

**ANNEX 4D**

**Operational Noise Assessment of Expanded STKSTW**

**NSR 1**

Area	Equipment	No. of Items	Sound Power Level*, dB(A)	Total Sound Power Level, dB(A)	Barrier / Enclosure Reduction**, dB(A)	Distance, m	Distance Attenuation, dB(A)	Façade Correction, dB(A)	Sound Pressure Level at NSR, dB(A)	Predicted Operational Noise Level, dB(A)	Total Predicted Operational Noise Level, dB(A)	Noise Criteria, dB(A)***	Exceed Noise Criteria?
A	Mechanical raked screen	4	89	95	20	162	52	3	26	31	38	45	No
	Mechanical pump	2	92	95	20	162	52	3	26				
	Submersible pump	3	85	90	20	162	52	3	21				
	Exhaust fan	4	79	85	10	162	52	3	26				
	Deodourization fan	1	85	85	20	162	52	3	16				
B	Mechanical pump	3	92	97	20	148	51	3	28	31	38	45	No
	Submersible pump	2	85	88	20	148	51	3	20				
	Exhaust fan	4	79	85	10	148	51	3	27				
	Deodourization fan	1	85	85	20	148	51	3	17				
C	Air blower	5	85	92	20	142	51	3	24	27	38	45	No
	Exhaust fan	2	79	82	10	142	51	3	24				
	Deodourization fan	1	85	85	20	142	51	3	17				
D	Mechanical pump	3	92	97	20	133	50	3	29	32	38	45	No
	Submersible pump	4	85	91	20	133	50	3	24				
	Exhaust fan	4	79	85	10	133	50	3	28				
E	Mechanical pump	2	92	95	20	124	50	3	28	31	38	45	No
	Submersible pump	1	85	85	20	124	50	3	18				
	Exhaust fan	4	79	85	10	124	50	3	28				

**NSR 2**

Area	Equipment	No. of Items	Sound Power Level*, dB(A)	Total Sound Power Level, dB(A)	Barrier / Enclosure Reduction**, dB(A)	Distance, m	Distance Attenuation, dB(A)	Façade Correction, dB(A)	Sound Pressure Level at NSR, dB(A)	Predicted Operational Noise Level, dB(A)	Total Predicted Operational Noise Level, dB(A)	Noise Criteria, dB(A)***	Exceed Noise Criteria?
A	Mechanical raked screen	4	89	95	20	148	51	3	27	32	38	45	No
	Mechanical pump	2	92	95	20	148	51	3	27				
	Submersible pump	3	85	90	20	148	51	3	21				
	Exhaust fan	4	79	85	10	148	51	3	27				
	Deodourization fan	1	85	85	20	148	51	3	17				
B	Mechanical pump	3	92	97	20	143	51	3	29	31	38	45	No
	Submersible pump	2	85	88	20	143	51	3	20				
	Exhaust fan	4	79	85	10	143	51	3	27				
	Deodourization fan	1	85	85	20	143	51	3	17				
C	Air blower	5	85	92	20	142	51	3	24	27	38	45	No
	Exhaust fan	2	79	82	10	142	51	3	24				
	Deodourization fan	1	85	85	20	142	51	3	17				
D	Mechanical pump	3	92	97	20	141	51	3	29	32	38	45	No
	Submersible pump	4	85	91	20	141	51	3	23				
	Exhaust fan	4	79	85	10	141	51	3	27				
E	Mechanical pump	2	92	95	20	140	51	3	27	30	38	45	No
	Submersible pump	1	85	85	20	140	51	3	17				
	Exhaust fan	4	79	85	10	140	51	3	27				

Notes:

- Area A : Preliminary treatment area
- Area B : Sludge dewatering and thickening area
- Area C : Air blower area
- Area D : MBR area
- Area E : Outfall pump area

\* Sound Power Level of equipment derived from Outlying Island Sewerage Stage 2 EIA (EIAO Register No. AEIAR-181/2013).

\*\* 20 dB(A) reduction from enclosed building design; 10 dB(A) reduction from acoustic louver / silencer.

\*\*\* 5 dB(A) below the appropriate night time noise level for the Area Sensitivity Rating (ASR) under the TM for the Assessment of Noise from Places other than Domestic Premises, Public Places or Construction Sites or prevailing background noise level.

