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A business unit of the Department of  
Natural Resources and Mines

## Laboratory Test Report

Report Number	OL75572F1
Issue Date	4 December 2003
Report To	Queensland Police Service Brisbane
Client Reference	Property Tag A837198 - Cylinder No. SF9682
Job Description	Compressed Gas Analysis
Date Received	18 November 2003
Date Conducted/Completed	25 November 2003
Responsibility for Sampling	Client
Approved Signatory	Samantha Forster Senior Chemist

A handwritten signature in cursive script, appearing to read 'S Forster', positioned above a horizontal line.

Unless otherwise indicated responsibility for sampling rests with the client. Where test items are submitted by the client results expressed in this report relate only to test items as received.  
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Quality System Certification Number: 6039 (Certified to AS/NZS ISO 9001).

REPORT NO: OL75572F1

CODE OF PRACTICE

The Industry Code of Practice for Compressed Air Recreational Diving and Recreational Snorkelling<sup>1</sup> states the air used in SCUBA cylinders should:-

- Have no objectionable or nauseous odour;
- Contain not more than 5ppm of carbon monoxide
- Contain not more than 480ppm of carbon dioxide
- Contain not more than 0.3 mg/m<sup>3</sup> of oil
- The water content in steel cylinders should be monitored to reduce corrosion of cylinders.

RESULTS

Laboratory Number	OL75572/01	Limit of Reporting
Sample ID	Cylinder SF9682	
Components	% by vol	
Hydrogen	< 0.001	0.001
Oxygen	20.7	0.1
Nitrogen	78.3	0.1
Methane	< 0.01	0.01
Carbon Monoxide	< 0.0005	0.0005
Carbon Dioxide	0.06	0.01
Ethylene	< 0.002	0.002
Ethane	< 0.002	0.002
Argon*	0.9	0.1

\* Argon is a calculated value based on Nitrogen concentration.  
Carbon monoxide confirmed using API Gas Filter Correlation CO analyser.

Laboratory Number	Sample ID	Water (mg/m <sup>3</sup> )	Oil (mg/m <sup>3</sup> )
OL74971/01	Cylinder SN2918	50	Negative
Limit of Detection		5	dependant on oil type
Temperature		20°C	20°C

Oil type unknown as determined by client. Results for water and oil concentration are qualitative only.

REPORT NO: OL75572F1

REFERENCES

1. Workplace Health and Safety; Industry Code of Practice for Compressed Air Recreational Diving and Recreational Snorkeling - Effective 1 February 2000 to 31 January 2005.
2. Simtars Laboratory Procedure LP0043 - "Procedure For Analysis Of General Permanent Gases Using HP Quad Gas Chromatograph".
3. Simtars Laboratory Procedure LP0017 - "Preparation of Standard Gas Mixtures. Laboratory Procedure for Preparation of Standard Gas Mixtures by Wosthoff Pump".
4. Bauer AIRLAB Electronic IV Air Quality Test Set. Oil determined by Drager tube Oil 10/a-P, Water by Drager tube Water Vapour 5/a-P.

Oaths Act Declaration

**OATHS ACT 1867 (DECLARATION)**

I, Tony Kelly..... do solemnly and sincerely declare that:

- (1) This written statement by me dated 4 December 2003 and contained in pages numbered 1 to 3 is true to the best of my knowledge and belief; and
- (2) I make this statement knowing that if it were admitted as evidence, I may be liable to prosecution for stating in it anything I know to be false.

and I make this solemn declaration conscientiously believing the same to be true and virtue of the provisions of the Oaths Act 1867

..... Signature

Taken and declared before me at REDBANK QUEENSLAND

this 15<sup>th</sup> day of SEPTEMBER 2004

Witness David Stevens JP Qld 15/09/2004

(Justice of the Peace / JP)  
Commissioner of Declarations  
Other (Please State) .....

# DIVING MEDICAL CENTRE

132 Yallambee Road,  
Jindalee,  
Brisbane, Q'ld. 4074.  
Australia.  
20<sup>th</sup>. February 2004

Sgt. John Perkins  
Officer-in-Charge,  
Police Diving Squad,  
Q'LD. Police,  
P.O. Box 8103,  
Wynnum North, Q'ld. 4178.

Dear John,

Re: Your Fax 20/2/04 and CO<sub>2</sub> Levels.


Thanks for the Fax John concerning the air purity of a cylinder test involved in a recent dive fatality.

A stated in a letter in Jan 2003, I would again doubt that an additional amount of CO<sub>2</sub> found in the cylinder (in this case some 320ppm over the Code of Practice guidelines) would have any effect, bearing in mind that the Australian Standard (480ppm (.048%) is VERY conservative). In fact the British standard for CO<sub>2</sub> in breathing air (I think) is even more conservative at 300ppm(.03%) and the American (USN) much more liberal at 1000ppm (.1%).

