

ภาคผนวก ก

เอกสารประกอบการปฏิบัติตาม
มาตรการติดตามตรวจสอบผลกระทบสิ่งแวดล้อม

ภาคผนวก ค.1

ผลการตรวจสอบความถูกต้องของระบบตรวจวัดคุณภาพอากาศ
จากปล่องระบายอากาศแบบต่อเนื่อง (Auditing-RATA)

Relative Accuracy Determination for CEMS STAR PETROLEUM REFINING PUBLIC CO.,LTD. : RFCCU

DATE May 19,2023

Run No.	Time		O ₂			NO _x			SO ₂			CO			Fuel Gas (kg/h)
	Start	End	%			ppm@7% O ₂			ppm@7% O ₂			ppm@7% O ₂			
			RM	CEMS	Diff(d _i)	RM	CEMS	Diff(d _i)	RM	CEMS	Diff(d _i)	RM	CEMS	Diff(d _i)	
1	11:20 AM	11:40 AM	3.28	3.55	-0.27	123.00	130.70	-7.70	562.69	574.83	-12.14	169.86	173.02	-3.16	859.29
2	11:41 AM	12:01 PM	3.33	3.60	-0.27	123.22	128.04	-4.82	569.52	585.86	-16.34	171.93	172.69	-0.76	860.46
3	12:02 PM	12:22 PM	3.32	3.58	-0.26	122.83	127.46	-4.63	571.14	589.80	-18.66	172.75	172.63	0.12	869.64
4	12:23 PM	12:43 PM	3.26	3.52	-0.26	121.58	127.72	-6.15	570.08	591.54	-21.46	170.37	171.50	-1.13	891.30
5	1:10 PM	1:30 PM	3.45	3.52	-0.07	125.33	129.82	-4.49	572.93	577.63	-4.70	170.25	173.21	-2.97	918.08
6	1:31 PM	1:51 PM	3.36	3.53	-0.17	125.35	129.36	-4.00	574.03	581.84	-7.81	170.90	173.93	-3.03	915.51
7	1:52 PM	2:12 PM	3.36	3.53	-0.17	121.47	128.75	-7.28	571.45	582.32	-10.87	171.51	173.21	-1.70	903.99
8	2:13 PM	2:33 PM	3.36	3.53	-0.17	121.30	127.56	-6.26	569.27	576.39	-7.12	170.54	175.19	-4.65	902.30
9	3:00 PM	3:20 PM	3.47	3.50	-0.03	123.94	125.23	-1.29	566.38	580.23	-13.85	173.71	174.08	-0.36	909.76
10	3:21 PM	3:41 PM	3.36	3.49	-0.13	125.49	124.48	1.01	573.13	572.77	0.36	168.11	176.56	-8.45	927.45
11	3:42 PM	4:02 PM	3.39	3.55	-0.16	124.02	123.79	0.23	578.34	585.35	-7.02	173.22	173.51	-0.29	954.41
12	4:03 PM	4:23 PM	3.44	3.51	-0.07	124.82	123.94	0.88	580.93	583.71	-2.78	174.15	173.48	0.67	972.78
Average			3.37	3.53	-0.17	123.53	127.24	-3.71	571.66	581.86	-10.20	171.44	173.59	-2.14	907.08
Confidence Coefficient			-			1.9966			4.1788			1.6179			
Relative Accuracy			0.17			2.28			2.51			0.68			
Performance Specification : RA			1%			10%***			20%**			5%****			

* Instrumental RM and CEMS data are on a consistent basis, that is, dry and actual oxygen.

** 20 % of RM value for SO₂

*** 10% of Emission Standard value 250 ppmvd@7%O₂ for NO_x

**** 5% of Emission Standard value 554 ppmvd@7%O₂ for CO

Relative Accuracy Determination for CEMS STAR PETROLEUM REFINING PUBLIC CO.,LTD. : CDU

DATE May 17,2023

Run No.	Time		O ₂			NOx			Fuel Gas
	Start	End	%			ppm@7% O ₂			
			Instrumental RM	CEMS	Diff(d _i)	Instrumental RM	CEMS	Diff(d _i)	
1	10:40 AM	11:00 AM	3.15	3.41	-0.26	12.51	10.82	1.69	9,764.59
2	11:01 AM	11:21 AM	3.17	3.51	-0.34	12.61	11.04	1.58	9,759.46
3	11:22 AM	11:42 AM	3.26	3.54	-0.28	12.39	11.07	1.32	9,785.37
4	11:43 AM	12:03 PM	3.32	3.56	-0.24	12.70	11.15	1.55	9,807.16
5	12:30 PM	12:50 PM	3.38	3.59	-0.21	13.19	10.70	2.50	9,825.59
6	12:51 PM	1:11 PM	3.36	3.57	-0.21	13.01	10.76	2.26	9,819.64
7	1:12 PM	1:32 PM	3.33	3.53	-0.20	12.72	10.49	2.23	9,818.45
8	1:33 PM	1:53 PM	3.30	3.51	-0.21	12.69	10.53	2.16	9,782.30
9	2:20 PM	2:40 PM	3.36	3.34	0.02	12.59	10.61	1.99	9,689.77
10	2:41 PM	3:01 PM	3.32	3.32	0.00	12.35	10.28	2.07	9,708.52
11	3:02 PM	3:22 PM	3.37	3.37	0.00	12.35	10.45	1.90	9,747.73
12	3:23 PM	3:43 PM	3.48	3.45	0.03	12.28	10.69	1.59	9,763.97
Average			3.32	3.48	-0.16	12.62	10.71	1.90	9,772.71
Confidence Coefficient			-			0.2270			
Relative Accuracy			0.16			16.88			
Performance Specification : RA			1%			20%**			

* Instrumental RM and CEMS data are on a consistent basis, that is, dry and actual oxygen.

