Sasol South Africa

Secunda Synfuels Operations

AEL No: Govan Mbeki *Sasol Chemical Industries* (Pty) Ltd 0016/2015/F02

Annual Emission Report

Prepared for

Gert Sibande District Municipality

31 August 2016

Reporting period: July 2015 – June 2016

Date of submission: 31 August 2016

TABLE OF CONTENTS

1. INTRODUCTION

Emission monitoring was conducted by various independent service providers. Section 3 of this document summarises the emissions measured compared to the maximum emission rates as per the Atmospheric Emission License.

2. SERVICE PROVIDERS

SGS South Africa, Levego, Future Projects and Kentz are the independent parties who did the necessary emission testing. Their contact details are shown in table 2.1.1 to 2.1.4 below.

Table 2.1.1: Levego Contact details

Physical address	Building R6, Pinelands Site Ardeer Road, Modderfontein 1645
Postal address	PO Box 422, Modderfontein 1645
Telephone No:	+27 11 608 4148
Fax No	+27 011 608 2621
Email	info@levego.co.za

Table 2.1.2: SGS Contact details

Physical address	58 Mellville Street, Booysens Johannesburg, 2135 South Africa
Postal address	P.O. Box 82582, Southdale Johannesburg, 2135 South Africa
Telephone No:	+27 11 681 2500
Fax No	+27 11 433 365
Email	envi.africa@sgs.com

Table 2.1.3: Future Projects Contact details

Physical address	480 Smuts Drive, Halfway Gardens, Midrand, Gauteng, 1685 South Africa.
Telephone No:	+27 11 052 1250
Email	info@futureprojects.co.za

Table 2.1.4: Kentz Contact details

Physical address	Secunda South Africa
Postal address	P.O. Box Johannesburg, South Africa
Telephone No:	+27 631 3080
Email	Breyten.Groenewald@snclavalin.com

3. RESULTS

3.1 EMISSIONS TESTING RESULTS

Table 3.1: Summarised sampling results for SSO: Steam Plant (sub-category 1.1), Gas Turbine (sub-category 1.4) and Rectisol (sub-category 3.6)

Point source code	Pollutant		Measured concentration: daily average	Reference AEL limit (mg/Nm^3)
B1 (U43) Main stack west	PM		See **figure 1** for online PM data	120 mg/Nm^3 at 10 % O_2
	NOx expressed as NO_2		Measurements could not be taken due to the replacement of the lift in the stack. Emission sampling is planned for November 2016	1100 mg/Nm^3 at 10 % O_2
	SO_2			3500 mg/Nm^3 at 10 % O_2
B2 (U243) Main stack east	PM		See **figure 2** for online PM data	120 mg/Nm^3 at 10 % O_2
	NOx expressed as NO_2		See **figure 3** for online NO_x data	1100 mg/Nm^3 at 10 % O_2
	SO_2		See **figure 4** for online SO_2 data	3500 mg/Nm^3 at 10 % O_2
GT1	PM		1	10 mg/Nm^3 at 15 % O_2
	NOx expressed as NO_2		62.2	300 mg/Nm^3 at 15 % O_2
	SO_2		<3	500 mg/Nm^3 at 15 % O_2
GT2	PM		2	10 mg/Nm^3 at 15 % O_2
	NOx expressed as NO_2		46	300 mg/Nm^3 at 15 % O_2
	SO_2		<3	500 mg/Nm^3 at 15 % O_2
Rectisol East (off gas to main stack)	H_2S (measured as S)		See **figure 5 & 6**	13.5 t/h max daily average during upset conditions 8400 mg/Nm^3 normal operating conditions
	Quarter 1	VOCs	124	300 mg/Nm^3
		SO_2	164	3500 mg/Nm^3
	Quarter 2	Total VOCs	26	300 mg/Nm^3
		SO_2	59	3500 mg/Nm^3
	Quarter 3	VOCs	43	300 mg/Nm^3
		SO_2	11	3500 mg/Nm^3
	Quarter 4	VOCs	58	300 mg/Nm^3
		SO_2	<3	3500 mg/Nm^3
Rectisol west (off gas to main stack)	H_2S (measured as S)		See **figure 5 & 6**	13.5 t/h max daily average during upset conditions 8400 mg/Nm^3 normal operating conditions
	Quarter 1	VOCs	216	300 mg/Nm^3
		SO_2	<3	3500 mg/Nm^3
	Quarter 2	VOCs	95	300 mg/Nm^3
		SO_2	5	3500 mg/Nm^3
	Quarter 3	VOCs	117	300 mg/Nm^3
		SO_2	<3	3500 mg/Nm^3
	Quarter 4	VOCs	54	300 mg/Nm^3
		SO_2	5	3500 mg/Nm^3

Table 3.2: Summarised sampling results for SSO: Catalyst Manufacturing (sub-category 4.2 and 4.7) and Heaters (sub-category 2.1)

Point source code	Pollutant	Measured concentration: daily average	Reference AEL limit (mg/Nm^3)
CM1 (West Kiln stack)	PM	4	100 mg/Nm^3
	NOx expressed as NO_2	119	500 mg/Nm^3
	SO_2	113	2000 mg/Nm^3
CM2 (West Arc Furnace Stack)	PM	4	100 mg/Nm^3
	NOx expressed as NO_2	36	500 mg/Nm^3
	SO_2	<3	500 mg/Nm^3
CM3 (East Kiln A Stack)	PM	Sampling was done during plant operational challenges. Resampling was done - awaiting results which will be submitted to the authorities once received	100 mg/Nm^3
	NOx expressed as NO_2		500 mg/Nm^3
	SO_2		2000 mg/Nm^3
CM4 (East Arc Furnace Stack)	PM	Sampling was done during plant operational challenges. Resampling will be done once kiln B is back in operation and feed to CM4 on normal load.	100 mg/Nm^3
	NOx expressed as NO_2		500 mg/Nm^3
	SO_2		500 mg/Nm^3
CM5 (East Kiln B Stack)	PM	Sampling was done during plant operational challenges. Kiln B is out of commission due to trust rollers being repaired. Measurement will be done once the kiln is back in operation. Results will be submitted once available in monthly emissions report.	100 mg/Nm^3
	NOx expressed as NO_2		500 mg/Nm^3
	SO_2		2000 mg/Nm^3
R1 (14HT101)*	NOx expressed as NO_2	146	1700 mg/Nm^3 at 10 % O_2
	SO_2	18	1700 mg/Nm^3 at 10 % O_2
R2(14HT201)*	NOx expressed as NO_2	172	1700 mg/Nm^3 at 10 % O_2
	SO_2	2	1700 mg/Nm^3 at 10 % O_2
R3(214HT101)*	NOx expressed as NO_2	Could not be measured due to access limitation. Emissions expected to be in line with the other heaters.	1700 mg/Nm^3 at 10 % O_2
	SO_2		1700 mg/Nm^3 at 10 % O_2
R4(214HT201)*	NOx expressed as NO_2	130	1700 mg/Nm^3 at 10 % O_2
	SO_2	30	1700 mg/Nm^3 at 10 % O_2
R5(228HT101)*	NOx expressed as NO_2	124	1700 mg/Nm^3 at 10 % O_2
	SO_2	23	1700 mg/Nm^3 at 10 % O_2
R6 (30HT101)*	NOx expressed as NO_2	95	1700 mg/Nm^3 at 10 % O_2
	SO_2	82	1700 mg/Nm^3 at 10 % O_2
R7 (30HT102)*	NOx expressed as NO_2	123	1700 mg/Nm^3 at 10 % O_2
	SO_2	37	1700 mg/Nm^3 at 10 % O_2

