



MRA HELENA EAST MONITORING PLAN

20th August 2007

Introduction

Compliance Monitoring were contracted by Midland Redevelopment Authority (hereafter MRA) to conduct air monitoring in accordance with the Dust and Air Quality Management Plan, Version 6 for the Remediation of Helena East Soils at Midland Railway Workshops (DAQMP). The monitoring is to include public health ambient air measurement of asbestos, PM10 particulates, total suspended particulates (TSP), particulate metals, VOCs and exclusion zone boundary monitoring of PAHs and PM10 particulates for management purposes.

There will be regular meetings held to discuss the progress, data and findings of the air monitoring. The meetings may result in recommendations to modify the planned monitoring based on data obtained, in accordance with the DAQMP.

This plan explains the techniques to be employed & principles applied to determine station siting and monitoring outputs.

Definitions

Equivalent aerodynamic diameter (EAD)

The diameter of a spherical particle of density 1000 kg/m³ which exhibits the same aerodynamic behaviour as the particle in question.

PM₁₀

Suspended particulate matter consisting of particles having an EAD of less than 10µm, which is passed by a size classifier having performance characteristics as defined in US Code of Federal Regulations: 40 CFR 50, Part 53, Subpart D.

Total Suspended Particulates

Atmospheric suspended particulate matter having an approximate EAD of less than 50µm.

TEOM

Tapered element oscillating microbalance, as manufactured by Rupprecht & Patashnick Co. Inc., New York, USA.

PAHs

Polycyclic aromatic hydrocarbons

VOCs

Volatile organic compounds

DAQMP

Dust and Air Quality Management Plan Remediation of Helena East Soils and Midland Railway Workshops (version 6) incorporating Addendum 1, produced by ATA Environmental, 2 Bulwer Street Perth WA 6000, Report No. 2005/221, June 2007.

Monitoring Station Infrastructure

The fixed monitoring stations each require a 10A 240VAC electricity supply. This is being provided by MRA. The three monitoring locations are being differentiated by the designation of being North, East and West stations. They are correspondingly located North, East and West of the remediation activities to protect the sensitive receptors in the direction of the sites.

The North site is within the MRA workshop site boundary which has security fencing and boom gate access. MRA are providing a 2m x 5m perimeter fence for the East site on the external fence close to the WAPS swipe gate entry. A larger 5m x 5m perimeter fence with external vehicle access is being provided for the West site. This is located along a fence-line which is being extended running North-South along the western edge of the remediation area.

The exclusion zone boundary monitoring will also be a secure site, not requiring immediate perimeter fencing.

Localised temporary hardstand will be installed where required by Compliance Monitoring for all the monitoring stations.

Attention will be given to the dust source combined with wind speed to determine localised dust sources are contributing to the background measurements. If this is the case then we will advise on the need for dust suppression at the source of the dust.

Monitoring Objective

The DAQMP dictates the techniques to be used plus the measurement parameters, number of sites and equipment type.

The monitoring is primarily being employed to protect public health and also tenants of co-located companies and organisations. For further information please refer to the DAQMP.

Station Siting

Sensitive receptors are on-site Midland workshop personnel working for a number of individual organisations. Nearby residential receptors occur both to the North and West of the remediation zone. East of the zone is occupied by the Western Australian Police Service. The stations have been located to primarily provide measurements of airborne contamination between the remediation activity and sensitive receptors. This has taken precedence over locating the sites to conform strictly to the siting standards. Below is a summary of the monitoring and sampling being performed at each site. For a more detailed assessment of each site please refer to the appendices for the 'Siting AS2922-1990 Particulate Audit Worksheets' for each site.



North Station

AS2922 Defined Station Type: Peak station

Station Location: 31° 53.600S 116° 00.182E ± 5m

Measured parameters: PM₁₀, TSP, particulate metals, asbestos fibres, VOCs, PAHs

This site was chosen as it is the most direct ground level route for pollutants to exit the site boundary to the North. At the time of site selection there were a number of railway carriages obscuring the path between the monitoring site and the proposed remediation activities however it was advised my MRA staff that the carriages were being removed. As MRA do not own/operate the rail service they will lobby the operator in a bid to ensure the carriages are removed from site prior to the commencement of the remedial earthworks. If the carriages remain in place for the period of background monitoring we believe they will have little adverse impact on the background monitoring results.

