



## **Test Report: Dust Fallout Monitoring – October 2022**

Prepared for

**Saldanha Bay Municipality**

**AQ0344**

**Test dates: 8<sup>th</sup> September – 11<sup>th</sup> October 2022**

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## EXECUTIVE SUMMARY

Dust fallout sampling was conducted at seven (7) sites in the Saldanha Bay Municipal area, commencing Feb 2015 and samplers are exchanged and collected on a monthly basis.

There was valid data for five (5) of the seven (7) samples collected, resulting in 71% data capture for the period under review. The SBM-04 and SBM-05 samplers are damaged by corrosion and replacement samplers are being procured. This report covers the period 8<sup>th</sup> September – 11<sup>th</sup> October 2022.

The sampler SBM-03, located at the Curro School Site, is adjacent and close to recently commenced housing construction and reported elevated dust fallout levels.

There was one (1) exceedances of the South African National Dust Control Regulations residential limit of 600mg/m<sup>2</sup>/day at the SBM-03 site as explained above.

There was one (1) exceedances of the South African National Dust Control Regulations non-residential limit of 1200mg/m<sup>2</sup>/day at the same site (SBM-03)


Results for lead were evaluated against US EPA Federal Register (40 CFR Part 745: Lead; identification of dangerous levels of lead; Final Rule). This regulation establishes:

*“hazard standards for residential dust and soil lead. As stated in Unit II.F.3. Today’s rule establishes two hazard standards for bare residential soil; 400ppm for playgrounds and an average of 1200ppm for the rest of the yard.”*

This represents a cautionary approach in estimating worst-case scenarios for exposure to the general public. Lead levels for the “rest of the yard” (1200ppm) and the “playground areas” (400ppm) were not exceeded during the review period. Care must be taken in evaluating “concentrations” figures when dust fallout mass is low. A table of “net lead (Pb) mass in mg”, Table 4.2, has been added for information purposes.

Net lead masses were low and ranged between 3µg and 9µg over the month. These are possibly a better measure than concentration when assessing “heavy metal” levels in dust fallout. Meteorological conditions for the month of October 2022 were characterised by moderate to strong winds from the south-westerly (SW) quadrant with a 3% occurrence of calm conditions during the month.

## REPORT DETAILS

REFERENCE	AQ0344/202210
REPORT TITLE	Dust Fallout Monitoring, August 2022
DATE SUBMITTED	18 November 2022
CLIENT	René Toesie Saldanha Bay Municipality Pick and Pay Centre VREDENBURG  E-mail: rene.toesie@sbm.gov.za
PREPARED BY:	Dean Ravenscroft Argos Scientific Paarden Eiland Cape Town  dravenscroft@argos-sci.c.za
SIGNED	DR
APPROVER	G Ravenscroft      Signed: 
STATUS	Final
NOTICE	

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## ABBREVIATIONS

BDL	Below Detection Limit
DEAT	Department of Environment Affairs and Tourism
EPA	See US EPA
ℓ/min	Litres per minute
m.s <sup>-1</sup>	Metres per second
m <sup>3</sup>	Cubic metres
Max	Maximum
mg/m <sup>3</sup>	milligrams per cubic metre
Min	Minimum
PM <sub>10</sub>	Particulate matter of aerodynamic diameter less than 10mm
ppm	Parts per million
SABS	South African Bureau of Standards
SW	South West
US EPA	United States Environmental Protection Agency
VOCs	Volatile Organic Compounds
WHO	World Health Organisation

# 1 INTRODUCTION

ARGOS SCIENTIFIC was contracted by Saldanha Bay Municipality to perform dust fallout monitoring and heavy metals (Iron, lead, zinc, manganese and copper) measurements at various sites in the Saldanha Bay Municipal Area

A dust fallout and metals contamination impact assessment will be performed using this data.

## 1.1 *Scope of Work*

ARGOS SCIENTIFIC's understanding of the scope of work is as follows:

- To measure dust fallout rates at seven (7) sampling points for 12 months.
- Monthly collection of samples for duration of 12 months.
- Monthly sample analysis as follows: Seven (7) gravimetric samples per month.
- Elemental sample analysis as follows: Iron, lead, zinc, manganese and copper.
- Monthly results to client in electronic format.
- Data interpretation and reporting will be submitted electronically.

