

Odour Emission from the Proposed STW

Source ID	Type	X-cor	Y-cor	Release Height	Temperature	Exhaust Velocity	Diameter	Facilities	Effective Surface Area	Headroom [1]	Air Change Rate [1]	Extracted Volume	SOER [2]	Emission Rate	Odour Removal Efficiency	Mitigated Odour Emission Rate
		(m)	(m)	(m)	(K)	(m/s)	(m)		(m ²)	(m)	(ACH)	(m ³ /hour)	(OU/m ² /s)	(OU/s)	(%)	(OU/s)
DOU_1	POINT	819684	830743	10	Ambient	15	0.88	Deodouriser Unit 1	-	-	-	32593	-	21061	99.5	105
								Wet well of inlet pumping station	50	3	5	750	7.80	390		
								Inlet pumping station (with man access)	180	6	8	8640	7.80	1404		
								Preliminary Works	360	6	8	17280	5.72	2059		
								Primary Sedimentation Tanks	600	0.5	5	1500	5.68	3408		
								Emergency Tank	1000	0.5	5	2500	7.80	7800		
								Equalisation Tank	769	0.5	5	1923	7.80	6000		
DOU_2	POINT	819642	830636	10	Ambient	15	0.94	Deodouriser Unit 2	-	-	-	37760	-	4845	99.5	24
								Anoxic Tanks	545	0.5	5	1364	5.68	3098		
								Aeration tanks	1091	0.5	-	9764	0.60	655		
								Membrane Tanks	158	0.5	-	4594	0.60	95		
								Primary Sludge Storage Tanks	45	0.5	5	113	15.15	682		
								Pump and blower house	341	6	8	16368	0.60	205		
								Chlorine contact tank	73	0.5	5	182	0.60	44		
								Effluent pumping station (to TSE S/R)	112	6	8	5376	0.60	67		
DOU_3	POINT	819679	830636	10	Ambient	15	1.33	Deodouriser Unit 3	-	-	-	74921	-	9254	99.5	46
								Sludge Thickening House	644	6	8	30912	5.58	3594		
								Digested Sludge Holding Tanks [3]	151	0.5	5	377	3.90	588		
								Sludge Dewatering House	525	6	8	25200	5.58	2930		
								Sludge Skip Storage Area [3]	384	6	8	18432	5.58	2143		
DOU_4	POINT	819634	830572	10	Ambient	15	0.40	Deodouriser Unit 4	-	-	-	6785	-	405	99.5	2
								Secondary Clarifiers [3]	491	0.5	5	1227	0.60	295		
								UV channels [3]	73	0.5	5	182	0.60	44		
								Effluent pumping station [3]	112	6	8	5376	0.60	67		

Note:

[1] Headroom and air change rate are based on the preliminary design of the proposed STW.

[2] Specific Odour Emission Rate (SOER) for each facility are referenced from the approved EIA Study "Development of Lok Ma Chau Loop" (AEIAR-176/2013).

[3] Justification of SOER reference as below.

Location of YLS STW	Reference Location of LMC Loop STW	Justification
Digested Sludge Holding Tank	MBR sludge storage tanks	Reference is made with the SOER of MBR sludge storage tanks in LMC Loop STW. This is a conservative approach as digested sludge normally has lower SOER due to the removal of organic content from anaerobic digestion.
Sludge Skip Storage Area	Sludge filter press house (dewatered sludge tank surface, sludge dewatering building)	Reference is made with the SOER of sludge filter press house of LMC Loop STW, including the dewatered sludge tank surface. This SOER reflects the odour emission from dewatered sludge, which is stored in the Sludge Skip Storage Area in YLS STW.
Secondary Clarifier	Membrane bioreactor and pump compound (aerobic zone, aeration tanks)	The aeration tanks in LMC Loops STW are locations with one of the lowest SOERs due to the low pollutant concentration in the sewage in the tanks. The Secondary Clarifier, UV Channel and Effluent Pumping Station in YLS STW are used for handling treated effluent, which also contain low pollutant concentration and are expected to be the least odourous amongst the process units of the STW. Therefore, SOER 0.60 used in the aeration tanks is adopted.
UV channel		
Effluent Pumping Station		

Odour Emission from the Existing Chicken Farm

Odour Source	Effective Surface Area	SOER [1]	Side Opening Area	Measured Wind Flow	Measured Odour Conc.	Emission Rate
	(m ²)	(OU/m ² /s)	(m ²)	(m/s)	(OU/m ³)	(OU/s)
Excrement Channel for Small-sized Chicken	38	2.7 - 3.2	---	---	---	111
Excrement Channel for Medium-sized Chicken	34 - 38	0.8 - 1.0	---	---	---	31 - 34
Excrement Channel for Large-sized Chicken	27 - 38	3.0 - 9.6	---	---	---	170 - 236
Temporary Excrement Storage Tank	0.25 - 1	30.6	---	---	---	8 - 31
Excrement Collection Bin	0.25	86.6	---	---	---	22
Small Chicken House	---	---	18 - 29	0.1	71 - 112	167 - 267
Total Odour Emission from the Existing Chicken Farm						4,525

Odour Emission from the Existing Pig Farm

Odour Source	Effective Surface Area	SOER [1]	Opening Area	Measured Wind Flow	Measured Odour Conc.	Emission Rate
	(m ²)	(OU/m ² /s)	(m ²)	(m/s)	(OU/m ³)	(OU/s)
Waste Treatment Facilities	45 - 345	3.8 - 61.2	---	---	---	1321 - 7907
Rubbish Bin	0.25	61.2	---	---	---	15
Pig House (semi-opened)	---	---	200 - 674	0.1	28 - 287	1180 - 9352
Pig House (mechanically ventilated)	---	---	0.2 - 9.6	0.4 - 3	28 - 128	60 - 4424
Total Odour Emission from the Existing Pig Farm						33,434

Note:

[1] Odour sampling was conducted at chicken farm and pig farm. The Specific Odour Emission Rate (SOER) was then determined. Reference should be made to the "Odour Measurement at Livestock Farms" prepared by the Odour Research Centre, Technological and Higher Education Institute of Hong Kong.

[2] Emission rate = Effective Surface Area x SOER