* Internal project underway to assess the feasibility to install sampling ports on Refining heaters in order to undertake isokinetic sampling for PM. The PM emission results from the heaters should be similar to the PM emissions measured at another heater in a different plant since Refining heaters use the same fuel gas and similar design (Octene Train 1 HT101) with PM results of 10 mg/Nm^3

Table 3.2: Summarised sampling results for SSO: Heaters (sub-category 2.1) (continued)

Point source code	Pollutant	Measured concentration: daily average	Reference AEL limit (mg/Nm^3)
R8 (30HT103)*	NOx expressed as NO_2	73	1700 mg/Nm^3 at 10 % O_2
	SO_2	16	1700 mg/Nm^3 at 10 % O_2
R9 (30HT104)*	NOx expressed as NO_2	65	1700 mg/Nm^3 at 10 % O_2
	SO_2	7	1700 mg/Nm^3 at 10 % O_2
R10 (30HT105)*	NOx expressed as NO_2	60	1700 mg/Nm^3 at 10 % O_2
	SO_2	7	1700 mg/Nm^3 at 10 % O_2
R11 (230HT101)*	NOx expressed as NO_2	104	1700 mg/Nm^3 at 10 % O_2
	SO_2	26	1700 mg/Nm^3 at 10 % O_2
R12 (230HT102)*	NOx expressed as NO_2	84	1700 mg/Nm^3 at 10 % O_2
	SO_2	172	1700 mg/Nm^3 at 10 % O_2
R13 (230HT103)*	NOx expressed as NO_2	88	1700 mg/Nm^3 at 10 % O_2
	SO_2	255	1700 mg/Nm^3 at 10 % O_2
R14 (230HT104)*	NOx expressed as NO_2	67	1700 mg/Nm^3 at 10 % O_2
	SO_2	84	1700 mg/Nm^3 at 10 % O_2
R15 (230HT105)*	NOx expressed as NO_2	101	1700 mg/Nm^3 at 10 % O_2
	SO_2	15	1700 mg/Nm^3 at 10 % O_2
R17 (34HT101)*	NOx expressed as NO_2	64	1700 mg/Nm^3 at 10 % O_2
	SO_2	22	1700 mg/Nm^3 at 10 % O_2
R18 (234HT101)*	NOx expressed as NO_2	77	1700 mg/Nm^3 at 10 % O_2
	SO_2	17	1700 mg/Nm^3 at 10 % O_2
R19 (35HT101)*	NOx expressed as NO_2	89	1700 mg/Nm^3 at 10 % O_2
	SO_2	12	1700 mg/Nm^3 at 10 % O_2
R20 (35HT102)*	NOx expressed as NO_2	70	1700 mg/Nm^3 at 10 % O_2
	SO_2	11	1700 mg/Nm^3 at 10 % O_2
R22 (235HT101)*	NOx expressed as NO_2	107	1700 mg/Nm^3 at 10 % O_2
	SO_2	29	1700 mg/Nm^3 at 10 % O_2
R23 (235HT102)*	NOx expressed as NO_2	Measurements could not be done due to electrical problems with sampling equipment. Measurement scheduled for FY17 quarter 2	1700 mg/Nm^3 at 10 % O_2
	SO_2		1700 mg/Nm^3 at 10 % O_2
R24 (35HT103)*	NOx expressed as NO_2	35	1700 mg/Nm^3 at 10 % O_2
	SO_2	13	1700 mg/Nm^3 at 10 % O_2

* Internal project underway to assess the feasibility to install sampling ports on Refining heaters in order to undertake isokinetic sampling for PM. The PM emission results from the heaters should be similar to the PM emissions measured at another heater in a different plant since Refining heaters use the same fuel gas and similar design (Octene Train 1 HT101) with PM results of 10 mg/Nm^3

Table 3.2: Summarised sampling results for SSO: Heaters (sub-category 2.1) (continued)

Point source code	Pollutant	Measured concentration: daily average	Reference AEL limit (mg/Nm^3)
R25 (35HT104)*	NOx expressed as NO_2	68	1700 mg/Nm^3 at 10 % O_2
	SO_2	12	1700 mg/Nm^3 at 10 % O_2
R26 (35HT105)*	NOx expressed as NO_2	57	1700 mg/Nm^3 at 10 % O_2
	SO_2	12	1700 mg/Nm^3 at 10 % O_2
R27 (29HT101)*	NOx expressed as NO_2	87	1700 mg/Nm^3 at 10 % O_2
	SO_2	2	1700 mg/Nm^3 at 10 % O_2
R28 (29HT102)*	NOx expressed as NO_2	76	1700 mg/Nm^3 at 10 % O_2
	SO_2	25	1700 mg/Nm^3 at 10 % O_2
R29 (229HT101)*	NOx expressed as NO_2	108	1700 mg/Nm^3 at 10 % O_2
	SO_2	40	1700 mg/Nm^3 at 10 % O_2
R30 (33HT101)*	NOx expressed as NO_2	86	1700 mg/Nm^3 at 10 % O_2
	SO_2	7	1700 mg/Nm^3 at 10 % O_2
R31 (33HT102)*	NOx expressed as NO_2	67	1700 mg/Nm^3 at 10 % O_2
	SO_2	10	1700 mg/Nm^3 at 10 % O_2
R32 (33HT105)*	NOx expressed as NO_2	76	1700 mg/Nm^3 at 10 % O_2
	SO_2	13	1700 mg/Nm^3 at 10 % O_2
R33 (233HT101)*	NOx expressed as NO_2	54	1700 mg/Nm^3 at 10 % O_2
	SO_2	110	1700 mg/Nm^3 at 10 % O_2
R34 (233HT102)*	NOx expressed as NO_2	87	1700 mg/Nm^3 at 10 % O_2
	SO_2	44	1700 mg/Nm^3 at 10 % O_2
R35 (233HT105)*	NOx expressed as NO_2	87	1700 mg/Nm^3 at 10 % O_2
	SO_2	44	1700 mg/Nm^3 at 10 % O_2
R36 (32HT101)*	NOx expressed as NO_2	49	1700 mg/Nm^3 at 10 % O_2
	SO_2	15	1700 mg/Nm^3 at 10 % O_2
R37 (32HT201)*	NOx expressed as NO_2	53	1700 mg/Nm^3 at 10 % O_2
	SO_2	11	1700 mg/Nm^3 at 10 % O_2
R38 (32HT102)*	NOx expressed as NO_2	57	1700 mg/Nm^3 at 10 % O_2
	SO_2	30	1700 mg/Nm^3 at 10 % O_2
R39 (232HT101)*	NOx expressed as NO_2	86	1700 mg/Nm^3 at 10 % O_2
	SO_2	133	1700 mg/Nm^3 at 10 % O_2
R40 (232HT201)*	NOx expressed as NO_2	69	1700 mg/Nm^3 at 10 % O_2
	SO_2	33	1700 mg/Nm^3 at 10 % O_2
R41 (232HT102)*	NOx expressed as NO_2	44	1700 mg/Nm^3 at 10 % O_2
	SO_2	121	1700 mg/Nm^3 at 10 % O_2

* Internal project underway to assess the feasibility to install sampling ports on Refining heaters in order to undertake isokinetic sampling for PM. The PM emission results from the heaters should be similar to the PM emissions measured at another heater in a different plant since Refining heaters use the same fuel gas and similar design (Octene Train 1 HT101) with PM results of 10 mg/Nm^3