** 20 % of RM value for NO_x

Relative Accuracy Determination for CEMS STAR PETROLEUM REFINING PUBLIC CO.,LTD. : SRU

DATE **May 17,2023**

Run No.	Time		O ₂			SO ₂			Natural Gas
	Start	End	%			ppm@7% O ₂			
			Instrumental RM	CEMS	Diff(d _i)	Instrumental RM	CEMS	Diff(d _i)	
1	12:10 PM	12:30 PM	5.57	5.23	0.34	207.07	210.62	-3.55	557.63
2	12:31 PM	12:51 PM	5.62	5.25	0.37	214.79	209.84	4.94	555.53
3	12:52 PM	1:12 PM	5.58	5.25	0.33	220.21	208.64	11.57	553.12
4	1:13 PM	1:33 PM	5.66	5.23	0.43	238.63	208.54	30.08	551.87
5	1:55 PM	2:15 PM	5.49	5.23	0.26	219.12	213.02	6.10	552.45
6	2:16 PM	2:36 PM	5.43	5.26	0.17	230.47	215.51	14.96	553.99
7	2:37 PM	2:57 PM	5.44	5.25	0.19	229.75	218.95	10.79	555.59
8	2:58 PM	3:18 PM	5.49	5.32	0.17	217.23	217.72	-0.48	554.08
9	3:40 PM	4:00 PM	5.51	5.38	0.13	223.90	211.28	12.62	549.87
10	4:01 PM	4:21 PM	5.55	5.44	0.11	227.30	209.13	18.17	546.40
11	4:22 PM	4:42 PM	5.59	5.49	0.10	228.69	209.63	19.06	544.58
12	4:43 PM	5:03 PM	5.69	5.50	0.19	224.85	209.04	15.81	543.96
Average			5.55	5.32	0.23	223.50	211.83	11.67	551.59
Confidence Coefficient			-			5.8145			
Relative Accuracy			0.23			3.50			
Performance Specification : RA			1%*			10%**			

* Instrumental RM and CEMS data are on a consistent basis, that is, dry and actual oxygen.

** 10% of Emission Standard value 500 ppmvd@7%O₂ for SO₂

Relative Accuracy Determination for CEMS STAR PETROLEUM REFINING PUBLIC CO.,LTD. : Boiler 1

DATE **May 18,2023**

Run No.	Time		O ₂			NO _x			FUEL GAS (Nm3/h)
	Start	End	%			ppm@7% O ₂			
			Instrumental RM	CEMS	Diff(d _i)	Instrumental RM	CEMS	Diff(d _i)	
1	11:00 AM	11:20 AM	3.96	3.85	0.11	80.50	78.21	2.30	4,056.63
2	11:21 AM	11:41 AM	3.86	3.72	0.14	83.37	77.95	5.41	4,100.19
3	11:42 AM	12:02 PM	3.78	3.70	0.08	87.26	82.24	5.02	4,060.38
4	12:03 PM	12:23 PM	3.98	3.94	0.04	88.11	80.25	7.85	4,091.70
5	12:50 PM	1:10 PM	3.90	3.78	0.12	84.92	76.80	8.12	4,001.98
6	1:11 PM	1:31 PM	3.92	3.80	0.12	85.21	78.80	6.41	4,010.31
7	1:32 PM	1:52 PM	4.00	3.82	0.18	88.83	77.63	11.20	3,871.53
8	1:53 PM	2:13 PM	4.03	3.86	0.17	83.75	74.50	9.25	3,724.52
9	2:40 PM	3:00 PM	3.97	3.92	0.05	76.06	74.23	1.83	3,772.16
10	3:01 PM	3:21 PM	3.96	3.95	0.01	74.34	69.58	4.76	3,776.36
11	3:22 PM	3:42 PM	3.95	3.89	0.06	71.56	65.00	6.56	3,838.28
12	3:43 PM	4:03 PM	3.91	3.86	0.05	73.87	70.05	3.81	3,805.39
Average			3.94	3.84	0.09	81.48	75.44	6.04	3,925.79
Confidence Coefficient			-			1.7636			
Relative Accuracy			0.09			9.58			
Performance Specification : RA			1%			20%**			

* Instrumental RM and CEMS data are on a consistent basis, that is, dry and actual oxygen.

** 20 % of RM value for NO_x

Relative Accuracy Determination for CEMS STAR PETROLEUM REFINING PUBLIC CO.,LTD. : HRSG 1