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**Operational Noise Assessment of Expanded STKSTW**

**NSR 3**

Area	Equipment	No. of Items	Sound Power Level*, dB(A)	Total Sound Power Level, dB(A)	Barrier / Enclosure Reduction**, dB(A)	Distance, m	Distance Attenuation, dB(A)	Façade Correction, dB(A)	Sound Pressure Level at NSR, dB(A)	Predicted Operational Noise Level, dB(A)	Total Predicted Operational Noise Level, dB(A)	Noise Criteria, dB(A)***	Exceed Noise Criteria?
A	Mechanical raked screen	4	89	95	20	392	60	3	18	23	29	35	No
	Mechanical pump	2	92	95	20	392	60	3	18				
	Submersible pump	3	85	90	20	392	60	3	13				
	Exhaust fan	4	79	85	10	392	60	3	18				
	Deodourization fan	1	85	85	20	392	60	3	8				
B	Mechanical pump	3	92	97	20	405	60	3	20	22	29	35	No
	Submersible pump	2	85	88	20	405	60	3	11				
	Exhaust fan	4	79	85	10	405	60	3	18				
	Deodourization fan	1	85	85	20	405	60	3	8				
C	Air blower	5	85	92	20	420	60	3	15	18	29	35	No
	Exhaust fan	2	79	82	10	420	60	3	15				
	Deodourization fan	1	85	85	20	420	60	3	8				
D	Mechanical pump	3	92	97	20	428	61	3	19	22	29	35	No
	Submersible pump	4	85	91	20	428	61	3	13				
	Exhaust fan	4	79	85	10	428	61	3	17				
E	Mechanical pump	2	92	95	20	438	61	3	17	20	29	35	No
	Submersible pump	1	85	85	20	438	61	3	7				
	Exhaust fan	4	79	85	10	438	61	3	17				

**NSR 4**

Area	Equipment	No. of Items	Sound Power Level*, dB(A)	Total Sound Power Level, dB(A)	Barrier / Enclosure Reduction**, dB(A)	Distance, m	Distance Attenuation, dB(A)	Façade Correction, dB(A)	Sound Pressure Level at NSR, dB(A)	Predicted Operational Noise Level, dB(A)	Total Predicted Operational Noise Level, dB(A)	Noise Criteria, dB(A)***	Exceed Noise Criteria?
A	Mechanical raked screen	4	89	95	20	154	52	3	26	32	36	45	No
	Mechanical pump	2	92	95	20	154	52	3	26				
	Submersible pump	3	85	90	20	154	52	3	21				
	Exhaust fan	4	79	85	10	154	52	3	26				
	Deodourization fan	1	85	85	20	154	52	3	16				
B	Mechanical pump	3	92	97	20	164	52	3	27	30	36	45	No
	Submersible pump	2	85	88	20	164	52	3	19				
	Exhaust fan	4	79	85	10	164	52	3	26				
	Deodourization fan	1	85	85	20	164	52	3	16				
C	Air blower	5	85	92	20	175	53	3	22	26	36	45	No
	Exhaust fan	2	79	82	10	175	53	3	22				
	Deodourization fan	1	85	85	20	175	53	3	15				
D	Mechanical pump	3	92	97	20	182	53	3	27	29	36	45	No
	Submersible pump	4	85	91	20	182	53	3	21				
	Exhaust fan	4	79	85	10	182	53	3	25				
E	Mechanical pump	2	92	95	20	190	54	3	24	28	36	45	No
	Submersible pump	1	85	85	20	190	54	3	14				
	Exhaust fan	4	79	85	10	190	54	3	24				

Notes:

Area A : Preliminary treatment area

Area B : Sludge dewatering and thickening area

Area C : Air blower area

Area D : MBR area

Area E : Outfall pump area

\* Sound Power Level of equipment derived from Outlying Island Sewerage Stage 2 EIA (EIAO Register No. AEIAR-181/2013).

\*\* 20 dB(A) reduction from enclosed building design; 10 dB(A) reduction from acoustic louver / silencer.

\*\*\* 5 dB(A) below the appropriate night time noise level for the Area Sensitivity Rating (ASR) under the TM for the Assessment of Noise from Places other than Domestic Premises, Public Places or Construction Sites or prevailing background noise level.