Table 3.3: Summarised sampling results for SSO: SCC (sub-category 2.2), WSA (sub-category 7.2), Carbo Tar (sub-category 3.3), Phenosolvan (sub-category 3.6) and Storage Tanks (sub-categories 3.3)

Point source code	Pollutant	Measured concentration: daily average	Reference AEL limit (mg/Nm^3)
SCC 1 stack	PM	209	330 mg/Nm^3 at 10 % O_2
	SO_2	<2	3000 mg/Nm^3 at 10 % O_2
	NOx expressed as NO_2	14	550 mg/Nm^3 at 10 % O_2
WSA	SO_2	260	2800 mg/Nm^3
	SO_3	15	100 mg/Nm^3
	NOx expressed as NO_2	59	2000 mg/Nm^3
P1/P2 (Unit 016)	VOCs	Outstanding sampling results from service provider. Measurements in accordance with licence condition 7.6 which requires Sasol to determine actual emission values from 1 April 2015 to 31 March 2018	250 mg/Nm^3
P3/P4 (Unit 216)	VOCs		250 mg/Nm^3
FFP 1, 2, 3, 4 and 5.	VOCs	5 105 This common vent will be addressed in the Tar Value Chain Phase 1 project as included in air quality improvement roadmap	250 mg/Nm^3
CT 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 and 13	VOCs	CT 1 (039TK101): Outstanding sampling results from service provider. CT 2 (039TK102): Outstanding sampling results from service provider. CT 3, 4, 5 (039 TK 103, 104, 105 - common vent) – Outstanding sampling results from service provider. . CT 6, 7, 8, 9 (39TK112, 113, 114, 115): Tanks not in use and empty	250 mg/Nm^3
Storage tanks (15TK101 and 215TK101)	VOCs	Refer to Table 3.7 – LDAR results	Tanks are also monitored as per Fugitive Emissions Monitoring Plan and are included in the LDAR program
Progress on installation of floating devices	Following internal research and governance processes on Evapostop discs, Sasol has concluded that this technology is an equally effective alternative to internal floating roofs. Preparations are underway to be ready for the first installation opportunity on the first available tank which is planned to be taken out of operation in February 2017, in line with the communicated implementation schedule, as per the implementation schedule provided to the DEA during the 2014 postponement application.		

Table 3.4: Summarised results for Water and Ash Plant (sub-category 8.1) (Quarter1: July to September 2015)

* These point sources were the subject of postponement applications in 2015. However, at that stage, there was not sufficient data available for the National Air Quality Officer and the local licensing authority to determine an alternative emission limit and on this basis, the emission limits contained in the Minimum Emission Standards were included. In accordance with licence condition 7.6 which requires Sasol to determine actual emission values from 1 April 2015 to 31 March 2018, Secunda Synfuels Operations is conducting additional monitoring which will be used to inform further postponement applications to be submitted.

POLLUTANTS	WATER & ASH PLANT: SAMPLING SOURCES										
	HOW1 (052CI-101)	HOW2 (252CI-101)	Reference maximum release rate in AEL	WA1 (052 WK-2102)	WA2 (052 WK-2202)	WA3 (252 WK-2102)	WA4 (252 WK-2202)	WRF	Reference maximum release rate in AEL	SW1 (353IN101)	Reference maximum release rate in AEL
Particulate matter (PM) [mg/Nm^3 @ 10% O_2]	44*	100*	**400**	132*	223*	244*	This sampling source was not tested during Quarter 1 (July -Sept 15) due to plant's unavailability	33*	**300**	37*	**25**
CO [mg/Nm^3 @ 10% O_2]	<5.4*	1421*	**75**	2156*	3398*	2531*		94*	**3000**	171*	**75**
SO_2 [mg/Nm^3 @ 10% O_2]	171*	289*	**50**	208*	<7.7*	472*		84*	**70**	<8.16*	**50**
NO_x expressed as NO_2 [mg/Nm^3 @ 10 O_2]	1875*	2810*	**1600**	215*	493*	606*		178*	**500**	185*	**200**
HCl [mg/Nm^3 @ 10% O_2]	<1.9*	<1.74*	**10**	<0.93*	<1.21*	<1.2*		<0.6*	**12**	<1.57*	**10**
HF [mg/Nm^3 @ 10% O2]	<0.39*	0.35*	**1**	0.38*	<0.24*	0.85*		<0.12*	**20**	<0.314*	**1**
Pb+As+Sb+Cr+Co+Cu+Mn+Ni+V [mg/Nm^3 @ 10% O_2]	1.06*	0.8*	**21**	0.21*	0.39*	1.79*		0.51*	**1**	0.47*	**0.5**
Hg [mg/Nm^3 @ 10% O_2]	<0.03*	<0.02*	**0.27**	<0.04*	<0.31*	<0.14*		<0.01*	**0.5**	<0.019*	**0.05**
Cd+ Tl [mg/Nm^3 @ 10% O_2]	<0.01*	<0.009*	**0.12**	<0.006*	<0.007*	<0.015*		<0.01*	**0.12**	<0.009*	**0.05**
TOC [mg/Nm^3 @ 10% O_2]	25*	21*	**10**	532*	NM[1]	94*		4*	**10**	23*	**10**
NH_3 [mg/Nm^3 @ 10% O_2]	6*	1*	**10**	11*	19*	9*		<0.22*	**30**	0.8*	**10**
Dioxins + Furans [ng.Nm^{-3} I-TEQ @ 10% O_2]	<0.06*	0.2*	**0.1**	<0.023*	0.25*	0.02*		0.02*	**0.1**	<0.025*	**0.1**
Exit Temperature [^{o}C]	384	368	**300-400**	66	62	66		567	**NA**	368	**300-400**
Measured Oxygen (%)	18.4	18.4	**NA**	15.2	16.7	15.9		14.5	**NA**	17.1	**NA**
Sampling dates	02-04 Sept 2015	21-23 Jul 2015	**NA**	03-06 Aug 2015	09-11 Sept 2015	17, 24, 28 Jul 2015		20-26 Aug 2015	**NA**	30-31 Jul & 7 Aug 2015	**NA**
Normal corrected (N) = conditions of pressure (101.3 kPa) and temperature (0°C or 273 K) dry basis at 10% reference O_2											

[1] NM: Not measured due to plant's unavailability.

Table 3.5: Summarised results for Water and Ash Plant (sub-category 8.1) (Quarter2: October to December 2015)

* These point sources were the subject of postponement applications in 2015. However, at that stage, there was not sufficient data available for the National Air Quality Officer and the local licensing authority to determine an alternative emission limit and on this basis, the emission limits contained in the Minimum Emission Standards were included. In accordance with licence condition 7.6 which requires Sasol to determine actual emission values from 1 April 2015 to 31 March 2018, Secunda Synfuels Operations is conducting additional monitoring which will be used to inform further postponement applications to be submitted.