DATE **May 22,2023**

Run No.	Time		O ₂			NO _x			Fuel Gas (Nm3/h)
	Start	End	%			ppm@7% O ₂			
			Instrumental RM	CEMS	Diff(d _i)	Instrumental RM	CEMS	Diff(d _i)	
1	11:30 AM	11:50 AM	14.33	14.49	-0.16	98.19	106.47	-8.28	2,732.72
2	11:51 AM	12:11 PM	14.26	14.49	-0.23	97.22	106.36	-9.15	2,748.05
3	12:12 PM	12:32 PM	14.20	14.48	-0.28	94.64	105.44	-10.80	2,748.59
4	12:33 PM	12:53 PM	14.15	14.46	-0.31	93.31	105.26	-11.96	2,736.63
5	1:20 PM	1:40 PM	14.17	14.46	-0.29	94.43	106.39	-11.96	2,741.16
6	1:41 PM	2:01 PM	14.18	14.45	-0.27	94.78	106.89	-12.11	2,738.78
7	2:02 PM	2:22 PM	14.21	14.45	-0.24	95.22	106.63	-11.41	2,735.75
8	2:23 PM	2:43 PM	14.21	14.45	-0.24	95.78	107.39	-11.60	2,735.67
9	3:10 PM	3:30 PM	14.30	14.48	-0.18	97.89	109.34	-11.45	2,731.66
10	3:31 PM	3:51 PM	14.33	14.49	-0.16	99.08	109.94	-10.87	2,736.42
11	3:52 PM	4:12 PM	14.37	14.48	-0.11	99.83	109.10	-9.27	2,741.51
12	4:13 PM	4:33 PM	14.42	14.48	-0.06	100.43	108.93	-8.49	2,734.85
Average			14.26	14.47	-0.21	96.73	107.35	-10.61	2,738.48
Confidence Coefficient			-			0.9016			
Relative Accuracy			0.21			11.90			
Performance Specification : RA			1%			20%**			

* Instrumental RM and CEMS data are on a consistent basis, that is, dry and actual oxygen.

** 20 % of RM value for NO_x

ภาคผนวก ก.2

การจัดทำแผนผังแสดงเส้นเสียง (Noise Contour Map)

ประจำปี พ.ศ.2563

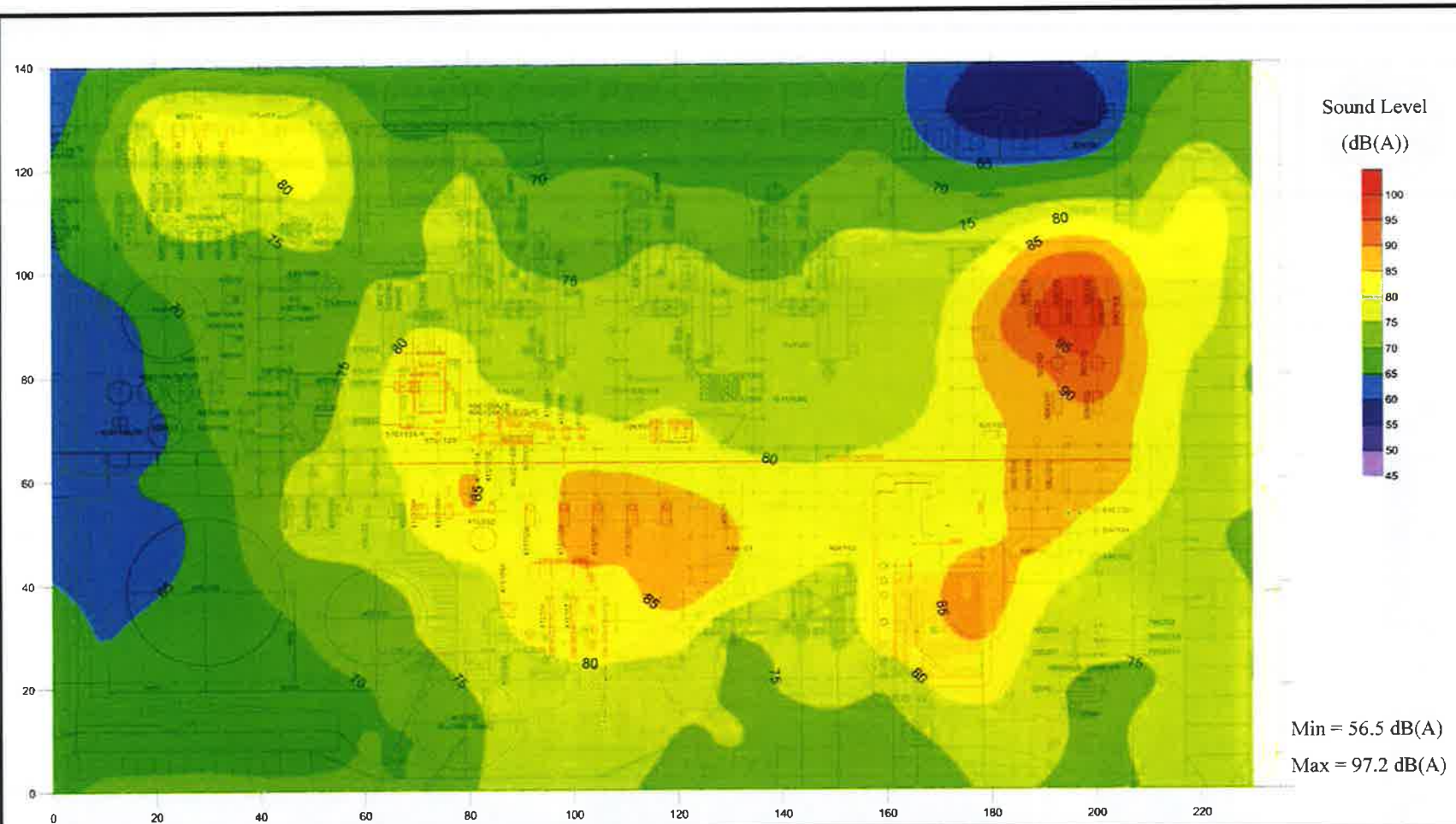
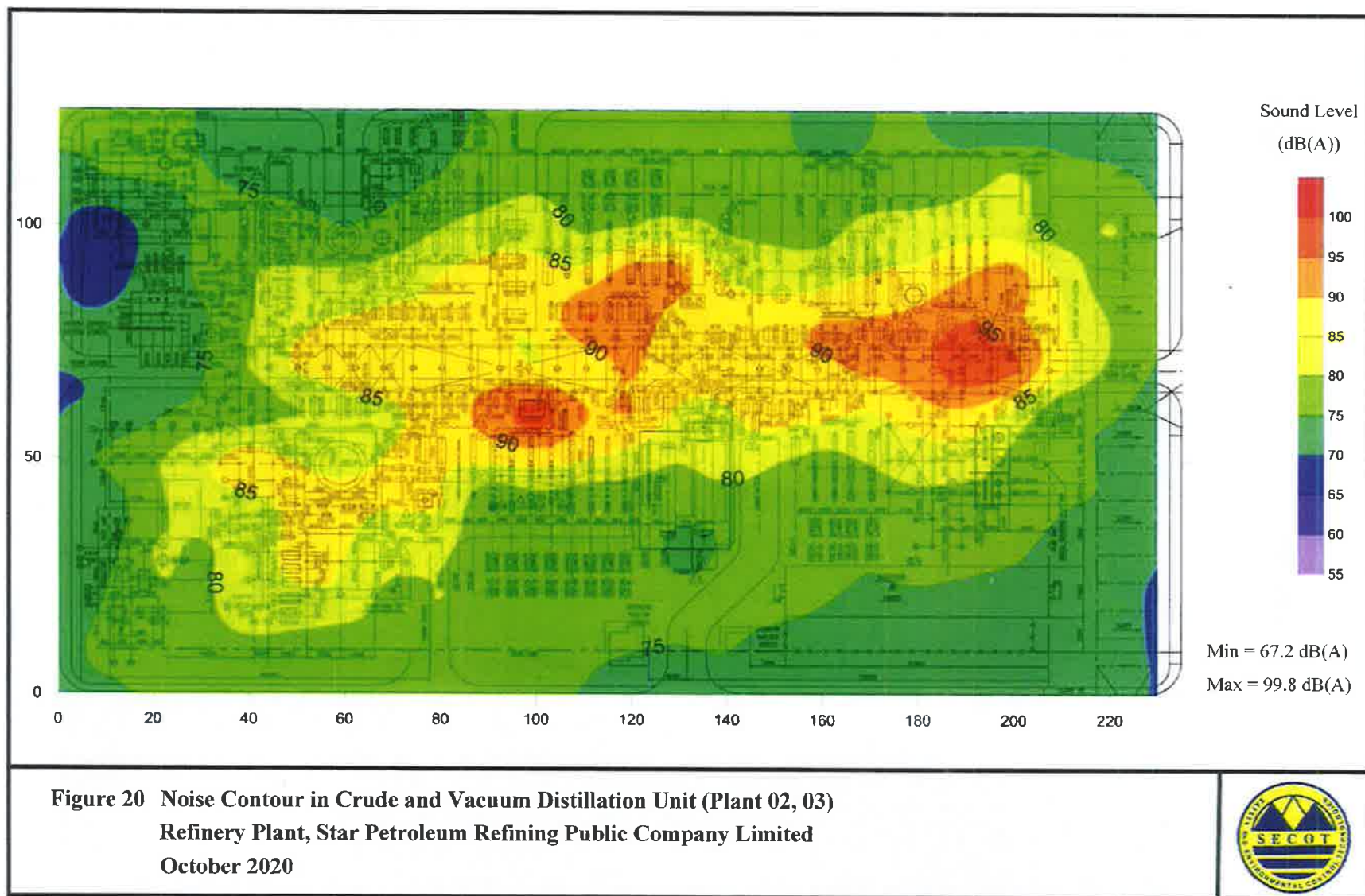


