EXHIBIT NO. 1

5
10-14-06

Docket Item #6
SPECIAL USE PERMIT #2005-0042
Virginia Paving Company

Planning Commission Meeting
September 7, 2006

ISSUE:	Consideration of a request for a special use permit to amend the hours that vehicles can enter and exit the property and to permit a stack height of 20 meters.
APPLICANT:	Virginia Paving Company by Mary Catherine Gibbs, attorney
LOCATION:	5601 Courtney Avenue
ZONE:	I/Industrial

PLANNING COMMISSION ACTION, OCTOBER 3, 2006: On a motion by Mr. Jennings, seconded by Mr. Komoroske, the Planning Commission voted to recommend approval of the request, subject to compliance with all applicable codes, ordinances and staff recommendation, and to amend conditions #25, #28, #44, #60, #61 and #74, and to add conditions #28a and #28b. The motion carried on a vote of 6 to 1, with Ms. Fossum voting against.

Reason: A majority of the Planning Commission members concurred with the staff analysis. While several members expressed general concerns about potential impacts of this industrial use on residents and Tucker School, the majority of the Commission believed that the conditions of the proposed SUP will reasonably address the various concerns raised by citizens. The Chairman stated that were three separate groups of scientists who had carefully analyzed the environmental impacts of the facility and after that analysis, supported the proposal, and further stated his belief that the Commission was making a well-informed decision, despite claims to the contrary. In addition, a member indicated that he had contacted a representative of the School District, who advised that the School District did not oppose the proposal. Ms. Fossum discussed concerns of enforceability, and wanted to defer the case in order to discuss additional conditions, and perhaps a sunset of the permit.

Note: A work session regarding Virginia Paving was held immediately prior to the meeting, where staff from the Office of the City Attorney and the Departments of Planning and Zoning and Transportation and Environmental Services reviewed the background of the case, land use issues, enforcement, the analysis of environmental issues, and proposed conditions. City staff and the City's consultants responded to several questions.

Speakers:

Mary Catherine Gibbs, applicant's attorney, spoke in support of the application.

Dr. Laura Green, environmental consultant for the applicant, spoke in support of the application.

Mike Cote, applicant, spoke in support of the application.

Mindy Lyle, President, Cameron Station Civic Association, spoke against the application.

Joe Bennett, Cameron Station Civic Association, spoke against the application.

Mike Waite, resident, Cameron Station, spoke against the application.

Matthew Natale, resident, Cameron Station, spoke against the application.

Arthur Impastato, Cameron Station Civic Association, spoke against the application.

Jordan Berliner, resident, Cameron Station, spoke against the application.

Maria Velez de Berliner, resident, Cameron Station, spoke against the application.

Jim Butler, resident, discussed need for strict enforcement for industrial uses in the city.

Penny Waite, Cameron Station Civic Association, spoke against the application.

Robert KaFalesus, resident, Cameron Station, spoke against the application.

Glenn Donnellan, resident, Cameron Station, spoke against the application.

Kathleen Burns, President, Brookville-Seminary Valley Civic Association, discussed need for strong level of scrutiny for industrial uses in the city.

Katy Cannady, resident, spoke against the application.

Leigh Strope, property owner, Summer's Grove, spoke against the application.

Janet Bowden, Virginia Paving employee, spoke in support of the application.

Ali Taheri, Virginia Paving employee, spoke in support of the application.

Van Van Fleet, resident, spoke against the application.

Julie Crenshaw, resident, spoke against the application.

Annabelle Fisher, resident, spoke against the application.

Ashley Profaizer, resident, Cameron Station, spoke against the application.

John Pecic, President, Summer's Grove Civic Association, spoke in support of the application, with all proposed conditions, and a noise barrier wall.