POLLUTANTS	WATER & ASH PLANT: SAMPLING SOURCES										
	HOW1 (052CI-101)	**HOW2 (252CI-101)**	**Reference maximum release rate in AEL**	**WA1 (052 WK- 2102)**	**WA2 (052 WK-2202)**	**WA3 (252 WK-2102)**	**WA4 (252 WK-2202)**	**WRF**	**Reference maximum release rate in AEL**	**SW1 (353IN101)**	**Reference maximum release rate in AEL**
Particulate matter (PM) [mg/Nm^3 @ 10% O_2]	49*	11*	**400**	136*	186*	151*	137*	Outstanding Sampling campaign	**300**	23*	**25**
CO [mg/Nm^3 @ 10% O_2]	<4*	<5*	**75**	2329*	2643*	2328*	1635*		**3000**	104*	**75**
SO_2 [mg/Nm^3 @ 10% O_2]	205*	84*	**50**	25*	<7*	16*	88*		**70**	11*	**50**
NO_x expressed as NO_2 [mg/Nm^3 @ 10 O_2]	2021*	2617*	**1600**	499*	331*	499*	244*		**500**	159*	**200**
HCl [mg/Nm^3 @ 10% O_2]	2.7*	1.6*	**10**	2.1*	<1*	2.1*	1.7*		**12.0**	<3*	**10**
HF [mg/Nm^3 @ 10% O2]	<0.3*	0.3*	**1**	0.6*	0.4*	0.3*	0.4*		**20**	<0.6*	**1**
Pb+As+Sb+Cr+Co+Cu+Mn+Ni+V [mg/Nm^3 @ 10% O_2]	0.043*	0.96*	**21**	0.55*	1.27*	2.0*	0.76*		**1**	0.67*	**0.5**
Hg [mg/Nm^3 @ 10% O_2]	0.031*	0.051*	**0.27**	0.082*	<0.018*	0.084*	0.019*		**0.5**	0.016*	**0.05**
Cd+ Tl [mg/Nm^3 @ 10% O_2]	<0.008*	<0.010*	**0.12**	0.009*	<0.010*	0.009*	0.007*		**0.12**	0.022*	**0.05**
TOC [mg/Nm^3 @ 10% O_2]	24*	28*	**10**	348*	889*	440*	287*		**10**	63*	**10**
NH_3 [mg/Nm^3 @ 10% O_2]	2.9*	1.6*	**10**	45.0*	19.0*	19.0*	57.0*		**30.0**	2.4*	**10**
Dioxins + Furans [ng.Nm^{-3} I-TEQ @ 10% O_2]	<0.077*	0.6*	**0.1**	<0.025*	<0.1*	<0.035*	0.03*		**0.1**	0.69*	**0.1**
Exit Temperature [^{o}C]	375	281	**300-400**	65	65	62	64		**NA**	322	**300-400**
Measured Oxygen (%)	17.1	17.06	**NA**	15.65	16.01	15.65	16.32		**NA**	17.62	**NA**
Sampling dates	3-4 Feb 16 & 18 Nov 15	4,5,25 Nov 2015	**NA**	3,4,12 Feb 16	27 Oct & 27 Nov 2015	26 Nov15& 11,16 Feb 16	26 Feb & 1-2 Mar 2016		**NA**	29Oct,01Dec 15&16Feb16	**NA**
Normal (N) = conditions of pressure (101.3 kPa) and temperature (0°C or 273 K) dry basis at 10% reference O_2											

Table 3.6: Summarised results for Water and Ash Plant (sub-category 8.1) (Quarter3: January to March 2016)

* These point sources were the subject of postponement applications in 2015. However, at that stage, there was not sufficient data available for the National Air Quality Officer and the local licensing authority to determine an alternative emission limit and on this basis, the emission limits contained in the Minimum Emission Standards were included. In accordance with licence condition 7.6 which requires Sasol to determine actual emission values from 1 April 2015 to 31 March 2018, Secunda Synfuels Operations is conducting additional monitoring which will be used to inform further postponement applications to be submitted.

POLLUTANTS	WATER & ASH PLANT: SAMPLING SOURCES										
	HOW1 (052CI-101)	HOW2 (252CI-101)	Reference maximum release rate in AEL	WA1 (052 WK- 2102)	WA2 (052 WK-2202)	WA3 (252 WK-2102)	WA4 (252 WK-2202)	WRF	Reference maximum release rate in AEL	SW1 (353IN101)	Reference maximum release rate in AEL
Particulate matter (PM) [mg/Nm^3 @ 10% O_2]	18*	5*	**400**	149*	165*	333*	179*	Outstanding Sampling campaign due to Plant operational challenges	**300**	23*	**25**
CO [mg/Nm^3 @ 10% O_2]	<5*	102*	**75**	2598*	2014*	3016*	2079*		**3000**	615*	**75**
SO_2 [mg/Nm^3 @ 10% O_2]	113*	510*	**50**	<7*	8*	<6*	103*		**70**	<8*	**50**
NO_x expressed as NO_2 [mg/Nm^3 @ 10 O_2]	2295*	4150*	**1600**	534*	389*	482*	295*		**500**	145*	**200**
HCl [mg/Nm^3 @ 10% O_2]	2.2*	<2.62*	**10**	<3.85*	<4.46*	9.1*	2.0*		**12.0**	<1.54*	**10**
HF [mg/Nm^3 @ 10% O2]	1.72*	0.75*	**1**	<2.5*	0.23*	1.49*	0.29*		**20**	<0.31*	**1**
Pb+As+Sb+Cr+Co+Cu+Mn+Ni+V [mg/Nm^3 @ 10% O_2]	1.7*	1.03*	**21**	0.63*	0.50*	7.4*	1.34*		**1**	0.24*	**0.5**
Hg [mg/Nm^3 @ 10% O_2]	<0.017*	<0.015*	**0.27**	0.13*	<0.29*	0.53*	0.14*		**0.5**	<0.01*	**0.05**
Cd+ Tl [mg/Nm^3 @ 10% O_2]	<0.007*	<0.011*	**0.12**	0.014*	0.014*	0.064*	<0.014*		**0.12**	0.008*	**0.05**
TOC [mg/Nm^3 @ 10% O_2]	18*	18*	**10**	357*	747*	NM[2]	223* 326*		**10**	148*	**10**
NH_3 [mg/Nm^3 @ 10% O_2]	33.7*	1.9*	**10**	24.3*	22.0*	36.8*	78.1*		**30.0**	2.6*	**10**
Dioxins + Furans [ng.Nm^{-3} I-TEQ @ 10% O_2]	0.15*	0.24*	**0.1**	0.05*	0.14*	0.03*	0.04*		**0.1**	0.03*	**0.1**
Exit Temperature [^{o}C]	398	334	**300-400**	57	67	66	67		**NA**	364	**300-400**
Measured Oxygen (%)	17.91	18.45	**NA**	16.45	15.73	15.66	16.21		**NA**	16.75	**NA**
Sampling dates	26-27 & 29 Jan& 01Feb16	19, 21-22 & 25 Jan 2016	**NA**	14,20 Jan & 01 Jul 16	4 Feb, 15Apr, 16 May&16 Jun16	5,9 &12 Feb 2016	23-29 Feb & 4 Mar 16		**NA**	12 Jan & 5, 10-11 Feb16	**NA**
Normal (N) = conditions of pressure (101.3 kPa) and temperature (0°C or 273 K) dry basis at 10% reference O_2											

[2] NM: Not measured due to plant's unavailability.

Table 3.7: Summarised results for Water and Ash Plant (sub-category 8.1) (Quarter4: April to June 2016)

* These point sources were the subject of postponement applications in 2015. However, at that stage, there was not sufficient data available for the National Air Quality Officer and the local licensing authority to determine an alternative emission limit and on this basis, the emission limits contained in the Minimum Emission Standards were included. In accordance with licence condition 7.6 which requires Sasol to determine actual emission values from 1 April 2015 to 31 March 2018, Secunda Synfuels Operations is conducting additional monitoring which will be used to inform further postponement applications to be submitted.

