



**RICHARDS BAY CLEAN AIR
ASSOCIATION
DUST DEPOSITION MONITORING
FEBRUARY 2009**

**Sampling period: 15 January – 17 February 2009
Final Monthly Progress Report**

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1. METHODOLOGY

This project commenced operation in June 2006. Windblown settleable dust (fall-out) is monitored based on the American Society of Testing and Materials standard method for collection and analysis of dustfall (ASTM D1739), with certain modifications. This method employs a simple device consisting of a cylindrical 5l container half-filled with de-ionised water exposed for one calendar month (30 ± 3 days). The water is treated with an inorganic biocide to prevent algal growth in the buckets. The most common reagent used for this is a 5% copper sulphate solution (approximately 1 ml per 3 litre of water bucket).

The bucket stand comprises a ring that is raised above the rim of the bucket to prevent contamination from perching birds (Fig 1). The bucket holder is connected to a 2.1 m galvanized steel pole, which is either directly attached to a fence post or can be attached to a galvanized steel base plate, which is buried to a depth of 500 mm. This allows for a variety of placement options for the fallout samplers. Exposed buckets, when returned to the AER laboratories, are rinsed with deionised water to remove residue from the sides of the bucket, and the bucket contents filtered through a coarse ($>1\text{mm}$) filter to remove insects and other coarse organic detritus. The sample is then filtered through a pre-weighed paper filter to remove the insoluble fraction, or dust fallout. This residue and filter are dried, and gravimetrically analysed to determine the insoluble fraction (dust fallout).

1.1 Operational Aspects

The sampling period was from 15 January to 17 February 2009 and samples were exposed for 33 days. The period complies with the standard exposure period of 30 ± 3 days. There is minor construction closer to Site 4 (Harbour West). There are road works and brush cutting closer to Site 8 (Nseleni Municipal Offices). No other operational problems were encountered and a valid sample return of 100% was achieved.



Figure 1: Single bucket monitoring unit, showing sampling bucket with bird ring and security clamp.

2. STANDARDS FOR DUST DEPOSITION

The Standards South Africa has published a new set of dustfall standards (SANS 1929:2005). These standards have been used to evaluate the level of dust deposition and are stated in Table 1 and Table 2 below.

2.1 Evaluation criteria for dust deposition

Dust deposition rates shall be expressed in units of $\text{mg}/\text{m}^2/\text{day}$ over a 30-day averaging period. Dust deposition is evaluated against a four band scale as presented in Table 1. The target, action and alert thresholds for ambient dust deposition are indicated in Table 2. Permissible margins of tolerance are outlined in 2.2, and exceptions noted in 2.3.

Table 1: Four-band scale evaluation criteria for dust deposition (SANS 1929:2005).

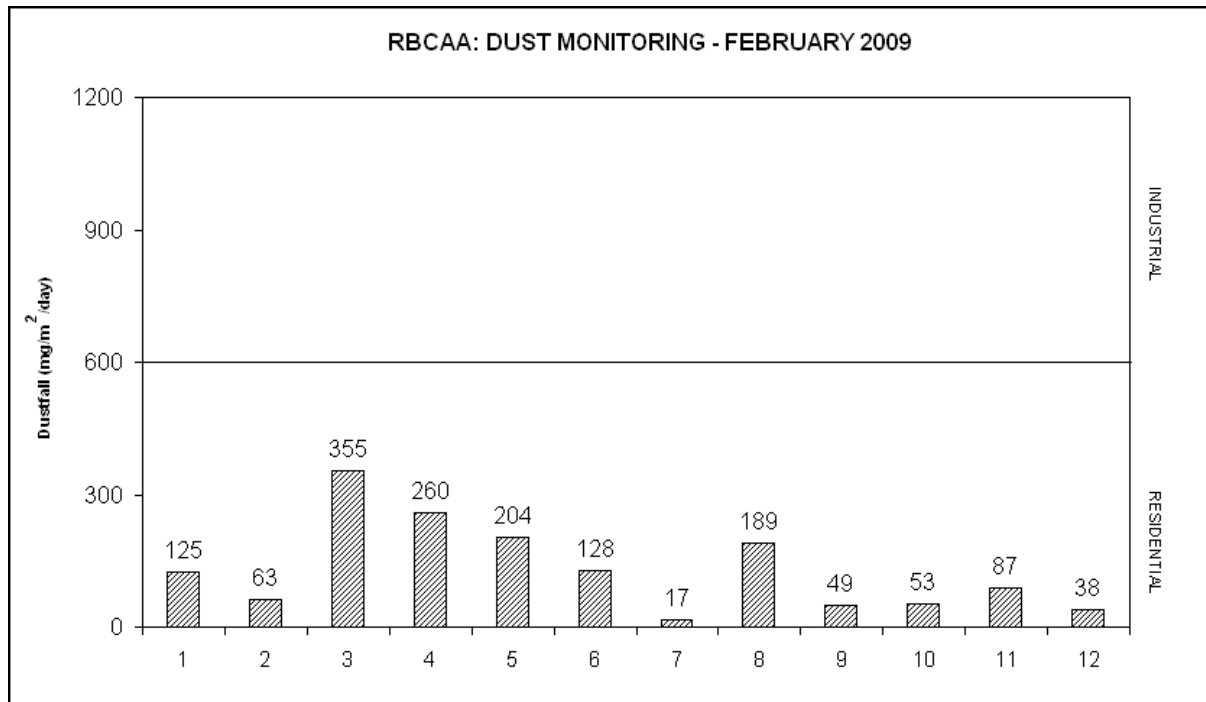
Band Number	Band Description Label	Dustfall rate (D) ($\text{mg}/\text{m}^2/\text{day}$, 30-day average)	Comment
1	Residential	$D < 600$	Permissible for residential and light commercial
2	Industrial	$600 < D < 1\ 200$	Permissible for heavy commercial and industrial
3	Action	$1\ 200 < D < 2\ 400$	Requires investigation and remediation if two sequential months lie in this band, or more than three occur in a year.
4	Alert	$2\ 400 < D$	Immediate action and remediation required following the first incidence of dustfall rate being exceeded. Incident report to be submitted to relevant authority.

Table 2. Dustfall standards, target, action and alert thresholds for dust deposition (SANS 1929:2005).

Level	Dustfall Rate ($\text{mg}/\text{m}^2/\text{day}$)	Permitted Frequency of Exceedances
Target	300	
Action residential	600	Three within any year, no two sequential months.
Action industrial	1 200	Three within any year not sequential months.
Alert threshold	2 400	None. First exceedance requires remediation and compulsory report to authorities.

4. RECOMMENDATIONS AND ACTIONS

- All the monitoring sites recorded RESIDENTIAL threshold levels and the results are considered satisfactory as they will not result in community complaints or nuisance.
- Site 2 (SAPS Garage) recorded one incident ACTION dustfall rate and is

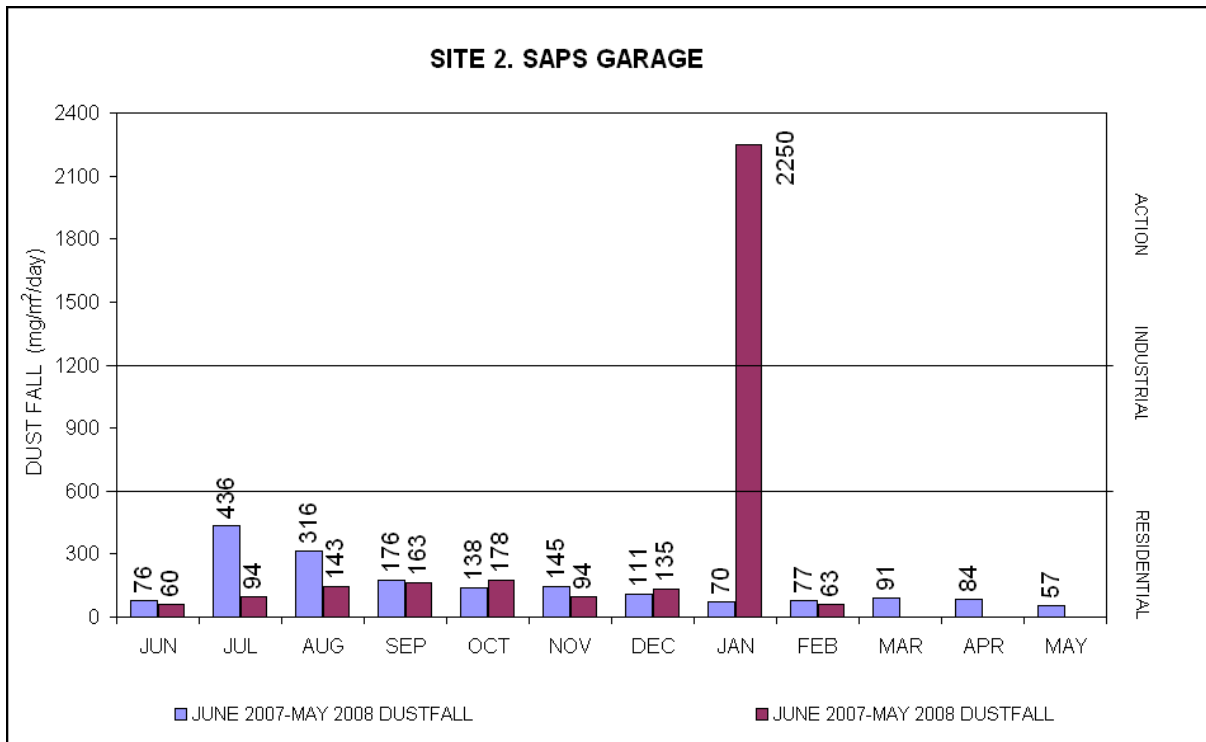
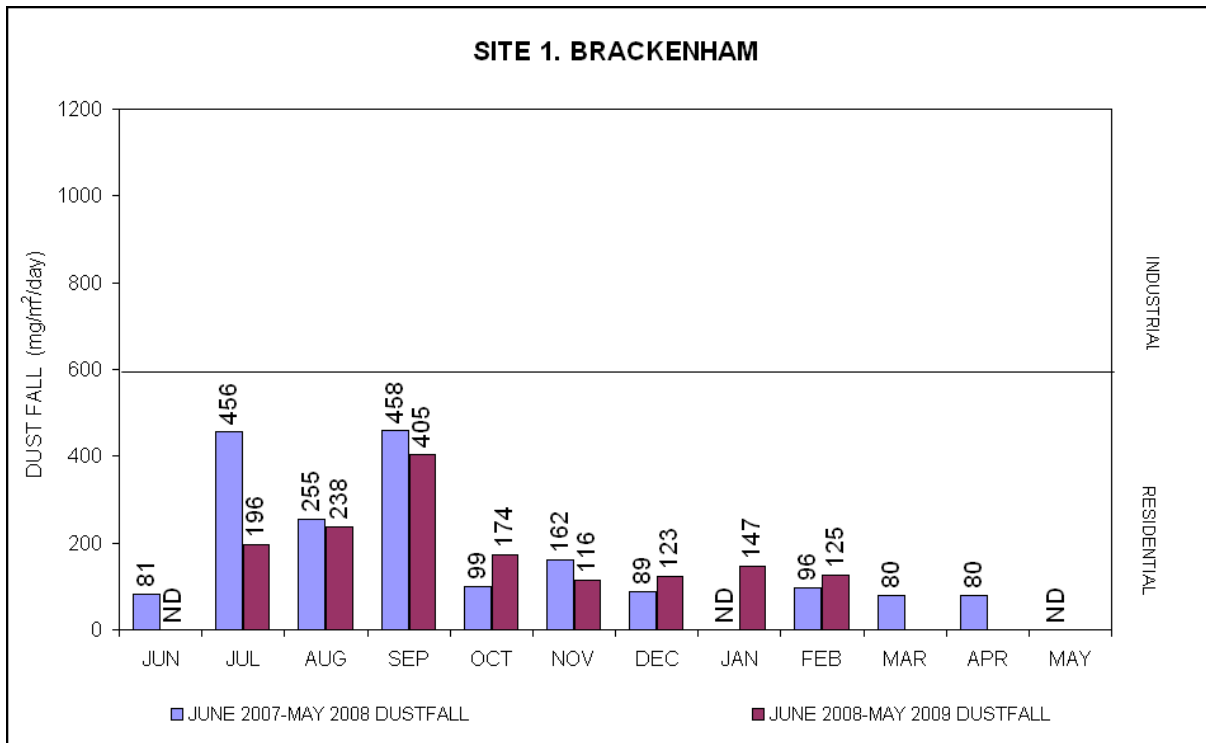
Figure 1: Graph showing results from all sites: February 2009

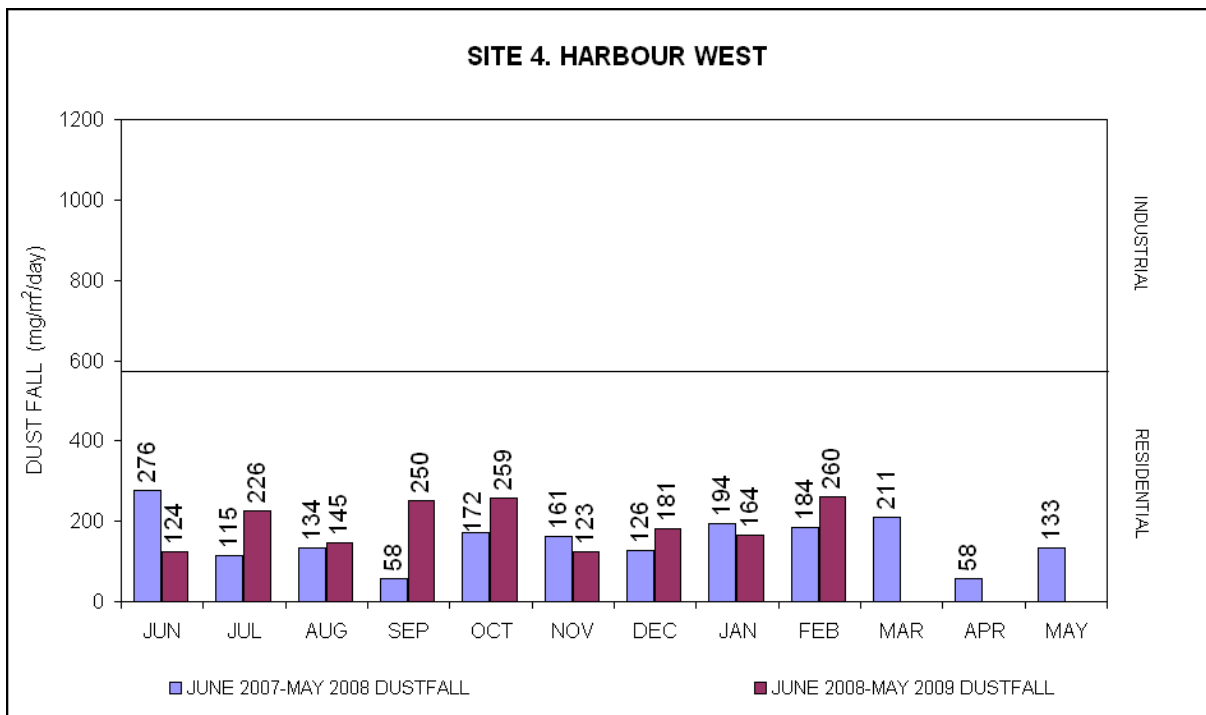
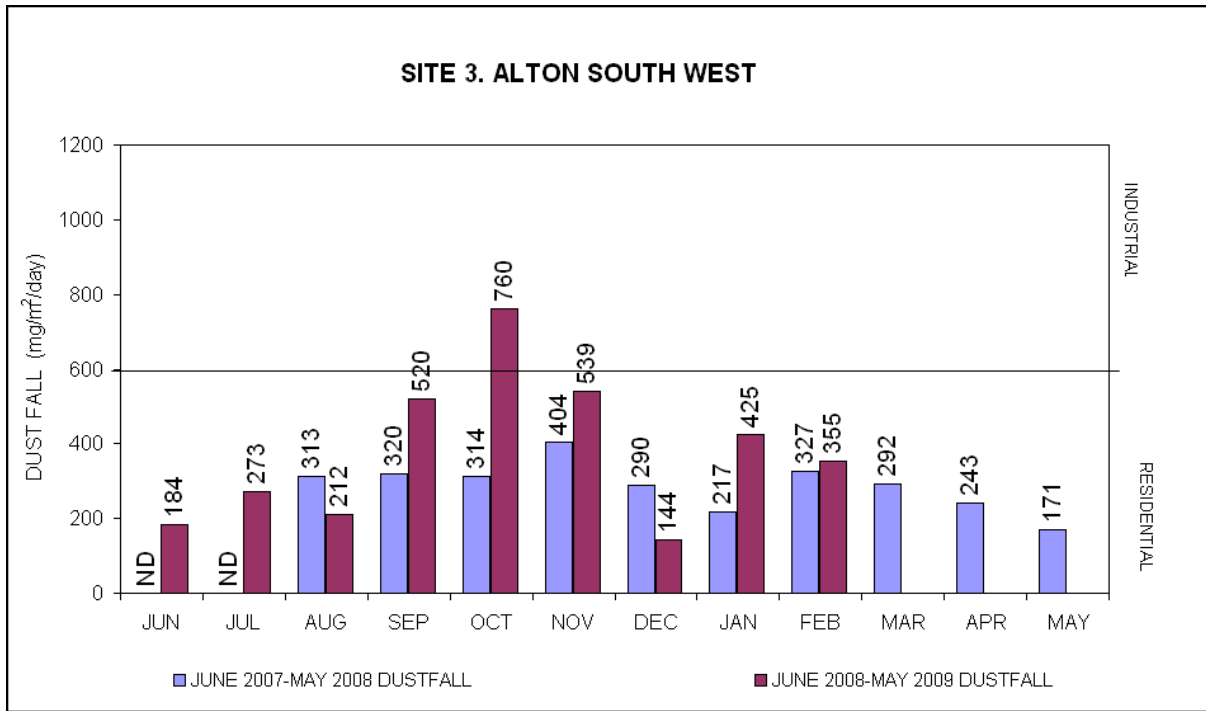
RBCAA DUSTFALL MONITORING			Month: FEBRUARY 2009 Sampling period: 15 January – 17 February 2009			
SITE DESCRIPTION	SITE CLASSIFICATION	SITE No.	FILTER CODE	NETT MASS (mg)	No. DAYS	DUST FALLOUT (mg/m ² /day)
Brackenham	RESIDENTIAL	1	RBCAA 09/229	94	33	125
SAPS Garage	RESIDENTIAL	2	RBCAA 09/230	47	33	63
Alton South West	INDUSTRIAL	3	RBCAA 09/231	266	33	355
Harbour West	INDUSTRIAL	4	RBCAA 09/232	194	33	260
CBD(Municipal office)	RESIDENTIAL	5	RBCAA 09/233	153	33	204
Scorpio	INDUSTRIAL	6	RBCAA 09/234	96	33	128
Alton fire station	RESIDENTIAL	7	RBCAA 09/235	13	33	17
Nseleni Municipal office	RESIDENTIAL	8	RBCAA 09/236	142	33	189
Empangeni police station	RESIDENTIAL	9	RBCAA 09/237	37	33	49
Felixton Village	RESIDENTIAL	10	RBCAA 09/238	40	33	53
Arboretum	INDUSTRIAL	11	RBCAA 09/239	65	33	87
Meerensee School	RESIDENTIAL	12	RBCAA 09/240	28	33	38

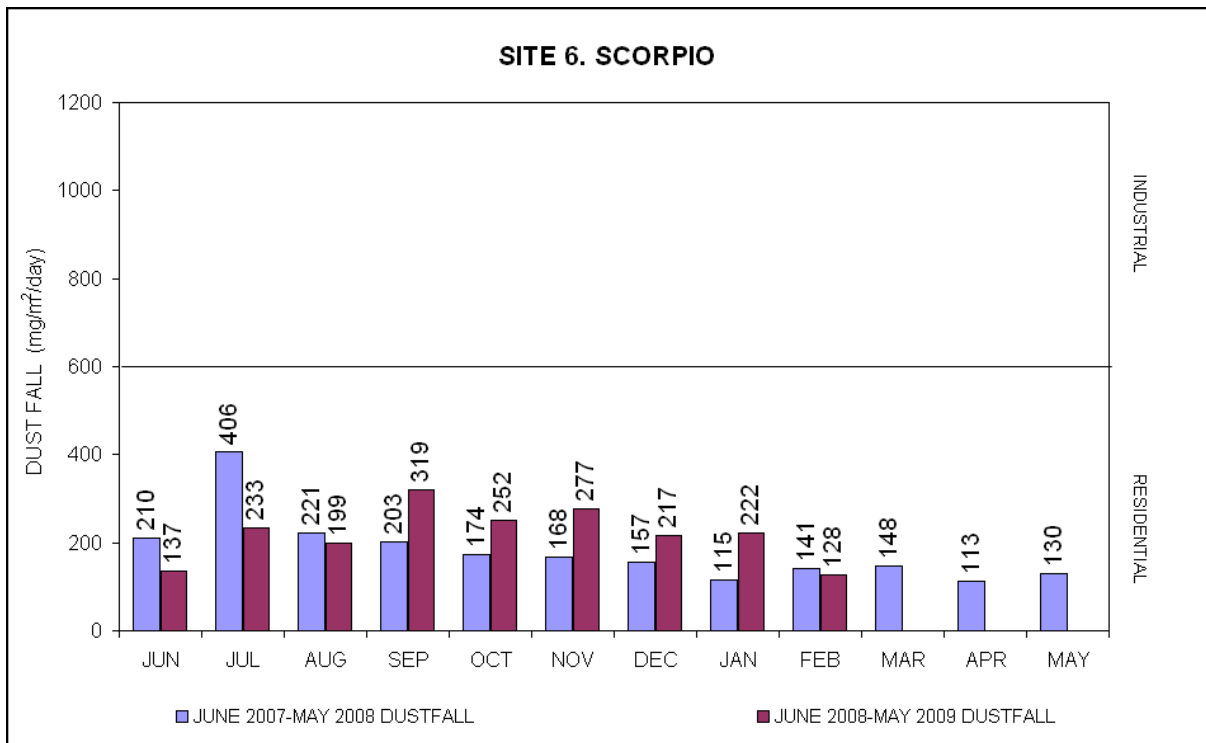
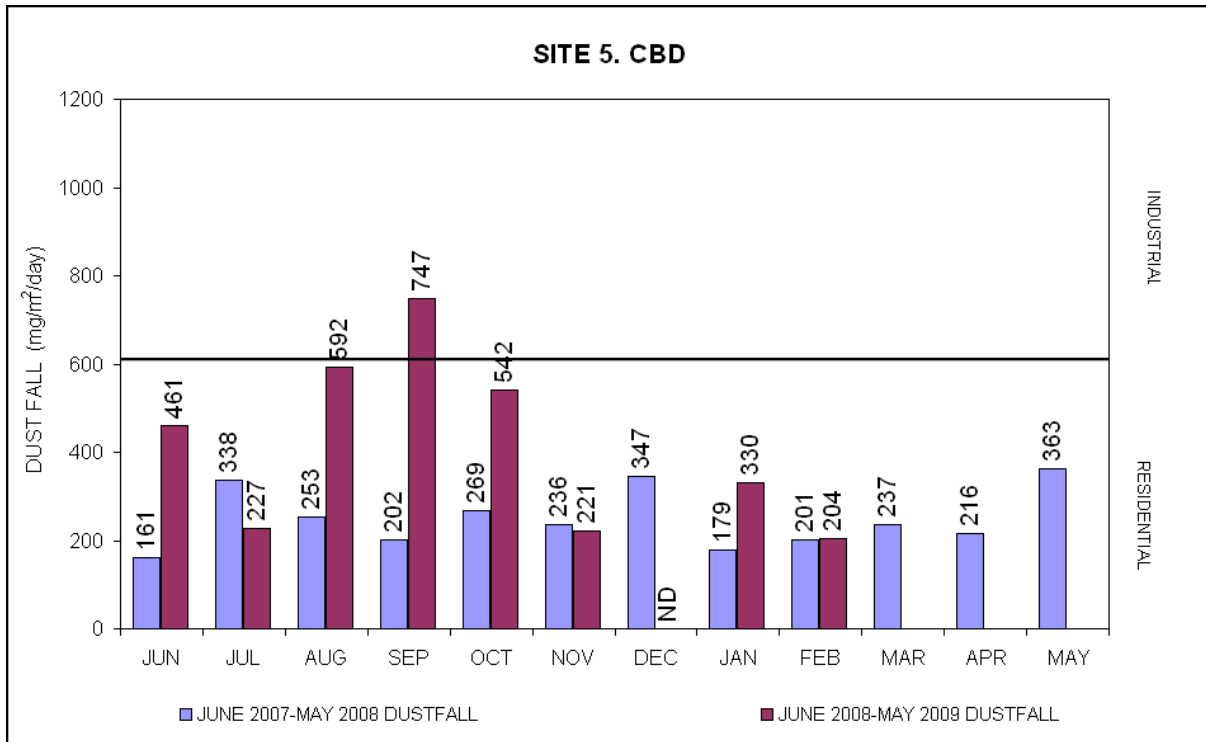
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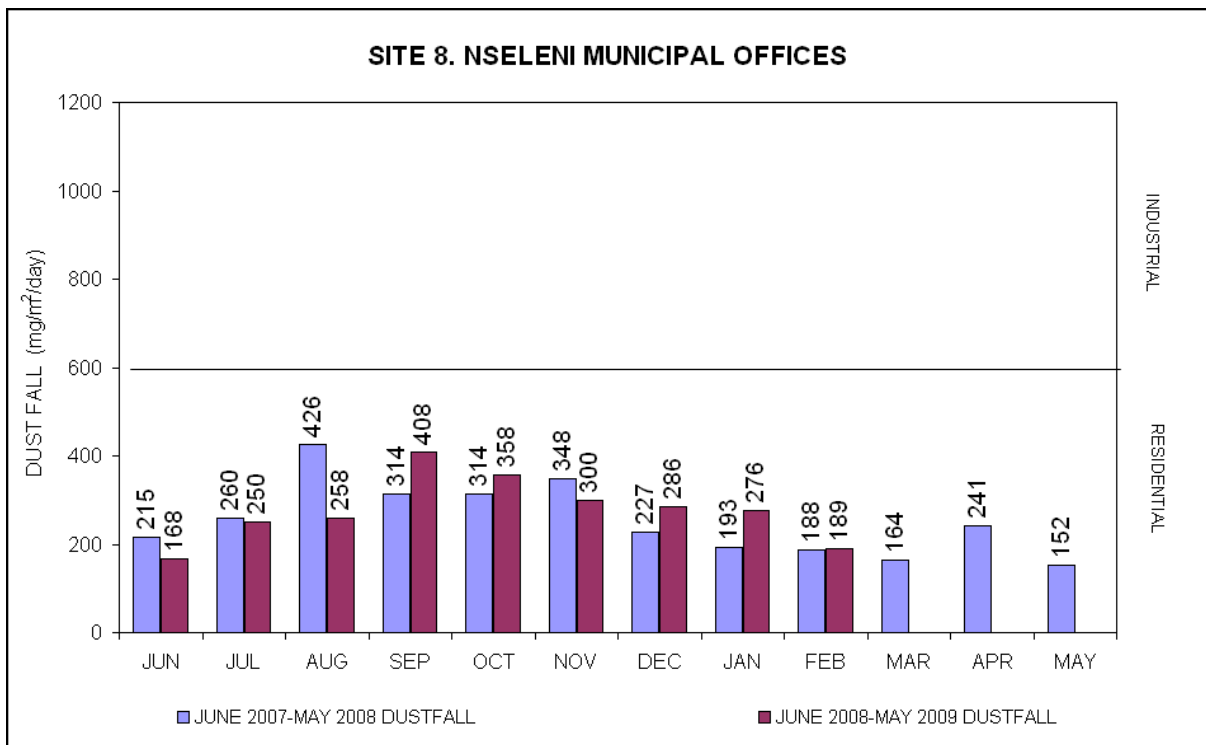
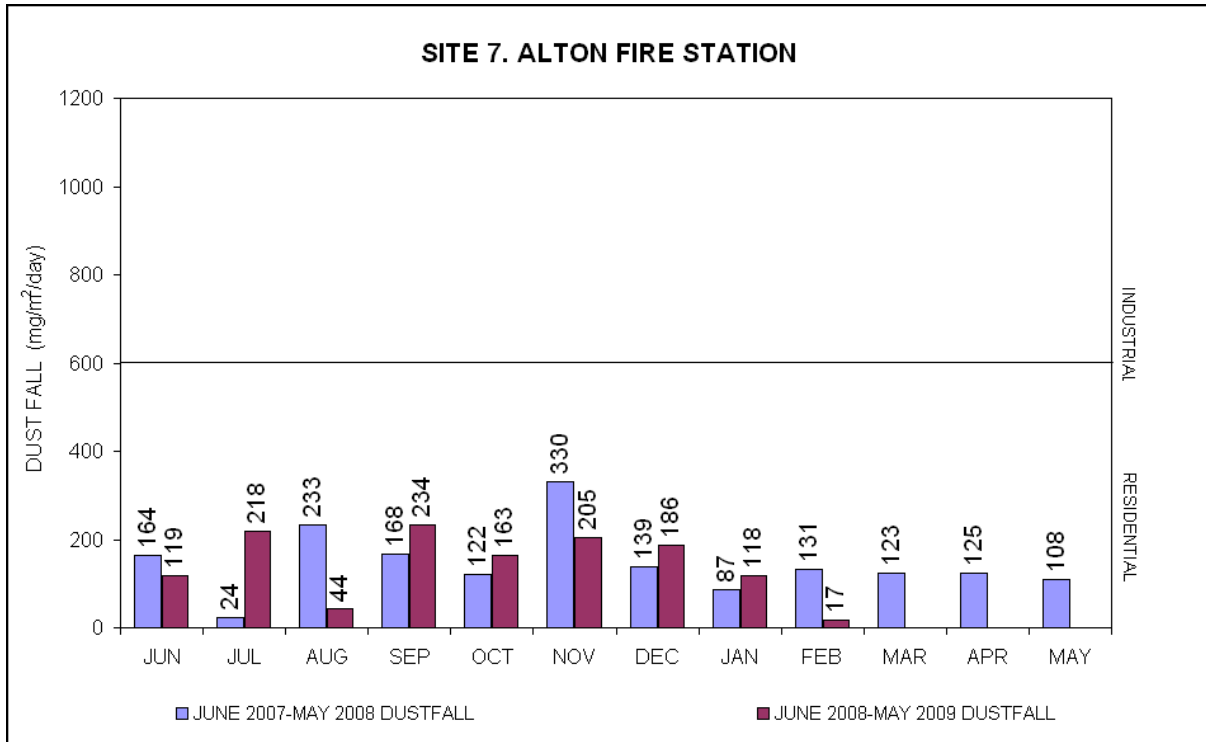
Specific Test Conditions	Samples stored at room temperature prior to analysis. Filters weighed at constant mass
Deviations From Method	None.
Measurement Uncertainty	± 5%

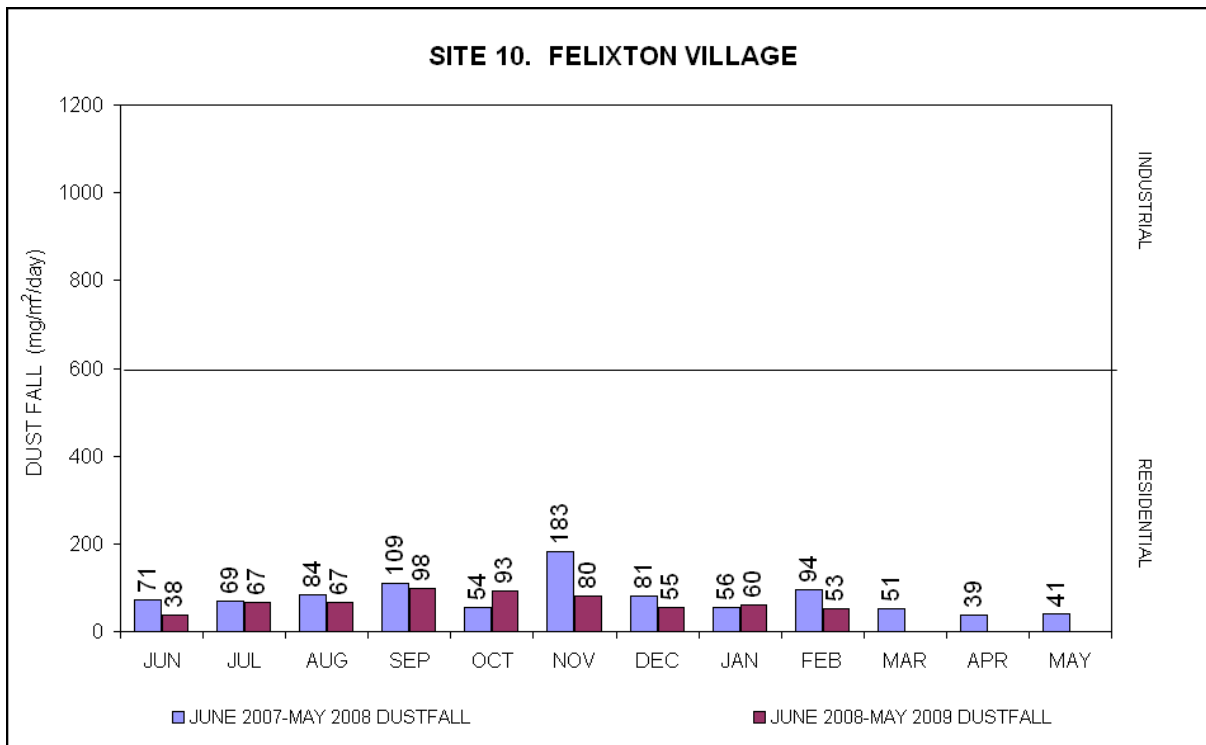
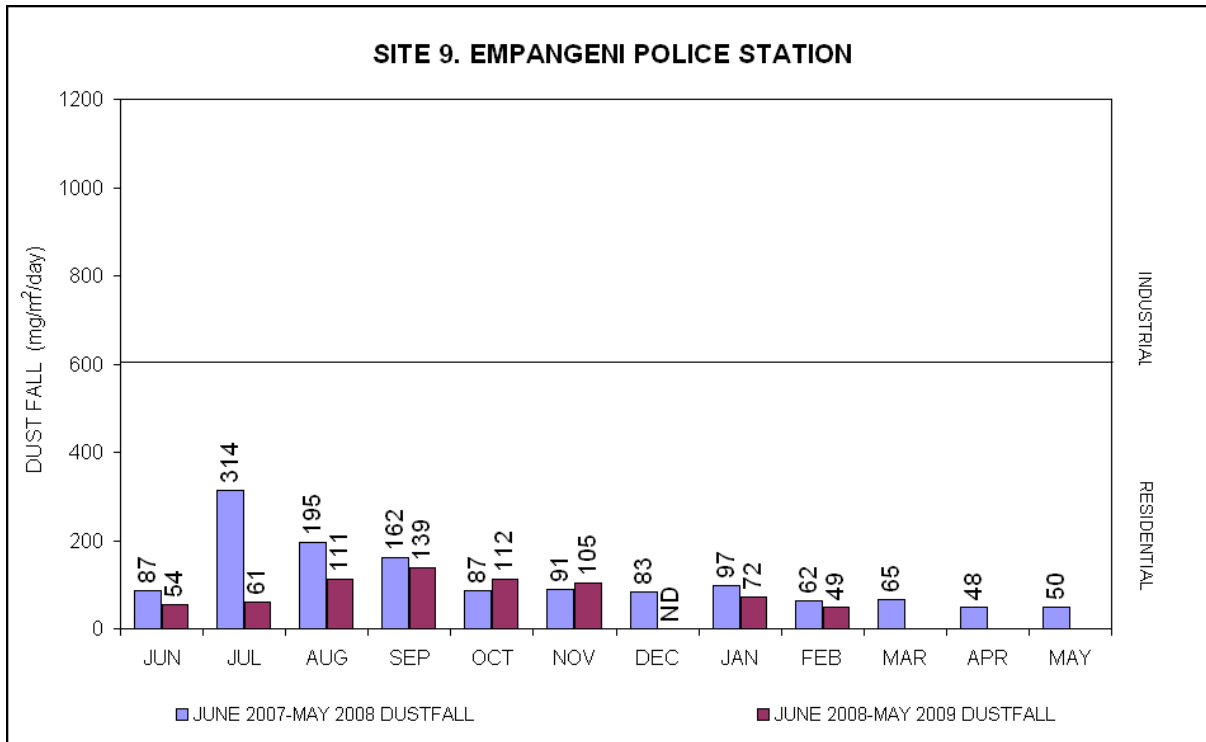
APPENDIX A RBCAA DUST FALLOUT MONTHLY TIMEPLOTS 2007 – 2009

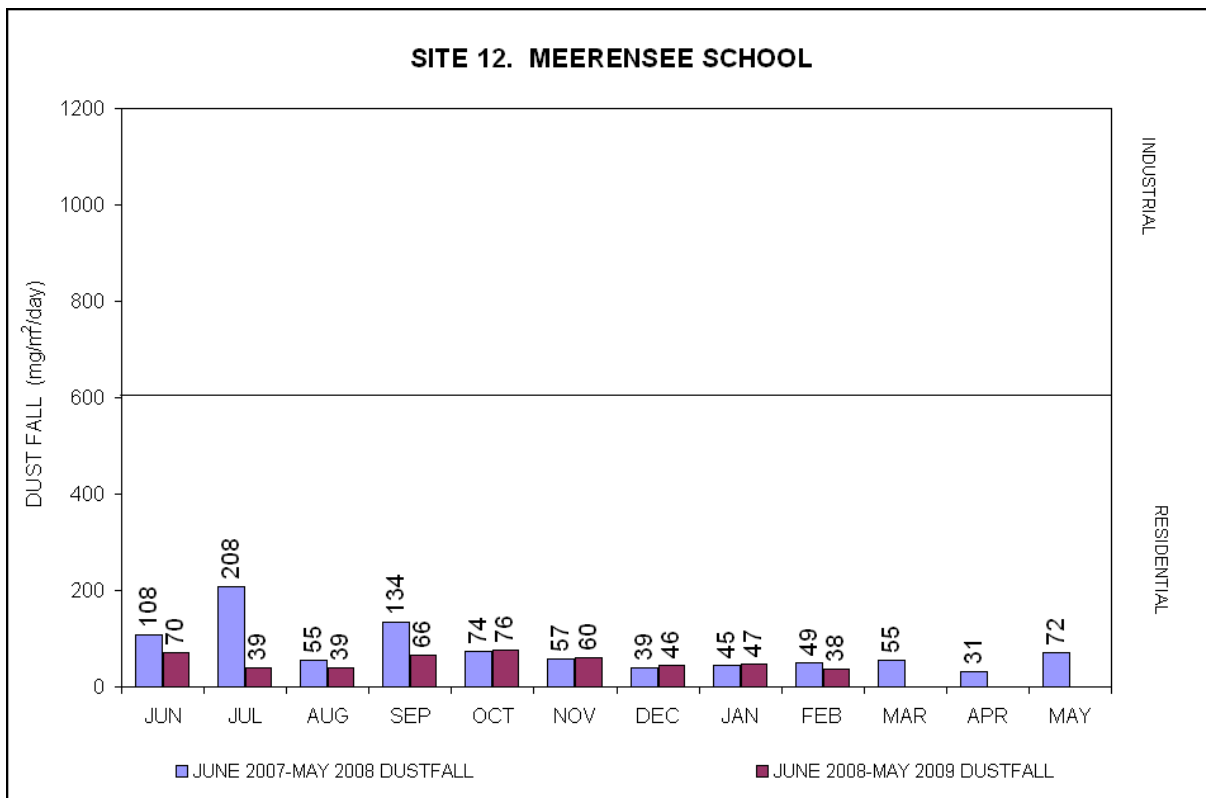
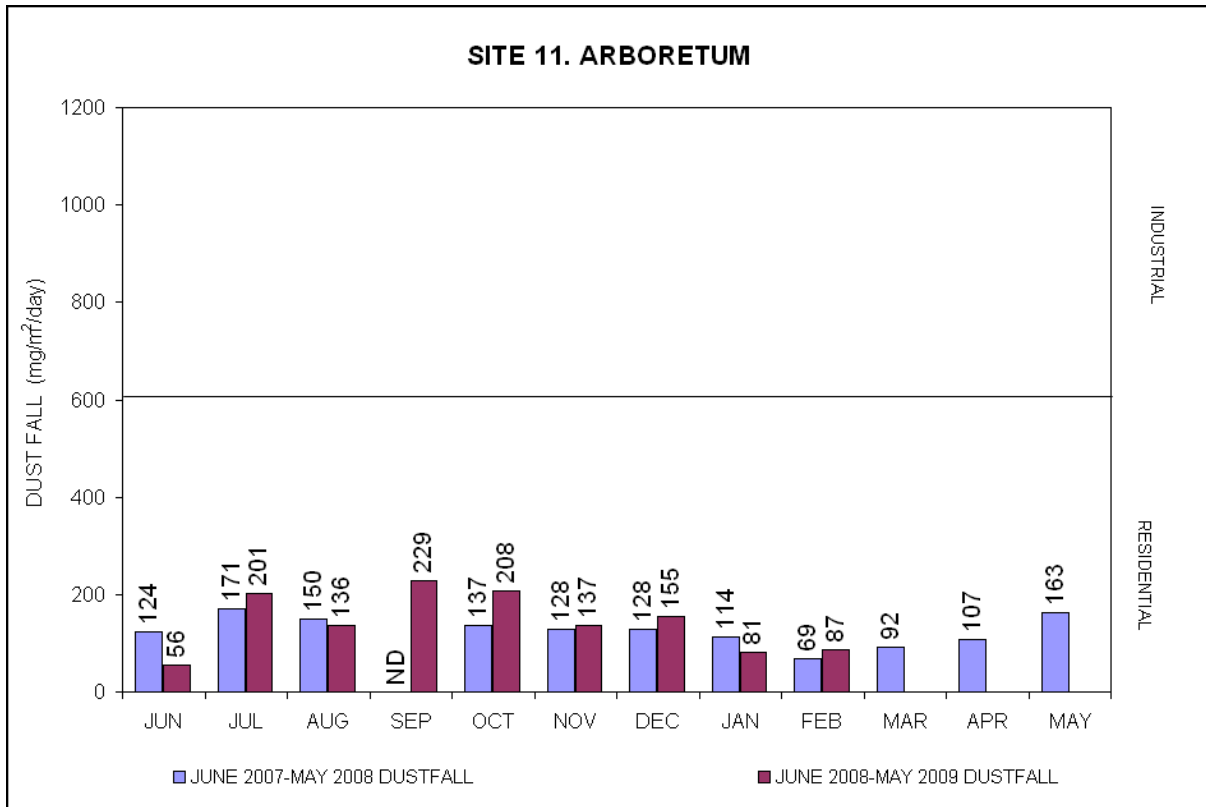












APPENDIX B: Sample Locations of all sites