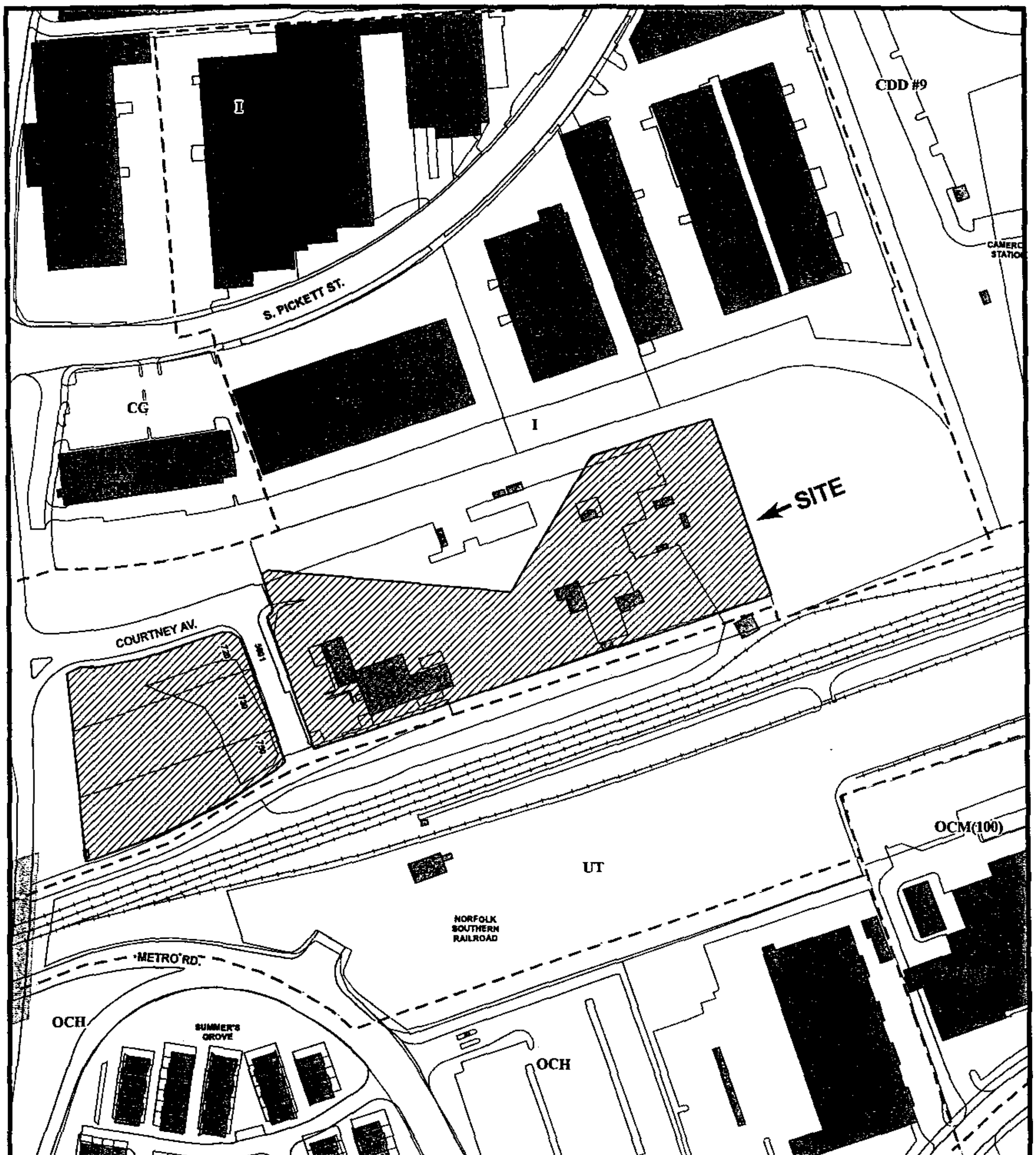
Pat Miller, Potomac West Business Association, spoke in support of the application.

Poul Hertel, resident, discussed that the application is not a Mirant case, but that an additional test may better reveal proposed impacts.

Andres Domeylio, Eisenhower Partnership, spoke in support of the application.

Mark Schwartz, Cameron Station Civic Association, spoke against the application.

Geoffrey Goodale, resident, recommended deferral of the application.



SUP #2005-0042 **10/03/06**

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I. EXECUTIVE SUMMARY

This very difficult case involves the co-existence of a long standing industrial use with nearby residential homes. Neighbors have had sincere and understandable concerns about the effects of the nearby asphalt plant on the quality of their lives, and have complained about noise, dust, odors and other negative impacts. The case has also presented challenging environmental questions and the City has worked to analyze each of the plant's alleged impacts carefully, to identify potential improvements to the asphalt plant to make it a better neighbor, and to search for a way to reconcile the opposing views. The dialogue among the staff, consultants, the applicant and the community has been constructive and productive. Staff has been working with the applicant, community and consultants for almost two years. Most recently, the applicant has been meeting on a regular basis with neighbors throughout the summer.

<u>SUP Application Issues</u>
The specific request before Council is to amend the asphalt plant's 1960 SUP condition, which now effectively prohibits nighttime truck traffic and therefore nighttime road paving. The plant seeks to operate at night from April 1 to November 1, and only for state or local government contracts that require nighttime work, and will not operate overnight during the winter months (specific condition language is set forth below). In addition, the applicant seeks an increase in stack height to 20 meters, which is one of the investments the applicant is willing to make to improve air quality.

In assessing whether the plant's request for nighttime hours is supportable, staff considered the following issues and made the following conclusions, each of which is discussed in detail in this report:

- The amendment presents an opportunity for dramatically enhanced environmental protection which the city does not have the power to require without the amendment;

- There are no violations of local, state or federal environmental regulations in the operation of the plant (except that the facility is not in compliance with their existing SUP condition related to construction of stormwater basins);

- Even though there are no actual violations of environmental regulations, there are potential improvements the plant could make in its operations that would benefit the environment;

- Nighttime paving on the roads of congested Northern Virginia benefits the City and the broader community generally;

- The existence of the plant, with or without night-time vehicular traffic, as well as other industrial uses located in Alexandria's western and southwestern corner, present land use questions. Although industrial and residential uses can coexist the broader question about the future of industrial uses in the West End will be considered in the context of the West Eisenhower Avenue Small Area Plan study, not the proposed amendment to Virginia Paving's SUP; and

- The plant will remain in operation at its existing location, although without nighttime vehicular traffic, if the amendment is denied. However, none of the proposed environmental controls would necessarily be implemented if the proposed amendment is denied.

Options for City Council
Thus, Council has the following options:

1. If Council **approves the request for amended condition language**, the plant will continue to operate, but it will do so with the new, extensive, modern, environmental controls that staff has enumerated in this report. The new SUP conditions, when implemented, will reduce impacts, place production caps, improve operational practices and result in significant new pollution control equipment at this facility. The new SUP conditions will also allow some nighttime vehicular traffic to and from the plant, thus facilitating night time paving for government contracts and thereby limiting traffic impacts to the larger citizenry.

