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Your Ref: 307/4

In reply please refer to:
A Borman/ivf2151

4 June 2013

Per email

HEALTH, ENVIRONMENT AND SAFETY

Mr Ossie Oswald
Regional Air Quality Practitioner
City Health
Air Quality Management
(021) 590 1419
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ossie.oswald@capetown.gov.za

Cc. J Leaner - joy.leaner@westerncape.gov.za

Dear Sir/Madam

REGISTRATION CERTIFICATE 307/4 - Annual Report 2012

With reference to Registration certificate 307/4 issued Chevron's Cape Town Refinery, we have attached the 2012 air emissions summary.

Attachment 1 contains a summary of the air emission data submitted to CAPCO on a quarterly basis.

Attachment 2 contains the average monthly SO₂ in metric tonnes per day for 2012.

1. Sulphur Dioxide (SO₂)

The annual average of total daily SO₂ emitted was 13.4 tonnes per day, well within the 22 tonnes per day limit as regulated by registration certificate number 307/4.

The daily average SO₂ emitted was below 22 tpd for the whole of 2012. This information was submitted to the City on a monthly basis.

The daily average sulfur content of all fuels used was below 2% for the whole of 2012.

The ground level concentration SO₂ measured at ambient air quality monitoring stations located in the area surrounding the refinery complied with South African ambient air quality standards for the whole of 2012.

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N Mbuyisa (Chairperson), S W E King (Chief Executive Officer - British Citizen)
Executive Directors: T J Stallbom, D J C Mendoza (US Citizen), L L Jacobs, N B Ngumbela, D C Pottenger (US Citizen)
Non-Executive Directors: M E Ramano, M I Scott, N V Tena

Reg No 1911/001154/07
Vat No. 4450161563

2. Particulate Matter

The annual average for particulate matter from the No. 1 Fluidised Catalytic Cracking Unit (FCCU) was 72 mg/m³ and 103 mg/m³ from the No. 2 FCCU.

A combination of abnormal conditions attributed to the high particulate emissions from the No.2 FCCU during May, June, August and December 2012 including:

- unplanned trips of the unit
- potential sources of catalyst attrition

Efforts to address these conditions were ongoing throughout 2012. During August 2012 a task team of Chevron FCCU experts from the United States were brought in to the refinery to assist with investigations into the operation of the No.2 FCCU. Actions taken based on the advice of Chevron's FCCU experts lead to stable plant operation during September, October and November 2012.

During December 2012 No.2 FCCU experienced 3 unplanned trips and a new source of catalyst attrition developed at the feed nozzles of the unit. Actions taken toward the end of December to reduce the attrition at this location were successful in reducing the PM emissions during January 2013.

In order to ensure the ongoing reliability of the unit, Chevron added the general maintenance and repairs required for the No.2 FCCU to the scope of the Scheduled Maintenance and Safety Inspection period planned for the refinery during February/March 2013. This enabled Chevron to carry out maintenance and repairs to mitigate suspected sources of catalyst attrition and return the unit to normal operating conditions.

The efforts to resolve these abnormal conditions were communicated to the City of Cape Town's Air Quality department in reports for the second, third and fourth quarters of 2012.

Chevron communicated to the City on 6 February 2013 that the No.2 FCCU would be shut down and followed up on the 18 March 2013 to provide feedback that the following repairs were completed during the shut down:

- Potential catalyst attrition sources were confirmed and repaired.
- Actions were taken to improve unit reliability including: cleaning of feed nozzles, removal of reactor coke and clearing of cyclone dipleg steam purge.
- Additional external inspections were performed on cyclones and no issues were identified.

We are pleased to report that PM emission results for No. 2 FCCU for February, March and April 2013 are below 100 mg/m³ and unit reliability has improved. We are continuing to monitor the unit's performance and will review the need for conducting further work during the 2014 planned maintenance shutdown. /3...

3. Fugitive emissions

The following initiatives were implemented in 2012 to reduce fugitive emissions:

a) *Leak Detection and Repair Program*

In 2007, Chevron purchased an infrared imaging camera to detect fugitive emissions in the operating areas. The camera is capable of seeing VOC emissions that are invisible to the naked eye and allows for a large number of sources to be scanned quickly and efficiently.

Two routine plant surveys plus an additional survey after the shut down were conducted on the Refinery during 2012.

