was assessed quantitatively.

Proposed Refuse Collection Points

3.5.32 There are two refuse collection points (RCPs) proposed at Site G.4 and Site G.7, as shown in **Figure 3.4**. The proposed RCPs would be provided with proper ventilation, deodourising and exhaust system. Commercially available odour control device[1] could achieve at least 95% and 80% removal on H_2S and NH_3 respectively, where H_2S and NH_3 are the primary odourous gas from municipal solid waste. The RCPs would be fully enclosed with ventilation system to ensure negative pressure would be maintained. Good site practices would also be adopted to enhance the hygiene of the RCPs by frequent washing, proper covering of refuse bins, closing of roller shutters and proper maintenance of the ventilation, deodourising and exhaust systems. A monitoring and sanction mechanism would be observed by Food and Environmental Hygiene Department (FEHD) to ensure satisfactory service by waste collection contractors such that the potential odour nuisance due to RCPs would be very limited. Therefore, odour from the operation of the RCPs is considered negligible.

[1] Nano Confined Catalytic Oxidation (NCCO) could achieve H_2S and NH_3 removal efficiencies at more than 96.97% and 95.65% respectively. Nano Plasma-Driven Catalysis (PDCC) could achieve H_2S and NH_3 removal efficiencies at 95% and 80% - 85% respectively. The data is provided from the manufacturer.

3.5.33 During transportation of municipal solid waste, fully-enclosed refuse collection vehicle (RCV) would be used to avoid odour spread. In addition, the route for the RCV between the RCPs and refuse transfer station(s) would be carefully designed so as to minimise the potential odour impact from these vehicles to the ASRs in the vicinity of the routing. The drivers of RCV should follow the procedures for cleaning the RCV in accordance with Code of Practice on the Operation of Refuse Collection Vehicles compiled by EPD so as to keep the RCV in a clean and hygienic condition. Therefore, odour from the operation of RCVs is considered negligible.

Revitalisation of Ngau Tam Mei Drainage Channel (NTMDC) and River Diversion Works

3.5.34 Since the purpose of the revitalisation is to enhance habitat creation and planting opportunities by converting the channel into a natural embankment to create a resilient hydraulic capacity of the river, the beautification and vegetating of the existing nullah would bring positive influence on the surrounding environment. In view of the nature of the works, the operation of the revitalised NTMDC is not expected to cause adverse odour impact to the ASRs. Therefore, odour from the revitalised NTMDC is considered negligible.

3.6 Assessment Methodology

Construction Phase

3.6.1 A review of dust monitoring data during construction phase of similar infrastructure projects including North East New Territories New Development Areas (NENT NDAs) and High Speed Rail (HSR) (formerly known as Express Rail Link), has been conducted. The NENT NDAs is a large-scale development project with a site area of about 614 ha, which is much larger than the Development Area of this Project (i.e. 130 ha). The HSR is also a large-scale infrastructure project with a railway corridor of approximately 26 km long, which is longer than that of the NOL Main Line. Both NOL Main Line and HSR require concrete batching plants of similar scale to support their construction. The work sites of both projects were located in close proximity of ASRs. Good site practices and air quality control measures as recommended in their EIA reports were adopted. Some existing ASRs, located in close proximity of construction works and the concrete batching plants, were selected as dust monitoring stations for impact monitoring during construction phase. Given these similarities, the data of these monitoring stations of both projects were selected for review.

3.6.2 For the NENT NDAs project, the measured 1-hour TSP and 24-hour TSP levels at all monitoring stations were below the action levels of 300 $\mu g/m^3$ and 150 $\mu g/m^3$ respectively, and limit levels of 500 $\mu g/m^3$ and 260 $\mu g/m^3$ respectively during site clearance and site formation with the monitoring locations ranging from 1 m to 169 m from the nearest works site boundary. No exceedance of action level and limit level was recorded throughout the entire construction period.

3.6.3 For the HSR project, the measured 24-hour TSP levels at all monitoring stations located from 11 m to 153 m from the nearest works site boundary complied with the limit level of 260 $\mu g/m^3$, except two recorded exceedance events. After investigation, these exceedances were found to be unrelated to the construction works of the project. In fact, over 99% of the measured 24-hour TSP levels at all monitoring stations (i.e. 146 to 217 $\mu g/m^3$) were below the action level throughout the entire construction period.

3.6.4 With reference to these past air quality monitoring data, the construction of larger-scale projects did not pose adverse air quality impacts. It is anticipated that the

Project would not cause adverse air quality impacts during the construction phase after the implementation of appropriate air quality control measures and good site practices. Therefore, qualitative assessment approach was adopted for construction dust assessment in accordance with Annex 12 of the EIAO-TM to ensure that the *Air Pollution Control (Construction Dust) Regulation* is complied with. A comprehensive environmental monitoring and audit (EM&A) programme with RSP and FSP real-time monitoring would be conducted to ensure the proper implementation of measures and the compliance with prevailing AQOs during the construction of the Project.

Operational Phase

Vehicular Emission from Proposed District Distributor Roads (Road D1) and Other Roads

3.6.5 Traffic on all existing and planned roads within the assessment area was included in this assessment using EPD Smart Air Modelling Platform v2.1 (SAMP v2.1) according to the latest *Technical Notes on Air Quality Modelling* on EPD's website and the EPD's *User Guide for the ROAD Tool in Smart Air Modelling Platform*. The modelled fleet is broken down into 18 vehicle classes based on the information in *Appendix 1* of *Guideline on Modelling Vehicle Emissions* published by EPD. The predicted 24-hour traffic flow and vehicle compositions at the identified roads was provided by the traffic consultant according to the methodology endorsed by Transport Department (TD), and are presented in **Appendix 3.1**. The induced traffic due to the Project such as population intake has been taken into account in the traffic data.

3.6.6 EMFAC-HK v4.3 model was adopted in SAMP v2.1 to estimate the vehicular emission rates of NOx (i.e. initial NO + initial NO_2), RSP and FSP for vehicular emission arising from open road, and the adopted temperature and relative humidity data were extracted from the meteorological output in SAMP v2.1 of the PATH grids where the road segments are located. The monthly hour minimum temperature and relative humidity data was adopted for the prediction of short-term averages of NO_2, while the monthly hour average temperature and relative humidity data was adopted for the prediction of long-term averages of NO_2, and annual minimum temperature and relative humidity was adopted for prediction of short-term and long-term averages of RSP and FSP. For calculations of start emissions by the broad-brush approach, start emissions for each vehicle class are assumed directly proportional to Trips per Vehicle-kilometre-travelled ratio (Trip/VKT) with consideration of the proportion of local and rural roads within Hong Kong based on the Annual Traffic Census (ATC) prepared by the TD. For SAMP v2.1, default trip and VKT values from EMFAC-HK v4.3 model are used in the calculations and the proportion of local and rural roads within Hong Kong of 21.8% is calculated based on raw data from ATC 2023 provided by TD in accordance with the methodology described in the Appendix K of ATC 2023, with details provided in **Appendix 3.3**. All rural and local roads within the assessment area are considered using the broad-brushed approach, including roads leading to the identified HGV parking sites. Zero emission vehicle scenario has been considered in the open road emission calculation.

Vehicular Emission associated with Concerned Facilities

3.6.7 Running, idling and start emissions within the proposed TIH and PTT were assessed with precise approach. It is envisaged that the proposed facilities would be decked with ingress and egress for vehicles. For STT TIH, while the operation year of the TIH is later than the assessment year of vehicular emission, it was considered in the modeling assessment as a conservative approach. Data regarding engine start at these concerned locations, such as the frequency and soak time, were derived according to the planned operation schedules, and is presented in **Appendix 3.2**. The start emissions calculation was conducted according to the *Technical Note on*

Calculation of Start Emissions in Air Quality Impact Assessment. Start emission factors of vehicle types at various soak times were extracted from EMFAC-HK v4.3. The annual minimum temperature and relative humidity were extracted from all the concerned PATH grids of the Project as shown in **Figure 3.1**, and the minimum set of values (i.e. 7 ºC and 16%) were adopted in the calculations as a conservative approach. The detailed calculation of start emission is presented in **Appendix 3.2**.

Determination of Assessment Year for Vehicular Emission

3.6.8 The population intake is expected to take place in three phases, namely Phase 1 in Year 2033, Phase 2 in Year 2034 and Phase 3 in Year 2036, while all project roads including Road D1, Road L1 to Road L3 will begin operation in Year 2034. For STT, its road network within the 500 m assessment area of this Project was considered to be in operation since 2034, in accordance with the STT EIA. The assessment years for open road vehicular emission was determined based on the highest emission strength from the road vehicles in the assessment area within the next 15 years after the first population intake year of the Project or within the next 5 years after the full population intake year of the Project, whichever is later, i.e. Year 2034 – 2048 inclusive. Therefore, the vehicular emission burdens in NOx, RSP and FSP for all these years were estimated with EMFAC-HK v4.3 from the annual minimum temperature and relative humidity associated with each road segment using SAMP v2.1 and are presented in **Table 3.6**.

Table 3.6 Vehicular Emission Burden in the Assessment Area

Year	Vehicular Emission Burden (tonne/year)		
	NOx	RSP	FSP
2034	**45.1**	**1.5**	**1.3**
2035	44.1	1.3	1.2
2036	44.1	1.2	1.1
2037	42.6	1.2	1.1
2038	40.9	1.1	1.0
2039	39.3	1.1	1.0
2040	37.5	1.0	0.9
2041	32.5	0.9	0.8
2042	31.3	0.9	0.8
2043	28.6	0.8	0.8
2044	24.8	0.7	0.8
2045	20.7	0.6	0.6
2046	21.4	0.6	0.6
2047	21.4	0.6	0.6
2048	21.4	0.6	0.6

3.6.9 Based on the above results, NOx, RSP and FSP all attain the highest vehicular emission burdens in Year 2034. Year 2034 were therefore selected as the assessment year. The associated traffic data and detailed emission calculations extracted from SAMP v2.1 is presented in **Appendix 3.1** and **Appendix 3.3** respectively.

Industrial Emission

3.6.10 Since no detailed design information is available for the proposed Integrated Hospital, and the total chimney emission is proportional to the total number of beds in the hospital with reference to the approved EIA report of North East New Territories New Development Area (Register No.: AEIAR-176/2007) (NENT NDA), the chimney emission of the proposed Integrated Hospital was estimated with reference to the design assumption of the RODP in which the proposed Integrated Hospital is estimated to have about 3,000 beds. The detailed calculation of emission rate is presented in **Appendix 3.4**.

