



Dust Monitoring for the Caroona Coal Project

Presentation to Caroona Coal Project
Community Consultative Committee
(CCC)

3 August 2010



Background

- The Caroona Coal Project (CCP) has established a monitoring program to collect baseline air quality monitoring data.
- The monitoring program includes groundwater and surface water monitoring, air quality monitoring and meteorological monitoring.
- Baseline environmental monitoring data would be required to inform the assessment of any future mining proposal within the EL area.
- The dust monitoring program has been designed to gather regional information – as project planning proceeds, the existing monitoring program will be continually reviewed and refined as needed.

Background

- Scientists and regulators refer to dust as particulate matter (PM), which includes a variety of sources such as ash from bushfires or wood heating, vehicle exhaust emissions, dust from agricultural activities and vehicle movements on unsealed roads, pollens from plants as well as particulate matter from mining.

Background

- Dust particles in the atmosphere are typically classified according to its particle size, as follows:
 - deposited matter refers to any dust that falls out of suspension in the atmosphere.
 - total suspended particles (TSP) typically refers to particles 50 μ m (micrometers) (0.05mm diameter) in size or less.
 - PM₁₀ refers to particles 10 μ m (0.01mm) in size or less.
 - PM_{2.5} refers to particles 2.5 μ m (0.0025mm) in size or less.

Background

Caroona Weather Station



Background



Air Quality Goals

- The NSW Department of Environment, Climate Change and Water (NSW DECCW) has regulatory criteria for assessing ambient air.
- The NSW DECCW standards take into account what we know about health effects on people with asthma, lung conditions, and heart disease.
- Particulate matter standards and criteria are set to control short (daily) and long term (average) levels and are incorporated into project approvals.

Air Quality Goals

- Current DECCW Air Quality Criteria for deposited matter:

Pollutant	Averaging Period	Maximum increase in deposited dust level	Maximum total deposited dust level
Deposited dust	Annual	2 g/m ² /month	4 g/m ² /month

Air Quality Goals

- Current DECCW Air Quality Criteria for suspended particulates:

Pollutant	Averaging Period	Criterion
TSP matter	Annual	90 $\mu\text{g}/\text{m}^3$
Particulate matter <10 μm (PM ₁₀)	Annual	30 $\mu\text{g}/\text{m}^3$
Particulate matter <10 μm (PM ₁₀)	24 hour	50 $\mu\text{g}/\text{m}^3$

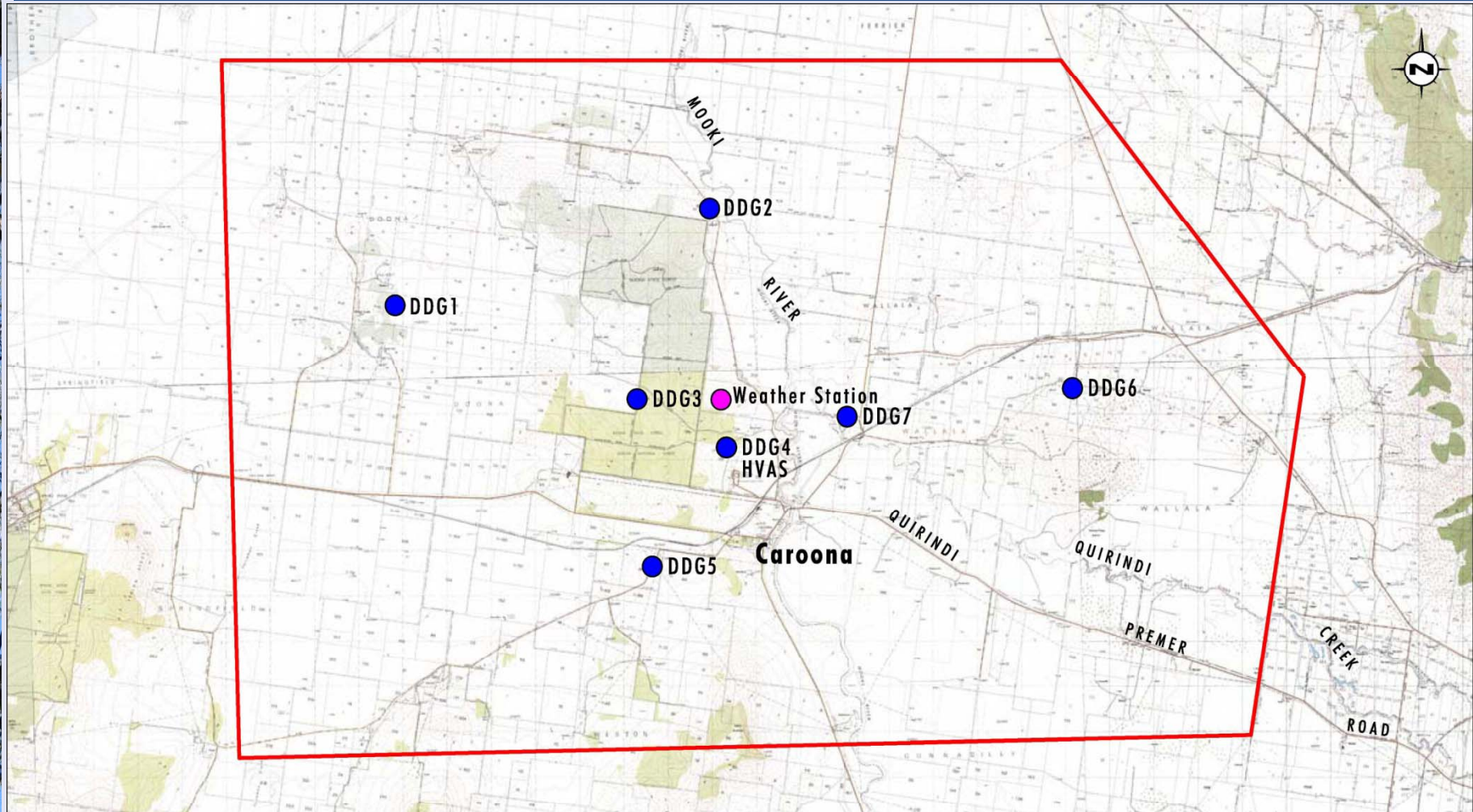
Air Quality Goals

- In May 2003, the National Environment Protection Council (NEPC) released advisory reporting standards for PM_{2.5} as follows:
 - 24 hour average = 25 µg/m³; and
 - Annual average = 8 µg/m³.
- No timeline for compliance or implementation was given.
- The advisory standards are not part of the DECCW assessment criteria.
- A PM_{2.5} monitor was added to the CCP monitoring program in May 2010.

CCP Air Quality Monitoring Program

- Air quality monitoring program established for the CCP in consultation with air quality experts.
- Location of dust gauges, high volume air samplers (HVAS) and meteorological station established on advice from Dr. Nigel Holmes.
- Monitoring program consists of seven dust gauges, one TSP HVAS, one PM₁₀ HVAS and one PM_{2.5} HVAS.
- Deposited matter monitored since June 2008, and suspended matter monitored since May 2008.