## 2 METHODOLOGY

### 2.1 Sample Location

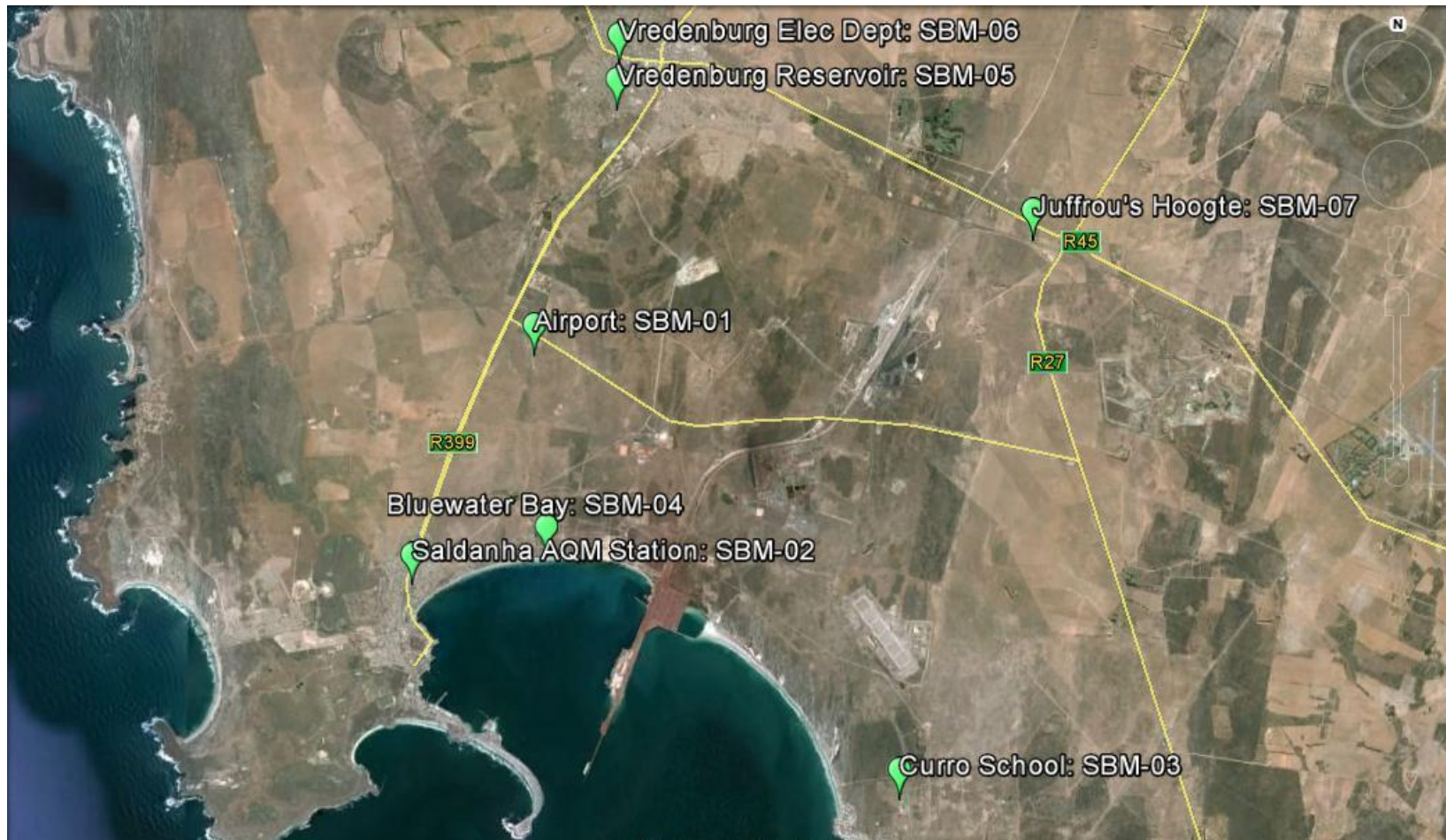
Dust fallout sampling was conducted the following seven sites sites:

<b>Vredenburg Electricity Dept.: SBM-06</b>	<b>32° 54' 27.2" S</b>	<b>17° 59' 13.7" E</b>
<b>Vredenburg Reservoir: SBM-05</b>	<b>32° 54' 56.1" S</b>	<b>17° 59' 12.9" E</b>
<b>Juffroushoogte: SBM07</b>	<b>32° 56' 13.8" S</b>	<b>18° 04' 33.6" E</b>
<b>Airport: SBM-01</b>	<b>32° 57' 34.5" S</b>	<b>17° 58' 12.5" E</b>
<b>Saldanha AQM Station: SBM-02</b>	<b>33° 00' 41.0" S</b>	<b>17° 56' 18.5" E</b>
<b>Blue Water Bay: SBM-04</b>	<b>32° 59' 43.8" S</b>	<b>17° 58' 24.7" E</b>
<b>Curro School: SBM-03</b>	<b>33° 02' 16.2" S</b>	<b>18° 02' 59.9" E</b>

Sites selected had to be:

- Along the prevailing wind vector for the area.
- Distributed evenly within the Saldanha Bay Municipality Area and near areas of possible contamination.

Figure 2.1.1: Location of dust fallout samplers for Saldanha Bay Municipality



## **2.2 Dust fallout**

Dust fallout samplers were deployed in Sept 2015 and samples are collected on a monthly basis. Distilled water was added to minimise sample loss, particularly during high wind speed episodes. Each series of samples were analysed at a SANS 17025 accredited facility.

Total insoluble dust fallout was determined in accordance with ASTM D 1739: 1970 or demonstrable equivalent, a requirement in terms of the SA National Standards (SANS 1929:2005 - Edition 1.1).