3.6.11 There is also no detailed design information available from the upgraded AWTP. Since a SP License will be required according to the ERR of AWTP, the emission limit of the corresponding SP License was adopted in this assessment as a conservative approach. For the chimney emission from the LBF, liquid fuel is used for the lard boiling. While the boiler type is unknown, the emission factors are adopted from AP-42, *Compilation of Air Pollutant Emissions Factors from Stationary Sources, 5th Edition*, published by the United States Environmental Protection Agency (USEPA). The emission inventory for AWTP and LBF and the detailed calculation of the emission parameters of the LBF is presented in **Appendix 3.4**.

Dispersion Modelling and Modelling Approach

3.6.12 With reference to Section 3.4.3, Appendices B and B-1 of the EIA Study Brief, and the EPD's *Guidelines for Local-Scale Air Quality Assessment Using Models*, the AERMOD model was employed to predict the potential air quality impact.

3.6.13 Hourly meteorological conditions including wind data, temperature, relative humidity, pressure, cloud cover and mixing height are extracted from the WRF meteorological data adopted in the PATH model, obtained through SAMP v2.1. The meteorological data was inputted as on-site data into AERMET (the meteorological pre-processor of AERMOD). Surface characteristic parameters such as albedo, Bowen ratio and surface roughness are required in the AERMET (the meteorological pre-processor of AERMOD) and could be found in **Appendix 3.7**. The land use characteristics of the project area are customised according to the RODP of the Project while that of the surrounding are classified based on the Planning Department's 2023 land utilisation map, and the AERMET output are generated by SAMP v2.1 for the AERMOD model run. Elevated terrain and urban mode in AERMOD were adopted for this assessment, with an urban population of 671,100 according to the 2024 Population and Household Statistics Analysed by District Council District released by Census and Statistics Department.

3.6.14 All open road vehicular emissions were modelled as "LINE" sources. The hourly initial NO, NO_2, RSP and FSP emission factors of each road segment in grams per second per square meter were generated using SAMP v2.1. Since the detailed design of the proposed TIH and PTT are not yet available during the preparation of this Report, the emissions from within the facilities were modelled as "VOLUME" sources located at the ingress/egress of the facilities, while the starting emissions from outside the facilities were modelled as "AREA" sources. **Appendix 3.2** shows the model parameters for these facilities in details.

3.6.15 Secondary air quality impacts arising from the implementation of existing, proposed or planned roadside noise mitigation measures under the Project (i.e. vertical noise barriers and cantilevered noise barriers) and other concurrent project, were incorporated into the air quality model using SAMP v2.1 according to the *Technical Note for Modelling Vehicular Emissions Using AERMOD* published by EPD. Locations and type of noise barriers are presented in **Figure 4.9**. For the industrial

sources, they were modelled as "POINT" sources, and the modeling parameters are presented in **Appendix 3.4**.

Cumulative Impact

3.6.16 The PATH model output was added to the sum of the AERMOD model results sequentially on an hour-to-hour basis to derive the short-term and long-term cumulative impacts at the ASRs. Year 2030 PATH model output was adopted as the background concentrations as conservative approach and the assessment year is 2034.

3.6.17 For the short-term cumulative NO_2 assessment (i.e. predictions of hourly average and daily average NO_2 concentration), Ozone Limiting Method (OLM) was adopted for conversion of NO from vehicle-related source (i.e. emissions from open roads and concerned facilities) and NOx from industrial sources to NO_2 based on the predicted O_3 level from PATH model. For industrial emissions of NOx, the initial NO_2-to-NOx ratio of 10% was adopted to derive the respective NO and NO_2 concentrations, with reference to *Air Quality Studies for Heathrow: Base Case, Segregated Mode, Mixed Mode and Third Runway Scenario modelling using ADMS-Airport, Cambridge Environmental Research Consultants, 2007*. The derived industrial NO and the predicted initial vehicular NO concentrations were added together on an hour-to-hour basis. OLM was then applied subsequently to all the initial NO and derived NO from industrial emissions. The NO_2/NOx conversion was calculated as follows:

$$[NO_2]_{predicted} = [NO_2]_{vehicular} + [NO_x]_{industrial} \times 0.1 + MIN \{[NO]_{vehicular} + [NO_x]_{industrial} \times 0.9, \text{ or } (46/48) \times [O_3]_{PATH}\}$$

where

$[NO_2]_{predicted}$	is the predicted NO_2 concentration
$[NO_2]_{vehicular}$	is the sum of predicted initial NO_2 concentration from open roads and concerned facilities
$[NO]_{vehicular}$	is the sum of predicted initial NO concentration from open roads and concerned facilities
$[NO_x]_{industrial}$	is the predicted initial NO_x concentration from industrial emissions
MIN	means the minimum of the two values within the brackets
$[O_3]_{PATH}$	is the representative O_3 PATH concentration (from other contribution)
(46/48)	is the molecular weight of NO_2 divided by the molecular weight of O_3

3.6.18 For the long-term cumulative NO_2 assessment (i.e. predictions of annual average NO_2 concentration), Jenkin method was adopted for the conversion of cumulative NO_x to NO_2 by using the functional form of annual mean of NO_2-to-NOx with reference to the *Review of Methods for NO to NO_2 Conversion in Plumes at Short Ranges*[2]. The mentioned functional form is referenced from Jenkin, 2004a[3] and is presented as follows:

$$[NO2] = \frac{\left([\mathrm{NOx}] + [\mathrm{OX}] + \frac{\mathrm{J}}{\mathrm{k}}\right) - \sqrt{([NOx] + [OX] + \frac{J}{k})^2 - 4[NOx][OX]}}{2}$$

where

[2] Environment Agency. 2007. *Review of methods for NO to NO_2 conversion in plumes at short range*. Prepared by Environmental Agency.

[3] Jenkin. 2004a. *Analysis of sources and partitioning of oxidant in the UK – Part 1: The NOx-dependence of annual mean concentrations of nitrogen dioxide and ozone.* Atmospheric Environment, 38, 5117-5129.

$[NO_2]$	is the NO_2 concentration
$[NO_x]$	is the NOx concentration
[OX]	is the sum of NO_2 concentration and O_3 concentration (i.e. [OX] = $[NO_2] + [O_3]$)
J	is the photolysis rate of NO_2
k	is the rate coefficient for reaction between NO and O_3

3.6.19 The above functional form was used to analyse the latest 5 years (i.e. 2019 to 2023) of annual mean data obtained from EPD's air quality monitoring stations including Yuen Long general station, Tap Mun general station and three roadside stations (i.e. Causeway Bay, Central and Mong Kok roadside stations). The Yuen Long general station is the nearest station and therefore was chosen as the representative station. Tap Mun general station and the three roadside stations were also included in order to cover a wider range of NOx concentration. The functional form curve would fit the annual mean data when [OX] = 95.57 µg/m^3 and J/k = 17.114 µg/m^3, as obtained from SAMP v2.1 The cumulative annual average NO_x to NO_2 conversion equation for this assessment was calculated as follows:

$$[NO2]_c = \frac{([NOx]_c + 95.57 + 17.114) - \sqrt{([NOx]_c + 95.57 + 17.114)^2 - 4[NOx]_c \times 95.57}}{2}$$

where

$[NO_2]_c$	is the predicted cumulative NO_2 concentration
$[NO_x]_c$	is the predicted cumulative NO_x concentration

3.6.20 For the estimation of 10-minute averaging SO_2 concentration, EPD's *Guidelines on the Estimation of 10-minute Average SO_2 Concentration for Air Quality Assessment in Hong Kong* was followed. A conversion factor of 2.45 was applied to the modelled results to convert the 1-hour averaged concentration to 10-minute averaged SO_2 concentration.

Operational Phase (Odour Impact)

Existing Livestock Farms

3.6.21 Excrement from chickens is the primary source of odour for chicken farms. In order to obtain the odour emission characteristics of individual livestock farm, odour samplings were conducted at both chicken farms under ambient temperature of at least 33°C. The details of the odour sampling and olfactometric analysis are presented in **Appendix 3.5**.

3.6.22 **Table 3.7** and **Table 3.8** present the emissions of all sources at Chicken Farm LK1106 and Chicken Farm LK723 respectively. **Appendix 3.5** provides the detailed emission inventory for all odour sources.

Table 3.7 Emission Inventory for Chicken Farm LK1106

Facility Type	Chicken House No. / Facility	Odour Emission Area (m^2) (1)	Odour Emission (OU/s) (3)
Large Chicken House (With Temperature Control)	6+7	- (2)	2,268.0
	8	87.0	41.7
	12	33.3	16.0
	14	46.6	22.4
	15	42.9	20.6
	16	55.9	26.8
	17	40.3	19.4
	18	71.4	34.3
	19	44.2	21.2

Facility Type	Chicken House No. / Facility	Odour Emission Area (m^2) (1)	Odour Emission (OU/s) (3)
	21	29.1	14.0
	23	41.2	19.8
	24	53.5	25.7
Large Chicken House (Without Temperature Control)	11	20.7	53.9
Medium Chicken House	4	168.5	454.9
	13	75.9	205.0
	22	128.4	346.8
Small Chicken House	10	151.3	196.7
	20	75.1	97.7
Excrement Transfer Tank	Excrement Transfer Tank	0.8	0.29
Excrement Collection Tank	Excrement Collection Tank	0.4	0.76
Excrement Collection Bins	Collection Point for 6+7	0.4	0.24
	Excrement Collection Bins Storage Area	49.2	27.5

Notes:
(1) Odour Emission Area refers to the total area of excretion collection channels/trays/conveyor belts/excrement collection bins or tank/excretion transfer tanks.
(2) Measured odour concentration adopted.
(3) The measured max. SOER or ambient concentration, whichever is larger, is adopted.

Table 3.8 Emission Inventory for Chicken Farm LK723

Type	Chicken House No. / Facility	Odour Emission Area (m^2) (1)	Odour Emission (OU/s) (2)
Medium & Large Chicken House	1+2	81.7	171.6
	3	66.1	138.9
	4+5	154.0	323.4
	7+8	109.4	229.8
	14	65.7	138.1
	15+16	153.3	322.0
Small Chicken House	10+11	62.9	17.6
Excrement Collection Bins Storage Area	Excrement Collection Bins Storage Area	67.5	222.9

Notes:
(1) Odour Emission Area refers to the total area of excretion collection channels/trays/conveyor belts/excrement collection bins or tank/excretion transfer tanks.
(2) The measured max. SOER or ambient concentration, whichever is larger, is adopted.

Existing Lard Boiling Factory

3.6.23 The raw materials, empty baskets, oil fume from boiling lard, cracklings and the processing areas are the primary odour sources in the LBF. In order to obtain the odour emission characteristics of the LBF, odour sampling was conducted during ambient temperature of at least 33°C, with the same samping methods for the chicken farms. The details of the odour sampling and olfactometric analysis are presented in **Appendix 3.5**.

3.6.24 **Table 3.9** presents the emissions of all sources in LBF, while a detailed emission inventory of odour sources is provided in **Appendix 3.5**. A reasonable worst-case

scenario in which both Factory A and Factory B are in operation simultaneously was adopted in the assessment.