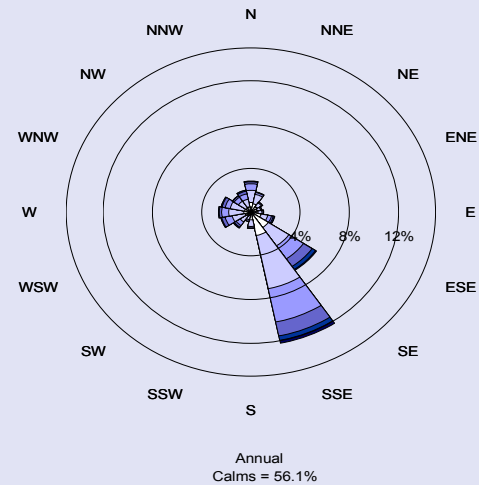
CCP Air Quality Monitoring Program



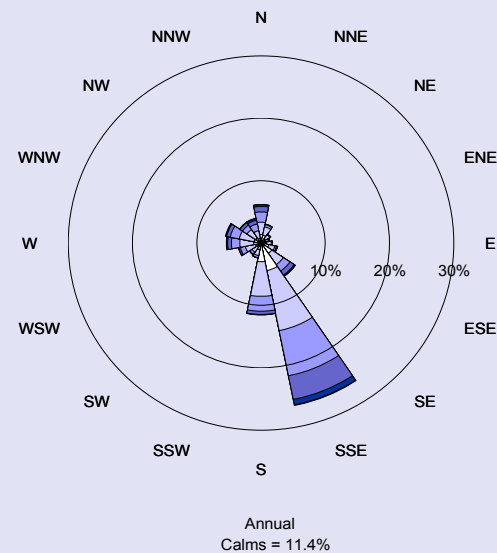
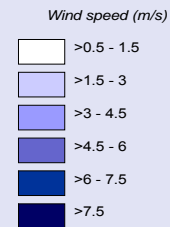
CCP Meteorological Monitoring Program

- It is important to have high quality local meteorological data for use in any future air quality modelling.
- Metrological station installed in July 2007.
- Records the following parameters every 10 minutes: rainfall, wind speed, wind direction, sigma-theta (variability of wind direction), temperature (at 2m and 10m), solar radiation and relative humidity.
- Data collected since July 2007 shows good correlation between years.

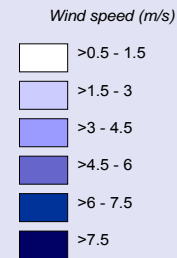
CCP Meteorological Monitoring Results to date



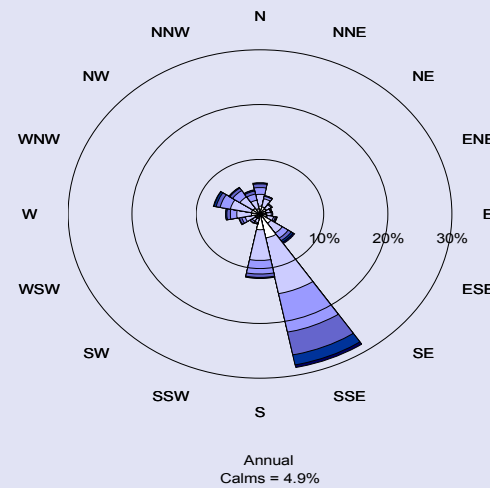
Annual and seasonal windroses for Caroona Weather Station (July to December 2007)



Annual and seasonal windroses for Caroona Weather Station (2008)

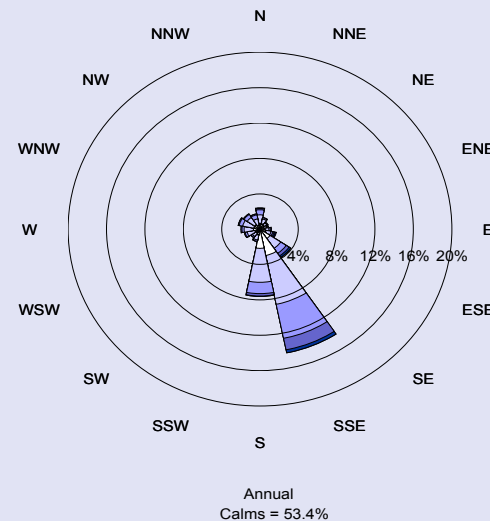
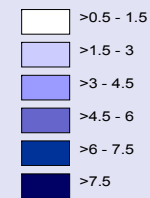


CCP Meteorological Monitoring Results to date



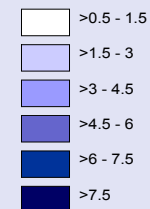
Annual and seasonal windroses for Carroona Weather Station (2009)

Wind speed (m/s)



Annual and seasonal windroses for Carroona Weather Station (January - June 2010)

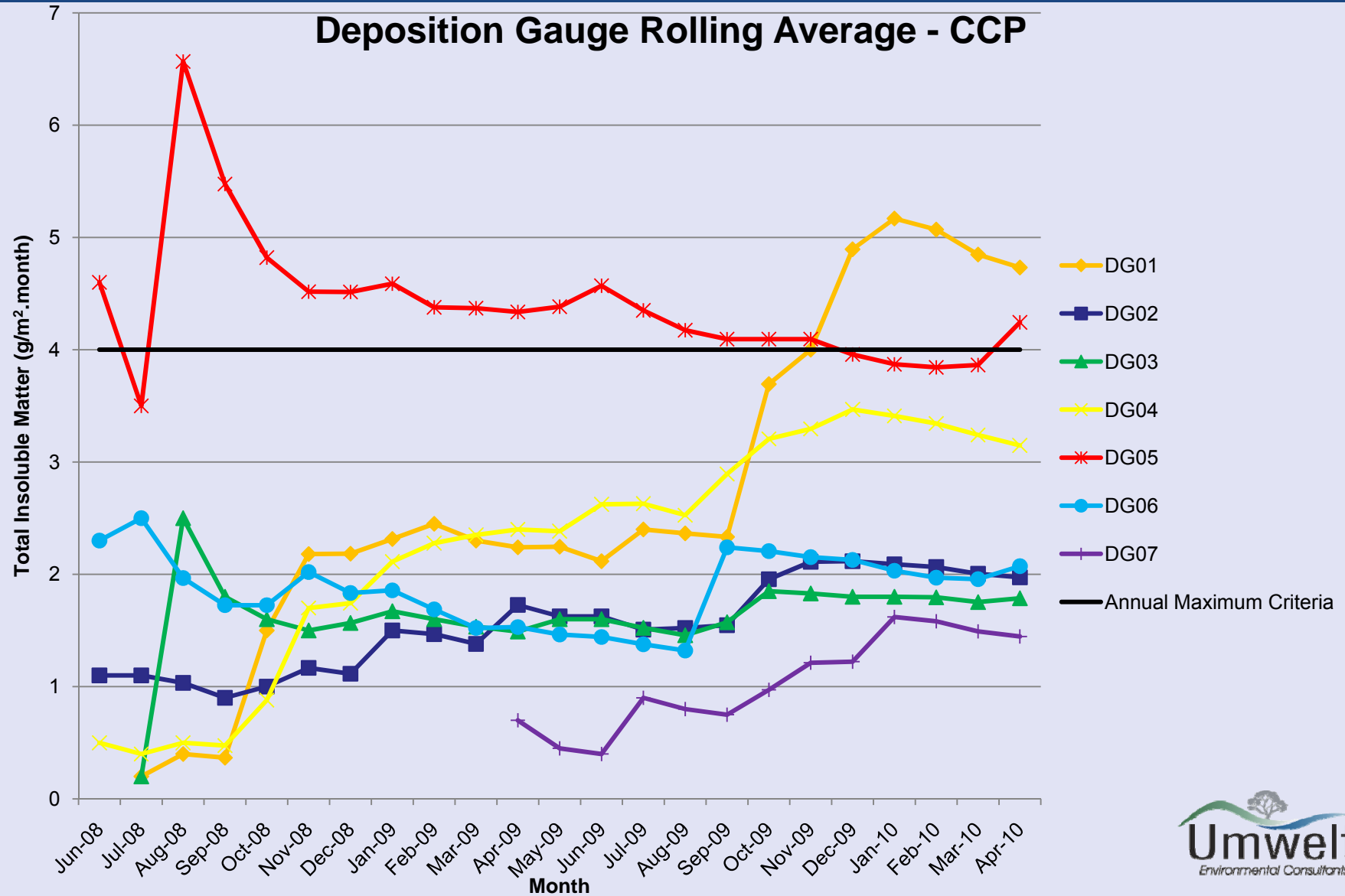
Wind speed (m/s)