West Station

AS2922 Defined Station Type: Peak station

Station Location: 31° 53.684S 116° 00.078E ±5m

Measured parameters: PM₁₀, TSP, particulate metals, asbestos fibres, VOCs, PAHs, wind speed and wind direction, ambient temperature

This site was chosen to measure potential impacts on residents to the West of the site. It is likely that this monitoring station will measure nearby offsite particulates generated by residential property development. A 'site contribution' calculation of real-time PM10 will be employed for alarms to the 'target criteria' and stop work control and compliance so the earthworks contractor for the remediation only responds to exceedances generated by their activities rather than off-site sources, the cause of which is not under their immediate control.

This site is the best located of the three sites for measurement of meteorological parameters.

East Station

AS2922 Defined Station Type: Peak station

Station Location: 31° 53.750S 116° 00.404E ± 5m

Measured parameters: PM₁₀, TSP, particulate metals, asbestos fibres, VOCs, PAHs

This site is situated at the perimeter fence-line of the WAPS Cadcom building. There are no sites along the Eastern edge of the remediation zone that were considered more suitable. Similar to the West site this station may be impacted by nearby earthworks and also dust lift-off in high winds from exposed soil between the monitoring station and the remediation zone. If the exposed ground is identified as the cause of exceedance of trigger values then dust suppression strategies may need to be implemented. As this nearby land is not owned by MRA there will need to be agreement by the property owner for implementation of the dust suppression techniques.



Exclusion Zone Boundary

PM10 particulates will be monitored downwind of the remediation activity using a mobile monitoring trailer. This trailer, housing a DusTrak, has an audiovisual alarm which will activate upon exceeding $300\mu\text{g}/\text{m}^3$ for a 1 hour averaging period.

Naphthalene (and other PAH compounds) will be sampled during background sampling and for the initial 4 weeks of active hydrocarbon earthworks. PAHs will be sampled using the same mobile trailer.

The trailer will be deployed prior to commencement of earthworks, relocated at/around Midday and retrieved for overnight re-charging by Georgio Group personnel. The time of trailer movements and locations must be recorded as part of this relocation process.

Tenant Proximity/Complaint Air Sampling Strategy

There is a requirement to conduct occupational sampling and analysis when remediation activities are being conducted within 50m of a tenant location. Although responsibilities not defined in the DAQMP, ATA Environmental will advise Compliance Monitoring when earthworks are due to be performed within 50m of on-site tenants. In this event Compliance Monitoring in liaison with ATA Environmental will advise, and co-ordinate if necessary, a sampling/analysis regime appropriate to the level and likely parameters of impact on the tenants.

Sampling adjacent to the tenants building (between the remediation activities and the occupants) will be established in addition to internal static sampling for the parameters likely to impact on the workforce. This may include personal and/or static sampling for dust, metals, VOCs, PAHs & fibre counts. The proposed sampling will be forwarded to ATA Environmental for approval prior to completion of the services outside the scope of the DAQMP.

Monitoring Schedule

The monitoring schedule will conform to Table 2 of the DAQMP.

Subcontractors

Compliance Monitoring shall be conducting the ambient air monitoring services with SGS Environmental Services (hereafter named SGS) subcontracted to perform sampling plus TSP, particulate metals, PAHs and fibre count analysis. Chemistry Centre of WA will be subcontracted to perform VOC analysis.



Laboratory Turnaround

The turnarounds listed below are those in working days, not including weekends or public holidays, from the receipt at the laboratory. Samples received by the laboratory after 3pm are deemed to have been received the following working day.

Parameter	Laboratory Working Day Turnaround
Asbestos fibre counts	2
TSP	2
Particulate metals	4
VOC	5
Naphthalene	5

Occupational Monitoring

There is no current occupational analysis requirement as part of the ambient air services contract.



Methodology & References

Ambient Monitoring

The following methods form the basis of measurements:

- (i) Asbestos Fibres
Fibre counting for static control monitoring and personal air samplers (analysis by SGS, method PASB-001)

Referenced method: *Guidance note on the membrane filter method for estimating airborne asbestos fibres [NOHSC: 3003 (2005)]*
- (ii) PM₁₀ (Fixed stations)

Referenced method: *Determination of suspended particulate matter - PM₁₀ continuous direct mass method using a tapered element oscillating microbalance analyser [AS/NZS3580.9.8:2001]*
- (iii) TSP (Analysis SGS, method PEI-100)