POLLUTANTS	WATER & ASH PLANT: SAMPLING SOURCES										
	HOW1 (052CI-101)	HOW2 (252CI-101)	Reference maximum release rate in AEL	WA1 (052 WK- 2102)	WA2 (052 WK-2202)	WA3 (252 WK-2102)	WA4 (252 WK-2202)	WRF	Reference maximum release rate in AEL	SW1 (353IN101)	Reference maximum release rate in AEL
Particulate matter (PM) [mg/Nm^3 @ 10% O_2]	5*	52*	**400**	314*	88*	202*	50*	Outstanding Sampling campaign due to Plant operational challenges	**300**	25*	**25**
CO [mg/Nm^3 @ 10% O_2]	49*	<5*	**75**	4212*	3121*	1898*	1898*		**3000**	9*	**75**
SO_2 [mg/Nm^3 @ 10% O_2]	172*	503*	**50**	<23*	<7*	124*	26*		**70**	60*	**50**
NO_x expressed as NO_2 [mg/Nm^3 @ 10 O_2]	2295*	2979*	**1600**	324*	516*	446*	241*		**500**	220*	**200**
HCl [mg/Nm^3 @ 10% O_2]	<8*	13*	**10**	<8*	31*	<5.63*	<6*		**12.0**	4.3*	**10**
HF [mg/Nm^3 @ 10% O2]	<0.39*	<0.46*	**1**	0.6*	0.71*	<0.38*	<0.30*		**20**	6.95*	**1**
Pb+As+Sb+Cr+Co+Cu+Mn+Ni+V [mg/Nm^3 @ 10% O_2]	0.4*	0.9*	**21**	0.35*	0.41*	1.13*	1.2*		**1**	0.28*	**0.5**
Hg [mg/Nm^3 @ 10% O_2]	<0.018*	<0.02*	**0.27**	<0.041*	<0.053*	<0.063*	<0.21*		**0.5**	<0.018*	**0.05**
Cd+ Tl [mg/Nm^3 @ 10% O_2]	<0.008*	<0.01*	**0.12**	<0.012*	0.008*	<0.009*	0.015*		**0.12**	0.009*	**0.05**
TOC [mg/Nm^3 @ 10% O_2]	25*	61*	**10**	482*	364*	355*	112*		**10**	141*	**10**
NH_3 [mg/Nm^3 @ 10% O_2]	5*	24*	**10**	42*	65*	30*	<0.72*		**30.0**	<0.52*	**10**
Dioxins + Furans [ng.Nm^{-3} I-TEQ @ 10% O_2]	0.12*	0.4*	**0.1**	0.064*	0.044*	0.035*	0.10*		**0.1**	0.043*	**0.1**
Exit Temperature [^{o}C]	373	344	**300-400**	58	64	67	64		**NA**	366	**300-400**
Measured Oxygen (%)	17.96	18.32	**NA**	17.84	16.58	16.12	16.36		**NA**	16.56	**NA**
Sampling dates	17-18 May & 14 Jun16	12-13 May & 09 Jun16	**NA**	28-30 Jun 16	20, 25 May & 10 Jun16	23-24 & 30 Jun 16	26 Apr, 05 May 19 Jul 16		**NA**	27 May, 3 Jun 27 Jun 16	**NA**
Normal (N) = conditions of pressure (101.3 kPa) and temperature (0°C or 273 K) dry basis at 10% reference O_2											

Table 3.7 LDAR summarised results from June 2015 - July 2016

Unit	Number of points measured	Number of leaks detected
Unit 012-Trains 1-2	4 996	47
Unit 012-Trains 4-5	5 362	57
Unit 014	636	4
Unit 015	2 265	0
Unit 020	12 602	123
Unit 023-Train 1	3 108	440
Unit 023-Train 2	3 065	352
Unit 030	12 036	37
Unit 032	29 214	553
Unit 033	5 930	41
Unit 039	4 120	4
Unit 214	549	3
Unit 215	1 866	5
Total	85 749	1 665

A total of 1665 leaks were identified during the monitoring campaign. The final leak rate stands at 1.94% for the monitoring campaign at Secunda Synfuels Operations. Leak reports were issued to all unit managers to initiate repairs as reasonably possible.

Table 3.8 Dust fall out results

Restriction areas	Dust fall rate (D) [mg/m^2/day, 30 days average)	Permitted frequency of exceeding dust fall rate
Residential areas	D < 600	2 within a year, not sequential months
Non-residential areas	600 < D < 1200	2 within a year, not sequential months
	Dust fall out results below are within the specification for non-residential areas:	
Location of bucket	**Coal Separation East (CP1)**	**Coal Separation West (CP2)**
October 2015	63	105
November 2015	229	217
December 2015	87	138
January 2016	34	25
February 2016	36	27
March 2016	89	75
April 2016	65	99
May 2016	35	87
June 2016	62	68

