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CLAYMONT STEEL INC.

SLAG DUST FUGITIVE EMISSIONS CONTROL STUDY

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March 2007

Project No. 98250

Earth Tech
A Tyco International Ltd. Company

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EXECUTIVE SUMMARY

Earth Tech Inc. was retained by Claymont Steel Inc. as required by Secretary's Order No. 2006-A-0048 issued by the Delaware Department of Natural Resources and Environment Control (DNREC) on October 23, 2006, to carry out an independent study of the sources of slag dust emissions and alternative control measures to reduce emissions from the Claymont Steel facility in Claymont, Delaware. The Order required two significant items to be completed and submitted in draft form for review by DNREC by March 1, 2007; A) a study identifying the sources of slag dust emissions and alternatives for control including a proposed implementation strategy, preliminary schedule and initial cost estimates, and B) a plan for implementing an ambient air monitoring program in the residential area surrounding the facility.

The submission of this draft report by March 1, 2007 represents a significant milestone in the process of addressing the requirements of the Order and Claymont Steel's commitment to improving slag dust emissions control from the Claymont Steel facility.

DUST SOURCES

The study involved several site visits for investigation of the various steel-making processes, their dust generation potential, initial planning for dust control measures and siting of ambient air monitoring stations. Discussions with several Claymont Steel employees assisted in developing the alternatives for control of the most significant dust sources.

All sources of dust emissions were listed and prioritized based on their general significance related to dust emissions.

The list of sources is presented below:

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Source	Dust Emitting Process	Category	
		Amount of Emissions	Frequency
Scrap yard	Roadways within scrap yard	Low – Moderate	High
	Scrap metal truck unloading	Low	High
Slay yard	Slag quenching stations	High	High
	Screening conveyor hopper charging	Moderate	High
	Processed slag storage piles	Low – Moderate	Low
	Slag storage pile relocation	Low – Moderate	Low
	Slag pit operation	Moderate	Low
Melt shop	Steel furnace operation	Moderate – High	High
	Scrap bucket preparation	High	High
	Carbon silo bin	High	High
	Lime storage bin	High	High
Ladle slag quenching	Ladle slag handling and quenching	Moderate	Low
Coal storage station	Handling and loading	Low	Moderate
Roadways	Major roadways	Moderate – High	High

ALTERNATIVES FOR CONTROL

Alternatives for controlling dust emissions from each source were developed based on proven technology and approaches used in the steel industry, other dust control measures used in other industries, knowledge of the general air dispersion characteristics of certain dust sources and general air pollution control expertise.

The sources were then grouped into three categories based on the significance of the source and the expected reduction in dust emissions for the recommended alternative for that source. The three groups can be described as:

- Phase 1: Immediate implementation with significant reductions expected from control measures that are relatively straightforward to implement, technically and cost-effectively. It is estimated that these measures can be implemented within 12 months.

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- Phase 2: Control measures that require additional study and engineering to define their expected level of reduction. Generally, these measures will entail more cost and will take longer to implement. Some or all of these measures may not be necessary, depending on the success of the Phase 1 measures and the predicted and observed reductions in dust concentrations and community complaints.
- Phase 3: Control measures that will require significant engineering and capital investment to implement. Although there may be significant long-term benefits to the implementation of these control measures, they would only be carried out after Phases 1 and 2 were fully implemented and their effects studied over time. It is unlikely that Phase 3 measures will need to be implemented to address the concerns of the Order.

The recommended control measures are presented below:

Dust Emitting Process	Proposed Control Solution	Estimated Costs
Phase 1 - Short Term Implementation		
Scrap yard roadways	Access road paving	$50,000
Slag quenching stations	Enclosure c/w baffles for particles removal (2 Stations)	$430,000
Screening conveyor hopper charging	Modify current operating procedure	Marginal
Processed slag storage piles	Water/Suppressant spray system	$10,000
Slag pit operation	Water/Suppressant spray system	$10,000
Slag storage pile relocation	Lower inventory	-
Melt shop - carbon silo bin	Silo repair	$20,000
Melt shop - lime storage bin	Storage bin repair	$26,000
Main roadways	Speed limit & rigorous road maintenance program	Marginal
Phase 2 - Intermediate Term Implementation		
Slag quenching stations	Re-design water spray control system and water drainage system	$100,000
Screening conveyor hopper charging	Side draft hood c/w particles removal screening	$80,000
Melt shop – steel furnace operations	EAF fume control system assessment	$16,000
	Melt shop ventilation system study	$28,000
Ladle slag handling and quenching	Enclose slag transfer route and re-design quenching stations	$50,000
Phase 3 - Long Term Implementation		
Scrap yard	Tree screening or concrete barrier panels	
Slag yard	Truck tire water cleaning system	
Ladle slag handling	Improved slag transfer process	
Melt shop	Additional dust control system	

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TRACKING OF PROGRESS

Tracking of the success of these control measures is an important part of this work and has been considered carefully in the recommended approach. There are three primary methods for tracking progress:

1) Air dispersion modeling to assess the expected impact at receptors that dust control measures may have,
2) Complaints tracking to monitor reductions in community complaints, and
3) Ambient air monitoring data analysis. While none of these three methods are, in themselves, sufficient to definitively show positive results of the dust control initiatives, the combination of all three will provide a clear indication of the success of the dust control measures.

The ambient air monitoring program has been developed using US EPA approved equipment, sampling protocols and analytical procedures to ensure the results are meaningful and comparable to other ambient air measurement studies. The siting of air monitoring stations has been done so that the affected residential areas are represented as well as other upwind and downwind locations such that under all wind conditions, an indication of the contribution from the Claymont Steel facility can be ascertained. However, there is a strong possibility that under certain wind conditions, it may not be possible to clearly determine a contribution from Claymont Steel relative to background or other sources of dust in the area.

The ambient air monitoring stations will be designed to measure total suspended particulate (TSP), thereby addressing the requirements of the Order to monitor dust concentrations in the nearby residential areas that could be affected by the release of slag dust from Claymont Steel.

One of the key objectives of the ambient air monitoring program and a key requirement of the Order is to provide a means of tracking the progress of the dust control measures. This requires monitoring ambient TSP concentrations before any dust control measures are implemented and then again following their implementation.

RECOMMENDATIONS

In order to implement those dust control measures that will have the most impact and are able to be implemented quickly, the Phase 1 dust control measures should be implemented first, followed by a period of assessment based on the combined tools discussed above. Further implementation of dust

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control measures will be subject to review of the progress made and the results of each of the three tracking tools.

Earth Tech recommends that the ambient air monitoring program be operational for a period of 6 months prior to any dust control measures being implemented and then again for a period of 6 months following completion of the Phase 1 dust control measures. Analysis of this body of data, along with the air dispersion model predictions and analysis of the complaints tracking over this time period will provide an indication of the success of the Phase 1 measures. Should additional dust control be required, implementation of the Phase 2 measures would be reviewed and a recommended approach presented.

COMMUNICATIONS

Regular communication of program status, implementation and community information sessions are recommended to ensure that all stakeholders are informed as to the status of progress being made as dust control measures are implemented. An initial public information session was held on January 25, 2007 in Claymont. Another session is planned for March 6, 2007 to coincide with the public review period of this draft report. Additional update meetings or written communications can be arranged as required as the program moves ahead.

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1 INTRODUCTION

Claymont Steel Inc. was served with a Notice of Conciliation and Secretary's Order No. 2006-A-0048 on October 23, 2006 by the Delaware Department of Natural Resources and Environmental Control (DNREC) related to the emissions of slag dust from their steel-making facility in Claymont, Delaware. The primary concern leading to issuance of the Order was a consistent volume of public complaints logged with DNREC between October 2005 and October 2006, specifically related to the deposition of particulate matter (dust) that has been identified, by DNREC, as possible emissions of slag dust from Claymont Steel's operations.

Claymont Steel has, during the past 12 months, implemented several measures in response to these complaints in order to mitigate the most significant sources of dust emissions. These are summarized in Table 1.1.

Table 1.1: Summary of Dust Mitigation Measures Implemented Before DNREC Order

Sources of Dust Controlled	Dust Control Measures Implemented
Slag Yard Operations	• Slag bay cooling stations with fine water sprays • Minimize slag inventories (IMS coordination) • Instruction for best practices for heavy equipment operations (IMS coordination)
Yard and Road Emissions from Truck Traffic	• Continuous watering of unpaved roads • Vacuum sweeper truck for paved roads • Paving of 2,300 feet of roadways • Speed limit implemented and enforced
Ladle Slag Handling	• Spray enclosure installed to wet ladle slag before outdoor processing
General Dust	• Tree planting along Naamans road
Other	• Weather station installed

The Order required Claymont Steel to submit the names and qualifications for three engineering firms to carry out an independent study of the sources and possible methods for improved control of slag dust

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emissions. Claymont Steel submitted these packages of information to DNREC by the deadline of November 15, 2006.

Following a 15 day review period, during which representatives of DNREC reviewed these qualifications and conducted interviews, Earth Tech Inc. was identified by DNREC as the preferred engineering firm for this assignment. Public participation in this process was invited by DNREC, however was not received.

As required by the Order, Claymont Steel retained Earth Tech to carry out the slag dust emissions control study. This draft report presents the initial findings as to the sources of dust from the outdoor slag handling operations and other dust producing activities at the facility and presents alternatives and recommendations for improving control of the emissions of slag dust. A preliminary, order-of-magnitude cost estimate has been developed for each alternative.

Based on the significance of the individual sources, and the expected impact on reducing dust emissions, a preliminary schedule of implementation has also been proposed. Recent measures that have been implemented by Claymont Steel are also listed and have been taken into account in developing the proposed additional control measures.

An ambient air monitoring program has been developed and the draft protocol document is presented in Appendix A. This plan is required by the Order and is intended to provide an indication of the effectiveness of the control measures implemented as a result of the Order.

A summary of next steps, considerations for implementing the proposed controls and a discussion of the measures of success that should be used to monitor progress are also provided.

The submission of this report achieves a significant milestone established by the Order, requiring Claymont Steel to submit the draft study report by March 1, 2007.

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2 SCOPE OF WORK

The following outlines the specific requirements of the Order and the scope of work developed for this phase of the work.

2.1 SUMMARY OF SECRETARY'S ORDER

The DNREC Secretary's Order issued on October 23, 2006 specifically outlines the actions that Claymont Steel is required to carry out and the dates for completion of each. These are summarized in Table 2.1.

Table 2.1: Summary of DNREC Order Requirements

Requirement	Date for Action	Action by Claymont Steel	Status of Order
1. Submit names and qualifications of independent firms able to undertake the study for dust reduction alternatives.	November 15, 2006	Qualification packages submitted to DNREC	Complied
2. Conduct a study to identify sources of slag dust emissions and other dust sources and propose alternatives for reducing emissions. Draft report to be submitted for review by DNREC and public. Study recommendations will include a plan for an ambient air monitoring program.	March 1, 2007	Earth Tech retained to carry out the study. Initial public presentation in January 2007. Submitted draft report on time.	Complied
3. DNREC Review of draft report and determination of dust emissions abatement options to be implemented	May 1, 2007		Pending
4. Prepare an implementation plan for the alternatives selected and agreed to with DNREC	60 days following DNREC review		Pending
5. Implementation of selected alternatives	According to schedule set by DNREC		Pending

2.2 SCOPE OF STUDY

The dust emissions study was developed to identify and prioritize the significant sources of dust emissions from Claymont Steel's operations and to develop alternatives for reduction of these emissions. In parallel with the dust source identification, an ambient air monitoring program has been developed and will serve as one element in tracking reductions in dust emissions that are achieved as the alternatives are implemented.

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The scope of the study included the following major steps:

1. Field investigation to identify the significant sources of dust emissions and to observe the processes leading to dust emissions. This step is important as it defines the scope of the sources considered for control and the impacts on the steel-making operations. In addition, knowledge obtained from the field investigation allows the evaluation of control options or process changes.
2. Analysis of the possible alternatives for improved dust control and development of the preferred dust control measures.
3. Cost estimation to establish preliminary, order-of-magnitude cost estimate for capital and operating costs for each alternative.
4. Develop a protocol document describing the equipment, sampling methods, analysis and monitor siting requirements for the ambient air monitoring program.
5. Prepare a proposed implementation program for the dust control alternatives.

2.3 COMMUNICATIONS

Communications with DNREC and the Claymont area residents is an important aspect of this work. It is important for clear and timely communications of progress to be made so that all stakeholders are aware of the plans for improvement, agree in principle with each major step being taken and that the results meet with the expectations of all parties.

An initial public information session was held on January 25, 2007 in Claymont to allow residents to meet Earth Tech personnel involved in the study and to understand the specific requirements of the Order issued by DNREC. This session was also important in that all stakeholders had the opportunity to ask questions of the various parties (Earth Tech, Claymont Steel, DNREC, etc.) and to get the information as to what is being done directly from the responsible parties.

A second session is planned for early March 2007 after this draft report has been submitted to DNREC and the 15-day public consultation period is still open. All parties are committed to continued communications to ensure adequate information is available as the next steps are discussed and further action is planned.

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2.4 NEXT STEPS

Following submission of this report and review by DNREC, a detailed implementation plan will be submitted based on the proposed implementation program discussed later in this report and DNREC's decisions as to the alternatives to be implemented.

Based on the step-wise implementation strategy presented in Section 8.3, several tools will be used to track progress at each step and to assess the need for implementing additional control measures. Tracking of progress will be through a combination of impact predictions based on air dispersion modelling, complaints tracking and review of ambient air monitoring results.

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3 COMPLAINTS REVIEW

A list of complaints from neighboring communities regarding dust deposition, possibly from Claymont Steel, was obtained from DNREC. The tracking of complaints started in October 2005 and is still on-going. The complaints were analysed to determine appropriate locations for the ambient air monitors (Appendix A). Figure 3.1 shows a compilation of all complaints received by DNREC between October 2005 and February 2007.