### 3 GUIDELINES AND AIR QUALITY STANDARDS

#### 3.1 Dust fallout

In terms of the *Government Gazette* Volume 476, No. 27318, the South African Air Quality Act 39 of 2004 was promulgated in 2005. The South African National Dust Control Regulations describes the proposed guidelines for dust fallout, an extract of which is discussed briefly below.

A standard for the acceptable dustfall rate is set out in Table 3.1. The target, action and alert thresholds are shown in Table 3.2.

**Table 3.1: Evaluation criteria for Dust Fallout**

Restriction Areas	Dust fall rate (D) mg/m <sup>2</sup> /day (30 day average)	Comment
Residential	D < 600	Permissible for residential and light commercial
Non-Residential	600 < D < 1200	Permissible for heavy commercial and industrial

For heavy commercial and industrial regions, the new guidelines state that monthly average dust fallout concentrations below 1200mg/m<sup>2</sup>/day “are permissible”. For residential regions, monthly average dust fallout concentrations not exceeding 600mg/m<sup>2</sup>/day “are permissible”.

**Table 3.2: Acceptable Dust Fall Rates**

Restriction Areas	Dust fallout rate (D) mg/m <sup>2</sup> /day (30 day average)	Averaging period	Permitted frequency of exceeding dust fall rate
residential	D<600	30 days	2 within a year, not sequential months
Non-residential	600<D<1200	30 days	2 within a year, not sequential months

The target annual average dust fallout concentration is 300mg/m<sup>2</sup>/day. This is an ultimate goal set to achieve “ongoing improvement”, even in areas where compliance with all other guidelines can be demonstrated. The monthly average “action level” for residential regions is 600mg/m<sup>2</sup>/day and for industrial regions 1200mg/m<sup>2</sup>/day.

Exceptions are granted where elevated concentrations arise on a regional scale from adverse meteorological conditions. Background dust monitoring sites can be used to identify and monitor impacts of such exceptions. Access to historical and current meteorological information, particularly wind conditions, can be used to distinguish between “adverse” and “normal” meteorological conditions.

## 4 RESULTS

### 4.1 Dust fallout and heavy metal results

Table 4.1 Dust fallout and heavy metal results from Sep - Oct 2022. Exceedance of Dust Fallout Industrial Standards in **Red**

Sampling Site	Sampling Start Date	Sampling End Date	Net Mass (g)	No. of Days	Dust Fall rate (mg/m <sup>2</sup> /day)	Lead (ppm)	Copper (ppm)	Zinc (ppm)	Iron (ppm)	Manganese (ppm)	Comments
SBM-01	08-Sep-22	11-Oct-22	0.093	33	125	43	268	579	7398	407	
SBM-02	08-Sep-22	11-Oct-22	0.027	33	37	109	803	839	43796	1095	
SBM-03	08-Sep-22	11-Oct-22	4.052	33	5414	1	4	9	1061	17	Bucket SBM-03 contained wind blown sand from nearby housing construction
SBM-04	08-Sep-22	11-Oct-22	0.000	-*	-*	-*	-*	-*	-*	-*	
SBM-05	08-Sep-22	11-Oct-22	0.000	-*	-*	-*	-*	-*	-*	-*	
SBM-06	08-Sep-22	11-Oct-22	0.021	33	28	429	429	3667	46190	8095	
SBM-07	08-Sep-22	11-Oct-22	0.069	33	92	87	116	464	20319	4935	

-\* / SBM04/06 – Broken due to corrosion

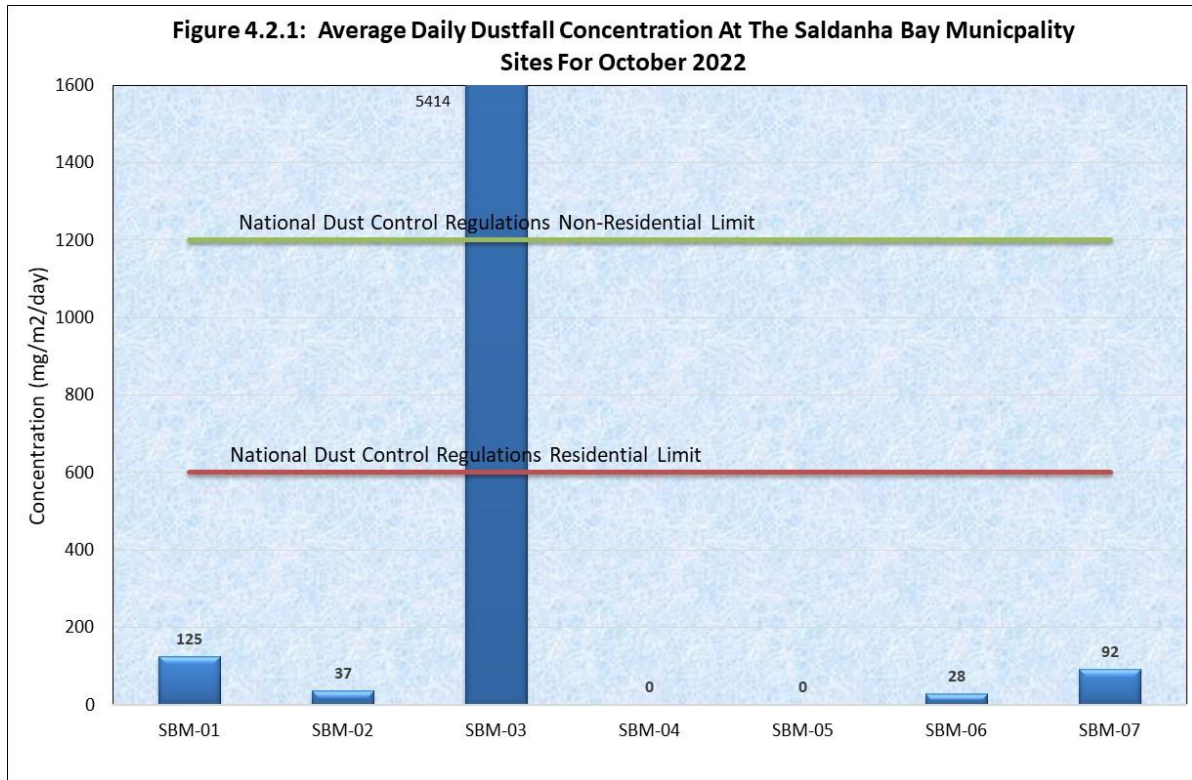
Table 4.2 Lead content (net mass, mg) in dust fallout, Oct 2019 – October 2022