Table 3.9 Emission Inventory of LBF

Facility Type	Facility	Odour Emission Area (m^2) (1)	Odour Emission (OU/s) (2)
Unloading and Storage Area for Raw Material (Baskets with raw pig fat)	Factory A	70.1	336.3
	Factory B	44.0	211.2
Unloading and Storage Area for Raw Material (Empty Baskets)	Factory A-1	70.1	2.3
	Factory A-2	6.2	0.2
	Factory B	44.0	1.5
Processing Area (Factory A)	Grinder, Conveyor A	12.0	2451.6
	Cracklings A	2.0	
Processing Area (Factory B)	Grinder, Conveyor B-1	16.0	6535.2
	Grinder, Conveyor B-2	16.0	
	Cracklings B-1	2.0	
	Cracklings B-2	2.0	
Lard Boiler	Factory A	0.6	6600.0
	Factory B-1	0.6	6600.0
	Factory B-2	0.6	6600.0
Cracklings Storage Area	Cracklings Storage Area	17.9	32.3

Notes:
(1) Odour Emission Area refers to the total exposed area of odour sources.
(2) Either the measured max. SOER or ambient concentration is adopted for calculation of odour emission.

Existing Sewage Treatment Plant at Tam Mei Barracks

3.6.25 While the engineering information of the TMB STP is not available, the potential odour sources of the TMB STP were identified with reference to the GeoInfo Map and the site observations from outside the fence at barracks perimeter, where slight odour was perceived. It was assumed that the sewage at the TMB STP would be mainly domestic sewage, and the STP is of a secondary treatment level comprising inlet works, sedimentation, bioreactor and a sludge thickening process. Given that the type of sewage received and the process conducted at these tanks, odour emission rates of inlet works, sedimentation tank, bioreactors and sludge treatment in the TMB STP therefore were generally made reference to the odour emission rates of tanks with similar type of treatment units in Shek Wu Hui Sewage Treatment Works (SWH STW) which also receives major domestic sewage without seawater flushing. The SWH STW emission rates are presented in the approved EIA report for NENT (Register No.: AEIAR-175/2013). **Table 3.10** summarises the odour emission rates of the TMB STP, and the details are provided in **Appendix 3.6**.

Table 3.10 Estimated Odour Emission for TMB STP

ID	Description	Odour Emission Area (m^2) (1)	Adopted SOER ($OU/m^2/s$)	Reference
BSTP1	Inlet Works	88	3.26	S1 Inlet Pumping Station of SWH STW
BSTP2-1	Bioreactor	129	1.65	S7 Bioreactor of SWH STW
BSTP2-2	Bioreactor	129	1.65	S7 Bioreactor of SWH STW
BSTP3	Sludge Treatment Tank	138	3.98	S12 Thickener of SWH STW
BSTP4	Sedimentation Tank	87	4.03	S6 Primary Sedimentation Tank of SWH STW

Note:
(1) Odour Emission Area refers to the total exposed area of odour sources and was determined from GeoInfo Map.

Proposed Sewage Pumping Station

3.6.26 Since the detailed design of the proposed SPS is not available during the preparation of this Report, the odour emission rate was adopted from a SPS of similar operating principles and capacity in the approved EIA report of STLMC DN. The referenced SPS in STLMC DN has a design capacity of 52,317 m^3/day, while the proposed SPS under this Project has a design capacity of 44,875 m^3/day. Similar to the referenced SPS in STLMC DN, the proposed SPS would be fully enclosed, operated under negative pressure and provided with DO with at least 95% odour removal efficiency (>99.5% removal for H_2S) at the ventilation exhaust to control the potential odour emission. The emission inventory of the proposed SPS is presented in **Appendix 3.6**.

Dispersion Modelling

3.6.27 The methodology for dispersion modelling shall follow **Section 3.6.12** to **Section 3.6.13**.

3.6.28 Cumulative odour impact arising from all identified odour emission sources were assessed, and their detailed emission inventory are presented in **Appendix 3.5** and **Appendix 3.6**. If the odour emission point sources are found to be wake-affected, the 1-hour to 1-second conversion factors from Methods for the Modelling and Assessment of Air Pollutants in New South Wales (NSW Approved Method) for wake-affected sources would be adopted, and the AERMOD building preprocessor was used to determine the building dimensions to be inputted to the AERMOD model to account for the building downwash. The conversion factors for different source types are listed in **Table 3.11** below. As a conservative approach, the conversion factor of 2.5 for area source was adopted regardless of the stability class.

Table 3.11 Conversion Factors to 5-second Mean Concentration

Pasquill Stability Class	Conversion Factor	
	Wake Affected Point / Volume Source	Area Source
A	2.3	2.5
B	2.3	2.5
C	2.3	2.5

D	2.3	2.5
E	2.3	2.3
F	2.3	2.3

3.6.29 The assessment heights were at predetermined heights above ground level according to the height of the ASRs. The contour plots of predicted odour levels at the worst affected heights of the ASRs were also produced.

3.7 Prediction and Evaluation of Environmental Impacts

Construction Phase

Construction Works within the Project Site

3.7.1 According to the construction phasing and schedule, as well as the construction programme presented in **Appendix 2.1** and **Appendix 2.2** respectively, the Project would be developed in three phases (i.e. Phase 1, Phase 2 and Phase 3). **Table 3.12** summarises the major construction works for the proposed DPs and other general sites at each stage.

Table 3.12 Summary of Construction Works in Different Development Stages

Development Stage	Area	Anticipated Start of Construction	Anticipated First Occupation/ Population Intake/ Completion Date
Phase 1	• DRE site • Integrated Hospital site & adjacent ESS site • Part of UniTown • Sewage pumping station • Road network connecting to the Integrated Hospital	Q1 2027	2033 for DRE site
Phase 2	• Remaining UniTown • Residential sites • Remaining G/IC and schools • Open space and amenity areas • Majority of road network • NTMDC	Q3 2028	Q2 2034
Phase 3	• Residential Site R.1, R.2 • Remaining open space • Remaining roadworks, landscape works, riverside & site formation works	Q3 2030	Q2 2036

3.7.2 Construction works of general sites generally involves site formation works, construction of superstructures and road works. Potential construction air quality impact would arise from the abovementioned construction works which involve site formation, excavation, backfilling, stockpiling, spoil handling, vehicle movement on haul roads and wind erosion of the exposed site area. Among which, dominant air emission would be associated with excavation and backfilling. The air emission arising from the construction of superstructures is expected to be minor. **Table 3.13** summarises the duration of construction activities with major air emission in each development stage. While the expected maximum active workfront area per year is

estimated in **Table 3.13**, the exact locations of excavation and backfilling works at a specific time are not available at this stage.

Table 3.13 Construction Activities with Major Dust Emission at Each Development Stage

Development Stage	Construction Activities	Duration	Maximum Active Workfront Area per Year (ha)
Phase 1	• Site Clearance, Site Formation Works, Excavation and Backfilling	2027 – 2029	11
Phase 2	• Site Clearance, Site Formation Works, Excavation and Backfilling • Site Clearance and Revitalisation of NTMDC	2028 – 2034	11
Phase 3	• Site Clearance, Site Formation Works, Excavation and Backfilling	2030 – 2036	9

3.7.3 According to the construction design by the engineer, cut and fill volumes to be handled in each construction year are summarised in **Table 3.14** which is also presented in detail in **Section 7**. The major excavation and backfilling works will commence in Year 2027 and peak in Year 2030, and the intensity will decrease significantly in Year 2032 for cut volume and Year 2034 for fill volume, when the site formation works for respective phases are completed. Based on this design, the number of trucks required for transportation of spoils including importing fill materials is summarised in **Table 3.14**.

Table 3.14 Estimated Cut and Fill Volumes of the Project by Year

Year	Cut Volume (m^3)	Fill Volume (m^3)	Approx. No. of Trucks Required (vehicle per day)
2027	103,289	134,551	111
2028	256,136	213,888	218
2029	324,573	194,599	241
2030	331,949	226,270	259
2031	189,630	198,810	180
2032	96,836	169,960	124
2033	101,455	215,018	147
2034	15,297	74,079	42
2035	1,776	8,788	5
2036	1,281	5,875	4
Total	**1,422,222**	**1,441,838**	**-**

3.7.4 All inert C&D materials generated from the Project are assumed to be suitable for reuse on-site as backfilling materials and will be temporarily stored within the Project Site. For importing fill materials and if transporting surplus inert C&D materials to a disposal outlet becomes necessary, the routes should avoid local roads and the truck traffic should avoid peak hours as far as practicable. Dump truck for transporting inert C&D materials should be equipped with water-tight container and mechanical cover to prevent fugitive dust emission on open roads. With these mitigation measures in place, it is anticipated that no adverse air quality impact would be caused by the transportation of inert C&D materials.

3.7.5 Air quality control measures stipulated in *Air Pollution Control (Construction Dust) Regulation* should be implemented as far as practicable to abate the air emission from the construction sites. Regular watering should be provided at the excavation and backfilling works, spoil handling and exposed areas. Stockpile areas should be covered with impervious sheets as far as practicable. Haul roads should be paved and regularly wetted to suppress the fugitive dust emission caused by the travelling construction vehicles. Vehicles transporting dusty spoil should be properly covered with mechanical cover or tarpaulin sheets to avoid any dust pickup by gust during travel. Wheel washing facility should also be provided at each exit of construction site such that no residue on the body of the construction vehicles would cause dust emission on public roads. With the implementation of appropriate air quality control measures and good site practices, the air emission from the construction works would be controlled.

3.7.6 In order to avoid any intensive works at construction sites that are in proximity to existing ASRs, site formation works should be at each site conducted individually, subject to the land resumption schedule and site conditions. It is common for a development site in large scale to implement several workfronts at the same time. Careful scheduling of nearby construction works could be managed by coordination or collaboration among construction sites. With the implementation of careful scheduling of works, the associated air emission would be controlled. Nevertheless, some existing ASRs are close to the Project Site with separation distance of less than 10 m as shown in **Table 3.4**. Dusty activities should be located away from these nearby ASRs as far as practicable. In addition to regular watering, hoarding of not less than 3.5 m high should be provided to shield off ASRs from these dusty works. Construction dust monitoring at these locations shall be considered to ensure the potential air quality impact could comply with AQOs during the construction phase.