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**Operational Noise Assessment of Expanded STKSTW**

**NSR 5**

Area	Equipment	No. of Items	Sound Power Level*, dB(A)	Total Sound Power Level, dB(A)	Barrier / Enclosure Reduction**, dB(A)	Distance, m	Distance Attenuation, dB(A)	Façade Correction, dB(A)	Sound Pressure Level at NSR, dB(A)	Predicted Operational Noise Level, dB(A)	Total Predicted Operational Noise Level, dB(A)	Noise Criteria, dB(A)***	Exceed Noise Criteria?
A	Mechanical raked screen	4	89	95	20	184	53	3	25	30	35	45	No
	Mechanical pump	2	92	95	20	184	53	3	25				
	Submersible pump	3	85	90	20	184	53	3	19				
	Exhaust fan	4	79	85	10	184	53	3	25				
	Deodourization fan	1	85	85	20	184	53	3	15				
B	Mechanical pump	3	92	97	20	200	54	3	26	28	35	45	No
	Submersible pump	2	85	88	20	200	54	3	17				
	Exhaust fan	4	79	85	10	200	54	3	24				
	Deodourization fan	1	85	85	20	200	54	3	14				
C	Air blower	5	85	92	20	215	55	3	20	24	35	45	No
	Exhaust fan	2	79	82	10	215	55	3	20				
	Deodourization fan	1	85	85	20	215	55	3	13				
D	Mechanical pump	3	92	97	20	222	55	3	25	28	35	45	No
	Submersible pump	4	85	91	20	222	55	3	19				
	Exhaust fan	4	79	85	10	222	55	3	23				
E	Mechanical pump	2	92	95	20	234	55	3	23	26	35	45	No
	Submersible pump	1	85	85	20	234	55	3	13				
	Exhaust fan	4	79	85	10	234	55	3	23				

**NSR 6**

Area	Equipment	No. of Items	Sound Power Level*, dB(A)	Total Sound Power Level, dB(A)	Barrier / Enclosure Reduction**, dB(A)	Distance, m	Distance Attenuation, dB(A)	Façade Correction, dB(A)	Sound Pressure Level at NSR, dB(A)	Predicted Operational Noise Level, dB(A)	Total Predicted Operational Noise Level, dB(A)	Noise Criteria, dB(A)***	Exceed Noise Criteria?
A	Mechanical raked screen	4	89	95	20	172	53	3	25	31	35	42	No
	Mechanical pump	2	92	95	20	172	53	3	25				
	Submersible pump	3	85	90	20	172	53	3	20				
	Exhaust fan	4	79	85	10	172	53	3	25				
	Deodourization fan	1	85	85	20	172	53	3	15				
B	Mechanical pump	3	92	97	20	191	54	3	26	29	35	42	No
	Submersible pump	2	85	88	20	191	54	3	17				
	Exhaust fan	4	79	85	10	191	54	3	24				
	Deodourization fan	1	85	85	20	191	54	3	14				
C	Air blower	5	85	92	20	208	54	3	21	24	35	42	No
	Exhaust fan	2	79	82	10	208	54	3	21				
	Deodourization fan	1	85	85	20	208	54	3	14				
D	Mechanical pump	3	92	97	20	216	55	3	25	28	35	42	No
	Submersible pump	4	85	91	20	216	55	3	19				
	Exhaust fan	4	79	85	10	216	55	3	23				
E	Mechanical pump	2	92	95	20	230	55	3	23	26	35	42	No
	Submersible pump	1	85	85	20	230	55	3	13				
	Exhaust fan	4	79	85	10	230	55	3	23				

Notes:

Area A : Preliminary treatment area

Area B : Sludge dewatering and thickening area

Area C : Air blower area

Area D : MBR area

Area E : Outfall pump area

\* Sound Power Level of equipment derived from Outlying Island Sewerage Stage 2 EIA (EIAO Register No. AEIAR-181/2013).

\*\* 20 dB(A) reduction from enclosed building design; 10 dB(A) reduction from acoustic louver / silencer.

\*\*\* 5 dB(A) below the appropriate night time noise level for the Area Sensitivity Rating (ASR) under the TM for the Assessment of Noise from Places other than Domestic Premises, Public Places or Construction Sites or prevailing background noise level.