CO<sub>2</sub> in breathing air would be expected to be toxic at about 8-10% (80-100,000 ppm) at the surface. At 2ATA, this would only require 40-50,000ppm or 4-5%, and correspondingly less at greater depths. Using the higher US limit, this would really only become toxic at a depth of 100 ATA – obviously not feasible on Scuba!

In any case, the depth of 1-2 metres only represented a very small increase in pressure (just > 1ATA) and I cannot believe that the small excess of CO<sub>2</sub> could exert any clinical effect whatsoever.

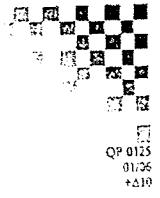
Regards,



F R.L.THOMAS



QUEENSLAND POLICE SERVICE  
STATEMENT OF WITNESS



Occurrence #: \_\_\_\_\_

Statement no.: \_\_\_\_\_ Date: \_\_\_\_\_

**Statement of**

Name of witness: THOMAS, Robert

Date of birth: \_\_\_\_\_ Age: \_\_\_\_\_ Occupation: Doctor

**Police officer taking statement**

Name of police officer: CAMPBELL, Gary Colin

Rank: Detective Sergeant Reg. no.: 6690

Region/Command/Division: Northern Station: Townsville Criminal Investigation Branch

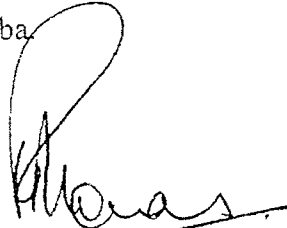
**Statement:**

Doctor Robert THOMAS states:

I have previously been asked to comment on the air purity of a cylinder test involved in a dive fatality.

As I have previously stated in a letter in January 2003, I would again doubt that an additional amount of CO2 found in the cylinder (in this case some 320ppm over the Code of Practice guidelines) would have any effect, bearing in mind that the Australian Standard (480ppm (.048%) is VERY conservative). In fact the British standard for CO2 in breathing air (I think) is even more conservative at 300ppm (.03%) and the American (USN) much more liberal at 1000ppm (.1%).

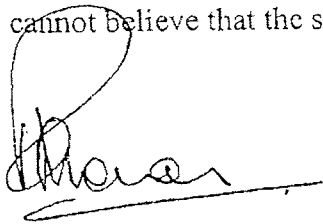
CO2 in breathing air would be expected to be toxic at about 8-10% (80-100,000 ppm) at the surface. At 2ATA, this would only require 40-50,000ppm or 4-5%, and correspondingly less at greater depths using the higher US limit, this would really only become toxic at a depth of 100 ATA – obviously not feasible on Scuba.

  
(Witness's signature)



\_\_\_\_\_  
(Police officer's signature)

In any case, the depth of 1-2 metres only represented a very small increase in pressure (just > 1ATA) and I cannot believe that the small excess of CO2 could exert any clinical effect whatsoever.



Doctor Robert THOMAS

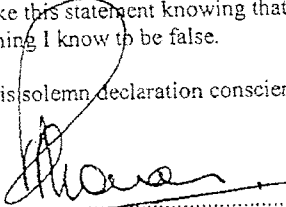
**Oaths Act Declaration**

**OATHS ACT 1867 (DECLARATION)**

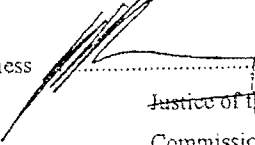
I .....Doctor Robert THOMAS.. do solemnly and sincerely declare that:

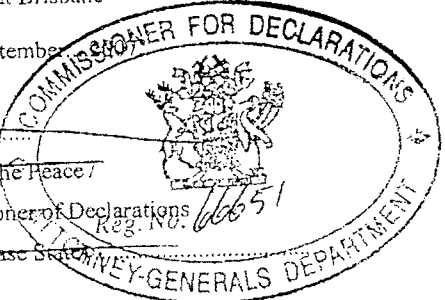
- (1) This written statement by me dated 26/9/2007 and contained in pages numbered 1 to 2 is true to the best of my knowledge and belief; and
- (2) I make this statement knowing that if it were admitted as evidence, I may be liable to prosecution for stating in it anything I know to be false.

and I make this solemn declaration conscientiously believing the same to be true and virtue of the provisions of the Oaths Act 1867

..........Signature

Taken and declared before me at Brisbane  
this...25.....day of ....September

Witness .....  
~~Justice of the Peace /~~  
Commissioner of Declarations  
~~Other (Please State)~~



(Witness's signature)

(Justice of the Peace (Qual.)/  
Commissioner for Declarations's signature)

(Police officer's signature)