

10th February 2015

South Durban Community for Environmental Alliance (SDCEA)

Att: Bongani Mthembu

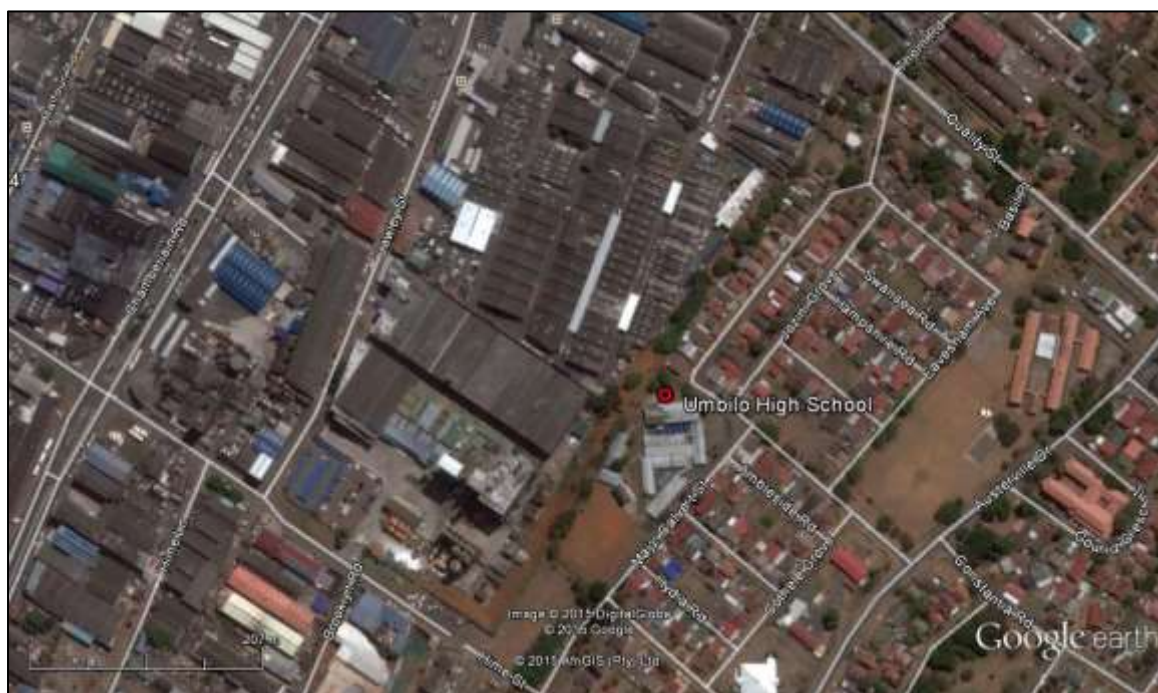
Ambient Air Quality Monitoring: Umbilo High School

1. Introduction:

Ambient Air Quality monitoring was undertaken at the Umbilo High School from the 5th of September till the 3rd of October 2014. Air pollutants such as Sulphur Dioxide, Nitrogen Dioxide, Volatile Organic Compounds and Dust Fallout was monitored using passive Radiello samplers and ASTM 1739-98 (Reapproved 2004) Dust Fallout stands and buckets.

The Radiello samplers for SO₂, NO₂ and VOC's were deployed for a period of 7 days, whilst the DFO Unit was deployed for a period of 29 days.

The figure below indicates the locality of the school in relation to its surrounding land use;



2. Results:

TABLE 1: RADIELLO SAMPLER'S RESULTS

Sample	Compound	Measured Concentration - $\mu\text{g}/\text{m}^3$	Ambient Air Quality Standard - $\mu\text{g}/\text{m}^3$	Evaluation
7929 – 1	Sulphur Dioxide – SO ₂	6.30	125 $\mu\text{g}/\text{m}^3$ 24hr	Compliant Results
	Nitrogen Dioxide – NOx	15.61	40 $\mu\text{g}/\text{m}^3$ 1 Year	
	Volatile Organic Compounds:			
	Benzene	3.88	5 $\mu\text{g}/\text{m}^3$ 1 Year	Compliant Result
	1-Pentane	7.43	N / A	No set National Ambient Air Quality Standards.
	n-Hexane	4.38		
	MEK	3.61		
	Ethyl acetate	1.37		
	Cyclohexane	1.14		
	2-Methylhexane	7.12		
	3-Methylhexane	9.35		
	1-Heptene	2.55		
	n-Heptane	63.18		
	Toluene	71.42		
	n-Octane	199.99		
	Ethyl benzene	196.64		
	Xylene	926.80		
	n-Nonane	615.90		
	Propyl benzene	106.09		
	1,2,3-Trimethylbenzene	216.21		
n-Decane	744.34			
1,2,4-Trimethylbenzene	570.09			
d-limonene	506.12			
1,3,5-Trimethylbenzene	359.24			
Total VOC	4616.85	-		

TABLE 2: DUST FALLOUT RESULTS

Sample	Location	GPS Coordinates	Residential Area (mg/m ² /Day)	Measured Concentration (mg/m ² /Day)
7929 - 1	Umbilo High School – Storage Container	26° 46' 21.30" S 31° 56' 25.62" E	D < 600	Result discarded

STANDARD LIMITS APPLIED

TABLE 3: NATIONAL DUST CONTROL REGULATIONS LIMITS

1	2	3	4
Level	Dustfall rate, D (mg·m ⁻² ·day ⁻¹ , 30-d average)	Averaging period	Permitted frequency of exceeding dustfall rate
Residential Area	D < 600	30 days	Two within any year, no two sequential months.
Non-residential Area	600 < D < 1200	30 days	Two within any year, not sequential months.

Source: National Dust Control Regulations, Government Gazette 36974 dated 1 November 2013

3. Evaluations

Radiello diffusive samplers deployed for Sulphur Dioxide (SO₂) and Nitrogen Dioxide (NO₂) returned **compliant** results when compared to the National Ambient Air Quality Standards.

The Radiello diffusive sampler deployed for Volatile Organic Compounds (VOCs) returned a result below the National Ambient Air Quality Standard for Benzene, i.e. compliant. The result however exceeded half the standard limit and is considered moderately high, considering that dilution of the air naturally occurs and the diffusion of the vapours onto a school property from neighbouring industries.

For all other VOCs, no set National Ambient Air Quality Standards are available to which the results can be compared. Future monitoring results could be used to establish a trend in concentrations.

The constituents of the Dust Fallout unit was noted to be contaminated and could not be adequately analysed. In accordance with ASTM 1739-98 (Reapproved 2004), the unit should be discarded and re-sampled. It is therefore recommended that the unit be re-deployed in order to obtain a dust fallout rate for the sample location.

4. Limitations

The results obtained were indicative of the conditions that prevailed during the sampling period. Changes in season, meteorology, production rate, process and other factors which affect contaminant generation and transmission, would cause variations in sample results. The archived DFO filters could be subjected to further analytical methods, on instruction from SDCEA or recommendation by Apex Environmental.

5. Certification Statement

This is to certify that the attached report has been compiled and issued under the authority, direction and the responsibility of an Apex Environmental, Occupational Hygienist.

Yours Sincerely,



Leon Pretorius
Environmental Manager
BSocSc Hons: Environmental Management (UKZN)
Registered Occupational Hygiene Technologist (SAIOH)