Reductions of fugitive emissions were obtained by repairing the components that were found to be leaking during the surveys.

An annual report was sent to the City, and it is enclosed as **Attachment 3**.

b) *Fence line monitoring program*

Chevron's 'Annual Report for Passive VOC Monitoring at Chevron Cape Town Refinery' dated 02 May 2013 is shown in Attachment 4. This report covers the passive VOC monitoring carried out by SGS Environmental from June 2011 to June 2012 which is the sixth annual reporting period since the sampling program was instituted in June 2005.

Two new passive sampling positions were added to the program in June 2010 to monitor BTEX at the fence line in the vicinity of the Loading Bay. The Loading Bay passive is internal to the refinery and is therefore not a suitable position for assessment against ambient standards. The annual average results for the new fence line positions from June 2011 to June 2012 are well within the current national ambient standard of $10\mu\text{g}/\text{m}^3$ and the 2015 national ambient standard of $5\mu\text{g}/\text{m}^3$. In line with the conclusions from the SGS report; the passive VOC monitoring program will continue sampling at the new fence line position (Staff Parking) and discontinue sampling at the internal Loading Bay position.

A review of the data gathered since 2005 indicates that the passive fence line monitoring program has been successful in identifying potential areas of concern and tracking effectiveness of actions taken to address these. Toluene, ethyl benzene and xylene results have been well within the program guidelines throughout the monitoring program. Annual average benzene results are below the current national ambient standard ($10\mu\text{g}/\text{m}^3$) and below the monitoring program guideline and the 2015 national ambient standard ($5\mu\text{g}/\text{m}^3$) at all fence line positions.

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4. **Low NOx burners**

Low NOx burners were installed on the No. 1 Crude Unit Charge Furnace (2F-1) as well as the No. 1 Crude Unit Pre-Flash Furnace (02F201) during 2012.

5. **Opacity**

Attachment 5 shows a summary of the availability of the opacity meters on the individual furnaces and boilers. Due to a shortage of critical spares for opacity meters, the opacity meter on furnace 52-F201 was unavailable during 2012. During this time opacity was monitored visually as far as possible. This furnace fires gas only, therefore opacity episodes are not common.

Chevron has launched a capital project to replace obsolete opacity meters. **Attachment 6** shows the project schedule.

6. **Summary of Air Related Incidents**

There were three air quality related incidents during 2012:

- On 19 July 2012 a faulty excess gas control valve to flare resulted in large gas volume being routed to the flare system causing intermittent dark smoke.
- During the third and fourth quarter of 2012 the particulate emissions from No. 2 FCCU exceeded the permit limit. Please refer to Section 2 of this letter for more detail.

7. **Summary of Complaints**

Attachment 7 contains a summary of complaints related to the Refinery in 2012.

8. **Plans for 2013**

The Refinery continues to accelerate the projects as agreed upon in the environmental improvement plan submitted to the DEA. Updates on these projects continue to be discussed during quarterly meetings with key stakeholders and regulators.

The Refinery submitted an application to convert the APPA registration certificate to an Air Emissions License to the City of Cape Town during the first quarter of 2013.

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Please contact Adele Borman if you require any further details on this report.