3.7.7 The planned ASRs in the earlier phases of the development will be exposed to potential construction air quality impact from the construction of the later phases. These ASRs include the Phase 1 DRE site RSc.1 with population intake in Year 2033, Phase 1 UniTown and Integrated Hospital with population intake in Year 2034 to 2036, as well as the Phase 2 ASRs with population intake in Year 2034. According to the construction programme in **Appendix 2.2**, while population intake of Phase 3 is in Year 2036, the site formation works with major air emissions for R.1 and R.2 will finish by Q4 2034. Therefore, it is expected that the potential air quality impact caused by the remaining road works and topside development of Phase 3 would be limited. Nonetheless, practices listed in **Section 3.7.5** and **Section 3.7.6** shall be followed to control the potential air quality impact. In addition, close liaison and coordination between workfronts shall be conducted to minimise construction air quality impact to the Phase 1 and Phase 2 ASRs.

3.7.8 Vehicular emissions induced from the use of NRMMs will cause potential air quality impact to the ASRs. While the detailed number and location of NRMMs is not available at this stage, according to *DEVB TC(W) No. 1/2015*, NRMMs with exempted label under the *Air Pollution Control (NRMM) Regulation* shall be avoided. The equipment would also be properly maintained to minimise any emissions. On-site power supply for NRMMs will be provided and the use of diesel generators and machinery will be avoided during the construction stage as far as practicable to reduce air emissions. The use of electrified NRMMs, which is unlikely to cause significant smoke and gaseous emissions, will also be adopted as far as practicable. Activities involving the use of non-electrical NRMMs should be located as far away as possible from the nearby ASRs, and careful scheduling of nearby construction works involving NRMMs could be managed by close coordination or collaboration among construction sites. Therefore, no adverse air quality impact is expected from the operation of the NRMMs.

3.7.9 The proposed revitalisation of the NTMDC may cause potential odour impact to the nearby ASRs during construction phase. The main source of odour in river or stream environments typically arises from the decomposition of organic material trapped within sediments. Given that the existing bottom of the NTMDC is of concrete lined (i.e. less deposition) and no significant sediment deposits were observed during the site inspection, the potential for odour generation during the proposed revitalisation works is considered minimal. Should excessive sediment accumulation occur, it will be removed through desilting works. In the event that odorous sediment is encountered during the works, standard good practices, including stockpiling the desilted materials as far away from the ASRs as possible, and covering of any remaining on-site desilted materials with tarpaulin sheets to minimise the release of potential odour, will be implemented. Additional measures to control the potential odour impact that could be implemented include limiting the scale of excavation/desilting works to be conducted at a time, containing the odourous excavated materials in airtight/watertight containers on-site, transporting the odourous excavated materials off-site for disposal within a day and avoiding over stockpiling, covering odourous excavated materials on the transportation trucks with tarpaulin sheets, and regular site inspections. With the implementation of the proposed odour control measures and good site practices, no adverse odour impact is anticipated from the desilting works.

Consideration of Cumulative Impact

3.7.10 NOL Main Line NTM Station and NTD will be constructed within the Project Site concurrently from Year 2026 to 2031. Owing to the large footprint of the NTM Station and NTD, construction is expected to occur in multiple workfronts. Major construction works, including excavation and backfilling, would be carried out from Q4 2026 to Q1 2030 for NTM Station, and from Q1 2027 to Q4 2028 for NTD. Since the construction works would be completed before the first population intake of Phase 1 (i.e. Year 2033), no planned ASRs will be affected by the NOL Main Line construction works. For the existing ASRs, it is anticipated that appropriate air quality control measures stipulated in *Air Pollution Control (Construction Dust) Regulation*, such as regularly watering and paved haul road would also be implemented by the contractors of NOL Main Line, in order to control the air emission from their construction activities. Close liaison with the contractors of NOL Main Line should be carried out to minimise any construction activities to be taken place in the proximity at the same time. Therefore, no adverse cumulative construction air quality impact is anticipated.

3.7.11 For NTMWTW Extension, while the pipelaying works with a minimum separation distance from the Project Site of >150 m will have the potential to generate air emissions, they are small-scale in nature without the need of major site formation or excavation works. With the implementation of procedures and requirements given in the *Air Pollution Control (Construction Dust) Regulation* and good site practice as detailed in its approved EIA report, the potential cumulative air quality impact due to pipelaying is expected to be minimal. The second potential dusty construction activity is the modification works of Chamber G of NTMWTW, with a separation distance from the Project Site of >450 m. According to its approved EIA report, the modification works would involve underground construction of tunnels and chambers using mined excavation with drill and break method. Mitigation measures outlined in its EIA report, such as water spraying, truck washing and installation of dust filters with dust removal efficiency of 95% at the exhaust of the tunnel, will be implemented. Close liaison with the contractors of NTMWTW Extension should also be carried out to avoid overlapping of any heavy or dusty works in order to minimise the potential cumulative construction air quality impact. Therefore, no adverse cumulative construction air quality impact is anticipated.

3.7.12 Site Formation and Infrastructure Works for Public Housing Development at Sha Po, Yuen Long by CEDD will start construction tentatively in Year 2025 and end by Year 2031. However, the main works site involving large-scale air emissions such as site clearance and site formation for the housing development is located more than 500 m away from the Project Site. While only some minor associated road and infrastructure works, such as junction improvement works and ancillary works, fall within the 500 m assessment area of this Project, they have a separation distance of 450 m from the Development Area where the main construction works will take place. Close liaison with the contractors of Sha Po Development should be carried out to minimise concurrent construction activities in close proximity. Therefore, no adverse cumulative construction air quality impact is anticipated.

3.7.13 STT is a large-scale new development area located to the north of the Project with a separation distance of >370 m over a hilly terrain between the development boundary of STT (excluding the planned service reservoirs since the construction would finish by Year 2026 before the start of this Project, according to the approved STT EIA) and the Development Area of this Project. Major construction works of STT within the assessment area of the Project would include the construction of general sites and road networks. These works would commence in end 2024 and complete by end 2034, overlapping with the construction of Phase 1, Phase 2 and part of Phase 3 of the Project. No planned ASRs will be affected given the Phase 1 ASRs are all located more than 500 m away from the boundary of STT. Considering the separation distance of about 350 m between STT and the nearest existing ASR (i.e. A12), also separated by hilly terrain, and with the implementation of air quality control measures stipulated in *Air Pollution Control (Construction Dust) Regulation*, such as regularly watering and paved haul road, by the contractors of STT, air emission from the construction activities of STT will be controlled. Close liaison with the contractors of STT should be carried out to minimise concurrent construction activities in close proximity. Therefore, no adverse cumulative construction air quality impact is anticipated.

3.7.14 With the implementation of careful scheduling of works, effective air quality control measures, good site practices and close liaison with contractors of concurrent projects, no adverse cumulative air quality impact at the ASRs is anticipated during the construction of the Project and other concurrent projects. A comprehensive EM&A programme with RSP and FSP real-time monitoring should be conducted to ensure the proper implementation of measures and the compliance of AQOs during the construction of the Project.

Operational Phase

3.7.15 The cumulative air quality impact at the representative ASRs in Year 2034 have been evaluated and the results are summarised in **Table 3.15** with predictions presented in **Appendix 3.8**. The predictions showed that daily and annual averages of RSP and FSP, hourly, daily and annual averages of NO_2, and 10-minute and daily averages of SO_2 at representative ASRs would comply with the respective AQO.

3.7.16 According to the discrete results, the worst affected level for ASRs would be in general 1.5 mAG for the majority of ASRs. The contour plots of RSP, FSP, NO_2 and SO_2 at 1.5 mAG are provided in **Figure 3.5** to **Figure 3.13**.

Table 3.15 Predicted Cumulative NO_2, RSP, FSP and SO_2 Concentrations at Representative Air Sensitive Receivers

ASR	Site	Description	Predicted Concentration (μg/m³)								
			19th Highest Hourly Average NO_2	10th Highest Daily Average NO_2	Annual Average NO_2	10th Highest Daily Average RSP	Annual Average RSP	19th Highest Daily Average FSP	Annual Average FSP	4th Highest 10-min Average SO_2	4th Highest Daily Average SO_2
AQO			200	120	40	75	30	37.5	15	500	40
A1	-	Yau Mei San Tsuen	90-97	31-35	17-19	54	21	32	13	29	7
A2	-	La Maison Vineyard	90-100	34-41	17-19	54	21	32	13	29	7
A3	-	La Maison Vineyard	84-92	32-36	16-18	54	21	32	13	29	7
A4	-	Wai Tsai Tsuen	71-76	27-28	13-14	53	20	32	13	27	7
A5	-	Wai Tsai Tsuen Village House 77C	70-77	27-29	13-14	53	20	32	13	27	7
A6	-	Elegant Park Block E	69-73	26-27	13	53	20	32	13	27	7
A7	-	Wai Tsai Tsuen	68-71	26-27	13	53	20	32	13	27	7
A8	-	The Vineyard House 12	68-71	25-26	12-13	53	20	32	13	27	7
A9	-	The Vineyard	68	25	12-13	53	20	32	13	27	7
A10	-	Greenacres Villa House A	64-65	23-24	12	54	21	33	13	29	7
A11	-	Tam Mei Barracks	60	22	11	51	20	31	12	28	7
A12	-	Tam Mei Barracks	60	22	11	51	20	31	12	28	7
A13	-	Village House	56	20	10	53	20	32	13	29	7
A14	-	Village House	57	20	10	53	20	32	13	29	7
A15	-	Village House	57	20	10	53	20	32	13	29	7
A16	-	Village House	58	20	10	53	20	32	13	29	7
A17	-	Village House	58	21	10	53	20	32	13	29	7
A18	-	Village House	57	21	10	53	20	32	13	29	7
A19	-	Village House	64	23	12	54	21	33	13	29	7
A20	-	Village House	64	23	12	54	21	33	13	29	7
A21	-	Village House	63-64	23	11-12	54	21	33	13	29	7
A22	-	Village House	63-64	23	11-12	54	21	33	13	29	7
A23	-	Village House	64	23	11-12	54	21	33	13	29	7
A24	-	Village House	63-64	23	12	54	21	33	13	29	7
A25	-	Hongtai Home for the Aged	66-67	25	12-13	54	21	33	13	29	7
A26	-	Sheung Chuk Yuen	65-67	25-26	12-13	54	21	33	13	29	7
A27	-	60E Sheung Chuk Yuen	81-84	32-33	16-17	54	21	32	13	29	7
A28	-	Sheung Chuk Yuen	78-80	31-32	16	54	21	32	13	29	7
A29	-	Sheung Chuk Yuen	84-88	33-35	17	54	21	32	13	29	7
A30	-	Kadoorie Villas	88-93	35-37	17	54	21	32	13	29	7
A31	-	Kadoorie Villas	94-103	39-44	18-20	54	21	32	13	29	7
A32	-	Kadoorie Villas	94-102	38-42	18-19	54	21	32	13	29	7
A33	-	Ian Court	96-103	38-42	18-19	54	21	32	13	29	7
A34	-	Wa On Villa Block 1	97-110	38-46	18-20	54	21	32	13	29	7
A35	-	Long Ha	91-104	36-42	17-19	54	21	32	13	29	7
A36	-	Meister House, House 6	99-114	37-46	21-25	55	21	32	13	29	7