Figure 19 Noise Contour in Utility Area
Refinery Plant, Star Petroleum Refining Public Company Limited
October 2020





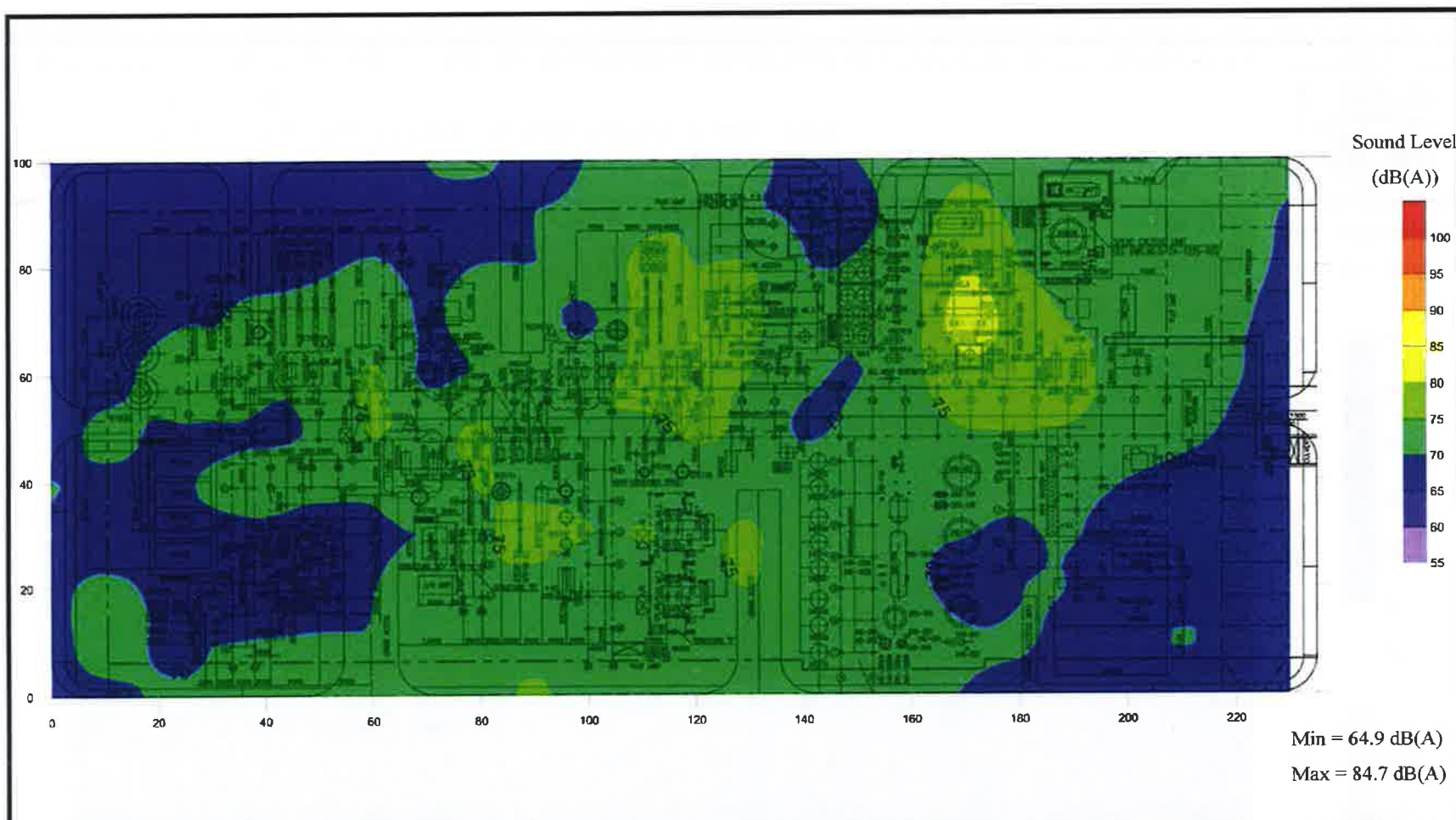


Figure 21 Noise Contour in Benzene Saturation Unit, Naphtha Hydrotreat Unit, Platformer Unit and Catregeneration (Plant 05, 06, 07, 08)
Refinery Plant, Star Petroleum Refining Public Company Limited, October 2020