Yours faithfully
CHEVRON SOUTH AFRICA (PTY) LIMITED



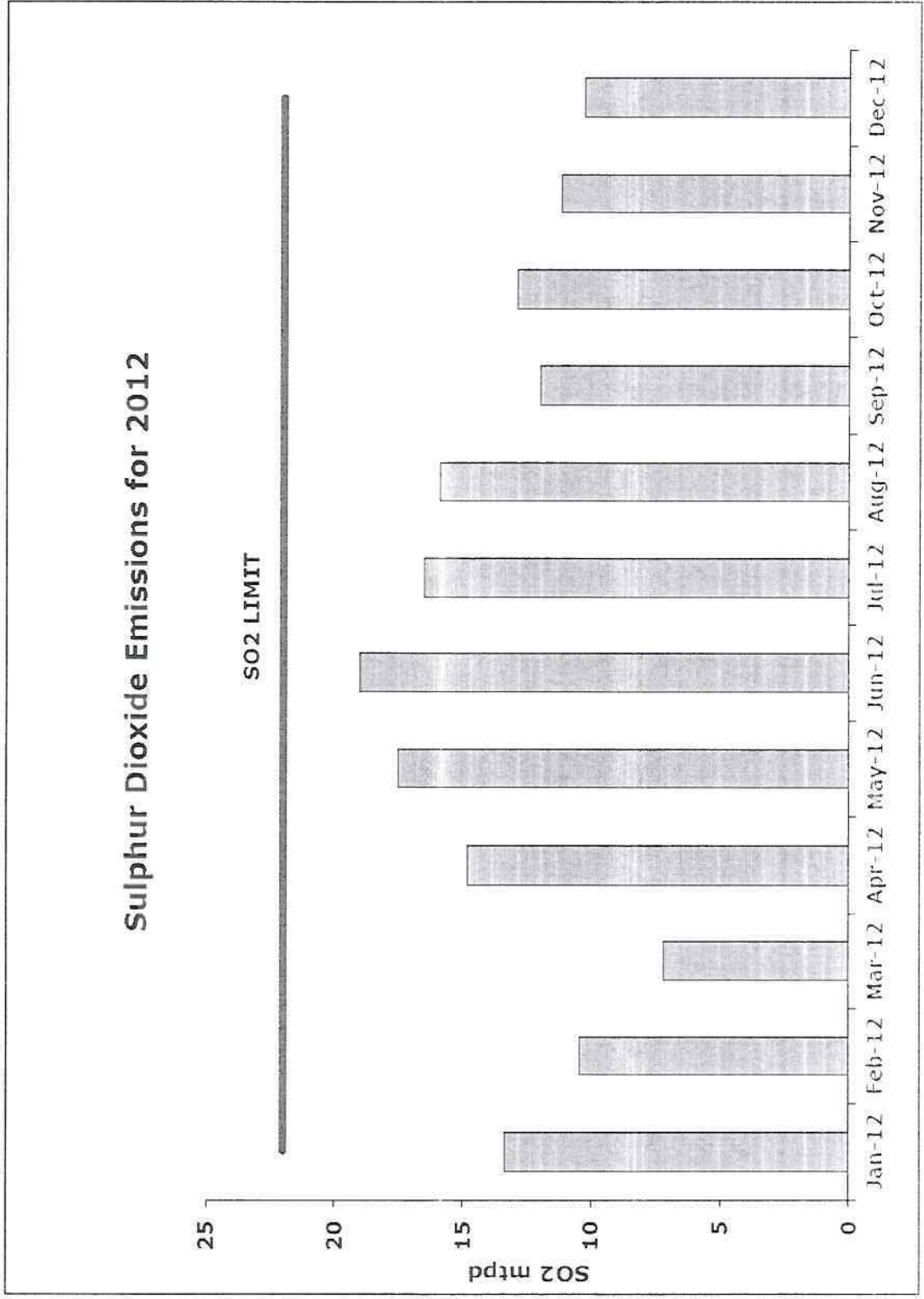
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KGELE MATHIBA
Manager – Health, Environment and Safety

ATTACHMENT 1:

CAPCO REPORT-2012

	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12	Avg	Limit
Sulphur Dioxide Emitted														
SO ₂ & SO ₃ as Total SO ₂	MT/D	13.4	10.5	7.2	14.5	15.2	16.5	15.9	12.0	12.9	11.2	10.3	13.4	22 max
2F-201 Slsk	MT/D	2.9	1.4	0.0	1.8	3.0	2.7	3.1	3.0	2.9	2.5	2.6	2.4	
2F-1 Combined	MT/D	1.3	0.7	0.0	1.4	1.5	1.5	1.6	1.6	1.4	1.3	1.6	1.3	
4F-1 Combined	MT/D	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
YIP Slsk	MT/D	0.6	0.5	0.7	1.2	2.1	3.3	1.4	0.5	0.5	0.8	0.5	1.1	
No. 1 FCCU Slsk	MT/D	2.2	1.7	0.0	1.9	2.0	2.1	3.4	2.4	2.2	1.6	1.1	1.9	
56F-201 Slsk	MT/D	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Major Combined	MT/D	6.3	5.8	6.1	9.2	8.8	8.1	7.5	4.5	5.6	4.9	4.2	6.6	
71F-1	MT/D	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Flare Slsk	MT/D	0.16	0.24	0.31	0.14	0.10	0.08	0.27	0.11	0.07	0.06	0.03	0.13	
Sulphur in Burner Fuel														
wt% S in Refinery Burner Fuel	wt%	0.35	0.93	0.16	0.39	0.53	0.47	0.39	0.14	0.22	0.21	0.15	0.37	2 max
Ambient Sulphur Dioxide														
Max. 24hr Average GLO	µg/m ³	39	63	24	22	48	46	29	23	47	25	32	33	265 max
No. of National Ambient Air Quality Exceedances (NAAQS Exceedances)		0	0	0	0	0	0	0	0	0	0	0	0	
125µg/m ³ limit														
Particulate Emissions from FCCUs														
No. 1 FCCU	mg/m ³	129	54	0	33	96	80	12	78	95	99	56	72	100 max
No. 2 FCCU	mg/m ³	81	64	100	50	106	84	158	56	63	64	226	103	100 max
SRUs Online Efficiency	%													
No. 1 SRU	%	95.6	95.9	99.1	98.5	97.2	95.7	95.3	95.9	99.9	99.7	99.9	99	95 min
No. 2 SRU	%	95.6	99.8	99.9	99.3	97.8	99.6	99.6	99.9	99.9	99.7	99.9	99	95 min
SRUs Availability	%													
SRU	%	100	100	100	100	100	100	100	100	100	100	100	100	95 min
100	MT/D													
						20 12			30 12			4Q 12		
						5.2			5.2			5.2		

ATTACHMENT 2:



ATTACHMENT 3:



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In reply please refer to:
AB/vf2150

22 May 2013

HEALTH, ENVIRONMENT & SAFETY

Per email

Mr Ossie Oswald
Regional Air Quality Practitioner
City Health
Air Quality Management
(021) 590 1621

Ossie.Oswald@capetown.gov.za

Dear Sir

Leak Detection and Repair Programme

Please find attached the annual report of the LDAR programme for 2012. The report should be self explanatory. However, please do not hesitate to enquire if you need any clarification. The report could also be further discussed at the next quarterly meeting.

Please forward the report to others in your organization who may have an interest.

Yours faithfully

CHEVRON SOUTH AFRICA (PTY) LIMITED

A handwritten signature in black ink, appearing to read 'K J Mathiba'.

K J MATHIBA

Manager – Health, Environment & Safety

N Mnyisa (Chairperson), S W E King (Chief Executive Officer - British Citizen)
Executive Directors: T J Staloom, D J C Mendoza (US Citizen), L L Jacobs, N B Ngumbele, D C Potenger (US Citizen)
Non-Executive Directors: M E Ramano, M I Scott, N V Tena

Reg No: 12150115407
Vat No: 469201563

**Leak Detection and
Repair Program
Cape Town Refinery
Annual Report – 2012**



1. Background

The Chevron Cape Town Refinery submitted a Draft Leak Detection and Repair (LDAR) Program to the Department of Environmental Affairs and Tourism (DEAT) in January 2007.

The latest revision (Rev 1.0) of the Draft Leak Detection and Repair (LDAR) program was submitted to the City of Cape Town for approval on 29 March 2012 in line with Section 11 (2) (a) (i) of the *National Environmental Management: Air Quality Act, 2004 (Act no.39 of 2004) List of activities which result in atmospheric emissions which have or may have a significant detrimental effect on the environment, including health, social conditions, economic conditions, ecological conditions and cultural heritage requirements.*

The draft program states that Chevron will conduct two leak detection surveys on all identified components per annum and produce an annual report stating the following:

- a) Process Unit Identification
- b) The number of valves, pumps and compressors for which leaks were detected
- c) The number of valves, pumps and compressors for which leaks were not repaired
- d) Facts that explain each delay of repair
- e) Any revisions to previous reports

This report outlines the results of the two surveys carried out in 2012. The first survey was carried out over the months of April-July and the second survey took place between October and December 2012. A follow up of faulty equipment was carried out after the 2013 shutdown; this report includes the status as on 01 May 2013.

This report has been expanded to include more detail as requested by the City of Cape Town in their letter dated 5 February 2013 received in response to the Chevron LDAR Program submitted on 29 March 2012.

2. Process Unit Identification

As shown in Figure 1 below, the refinery is split into four operating Zones. Each zone consists of a number of processing units.