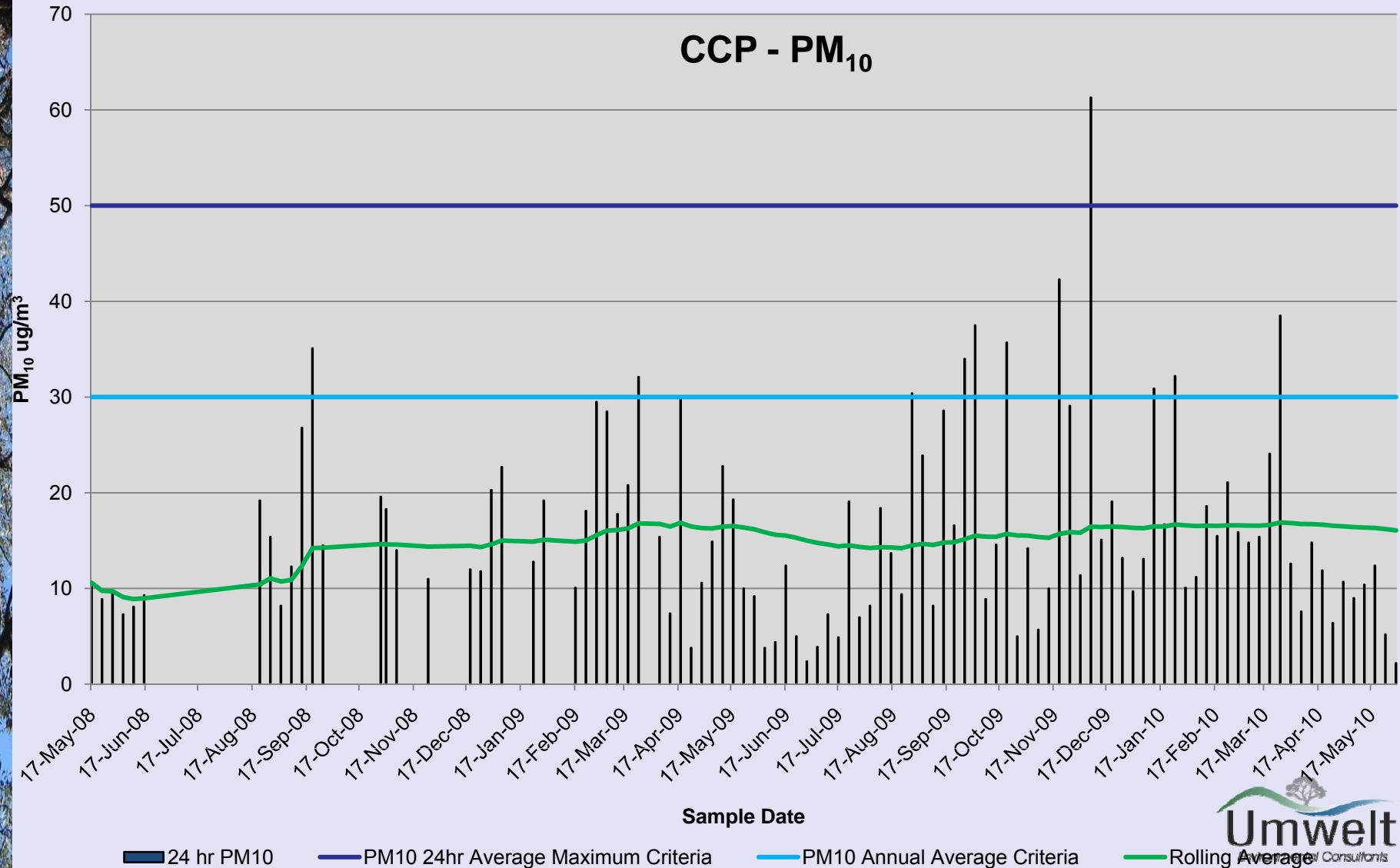
Air Quality Monitoring Program results to date

- Observations made from the baseline air quality data collected to date:
 - Seasonal variance in deposited dust levels, likely associated with seasonality of agricultural activities (e.g. DG01 spikes every year during spring).
 - Two dust gauges (DG01 and DG05) report concentrations above the DECCW criteria.
 - Suspended particulate matter below the annual average criteria, although some PM₁₀ results were reported above the 24-hour maximum criteria.
- PM_{2.5} monitor installed in May 2010 - limited data gathered to date.