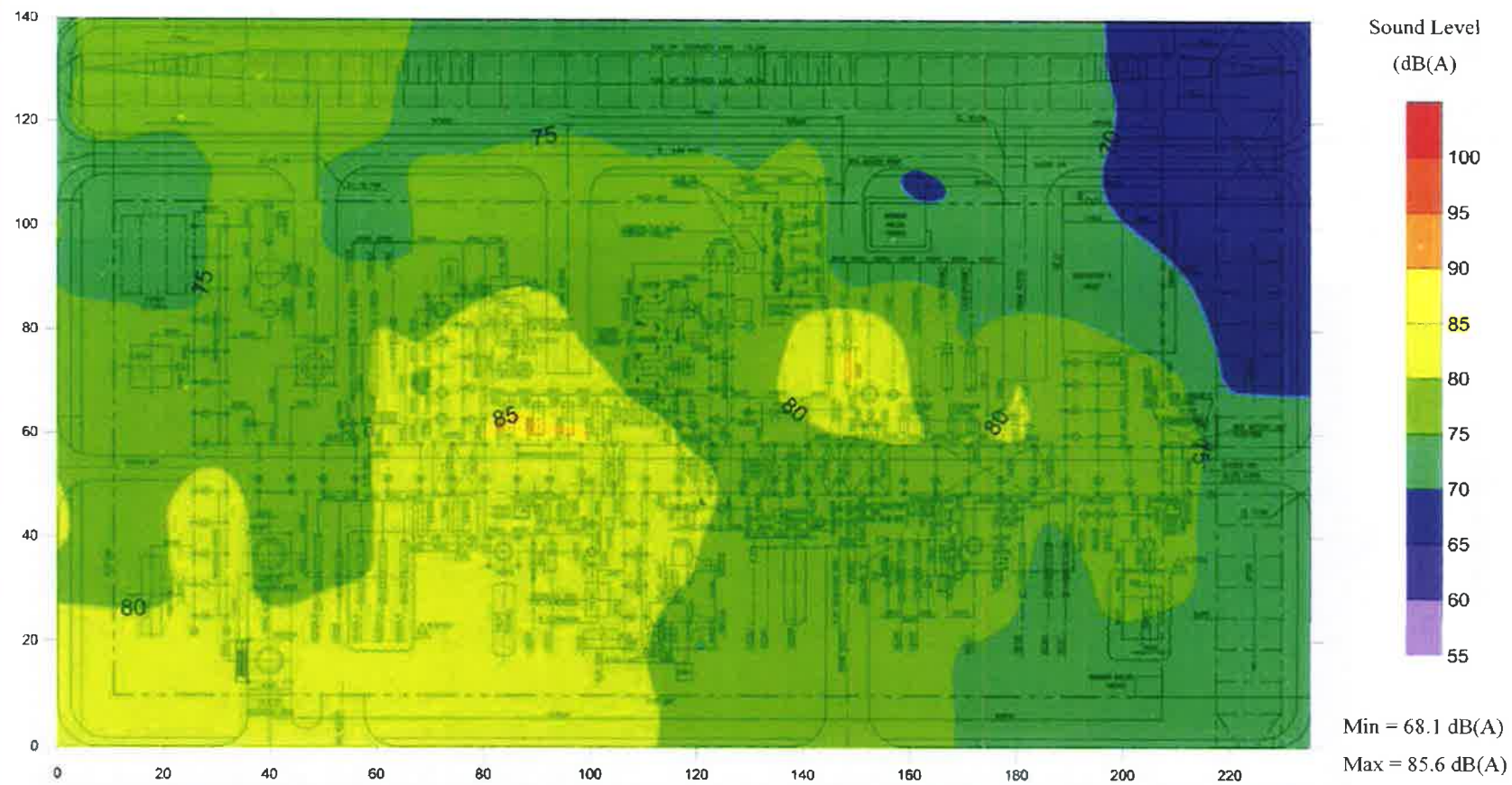


Figure 22 Noise Contour in Diesel Hydrotreating Unit and Heavy Vacuum Gas Oil Hydrotreating Unit (Plant 10, 11)