4. EMISSION TRENDS

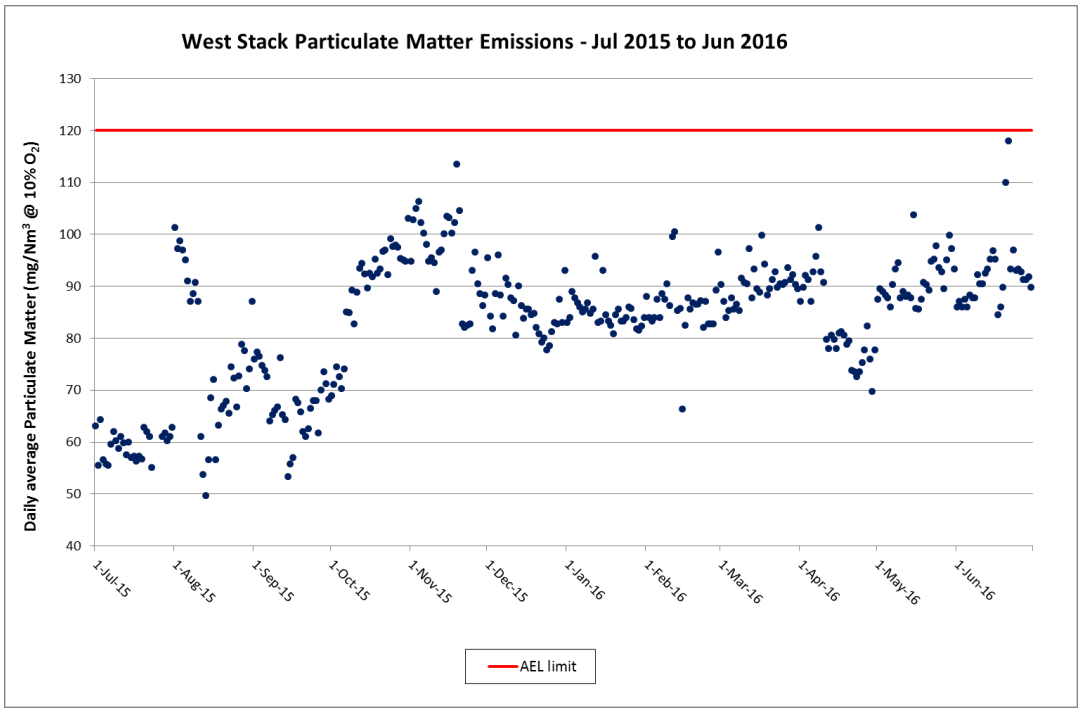

Figure 1: PM emissions for western stack

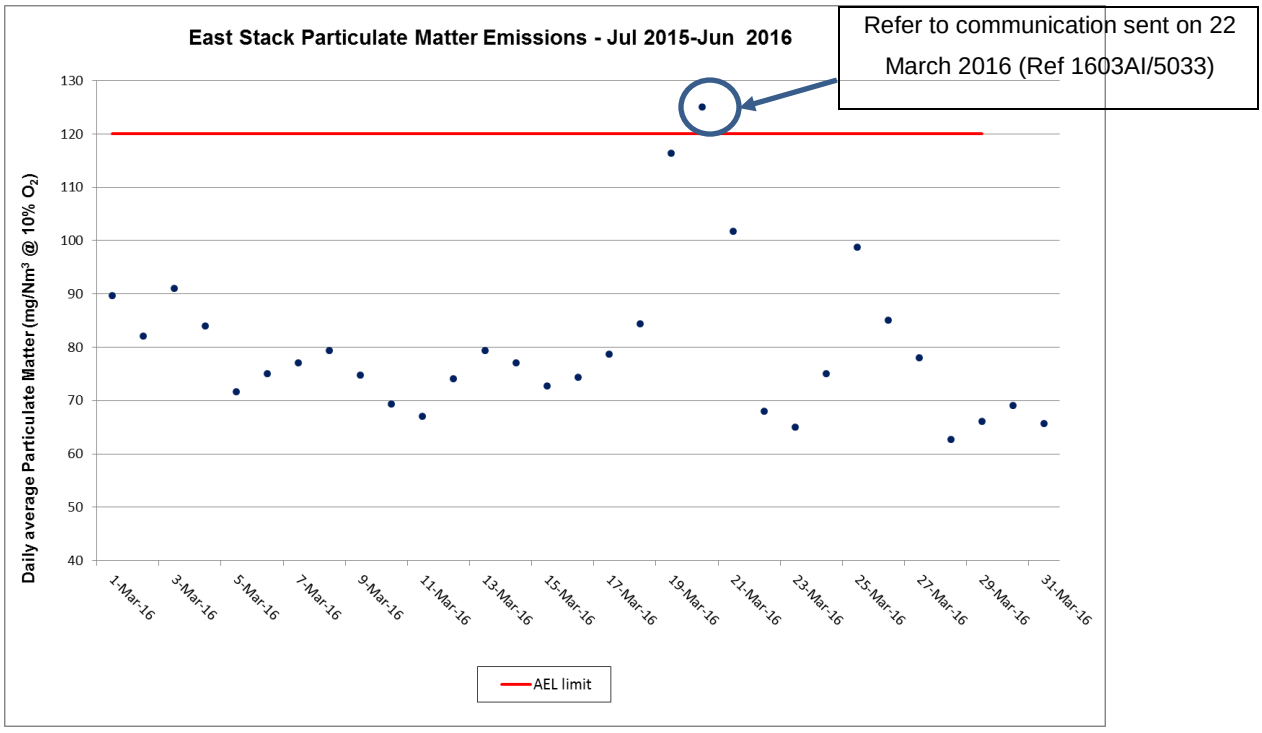

Figure 2: PM emissions from eastern stack

As per communication reference 1603AI/5033 dated 22 March 2016: The daily average particulate matter (PM) emissions from the east stack (point source code B2) exceeded the maximum emission rate on the 20th of March 2016. This was due to operational issues on boilers 3, 5, 7, 8 and 9 at steam plant east.

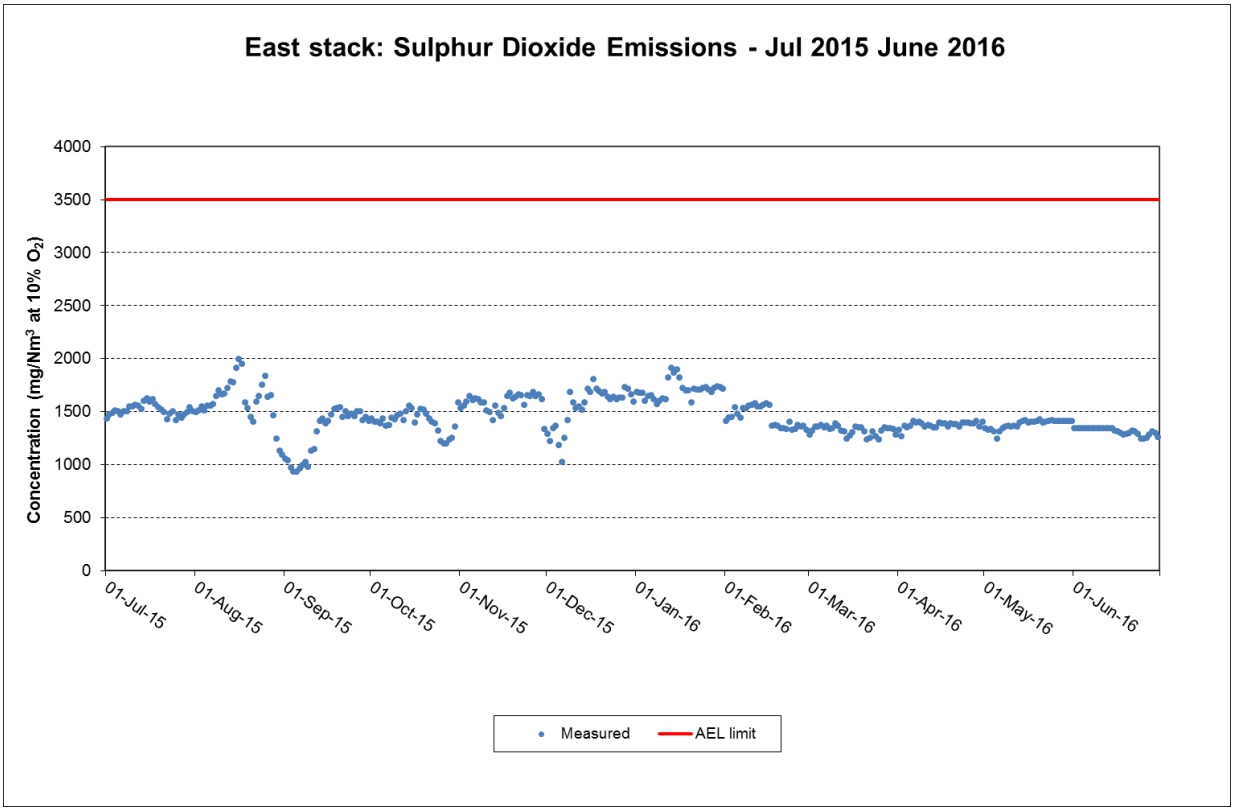

Figure 3: SO_2 emissions from eastern stack (point source code B2 (U243))

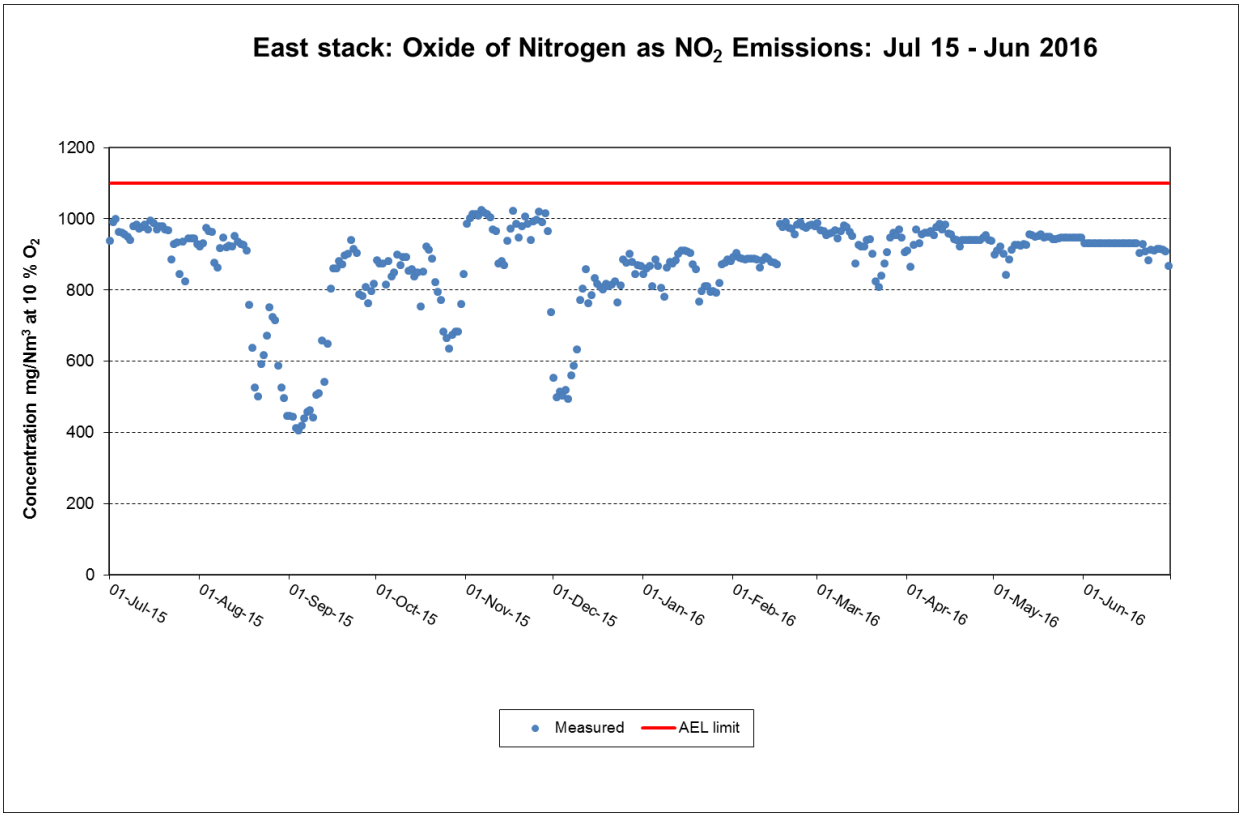

Figure 4: NO_2 emissions from eastern stack (point source code B2 (U243))