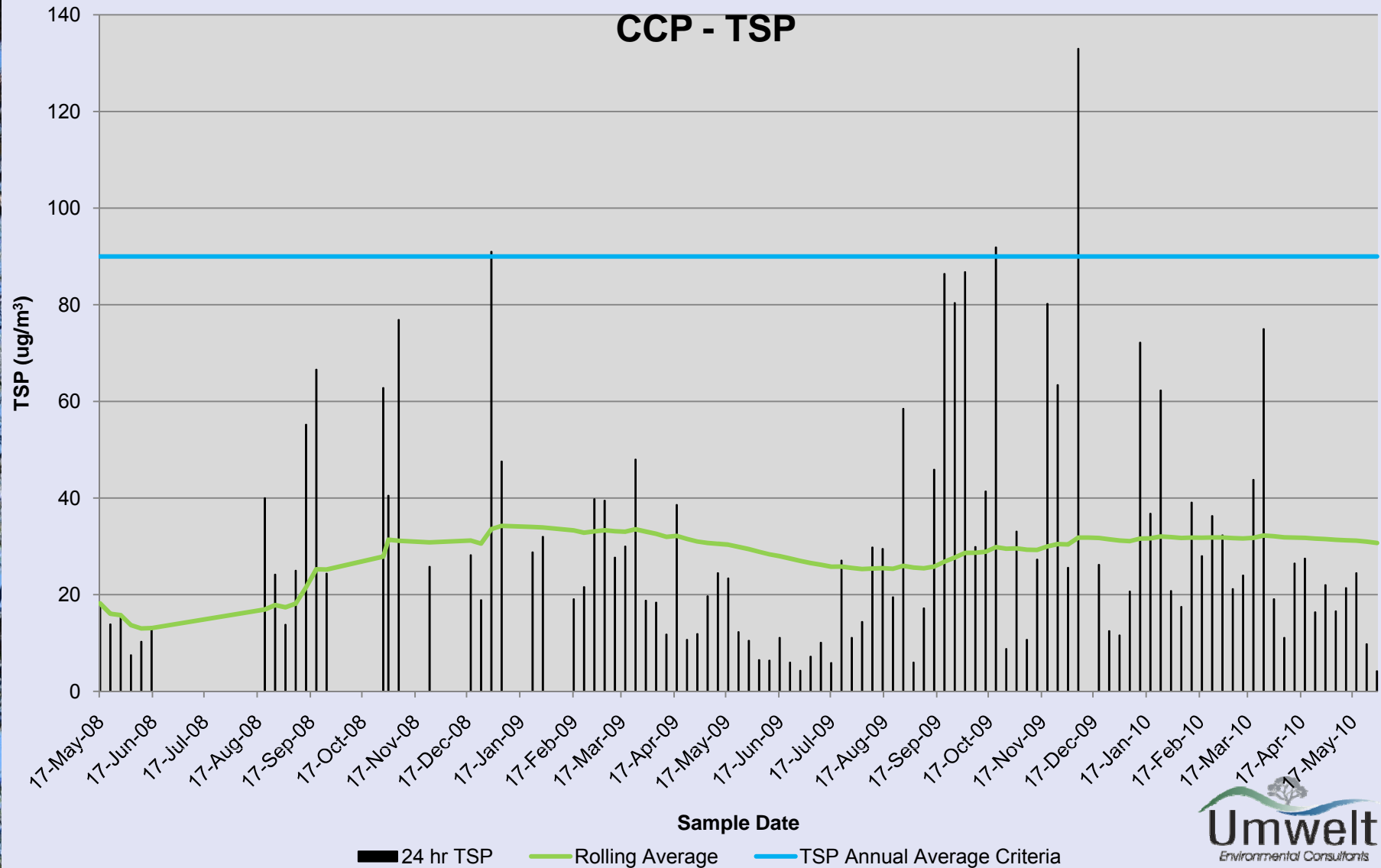
Air Quality Monitoring Program Results to Date



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Air Quality Monitoring Program Results to Date



Future Use Of Monitoring Program Data

- Information collected through the dust monitoring program provides baseline air quality data for the Caroona EL area.
- Should the project proceed and a mine be proposed, BHP Billiton will use the monitoring data so likely and actual impacts from any future mining operation can be properly predicted and monitored.

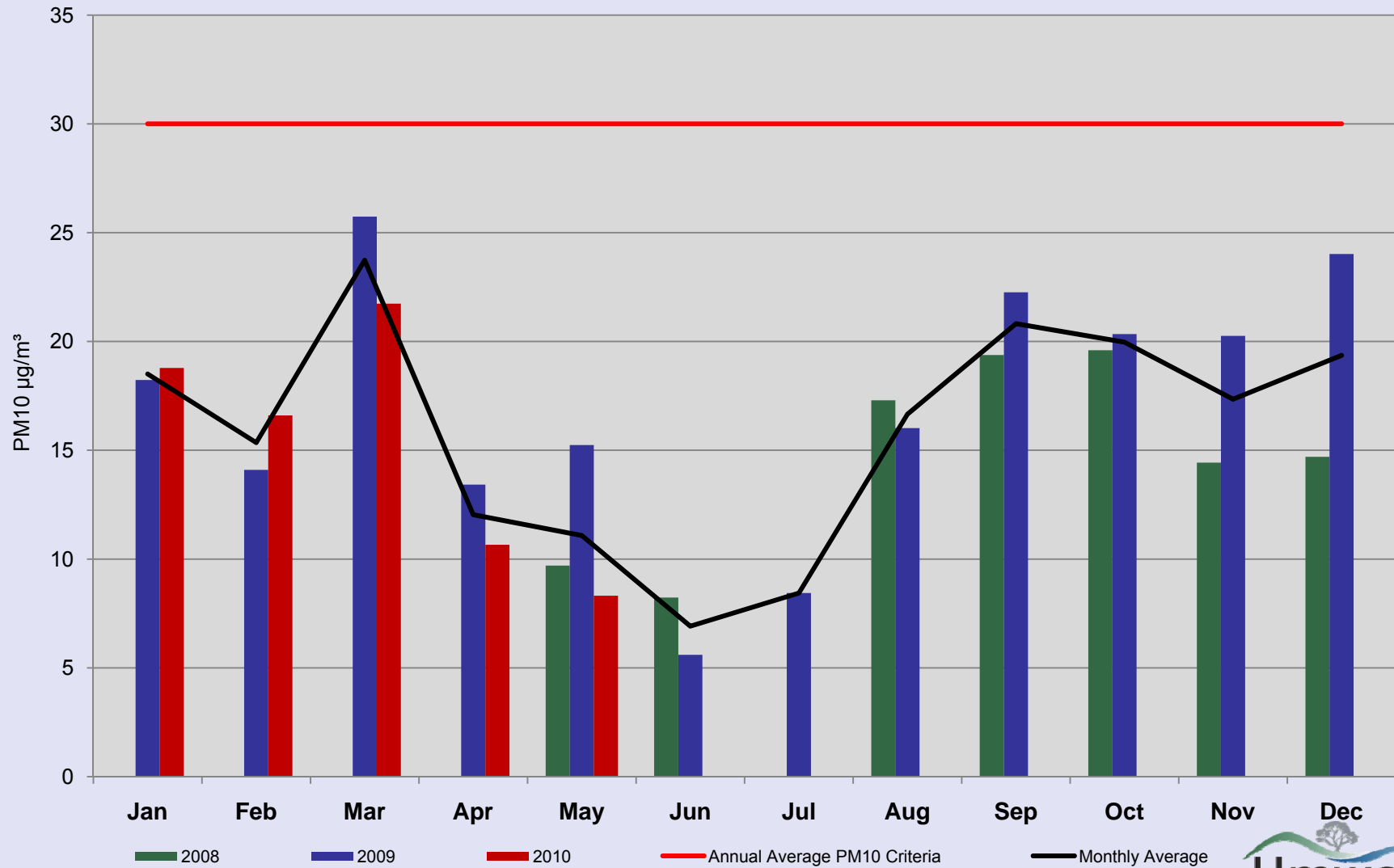
Air Quality Impact Assessment Process

- Any future mining proposal would be subject to a comprehensive air quality impact assessment as part of the Environmental Assessment and would consider potential cumulative impacts
- The air quality impact assessment process has several phases:
 - Gathering background data (dust levels, meteorological data, land use, terrain etc.)
 - Estimating dust emissions (what aspects of the project may generate dust and how much?)
 - Undertake dispersion modelling
 - Reviewing the model results and assessing impacts, and identifying required air quality management approaches
 - In practice the above is an iterative process where model results are used to refine the project to reduce the potential for impacts