Refinery Plant, Star Petroleum Refining Public Company Limited
October 2020



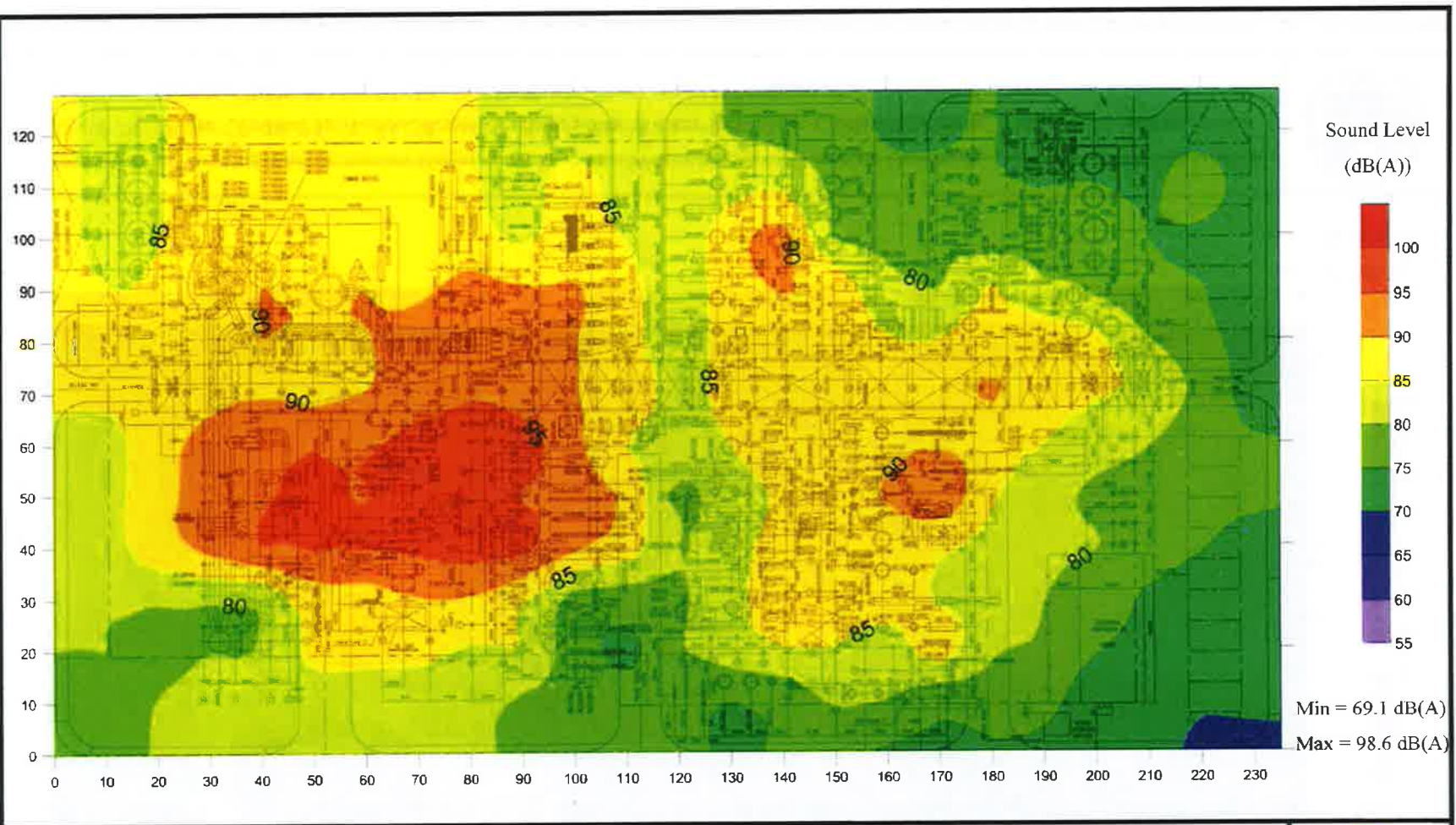
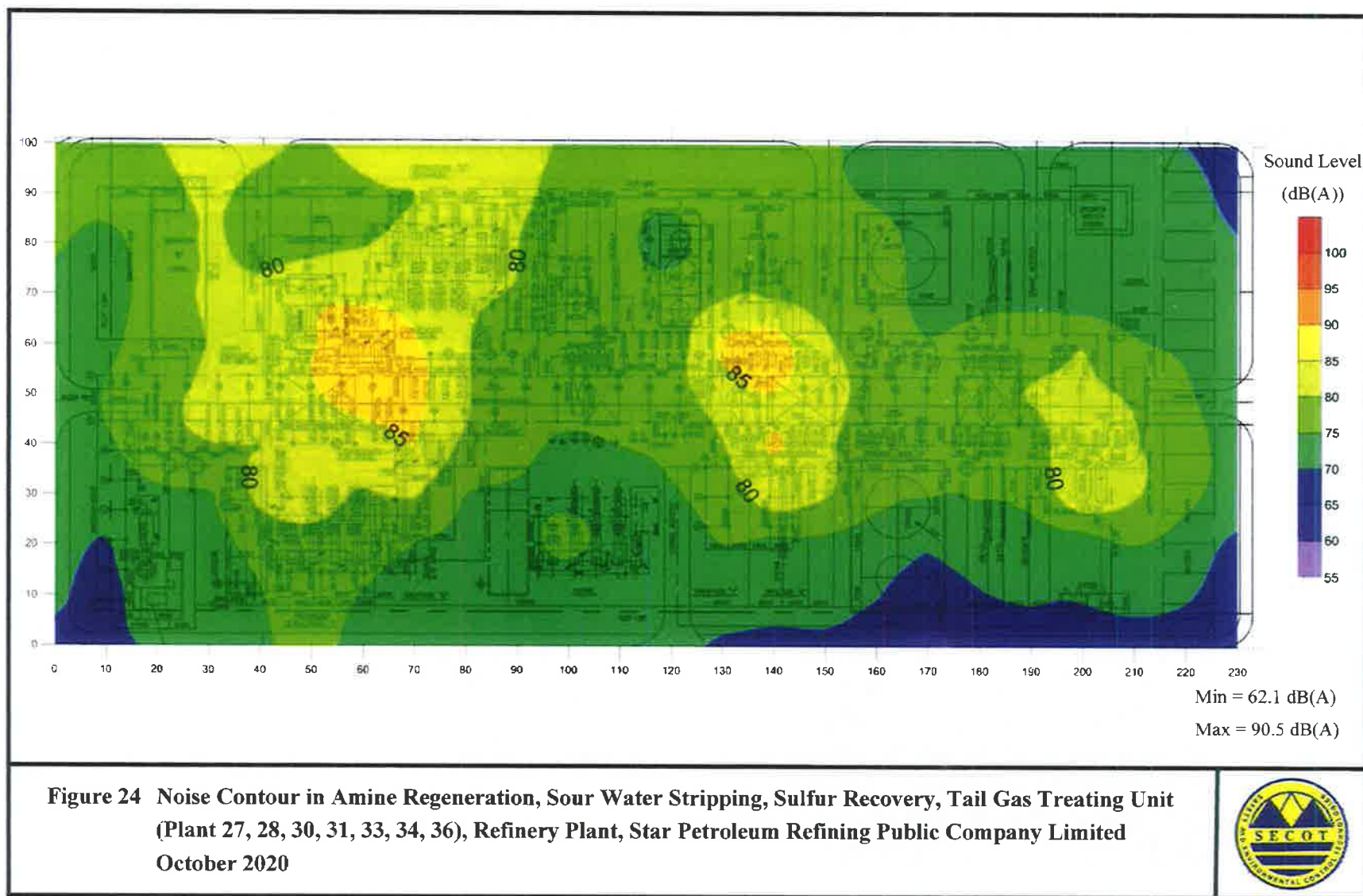