2. If Council **denies the SUP request**, the plant will continue to operate with the existing SUP conditions from the original 1960 permit. Accordingly, trucks would be prohibited from entering or leaving the plant after dark, in inclement weather, or on Sundays or holidays. It is important to remember that under the 1960 permit, the plant is allowed to *operate* during nighttime hours if it does not involve trucks coming or going; permitted nighttime work includes heating and mixing. In addition, by concentrating road paving work during daytime hours, the work would require lane closures and other traffic interruptions that impact a wide range of citizens. The additional environmental benefits conferred by the more stringent and more modern conditions which afford the City a greater opportunity to regulate the plant and address concerns of area residents would not be achieved. In the absence of a new SUP, there will be no production caps except 1,500,00 tons as stipulated in the State Operating Permit, and there are not guarantees that additional pollution control equipment and practices will be installed and/or implemented.

VA Paving Related Improvements
Staff has approached the community's concerns with a serious, concerted and coordinated interdepartmental effort. Drawing on the resources of the departments of Transportation and Environmental Services, Planning and Zoning, Code Enforcement, and Recreation, Parks and Cultural Activities, as well as the assistance of consulting experts, staff sought to identify the source of each of the problems neighbors have cited and to assess methods of addressing each problem. The conditions listed in this report are designed to address the community's issues. They far exceed existing governmental requirements and will make the plant a state of the art operation, second to none in the region. The applicant is agreeable to the conditions.

The enhanced SUP conditions will:

- restrict the hours during which the plant may operate in the future (not just the hours for vehicular traffic as limited in the current permit)
- require state of the art air quality enhancements and best management practices that will address air emissions and odors (not addressed in the current permit)

- require a significant commitment and investment by Virginia Paving over the next several years to implement the improvements (not capable of being required of the plant by the City under any existing permit or regulatory scheme)
- require regular testing and monitoring of operations to assure compliance(beyond what is required by the state regulatory agency)
- require best management practices for stormwater management (a greater requirement than the current requirement of settling basins in the current permit)
- require stream bank improvements and buffer enhancements to Backlick Run (not required under the current permit)
- restrict operations that contribute to noise during times when residents will be most affected (not required under the current permit)
- provide additional screening and buffering to make the operation less visible from adjoining residential areas (not required under the current permit)
- provide for an on-site manager who will serve as a liaison with the nearby residential communities (not required under the current permit), and
- establish a community outreach mechanism to provide residents a forum in which to voice concerns, questions, and suggestions regarding the operations of the plant (not required under the current permit).

The conditions require that all environmental improvements be phased in over the next two years, except for the replacement of the locomotive, which is to be done in four years. They will cost the applicant approximately two million dollars. The city is committed to enforcing these conditions, with monetary penalties and potential revocation of the SUP if the applicant fails to adhere to them.

<u>Staff Recommendation</u>

After a comprehensive analysis of the various impacts associated with the asphalt plant, staff finds that the plant will be a much better neighbor under an amended SUP than under the existing SUP. Therefore, staff supports the proposed amendment, subject to the conditions of this report.

II. BACKGROUND

Authority for an asphalt plant at 5601 Courtney Avenue began on April 12, 1960, when City Council approved SUP#398 for its operation (see attached SUP#398). The plant has been operating at that location continuously since that time, and continues to be authorized to operate under the conditions of the original permit. Newton Asphalt operated the plant until 2001, at which time Virginia Paving, a subsidiary of Lane Construction Co., acquired it.

SUP Condition

The 1960 SUP has few conditions, and there are no conditions that limit the operation of the plant or set hours of operation for the plant. One condition was included in the original 1960 permit as a matter of traffic safety (as the Van Dorn Interstate interchange wasn't constructed) by the Director of Traffic, and is stated as follows:

> That no operation of this plant requiring exit or entrance of vehicles be permitted after hours of darkness or during inclement weather or on Sundays or holidays.

The condition limits the plant operation with respect to vehicular traffic to and from the plant, primarily as to the trucks that transport the asphalt that is milled from the road surface to the plant to be recycled and those that take the newly manufactured asphalt from the plant for application to the roadway being repaved. According to the applicant, the plant has historically operated at night because its contracts with government agencies require paving at night on certain arterial roads to limit interruption to commuters. Although this condition was imposed on the plant back in 1960, the City has no record of any complaints regarding violation of the condition since the plant has been in operation and prior to the submission of this application.

SUP Amendment Request

The applicant's proposal would permit the entry and exit of vehicles during the nighttime and weekend hours when supplying asphalt materials to government projects, i.e., for the Virginia Department of Transportation and the City of Alexandria that require night work. According to the applicant, if its trucks block lanes of traffic on certain main arteries during daylight hours, its crews can be arrested. As much as 60% of its contract work for the City is done at night. Approximately 20% of its overall work is required to be done at night by VDOT and/or the City. As a result, the applicant needs the ability to have trucks pick-up and deliver asphalt outside of daytime hours for those government projects that require it during the high volume paving season, which occurs between April 1 and November 1. Specifically, the applicant requests the following hours of operation, including for truck traffic:

November 2 through March 31:	5:00 a.m. to 7:00 p.m. daily
April 1 through November 1:	24 hours a day Monday through Thursday, 12:00 midnight. to 7:00 p.m. Friday and Saturday; and, 7:00 p.m. to 12:00 midnight on Sunday. (*The later hours are requested only for government contracts that require nighttime and weekend work.*)

Community Outreach

Over the last two years, staff has discussed this case at length with citizens and consultants, responded to numerous emails and phone calls, written letters and memoranda, and attended a number of community meetings (*see attached chronology*). Most recently, staff has held or participated in the following community outreach:

- May 10, 2006—Staff held small focus meeting with community leaders.
- May 15, 2006—Staff held facilitated, community-wide meeting.
- May 2006—information and documents regarding Virginia Paving application, including audio from community meeting, posted on City's web site. All of the presentations from the meeting, including from staff, the applicant, outside experts and community members, and responses to questions, were posted. The air modeling analyses were also posted.
- August 7, 2006—staff attended a community open house arranged by the applicant.
- August 8, 2006—staff meets with Cameron Station Civic Association leaders.
- August 17, 2006 – staff and the City's consultants, along with VA Paving consultants met with representative of the community to address specific technical issues identified by the community to its consultant.
- September 18, 2006—Staff held facilitated, community-wide meeting. Meeting audio posted on website.

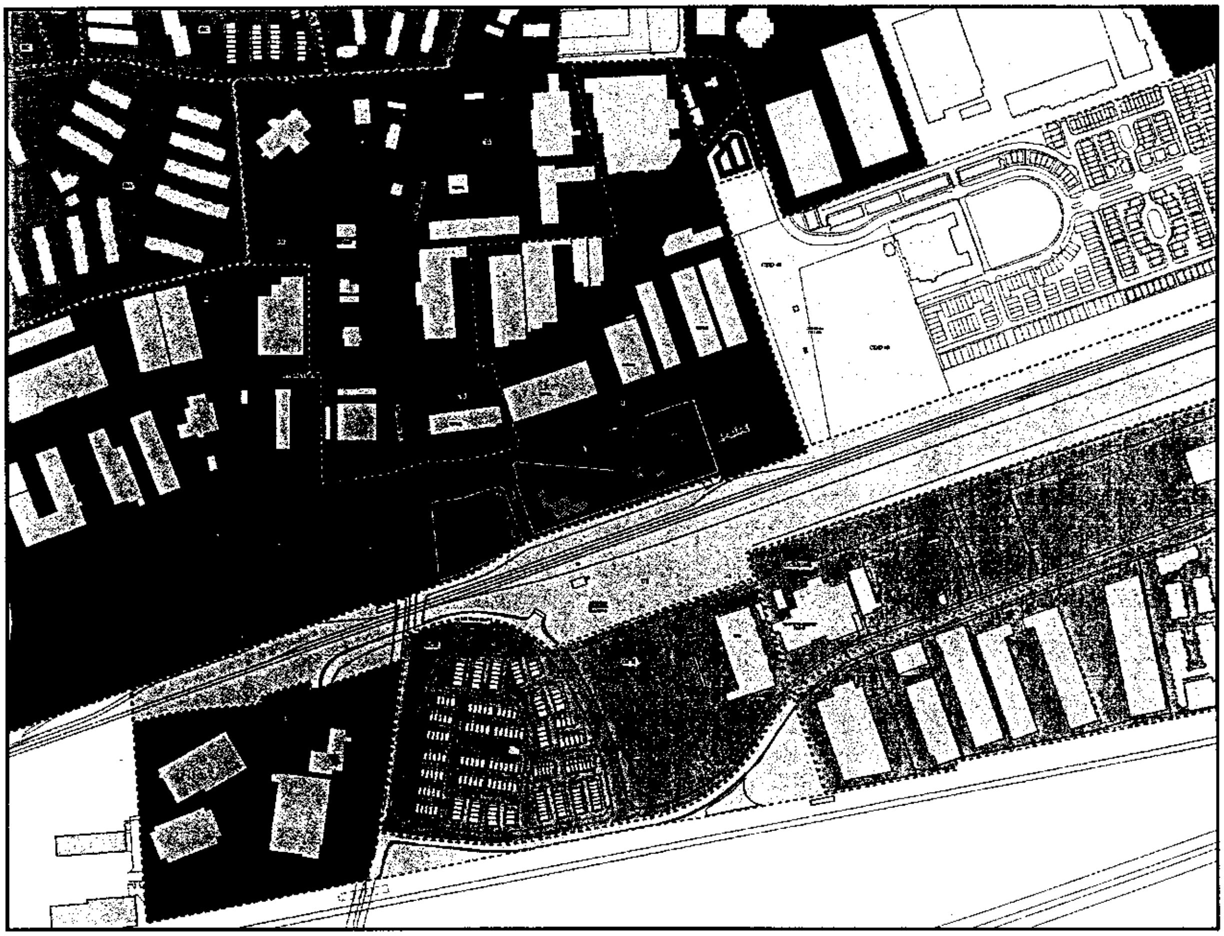
Site Description

The subject property is five lots of record with frontage on both Courtney Avenue and South Van Dorn Street, and occupies an area of approximately 10 acres. The site is developed with the Virginia Asphalt Plant and the U. S. Filter oil recycling facility, which leases space from Virginia Paving. Access to the property is from Courtney Avenue.

The surrounding area is occupied by a mix of uses, including industrial, commercial and residential development. There are several industrial facilities in the immediate area. Immediately to the north, along Pickett Street, are industrial warehouse and commercial uses. To the south is the Norfolk Southern railroad facility, the City Waste-to-Energy plant, a United Parcel Service shipping facility, the Police Firing Range, and the Metrorail tracks. To the west is Vulcan Materials Company, a concrete facility, and other warehouse, industrial uses. There are also residential uses in the immediate vicinity, including the Cameron Station development to the east, with a park and school, and Summer's Grove townhouse development to the south. Both Cameron Station and Summer's Grove were developed in the last ten years.