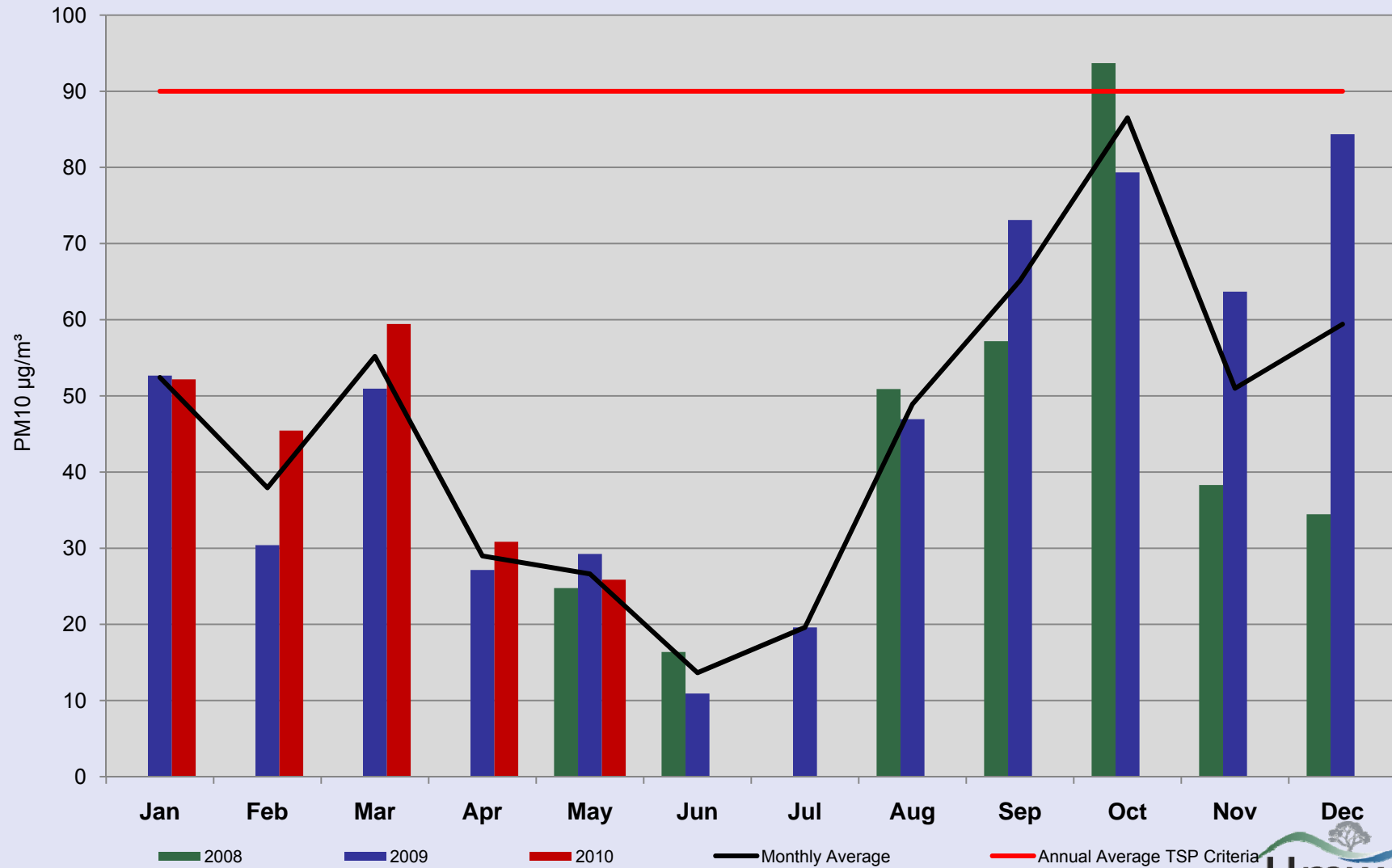
Other representations of the data

Monthly Results

PM₁₀ Results

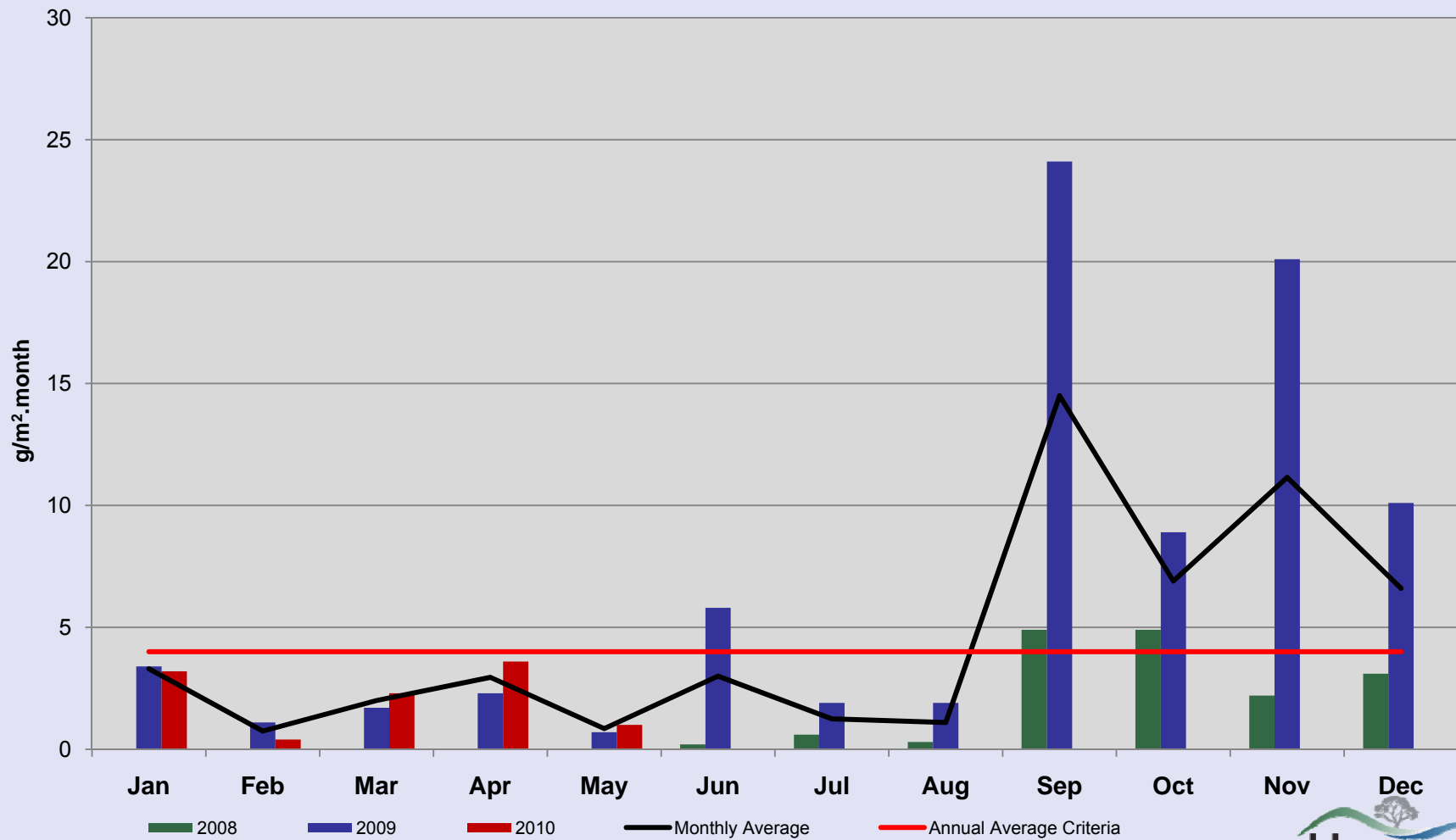


TSP Results