ASR	Site	Description	Predicted Concentration (μg/m³)								
			19th Highest Hourly Average NO_2	10th Highest Daily Average NO_2	Annual Average NO_2	10th Highest Daily Average RSP	Annual Average RSP	19th Highest Daily Average FSP	Annual Average FSP	4th Highest 10-min Average SO_2	4th Highest Daily Average SO_2
AQO			200	120	40	75	30	37.5	15	500	40
A37	-	Ha San Wai	103-110	37-41	20-23	55	21	32	13	29	7
A38	-	Ha San Wai	105-113	38-44	21-25	55	21	32	13	29	7
A39	-	EMINENT EIS International Preschool	112-113	43-44	25	55	21	32	13-14	29	7
A40	-	San Wai Tsuen	102-110	37-41	21-23	55	21	32	13	29	7
A41	-	Tai Yuen Villa	102-110	37-42	20-24	55	21	32	13	29	7
A42	-	Tai Yuen Villa	99-109	36-41	19-23	55	21	32	13	29	7
A43	-	Merry Garden Hse 1	96-113	36-47	19-25	51-52	20	30-31	12-13	30	7
A44	-	Villa Camellia Blk 15	88-89	32-33	17-18	54	21	32	13	29	7
A45	-	Chuk Yuen Tsuen 385	90-91	33	17-18	54-55	21	32	13	29	7
A46	-	Chuk Yuen Tsuen 128	92-93	34	18	54-55	21	32	13	29	7
A47	-	Palm Springs	83-84	29-30	16	54	21	32	13	29	7
A48	-	Palm Springs	82	28-29	15	54	21	32	13	29	7
A49	-	Maple Gardens B15	87-95	32-36	16-17	54	21	32	13	29	7
A50	-	Casa Paradizo A1	89-96	33-38	16-17	54	21	32	13	29	7
A51	-	Green Crest 65	73-75	27	13	53	20	32	13	27	7
A52	-	La Grande Vineyard 88	67	24	12	53	20	32	13	27	7
A53	-	Tam Mei Barracks Blk23	67	24	12	53	20	32	13	27	7
A54	-	Village House	63	23	12	54	21	33	13	29	7
A55	-	Wah On Villa Blk25	80-82	30	15	54	21	32	13	29	7
A56	-	San Wai Tsuen	75-76	30	15	54	21	32	13	29	7
P1	E.2	Proposed School	73-90	28-36	15-18	54	21	32	13	29	7
P2	E.2	Proposed School	73-91	28-36	15-18	54	21	32	13	29	7
P3	E.2	Proposed School	73-89	27-35	15-18	54	21	32	13	29	7
P4	E.2	Proposed School	73-84	27-33	15-17	54	21	32	13	29	7
P5	E.2	Proposed School	73-83	27-34	15-17	54	21	32	13	29	7
P6	E.2	Proposed School	73-87	27-35	15-18	54	21	32	13	29	7
P7	E.2	Proposed School	73-87	27-34	15-17	54	21	32	13	29	7
P8	E.1	Proposed School	76-110	27-47	14-20	54	21	32	13	29	7
P9	E.1	Proposed School	73-102	28-44	15-20	54	21	32	13	29	7
P10	E.1	Proposed School	73-107	28-45	15-20	54	21	32	13	29	7
P11	E.1	Proposed School	73-93	28-36	15-17	54	21	32	13	29	7
P12	Rsc.1	Proposed Residential	71-88	26-34	14-17	54	21	32	13	29	7
P13	Rsc.1	Proposed Residential	71-86	26-33	14-16	54	21	32	13	29	7
P14	R.1	Proposed Residential	71-86	26-33	14-16	54	21	32	13	29	7
P15	R.1	Proposed Residential	74-85	25-33	14-16	54	21	32	13	29	7
P16	R.1	Proposed Residential	65-72	23-27	12-14	53	20	32	13	27	7
P17	R.1	Proposed Residential	65-74	23-28	12-15	53	20	32	13	27	7
P18	R.1	Proposed Residential	62-71	23-27	11-14	54	21	33	13	29	7

ASR	Site	Description	Predicted Concentration (μg/m³)								
			19th Highest Hourly Average NO_2	10th Highest Daily Average NO_2	Annual Average NO_2	10th Highest Daily Average RSP	Annual Average RSP	19th Highest Daily Average FSP	Annual Average FSP	4th Highest 10-min Average SO_2	4th Highest Daily Average SO_2
AQO			200	120	40	75	30	37.5	15	500	40
P19	R.1	Proposed Residential	62-81	23-33	11-16	54	21	33	13	29	7
P20	R.1	Proposed Residential	62-76	23-30	11-15	54	21	33	13	29	7
P21	R.1	Proposed Residential	62-73	23-29	11-14	54	21	33	13	29	7
P22	Rsc.1	Proposed Residential	71-87	26-33	14-17	54	21	32	13	29	7
P23	R.2	Proposed Residential	62-75	23-29	11-13	54	21	33	13	29	7
P24	R.2	Proposed Residential	62-66	23-25	11-12	54	21	33	13	29	7
P25	R.2	Proposed Residential	62-66	23-24	11-12	54	21	33	13	29	7
P26	R.2	Proposed Residential	62-65	23-24	11-12	54	21	33	13	29	7
P27	R.2	Proposed Residential	62-66	23-24	11-12	54	21	33	13	29	7
P28	R.2	Proposed Residential	62-66	23-25	11-12	54	21	33	13	29	7
P29	R.2	Proposed Residential	62-66	23-24	11-12	54	21	33	13	29	7
P30	R.2	Proposed Residential	62-70	23-28	11-13	54	21	33	13	29	7
P31	R.2	Proposed Residential	62-72	23-28	11-13	54	21	33	13	29	7
P32	R.2	Proposed Residential	62-78	23-31	11-14	54	21	33	13	29	7
P33	R.2	Proposed Residential	62-96	23-40	11-19	54	21	33	13	29	7
P34	R.2	Proposed Residential	62-90	23-37	11-17	54	21	33	13	29	7
P35	R.2	Proposed Residential	62-72	23-29	11-13	54	21	33	13	29	7
P36	OU(RDCRD).1	Proposed Residential and Commercial Development atop Ngau Tam Mei Depot	62-65	23-24	11-12	54	21	33	13	29	7
P37	OU(RDCRD).1	Proposed Residential and Commercial Development atop Ngau Tam Mei Depot	62-71	23-28	11-13	54	21	33	13	29	7
P38	OU(RDCRD).1	Proposed Residential and Commercial Development atop Ngau Tam Mei Depot	62-70	23-28	11-13	54	21	33	13	29	7
P39	OU(RDCRD).1	Proposed Residential and Commercial Development atop Ngau Tam Mei Depot	62-70	23-28	11-13	54	21	33	13	29	7
P40	OU(RDCRD).1	Proposed Residential and Commercial Development atop Ngau Tam Mei Depot	62-71	23-28	11-13	54	21	33	13	29	7
P41	OU(RDCRD).1	Proposed Residential and Commercial Development atop Ngau Tam Mei Depot	62-70	23-27	11-13	54	21	33	13	29	7
P42	OU(RDCRD).1	Proposed Residential and Commercial Development atop Ngau Tam Mei Depot	62-70	22-27	11-13	54	21	33	13	29	7
P43	OU(RDCRD).1	Proposed and Commercial Development atop Ngau Tam Mei Depot	62-73	22-28	11-14	54	21	33	13	29	7
P44	OU(RDCRD).1	Proposed Residential and Commercial Development atop Ngau Tam Mei Depot	62-70	22-28	11-14	54	21	33	13	29	7
P45	OU(RDCRD).1	Proposed Residential and Commercial Development atop Ngau Tam Mei Depot	62-68	22-27	11-13	54	21	33	13	29	7
P46	OU(RDCRD).1	Proposed Residential and Commercial Development atop Ngau Tam Mei Depot	62-68	22-26	11-13	54	21	33	13	29	7
P47	OU(RDCRD).1	Proposed Residential and Commercial Development atop Ngau Tam Mei Depot	62-68	23-25	11-13	54	21	33	13	29	7

ASR	Site	Description	Predicted Concentration (μg/m³)								
			19th Highest Hourly Average NO_2	10th Highest Daily Average NO_2	Annual Average NO_2	10th Highest Daily Average RSP	Annual Average RSP	19th Highest Daily Average FSP	Annual Average FSP	4th Highest 10-min Average SO_2	4th Highest Daily Average SO_2
AQO			200	120	40	75	30	37.5	15	500	40
P48	OU(RDCRD).1	Proposed Residential and Commercial Development atop Ngau Tam Mei Depot	62-66	23-25	11-13	54	21	33	13	29	7
P49	OU(RDCRD).1	Proposed Residential and Commercial Development atop Ngau Tam Mei Depot	62-65	23-24	11-12	54	21	33	13	29	7
P50	OU(RDCRD).1	Proposed Residential and Commercial Development atop Ngau Tam Mei Depot	62-65	23-24	11-12	54	21	33	13	29	7
	OU(RDPOS).1	Proposed Open Space atop Ngau Tam Mei Depot									
P51	OU(RDCRD).1	Proposed Residential and Commercial Development atop Ngau Tam Mei Depot	62-65	23-24	11-12	54	21	33	13	29	7
P52	OU(RDCRD).1	Proposed Residential and Commercial Development atop Ngau Tam Mei Depot	62-65	23-24	11-12	54	21	33	13	29	7
P53	R.3	Proposed Residential	62-66	23-24	11-12	54	21	33	13	29	7
P54	R.3	Proposed Residential	62-69	23-24	11-12	54	21	33	13	29	7
P55	R.3	Proposed Residential	62-65	23-24	11-13	54	21	33	13	29	7
P56	R.3	Proposed Residential	62-64	23	11-12	54	21	33	13	29	7
P57	R.3	Proposed Residential	62-64	23	11-12	54	21	33	13	29	7
P58	R.3	Proposed Residential	62-65	22-23	11-12	54	21	33	13	29	7
P59	R.3	Proposed Residential	62-64	23	11-12	54	21	33	13	29	7
P60	R.4	Proposed Residential	62-65	23	11-12	54	21	33	13	29	7
	OU(RDPOS).1	Proposed Open Space atop Ngau Tam Mei Depot									
P61	R.4	Proposed Residential	62-65	23	11-12	54	21	33	13	29	7
P62	R.4	Proposed Residential	62-66	23-24	11-12	54	21	33	13	29	7
P63	G.5	Proposed Ambulance Depot cum Fire Station	62-68	23-26	11-13	54	21	33	13	29	7
P64	G.5	Proposed Ambulance Depot cum Fire Station	62-66	23-24	11-12	54	21	33	13	29	7
P65	G.5	Proposed Ambulance Depot cum Fire Station	62-65	23-24	11-12	54	21	33	13	29	7
P66	G.5	Proposed Ambulance Depot cum Fire Station	62-68	23-25	11-13	54	21	33	13	29	7
P67	R.4	Proposed Residential	62-69	23-24	11-13	54	21	33	13	29	7
P68	R.4	Proposed Residential	62-66	23	11-13	54	21	33	13	29	7
P69	R.4	Proposed Residential	62-65	23-24	11-13	54	21	33	13	29	7
P70	R.4	Proposed Residential	62-64	23	11-12	54	21	33	13	29	7
P71	G.6	Proposed UniTown	62-65	23-24	11-12	54	21	33	13	29	7
P72	G.6	Proposed UniTown	62-66	22-25	11-12	54	21	33	13	29	7
P73	G.6	Proposed UniTown	62-66	23-25	11-12	54	21	33	13	29	7
P74	G.6	Proposed UniTown	62-67	23-25	11-12	54	21	33	13	29	7
P75	G.6	Proposed UniTown	62-66	23-24	11-12	54	21	33	13	29	7
P76	G.6	Proposed UniTown	62-66	23-24	11-12	54	21	33	13	29	7
P77	G.6	Proposed UniTown	62-65	23-24	11-12	54	21	33	13	29	7