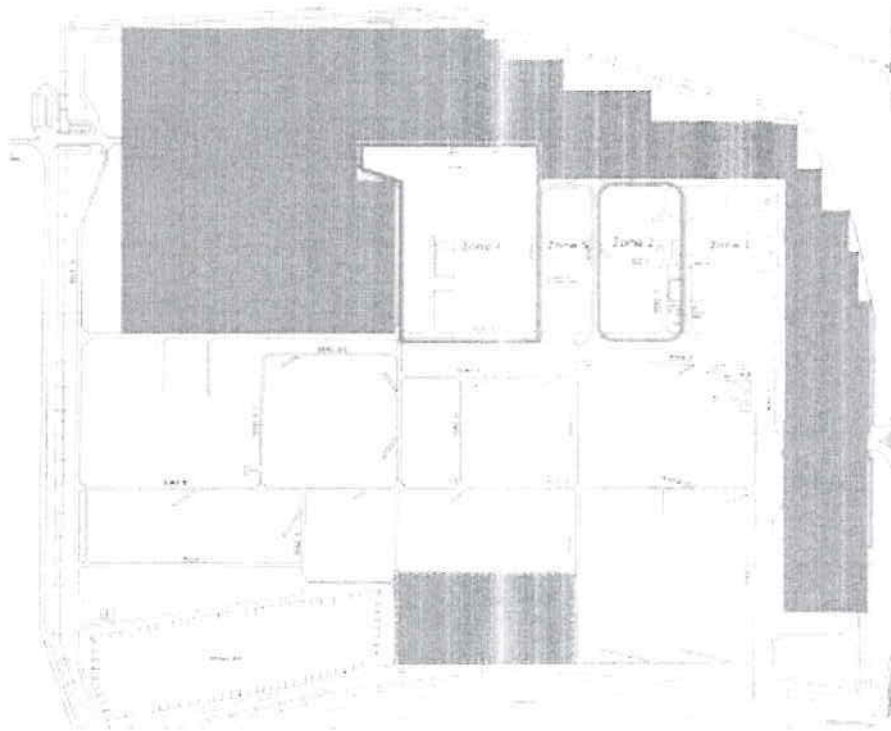


Figure 1: Schematic drawing of refinery highlighting each operating zone.

3. Leaking components identified during 2012

3.1. Result Summary:

The table below summarizes the status of leaking components identified during leak detection surveys conducting in 2012.

Component category	Total Estimated Number Installed <small>(Estimated from Atmospheric impact report dated November 2005)</small>	Number of leaks detected	Number of leaks repaired	Number of leaks not repaired
Pumps	339*	3	3	0
Compressors	6	2	2	0
Valves	16428*	12	12	0
General		25	25	0

Table 3.1: 2012 LDAR surveys result summary

3.2. Details of leaking equipment that has been repaired

The tables below details the number and location of pumps, compressors, valves and general equipment which showed a release of VOC in 2012 and which has been repaired.

Component Category	Zone 1	Zone 2	Zone 4	Zone 5
Pumps	Discharge valve bonnet on 71G11B.			
	Suction valve bonnet on 71G14B.			Pump seal leak on 70GM6BX.
Compressors	Valve bonnet of drain isolation	Pressure Indicator (PI) tapping. Smoking valve on Level Controller 02LC005.	Drain isolation valve on 69C4	
	Isolation valve on gauge glass 4E16			Valve spindle on 64C13
Valves	Drain valve isolation on gauge glass 4E18			Valve spindle on 70C3.
	Passing valve on 4D15			Valve spindle of RX filter on 70C12.
	Bonnet of bypass globe valve on pressure controller 4PC043.			Valve spindle of bypass filters on 70C12.
	Bonnet of outlet isolation valve on 71C16.			
	Process Safety Valve (PSV) 4PSV105-4A passing.			