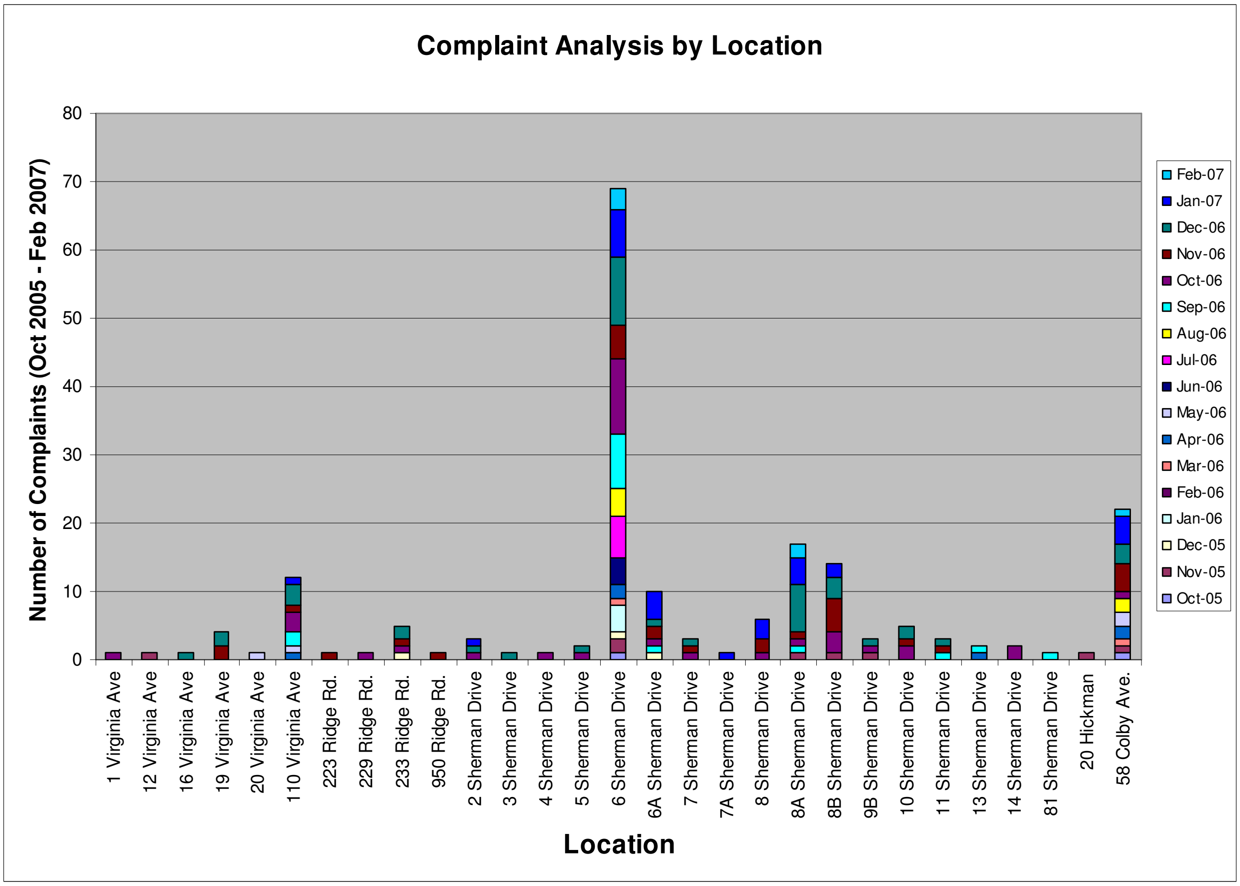

Figure 3.1: Dust complaints received by DNREC regarding Claymont Steel

DNREC received complaints from 29 locations. All, except the 58 Colby Avenue address, are located in Aniline Village, a community to the north east of Claymont Steel. The 58 Colby Avenue address is located in the Knollwood community situated west of Claymont Steel.

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4 FIELD STUDY

Earth Tech performed field investigations over the periods of January 4 – 5 and 17 – 18, 2007 to identify the significant sources of dust generation at Claymont Steel, understand the mechanisms of dust generation and gather process information for the dust control concepts. The following process operations were identified as dust emission sources that could potentially impact the neighboring communities:

- Scrap yard
- Slag yard: quenching station, screening, storage piles and slag pit
- Melt shop operations
- Ladle slag cooling and quenching
- Coal storage station
- Roadways

The field investigations combined visual observations of the process operations listed above and plant personnel interviews. A brief description of each process operation is provided below.

4.1 SCRAP YARD

The access road to the scrap yard is paved up to the weigh station. Once weighed, the trucks are diverted to several locations within the scrap yard for unloading, based on the size and type of scrap. These secondary roads are not paved. Dust control is achieved by means of water trucks which maintain a wet surface on these roads, except when the ambient air temperature is lower than 32 °F, when icy roads would present a hazard.

4.2 SLAG YARD

The furnace slag is transferred by front loader from the furnace pit to the slag yard for cooling. The yard has two (2) water cooling stations: one station is a double bay arrangement and the other station is a drive-through type with access at either end. The latter station, also known as the "Car Wash", is the primary slag quenching station, while the other station is used primarily for slag cooling.

Each cooling station is provided with 14 water spray nozzles which operate continuously. Each nozzle is rated for 6 GPM of water. The nozzles deliver a mixture of water and dust suppressant to each cooling station. During water quenching of the slag, evaporation of the water results in a turbulent cloud of steam that can cause dust particles to become airborne.

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After quenching, the slag is moved by the front loader to the process and screening system where it is unloaded into the hopper of the conveyor unit. The screening conveyor system includes: the splinter conveyor, the screen feed conveyor, conveyor #1 (particle size 0-2"), conveyor #2 (particle size 2-4") and conveyor #3 (particle size 4" and larger). The processed slag is piled in different areas of the yard based on particle size, until it is transported off-site to end users of the slag material. Although the inventory of slag stored on site is managed to minimize the amount of material stored in piles, the slag storage piles are relocated from time to time to maximize the available space.

Furnace slag containing a significant portion of metal is transferred to the slag yard in the area called the “Slag Pit”. A steel ball is used to break and separate the metal from the solidified slag material. The separation of the recoverable metal is accomplished with a magnet which places the recovered metal into a transport truck for return to the scrap yard via the weigh station.

4.3 Melt Shop Operations

The melt shop is provided with one active canopy hood connected to a baghouse to control the fume emissions during the steel furnace charging and furnace slag pouring. The melting and tapping emissions are collected by the direct furnace evacuation control system and the tapping hood. These two systems are combined with the canopy hood ductwork prior to the entrance to the baghouse.

The other dust generating activities that take place in the melt shop are the scrap bucket preparation and the operation of the carbon and lime storage silos. Dust emissions from these process steps become part of the general building ventilation system.

4.4 Ladle Slag Handling and Quenching

At the end of the casting process, the tapping ladle is emptied onto the floor of the casting area for removal of the ladle slag. Once cooled, the ladle slag is moved by front loader to the quenching station located in the open hearth building. When completely cool, the ladle slag is transferred by front loader to the storage piles in the slag yard. Emissions from the ladle slag quenching station are part of the open hearth building ventilation system.

4.5 Coal Storage Station

The coal required in the steel-making process is stored outside the melt shop and transferred to the process storage station by a conveyor system. The coal handling and loading was not observed during the filed investigations. However, from experience at other steel-making facilities, this process is considered a low dust generation source.

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4.6 ROADWAYS

The roadways used by the scrap delivery trucks and slag hauling equipment are a source of dust emissions due to the re-suspension of loose material on the road surface. The length of the main paved road from the plant entrance to the scrap yard is approximately 1,900 ft. On a daily basis, Claymont Steel averages 150 scrap deliveries and 15 off-site slag transfers. When the ambient temperature is higher than the freezing point of water, water trucks are used to wet the roadways and thereby minimize the dust emissions, while a vacuum sweeper truck treats the paved roadways to further control dust.

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5 CATEGORIZATION OF DUST EMISSION SOURCES

The dust sources identified in Section 4 were categorized based on the amount of dust emitted and the operating frequency of the dust-generating process. Table 5.1 presents a summary of the categorization process.

Table 5.1: Source Categorization

Source	Dust Emitting Process	Category	
		Amount of Emissions	Frequency
Scrap yard	Roadways within scrap yard	Low - Moderate	High
	Scrap metal truck unloading	Low	High
Slag yard	Slag quenching stations	High	High
	Screening conveyor hopper charging	Moderate	High
	Processed slag storage piles	Low - Moderate	Low
	Slag storage pile relocation	Low - Moderate	Low
	Slag pit operation	Moderate	Low
Melt shop	Steel furnace operation	Moderate - High	High
	Scrap bucket preparation	High	High
	Carbon silo bin	High	High
	Lime storage bin	High	High
Ladle slag quenching	Ladle slag handling and quenching	Moderate	Low
Coal storage station	Handling and loading	Low	Moderate
Roadways	Major roadways	Moderate – High	High

5.1 SOURCE IMPACT ASSESSMENT

Atmospheric dispersion of the dust emitted from the sources in Table 5.1 depends on the types of sources. At Claymont Steel, these range from ground-level sources with varying degrees of buoyancy to elevated sources with considerable vertical momentum. An off-site impact assessment of the sources is required to determine the ones most likely to cause dust deposition on the surrounding communities and to evaluate the reduction in dust deposition from the proposed control measures. This assessment will allow the dust-

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generating sources to be ranked according to their off-site impacts and provide a basis for implementation of the dust control measures, based on their effectiveness at reducing off-site impacts.

Atmospheric dispersion modelling is a US EPA approved method for assessing ground-level impacts of emissions. The model predicts dispersion based on the source characteristics, emission rates, meteorological conditions, and the effect of neighboring buildings and structures.

A source impact assessment using air dispersion modeling is recommended for the next phase of the project to confirm the selection of sources to be controlled in Phase 1 (Short-term implementation). The results of the air dispersion modeling will also be used to predict reductions at various receptors and will be useful in tracking progress as dust control measures are implemented.

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6 ALTERNATIVES FOR IMPROVEMENT

Accepted industry practices, process similarities and experience with other steel mills were considered when evaluating the dust control methods for Claymont Steel. The order of implementation will be based on the source impact assessment, as described in Section 5.1. In addition, the proposed controls will be phased in to allow review of the effectiveness of the control measures implemented. The success of each phase of the dust control program will be gauged from the results of the ambient air monitoring and the level of complaints from neighboring communities, and will determine the requirements to proceed with the next phase. The results of the ambient air monitoring program will be used in conjunction with these other tools to determine the effectiveness of control measures.

Three phases of dust control have been identified. They are presented in Table 6.1 below. The cost associated with each control method is presented as well to provide an indication of the magnitude of the work involved, except for Phase 3, where the work required will depend on the degree of success in Phases 1 and 2. No controls are proposed for the processes with low dust emissions, i.e. the scrap metal truck unloading and the coal storage pile. Implementation of the Phase 1 control measures is expected to take place over 12 months.

Claymont Steel has an on-going contract with IMS to manage all slag (furnace and ladle) handling related issues at the facility. All control measures regarding slag dust emissions will require implementation by Claymont Steel and IMS.

Table 6.1: Dust Control Measures

Dust Emitting Process	Proposed Control Solution	Estimated Costs
Phase 1 - Short Term Implementation		
Scrap yard roadways	Access road paving	$50,000
Slag quenching stations	Enclosure c/w baffles for particles removal (2 Stations)	$430,000
Screening conveyor hopper charging	Modify current operating procedure	Marginal
Processed slag storage piles	Water/Suppressant spray system	$10,000
Slag pit operation	Water/Suppressant spray system	$10,000
Slag storage pile relocation	Lower inventory	-
Melt shop - carbon silo bin	Silo repair	$20,000
Melt shop - lime storage bin	Storage bin repair	$26,000
Main roadways	Speed limit & rigorous road maintenance program	Marginal

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Dust Emitting Process	Proposed Control Solution	Estimated Costs
Phase 2 - Intermediate Term Implementation		
Slag quenching stations	Re-design water spray control system and water drainage system	$100,000
Screening conveyor hopper charging	Side draft hood c/w particles removal screening	$80,000
Melt shop – steel furnace operations	EAF fume control system assessment	$16,000
	Melt shop ventilation system study	$28,000
Ladle slag handling and quenching	Enclose slag transfer route and re-design quenching stations	$50,000
Phase 3 - Long Term Implementation		
Scrap yard	Tree screening or concrete barrier panels	
Slag yard	Truck tire water cleaning system	
Ladle slag handling	Improved slag transfer process	
Melt shop	Additional dust control system	

6.1 SCRAP YARD

Road paving is an accepted method for controlling vehicular traffic dust emissions. Paving of the access roads in the scrap yard, combined with the existing dust suppression measures using water trucks, will reduce the dust emissions from this source. This control measure is part of Phase 1 of the dust control program. If further controls are required, they would be considered under Phase 3 as tree screening or concrete barrier panels.

6.2 SLAG YARD

6.2.1 Slag Cooling Stations

The slag quenching process at Claymont is similar to the coke quenching process employed in integrated steel mills. Both employ water sprays to cool a hot mass rapidly, thereby generating large amounts of steam with entrained particles.

The use of impingement baffles to reduce dust emissions during coke quenching is an accepted practice at integrated steel mills. Examples of such applications can be found at U.S. Steel in Pennsylvania and Algoma Steel Inc. in Ontario.

A similar approach is proposed for both slag cooling stations at Claymont Steel as part of Phase 1 of the dust control program. Sketch A1-98250-M01 in Appendix B shows a concept of the proposed dust control measure. The cooling station is enclosed on all sides, with an opening for access. The enclosure is exhausted by natural draft to a tower with baffles installed at the discharge point. Impingement of the enclosure exhaust stream on the baffles causes the particles to become trapped and drop out of the stream.

Additional control measures proposed under subsequent phases of the dust control program include re-design of the water spray system and water drainage system for better control of the quenching process (Phase 2), and a truck tire water cleaning system to prevent dust track-out by vehicle traffic (Phase 3).

6.2.2 Screening Conveyor Hopper Charging

Dust emissions occur due to turbulence created by the falling stream of slag material onto the hopper bed. These emissions can be minimized by slowing the rate of discharge of the slag material from the front loader into the hopper. Revising the operating procedure for this process step will assist in reducing dust emissions under Phase 1 of the dust control program. Should active dust control be required, a side draft hood with a dust removal system is proposed under Phase 2.

6.2.3 Slag Storage Piles and Slag Pit Operation

The application of the water/dust suppressant mixture used at the slag cooling stations to the slag storage piles will prevent re-suspension of dust from the storage piles under windy conditions. Similarly, wetting of the slag pit prior to and during the metal reclaim process will reduce emissions from impact of the steel ball on solidified slag material and during disturbance of the slag pit by the magnet used for moving the metal pieces. These measures are recommended under Phase 1 of the dust control program.

6.2.4 Slag Storage Pile Relocation

Relocation of the slag storage piles is a source of dust emissions due to handling of the slag material. Reducing the processed slag inventory will minimize the requirement for storage pile relocation and will reduce the amount of slag material exposed to windy conditions. This strategy, while already part of Claymont Steel's general operating practices will be revised and adjusted under Phase 1.

6.3 MELT SHOP

The sources of dust emissions within the melt shop are considered under different phases of the dust control program. Repairing the carbon silo bin and the lime storage bin during Phase 1 will reduce the dust load from the melt shop. Since dust emissions from the steel furnace operations are currently controlled, they will be considered under Phase 2 if additional dust emission reductions are required. The proposed measures include an assessment of the steel furnace fume control system and a study of the melt shop ventilation system. The results and recommendations from Phase 2 would be considered for implementation under Phase 3.

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6.4 LADLE SLAG HANDLING AND QUENCHING

If the control measures implemented under Phase 1 in Sections 6.1 to 6.3 are deemed insufficient to bring the dust load from Claymont Steel to acceptable levels, control of dust emissions from the current ladle slag handling and quenching operations will be considered under Phase 2. In the current operation, the areas of dust emissions consist of the roadway between the casting area and the open hearth building, during transfer of the slag to the quenching stations, and the quenching stations located in the open hearth building. The control measures proposed include enclosing the transfer path between the two buildings and modifying the quenching stations to include impingement baffles at the exhaust point. If Phase 3 control measures are required, these will include an improved method of ladle slag transfer between the casting area and the quenching stations.

6.5 MAJOR ROADWAYS

Since the major roadways are paved, Phase 1 of the dust control program will consist of improved cleaning and maintenance of the road surfaces using the existing water trucks and vacuum sweeper truck. Instituting and enforcing a speed limit will contribute to a reduction in the amount of re-suspended dust.

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7 AMBIENT AIR MONITORING PROGRAM DEVELOPMENT

Appendix A presents the Ambient Air Monitoring Program Draft 1 document for review by DNREC and other stakeholders. This document presents the proposed monitoring sites, sampling equipment, sampling frequency and analytical procedures for conducting the ambient air monitoring program for the area surrounding the Claymont Steel site.

A summary of the program is provided here for reference, however, the document in Appendix A is a stand alone document that should be referred to for the specific details of the proposed program.

7.1 PROGRAM OBJECTIVES

The objectives of the ambient air monitoring program are to establish a baseline for the ambient TSP in the locations identified by the complaints tracking, i.e. Aniline Village and Knollwood, prior to and after implementation of control measures agreed upon by DNREC and Claymont Steel. Additional monitors are proposed upwind of the complaints location to determine the impact of the Claymont Steel operations and improvements brought about by the control measures, if possible. This uncertainty in correlating the effect of the dust control measures with ambient concentrations of TSP is due to the monitors being exposed to local and regional dust generating sources other than the Claymont Steel operations, through atmospheric air sampling.

7.2 PROGRAM OVERVIEW

The ambient air monitoring program will involve standard US EPA approved sampling station equipment located according to the siting criteria used for most ambient air monitoring systems. A site visit was conducted specifically to identify appropriate locations for the ambient air monitoring stations. Four stations will be used, 1 near Aniline Village, 1 in the Knollwood area, and 2 other stations generally upwind of the Claymont Steel facility. Other factors were considered in selecting the preferred monitoring locations including access to power, security, access by technicians, safety of the general public, proximity to interferences such as trees and buildings, and appropriate separation from other dust sources such as major roads or highways.

The monitors will measure total suspended particulate (TSP) on a 6-day rotating basis with each sample taken over a 24-hour period from midnight to midnight. This approach provides for each sample to cover an entire daily production cycle while altering the sampling day through the days of the week so that week days and weekends are covered.

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It is proposed that the sampling program be established as soon as is practical and run for 6 months before any dust control measures are implemented. This will define the baseline TSP concentrations currently experienced at the various sampling locations. Following implementation of the Phase 1 approved dust control measures, the program will be re-started (or continued) for another 6 month period of time. This phase of the ambient air monitoring program, along with dispersion modeling predictions and analysis of the complaints tracking system, will establish an indication of improved dust deposition in the areas surrounding the facility.

All sample preparation, retrieval, analysis and equipment maintenance will be provided under direct supervision of Earth Tech professionals by local, qualified technical resources so that timely sample analysis and equipment maintenance will support a robust monitoring program with a high degree of sample validity.

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8 RECOMMENDATIONS

The sections above present the list of dust sources, their relative significance and alternatives for improving dust control from these processes. Several factors must be considered when determining the most appropriate implementation strategy. The following sections outline the implementation strategy that is proposed for putting control measures in place, tracking the effects and reporting to arrive at a defined level of reduction that meets the needs of the community and DNREC and at the same time is technically and economically feasible for Claymont Steel.

8.1 OBJECTIVES

The primary objective of this study (as described in the Order) is the implementation of appropriate dust control measures to reduce complaints from nearby residents pertaining to the deposition of dust on their properties. In order to achieve this objective several steps are being taken to improve control and to monitor the success of these efforts. It is important that the function of each of these steps be clearly defined and understood so that the overall success of the dust control measures can be fairly assessed.

8.2 METHODS TO TRACK PROGRESS

Several methods are to be used to track progress. Each in itself is not sufficient to show positive results of the dust control measures being proposed. Each is described below followed by the proposed plan, using all three methods together, to track improvements.

8.2.1 Complaints Tracking System

DNREC has a well-established system of complaints tracking and follow-up investigation by Environmental Enforcement Officers. This system of complaints tracking provided the initial body of complaints logs that was included as a significant precursor to the Order being issued by DNREC in October 2006.

This complaints tracking system has been a source of information for the dust control study team to assess the locations of impact, the siting of ambient air monitoring stations and will continue to be used to track progress in the reduction of impacts as dust control measures are implemented.

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8.2.2 Ambient Air Monitoring Program

The ambient air monitoring program will be set up such that existing dust concentrations are established in the areas near the plant, both upwind and downwind and with specific focus on the areas from which most of the complaints are being logged.

The monitoring program will measure levels of total suspended particulate (TSP) using US EPA approved methods and equipment. The program is designed to measure dust concentrations upwind and downwind of the facility, thereby offering an indication of the contribution to downwind dust concentrations from the facility. The program is also designed to measure dust concentrations in areas that are suspected of being affected, based on the location and frequency of complaints related to dust deposition (i.e. Knollwood and Aniline Village).

The ambient air monitoring program will be used to provide information regarding reduced dust concentration when certain dust control measures are implemented. However, it is important to note that the ability for ambient air monitoring systems alone to specifically show significant changes in ambient air and to directly correlate them to the actions at one facility may be influenced by other sources unrelated to the facility operations, on both local and regional scales.

8.2.3 Air Dispersion Modeling

Air dispersion modeling is commonly used to show compliance with state or federal legislation governing the release of contaminants into the atmosphere from industrial facilities. Based on a complete emissions inventory of the plant, local meteorological data and knowledge of the physical characteristics of the buildings, emissions sources (vents, stacks and area sources), temperature and gas flow conditions, air dispersion models can be used to accurately predict the concentration of these contaminants at various receptors.

Other uses of dispersion models involve the prediction of impact reductions that can be expected for given reductions in source emissions. This is the use that is proposed in this case. By developing an estimated emissions inventory and using proposed reductions for various sources, relative concentrations can be predicted for various scenarios.

8.2.4 Tracking Using Combined Tools

The use of a dispersion model will support the use of ambient air monitoring results and complaints tracking to support the step-wise process of implementing dust control measures and assessing the success before committing to further dust control implementation. This will allow for a balanced

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approach to implementing dust control measures to the degree required for the needed reduction in complaints.

8.3 RECOMMENDED IMPLEMENTATION STRATEGY

The recommended implementation strategy is shown in Figure 8.1.

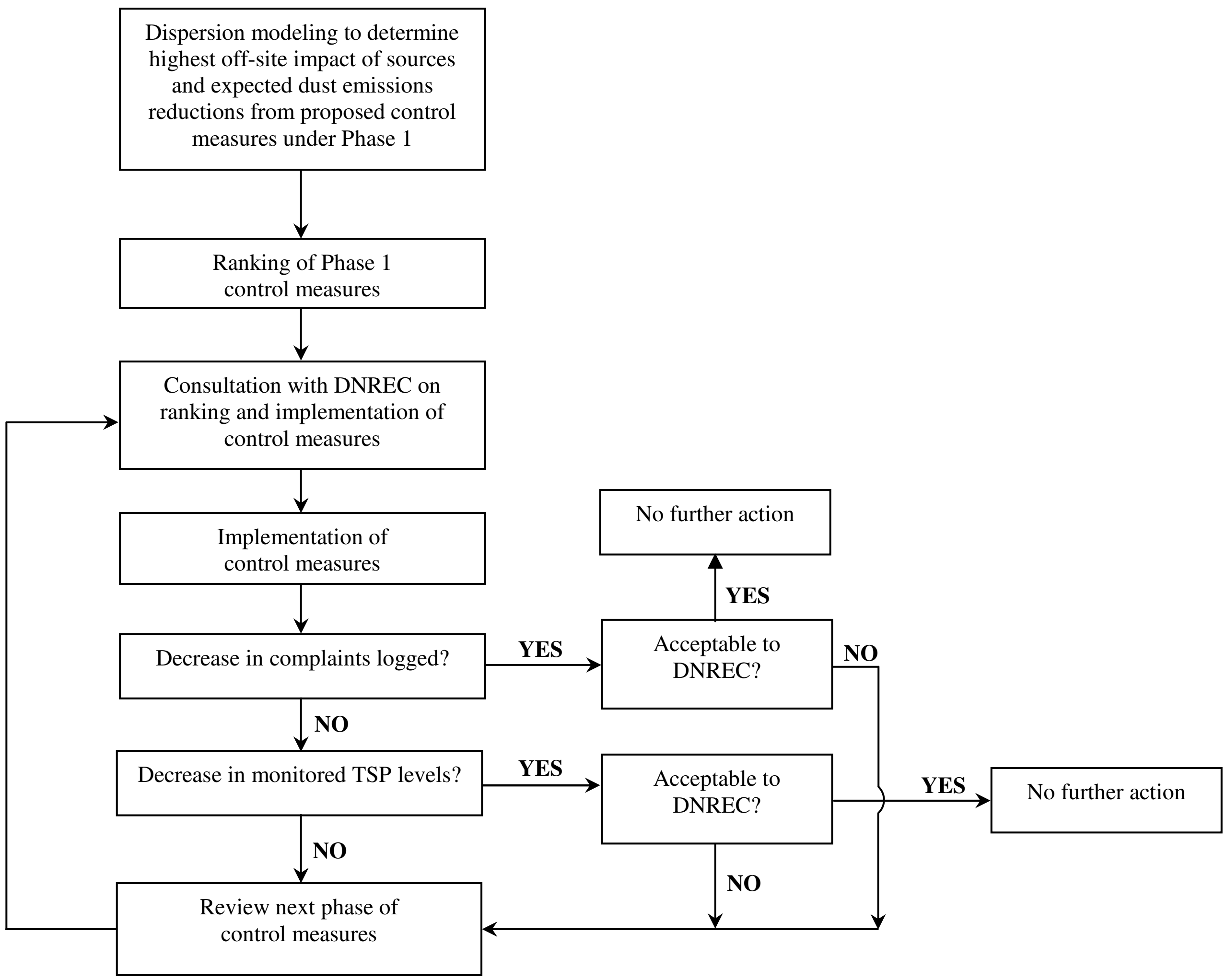

Figure 8.1: Decision Logic for Tracking Progress of Dust Control Measures

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9 SUMMARY OF NEXT STEPS

An outline of the next steps proposed by Claymont Steel to fulfill the requirements of Order No. 2006-A-0048, is presented below.

9.1 DISPERSION MODELLING

Set up an air dispersion model with all the sources identified for control in Table 6.1 to establish a baseline for the off-site impacts from the existing sources of dust emissions.

9.2 SELECTION OF CONTROL MEASURES AND IMPLEMENTATION PLAN

Use the air dispersion model to predict the off-site impact reduction from implementation of the proposed Phase 1 control measures in Table 6.1. Analyze the impact reduction contribution from each control measure and design a step-wise implementation program that takes into account the effectiveness of each control measure, as well as the feasibility and cost of implementation. The program will be reviewed with DNREC prior to implementation.

9.3 AMBIENT AIR MONITORING PROGRAM IMPLEMENTATION

Set up the ambient air monitoring program described in Appendix A to collect ambient TSP concentrations prior to and after implementation of the control measures at the known locations of dust complaints regarding Claymont Steel, i.e. Aniline Village and Knollwood community. Two additional monitoring stations located upwind and cross-wind of the complaints locations will be used to measure background ambient TSP concentrations in the neighborhood.

9.4 MEASURES OF ACHIEVEMENT

The predicted off-site impact reduction, the results from the ambient air monitoring program and complaints tracking by DNREC will be used to evaluate the effectiveness of the implemented control measures. Claymont Steel will maintain regular communications with DNREC throughout implementation of the dust control program to ensure it meets DNREC's expectations.

APPENDIX A
Ambient Air Monitoring Program
Protocol Document
Draft 1

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CLAYMONT STEEL INC.

AMBIENT AIR MONITORING PROGRAM FOR
TOTAL SUSPENDED PARTICULATE MATTER (TSP)

Prepared for:

CLAYMONT STEEL INC.
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March 2007

Project No. 98250

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1 INTRODUCTION

Claymont Steel operates an electric arc furnace steel-making facility located in Claymont, New Castle County, Delaware. Claymont Steel was served with Notice of Conciliation and Secretary's Order No. 2006-A-0048 issued by the State of Delaware's Department of Natural Resources and Environmental Control (DNREC) in October 2006 and was required to develop an independent study defining the most significant sources of dust emissions from its facility and to develop appropriate control measures to improve control of these emissions. Part of this Order required Claymont Steel to design and implement an ambient air monitoring program to measure the concentration of ambient dust loads near its facility now and after it has implemented any required dust control measures. In a meeting with DNREC on December 15, 2006 it was agreed that the ambient air monitoring program would be developed, for review by DNREC, to monitor Total Suspended Particulate concentrations as part of the response to the Order. This document outlines the objectives, proposed monitor locations, general equipment specifications and analytical procedures to be employed in the execution of the ambient air monitoring program.

Incorporated in this proposed ambient air monitoring program for TSP are the following main items:

- Program Objectives
- Criteria for the siting of the TSP ambient monitoring equipment.
- Equipment for the TSP ambient air monitoring.
- Implementation procedures for the execution of the TSP ambient air monitoring program.
- Program schedule and timing

EPA equipment selection, protocols, and siting requirements have been used in the development of the TSP ambient air monitoring program presented in this document. All aspects of this program will meet EPA requirements

2 MONITORING PROGRAM OBJECTIVES

The Order issued to Claymont Steel in October 2006 makes specific reference to the slag dust emissions impacts on nearby residential neighborhoods that are suspected of being related to operations at Claymont Steel's facility. The requirements to implement an ambient air monitoring program is identified in the Order and specifically requires:

> "… a plan for ambient air monitoring in and around the adjacent neighborhoods to the facility prior to and following the implementation of additional control measures employed as a result of the findings of the study."[1]

The Order refers to complaints received in the 12 month period immediately prior to issue of the Order and is the basis upon which Claymont Steel has been ordered to:

> "1. …sponsor and fund an independent study of engineering and operational options to control slag dust and other particulate emissions from the facility so that the slag dust emissions and other particulate emissions shall not interfere with the enjoyment of life and property in the neighborhoods surrounding the Facility."[2]

In order for the ambient air monitoring program to reflect this focus on near-field nuisance deposition, the program objectives have been developed as follows:

- Total Suspended Particulate (TSP) will be the only parameter measured by the program,
- United States Environmental Protection Agency (USEPA) references, equipment specifications, siting requirements and sampling protocols will be used exclusively for designing the ambient air monitoring program (these are discussed and referenced later in this document),
- The monitoring program will be operational for 6 months prior to any implementation of control measures by Claymont Steel and 6 months thereafter so that any reduction in TSP in the nearby neighborhoods can be evaluated.

[1] Pg. 7. "Notice of Conciliation and Secretary's Order No. 2006-A-0048", Department of Natural Resources and Environmental Control, Office of the Secretary, State of Delaware, October 23, 2006.
[2] Pg. 6, ibid.

3 SITING INFORMATION

A total of four ambient air monitoring sites are proposed for this program:

1) Location One: Frontage area of 84 Lumber (a commercial lumber distributor) on Ridge Road. The area in front of the fence of 84 Lumber at 312 Ridge Road, Claymont, Delaware.

2) Location Two: Across the street from the Knollwood Community Center at 4 Colby Avenue, Claymont, Delaware. Between the baseball field's backstop and the park sign.

3) Location Three: Woodshaven Kruse Park off of Darley Road, Claymont, Delaware. The area in the vicinity of the cell phone tower.

4) Location Four: Waterfall Banquet & Conference Center located at 3416 Philadelphia Pike, Claymont, Delaware. Near the center of the parking lot in the back of the conference center building.

This list of proposed monitoring sites establishes an upwind, downwind and cross-wind site with an additional site that will be generally upwind of the facility. This selection of sites provides for good coverage of the areas that are suspected to be affected and at the same time provides for simultaneous up-wind and down-wind measurements under most anticipated wind directions. Finalization of the proposed monitoring sites is subject to approval from DNREC and the land owners.

EPA siting criteria protocols and requirements were followed. Siting criteria for ambient air quality monitoring found in the Code of Federal Regulations (CFR) Title 40, Part 58, Appendix E was followed to the maximum extent possible. The area around the plant was examined via topographical maps, aerial photos, and visiting the neighborhoods, park, and traveling the local roads.

Vertical placement of the probe or at least 80% of the monitoring path must be located between 2 and 7 meters above ground level for particulate matter. The probe or monitoring path for each proposed monitoring location will be a minimum of 2 meters and no greater than 7 meters above ground level.

Horizontal placement of the probe or at least 90% of the monitoring path will be at least 1 meter away from any supporting structure, walls, parapets, penthouses, etc., and away from dusty or dirty areas.

This situation is not anticipated however, if a probe or a significant portion of the monitoring path must be located near the side of a building, then it will be located on the windward side of the building relative to the prevailing wind direction. The sites are also planned not to be in unpaved areas unless there is vegetative ground cover, so the impact of wind blown dusts will be minimized.

Spacing from trees to reduce possible interference/obstruction, the probe, inlet, or at least 90% of the monitoring path should be at least 10 meters or further from the drip line of trees. Location Two across the street from the Knollwood Community Center has some young trees within 10 meters of the proposed monitoring location. This site is the optimal location within the Knollwood neighborhood.

Siting of the monitoring locations from the nearest traffic lanes will meet the range of acceptable distances from Figure E-1 in CFR Title 40, Part 58, Appendix E also included in Attachment B of this document.

Attachment C provides meteorological data regarding the wind speed and direction from the Philadelphia International Airport. The four monitoring sites are located within the following wind sectors:

- Downwind location - Location One: Frontage area of 84 Lumber on Ridge Road.

- Upwind location - Location Two: Across the street from the Knollwood Community Center at 4 Colby Avenue, Claymont, Delaware.

- Crosswind location - Location Three: Woodshaven Kruse Park off of Darley Road, Claymont, Delaware.

- Lesser upwind location - Location Four: Waterfall Banquet & Conference Center located at 3416 Philadelphia Pike, Claymont, Delaware.

4 AMBIENT AIR MONITORING EQUIPMENT

Ambient air monitoring equipment will employ EPA testing equipment and protocols. The Partisol Model 2000 Air Sampler has been approved for use as an EPA reference method (RFPS-0694-098) for ambient concentrations of particulate matter (PM10). The Federal Register notice is included in Attachment D.

In its simplest form, the Partisol Sampler is set up to collect particulate matter (PM-10, PM-2.5 or TSP) on a standard 47 mm filter disk for 24-hour periods stretching from midnight to midnight. This project will incorporate the sampling procedures for TSP only. As with other manual sampling devices, the filters used in the procedure are conditioned and weighed before exposure, and then conditioned and weighed again after use to determine the mass of particulate collected during the 24-hour exposure time. The Partisol hardware will store the data relevant to each 24-hour collection period in its internal data logger for viewing and/or retrieval after the fact. Information includes the total volume (in terms of standard temperature and pressure), total collection time, average temperature, and average pressure during the collection period.

After the sample flow passes through the collection hardware and solenoid valve, it flows through an in-line filter that protects the mass flow sensor. The sampler measures the current atmospheric pressure and ambient temperature to adjust the reading from the mass flow sensor so that the proper volumetric flow rate is maintained. While the vacuum pump constantly operates at full capacity, a servo valve allows varying rates of flow to enter the system so that the sample flow is maintained at its volumetric set point. The accumulator minimizes pulsations caused by the vacuum pump, while the manual shut-off valves and vacuum gauge are used in audit and calibration procedures.

The Partisol Sampler maintains a constant volumetric flow rate through the unit at the set point entered by the user, while reporting flow volumes (m3) in mass terms based upon standard temperature and pressure. The flow rate used must be appropriate for the inlets being used in the Partisol system. The TSP inlets from typically operate at a flow rate of 16.7 l/min (1 m3/h).

The Model 2000 hardware determines the ambient temperature and pressure for flow rate calculations in one of two different ways: 1) temperature and pressure transducers measure the current ambient temperature (°C) and ambient pressure (Atmospheres); or 2) if the sampler is installed in an *indoor* location where *outdoor* air is being sampled, the user can override the automatic temperature and pressure measurements by entering seasonal averages for temperature and pressure in the software.

The mass flow meter in the Model 2000 sampler is calibrated at a temperature of 0 °C and pressure of 1 Atmosphere (1013.2 millibars or 760 mm Hg). For the device to sample at the correct volumetric flow rate, it makes use of the measured (or entered) average temperature and pressure. Using this information, the microprocessor calculates the correct mass flow set point (Flow RateSTP) using the following formula:

$$\textit{Flow RateSTP} = \textit{Flow RateVol} \times \frac{273.15}{\textit{Ave Temp} + 273.15} \times \frac{\textit{Ave Pres}}{1.0}$$

where:

Flow RateSTP = Control set point of the mass flow meter (equivalent flow at 0 °C and 1 Atmosphere).

Flow RateVol= Volumetric flow rate set point (l/min) as entered by the user in the Setup Screen. This value is typically 16.7 l/min (1 m3/h).

Ave Temp = The current temperature (°C) as measured by the temperature transducer mounted on the sample tube of the unit or the value entered for average temperature by the user.

Ave Pres = The current pressure (Atmospheres) as measured by the pressure transducer in the unit or the value entered for average pressure by the user.

Mass concentration data reported to the U.S. EPA must be referenced to standard cubic meters of air based on a standard temperature of 25 °C and standard pressure of 1 Atmosphere.

The flow volumes referenced internally by the instrument to 0 °C are converted to EPA standard conditions using the following computation:

$$\textit{VolumeEPA} = \textit{VolumeSTP} \times \frac{\textit{Std Temp} + 273.15}{273.15} \times \frac{1\ \text{Atm}}{1\ \text{Atm}}$$

5 MONITORING EQUIPMENT PROCEDURES

All procedures in this section are based upon the operation of the Partisol Model 2000 air sampler.

The ambient monitoring stations will measure TSP on a 6-day rotating basis with each sample taken over a 24-hour period from midnight to midnight. This approach provides for each sample to cover an entire daily production cycle while altering the sampling day through the days of the week so that week days and weekends are covered.

5.1 Instrument Operation – Manual Mode:

The Manual programming mode allows the user to turn on a selected sampling station by pressing the appropriate key on the keypad of the Partisol Sampler. This gives the operator significant flexibility in the operation of the hardware through direct input. The device keeps track of the total exposure time for each measurement station along with the volume (in terms of standard temperature and pressure) drawn through each 47 mm filter. Select this programming mode by setting "Run Type" in the Setup Screen to "MAN".

In the Manual programming mode, the user gains access to the keys that control system operation in the Main Screen. If the sampler is not currently in the Main Screen, press <ESC> until this display appears. The layout of the Main Screen can vary somewhat depending upon the programming mode that is currently chosen.

With the system in the "Stop" operating mode, execute the procedure below to exercise the Manual programming mode:

1) Replace the filters in the units according to the instrument's operating instructions.

2) Press <F4: Run/Stp> to enter the "Run" operating mode, as shown in the upper right-hand corner of the Main Screen.

3) Press <SHIFT> to display the second line of the soft function key menu.

4) Press the <F6: Hub1>, <F7: Sat2>, <F8: Sat3>, <F9: Sat4>, or <F10: AllOff> keys, as desired, to operate the selected sampling station (or no station in the case of <F10: AllOff>). Press <F10: AllOff> (SHIFT <F5>) to turn off all stations but remain in the "Run" operating mode. The Main Screen displays the currently active station in the "Stat" column.

   Press these keys as desired to switch among stations when the sampler is in the "Run" operating mode.

5) When the sampling program is complete, press <SHIFT> to display the first line of the soft function key menu again, and then press <F4: Run/Stp> to enter the "Stop" operating mode. This is indicated in the upper right-hand corner of the Main Screen. All sampling stations then indicate "OFF" in the "Stat" column, and the sampler no longer updates the volume and time accumulators. The data for the exposed filters are stored as "Filter Data" in the internal data logger.

6) Retrieve the exposed filters for weighing and/or analysis.

5.2 Audit Procedures:

This section describes the means by which the ambient temperature, ambient pressure, and sample flow rate measured by the unit are audited. In addition, this part describes the procedure for performing a leak check of the units.

The tests described in this section will be performed at the beginning of the sampling program, after every three months of continuous operation, and at the end of the sampling program. Routine maintenance will be executed at the same time as the audits in this section.

5.2.1 TEMPERATURE AUDIT

Perform an ambient temperature audit in the following manner:

1) Press <F5: Audit> when in the Setup Screen to access the Audit Screen.

2) Determine the current temperature (°C) at the ambient temperature sensor positioned on the sample tube of the unit using an external thermometer, [°C = 5/9 x (°F - 32)].

3) Verify that the value for temperature displayed for "Temperature" in the Audit Screen is within ±2 °C of the measured temperature. If this is not the case, perform the temperature calibration procedure.

5.2.2 PRESSURE AUDIT

Perform an ambient pressure audit in the following manner:

1) Press <F5: Audit> when in the Setup Screen to access the Audit Screen.

2) Determine the current ambient station pressure in Atmospheres (absolute pressure, not corrected to sea level).

   - To convert from mm Hg @ 0 °C to Atmospheres, multiply by 0.001316.
   - To convert from millibars to Atmospheres, multiply by 0.000987.
   - To convert from inches Hg @ 32 °F to Atmospheres, multiply by 0.03342.

3) Verify that the value for "Pressure" in the Audit Screen is within ±0.02 Atmospheres of the measured ambient pressure. If this is not the case, perform the pressure calibration procedure.

5.2.3 LEAK CHECK

Perform a leak test on the unit in the manner described below. To ensure leak tightness, a filter cassette containing a new 47 mm filter must be installed in each sampling station tested.

1) Press <F5: Audit> when in the Setup Screen to access the Audit Screen.
2) Carefully remove the size-selective inlet from sampling station being checked. Perform the maintenance procedure for the PM-10 inlet.
3) Install the Flow Audit Adapter on the end of the sample tube of the sampling station being checked.
4) Turn on the pump by pressing <F5: Pump> when in the Audit Screen.
5) Press either <F1: Hub1>, <F2: Sat2>, <F3: Sat3>, or <F4: Sat4>, depending upon which sampling station is currently being checked.
6) Shut off the valve on the Flow Audit Adapter.
7) Shut off the flow to the flow controller assembly by turning the manual shut off valve attached to the large air filter on the left side of the manifold in the unit.
8) Record the reading on the vacuum gauge in the unit.
9) Shut off the flow to the pump by turning the other manual shut off valve located on the bottom of the manifold in the unit.

10) Record the reading on the vacuum gauge 10 seconds after the pump valve is closed. This reading should not drop below half of the original reading during this 10 second period. If this is not the case, trace the internal (and external) flow paths to identify problems in tubing or connections.

11) Open the flow controller valve and pump valve that were closed insteps 7 and 9 above.

12) Open the valve of the Flow Audit Adapter, and remove this hardware from the sampling station being checked. Replace the size-selective inlet.

13) Perform steps 2 to 12 above for each sampling station.

5.2.4 FLOW AUDIT

Perform the temperature audit, pressure audit and leak check described above before executing the flow audit procedure below.

Perform a flow audit in the following manner:

1) Press <F5: Audit> when in the Setup Screen to access the Audit Screen.

2) Install a filter cassette containing a 47 mm filter into the filter holder of the unit. This filter will be thrown away at the end of this flow audit.

3) Carefully remove the size-selective inlet from the unit. Refer to the maintenance procedure for the TSP inlet.

4) Install the Flow Audit Adapter on the end of the sample tube of the unit.

5) Attach a volumetric flow meter to the Flow Audit Adapter.

6) Turn on the pump by pressing <F5: Pump>, and then press <F1:Hub1>.

7) Determine the flow in units of actual (volumetric) l/min using the external flow meter and verify that it matches the value displayed for flow in the "Calc" column of the Calibration Screen to within ±7%. If this is not the case, perform the flow calibration procedure.

8) Return to the Main Screen by pressing <ESC> twice.

9) Restore the sampling hardware to its original state by removing the flow metering hardware and re-installing the size selective inlet on the sample tube of the unit.

Remove the filter cassette from this sampling station, and throw away the filter installed in it.

5.3 Filter Handling and Exchange:

This section covers the initial inspection of 47 mm filters used in the Partisol system, as well as the equilibration and weighing before use. Further, the procedure for filter insertion and removal is described along with the means by which post-collection equilibration and weighing occur. Follow the guidelines described in this section closely to ensure data quality.

5.3.1 FILTER HANDLING AND INITIAL INSPECTION

A number of different media are available in the standard *47 mm* size for use with the Partisol Sampler: Pallflex TX40 Filters, Teflon Filters, 2.0 µm pore size, and Quartz Fiber Filters.

The above-listed materials are currently acceptable for use in U.S. EPA equivalent and reference PM-10 instrumentation. All are suitable for particulate mass measurement; however, one type of media may be preferable to the other depending upon the type of post-collection chemical speciation desired. Filter media may be used for U.S. EPA PM-10 reporting purposes as long as the material meets the collection efficiency, integrity and alkalinity requirements of 40 CFR Part 50 Appendix J. Further, materials to be used *must* have relatively low pressure drop characteristics so that the sampler can maintain the 16.7 l/min flow rate required for the PM-10 inlet during an entire 24-hour sampling period.

NOTE: Utmost care must be taken when handling and transporting sample filters. Quartz fiber filters are very brittle, while other types of material are susceptible to tearing. The user must be careful to keep filters clean and never to touch filters with fingers. Filters should be stored and transported in petri dishes. Only non-serrated forceps should be used to handle the 47 mm filters used with the sampler.

Inspect each filter visually for integrity before use. Check for the following:

- Pinholes
- Chaff or flashing
- Loose material
- Discoloration
- Non-uniformity

5.3.2 INITIAL FILTER EQUILIBRATION

Perform the steps below to equilibrate 47 mm filters before use. Petri dishes are used to store and transport the filters.

1) Place a label on the cover of each petri dish and number each dish.

2) Place the petri dish cover *under* the bottom half of the dish.

3) Place each inspected filter into a separate petri dish.

4) Record the filter number, relative humidity, temperature, date and time at the beginning of equilibration.

5) Equilibrate each filter for *at least* 24 hours under the following conditions:

   The equilibration room must be held at a constant relative humidity between 20 and 45% with a variability of not more than ±5%.

   The equilibration room must be held at a constant temperature between 15 and 30 °C with a variability of not more than ±3 °C.

5.3.3 INITIAL FILTER WEIGHING

Follow the procedure below to perform an initial weighing of 47 mm collection filters (tare weight):

1) Ensure that each filter has been equilibrated for at least 24 hours before weighing.

2) Filters must be weighed on a semi-micro balance with a minimum resolution of 0.01 mg. Ensure that the balance has been turned on for at least one hour before performing any weighings.

3) Weigh each filter at least once (three times recommended), recording the mass in grams. The average mass reading is the initial filter weight, W_i.

4) Immediately place each weighed filter into an open filter cassette and then close the filter cassette by snapping its top part onto the bottom section. Ensure that the cassette is properly sealed by *one* of the following methods:

While holding the bottom part of the filter cassette in one hand, rotate the top of the cassette approximately 1/8 of a turn while applying pressure.

Hold the closed cassette in both hands with your thumb on the top and fore finger on the bottom. Rotate the entire cassette completely while applying pressure with your thumb and fore finger.

Place the filter cassette with its 47 mm filter installed into a Petri dish, and place the cover over the petri dish.

5) Document the relative humidity, temperature, date and time of the initial weighing.

6) The "zero" reading of the semi-micro balance should be verified between each filter weighing.

5.3.4 FILTER EXCHANGE

Collection filters must be transported carefully in their petri dishes to and from the sampling site.

IMPORTANT NOTE: With the exception of the Basic programming mode, the sampler must be in the "Stop" operating mode before filters are exchanged. Press <F4: Run/ Stp> when in the Main Screen to toggle between the "Run" and "Stop" operating modes.

When in the Basic programming mode, leave the sampler in the "Run" operating mode, but be careful not to exchange the filter in the currently operating sampling station. The active unit is displayed on the second line of the Main Screen as "Curr".

Perform the following procedure for each sampling unit in which a filter is to be exchanged:

1) For each sampling station where a filter is being exchanged, record the valid and total exposure times, as well as the standard volume (VSTD) displayed on the Main Screen.

2) Lift the handle of the filter exchange mechanism in the unit into its upward position to expose the area in which the filter cassette is installed.

3) If a filter is currently installed in the sampling unit, remove the filter cassette with its filter installed, and place it immediately into its uniquely-numbered petri dish. A groove in the filter holding mechanism allows the user to gain better access to the filter cassette for removal.

4) Take the new filter cassette with its unused filter installed out of its petri dish, and place it into the filter holding well of the filter exchange mechanism. The enclosure of the sampling station serves as a good storage location for the petri dish of the filter currently in use.

5) Close the filter exchange mechanism.

If the Partisol Sampler is being operated in its Basic programming mode, use the soft function keys in the Edit Mode to define the sampling program for the newly-installed 47 mm filters. Make sure that the hardware remains in its "Run" operating mode so that the newly-defined sampling program is executed, or press <F4: Run/Stp> if the sampler is currently in the "Stop" operating mode.

If the unit is in any other programming mode besides the Basic mode, use the soft function keys in the Edit mode to define the sampling program for the newly-installed 47 mm filters. Then, return the sampler to the "Run" operating mode by pressing <F4: Run/Stp> when in the Main Screen (Section 4.3) so that the newly defined sampling program is carried out.

5.3.5 POST COLLECTION EQUILIBRATION

Perform the following steps to equilibrate 47 mm filters after use:

1) Examine the filter for defects that may have occurred during sampling, as well as for evidence of leaks in the filter cassette. Leaks manifest themselves as pronounced radial streaks that extend beyond the exposed area of the filter.

2) Carefully remove the 47 mm filter from the filter cassette and set the filter in its petri dish. The cassette can then be used to hold other filters once it has been cleaned.

3) Place the petri dish cover *under* the bottom half of the dish.

4) Place a paper towel over the open petri dish during equilibration.

5) Record the filter number, relative humidity, temperature, date and time at the beginning of this post-collection equilibration.

6) Equilibrate each filter for *at least* 24 hours under the following conditions:

   The equilibration room must be held at a constant relative humidity between 20 and 45% with a variability of not more than ±5%.

The equilibration room must be held at a constant temperature between 15 and 30 °C with a variability of not more than ±3 °C.

5.3.6 POST COLLECTION WEIGHING

Follow the procedure below to perform a post-collection weighing of the 47 mm collection filters:

1) Ensure that the filter has been equilibrated for at least 24 hours before weighing.

2) Filters must be weighed on a semi-micro balance with a minimum resolution of 0.01 mg. Ensure that the balance has been turned on for at least one hour before performing any weighings.

3) Remove the filter from its petri dish.

4) Weigh each filter at least once (three times recommended), recording the mass in grams. The average mass reading is the final filter weight, W_f.

5) Return the filter to its petri dish and store for archival purposes.

6) Document the relative humidity, temperature, date and time of the post-collection weighing.

7) The "zero" reading of the semi-micro balance should be verified between each filter weighing.

8) Determine the net mass filter loading (*DW*) by subtracting the average initial filter weight (W_i (g) computed in the initial filter weighing procedure) from the final filter weight (W_f (g) computed in step 4 above). Ensure that the figures used in this computation were obtained from the *same filter and balance*.

5.4 Calculation of TSP Concentration:

Compute the average mass concentration (MC) of TSP during the sampling period of each filter by using the following formula with the information assembled from the Filter Handling and Exchange Section:

$$MC = \frac{DW \times 10^6}{VSTD}$$

where:

DW = the net change in the mass (g) of the 47 mm filter between the initial weighing and the post collection weighing, as computed in step 8 of the Post Collection Weighing Section.

10^6 = Conversion factor from grams (g) to micrograms (µg).

VSTD = the volume (std m3) drawn through the filter, as recorded in step 1 of the Filter Exchange Section above.

For 24-hour PM-10 measurement averages to be valid for U.S. EPA reporting purposes, the “Valid Time” recorded in step 1 of the Filter Exchange Section above must be at least 23 hours. The “Total Time” is the length of time during which the sample stream flows through a filter, while the “Valid Time” is the length of time during which the status condition is “Ok.” Therefore, the “Valid Time” is always less than or equal to the “Total Time.”

6 PROGRAM SCHEDULE

The ambient air monitoring program is required to be in operation before and after implementation of additional dust control measures in order to assess the degree of improvement in slag dust emissions from the control measures. Based on the planned review schedule by DNREC and the time required to implement any control measures, it is proposed that the initial ambient air monitoring program be established and operational by July 30, 2007. This phase of the program will satisfy the requirement for Claymont Steel to establish an ambient air monitoring program before additional control measures are put in place. The anticipated duration of this phase of the program is 6 months.

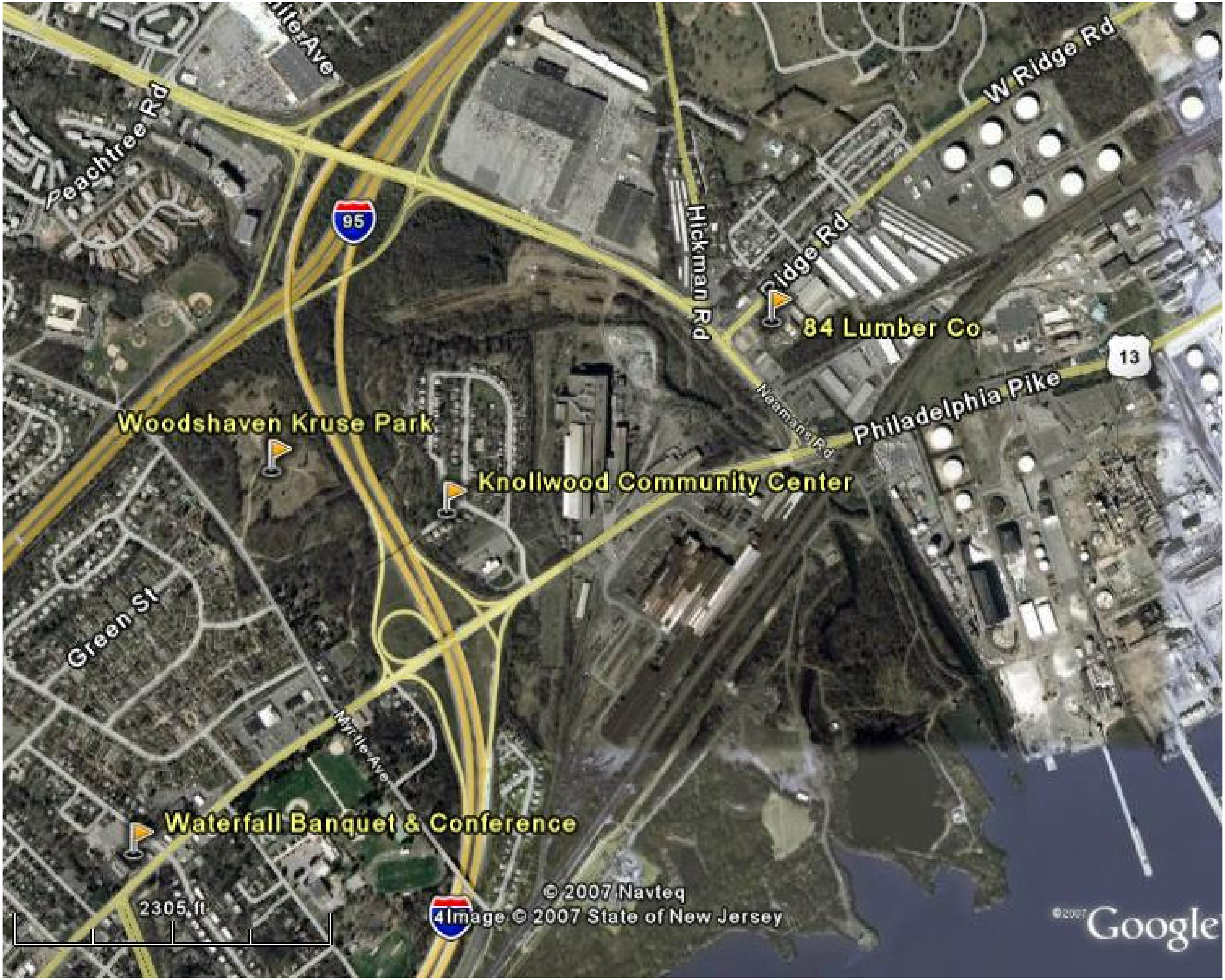
Following implementation of the first additional dust control measures, the ambient air monitoring program will be re-started and will run for 6 months after the next round of dust control measures are implemented.

7 PROGRAM RESULTS

The results from the ambient monitoring program will be summarised in a letter to DNREC for each phase of data collection. The average mass concentration of TSP will be presented in table format for each filter sampling period at each monitoring location.

ATTACHMENT A

Ambient Air Monitoring Locations


W Ridge Rd
Ridge Rd
84 Lumber Co
Hickman Rd
Naamans Rd
Philadelphia Pike
13
Peachtree Rd
95
Woodshaven Kruse Park
Knollwood Community Center
Green St
Myrtle Ave
Waterfall Banquet & Conference
2305 ft
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ATTACHMENT B

CFR Title 40 Part 58 – Appendix E

Appendix E to Part 58—Probe and Monitoring Path Siting Criteria for Ambient Air Quality Monitoring

1. Introduction

(a) This appendix contains specific location criteria applicable to SLAMS, NCore, and PAMS ambient air quality monitoring probes, inlets, and optical paths after the general location has been selected based on the monitoring objectives and spatial scale of representation discussed in appendix D to this part. Adherence to these siting criteria is necessary to ensure the uniform collection of compatible and comparable air quality data.

(b) The probe and monitoring path siting criteria discussed in this appendix must be followed to the maximum extent possible. It is recognized that there may be situations where some deviation from the siting criteria may be necessary. In any such case, the reasons must be thoroughly documented in a written request for a waiver that describes how and why the proposed siting deviates from the criteria. This documentation should help to avoid later questions about the validity of the resulting monitoring data. Conditions under which the EPA would consider an application for waiver from these siting criteria are discussed in section 10 of this appendix.

(c) The pollutant-specific probe and monitoring path siting criteria generally apply to all spatial scales except where noted otherwise. Specific siting criteria that are phrased with a “must” are defined as requirements and exceptions must be approved through the waiver provisions. However, siting criteria that are phrased with a “should” are defined as goals to meet for consistency but are not requirements.

2. Horizontal and Vertical Placement

The probe or at least 80 percent of the monitoring path must be located between 2 and 15 meters above ground level for all ozone, sulfur dioxide and nitrogen dioxide monitoring sites, and for neighborhood scale Pb, PM_{10}, $PM_{10-2.5}$, $PM_{2.5}$, and carbon monoxide sites. Middle scale $PM_{10-2.5}$ sites are required to have sampler inlets between 2 and 7 meters above ground level. Microscale Pb, PM_{10}, $PM_{10-2.5}$ and $PM_{2.5}$ sites are required to have sampler inlets between 2 and 7 meters above ground level. The inlet probes for microscale carbon monoxide monitors that are being used to measure concentrations near roadways must be 3± 1/2 meters above ground level. The probe or at least 90 percent of the monitoring path must be at least 1 meter vertically or horizontally away from any supporting structure, walls, parapets, penthouses, etc., and away from dusty or dirty areas. If the probe or a significant portion of the monitoring path is located near the side of a building, then it should be located on the windward side of the building relative to the prevailing wind direction during the season of highest concentration potential for the pollutant being measured.

3. Spacing From Minor Sources

(a) It is important to understand the monitoring objective for a particular location in order to interpret this particular requirement. Local minor sources of a primary pollutant, such as SO_2, lead, or particles, can cause high concentrations of that particular pollutant at a monitoring site. If the objective for that monitoring site is to investigate these local primary pollutant emissions, then the site is likely to be properly located nearby. This type of monitoring site would in all likelihood be a microscale type of monitoring site. If a monitoring site is to be used to determine air quality over a much larger area, such as a neighborhood or city, a monitoring agency should avoid placing a monitor probe, path, or inlet near local, minor sources. The plume from the local minor sources should not be allowed to inappropriately impact the air quality data collected at a site. Particulate matter sites should not be located in an unpaved area unless there is vegetative ground cover year round, so that the impact of wind blown dusts will be kept to a minimum.

(b) Similarly, local sources of nitric oxide (NO) and ozone-reactive hydrocarbons can have a scavenging effect causing unrepresentatively low concentrations of O_3 in the vicinity of probes and monitoring paths for O_3. To minimize these potential interferences, the probe or at least 90 percent of the monitoring path must be away from furnace or incineration flues or other minor sources of SO_2 or NO. The separation distance should take into account the heights of the flues, type of waste or fuel burned, and the sulfur content of the fuel.

4. Spacing From Obstructions

(a) Buildings and other obstacles may possibly scavenge SO_2, O_3, or NO_2, and can act to restrict airflow for any pollutant. To avoid this interference, the probe, inlet, or at least 90 percent of the monitoring path must have unrestricted airflow and be located away from obstacles. The distance from the obstacle to the probe, inlet, or monitoring path must be at least twice the height that the obstacle protrudes above the probe, inlet, or monitoring path. An exception to this requirement can be made for measurements taken in street canyons or at source-oriented sites where buildings and other structures are unavoidable.

(b) Generally, a probe or monitoring path located near or along a vertical wall is undesirable because air moving along the wall may be subject to possible removal mechanisms. A probe, inlet, or monitoring path must have unrestricted airflow in an arc of at least 180 degrees. This arc must include the predominant wind direction for the season of greatest pollutant concentration potential. For particle sampling, a minimum of 2 meters of separation from walls, parapets, and structures is required for rooftop site placement.

(c) Special consideration must be given to the use of open path analyzers due to their inherent potential sensitivity to certain types of interferences, or optical obstructions. A monitoring path must be clear of all trees, brush, buildings, plumes, dust, or other optical obstructions, including potential obstructions that may move due to wind, human activity, growth of vegetation, etc. Temporary optical obstructions, such as rain, particles, fog, or snow, should be considered when siting an open path analyzer. Any of these temporary obstructions that are of sufficient density to obscure the light beam will affect the ability of the open path analyzer to continuously measure pollutant concentrations. Transient, but significant obscuration of especially longer measurement paths could occur as a result of certain meteorological conditions (*e.g.*, heavy fog, rain, snow) and/or aerosol levels that are of a sufficient density to prevent the open path analyzer's light transmission. If certain compensating measures are not otherwise implemented at the onset of monitoring (*e.g.*, shorter path lengths, higher light source intensity), data recovery during periods of greatest primary pollutant potential could be compromised. For instance, if heavy fog or high particulate levels are coincident with periods of projected NAAQS-threatening pollutant potential, the representativeness of the resulting data record in reflecting maximum pollutant concentrations may be substantially impaired despite the fact that the site may otherwise exhibit an acceptable, even exceedingly high overall valid data capture rate.

5. Spacing From Trees

(a) Trees can provide surfaces for SO_2, O_3, or NO_2 adsorption or reactions, and surfaces for particle deposition. Trees can also act as obstructions in cases where they are located between the air pollutant sources or source areas and the monitoring site, and where the trees are of a sufficient height and leaf canopy density to interfere with the normal airflow around the probe, inlet, or monitoring path. To reduce this possible interference/obstruction, the probe, inlet, or at least 90 percent of the monitoring path must be at least 10 meters or further from the drip line of trees.

(b) The scavenging effect of trees is greater for O_3 than for other criteria pollutants. Monitoring agencies must take steps to consider the impact of trees on ozone monitoring sites and take steps to avoid this problem.

(c) For microscale sites of any air pollutant, no trees or shrubs should be located between the probe and the source under investigation, such as a roadway or a stationary source.

6. Spacing From Roadways

6.1 Spacing for Ozone and Oxide of Nitrogen Probes and Monitoring Paths. In siting an O_3 analyzer, it is important to minimize destructive interferences from sources of NO, since NO readily reacts with O_3. In siting NO_2 analyzers for neighborhood and urban scale monitoring, it is important to minimize interferences from automotive sources. Table E–1 of this appendix provides the required minimum separation distances between a roadway and a probe or, where applicable, at least 90 percent of a monitoring path for various ranges of daily roadway traffic. A sampling site having a point analyzer probe located closer to a roadway than allowed by the Table E–1 requirements should be classified as middle scale rather than neighborhood or urban scale, since the measurements from such a site would more closely represent the middle scale. If an open path analyzer is used at a site, the monitoring path(s) must not cross over a roadway with an average daily traffic count of 10,000 vehicles per day or more. For those situations where a monitoring path crosses a roadway with fewer than 10,000 vehicles per day, one must consider the entire segment of the monitoring path in the area of potential atmospheric interference from automobile emissions. Therefore, this calculation must include the length of the monitoring path over the roadway plus any segments of the monitoring path that lie in the area between the roadway and the minimum separation distance, as determined from Table E–1 of this appendix. The sum of these distances must not be greater than 10 percent of the total monitoring path length.

6.2 Spacing for Carbon Monoxide Probes and Monitoring Paths. (a) Street canyon and traffic corridor sites (microscale) are intended to provide a measurement of the influence of the immediate source on the pollution exposure of the population. In order to provide some reasonable consistency and comparability in the air quality data from microscale sites, a minimum distance of 2 meters and a maximum distance of 10 meters from the edge of the nearest traffic lane must be maintained for these CO monitoring inlet probes. This should give consistency to the data, yet still allow flexibility of finding suitable locations.

(b) Street canyon/corridor (microscale) inlet probes must be located at least 10 meters from an intersection and preferably at a midblock location. Midblock locations are preferable to intersection locations because intersections represent a much smaller portion of downtown space than do the streets between them. Pedestrian exposure is probably also greater in street canyon/corridors than at intersections.

(c) In determining the minimum separation between a neighborhood scale monitoring site and a specific roadway, the presumption is made that measurements should not be substantially influenced by any one roadway. Computations were made to determine the separation distance, and Table E–2 of this appendix provides the required minimum separation distance between roadways and a probe or 90 percent of a monitoring path. Probes or monitoring paths that are located closer to roads than this criterion allows should not be classified as a neighborhood scale, since the measurements from such a site would closely represent the middle scale. Therefore, sites not meeting this criterion should be classified as middle scale.

6.3 Spacing for Particulate Matter (PM2.5, PM10, Pb) Inlets. (a) Since emissions associated with the operation of motor vehicles contribute to urban area particulate matter ambient levels, spacing from roadway criteria are necessary for ensuring national consistency in PM sampler siting.

(b) The intent is to locate localized hot-spot sites in areas of highest concentrations whether it be from mobile or multiple stationary sources. If the area is primarily affected by mobile sources and the maximum concentration area(s) is judged to be a traffic corridor or street canyon location, then the monitors should be located near roadways with the highest traffic volume and at separation distances most likely to produce the highest concentrations. For the microscale traffic corridor site, the location must be between 5 and 15 meters from the major roadway. For the microscale street canyon site the location must be between 2 and 10 meters from the roadway. For the middle scale site, a range of acceptable distances from the roadway is shown in figure E–1 of this appendix. This figure also includes separation distances between a roadway and neighborhood or larger scale sites by default. Any site, 2 to 15 meters high, and further back than the middle scale requirements will generally be neighborhood, urban or regional scale. For example, according to Figure E–1 of this appendix, if a PM sampler is primarily influenced by roadway emissions and that sampler is set back 10 meters from a 30,000 ADT (average daily traffic) road, the site should be classified as microscale, if the sampler height is between 2 and 7 meters. If the sampler height is between 7 and 15 meters, the site should be classified as middle scale. If the sample is 20 meters from the same road, it will be classified as middle scale; if 40 meters, neighborhood scale; and if 110 meters, an urban scale.

7. Cumulative Interferences on a Monitoring Path

(This paragraph applies only to open path analyzers.) The cumulative length or portion of a monitoring path that is affected by minor sources, trees, or roadways must not exceed 10 percent of the total monitoring path length.

8. Maximum Monitoring Path Length

(This paragraph applies only to open path analyzers.) The monitoring path length must not exceed 1 kilometer for analyzers in neighborhood, urban, or regional scale. For middle scale monitoring sites, the monitoring path length must not exceed 300 meters. In areas subject to frequent periods of dust, fog, rain, or snow, consideration should be given to a shortened monitoring path length to minimize loss of monitoring data due to these temporary optical obstructions. For certain ambient air monitoring scenarios using open path analyzers, shorter path lengths may be needed in order to ensure that the monitoring site meets the objectives and spatial scales defined in appendix D to this part. The Regional Administrator may require shorter path lengths, as needed on an individual basis, to ensure that the SLAMS sites meet the appendix D requirements. Likewise, the Administrator may specify the maximum path length used at NCore monitoring sites.

9. Probe Material and Pollutant Sample Residence Time

(a) For the reactive gases, SO2, NO2, and O3, special probe material must be used for point analyzers. Studies 20–24 have been conducted to determine the suitability of materials such as polypropylene, polyethylene, polyvinyl chloride, Tygon&supreg;, aluminum, brass, stainless steel, copper, Pyrex&supreg; glass and Teflon&supreg; for use as intake sampling lines. Of the above materials, only Pyrex&supreg; glass and Teflon&supreg; have been found to be acceptable for use as intake sampling lines for all the reactive gaseous pollutants. Furthermore, the EPA25 has specified borosilicate glass or FEP Teflon&supreg; as the only acceptable probe materials for delivering test atmospheres in the determination of reference or equivalent methods. Therefore, borosilicate glass, FEP Teflon&supreg; or their equivalent must be the only material in the sampling train (from inlet probe to the back of the analyzer) that can be in contact with the ambient air sample for existing and new SLAMs.

(b) For volatile organic compound (VOC) monitoring at PAMS, FEP Teflon&supreg; is unacceptable as the probe material because of VOC adsorption and desorption reactions on the FEP Teflon&supreg;. Borosilicate glass, stainless steel, or its equivalent are the acceptable probe materials for VOC and carbonyl sampling. Care must be taken to ensure that the sample residence time is kept to 20 seconds or less.

(c) No matter how nonreactive the sampling probe material is initially, after a period of use reactive particulate matter is deposited on the probe walls. Therefore, the time it takes the gas to transfer from the probe inlet to the sampling device is also critical. Ozone in the presence of nitrogen oxide (NO) will show significant losses even in the most inert probe material when the residence time exceeds 20 seconds.26 Other studies 27−28 indicate that a 10-second or less residence time is easily achievable. Therefore, sampling probes for reactive gas monitors at NCore must have a sample residence time less than 20 seconds.

10. Waiver Provisions

Most sampling probes or monitors can be located so that they meet the requirements of this appendix. New sites with rare exceptions, can be located within the limits of this appendix. However, some existing sites may not meet these requirements and still produce useful data for some purposes. The EPA will consider a written request from the State agency to waive one or more siting criteria for some monitoring sites providing that the State can adequately demonstrate the need (purpose) for monitoring or establishing a monitoring site at that location.

10.1 For establishing a new site, a waiver may be granted only if both of the following criteria are met:

10.1.1 The site can be demonstrated to be as representative of the monitoring area as it would be if the siting criteria were being met.

10.1.2 The monitor or probe cannot reasonably be located so as to meet the siting criteria because of physical constraints (e.g., inability to locate the required type of site the necessary distance from roadways or obstructions).

10.2 However, for an existing site, a waiver may be granted if either of the criteria in sections 10.1.1 and 10.1.2 of this appendix are met.

10.3 Cost benefits, historical trends, and other factors may be used to add support to the criteria in sections 10.1.1 and 10.1.2 of this appendix, however, they in themselves, will not be acceptable reasons for granting a waiver. Written requests for waivers must be submitted to the Regional Administrator.

11. Summary

Table E–4 of this appendix presents a summary of the general requirements for probe and monitoring path siting criteria with respect to distances and heights. It is apparent from Table E–4 that different elevation distances above the ground are shown for the various pollutants. The discussion in this appendix for each of the pollutants describes reasons for elevating the monitor, probe, or monitoring path. The differences in the specified range of heights are based on the vertical concentration gradients. For CO, the gradients in the vertical direction are very large for the microscale, so a small range of heights are used. The upper limit of 15 meters is specified for consistency between pollutants and to allow the use of a single manifold or monitoring path for monitoring more than one pollutant.

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[71 FR 61323, Oct. 17, 2006]

Table E-1 to Appendix E of Part 58. Minimum Separation Distance Between Roadways and Probes or Monitoring Paths for Monitoring Neighborhood and Urban Scale Ozone (O_3) and Oxides of Nitrogen (NO, NO_2, NO_X, NO_y)

Roadway average daily traffic, vehicles per day	Minimum distance \1\ (meters)	Minimum distance 1, 2 (meters)
[le]1,000	10	10
10,000	10	20
15,000	20	30
20,000	30	40
40,000	50	60
70,000	100	100
>=110,000	250	250

\1\ Distance from the edge of the nearest traffic lane. The distance for intermediate traffic counts should be interpolated from the table values based on the actual traffic count.

\2\ Applicable for ozone monitors whose placement has not already been approved as of December 18, 2006.

Table E-2 to Appendix E of Part 58. Minimum Separation Distance Between Roadways and Probes or Monitoring Paths for Monitoring Neighborhood Scale Carbon Monoxide

Roadway average daily traffic, vehicles per day	Minimum distance \1\ (meters)
[le]10,000	10
15,000	25
20,000	45
30,000	80
40,000	115
50,000	135
>=60,000	150

\1\ Distance from the edge of the nearest traffic lane. The distance for intermediate traffic counts should be interpolated from the table values based on the actual traffic count.

Table E-4 of Appendix E to Part 58. Summary of Probe and Monitoring Path Siting Criteria

Pollutant	Scale (maximum monitoring path length, meters)	Height from ground to probe, inlet or 80% of monitoring path \1\	Horizontal and vertical distance from supporting structures \2\ to probe, inlet or 90% of monitoring path \1\ (meters)	Distance from trees to probe, inlet or 90% of monitoring path \1\ (meters)	Distance from roadways to probe, inlet or monitoring path \1\ (meters)
SO2 3,4,5,6	Middle (300 m) Neighborhood Urban, and Regional (1 km).	2-15	> 1	> 10	N/A
CO 4,5,7	Micro, middle (300 m), Neighborhood (1 km).	3±\1/2\: 2-15	> 1	> 10	2-10; see Table E-2 of this appendix for middle and neighborhood scales.
NO2, O3 3,4,5	Middle (300 m) Neighborhood, Urban, and Regional (1 km).	2-15	> 1	> 10	See Table E-1 of this appendix for all scales.
Ozone precursors (for PAMS) 3,4,5	Neighborhood and Urban (1 km).	2-15	> 1	> 10	See Table E-4 of this appendix for all scales.
PM,Pb 3,4,5,6,8	Micro: Middle, Neighborhood, Urban and Regional.	2-7 (micro); 2-7 (middle PM10-2.5); 2-15 (all other scales).	> 2 (all scales, horizontal distance only).	> 10 (all scales)	2-10 (micro); see Figure E-1 of this appendix for all other scales.

N/A_Not applicable.

\1\ Monitoring path for open path analyzers is applicable only to middle or neighborhood scale CO monitoring and all applicable scales for monitoring SO2,O3, O3 precursors, and NO2.

\2\ When probe is located on a rooftop, this separation distance is in reference to walls, parapets, or penthouses located on roof.

\3\ Should be >20 meters from the dripline of tree(s) and must be 10 meters from the dripline when the tree(s) act as an obstruction.

\4\ Distance from sampler, probe, or 90% of monitoring path to obstacle, such as a building, must be at least twice the height the obstacle protrudes above the sampler, probe, or monitoring path. Sites not meeting this criterion may be classified as middle scale (see text).

\5\ Must have unrestricted airflow 270 degrees around the probe or sampler; 180 degrees if the probe is on the side of a building.

\6\ The probe, sampler, or monitoring path should be away from minor sources, such as furnace or incineration flues. The separation distance is dependent on the height of the minor source's emission point (such as a flue), the type of fuel or waste burned, and the quality of the fuel (sulfur, ash, or lead content). This criterion is designed to avoid undue influences from minor sources.

\7\ For microscale CO monitoring sites, the probe must be >10 meters from a street intersection and preferably at a midblock location.

\8\ Collocated monitors must be within 4 meters of each other and at least 2 meters apart for flow rates greater than 200 liters/min or at least 1 meter apart for samplers having flow rates less than 200 liters/min to preclude airflow interference.

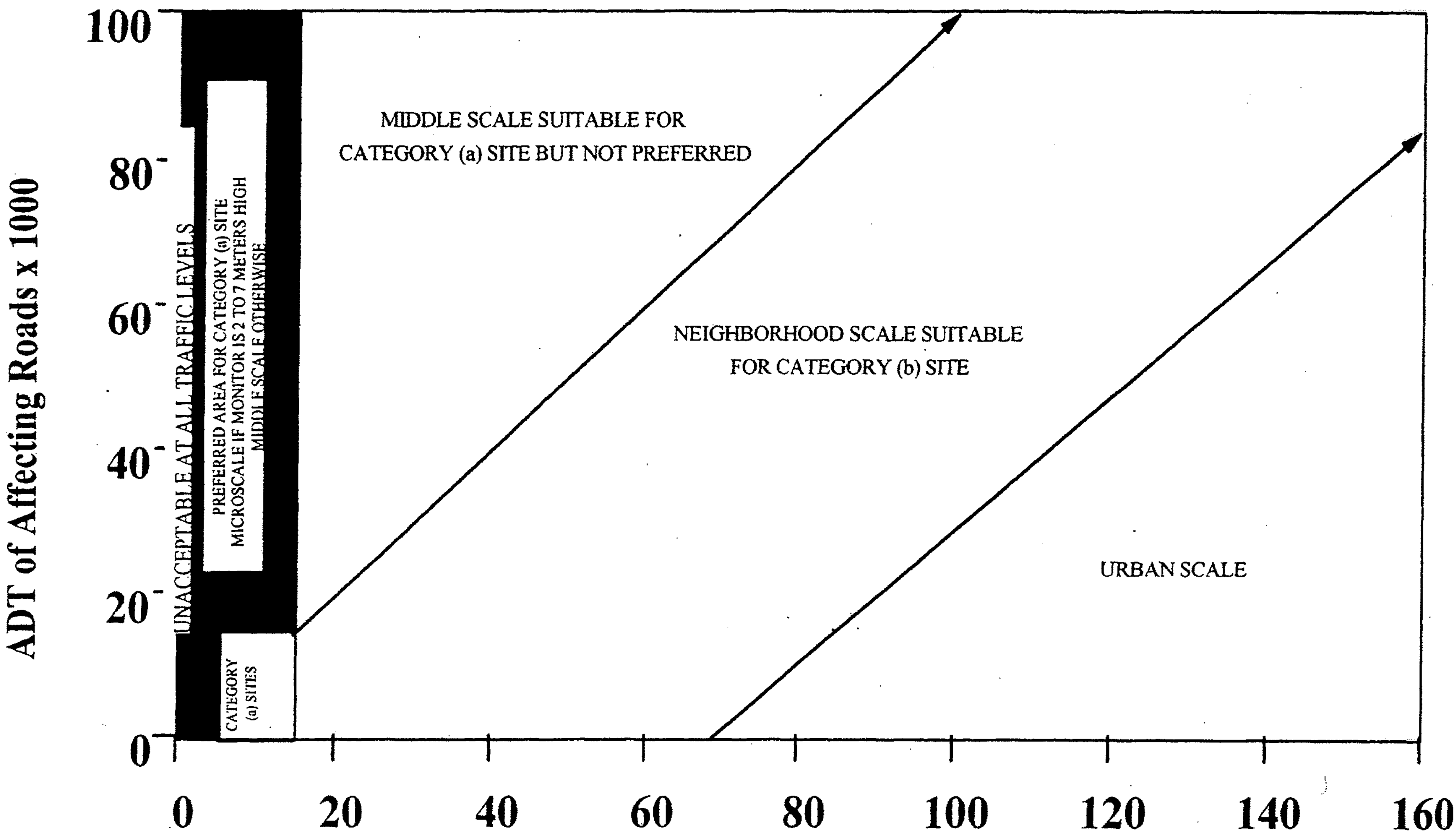


Figure E-1. Distance of PM samplers to nearest traffic lane (meters)

ATTACHMENT C

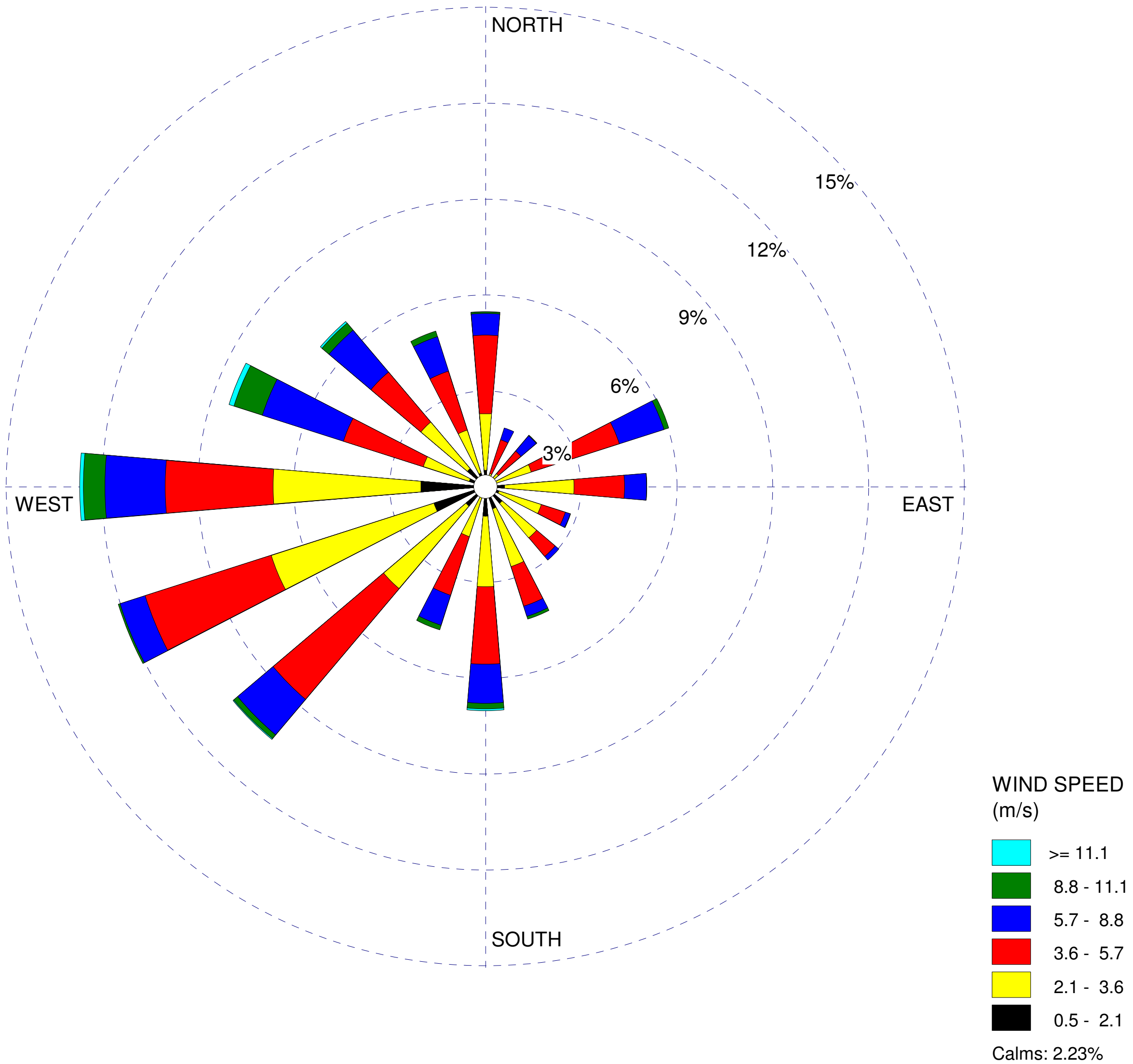
Wind Rose Plot – Philadelphia Airport

WIND ROSE PLOT:

Station #13739 - PHILADELPHIA/INT'L ARPT, PA

DISPLAY:

Wind Speed
Direction (blowing from)



COMMENTS:	DATA PERIOD:	COMPANY NAME:	
	1990 **Jan 1 - Dec 31** **00:00 - 23:00**	MODELER:	
	CALM WINDS: **2.23%**	TOTAL COUNT: **8759 hrs.**	
	AVG. WIND SPEED: **4.36 m/s**	DATE: **01/12/2007**	PROJECT NO.: **98250**

ATTACHMENT D

Federal Register Notice

expiration date extended from 09/30/94 to 12/31/94

Dated: June 27, 1994.

Paul Lapsley,

Director, Regulatory Management Division.

[FR Doc. 94-78722 Filed 7-8-94; 8:45 am]

BILLING CODE 8560-80-M

Office of Research and Development

[TRL-5010-5]

Ambient Air Monitoring Reference and Equivalent Methods; Reference Method Designation

Notice is hereby given that EPA, in accordance with 40 CFR part 53, has designated another reference method for the determination of ambient concentrations of particulate matter measured as PM_{10}. The new reference method is a gravimetric method which utilizes a specially designed PM_{10} sampler for particle collection. The designated method is identified as

RFPS-0694-098, "Rupprecht & Patashnick., Partisol[TM] Model 2000 Air Sampler", consisting of a Hub Unit and 0, 1, 2, or 3 Satellite Units, with each sampling station used for PM_{10} measurements equipped with a Rupprecht & Patashnick PM_{10} Inlet and operated for continuous 24-hour periods using the Basic, Manual, Time. Analog Input, or Serial Input programming modes, and with or without any of the following options:

Stand for Hub or Satellite........57-002320
Advanced EPROM...................59-2542
Large Pump (1/4 hp)., 120 VAC 10-001403
Hardware for Indoor Installation consisting of:
Temperature Sensor (Extended Length.................51-002638-xxxx
Roof Flange, (1¼")...................55-001289
Support Tripod for Inlet..................57-000604
Sample Tube Extension (1m)..57-002526-0001
Sample Tube Extension (2m)..57-002526-0002
Hardware for Outdoor Installation Extreme Cold Environments
Insulating Jacket for Hub Unit........10-002645

This method is available from Rupprecht & Patashnick Co., Inc. (R&P), 25 Corporate Circle, Albany, New York 12203. A notice of receipt of application for this method appeared in the Federal Register, Volume 59, March 30, 1994, page 14853.

The hub unit of the Partisol[TM] Model 2000 Air Sampler contains a filter holder assembly, the flow control system, the valves to direct the sample flow through the hub or appropriate satellite unit, the sample pump, a microprocessor, keypad, information display, and associated electronics. Each satellite unit contains only a filter holder assembly and is connected to the hub unit through a single flow line. Each sampling station (hub or satellite) used for PM_{10} measurements must be equipped with an R&P PM_{10} inlet (other sampling stations may have other types of inlets). Only one sampling station may operate at a time.

The Model 2000 uses 47mm diameter filters mounted in cassettes. Filter media meeting the minimum requirements specified in appendix J to 40 CFR part 50 (Reference Method for the Determination of Particulate Matter as PM_{10} in the Atmosphere) are available from R&P, or may be obtained from other sources, depending on individual user needs. A 5-place analytical balance is required for weighing filters before and after sampling.

Test samplers representative of this method have been tested by the applicant, in accordance with the test procedures specified in 40 CFR part 53. After reviewing the results of these tests and other information submitted by the applicant, EPA has determined, in accordance with part 53; that this method should be designated as a reference method. The information submitted by the applicant will be be kept on file at EPA's Atmospheric Research and Exposure Assessment Laboratory, Research Triangle Park, North Carolina 27711, and will be available for inspection to the extent consistent with 40 CFR part 2 (EPA's regulations implementing the Freedom of Information Act).

As a designated reference method, this method is acceptable for use by States and other air monitoring agencies under requirements of 40 CFR part 58, Ambient Air Quality Surveillance. For such purposes, the method must be used in accordance with the guidance in appendix J to 40 CFR part 50 and the a specific procedures contained in the operation or instruction manual associated with the method. Use of the method is also subject to any limitations specified in the applicable designation (see description of the method above). Vendor modifications of a designated method used for purposes of part 58 are permitted only with prior approval of EPA, as provided in part 53. Provisions concerning modification of such methods by users are specified under section 2.8 of appendix C to 40 CFR part 58 (Modifications of Methods by Users).

In general, this designation applies to any'sampler which is identical to the sampler described in the designation. Similar samplers manufactured and sold prior to the designation may be upgraded (e.g., by minor modification or by substitution of a new operation or instruction manual) so as to be identical to the designated method and thus achieve designation status at a modest cost. The manufacturer should be consulted to determine the feasibility of such upgrading.

Part 53 requires that sellers of designated methods comply with certain conditions. These conditions are given in 40 CFR 53.9 and are summarized below for PM_{10} methods:

(1) A copy of the approved operation or instruction manual must accompany the PM_{10} sampler when it is delivered to the ultimate purchaser.

(2) The PM_{10} sampler must not generate any unreasonable hazard to operators or to the environment.

(3) The PM_{10} sampler must function wit&in the limits of the performance specifications given in table D-1 of part 53 for at least one year after delivery when maintained and operated in accordance with the operation manual.

(4) Any PM_{10} sampler offered for sale as a reference or equivalent method must bear a label or sticker indicating that it has been designated as a reference or equivalent method in accordance with part 53.

(5) An applicant who offers PM_{10} samplers for sale as reference or equivalent methods is required to maintain a list of ultimate purchasers of such samplers and to notify them 30 days if a reference or equivalent -method designation applicable to the sampler has been canceled or if adjustment of the samplers is nece- under 40 CFR 53.11(b) to avoid a cancellation.

(6) An applicant who modifies PM_{10} sampler previously designated as a reference or equivalent method is not permitted to sell the sampler (as modified) as a reference or equivalent method (although he may choose to sell it without such representation), nor to attach a label or sticker to the sampler (as modified) under the provisions described above, until he has received notice under 40 CFR 53.14(c) that the original designation or a new designation applies to the method as modified or until he has applied for and received notice under 40 CFR 53.8(b) of a new reference or equivalent method determination for the sampler as modified.

Aside from occasional breakdowns or malfunctions, consistent or repeated noncompliance with any of these conditions should be reported to: Director, Atmospheric Research and Exposure Assessment Laboratory, Department E (MD-77). U.S. Environmental Protection Agency, Research Triangle Park. North Carolina 27711.

Designation of this reference method will provide assistance to the States in establishing and operating their air quality surveillance systems under part 58. Technical questions concerning the method should be directed to the. manufacturer. Additional information concerning this action may be obtained from Frank F. McElroy, Methods Research and Development Division (MD-77). Atmospheric Research and Exposure Assessment Laboratory, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711, (919) 541-2622.

Carl Gerber,

Assistant Administrator for Research and Development.

[FR Doc. 94-16723 filed 7-8-94; 8:45 am]

BILLING CODE: 6560-50-M

[FRL-5010-8]

Performance Evaluation Reports for Fiscal Year 1993; Section 105 Grants; Missouri, Kansas, Iowa, Nebraska

AGENCY: Environmental Protection Agency (EPA).

ACTION: Notice of availability of grantee performance evaluation reports.

SUMMARY: EPA's grant regulations (40 CFR 35.150) require the Agency to conduct yearly performance evaluations On the progress of the approved State/ EPA Agreements. EPA's regulations (40 CFR 56.7) require that the agency make available to the public the evaluation reports. EPA has conducted evaluations on the Missouri Department of Natural Resources, Nebraska Department of Environmental Quality. Iowa Department of Natural Resources, and Kansas Department of Health and Environment. These evaluations were conducted to assess the agencies' performance under the grants made to them by EPA pursuant to section 105 of the Clean Air Act.

EFFECTIVE DATE: July 11, 1994.

ADDRESSES: Copies of the evaluation reports are available for public inspection at the EPA's Region VII Office, Air and Toxics Division, 726 Minnesota Avenue. Kansas City, Kansas 66101.

FOR FURTHER INFORMATION CONTACT: Carol D. Levalley at (913)551-7610.

Dated: June 13, 1994.

Delores Platt,

Acting Regional Administrator.

[FR Doc. 94-16724 Filed 7-8-91; 8:45am]

BILLING CODE 6560-58-P

[FRL5010-7]

Public Water Supply Supervision Program Revision for the State of South Carolina

AGENCY: Environmental Protection Agency.

ACTION: Notice.

SUMMARY: Notice is hereby given that the State of South Carolina is revising its approved State public Water Supply Supervision Primacy Program. South Carolina has adopted drinking water regulations for Volatile Organic Chemicals, Synthetic Organic Chemicals and Inorganic Chemicals (known as Phase II and Phase IIB of the Federal Safe Drinking Water Regulation) and for Lead and Copper. EPA has determined. that these State program revisions are no less stringent than the corresponding federal regulations. Therefore, EPA has tentatively decided to approve the State program revisions.

All interested parties may request a public hearing A request for a public hearing must be submitted by August 10, 1994, to the Regional Administrator at the address shown below. Frivolous or insubstantial requests for a hearing may be denied by the Regional Administrator. However, if a substantial request for a public hearing is made by August 30, 1994, a public hearing will **be held. If no timely and appropriate request for a hearing is received and the Regional Administrator does not elect to hold a hearing on his/her own motion, this determination shall become final** and effective August 10, 1994.

Any request for a public hearing shall include the following: (1) The name, address and telephone number of the individual, organization, or other entity requesting a hearing; (2) a brief statement of the requesting person's interest in the Regional Administrator's determination and a brief statement of the information that the requesting person intends to submit at such a hearing; and (3) the signature of the individual making the request, or if the request is made on behalf of an organization or other entity. the signature of a responsible official of the organization or other entity.

ADDRESSES: All documents relating to this determination are available for inspection between the hours of 8:00 a.m. and 4:30 p.m.; Monday through Friday, at the following offices:

Department of Health and Environmental Control, 2600 Bull Street, Columbia, South Carolina 29201.

Environmental Protection Agency Region IV, 345 Courtland Street, NE., Atlanta Georgia 30365.

FOR FURTHER INFORMATION CONTACT: Philip H. Vorsatz, EPA, Region IV, Drinking Water Section at the Atlanta address given above or telephone (404) 347-2913.

(**Sec. 1413 of the Safe Drinking Water Act, as** amended (1986),and 40 CFR 141 and 142 of the National Primary Drinking Water Regulations)

Dated: June 1, 1994.

Patrick M. Tobin

Acting Regional Administrator, EPA, Region IV

[FR Doc94-18727 Filed 7-8-94; 8:45 am

BILLING CODE 8680-69-P

[FRL-5009-9]

Report to Congress: "A Review of Federal Authorities for Hazardous Materials Accident Safety

AGENCY: Environmental Protection Agency.

ACTION: Notice of Availability and Request for Public Input on the Environmental Protection Agency Report to Congress: "A Review of Federal Authorities for Hazardous Materials Accident Safety".

SUMMARY: The purpose of this notice Is to announce the availability of the above cited report and provide a public input opportunity on the report's findings.

DATES: Written statements should be submitted on or before August 31, 1994 and should be addressed as indicated below.

ADDRESSES: Requests for the report can be faxed to, the Emergency Planning and Community Right-to-Know Hotline at (703) 412-3333 or you may contact the Hotline by phone at 1-800-535-0202 to request a copy. Statements concerning the report should be sent to: David Speights, U.S. Environmental Protection Agency, Chemical Emergency Preparedness and Prevention Office, Mail Code: 5101, 401 M Street, SW., Washington, DC 20460.

FOR FURTHER INFORMATION CONTACT David Swack, Chemical Emergency Preparedness and Prevention Office, at (202)260-3850.

BACKGROUND INFORMATION: Section 112(r)(l0) of the Clean Air Act directs the President to conduct a review of release prevention, mitigation, and response authorities across the Federal government. The Environmental Protection Agency, in conjunction with the other member agencies of the Federal National Response Team (NRT)

ATTACHMENT E

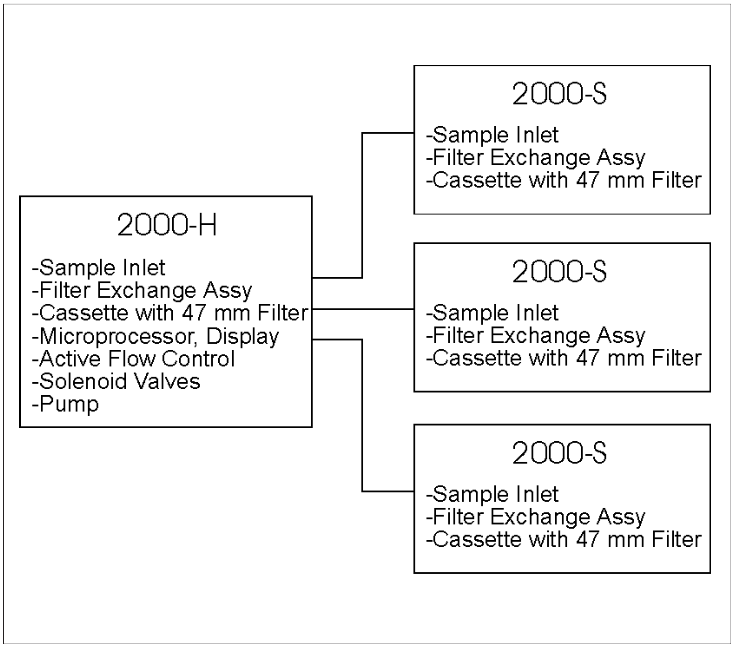
Partisol Model 2000 Air Sampler

FEATURES SHEET

PARTISOL® MODEL 2000 AIR SAMPLER

The Partisol Model 2000 Air Sampler is designed to provide a flexible, cost-effective means of sampling particulate matter on a filter using a PM-10, PM-2.5, PM-1 or TSP inlet. The device has set the standard for high-quality low volume particulate matter sampling. It contains the following features:

- U.S. EPA reference method for PM-10 sampling (RFPS-0694-098), and has demonstrated equivalency with the European PM-10 Norm EN12341 in a report published by the TÜV-Essen.
- Uses standard 47 mm filters, including quartz fiber, Teflon®-coated glass fiber and Teflon membrane. These are housed in R&P's molded FRM-style filter cassettes, which are manufactured to high quality standards.
- Filter exchange made easy by quick-exchange mechanism and filter cassettes.
- ActiVol™ flow control system maintains a constant volumetric flow at the rate specified by the user (5 to 18 l/min) by incorporating a mass flow sensor, ambient temperature sensor and ambient pressure sensor.
- STARNET™ Hub and Satellite configuration allows up to three low-cost satellite units to be controlled by the hub sampler.
- Selective sampling among the hub and satellite units by wind speed and/or wind direction. An analog input or RS-232 interface can be used to direct the operation of the STéRNET system from another device.
- Flow through the hub and satellite units reported in volumetric or standard (mass) terms. The conversion from volumetric to standard units is performed automatically by measuring the ambient temperature and pressure continuously.
- Microprocessor allows for easy setup of sampling program and storage of operating and status data.
- Internal data storage capability retains important operating and status information from the current and previous measurement periods.
- Built-in support for flow audits/calibrations using the Streamline™ FTS Flow Transfer Standard.
- RS-232 interface for efficient data transfer to a personal computer and for controlling instrument operation. Half-hour summary data of station usage can also be transmitted through this port.
- Easily transportable through compact form factor and light-weight design.
- Low noise–also appropriate for indoor monitoring.
- Low maintenance requirements through the use of durable components and a long-life vacuum pump.
- Only one flow audit/calibration required for four sampling points.
- Supported by Thermo's PC-based RPCOMM communications program for Windows.



Thermo ELECTRON CORPORATION

Air Quality Instruments
rp Products
www.thermo.com/air

26 Tech Valley Drive (518)452-0065
East Greenbush, NY 12061 (518)452-0067 fax

ISO9001:2000 Certified

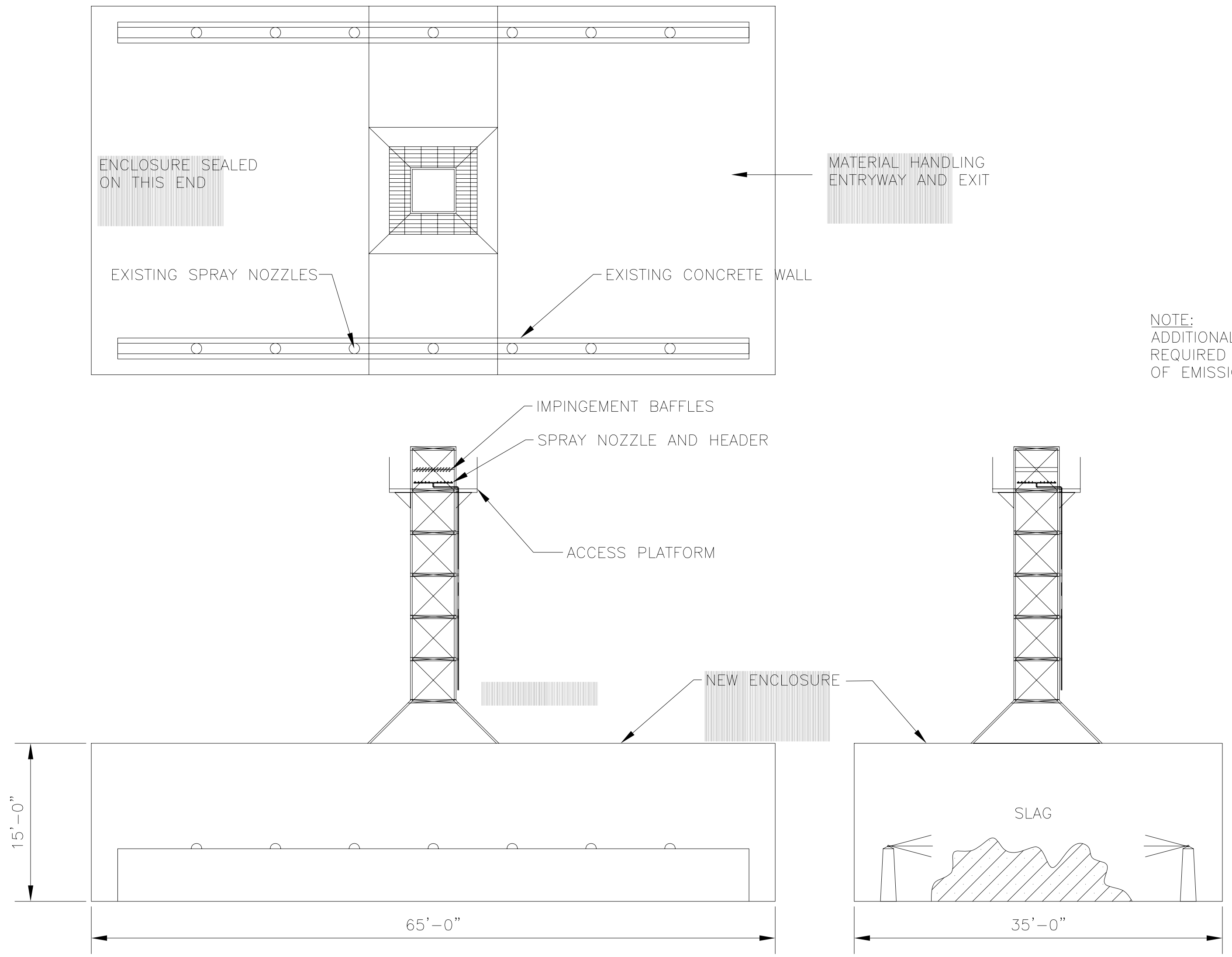
Operating Modes

The Partisol Sampler contains a number of operating modes to match the monitoring needs of the user.

Basic	In this mode each collection filter is exposed for one 24-hour period, from midnight to midnight. The user may select a 6-day timing interval to sample every six days without making any keypad entries. Other timing intervals are available from every 2 to 30 days.
Manual	In this mode the user can specify which flow channel (hub or one of the satellites) is currently active by pressing function keys in the hub unit.
Time	The user can specify for each sampling station (hub or satellite) up to two time intervals each day (for example 9:00 to 12:00 and 18:00 to 22:00) during which a sample is to be collected. A date range is also entered, so that this type of sampling can be performed on either a single day or on a desired number of consecutive days. In addition, this programming mode makes it possible to perform comparisons between two or more size-selective inlets. When the user sets up the sampler for “time sequenced” operation, the sample stream alternates between two or more sampling stations. For example, the system can be programmed so that the sample stream flows alternately for five minutes through a hub unit equipped with a PM-10 inlet and a satellite equipped with a PM-2.5 inlet.
Meteorology	In this mode the user can define under which wind speed and wind direction conditions each sampling station is activated during a selected range of days. A wind vane/anemometer can be purchased from Thermo that connects directly through a special cable to the analog input connector in the back of the hub unit.
Analog Input	The Model 2000 sampler's analog input capability allows for remote control through an analog signal generated by an external device such as a data logger or specially-equipped personal computer. By sending the appropriate voltage level to the Partisol Sampler, the external device controls which sampling station is currently active.
Serial Input	Using the sampler's two-way RS-232 communication capability, the user can control which sampling station is currently active from a remote device by changing the value of a control variable.

DRAFT

APPENDIX B
Control Concepts



NOTE:
ADDITIONAL DESIGN ENGINEERING REQUIRED PRIOR TO IMPLEMENTATION OF EMISSION CONTROL CONCEPT.

NOTES:

NO.	REVISION	DATE	INITIAL

APPROVED

CLAYMONT STEEL

FURNACE SLAG QUENCHING STATION
DUST EMISSION CONTROL CONCEPT

EARTH TECH

Earth Tech (Canada) Inc.

DRAWN BY: ACC CHECKED BY: ATC	SCALE: NTS	DATE: FEB.20 2007	SHEET NO.
CADD SYSTEM AutoCAD	DWG NO. A1– 98250–M01	REV.	CONTRACT 98250