Site/Period	Oct – Nov 19	Nov – Dec 19	Dec – Jan 20	Jan – Feb 20	Feb – Mar 20	Mar - Apr 20	Apr – May 20	Oct – Nov 20	Nov - May 21
SBM-01	0.005	0.002	0.002	0.002	0.003	0.004	0.004	0.007	0.004
SBM-02	0.003	0.003	0.002	0.005	0.003	0.002	0.002	0.002	0.010
SBM-03	0.004	0.001	0.001	0.002	N/A	N/A	0.001	0.001	0.002
SBM-04	0.005	0.004	0.002	0.010	0.004	0.002	0.003	0.002	N/A
SBM-05	0.015	0.012	0.006	0.019	0.020	0.009	0.003	0.004	0.032
SBM-06	0.013	0.008	0.006	0.044	0.014	0.023	0.002	0.017	0.021
SBM-07	0.002	0.003	0.002	0.004	0.002	0.003	0.003	0.006	0.012

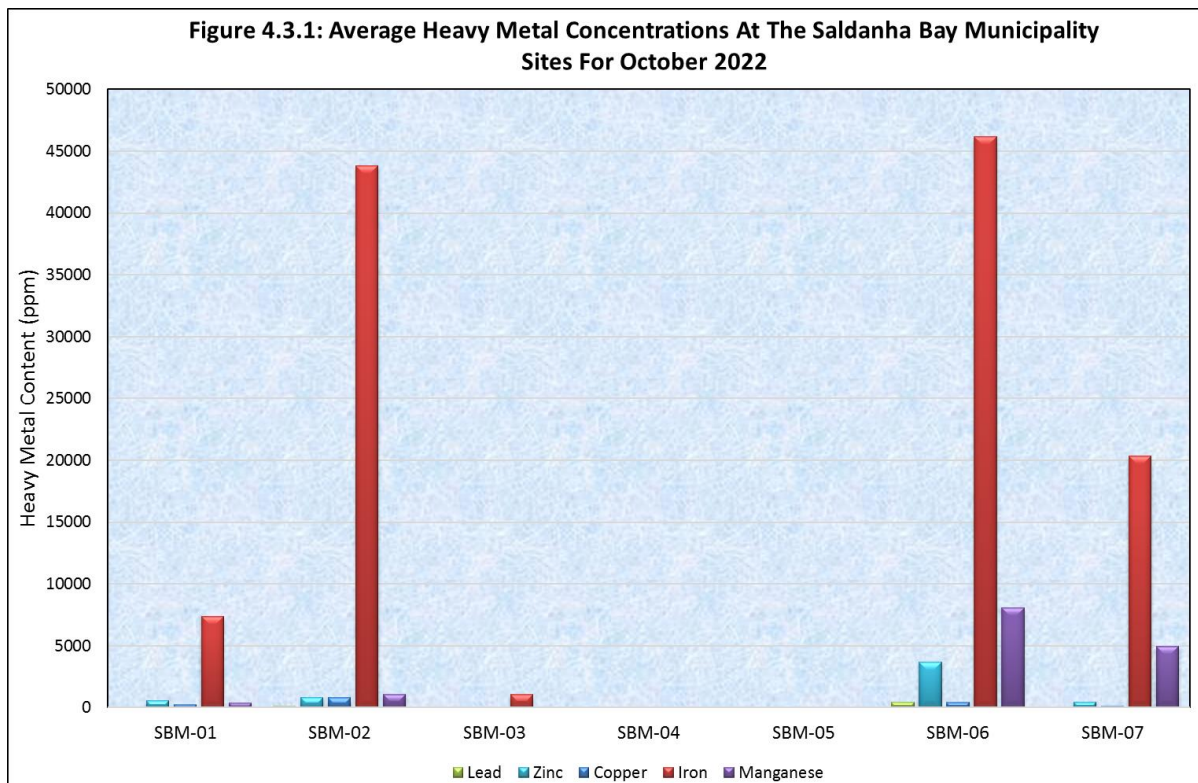
Site/Period	Mar-21	Apr-21	May-21	June 21 - Mar 22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22
SBM-01	N/A	0.002	N/A	0.018	0.004	0.001	0.005	0.002	0.005	0.006	0.004
SBM-02	<0.001	0.010	0.002	0.011	0.005	0.001	0.004	0.003	0.001	0.004	0.003
SBM-03	0.004	0.004	0.002	0.011	0.004	0.001	0.003	0.003	0.002	0.004	0.005
SBM-04	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SBM-05	0.012	0.009	0.007	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SBM-06	0.018	0.006	0.006	0.032	0.021	0.007	0.006	0.004	0.003	0.006	0.009
SBM-07	0.006	0.060	0.013	0.008	0.004	0.002	0.005	0.002	0.005	0.002	0.006