**ANNEX 4D**

**Operational Noise Assessment of Expanded STKSTW**

**NSR 7**

Area	Equipment	No. of Items	Sound Power Level*, dB(A)	Total Sound Power Level, dB(A)	Barrier / Enclosure Reduction**, dB(A)	Distance, m	Distance Attenuation, dB(A)	Façade Correction, dB(A)	Sound Pressure Level at NSR, dB(A)	Predicted Operational Noise Level, dB(A)	Total Predicted Operational Noise Level, dB(A)	Noise Criteria, dB(A)***	Exceed Noise Criteria?
A	Mechanical raked screen	4	89	95	20	304	58	3	20	26	31	45	No
	Mechanical pump	2	92	95	20	304	58	3	20				
	Submersible pump	3	85	90	20	304	58	3	15				
	Exhaust fan	4	79	85	10	304	58	3	20				
	Deodourization fan	1	85	85	20	304	58	3	10				
B	Mechanical pump	3	92	97	20	322	58	3	22	24	31	45	No
	Submersible pump	2	85	88	20	322	58	3	13				
	Exhaust fan	4	79	85	10	322	58	3	20				
	Deodourization fan	1	85	85	20	322	58	3	10				
C	Air blower	5	85	92	20	340	59	3	16	20	31	45	No
	Exhaust fan	2	79	82	10	340	59	3	16				
	Deodourization fan	1	85	85	20	340	59	3	9				
D	Mechanical pump	3	92	97	20	347	59	3	21	24	31	45	No
	Submersible pump	4	85	91	20	347	59	3	15				
	Exhaust fan	4	79	85	10	347	59	3	19				
E	Mechanical pump	2	92	95	20	360	59	3	19	22	31	45	No
	Submersible pump	1	85	85	20	360	59	3	9				
	Exhaust fan	4	79	85	10	360	59	3	19				

**NSR 8**

Area	Equipment	No. of Items	Sound Power Level*, dB(A)	Total Sound Power Level, dB(A)	Barrier / Enclosure Reduction**, dB(A)	Distance, m	Distance Attenuation, dB(A)	Façade Correction, dB(A)	Sound Pressure Level at NSR, dB(A)	Predicted Operational Noise Level, dB(A)	Total Predicted Operational Noise Level, dB(A)	Noise Criteria, dB(A)***	Exceed Noise Criteria?
A	Mechanical raked screen	4	89	95	20	382	60	3	18	24	29	41	No
	Mechanical pump	2	92	95	20	382	60	3	18				
	Submersible pump	3	85	90	20	382	60	3	13				
	Exhaust fan	4	79	85	10	382	60	3	18				
	Deodourization fan	1	85	85	20	382	60	3	8				
B	Mechanical pump	3	92	97	20	400	60	3	20	22	29	41	No
	Submersible pump	2	85	88	20	400	60	3	11				
	Exhaust fan	4	79	85	10	400	60	3	18				
	Deodourization fan	1	85	85	20	400	60	3	8				
C	Air blower	5	85	92	20	418	60	3	15	18	29	41	No
	Exhaust fan	2	79	82	10	418	60	3	15				
	Deodourization fan	1	85	85	20	418	60	3	8				
D	Mechanical pump	3	92	97	20	425	61	3	19	22	29	41	No
	Submersible pump	4	85	91	20	425	61	3	13				
	Exhaust fan	4	79	85	10	425	61	3	17				
E	Mechanical pump	2	92	95	20	438	61	3	17	20	29	41	No
	Submersible pump	1	85	85	20	438	61	3	7				
	Exhaust fan	4	79	85	10	438	61	3	17				

Notes:

Area A : Preliminary treatment area

Area B : Sludge dewatering and thickening area

Area C : Air blower area

Area D : MBR area

Area E : Outfall pump area

\* Sound Power Level of equipment derived from Outlying Island Sewerage Stage 2 EIA (EIAO Register No. AEIAR-181/2013).

\*\* 20 dB(A) reduction from enclosed building design; 10 dB(A) reduction from acoustic louver / silencer.

\*\*\* 5 dB(A) below the appropriate night time noise level for the Area Sensitivity Rating (ASR) under the TM for the Assessment of Noise from Places other than Domestic Premises, Public Places or Construction Sites or prevailing background noise level.