Zoning and Master Plan

The property is located in the I/Industrial zone. Section 4-1203(A) of the Zoning Ordinance allows an asphalt plant in the I zone with a special use permit. The use is also consistent with the Landmark/Van Dorn Small Area Plan chapter of the Master Plan, which identifies the property for industrial use and zoning.



City Council Action in June 2005 and June 2006

This application was submitted on March 29, 2005, and Council acted on June 27, 2005, to allow very limited nighttime work under the SUP, including vehicles coming and going from the site, so that Virginia Paving could work on existing government contracts that required nighttime work. The scope of government projects requiring night time work was amended by City Council on June 9, 2006. This temporary solution was essential to provide sufficient time to address citizen's concerns through a detailed environmental review and testing and a full and fair assessment of the plant.

III. DISCUSSION

In the last three years, with the near completion of Cameron Station as a residential neighborhood, there have been an increasing number of complaints from Cameron Station residents regarding:

- air quality
- odors
- smoke and soot

In response to these complaints, the City staff investigated potential sources of the problems in the immediate area. In researching the SUP for Virginia Paving, staff determined that the plant was not complying with the SUP condition regarding nighttime truck traffic. In its investigations of the Virginia Paving site, staff observed other, non-SUP violations on the property, and notified the applicant in a letter dated October 26, 2004 (see attached letter). At a meeting with staff on November 22, 2004, the Virginia Paving Company agreed to a comprehensive review of its operations to assess its environmental impacts and compliance. As discussed in the memo to City Council on June 27, 2005, the specific issues which have been a part of the investigation include:

- air emissions, including odors
- noise
- storm water management
- asphalt spillage
- maintenance
- building and fire code violations
- Resource Protection Area (RPA) buffer
- underground storage tanks
- storage and disposal of oil and hazardous materials

While the above issues pertain to industrial uses generally, and are regulated in large part by the Commonwealth, Virginia Paving's SUP non-compliance gave the City the opportunity to comprehensively review and improve the facility, with the potential of bringing it to a higher level than required by its State permits. To have sufficient data to respond accurately and fully to citizen concerns and to have a basis for crafting SUP environmental conditions, extensive environmental testing and analysis was required. Staff requested the following information from the applicant to conduct its analysis of environmental issues:

- Report of Immediate Environmental Concerns and Short Term Work Plan *(submitted February 4, 2005)*
- Environmental Baseline Survey *(submitted March 16, 2005)*
- Environmental Long Term Work Plan *(submitted March 30, 2005)*
- Emissions and Air Dispersion Modeling Study and Public Health Evaluation (December 7, 2005)
- Memoranda on Formaldehyde and Fugitive Dioxin (August 28, 2006)
- Memoranda on Low Wind Speed (September 13, 2006)

More detailed information on the contents of these plans was requested and received by staff since the original submission.

Asphalt Plant Operations

The applicant has been the operator of the plant at this location since 2001. There are approximately 150 employees during the paving season, between April 1 and November 30. There are 25 full-time employees present throughout the year.

Hot mix asphalt is produced by heating and mixing liquid asphalt with various aggregates such as rocks, sand, and crushed recycled asphalt pavement (RAP). The facility maintains on-site aggregate storage piles and a lime storage silo, and operates aggregate handling equipment such as a RAP crusher, front end loaders, conveyors and trucks. Most aggregate is delivered to the facility by rail cars, while some aggregate (including RAP) is delivered by trucks. The facility operates two hot oil heaters for liquid asphalt, and two drum dryer mixers (Plants No. 1 and 2) for producing hot mix asphalt. The final product is conveyed to asphalt storage silos for temporary storage prior to shipping off-site via trucks. The facility operates at various daytime and nighttime hours.

According to the applicant, there are 20 trucks in its fleet, and 20 trucks operated by independent companies that haul asphalt from its plant. When trucks arrive to the site to pick up asphalt, they are sprayed with a material that prevents asphalt from sticking in the beds. Maintenance of trucks in the fleet takes place on premises in the six-bay repair garage.

Staff reviewed the September 8, 2005 traffic analysis prepared for the Virginia Paving Company. The analysis concluded that if nighttime operation is prohibited, the vehicle delay at the intersection of Van Dorn Street and Courtney Avenue will increase slightly, and the over delay on affected roadways during paving operations will also increase. Furthermore, the study found that the hours of operation have no impact on safety. Staff concurs with these conclusions.

Operations at the plant include off-loading of aggregate material from railcars. Off-loading typically occurs during the morning, after 7:30 a.m.

Virginia Paving's Current Regulatory Status

Virginia Department of Environmental Quality (VDEQ) is the primary environmental regulatory agency governing the operations at the Virginia Paving plant. Virginia Paving currently operates under an operating permit from VDEQ. The facility's current air quality permit was issued to VIRGINIA Paving by VDEQ on February 17, 2005.

The current VDEQ permit allows an annual production of 1.5 million tons of asphalt and based on the total potential to emit, the facility is permitted as a minor source of air pollution. As such, the facility is not required by VDEQ to perform dispersion modeling analyses or extensive source testing. However, the facility performed limited stack testing of its drum dryer mixers to modify their operating permit from

VDEQ. The results from those stack tests were used to establish the emission limits listed in Table 1 for the asphalt plant.

TABLE 1
Summary of Current Emission Limits
Virginia Paving Company, Alexandria, Virginia

Emission Source	Pollution Control	Emission Limits		
		Pollutant	**Short Term**	**Annual**
Asphalt Plant No. 1	Baghouse	PM-10 NO_2 CO VOC SO_2 Formaldehyde Quinone PAH	0.04 gr/dscf 0.021 lb/ton 0.13 lb/ton 0.0028 lb/ton n/a n/a n/a n/a	17.3 tons/yr 16.1 tons/yr 76.9 tons/yr 2.0 tons/yr 43.6 tons/yr 2.3 tons/yr 1.2 tons/yr 0.7 tons/yr (total for both asphalt plants)
Asphalt Plant No. 2	Baghouse	PM-10 NO_2 CO VOC	0.04 gr/dscf 0.023 lb/ton 0.012 lb/ton 0.0021 lb/ton	
Hot Oil Heater	None	PM-10 NO_2 CO SO_2	n/a n/a n/a n/a	0.8 tons/yr 5.8 tons/yr 0.6 tons/yr 8.7 tons/yr (total for both heaters)
Hot Oil Heater	None			
RAP Crusher	Wet Suppression	PM-10	none	none
Lime Silo	Baghouse	PM-10	none	none
Fugitive Dust	Various	PM-10	none	none

The proposed SUP conditions cap annual production to 1.2 million tons/year, 20% less than the production allowed under the VDEQ permit. Furthermore, the production will be limited to 900,000 tons/year (approximately the same amount produced by the applicant in 2005 and 40% less than the production allowed under the VDEQ permit) until all proposed emission controls are installed and in operation. Virginia Paving also performed dispersion modeling analyses to demonstrate that proposed operations at the plant do not result violations of National Ambient Air Quality Standards. This analysis was extensively reviewed by City Staff and its consultants, as well as by David Sullivan, the review consultant retained on behalf of the Cameron Station community. Additionally, the City hired consultants to conduct an independent dispersion modeling analysis. The team hired by the City is the same as it has used for its technical analysis of the Mirant Power Plant. The conclusions made by the City's consultants were similar to analysis provided by Virginia Paving, and confirmed by the community's consultant, which was that Virginia Paving's operations are in compliance with NAAQS.

The Virginia Paving facility consists of two drum dryer mixer Plants No. 1 and 2, as well as two hot oil heaters, both oil-fired. The asphalt plants and the larger of the two hot oil heaters are allowed to use recycled fuel oil (RFO) that meets EPA and VDEQ regulations, i.e., regulations that specify maximum limits of certain contaminants found in RFO such as PCBs, halogens and heavy metals. The smaller hot oil heater serves as a backup to the larger heater and exclusively burns No. 2 distillate oil. No. 2 distillate oil is also used as a backup fuel for RFO. All these units are sources of criteria pollutants resulting from fuel combustion, i.e., NOx, CO, VOC, SO_2 and PM-10. Additionally, fuel combustion results in small amounts of hazardous air pollutant emissions. Both drum dryer mixers also generate PM-10 emissions from the handling of aggregate and are controlled by baghouse.

All aggregate storage and handling activities at the facility are sources of particulate matter (PM-10) emissions. PM-10 emissions from storage piles are generated due to wind erosion and storage pile maintenance activities. Aggregate handling emissions are generated due to front-end loaders, material load-in and load-out operations, and conveyors. Additional PM-10 emissions result from truck traffic and other vehicles traveling on dusty surfaces. These fugitive PM-10 sources are required to be controlled by water suppression, chemical suppression, asphalt application or an equivalent control method. PM-10 emissions from the lime storage silo are generated during silo filling operations and are controlled by baghouse.

The facility maintains twenty one (21) storage tanks ranging in size from 500 gallons to 20,000 gallons for storing recycled oil, distillate oil, motor oil, liquid asphalt, TACK, etc. All tanks are above ground and are small sources of VOC emissions.

A summary of all current operational limitations on the plant is provided in Table 1A. As proposed by this SUP, a series of operational limitations will be imposed on Virginia Paving that are more restrictive than those listed in this table.

TABLE 1A
Summary of Current Operational Limits
Virginia Paving Company, Alexandria, Virginia

Emission Source	Operational Limits		
	Production Limit	**Fuel**	**Pollution Control**
Asphalt Plant No. 1	600 tons/hr 1,150,000 tons/yr	Recycled Oil No. 2 Oil Backup	Baghouse No other control
Asphalt Plant No. 2	400 tons/hr 350,000 tons/yr	Recycled Oil No. 2 Oil Backup	Baghouse No other control
Hot Oil Heater	5.64 MMBtu/hr	Recycled Oil 200,000 gal/yr	None
Hot Oil Heater	2.50 MMBtu/hr	No. 2 Oil 25,000 gal/yr	None
Lime Silo	25 tons/hr 6,000 tons/yr	N/A	Baghouse
Fugitive Dust	None	N/A	Various (e.g., wet suppression)
Recycled Oil	Sulfur 0.5 wt% Arsenic 5 ppm Cadmium 2 ppm Chromium 10 ppm	Lead 100 ppm Halogens 1,000 ppm (as chlorine) PCB 49 ppm Flash Point 100 °F (minimum)	
No. 2 Oil	Sulfur 0.5 wt%		

Historical complaints and staff actions

The current Cameron Station residential development used to be an army base, and historically (prior to 2003), there were very few complaints regarding operations on the adjacent industrial facilities. Occasional odor complaints were traced to either the "Classified document incinerator" at the Cameron Station, or the Virginia Paving facility.

As more phases of the Cameron Station residential development were built and residents moved in, the frequency and number of complaints increased. As a result of these complaints, in 2003, the staff investigated these complaints and various state and City permits for the adjacent industrial facilities. In its investigation, the staff discovered a City-issued Special Use Permit (SUP) for the asphalt plant, dated 1960. Based on its review and investigation, the staff also discovered that the existing operations at the Plant may not be in compliance will all SUP conditions (1960), specifically the use of trucks after hours of darkness and a condition regarding onsite Stormwater Management. The staff viewed this as an opportunity to require Virginia Paving to install best management practices and controls to minimize impacts on the residential neighborhood, far beyond the specific terms in the 1960 SUP that were in question. This resulted in a multi-departmental inspection of the facility in coordination with the City Attorney's office. A detailed letter was sent to the facility requiring a baseline study and plan of action. In response to the City's letter, Virginia Paving submitted a new SUP application for its facility.

Summary of Air Monitoring Data in the vicinity of VA Paving Plant

Ambient Air Monitoring

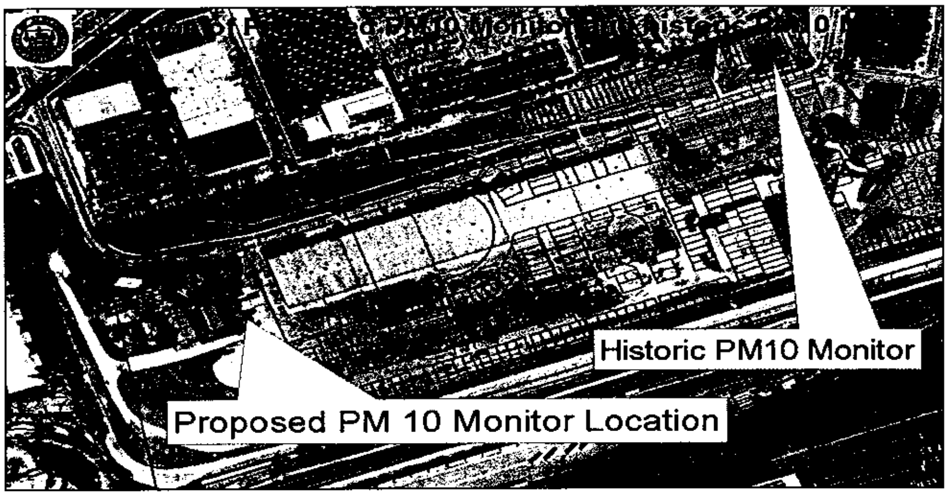
The City of Alexandria operated a monitoring site at Cameron Station on 4900 Duke Street, approximately one mile to the northeast of the Virginia Paving facility. The monitoring site measured particulate matter (PM10 and TSP) concentrations in the ambient air from 1990 to 1996. In addition, the samples were analyzed for lead, cadmium and mercury. This monitoring station was a community ambient air monitoring station installed to address community's concerns regarding impacts from emissions from industrial facilities in Eisenhower Valley. The City staff reviewed air monitoring data to ensure that the residents were not exposed to pollution levels that exceed National Ambient Air Quality Standards. Table 2 provides a summary of the monitoring period and the concentrations measured at this monitoring site.

TABLE 2
Highest Monitored Concentrations (μg/m^3)
4900 Duke Street, Alexandria, Virginia

Pollutant	Averaging Period	1991	1992	1993	1994	1995	1996	NAAQS
TSP	24-Hour	97	83	101	96	107	63	150
	Annual	43	36	39	n/a	39	n/a	75
PM-10	24-Hour	64	55	62	57	53	59	150
	Annual	28	n/a	23	n/a	n/a	n/a	50
Lead	Quarter	0.06	0.01	0.01	n/a	0.01	n/a	1.5
Cadmium	24-Hour	0	0	0	0	0	0	none
Mercury	24-Hour	0	0	0	0	0	0	none

Additionally, in response to the community's concerns, the City staff also conducted limited particulate matter monitoring during August 2004 at Armistead Boothe Park and Ben Brenmann Park. Several samples were also analyzed for metals content. Because of limited sampling days, sampling was suspended on days when wet weather was expected. The sampling was also not conducted when northerly winds were expected. The daily TSP concentrations were found to range from 22 to 100 μg/m^3, with an average of 58 μg/m^3. The daily PM-10 concentrations were found to range from 18 to 71 μg/m^3, with an average of 45 μg/m^3. **These concentrations are well below the National Ambient Air Quality Standard (NAAQS) of 150 μg/m^3.**

The metals analysis showed that the largest constituents of particulate matter samples are sodium, sulfur, calcium, iron, potassium, aluminum and magnesium, and range from 1 to 17 μg/m^3. Lead was found to be in the order of 0.01 μg/m^3, i.e., similar to the Duke Street monitor, while many heavy metals were found to be below detection limits, e.g., arsenic, beryllium and cadmium.