ASR	Site	Description	Predicted Concentration (μg/m³)								
			19th Highest Hourly Average NO_2	10th Highest Daily Average NO_2	Annual Average NO_2	10th Highest Daily Average RSP	Annual Average RSP	19th Highest Daily Average FSP	Annual Average FSP	4th Highest 10-min Average SO_2	4th Highest Daily Average SO_2
AQO			200	120	40	75	30	37.5	15	500	40
P78	G.6	Proposed UniTown	62-65	23	11-12	54	21	33	13	29	7
P79	G.6	Proposed UniTown	62-65	23	11-12	54	21	33	13	29	7
P80	G.11	Proposed UniTown	62-65	23-24	11-12	54	21	33	13	29	7
P81	G.11	Proposed UniTown	62-65	23-24	11-12	54	21	33	13	29	7
P82	G.11	Proposed UniTown	62-65	23-24	11-12	54	21	33	13	29	7
P83	G.11	Proposed UniTown	62-66	23-25	11-12	54	21	33	13	29	7
P84	G.11	Proposed UniTown	62-66	23-25	11-12	54	21	33	13	29	7
P85	G.11	Proposed UniTown	62-66	23-25	11-12	54	21	33	13	29	7
P86	G.11	Proposed UniTown	62-66	23-25	11-12	54	21	33	13	29	7
P87	G.11	Proposed UniTown	62-64	23	11-12	54	21	33	13	29	7
P88	G.11	Proposed UniTown	62-64	23	11	54	21	33	13	29	7
P89	G.11	Proposed UniTown	62-64	23	11	54	21	33	13	29	7
P90	G.11	Proposed UniTown	55-58	20-22	10-11	53	20-21	32	13	29	7
P91	G.11	Proposed UniTown	55-58	20-22	10-11	53	20-21	32	13	29	7
P92	G.11	Proposed UniTown	55-59	20-22	10-11	53	20-21	32	13	29	7
P93	G.11	Proposed UniTown	55-59	20-22	10-11	53	20-21	32	13	29	7
P94	G.11	Proposed UniTown	55-59	20-21	10-11	53	20-21	32	13	29	7
P95	G.11	Proposed UniTown	55-59	20-21	10-11	53	20-21	32	13	29	7
P96	G.11	Proposed UniTown	55-58	20-21	10	53	20	32	13	29	7
P97	G.11	Proposed UniTown	55-58	20-21	10	53	20	32	13	29	7
P98	G.13	Proposed GIC	62-68	23-25	11-12	54	21	33	13	29	7
P99	G.13	Proposed GIC	62-65	23-24	11-12	54	21	33	13	29	7
P100	G.13	Proposed GIC	62-65	23-24	11-12	54	21	33	13	29	7
P101	G.13	Proposed GIC	62-69	23-27	11-13	54	21	33	13	29	7
P102	G.13	Proposed GIC	62-69	23-27	11-13	54	21	33	13	29	7
P103	G.8	Proposed Integrated Hospital	62-99	23-27	11-12	54	21	33	13	29	7
P104	G.8	Proposed Integrated Hospital	62-99	23-30	11-13	54	21	33	13	29	7
P105	G.8	Proposed Integrated Hospital	62-72	23-26	11-13	54	21	33	13	29	7
P106	G.8	Proposed Integrated Hospital	62-69	23-25	11-13	54	21	33	13	29	7
P107	G.8	Proposed Integrated Hospital	62-67	23-25	11-13	54	21	33	13	29	7
P108	G.8	Proposed Integrated Hospital	62-65	23-25	11-13	54	21	33	13	29	7
P109	G.8	Proposed Integrated Hospital	62-71	23-24	11-12	54	21	33	13	29	7
P110	G.8	Proposed Integrated Hospital	62-70	23-24	11-12	54	21	33	13	29	7
P111	G.8	Proposed Integrated Hospital	62-108	23-30	11-14	54	21	33	13	29	7
P112	G.8	Proposed Integrated Hospital	62-77	23-27	11-12	54	21	33	13	29	7
P113	G.8	Proposed Integrated Hospital	55-59	20-21	10	53	20	32	13	29	7
P114	G.8	Proposed Integrated Hospital	55-59	20-21	10	53	20	32	13	29	7
P115	G.8	Proposed Integrated Hospital	62-69	23-24	11-12	54	21	33	13	29	7
P116	G.8	Proposed Integrated Hospital	62-64	23	11-12	54	21	33	13	29	7

ASR	Site	Description	Predicted Concentration (μg/m³)								
			19th Highest Hourly Average NO_2	10th Highest Daily Average NO_2	Annual Average NO_2	10th Highest Daily Average RSP	Annual Average RSP	19th Highest Daily Average FSP	Annual Average FSP	4th Highest 10-min Average SO_2	4th Highest Daily Average SO_2
AQO			200	120	40	75	30	37.5	15	500	40
P117	G.8	Proposed Integrated Hospital	62-78	23-24	11-12	54	21	33	13	29	7
P118	G.11	Proposed UniTown	55-58	20-21	10	53	20-21	32	13	29	7
P119	G.11	Proposed UniTown	55-58	20-21	10	53	20-21	32	13	29	7
P120	G.11	Proposed UniTown	55-58	21	10	53	20-21	32	13	29	7
P121	G.11	Proposed UniTown	55-58	21	10	53	20-21	32	13	29	7
P122	G.11	Proposed UniTown	55-58	20-21	10	53	20-21	32	13	29	7
P123	G.11	Proposed UniTown	55-58	20-21	10-11	53	20-21	32	13	29	7
P124	G.11	Proposed UniTown	55-58	20-21	10-11	53	20-21	32	13	29	7
P125	G.11	Proposed UniTown	55-59	20-21	10	53	20-21	32	13	29	7
P126	G.11	Proposed UniTown	55-59	20-21	10	53	20-21	32	13	29	7
P127	G.11	Proposed UniTown	55-58	20-21	10	53	20	32	13	29	7
P128	G.11	Proposed UniTown	55-58	20-21	10	53	20	32	13	29	7
P129	G.10	Proposed UniTown	63-65	23-24	11-12	54	21	33	13	29	7
P130	G.10	Proposed UniTown	63-64	23-24	11-12	54	21	33	13	29	7
P131	G.10	Proposed UniTown	63-64	23	11-12	54	21	33	13	29	7
P132	G.10	Proposed UniTown	63-64	23-24	11-12	54	21	33	13	29	7
P133	G.10	Proposed UniTown	63-64	23-24	11-12	54	21	33	13	29	7
P134	G.10	Proposed UniTown	63-65	23-25	11-12	54	21	33	13	29	7
P135	G.10	Proposed UniTown	63-66	23-25	11-13	54	21	33	13	29	7
P136	G.10	Proposed UniTown	63-67	23-25	11-13	54	21	33	13	29	7
P137	G.10	Proposed UniTown	63-66	23-25	11-13	54	21	33	13	29	7
P138	G.12	Proposed UniTown	55-59	20-21	10	53	20	32	13	29	7
P139	G.12	Proposed UniTown	55-58	20-21	10	53	20	32	13	29	7
P140	G.12	Proposed UniTown	55-58	20-21	10	53	20	32	13	29	7
P141	G.12	Proposed UniTown	55-58	20	10	53	20	32	13	29	7
P142	G.12	Proposed UniTown	55-58	20	10	53	20	32	13	29	7
P143	G.12	Proposed UniTown	55-57	20	10	53	20	32	13	29	7
P144	G.12	Proposed UniTown	55-56	20	10	53	20	32	13	29	7
P145	G.12	Proposed UniTown	55-56	20	10	53	20	32	13	29	7
P146	G.12	Proposed UniTown	55-56	20	10	53	20	32	13	29	7
P147	G.12	Proposed UniTown	55-57	20	10	53	20	32	13	29	7
P148	G.12	Proposed UniTown	55-57	20	10	53	20	32	13	29	7
P149	G.12	Proposed UniTown	55-57	20	10	53	20	32	13	29	7
P150	G.12	Proposed UniTown	55-57	20	10	53	20	32	13	29	7
P151	G.12	Proposed UniTown	55-58	20	10	53	20	32	13	29	7
P152	G.12	Proposed UniTown	55-58	20	10	53	20	32	13	29	7
P153	G.12	Proposed UniTown	55-58	20-21	10	53	20	32	13	29	7
P154	G.12	Proposed UniTown	55-58	20-21	10	53	20	32	13	29	7
P155	G.12	Proposed UniTown	55-58	20-21	10	53	20	32	13	29	7