Component Category	Zone 1	Zone 2	Zone 4	Zone 5
General	Damaged fin fan rods on 5E1B	4" line on sponge absorber on 53C221	Gasket on 69F1A	High point vent on 63SIL001/002
	Dispersion steam vent leaking on 71C17	Braided hose on 52F201 – burner pot number 1	Flexible hose on 69F1C	Bar plugs and side bolts on 70E1B/E
	Braided hose on 4F1 – burner pot number 2	Braided hose on 52F201 – burner pot number 2	Vent on 69F1C – 69XY403 and 413	Sample point on 64C13
	Reactor flange leaking on 3D1	Braided hose on 52F201 – burner pot number 6		Manway cover of 70C12
	Tube side flange of heat exchanger-4E18	Braided hose on 52F201 – burner pot number 7		Manway cover of 70C13
	Bar plug on instrument tapping 4FIT142	Take off line o P-Body on 53C205.		Manway cover of 70C17
	Vent on north side furnace 5F1	Manway on 53E204.		
		Braided hose on 52F202 – burner pot number 4		
		Braided hose on 52F202 – burner pot number 10		

3.3. Details of leaking equipment that has not been repaired

All leaks identified during 2012 have been repaired.

4. Revisions to previous reports

The leaks reported as not repaired on 15 March 2010 (3214/ivf1932); 01 March 2011 (3214/ivf2000) and 22 March 2012 (M Fortuin/ivf2072) have been repaired in accordance with timeframes prescribed in the Component Delay of Repair Procedure.

5. Training

All new employees receive fugitive emissions awareness training as part of the new employee induction program.

A new LDAR survey coordinator has been appointed. The coordinator received on the job training from the previous LDAR coordinator and also completed external Infrared Thermography training.

6. Conclusion

This report presents the results from both the full plant surveys conducted during 2012 in accordance with the Draft Leak Detection and Repair Program, Rev 1.0 dated March 2012.

The first survey for 2013 started at the end of February 2013 and will be completed in June 2013.

ATTACHMENTS 4:

Annual Report for Passive VOC Monitoring at Chevron Cape Town Refinery: June 2011 to June 2012, including:

Appendix 1: SGS report number AQ175: "Passive sampling at Chevron South Africa for BTEX compounds Cape Town Refinery (June 2011 to June 2012)"

ATTACHMENT 5:

		Availability of Opacity meters (%)												
		Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12	Average
02F-201	02AI004	100	100	100	100	100	100	100	100	100	100	100	100	100
2F-1	02AI001	100	100	100	100	100	100	100	100	100	100	100	100	100
3F-2 (3F1/3F2 & 6F1 Flue)	03AI002	100	100	100	100	100	100	100	100	100	100	100	100	100
4F-1/2/3/4 Combined Flue	04AI003	100	100	100	100	100	100	100	100	100	100	100	100	100
5F-1	05AI001	100	100	100	100	100	100	100	100	100	100	100	100	100
52F-201 (Note 1)	52AI001													
52F-202	52AI002	100	100	100	100	100	100	100	100	100	100	100	100	100
56F-201	56AI001	100	100	100	100	100	100	100	100	100	100	100	100	100
60F-1	60AI006	100	100	100	100	100	100	100	100	100	100	100	100	100
61F-1	61AI004	100	100	100	100	100	100	100	100	100	100	100	100	100
69F-1A	69AI004	100	100	100	100	100	100	100	100	100	100	100	100	100
69F-1B	69AI006	100	100	100	100	100	100	100	100	Note 2	100	100	100	100
69F-1C	69AI007	100	100	100	100	100	100	100	100	100	100	100	100	100
69F-2	69AI601	100	100	100	100	100	100	100	100	100	100	100	100	100
71F-1	71AI008	100	100	100	100	100	100	100	100	100	100	100	100	100

Notes:

1. Analyser 52F201 obsolete. Capital project initiated to replace.
2. Boiler offline for reliability upgrade

ATTACHMENT 6:

DWRZA P1627 UPGRADE OPACITY ANALYZERS ON ALL STACKS									
		11 - 14/06/13	16 - 21/06/13	24/06 - 31/07/13	01 - 31/07/13	01/08 - 01/10/13	02/10/13 - 27/6/2014		
Design review	Comment								
PHA	P&ID's marked up/ Confirm								
Mechanical design	AI-4 in or out								
Analyzer design	In progress								
Analyzer spec sheets									
Mechanical contractor quotes									
Analyzer contractor updated quotes									
Mechanical fabrication									
Construction & Commissioning	Installation to start with units as indicated by HES								

COMPILED BY: Noel Nymen
 Analyzer Technician
 Technical Services Department



ATTACHMENT 7:

