AECOM

Environment

Submitted to:
PPG Industries Inc.
Jersey City, NJ

Submitted by:
AECOM
Piscataway, NJ
60149955-4010A
May 14, 2012

Air Monitoring Plan for Ground Intrusive Activities at the Various PPG Hexavalent Chromium Sites in New Jersey

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Contents

List of Appendices

List of Tables

List of Figures

1.0 Introduction

This Air Monitoring Plan (AMP) has been developed to provide specific procedures for measuring, documenting, and responding to potential airborne contaminants during the remedial activities at the various PPG Industries (PPG) Hexavalent Chromium (Cr^{+6}) sites in New Jersey. Project specific information and changes to the Generic AMP will be addressed using the Amendment Form provided in **Appendix A**. Site specific information including the following will be addressed as an Amendment:

- Alert and Action Levels;
- Acceptable Ambient Concentration for Cr^{+6}, if required;
- Number of air monitoring stations;
- Locations of air monitoring stations; and
- Specific program requirements, such as manual or automatic data downloads.

Previous investigations on various portions of the sites have indicated the presence of Cr^{+6}. Ground intrusive activities associated with the remediation of the Site have the potential to generate fugitive emissions. PPG has integrated an air monitoring and control component into the program to minimize the potential impact of these emissions.

As stated previously, these constituents may contribute to fugitive emissions during the proposed remedial activities. Cr^{+6}, a heavier constituent, are associated with entrained particulate matter. Cr^{+6} concentrations will be measured using a real-time particulate approximation for Cr^{+6} concentrations in air and compared to the site-specific action level.

Monitoring activities will be conducted throughout the ground intrusive activities to: evaluate Site conditions; ensure that the measures used to control potential fugitive emissions are effective; and document ambient air quality/conditions in the immediate vicinity of the Site. The integrated air monitoring approach consists of the following components:

- Air Monitoring – conducted using real-time air monitoring techniques for the constituents of interest (COI);
- Quality Assurance / Quality Control – specific procedures performed to ensure the validity of the data and associated conclusions related to Site conditions; and
- Reporting – progress reports/data summaries will be prepared throughout the program, with a summary report that includes an interpretation of the data provided as part of the Remediation Completion Report.

This AMP describes the air monitoring activities to be implemented during the program, and is organized in the following manner: the methods for real-time monitoring and integrated sampling are detailed in **Section 2**; procedures for evaluating results and ensuring that the data is appropriate to accurately characterize ambient air quality are presented in **Section 3;** and activities for reporting the results from the program are outlined in **Section 4**.

2.0 Air Monitoring Procedures

Air monitoring activities will be conducted throughout the program to evaluate conditions at the property line (fenceline) to ensure that the measures used to control potential fugitive emissions are effective, and document ambient air quality/conditions at the site. The monitoring program will consist of the following types of activities:

- Real-time PM_{10} monitoring – to promptly identify potential site problems, to allow the appropriate engineering/emission controls to be implemented, and to prevent significant off-site issues; and
- Meteorological monitoring for wind direction, wind speed, and temperature – to document the onsite weather conditions and the effect on possible fugitive emissions.

An overview of the monitoring approach is provided in **Table 2-1**.

Table 2-1: Air Monitoring Approach

Sampling Activity	Parameter	Instrument	Monitoring Frequency	Documentation	Contingency Plan
Real-Time Air Monitoring	Dust (PM_{10})	DustTrak® or Equivalent	Continuous workday 15-minute block averages during work periods at fenceline locations. Hand-held supplemental monitoring by field technician at selected locations (based on Site activities and estimated to occur every 1- to 2-hours).	Data downloaded manually daily. Hand-held data recorded on appropriate log sheet.	Alert Level: PM_{10} > Alert Level for 15-minutes; notify Site Manager. Action Level: PM_{10} > Action Level for 15-minutes; notify Site Manager.
	Visible Dust	Walk around observations	Conducted during walk around with hand-held monitoring devices. Locations based on Site activities and estimated to be every 1- to 2-hours by field technician.	Record on appropriate log sheet.	Action Level: Site related visible dust onsite or migrating offsite; notify the Site Manager.
Meteorological Monitoring	Wind Direction, Wind Speed, Wind Variation, and Temperature	Climatronics	Continuous 15-minute block averages will be measured during periods of site activities.	Data downloaded manually daily.	None.
Optional Integrated Sampling	PM_{10} and Cr^{+6}	Airmetrics MiniVol™ or equivalent	Workday 8-hour samples collected at each air monitoring location and submitted to an analytical laboratory for analysis.	Record on appropriate log sheet.	Results compiled to calculate a program-to-date PM_{10} and Cr^{+6} concentrations for comparison to the AACs.

2.1 Site Specific Alert and Action Levels

Site specific Alert and Action Levels will be developed based on the results from a site-specific investigation. Alert and Action Levels will be used to evaluate site conditions during periods of remediation activities. Alert and Action Levels are defined below as:

- Alert Level - is a contaminate concentration that, when exceeded, triggers contingent measures. For example, if visible dust is detected on site, contingent measures such as the use a of dust suppression method may be required.

- Action Level – is a contaminant concentration that when exceeded requires a response such as additional hand-held sampling, immediate work procedure modifications and/or a temporary work stoppage until the issue is resolved or elevated concentrations are reduced to an acceptable level.

Site specific Alert and Action Levels will be defined in a separate document and will include the calculations of such Alert and Action Levels.

2.2 Real-Time Air Monitoring

Continuous real-time data will be collected for PM_{10}. The results from these measurements will be compared to a set of Site-specific "Action Levels", i.e. the concentration/level at which additional sampling and/or control measures are required to ensure that Site conditions will not pose a potential health risk to off-Site areas.

At a minimum real-time air monitoring will consist of a fenceline network of Portable Air Monitoring (PAM) stations, walk-around hand-held monitoring devices, and meteorological monitoring to identify periods of elevated concentrations. These real-time monitoring techniques are discussed in more detail in the following sections.

2.2.1 Portable Air Monitoring (PAM) Stations

A fenceline air monitoring network will be installed at the Site to monitor potential fugitive emissions from remedial activities on a real-time basis. The network will consist of at least two (2) PAM stations set up along the Site fenceline. One (1) set of spare instruments will be stored onsite and used as backup. Larger sites may require additional PAM stations for complete coverage of the fenceline upwind of any sensitive receptors. Each PAM station includes the following items (**Figure 2-1**):

- Station tripod;
- Weatherproof enclosure;
- Particulate monitor (such as the DustTrak®); and
- Data logger.

Figure 2-1: AECOM Portable Air Monitoring Station

The PAM system will be used to collect and analyze data from the two (2) locations during active work periods throughout the duration of the project. Locations of sample stations may change to reflect specific Site activities, wind conditions, and/or accessibility.

The monitors will be housed in weather tight enclosures, with sampling inlets located approximately at the top of the fence (2-meters), which is in the breathing zone. The PM_{10} monitor at each PAM station will be set up to calculate 15-minute block averages. The internal data loggers will be programmed to compare the 15-minute average concentrations to the Alert and Action Levels to trigger Alert and Action Level alarm notifications. This tiered approach allows Site management ample time to respond to elevated concentrations greater than the Alert Level; before an Action Level has been exceeded.

Depending on the length and the scope of the remediation program, data can be downloaded manually at the end of each sampling day or transmitted in real-time to the central computer using a radio telemetry system. Using the manual download method, PAM stations will be programmed to provide auditory and visual alarm notifications for concentrations greater than the Action Levels. Using the automated system, real-time transmission of the data allows for an automated interactive computer display that is capable of notifying field staff to Site conditions using a pager system. The specifications and advantages to using the automated system are provided in **Section 2.4**.

2.2.2 Walk Around Hand-Held Monitoring

During active work periods, measurements from the fenceline network will be supplemented with data collected by the field technician at the Site fenceline immediately downwind from the work areas using hand-held measurement devices. Hand-held measurements for PM_{10} will be conducted routinely (approximately every 1- to 2-hours) throughout active work periods. In addition to PM_{10} measurements the field staff will also make routine observations of visible dust during the walk around hand-held monitoring. The following monitors and/or observations will be used by the technicians during their walk around monitoring:

- Particulate matter – a DustTrak® dust monitor, or equivalent, will be used to monitor PM_{10} concentrations; and
- Visible dust – subjective assessment by the field technicians.

The location of the hand-held monitoring points will be subject to daily site operations, as required, throughout the program to evaluate potential emissions from specific site activities/areas. Field notes from these activities will be documented in field log book.

2.2.3 Meteorological Monitoring

A portable meteorological tower will be erected at an onsite central location. The tower will be mounted on a tripod at least 3-meters above grade, and will be equipped with sensors to measure wind direction, wind speed, wind variability (sigma theta), and temperature on a continuous basis during remedial activities. Depending on the program relative humidity or dew point temperature can added to the meteorological system.

A Climatronics® system (or equivalent) will be used for meteorological measurements. A Campbell Scientific® data logger (or equivalent) provided with the meteorological system also includes a digital standard deviation (sigma) processor which calculates the wind fluctuation (sigma theta). Sigma theta is an important parameter to observe during remediation activity, so that the potential for fugitive emissions to change direction during slow wind periods can be assessed and documented.

The onsite meteorological system will continuously collect data and log the results as 15-minute block averages. The data from both the meteorological system will be manually downloaded or transmitted in real-time to the central computer system.

2.3 Real-Time Notification of Elevated Concentrations

Field staff will be notified of periods of PM_{10} concentrations elevated above the Alert and/or Action Levels through a visual and auditable alarm notification system. At this time the, field technician will perform the following actions:

- Evaluation of the operating condition of the PM_{10} monitor reporting the elevated concentrations;
- Evaluation of site conditions (i.e., background concentrations, weather, site activities and/or etc.)
- Evaluation of calibration and equipment records; and
- Preliminary validation of real-time data.

If the elevated concentrations are determined to be caused by site activities, the field technician will inform the Site Manager so appropriate actions can be taken. An exceedance of Alert and/or Action Level will result in actions outlined in the Emissions Control Plan.

2.4 Optional Central Computer System and Interactive Display

A central computer system and interactive display may be used. A data logger installed at the central computer will be programmed to compare the 15-minute average PM_{10} concentrations to the Alert and Action Levels, respectively and will initiate an alarm both visual and to the field technicians cell phone (via text messaging or pager system). Data will be visually displayed on a computer in the central trailer. The field technician will have the ability to interact and manipulate current and past PM_{10} and meteorological data.

2.5 Optional Integrated Sampling Approach

Programs that include an Acceptable Ambient Concentration (AAC) will require additional workday 8-hour integrated sampling at each of the air monitoring stations for PM_{10} and Cr^{+6}. The Airmetrics MiniVol™ (or equivalent) portable air sampler will be used for the integrated sampling of PM_{10} and Cr^{+6} on 47 mm filters. This will be achieved by using two separate MiniVol samplers, one for PM_{10} and the other for Cr^{+6} at each of the air monitoring locations.

The MiniVol is a self-contained, low maintenance DC or AC operated sampler designed for portable, unattended operation. All electronics are housed in an all weather case. It is mobile, versatile, rugged and easy to use. The sampler could be mounted on an optional 5-foot tripod during sampling, and can be relocated and re-installed easily from site to site. The built-in lithium ion battery can maintain a continuous operation of more than 60 hrs when fully charged. The MiniVol also contains a self-regulated sample pump to control the sampling flow rate at a set point and a programmable 7-day timer. The site operator will be able to program the timer to start and stop single or multi sampling events at a pre-set time.

2.5.1 Integrated PM_{10} Sampling

For the PM_{10} sample collections, the MiniVols will be configured to draw air at approximately 5 liters/minute through a 10 micron (µm) particle size separator (impactor) and then through a 47mm filter.

The filter will be weighed pre and post-exposure within the AECOM gravimetric lab to determine the final PM_{10} concentrations ($\mu g/m^3$). Samples will be analyzed gravimetrically in order to achieve a particulate concentration over the entire sampling period in accordance with 40 CFR 50 – Appendix J – Reference Method for PM_{10} Sampling. Sample analysis turnaround is projected to be 10 working days after lab receipt of samples.

2.5.2 Integrated Cr^{+6} Sampling

A similar set-up will be employed for the sampling of Cr^{+6}, using a 10 micron (µm) particle size separator (impactor). The sampling flow rate will also be set at approximately 5 liters/min as specified in the operational specifications for the sampler. The exposed respirable Cr^{+6} filter will be shipped to an analytical laboratory to analyze for Cr^{+6} using modified OSHA method 215. Sample analysis turnaround is projected to be 5 working days after lab receipt of samples.

2.6 Pre-Air Monitoring Activities

Real-time air monitoring (PAM, hand-held, and meteorological) sampling will be conducted prior to the start of Site remediation activities. Real-time air monitoring will be conducted for a period of at least 3-days pre-remediation to establish baseline concentrations for the site.

3.0 Quality Assurance

The AMP will include several activities related to Quality Assurance and Quality Control (QA/QC) designed to ensure that the field program is being and has been properly conducted and the analytical results have been reviewed for accuracy and overall quality. Goals of the QA/QC aspect of the program are, among other things, to assure that the field aspect, laboratory results, the associated responses to exceedances, and the data reporting are appropriate and protective of the environment and public health.

3.1 Real-Time Air Monitoring

A field log book and instrument calibration field forms (**Appendix B**), along with data listings, will be maintained by AECOM throughout the sampling effort. Information to be recorded by AECOM will include:

- Description of remediation activities conducted during any elevated PM_{10} concentrations;
- Daily Site maps showing the locations of each PAM station and the hand-held monitoring locations;
- Any corrective actions used in response to elevated real-time air monitoring concentrations such as shut-downs, covering stockpiles, reduced work pace, etc.;
- Monitoring instruments installation, operation, and removal dates;
- Monitoring instruments calibration dates and results;
- General field weather conditions on sampling days;
- Any unusual situations which may affect samples or sampling; and
- Start and stop times.

General QA/QC procedures related to the collection and analysis of representative field samples are discussed in the following sections.

3.2 Instrument Calibration

Instrumentation associated with PAM and hand-held activities will be calibrated on a daily basis in accordance with AECOM's direction and the manufacturers' instructions using either commercially available standards, or internal calibration points. Specific calibration checks will be conducted at the start of daily remediation activities. In certain circumstances similar calibration checks will be conducted at the conclusion of the measurement day. For example: A calibration check will be conducted if a device, such as a PM_{10} monitor, is suspected to not be functioning properly or a calibration check may be conducted during the operational day if a device is suspected of malfunction. There may also be circumstances where a calibration check is conducted in conjunction with a period of elevated concentrations to verify or validate the instrument (device) measurements. This check could be

conducted just after the period of elevated concentrations or in certain circumstances during the period of elevated concentrations.

PM_{10} monitors will be zeroed daily plus a once-per-week upscale check will be performed on each monitor. Hand-held instrumentation will be calibrated before each use. The results of the daily calibrations will be recorded on the appropriate field calibration form (examples included in **Appendix B**).

The meteorological instrumentation will be calibrated upon installation in the field and then again prior to demobilization plus every 6-months in between to document the condition of the equipment and assure the quality of the meteorological data recorded. Data will be subject to review and validation by a qualified meteorologist each time the meteorological tower is installed to verify the alignment of the wind sensors.

3.3 Data Validation

Data collected will be subject to a comprehensive validation process conducted by a qualified data processor. The data processor will perform routine QC checks of the air monitoring results and will include, but is not limited to, the following:

- Verifying that the requested monitoring periods are reported;
- Verifying that the real-time air quality monitoring and meteorological instrumentation equipment are responding correctly to site conditions; and
- Verifying that the real-time air quality monitoring and meteorological instrumentation equipment has been properly calibrated and maintained.

Environmental data that are not representative of environmental conditions because they were generated through poor field or laboratory practices will not be used in the evaluation process. This determination will be made using the professional judgment of a multi-disciplinary air monitoring contractor team and other personnel with direct experience in the data collection effort. This coordination is essential for the identification and proper evaluation of valid data. After data are evaluated, the data reporting and interpretation process may be performed.

4.0 Reporting

Depending on the length and scope of the remediation activities several reporting structures are available. At a minimum each site will receive verbal real-time notifications of PM_{10} exceedances and a project summary as part of the Remediation Completion Report. Longer programs may require more frequent reports (i.e., weekly) to facilitate communication with stakeholders on an on-going basis. The following sections describe the individual reporting structures available.

4.1 Exceedance Notifications

AECOM will provide verbal notifications of Alert and Action Level exceedances to the Site Manager as they occur. Field staff will record the following information in the field log book:

- Time of exceedance;
- Location of exceedance;
- Cause for exceedance;
- Relevant meteorological conditions;
- Site activities; and
- Documented response actions.

4.2 Remediation Completion Report

At the conclusion of the program, AECOM will prepare a summary of the air monitoring results. The report will include summaries of real-time data from each air monitoring location, hand-held data results, and meteorological data. The report will also include the information listed above for any periods of exceedances.

AECOM will prepare up to two (2) hardcopies and one (1) electronic copy documenting the results of the air monitoring program. Additionally, copies of the real-time data and QC documentation will be provided on CD following the completion of the Remediation Completion Report.

4.3 Optional Weekly Project Summaries

For remediation programs expected to last longer than 1 month, AECOM recommends a more vigorous reporting program including weekly project summaries. Weekly reports will include daily maximum PM_{10} concentrations and weekly meteorological summaries. If the integrated sampling is required the weekly project summaries will include updated program-to-date PM_{10} and Cr^{+6} concentrations for comparison to the AAC.

Appendix A

Air Monitoring Plan Amendment Form

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Air Monitoring Plan Amendment

Amendment No.: _____

Client: PPG Industries	**AECOM Project Number:**
Location: New Jersey	**Date:**
AECOM Project Manger:	**Site Manager:** **Oversight Manager:**
Amendment Description:	
Reason for Amendment:	

Signature	Date:
Signature	Date:
Signature	Date:

Appendix B

Field Data Sheets