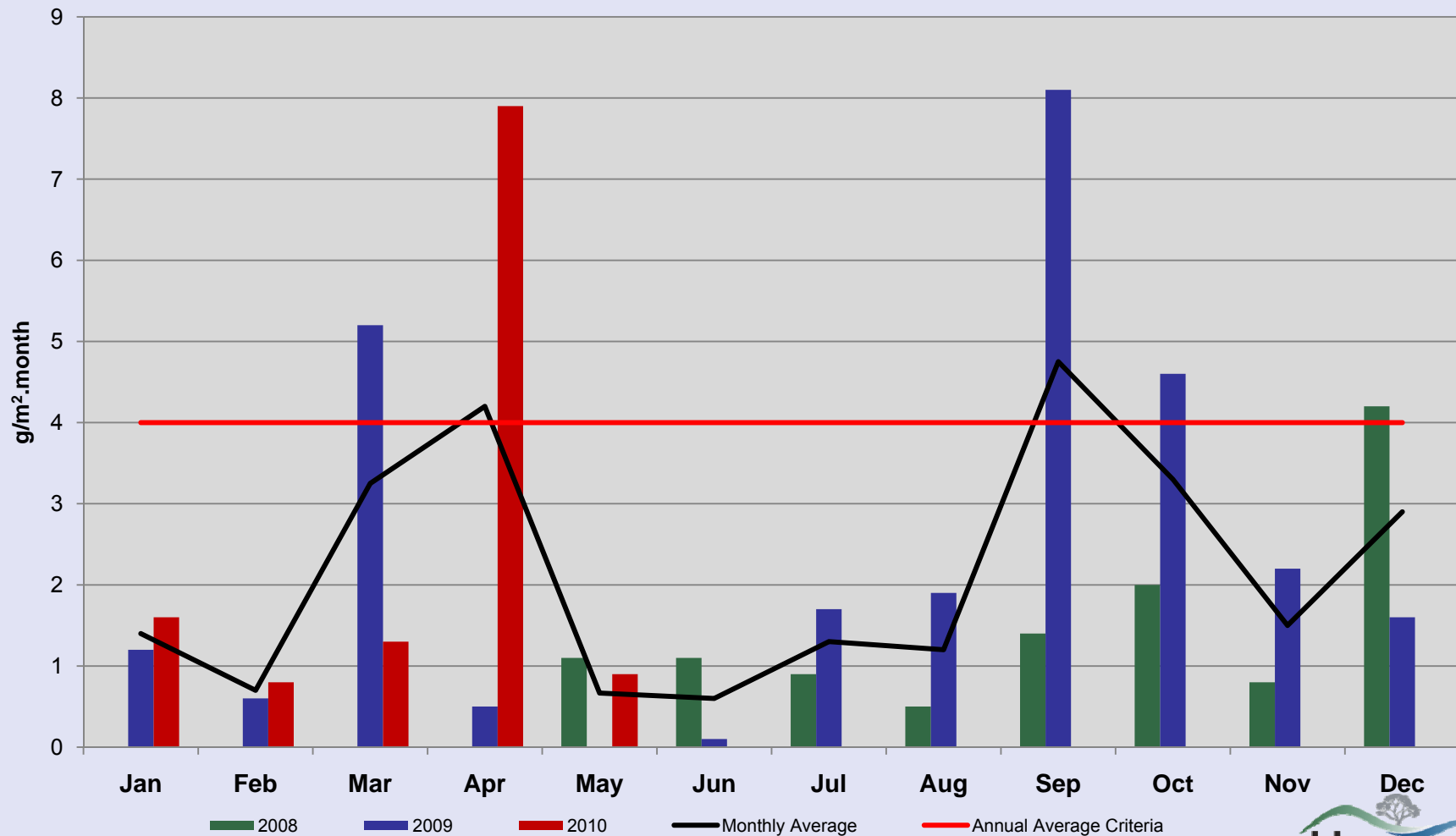
Dust Gauge 1 Results

DG01 Total Insoluble Matter



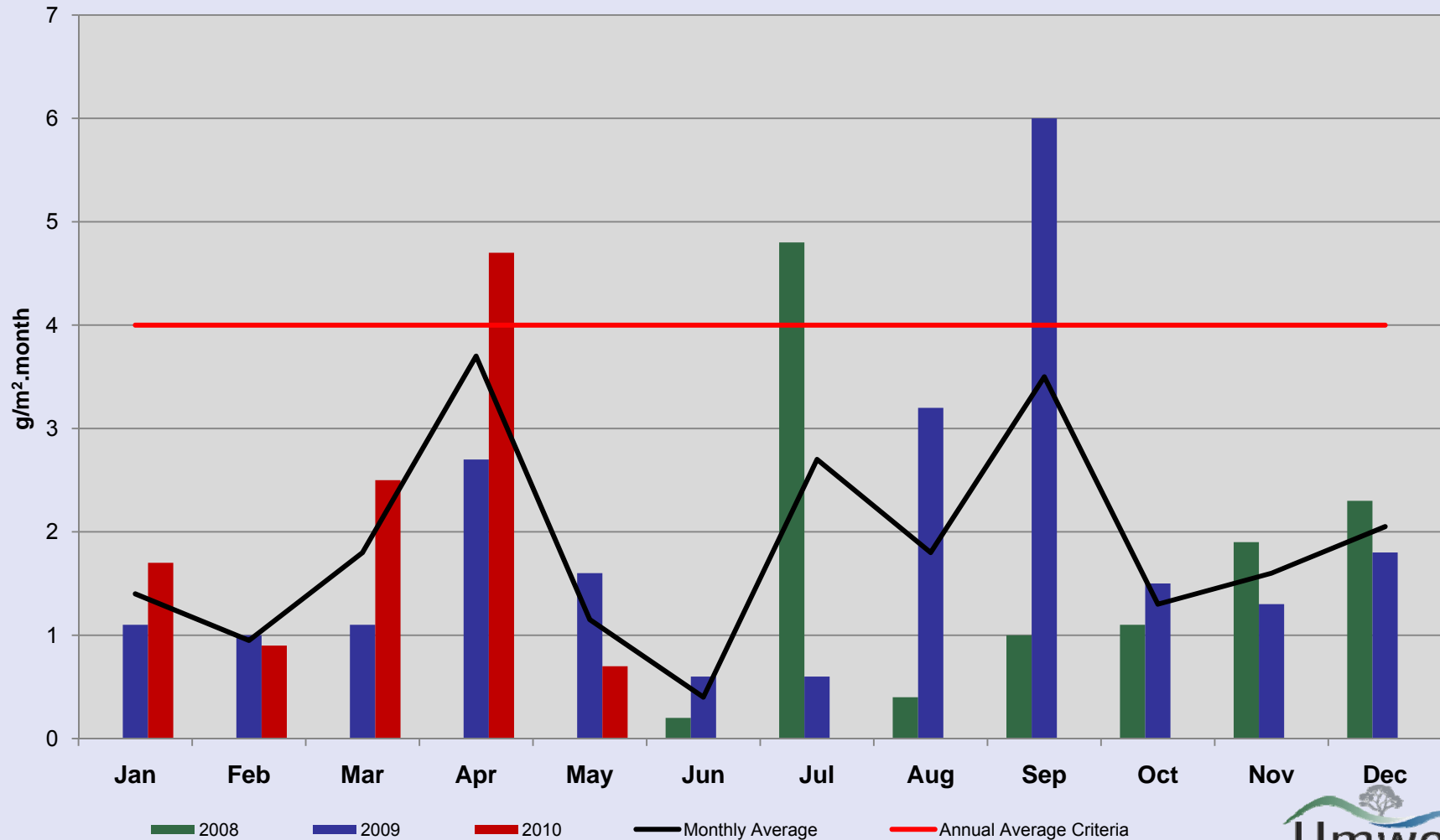
Dust Gauge 2 Results

DG02 Total Insoluble Matter