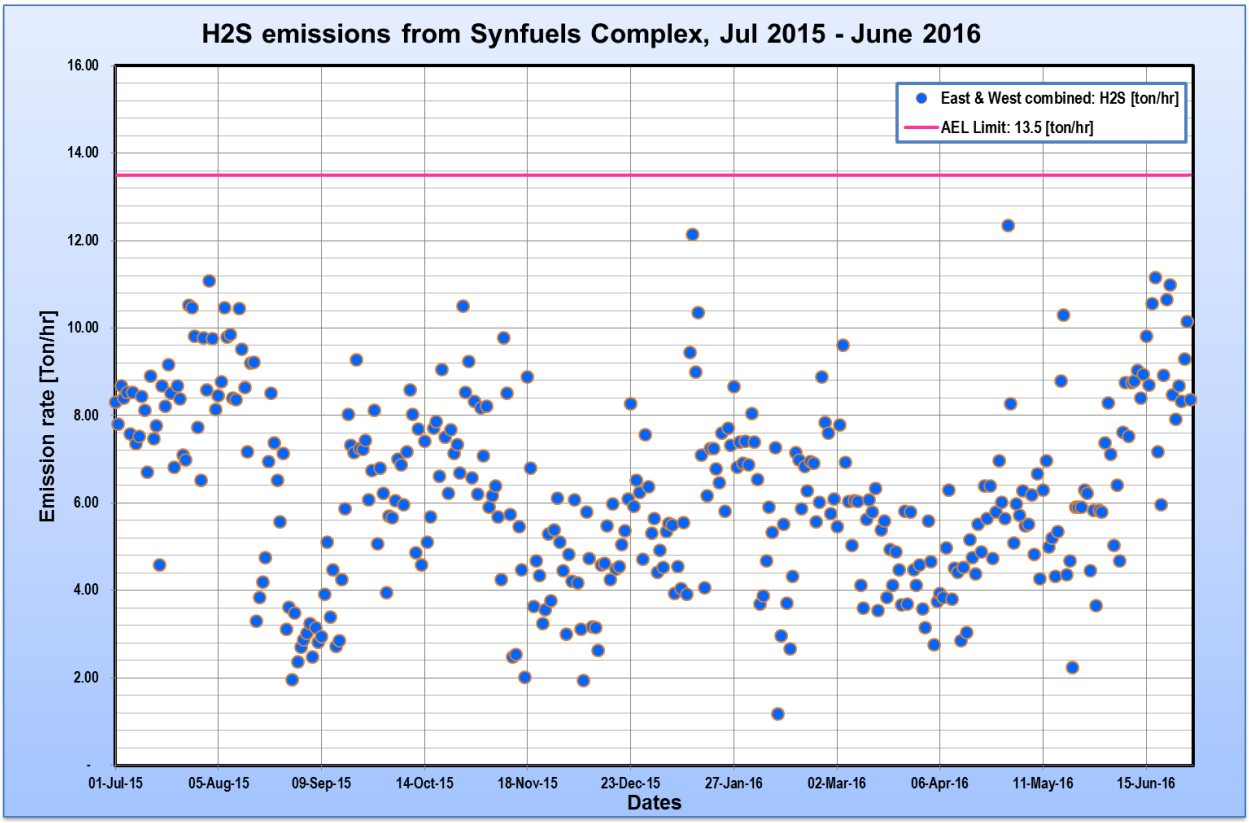

Figure 5: H_2S emissions from Sulphur Recovery 1 July 2015 to June 2016

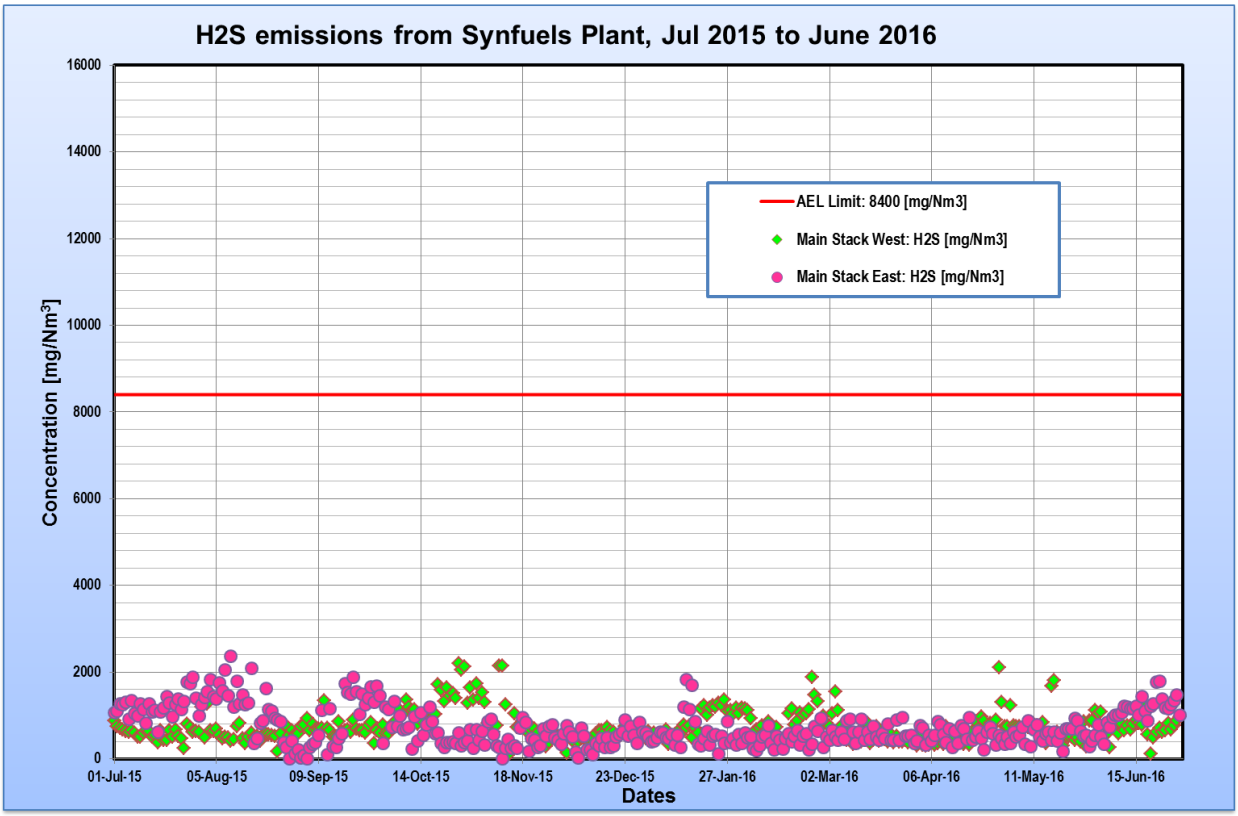

Figure 6: H_2S emissions from Sulphur Recovery 1 July 2015 to June 2016

5. COMPLIANCE AUDIT REPORTS

No compliance audit was conducted in the financial year 2016 (1 July 2015 to 30 June 2016). An external certification audit was conducted by DQS which included ISO 14001. It was concluded that the management system supports sustainability and continuous improvement.

6. MAJOR UPGRADE PROJECTS

Table 3.3.1: Major upgrades projects for Synfuels

Project description	Planned completion date	Status
VOC abatement project in tar value chain (installation of Regenerative Thermal Oxidisers)	April 2017	The construction team is working against a tight schedule to commission ahead of 31 March 2017.

7. GREENHOUSE GAS EMISSIONS

In the absence of the promulgation of the GHG Reporting Regulations, Sasol voluntarily submitted its 2015 GHG inventory to the national Department of Environmental Affairs using the prescribed IPCC mass balance approach.

8. PUBLIC CONSULTATION FORUM

In accordance with the AEL requirements, two public consultation sessions were held in Secunda (2 December 2015 and 27 June 2016) and in eMbalenhle (25 November 2015 and 27 June 2016). The attendance registers, as well as the presentations that were communicated on the respective days, are attached.

9. ACTIONS TAKEN ON COMPLAINTS RECEIVED

Complaint 1

Date complaint received	Type of complaint	Internal/External complaint
23 July 2015	Dust	Internal
Description of complaint		
Yellow dust was observed at the maintenance workshop close to the road loading area. It was expected that the dust was coming from Unit 219 which is situated close to the area.		
Actions taken		
The process at unit 219 is a batch process. It was confirmed with Unit 219 that the plant was operating under normal conditions. The dust was visible during the batch process at that time.		

Complaint 2

Date complaint received	Type of complaint	Internal/External complaint
31 July 2015	Smell	External
Description of complaint		
Strong unpleasant odour the last 2 days in Secunda – during this time of year with sinusitis issues, the smell aggravates the sinusitis.		
Actions taken		
The data recorded at the Secunda Club air quality monitoring station shows higher than normal concentrations of hydrogen sulphide (H_2S). The reason for the H_2S concentrations was due to higher than normal emissions from the sulphur recovery plants, although we were still within the limit as specified by our atmospheric emission license. During the winter periods the atmospheric conditions are very stable (unfavourable) with poor dispersion of emissions from our stacks, especially during early mornings. The temperature during the last 2 days was also much lower (cold front) which aggravated the situation.		

Complaint 3

Date complaint received	Type of complaint	Internal/External complaint
7 August 2015	Smell	Internal
Description of complaint		
An unpleasant odour was observed in the growth and management building, possibly VOC's. The central coordination team was requested to ask all plants to investigate possible sources to the oily water sewer.		
Actions taken		
A strong alcohol smell was observed from the oily water sewer channels. It was recommended that the doors to the buildings be opened to allow the smell to dissipate. After further investigation, high levels of methanol concentrations were reported in samples taken from the oily water sewer, but no root cause could be identified. It is suspected that alcohol product accidentally entered the oily water sewer, causing the smell.		

Complaint 4

Date complaint received	Type of complaint	Internal/External complaint
12 August 2015	Dust	Internal
Description of complaint		
Is the equipment at unit 219 operating under normal conditions, since we see yellow sulphur dust from the two vents at the plant.		
Actions taken		
The process at unit 219 is a batch process. It was confirmed with Unit 219 that the plant was operating under normal conditions. The dust was visible during the batch process at that time.		

Complaint 5

Date complaint received	Type of complaint	Internal/External complaint
3 November 2015	Smell	External
Description of complaint		
Mr. Van Rensburg phoned 20:10 complaining about bad smells from Synfuels. Upon further discussion with Mr. Van Rensburg, he mentioned that the smells were like sulphur and they were more prevalent during early hours of the morning and in the evening.		
Actions taken		
The data recorded at our ambient air quality monitoring station located in the Secunda residential area, shows that the wind direction was from the Synfuels factory. Although the Sulphur Recovery plants were operating within our atmospheric emission license limit, the hydrogen sulphide smell was due to the wind direction from the plant, as well as poor dispersion during the morning and evenings. The ambient monitoring station H2S data confirmed the higher concentrations which were emitted from our stacks.		

10. HIGHVELD PRIORITY AIR QUALITY MANAGEMENT PLAN AND OFFSET PROGRAM

Please find reporting document on Highveld Priority Air Quality Management Plan in Annexure 2. The offsetting plan to reduce PM and SO_2 emissions (including a Stakeholder Engagement Report with detailed Comments and Responses Report) was submitted to the National Air Quality Officer and licensing authority on 18 May 2016. Progress on the offsetting plan was also provided at the bi-annual public consultation session (see slides attached in Annexure 1). Baseline campaign activities commenced in eMbalenhle in June 2016. In Lebohang innovative solutions have been shortlisted and shared with communities and Sasol is currently in the planning phase for implementing these trial solutions. The solutions shortlisted are: insulating serviced informal houses with polyurethane foam together with a stove swop and surfacing of roads to reduce dust. Veld fire management activities continue to be managed by the SSO emergency management team.

Annexure 1

Public consultation session attendance list and presentation

Annexure 2

Highveld Priority Air Quality Management Plan