Referenced method: *Determination of suspended particulate matter - Total suspended particulate matter (TSP) - High volume sampler gravimetric method [AS/NZS3580.9.3:2003]*
- (iv) Ambient lead/particulate metals (Analysis SGS, method PEM 005-9)

Referenced method: *Determination of particulate lead - High volume sampler gravimetric collection - Flame atomic absorption spectrometric method [AS2800 1985]*
- (v) Wind Speed and Direction

Ambient air - *Guide for measurement of horizontal wind for air quality applications [AS2923 -1987].*
- (vi) PAHs (analysis by SGS method SEO123 - with GCMS)

Referenced method: *Polynuclear aromatic hydrocarbons by gas chromatography [NIOSH 5506/5515].*
- (vii) VOCs (analysis Chemistry Centre of WA)

Referenced method: *Determination of volatile organic compounds (VOCs) in ambient air using specially prepared canisters with subsequent analysis by gas chromatography [USEPA TO-14A/ 15]*



Program Review

Regular review meetings will be held throughout the program at which the effectiveness of the monitoring program will be reviewed and if necessary the scope and nature of monitoring program amended in consultation with the MRA and regulatory agencies.

The following groups will be invited to these meetings:

1. Compliance Monitoring
2. Coffey Environments
3. MRA
4. The Site Contamination Auditor or his nominated representative
5. The Department of Environment and Conservation - Air Quality Branch
6. The Department of Health

A quorum will consist of Compliance monitoring and Coffey Environments. Notes summarising the outcome of the meeting will be provided to all invited attendees. A nominal meeting schedule is included below. All times quoted are relative to the commencement of background monitoring.

Week	Purpose
Week 3	Review monitor performance and background results
Week 5	Review monitor performance and initial results and monitoring scope
Week 7	Review monitor performance and initial results and monitoring scope
Every 4 weeks thereafter	Review monitor performance and initial results and monitoring scope

Reporting

Daily unverified PM₁₀ & wind data reports plus laboratory test spreadsheets will be emailed to Mr Greg Milner, the ATA Environmental representative or his delegate. Refer to the appendices for an example report layouts. SMS alarms will be automatically reported when TEOM PM₁₀ values exceed corrective action levels to Mr Greg Milner (or his representative) and the nominated earthworks contract manager, Georgiou Group.

Fortnightly (as required at the beginning of the project) and monthly verified data reports will be provided in a format suitable for uploading to the MRA website. The naming convention will be "YYMMDD Air Results Helena East" where MM is the month, DD the day and YY is the year.

Should any lab results exceed target criteria, corrective action or work stoppage levels the exceedance shall be reported by email within 2 hours of receipt to Mr Greg Milner (or his representative).



Trigger Levels

Parameter	Target Criteria	Corrective Action	Work Stoppage	Units
Asbestos fibre count	<0.01	-	0.01	fibres/mL
TSP	750 (15min average) 90 (24hr average)	-	1000 (15min average) 150 (24hr average)	µg/m ³
PM ₁₀ (fixed stations)	50 (24hr average)	120 (1hr average) 120 (10min site contribution average for SMS alarm)	600 (1hr average)	µg/m ³
PM ₁₀ (management)	-	300 (1hr average for audiovisual alarm)	750 (1hr average)	µg/m ³
Antimony	14	14	-	µg/m ³
Arsenic	0.8	0.8	-	µg/m ³
Cadmium	0.2	0.2	-	µg/m ³
Chromium	1	1	-	µg/m ³
Cobalt	5	5	-	µg/m ³
Copper	90	90	-	µg/m ³
Lead	1.3	1.3	-	µg/m ³
Manganese	1	1	-	µg/m ³
Mercury	NA	NA	-	µg/m ³
Nickel	1.8	1.8	-	µg/m ³
Zinc	350	350	-	µg/m ³
Dichloromethane	-	790	1580	ppb
Chloroform	-	0.2	0.4	ppb
1,2-Dichloroethane	-	160	320	ppb
Benzene	-	750	1500	ppb
Trichloroethylene	-	-	-	ppb
Toluene	-	95	190	ppb
Tetrachloroethylene	-	35	70	ppb
Ethylbenzene	-	6970	13940	ppb
Xylenes (total)	-	1015	2030	ppb
Styrene	-	90	180	ppb
Naphthalene	-	52 (8 hr TWA)	104 (8 hr TWA)	mg/m ³

NB. Based on 24 hour samples unless otherwise stated.

Yours Sincerely



Nigel Ball
Project Manager