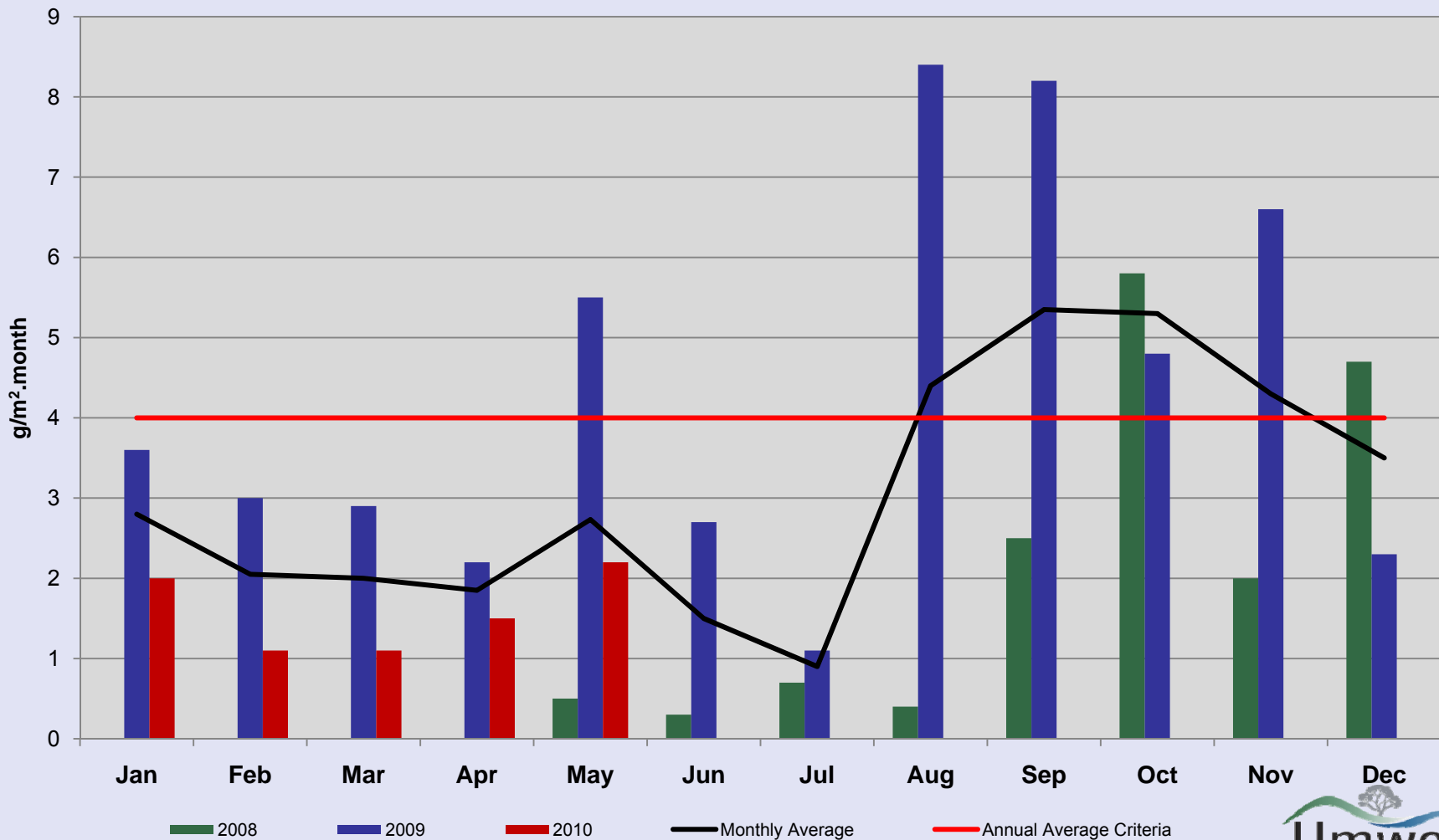
Dust Gauge 3 Results

DG03 Total Insoluble Matter



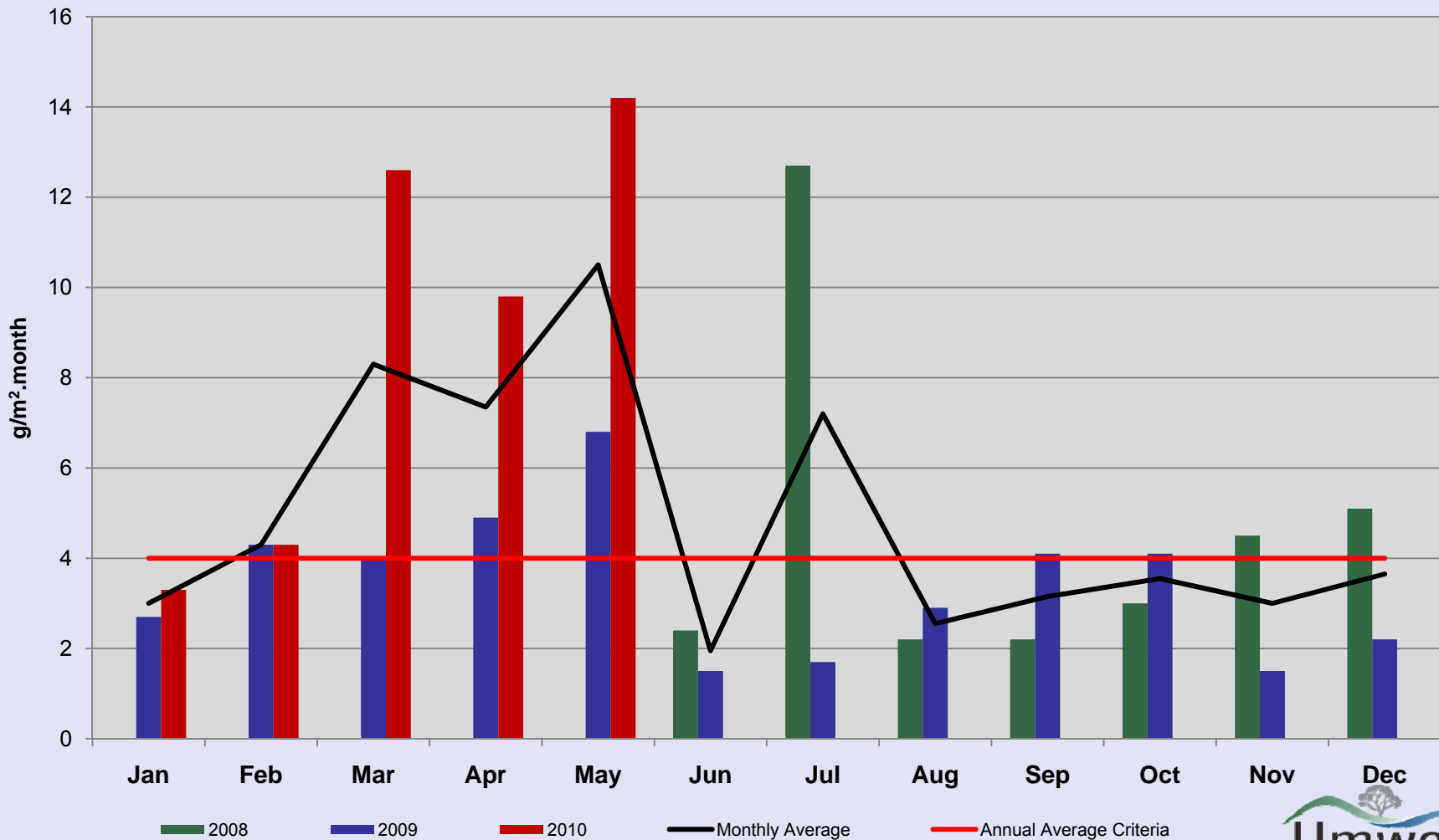
Dust Gauge 4 Results

DG04 Total Insoluble Matter