ASR	Site	Description	Predicted Concentration (μg/m³)								
			19th Highest Hourly Average NO_2	10th Highest Daily Average NO_2	Annual Average NO_2	10th Highest Daily Average RSP	Annual Average RSP	19th Highest Daily Average FSP	Annual Average FSP	4th Highest 10-min Average SO_2	4th Highest Daily Average SO_2
AQO			200	120	40	75	30	37.5	15	500	40
P156	G.12	Proposed UniTown	55-58	20-21	10	53	20	32	13	29	7
P157	G.12	Proposed UniTown	55-58	20-21	10	53	20	32	13	29	7
P158	G.12	Proposed UniTown	55-59	20-22	10-13	53	20-21	32	13	29	7
P159	G.12	Proposed UniTown	55-59	20-21	10-11	53	20-21	32	13	29	7
P160	G.12	Proposed UniTown	55-58	20-22	10-11	53	20	32	13	29	7
P161	G.12	Proposed UniTown	55-58	20-21	10	53	20	32	13	29	7
P162	G.12	Proposed UniTown	55-59	20-22	10-11	53	20-21	32	13	29	7
P163	G.12	Proposed UniTown	55-59	20-21	10	53	20	32	13	29	7
P164	G.12	Proposed UniTown	59-61	21-22	11	51	20	31	12	28	7
P165	G.12	Proposed UniTown	59-61	21-22	11	51	20	31	12	28	7
P166	G.12	Proposed UniTown	59	21	11	51	20	31	12	28	7
P167	G.12	Proposed UniTown	59	21	11	51	20	31	12	28	7
P168	G.12	Proposed UniTown	59	21	11	51	20	31	12	28	7
P169	G.12	Proposed UniTown	59	21	11	51	20	31	12	28	7
P170	G.12	Proposed UniTown	59	21	11	51	20	31	12	28	7
P171	G.12	Proposed UniTown	55-56	20	10	53	20	32	13	29	7
P172	G.12	Proposed UniTown	55-56	20	10	53	20	32	13	29	7
P173	G.12	Proposed UniTown	55-56	20	10	53	20	32	13	29	7
P174	G.12	Proposed UniTown	55-56	20	10	53	20	32	13	29	7
P175	G.12	Proposed UniTown	55-56	20	10	53	20	32	13	29	7
P176	G.12	Proposed UniTown	55-57	20	10	53	20	32	13	29	7
P177	G.12	Proposed UniTown	55-58	20-21	10	53	20	32	13	29	7
P178	G.2	Proposed GIC	70-75	27-28	13-14	53	20	32	13	27	7
P179	G.2	Proposed GIC	82-88	30-36	15-17	54	21	32	13	29	7
P180	G.2	Proposed GIC	70-78	27-31	13-15	53	20	32	13	27	7
P181	G.2	Proposed GIC	69-76	26-29	13-15	53	20	32	13	27	7
ST1	-	Proposed School	59-65	21-25	11-12	51	20	31	12-13	28	7
ST2	-	Proposed School	59-61	21-23	11	51	20	31	12-13	28	7
ST3	-	Proposed School	59-61	21-22	11	51	20	31	12-13	28	7
ST4	-	Proposed School	59-61	21-22	11	51	20	31	12	28	7
ST5	-	Proposed Residential	59-60	21-22	11	51	20	31	12	28	7
ST6	-	Proposed Residential	59-64	21-25	11-12	51	20	31	12-13	28	7
ST7	-	Proposed Residential	59-61	21-22	11	51	20	31	12-13	28	7
ST8	-	Proposed Residential	59-63	21-24	11-13	51	20	31	12-13	28	7
ST9	-	Proposed Residential	59-66	21-26	11-13	51	20	31	12-13	28	7

3.7.17 Subject to the detailed design of UniTown, the proposed PTT may be decked or adopt an open-air design. Under open-air design, vehicular emissions within the PTT would be dispersed naturally instead of being channelled to specific ingress/egress locations, leading to a more even dilution of air pollutants over a wider area. As a result, it is expected that the predicted cumulative concentrations of all air pollutants

at ASRs near the ingress/egress (i.e. P157, P158 and P159) under open-air design would not be higher than that with the decked PTT. Given that the predicted concentrations of all air pollutants at all planned ASRs within UniTown with the decked PTT have already been demonstrated to meet the AQOs with significant margins, adverse air quality impacts are also not anticipated for an open-air PTT design.

Operational Phase (Odour Impact)

3.7.18 The cumulative odour impact at the representative ASRs due to the existing chicken farms, LBF, TMB STP and the proposed SPS were predicted and are summarised in **Table 3.16**, with detailed results presented in **Appendix 3.9**. The prediction shows that the cumulative 5-second average odour concentrations would exceed EIAO-TM criterion of 5 OU/m^3 at some ASRs.

Table 3.16 Predicted Cumulative Odour Concentrations at Representative Air Sensitive Receivers

Site ID	ASR ID	Description	Range of Maximum 5-second Average Odour Concentration (OU/m^3)(1)
Existing ASRs			
-	A2	La Maison Vineyard	1.20
-	A3	La Maison Vineyard	1.22
-	A4	Wai Tsai Tsuen	0.82
-	A5	Wai Tsai Tsuen	0.68
-	A6	Elegant Park	0.86
Planned ASRs			
E.1	P8, P10	Proposed School	1.32-1.70
G.5	P63-P66	Proposed Ambulance Depot cum Fire Station	3.15-**5.23**
G.6	P71-P74, P76-P79	Proposed UniTown	1.76-**5.43**
G.8	P103-P106, P108, P110-P111, P116-P117	Proposed Integrated Hospital	1.98-2.77
G.10	P129-P131, P136-P137	Proposed UniTown	1.71-3.50
G.11	P80, P83, P118-P122	Proposed UniTown	1.09-2.15
G.13	P98-P102	Proposed GIC	**18.74-44.10**
OU(RDCRD).1	P37-P48, P50, P52	Proposed Residential and Commercial Development atop Ngau Tam Mei Depot	3.03-**41.22**

Site ID	ASR ID	Description	Range of Maximum 5-second Average Odour Concentration (OU/m^3)(1)
OU(RDPOS).1	P50, P60	Proposed Open Space atop Ngau Tam Mei Depot	0.32-**5.20**
R.1	P15-P17, P20	Proposed Residential	1.31-2.25
R.2	P23-P30, P32, P34	Proposed Residential	1.75-3.39
R.3	P53-P54, P56-P59	Proposed Residential	2.16-3.32
R.4	P60, P62, P67, P69	Proposed Residential	3.21-5.00
RSc.1	P12	Proposed Residential	2.01-2.01

Remark:
(1) **Bolded** values indicate exceedance in relevant criterion.

3.7.19 According to the results in **Appendix 3.9**, the predicted exceedance of maximum 5-second average cumulative odour concentration at ASRs would occur between 1.5 mAG and 50 mAG. Therefore, contour plots have been prepared for this range until there are no exceedance and are shown in **Figure 3.14** to **Figure 3.25**. Odour exceedance zones were found at Site G.6 near the TMB STP, as well as Sites OU(RDCRD).1, OU(RDPOS).1, G.5 and G.13 near the LBF and Chicken Farm LK1106. Although the exceedance zones cover Sites A.2, A.4, A.5, A.6, O.4, GB.2, and OU(RF).1, it is confirmed that no ASRs will exist within the exceedance zones covering these sites (**Figure 3.2** refers).

3.7.20 For Site G.6, odour exceedance only occurs at the assessment heights between 1.5 mAG and 10 mAG[4] and no odour exceedance was predicted at 15 mAG[5] or above at ASRs P71 and P72, while no odour exceedance at all heights was predicted for other ASRs within the site. In view of the exceedance predicted, mitigation measures are proposed in **Section 3.8.8**.

3.7.21 The ASRs with predicted exceedance at Sites OU(RDCRD).1, OU(RDPOS).1, G.5 and G.13 are located at more than 500 m away from the proposed SPS and the TMB STP, but are in proximity to two existing odour sources, namely LBF and Chicken Farm LK1106. Based on the assessment results at the planned ASR with the highest odour concentration (i.e. P98) at the worst hit level 1.5 mAG, it is revealed that 90% of the overall odour concentration would be contributed by the odour emissions from the LBF, while the odour concentrations contributed by remaining sources are below the odour criteria of 5 OU/m^3 (**Table 3.17** refers). Therefore, it is concluded that the existing LBF is the major contributor to the exceedances predicted at some planned ASRs in the southern portion of the Development Area.

[4] Based on site formation level of 8 mPD at G.6, the predicted odour exceedance is located between 9.5 and 18 mPD.
[5] Based on site formation level of 8 mPD at G.6, no odour exceedance is predicted at 23 mPD or above.

Table 3.17 Contribution of Odour Concentration at ASR P98 at 1.5 mAG (Unmitigated)

	Cumulative	Lard Boiling Factory	Chicken Farm LK1106	TMB STP	Proposed SPS
Odour Concentration (OU/m^3)	44.105	39.574	4.531	0.000	0.000
Percentage of Contribution	-	90%	10%	0%	0%

3.7.22 In view of the predicted odour concentrations near the LBF, mitigation measures are proposed in the below section.

3.8 Mitigation Measures

Construction Phase

3.8.1 Air quality control measures stipulated in *Air Pollution Control (Construction Dust) Regulation* and good site practices listed below should be carried out to further minimise construction air quality impact:

- Regular watering to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather;
- Frequent watering for particularly dusty construction areas and areas close to ASRs;
- Provide side enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering shall be applied to aggregate fines;
- For the works sites close to the ASRs with a separation distance less than 10 m as shown in **Table 3.4**, provide hoardings of not less than 3.5 m high from ground level along the site boundary; for the other works sites in general, provide hoarding of not less than 2.4 m high from ground level along site boundary except for site entrance or exit;
- Avoid positioning material stockpiling areas, major haul roads and dusty works within the construction site close to concerned ASRs;
- Avoid unnecessary exposed earth;
- Locate all the dusty activities away from any nearby ASRs as far as practicable;
- Open stockpiles shall be avoided or covered. Where possible, prevent placing dusty material storage piles near ASRs;
- Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations;
- Establishment and use of vehicle wheel and body washing facilities at the exit points of the site;

- Where possible, routing of vehicles and positioning of construction plant should be at the maximum possible distance from ASRs;

- Imposition of speed controls for vehicles on site haul roads; and

- Instigation of an EM&A programme with continuous construction dust monitoring to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise.

3.8.2 Guidelines stipulated in EPD's *Recommended Pollution Control Clauses for Construction Contracts* should be incorporated in the contract document to abate construction air quality impacts. These clauses include:

- The Contractor shall observe and comply with the APCO and its subsidiary regulations, particularly the *Air Pollution Control (Open Burning) Regulation*, *Air Pollution Control (Construction Dust) Regulation*, *Air Pollution Control (NRMM) (Emission) Regulation*, *Air Pollution Control (Fuel Restriction) Regulations* and *Air Pollution Control (Smoke) Regulations*;

- In addition to the statutory requirements of the Regulations, the contractor of the public works contracts shall also observe the requirements as set out in the government circulars, including *DEVB TC(W) No. 13/2020* and *DEVB TC(W) No. 1/2015*;

- The contractor shall undertake at all times to prevent dust nuisance and smoke as a result of his activities, and minimise the emission of air pollutants from construction plant and equipment;

- The contractor shall ensure that there will be adequate water supply/storage for dust suppression;

- The contractor shall devise, arrange methods of working and carrying out the works in such a manner so as to minimise dust impacts on the surrounding environment, and shall provide experienced personnel with suitable training to ensure that these methods are implemented;

- For better smoke control, the contractor shall not use diesel hammer for percussive piling; and

- Before the commencement of any work, the Engineer may require the methods of working, plant, equipment and air pollution control system to be used on the site to be made available for inspection and approval to ensure that they are suitable for the Project.