**ANNEX 4D**

**Operational Noise Assessment of Expanded STKSTW**

**NSR 9**

Area	Equipment	No. of Items	Sound Power Level*, dB(A)	Total Sound Power Level, dB(A)	Barrier / Enclosure Reduction**, dB(A)	Distance, m	Distance Attenuation, dB(A)	Façade Correction, dB(A)	Sound Pressure Level at NSR, dB(A)	Predicted Operational Noise Level, dB(A)	Total Predicted Operational Noise Level, dB(A)	Noise Criteria, dB(A)***	Exceed Noise Criteria?
A	Mechanical raked screen	4	89	95	20	74	45	3	33	38	41	49	No
	Mechanical pump	2	92	95	20	74	45	3	33				
	Submersible pump	3	85	90	20	74	45	3	27				
	Exhaust fan	4	79	85	10	74	45	3	33				
	Deodourization fan	1	85	85	20	74	45	3	23				
B	Mechanical pump	3	92	97	20	94	47	3	32	35	41	49	No
	Submersible pump	2	85	88	20	94	47	3	24				
	Exhaust fan	4	79	85	10	94	47	3	31				
	Deodourization fan	1	85	85	20	94	47	3	21				
C	Air blower	5	85	92	20	112	49	3	26	29	41	49	No
	Exhaust fan	2	79	82	10	112	49	3	26				
	Deodourization fan	1	85	85	20	112	49	3	19				
D	Mechanical pump	3	92	97	20	120	50	3	30	33	41	49	No
	Submersible pump	4	85	91	20	120	50	3	24				
	Exhaust fan	4	79	85	10	120	50	3	28				
E	Mechanical pump	2	92	95	20	132	50	3	28	31	41	49	No
	Submersible pump	1	85	85	20	132	50	3	18				
	Exhaust fan	4	79	85	10	132	50	3	28				

Notes:

Area A : Preliminary treatment area

Area B : Sludge dewatering and thickening area

Area C : Air blower area

Area D : MBR area

Area E : Outfall pump area

\* Sound Power Level of equipment derived from Outlying Island Sewerage Stage 2 EIA (EIAO Register No. AEIAR-181/2013).

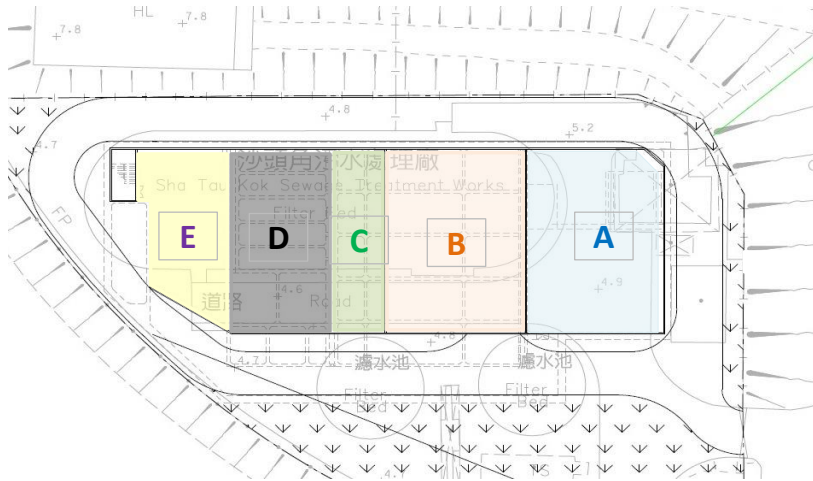
\*\* 20 dB(A) reduction from enclosed building design; 10 dB(A) reduction from acoustic louver / silencer.

\*\*\* 5 dB(A) below the appropriate night time noise level for the Area Sensitivity Rating (ASR) under the TM for the Assessment of Noise from Places other than Domestic Premises, Public Places or Construction Sites or prevailing background noise level.

For NSR 9 (Tin Hau Temple), night time (23:00 - 07:00) use is not expected. Noise criteria for day time / evening (07:00 - 23:00) is adopted.

## ANNEX 4D

### Operational Noise Assessment of Expanded STKSTW



#### Main Operating Areas within the Expanded STKSTW:

- A = preliminary treatment unit
- B = sludge dewatering and thickening
- C = air blower
- D = MBR
- E = outfall pump