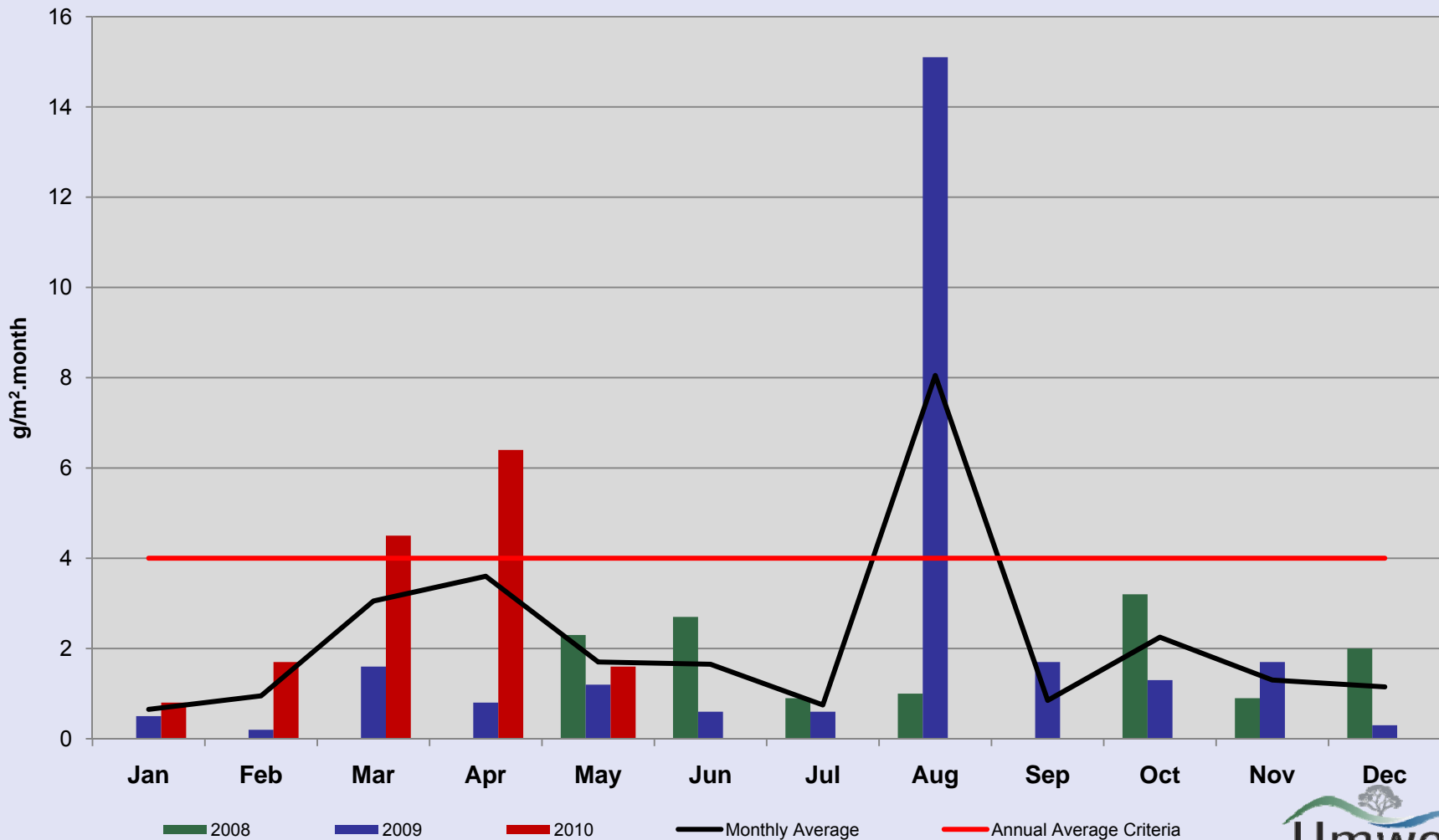
Dust Gauge 5 Results

DG05 Total Insoluble Matter



Dust Gauge 6 Results

DG06 Total Insoluble Matter



Dust Gauge 7 Results

DG07 Total Insoluble Matter