3.8.3 In order to help reduce carbon emission and pollution, timely application of temporary electricity and water supply should be made and EVs should be adopted as far as practicable in accordance with *DEVB TC(W) No. 13/2020*.

3.8.4 To minimise the exhaust emission from NRMMs during the construction phase, *DEVB TC(W) No. 1/2015* shall be followed, and the following measures should be applied as far as practicable:

- Connect construction plant and equipment to main electricity supply and avoid use of diesel generators and diesel-powered equipment;

- Avoid exempted NRMMs; and
- Deploy electrified NRMMs.

3.8.5 In the event that odorous sediment is encountered during the desilting works, standard good practices, including stockpiling the desilted materials as far away from the ASRs as possible, and covering of any remaining on-site desilted materials with tarpaulin sheets to minimise the release of potential odour, should be implemented. Additional measures to control the potential odour impact that could be implemented include limiting the scale of excavation/desilting works to be conducted at a time, containing the odourous excavated materials in airtight/watertight containers on-site, transporting the odourous excavated materials off-site for disposal within a day and avoiding over stockpiling, covering odourous excavated materials on the transportation trucks with tarpaulin sheets, and regular site inspections.

Operational Phase

3.8.6 No adverse air quality impact is anticipated during the operational phase of the Project, thus mitigation measure is deemed not necessary.

Operational Phase (Odour Impact)

3.8.7 Although adverse odour impact from the proposed SPS is not expected, appropriate odour control measures commonly adopted in other existing SPSs in Hong Kong should be implemented in the detailed design stage, such as enclosure of odour sources with negative pressure to prevent leakage of odourous air and provision of odour removal system with odour removal efficiency of at least 95% (>99.5% removal for H_2S) at the ventilation exhaust to control the potential odour emission. The exhaust of the DO should also be designed to be located furthest away and pointing away from any ASRs as far as practicable to further minimise any odour impact on the vicinity ASRs.

3.8.8 Proper planning on the location of air sensitive uses at Site G.6 should be adopted such that no air sensitive use, including openable window, fresh air intake and recreational use in open space, shall be allowed below 15 mAG within the odour exceedance zone.

3.8.9 The operation of the LBF was regularly monitored to ensure compliance with the requirements and conditions set out in the offensive trade license (OTL), as well as the Public Health and Municipal Services Ordinance, Cap. 132 (the Ordinance) and its subsidiary legislations, including but not limited to the Offensive Trades Regulation, Cap. 132AX. In accordance with the current OTL for the LBF, the operation of the LBF shall fully comply with all relevant health and hygiene requirements to minimise any nuisance to the surrounding environment. Under the prevailing licensing regime, FEHD can impose additional licensing condition(s), by incorporating relevant departments' expert advice in the necessity of tightening up the odour emission control, during the annual renewal of the OTL for the LBF, as deemed appropriate so as to achieve up-to-date air pollution control related requirements / standards.

3.8.10 To alleviate the odour impact to the planned development of the Project, the following mitigation measures, which are similar to those proposed in the approved EIA report for Provision of a Poultry Slaughtering Centre in Sheung Shui (Register No.: AEIAR-142/2009), should be incorporated as the licensing conditions after taking into account expert advice of EPD during the annual renewal of the OTL for the LBF and implemented prior to the population intake of the proposed development at OU(RDCRD).1, OU(RDPOS).1 and the proposed G/IC at G.5 and G.13 where ASRs will exist (**Figure 3.4** refers).

- Proper storage, transport and handling of raw materials;
- Good housekeeping;
- Full enclosure of all odour emission sources of LBF except the Cracklings Storage Area (CSA), including Unloading and Storage Area of Raw Materials, Processing Areas and Lard Boilers, and all these fully enclosed areas shall be maintained under negative pressure; and
- Provision of DO(s) (biofilters or other appropriate deodourising equipment with the odour removal efficiency of at least 95%[6]) to treat all odourous air from the fully enclosed sources before discharging into the atmospheric environment.

3.8.11 Based on the mitigation measures outlined above, the emission inventory for the mitigated scenario, along with detailed modeling assumptions for the proposed mitigation measures, is provided in **Appendix 3.10**. The predicted odour concentrations for the planned ASRs near LBF under this mitigated scenario are presented in **Table 3.18** and **Appendix 3.11**.

3.8.12 In case the mitigation measures mentioned in **Section 3.8.10** or the specified odour removal efficiency cannot be achieved by the LBF before population intake of the areas within odour exceedance zones (**Figure 3.14** to **Figure 3.24** refer), the assessment results presented in **Table 3.18** and **Appendix 3.11** would not be valid. Subject to the licensing conditions on the OTL for the LBF, further review and assessment may be required at a later stage to ensure no adverse odour impact occurs. In the event that the operation of LBF causes odour nuisance to any ASRs and fails to comply with the licensing conditions, the FEHD shall enforce the licensing control measures accordingly until the odour nuisance is fully mitigated.

3.8.13 Alternatively, relocating the LBF to other industrial area(s), such as Eco Park, could be considered at a later stage to improve the environmental conditions in the vicinity of the Development Area.

Table 3.18 Predicted Cumulative Odour Concentrations at Representative Air Sensitive Receivers (Mitigated)

Site ID	ASR ID	Description	Range of Maximum 5-second Average Odour Concentration (OU/m^3)(1)
G.13	P98-P102	Proposed GIC	2.19 - **7.18**
OU(RDCRD).1	P37-P48, P50, P52	Proposed Residential and Commercial Development atop Ngau Tam Mei Depot	0.79 - **11.1**

Remark:
(1) **Bolded** values indicate exceedance in relevant criterion.

3.8.14 According to **Table 3.18**, odour exceedance at Sites OU(RDCRD).1 and G.13 was found to persist. The predicted exceedance of maximum 5-second average cumulative odour concentration at these ASRs would occur between 1.5 mAG and 20 mAG for Site OU(RDCRD).1, and between 1.5 mAG and 15 mAG for Site G.13. Therefore, contour plots have been prepared for this range until there is no exceedance and are shown in **Figure 3.26** to **Figure 3.31**. **Table 3.19** presents the

[6] Luo, J., & Agnew, M. P. (2001). Gas Characteristics before and after Biofiltration Treating Odorous Emissions from Animal Rendering Processes. *Environmental Technology*, *22*(9), 1091–1103. https://doi.org/10.1080/09593332208618220

breakdown of the odour concentration for ASR P43 at 5 mAG, and found that the chicken farm is the major contributor to the odour concentration in this scenario.

Table 3.19 Contribution of Odour Concentration at ASR P43 at 5 mAG (Mitigated)

	Cumulative	Lard Boiling Factory (Mitigated)	Chicken Farm LK1106	TMB STP	Proposed SPS
Odour Concentration (OU/m^3)	11.101	0.302	10.799	0.000	0.000
Percentage	-	3%	97%	0%	0%

3.8.15 Proper planning on the location of air sensitive uses at Sites OU(RDCRD).1 and G.13 should be adopted such that no air sensitive use including openable window, fresh air intake and recreational use in open space shall be allowed below 25 mAG for OU(RDCRD).1 and 20 mAG for G.13[7] within the odour exceedance zone as shown in **Figure 3.26** to **Figure 3.30**, and **Appendix 3.11**.

3.9 Evaluation of Residual Impacts

Construction Phase

3.9.1 With the implementation measures specified in *Air Pollution Control (Construction Dust) Regulation* together with the recommended good site practices such as regular watering on the works areas, exposed surface and paved road, no residual impact would be expected from the construction of the Project.

Operational Phase

3.9.2 No residual impact is expected during the operational phase of the Project.

Operational Phase (Odour Impact)

3.9.3 With the implementation of mitigation measures as stated in **Section 3.8**, no residual odour impact is expected.

3.10 Environmental Monitoring and Audit

Construction Phase

3.10.1 EM&A with continuous construction dust monitoring are recommended during the construction phase of the Project to check compliance with the relevant legislative requirements. Details of the construction dust monitoring and audit programme are presented in a stand-alone EM&A Manual.

3.10.2 Close liaison with contractors of concurrent projects, including NOL Main Line, NTMWTW Extension, Site Formation and Infrastructure Works for Public Housing Development at Sha Po, Yuen Long, and STT, should be carried out for the purpose of minimising the cumulative construction air quality impact and facilitating the investigation of observed exceedance by construction dust monitoring if any.

[7] Based on site formation level of 14.5 mPD at OU(RDCRD).1 and 26 mPD at G.13, odour exceedance is predicted at 39.5 mPD or below for OU(RDCRD).1, and 46 mPD or below for G.13.

Operational Phase

3.10.3 No adverse impact would be generated during the operational phase of the Project. No EM&A would be required during the operation of the Project.

Operational Phase (Odour Impact)

3.10.4 No adverse impact would be generated during the operational phase of the Project. No EM&A would be required during the operation of the Project.

3.11 Environmental Acceptability of Schedule 2 Designated Projects

New District Distributor Road (DP1)

3.11.1 With the proper implementation of mitigation measures for construction activities (as detailed in **Section 3.8**), no unacceptable air quality impact would be resulted from the proposed roads during the construction phases. There is no adverse operational air quality impact as mentioned in **Section 3.7**.

A Drainage Channel or River Training and Diversion Works Located Less Than 300 m from the Nearest Boundary of an Existing or Planned Conservation Area (DP2)

3.11.2 With the proper implementation of mitigation measures for construction activities (as detailed in **Section 3.8**), no unacceptable air quality impact would be resulted from the proposed construction works. There is no adverse operational air quality impact as mentioned in **Section 3.7**.

3.12 Conclusion

Construction Phase

3.12.1 Potential air quality impact from the construction works of the Project would mainly be related to the construction activities of excavation, material handling, spoil removal and wind erosion. Construction activities of the concurrent projects within 500 m assessment area would also pose cumulative construction air quality impact. With the implementation of mitigation measures specified in the *Air Pollution Control (Construction Dust) Regulation* together with the recommended air quality control measures including frequent watering on active works areas, exposed areas and unpaved haul roads and other site management measures such as good site practices, and EM&A programme, no adverse air quality impact on ASRs in the vicinity of the works sites would be anticipated during the construction phase.

Operational Phase

3.12.2 Cumulative air quality impact arising from the vehicular emission from existing and planned open roads, proposed transport facilities including TIH and PTT, and HGV/coach parking sites, as well as the existing and planned industrial emissions within 500 m assessment area has been assessed. No adverse air quality impact on the existing and planned ASRs is anticipated.

3.12.3 Cumulative odour impact arising from existing odour sources and the proposed SPS has been assessed. With implementation of the proposed mitigation measures in **Section 3.8**, adverse odour impact is not expected.