N/A = Corroded / Broken or contaminated

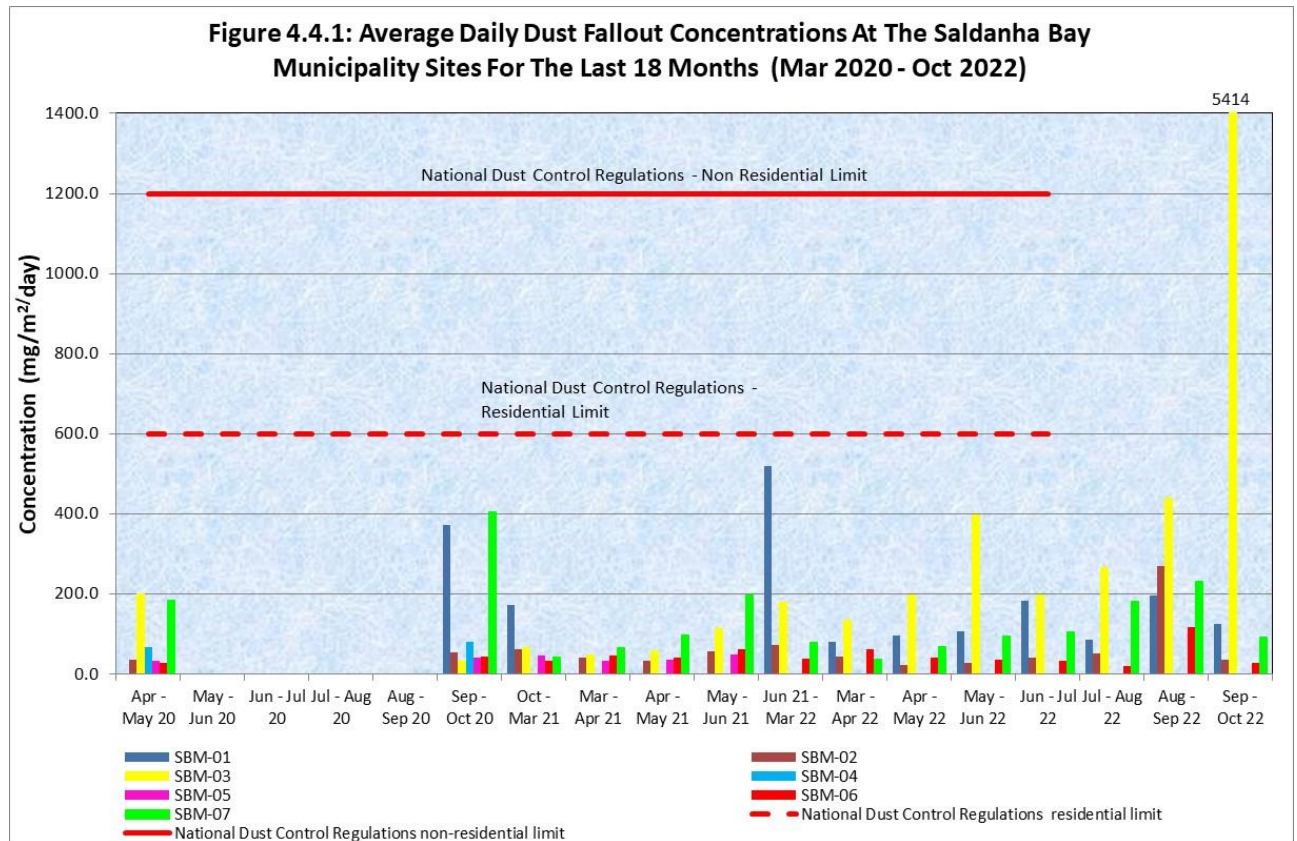
### 4.2 Dust fallout concentration



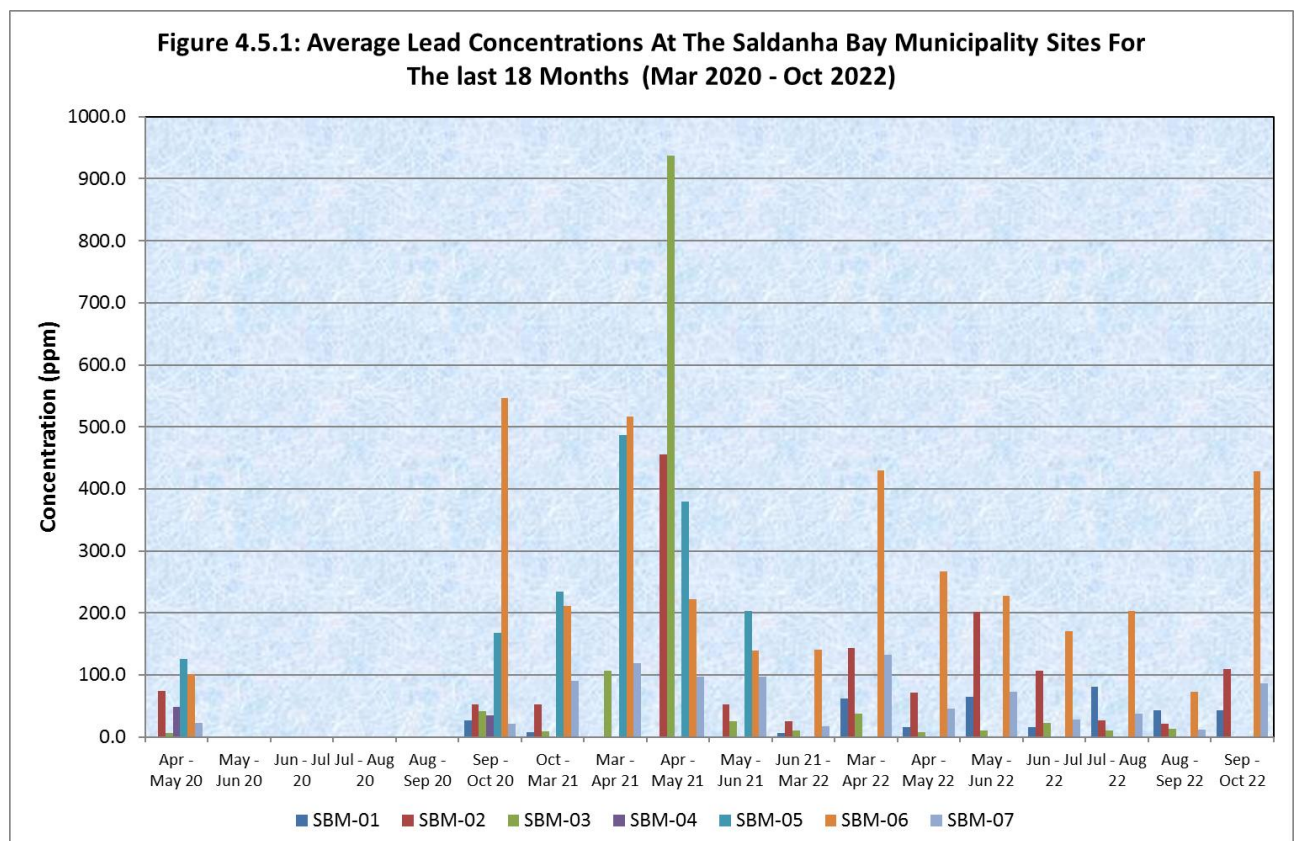
### 4.3 Heavy metal concentration



#### 4.4: Average Historical Daily Dust fallout concentrations

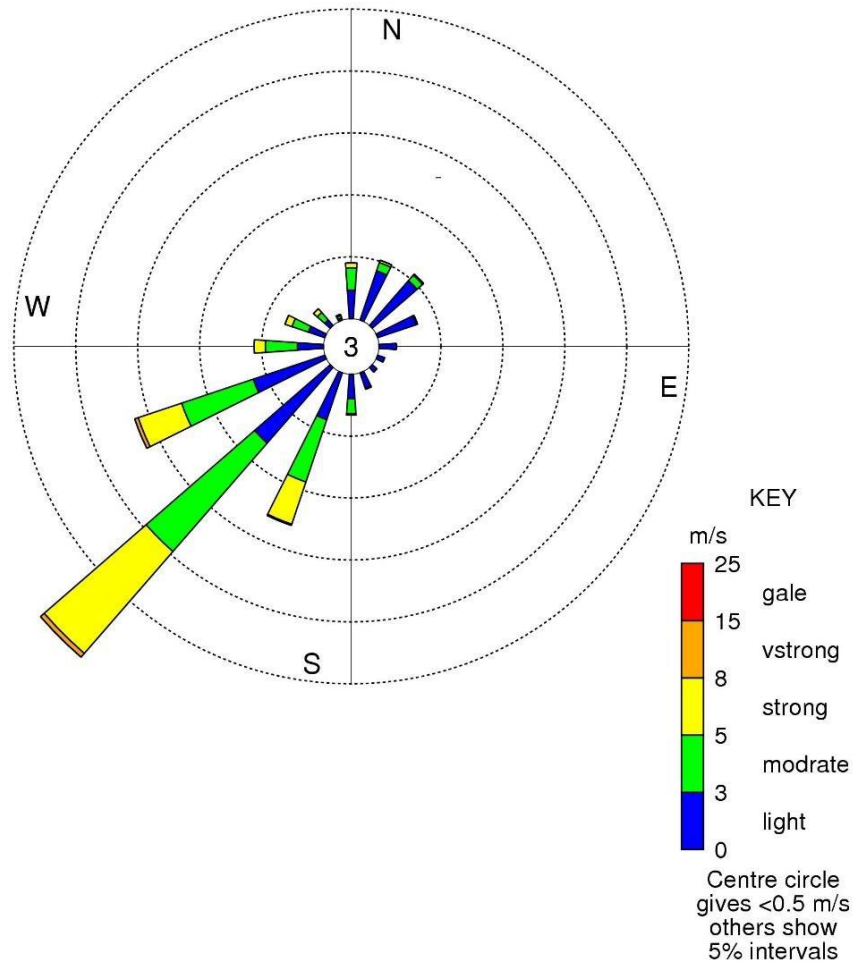


#### 4.5: Average Historical Lead fallout concentrations



### 4.6 Wind Roses for Saldanha Bay Municipality

WIND ROSE SALDANHA – OCTOBER 2022



## 5 CONSULTANT'S OBSERVATIONS AND CONCLUSIONS

There was valid data for five (5) of the seven (7) samples collected, resulting in 71% data capture for the period under review. The SBM-04 and SBM-05 samplers are damaged by corrosion and replacement samplers are being procured.

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Meteorological conditions for the month of October 2022 were characterised by moderate to strong winds from the south-westerly (SW) quadrant with a 3% occurrence of calm conditions during the month.

## **5.1 SANAS Accredited Certificates of Analysis for Dust Fallout**



*In association with SKYSIDE South Africa*


## Monthly Dust Fallout Results

Prepared for  
**Argos Scientific**

**AQ344**

**Report date - 17 November 2022**

**The accredited scope for this report includes the gravimetric analysis only, based on samples received from the client. The deployment of sample buckets is the responsibility of the client. The exposure period of samples is therefore under the control of the client and the client needs to ensure that the sample acceptance criteria are met and reported together with the sample submission to the laboratory.**

REFERENCE:	AQ344 SBM
CLIENT REFERENCE:	
REPORT TITLE:	Monthly Dust Fallout Results
DATE SUBMITTED:	Thursday, 17 November 2022
CUSTOMER:	Lukas Tshela Argos Scientific 8 Section St, Paarden Eiland Cape Town, 7405 Tel: + 27 (0) 21 0015392 E-mail: ltshehla@argos-sci.co.za Tel: + 27 (0) 21 0015392 E-mail: ltshehla@argos-sci.co.za
REPORT COMPILED BY: DESIGNATION:	Mathew Weedman Project Manager Skyside South Africa (Pty) Ltd Ninian Westmead Estate, Unit 2, Building 4, 33 Henry Pennington (Richmond) Road Westmead, 3610 Tel: +27 (0) 31 100 1310 E-mail: mathew@skyside.co.za
SIGNATURE:	
REPORT AUTHORISED BY: DESIGNATION: SIGNATURE:	Fathima Ally Technical Signatory 
NOTICE:	<p><i>The Technical Signatory hereby declares that, to the best of his/her knowledge, the analytical data was checked for completeness, the results presented in this report are accurate and legible, and analysis was conducted in accordance with the methods in the approved protocol.</i></p> <p><i>Disclaimer:</i></p> <ol style="list-style-type: none"> <li><i>1. The preparation of sample buckets and the deployment thereof is the responsibility of the client.</i></li> <li><i>2. The results contained in this report relate only to the streams tested and to the conditions prevalent during such tests.</i></li> <li><i>3. In certain instances, generally identified, SKYSIDE relied on information provided by third parties. It was not possible to verify all such information independently.</i></li> <li><i>4. The report includes the most pertinent calibration evidence and field data, but further traceability and similar data not considered immediately relevant is available at SKYSIDE offices if required. Signed calibration certificates are available on request.</i></li> <li><i>5. This test report may not be reproduced except in full.</i></li> <li><i>6. SKYSIDE is accredited for compliance with ISO/IEC 17025:2017.</i></li> <li><i>7. Results marked "Not SANAS Accredited" or otherwise marked with # in this report are not included in the SANAS Scope of Accreditation for SKYSIDE.</i></li> <li><i>8. Opinions and interpretations expressed herein are outside the scope of SANAS accreditation.</i></li> </ol>

**Test Results: ARGOS SCIENTIFIC DUST FALLOUT**

**Client** Argos Scientific  
**Project code** AQ344  
**Report date** Thursday, 17 November 2022

Site Description	Net Mass (mg)	No of Days Exposed	Dust fallout (mg/m <sup>2</sup> /day)	Comments
SBM1- 09	93	33	125	
SBM2- 09	27	33	37	
SBM3- 09	4052	33	5414	
SBM6- 09	21	33	28	
SBM7- 09	69	33	92	

Specific Test Conditions	Samples stored at room temperature prior to analysis. Filters weighed at constant mass
Deviations from Method	None.
Measurement Uncertainty	± 5%

Note: Laboratory results are reported for gravimetric analysis based on samples received from the client. The preparation of sample buckets and the deployment thereof is the responsibility of the client. Sample handling and transportation is done by the client (or field personnel that act on behalf of the client). The exposure period of samples is therefore under the control of the client and the client needs to ensure that the sample acceptance criteria are met and reported together with the sample submission to the laboratory.