Figure 23 Noise Contour in Residuum Fluid Catalytic Cracking Unit, Merox/Sweetening Units (Plant 16, 18, 20, 23)
Refinery Plant, Star Petroleum Refining Public Company Limited
October 2020





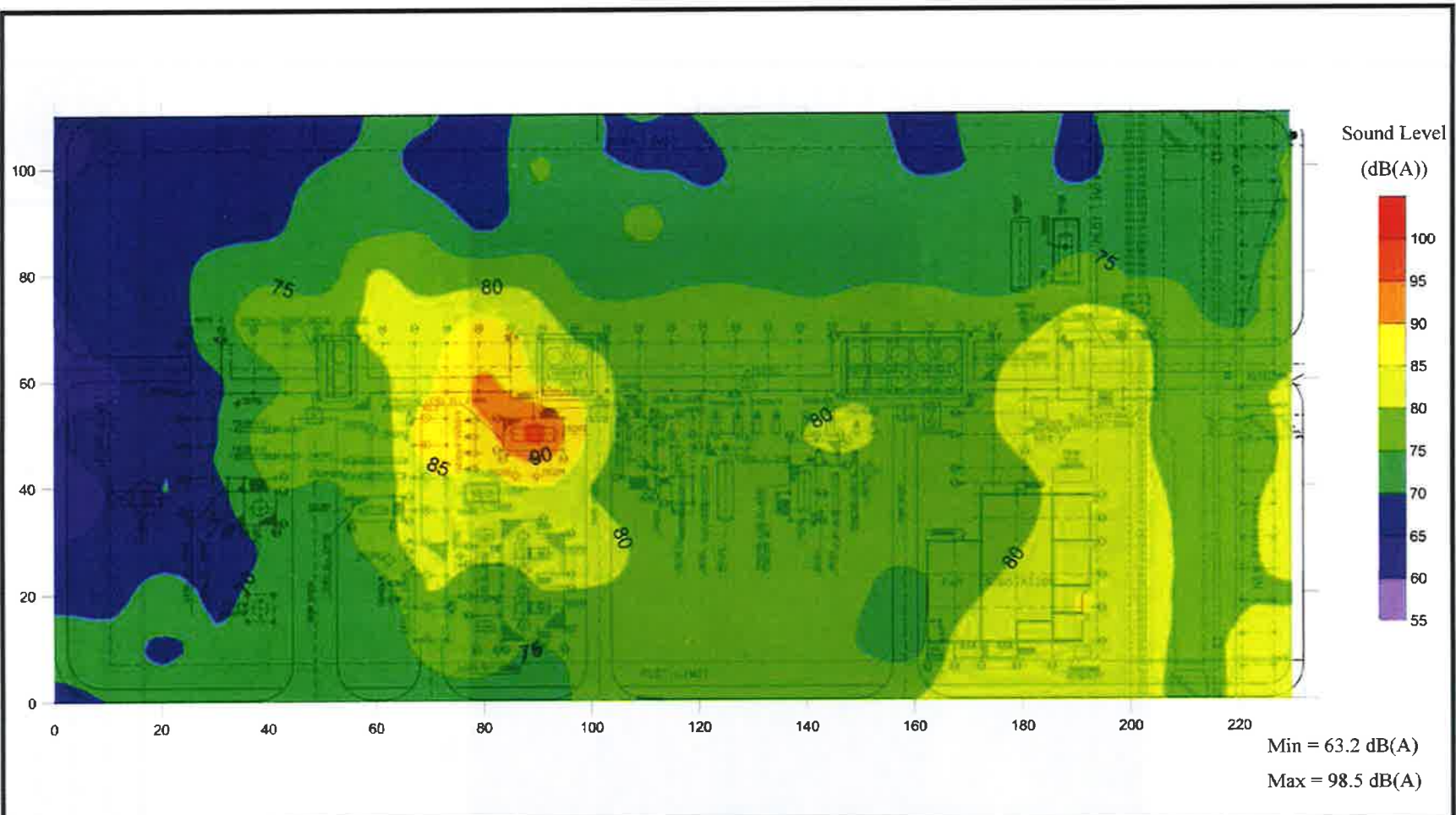
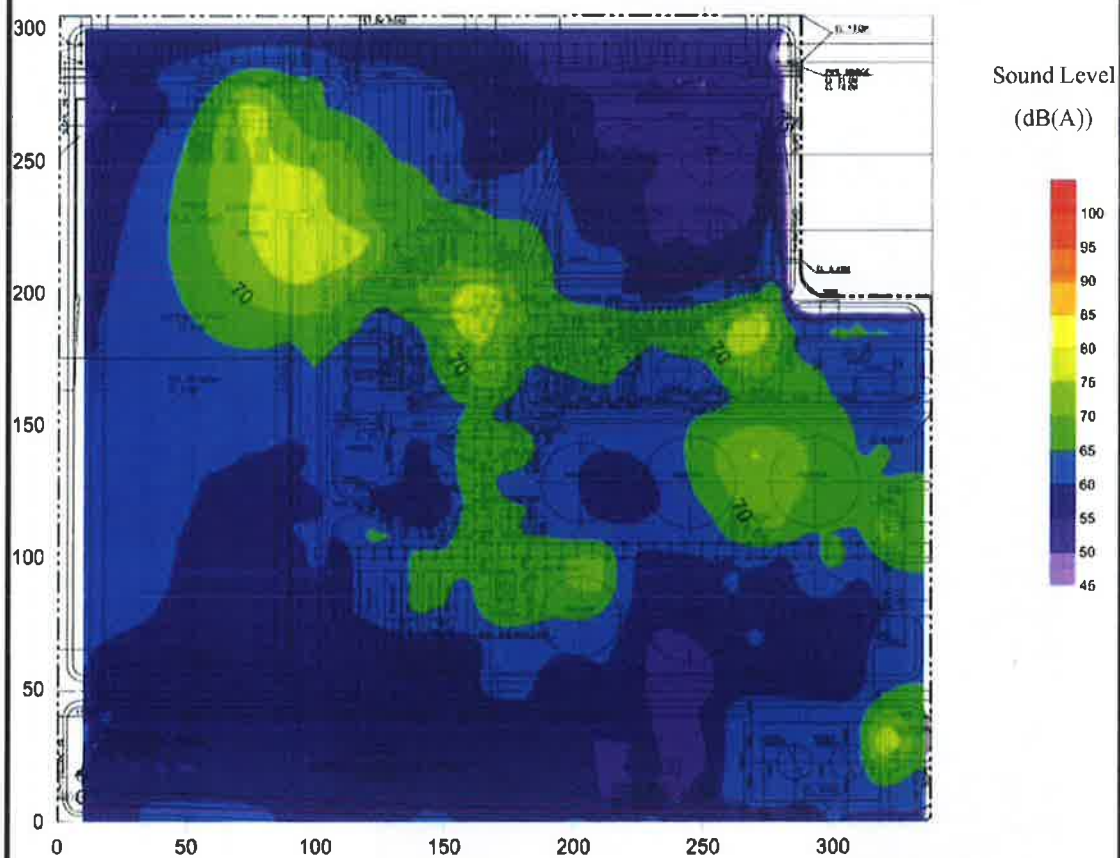


Figure 25 Noise Contour in Whole Cracked Naphtha Hydrotreating Unit (Plant 15)
Refinery Plant, Star Petroleum Refining Public Company Limited
October 2020





Min = 49.6 dB(A)

Max = 82.8 dB(A)

Figure 26 Noise Contour in Effluent Treatment Area

**Refinery Plant, Star Petroleum Refining Public Company Limited
October 2020**