*It is recommended that the client conforms to the sample exposure period of 30 ± 3 days.*

## CLIENT DETAILS

Contact Mathew Weedman  
Client SKYSIDE (PTY) LTD  
Address 2 Samantha Street  
Strydompark  
Randburg  
Telephone 011 590-3000  
Facsimile  
Email mathew@skyside.co.za  
Order Number AQ344 September  
Samples 5  
Sample matrix AIR

## LABORATORY DETAILS

Laboratory X-Lab Earth Science  
Address 2 Samantha Street, Strydompark, Randburg,  
2169  
Telephone +27 (0)11 590 3000  
Laboratory Manager Mrs Tasneem Tagari  
Lab Reference JBX22-13182  
Report Number 0000049776  
Date Received 20/10/2022 15:02  
Date Started 25/10/2022 8:22  
Date Reported 25/10/2022 12:41

The document is issued in accordance with SANAS's accreditation requirements.  
Accredited for compliance with ISO/IEC 17025. SANAS accredited laboratory T0775.



Samples received at ambient temp good condition.

## SIGNATORIES

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Tasneem Tagari

General Manager/Technical Signatory

**TEST REPORT**

Sample Number	JBX22-13182.001	JBX22-13182.002	JBX22-13182.003	JBX22-13182.004
Sample Name	SBM1-09	SBM2-09	SBM3-09	SBM6-09

Parameter                      Units                      LOR

**Metals on Filters    Method: ME-AN-027**

Copper	mg/filter	0.002	0.025	0.022	0.017	0.009
Iron	mg/filter	0.005	0.69	1.2	4.3	0.97
Manganese	mg/filter	0.001	0.038	0.030	0.070	0.17
Lead	mg/filter	0.001	0.004	0.003	0.005	0.009
Titanium	mg/filter	0.0005	0.0072	0.017	0.064	0.015
Zinc	mg/filter	0.001	0.054	0.023	0.035	0.077

Sample Number	JBX22-13182.005
Sample Name	SBM7-09

Parameter                      Units                      LOR

**Metals on Filters    Method: ME-AN-027**

Copper	mg/filter	0.002	0.008
Iron	mg/filter	0.005	1.4
Manganese	mg/filter	0.001	0.34
Lead	mg/filter	0.001	0.006
Titanium	mg/filter	0.0005	0.020
Zinc	mg/filter	0.001	0.032

**METHOD SUMMARY**

## METHOD

ME-AN-027

## METHOD SUMMARY

Filters are digested with a mixture of nitric and hydrochloric acids. The digest is then analysed for metals, excluding Hg, by inductively coupled plasma optical emission spectrometry (ICP-OES). Based on NIOSH methods 7300 and 7301.

## FOOTNOTES

IS	Insufficient sample for analysis.	-	The sample was not analysed for this analyte
LNR	Sample listed, but not received.	*	Results marked "Not SANAS Accredited" in this report are not included in the SANAS Schedule of Accreditation for this laboratory / certification body / inspection body".
^	Performed by outside laboratory.		
LOR	Limit of Reporting		

Samples analysed as received.  
Solid samples expressed on a dry weight basis.

Unless otherwise indicated, samples were received in containers fit for purpose.

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Signed with Impression - Chain of Custody



*Signature Request*

Signature Request ID:	9b023683-32d1-45ae-a30d-960d3c489da7	Timestamp:	2022-10-25 11:29:01 GMT
Signee Name:	Tasneem Tagari	Sender Name:	Tasneem Tagari
Request Type:	WebSigning	Request Status:	WEBVIEWER SIGNED

*Original Document*

Document Name:	JBX2213182_0000033371PDF.pdf	Document Size:	137.5 KB
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*Email Evidence*

Signee Email:	tt@xlab.earth	Email Subject:	Not available in Silent Mode
Email Sent Timestamp:	Not available in Silent Mode	Email Opened Timestamp:	Not available in Silent Mode

*Web Evidence*

Signee IP Address:	41.79.81.146	Request Timestamp:	2022-10-25 11:28:40 GMT
Signee GPS (if shared):	ZA: Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/106.0.0.0 Safari/537.36	Terms Accepted Timestamp:	2022-10-25 11:28:51 GMT

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Signature Count:	1	Form Fields Filled Count:	0
Text Annotation Count:	0	Initial All Pages Count:	0
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Security Challenge:	NONE	Part of Workflow:	NONE

*Chain Of Custody Generation*

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