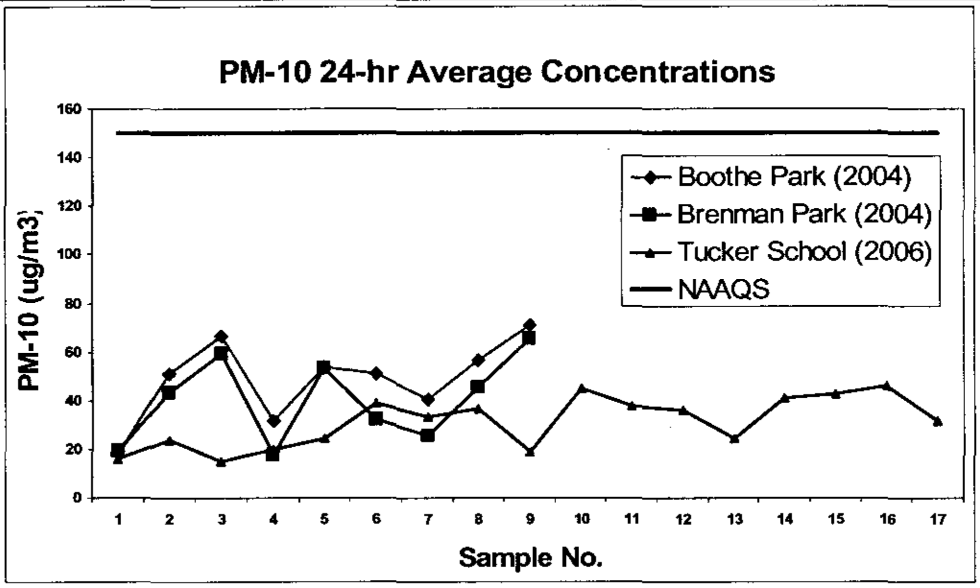
Because the historical Duke Street monitor and the limited August 2004 monitoring were not targeted specifically to measure concentrations from the Virginia Paving facility and in order to provide the community a continued assurance about the particulate levels in the ambient air in the community, the City planned a new monitoring program and installed a new monitor at Boothe Park near Tucker School to measure particulate matter concentrations. The location of the new monitoring site(s) was determined based on several factors, including both the locations identified by dispersion modeling to have high impacts from the Virginia Paving facility and locations of concern such as schools, residences, and population centers, and extensive consultations with the community and its environmental consultant. The selected location is closer to the Virginia Paving facility and has been set up as a permanent monitoring site. The aerial picture shows the locations of the new and the historical PM10 monitors. The layout of the present-day Cameron Station is shown superimposed on the Cameron Station Army Base for reference purposes.

Table 2A is a summary of the PM-10 monitoring results. The table lists the measured concentrations from all monitors in this study. The listed values are 24-hour average PM-10 concentrations and can be directly compared to the EPA-specified National Ambient Air Quality Standard (NAAQS) of 150 μg/m^3. A chart of the PM-10 concentrations is provided in Table 2A.

TABLE 2A
PM-10 Monitoring Results

Sample No.	Measured 24-Hour Average PM-10 Concentrations (μg/m^3) at Cameron Station					
	Boothe Park August 2004 Limited monitoring		Brenman Park August 2004 Limited monitoring		Boothe Park near Samuel Tucker School (New Long term Monitor)	
1	8/6/2004	**18.9**	8/6/2004	**19.4**	6/4/2006	**15.8**
2	8/9/2004	**51.2**	8/9/2004	**43.0**	6/7/2006	**23.8**
3	8/10/2004	**66.5**	8/10/2004	**59.4**	6/10/2006	**14.8**
4	8/11/2004	**31.3**	8/11/2004	**17.9**	6/13/2006	**20.2**
5	8/16/2004	**53.9**	8/16/2004	**53.0**	6/16/2006	**24.1**
6	8/17/2004	**50.7**	8/17/2004	**31.9**	6/19/2006	**38.9**
7	8/18/2004	**40.4**	8/18/2004	**25.7**	6/22/2006	**33.3**
8	8/23/2004	**56.4**	8/23/2004	**45.4**	7/1/2006	**36.3**

9	8/24/2004	70.8	8/24/2004	65.2	7/7/2006	18.9
10	[redacted]				7/10/2006	45.0
11	[redacted]				7/16/2006	37.7
12	[redacted]				7/19/2006	35.9
13	[redacted]				7/22/2006	24.3
14	[redacted]				7/28/2006	41.0
15	[redacted]				7/31/2006	42.6
16	[redacted]				8/3/2006	46.2
17	[redacted]				8/15/2006	31.5



As can be seen from both the long term historical measurements at the Duke Street monitor as well as more recent measurements at Cameron Station, **the ambient concentrations of PM-10 do not exceed the NAAQS.** Furthermore, the Cameron Station study concluded that even though human activity (industrial facilities, transportation sources, etc.) may have contributed to the measured concentrations, no direct link could be established with any single source.

Other nearby Sources of Air Pollution

In order to develop a relative perspective, the City analyzed emissions of other major sources of air pollution within the City of Alexandria. This included the two largest stationary sources within the City, namely, Mirant's Potomac River Generating Station (PRGS) and Covanta Waste-to-Energy (WTE) facility. In addition, we evaluated transportation related emissions from the sections of roadways (both highways and local roads) surrounding the Virginia Paving facility, i.e., Eisenhower Avenue, Duke Street, Van Dorn Street and I-495 Beltway. Table 3 provides a summary of this emissions analysis.

Table 3 shows that the potential emissions from the Virginia Paving facility are small compared to other sources of air pollution within the City of Alexandria. However, it must be noted that all emissions from Virginia Paving are released from low level sources, i.e., ground level releases or short stacks, as compared to Mirant PRGS and Covanta WTE facility. Also, Virginia Paving emissions are localized, i.e., they are released from a relatively small area as compared to the roadway emissions which are spread out over a large area. To assess the potential and extent of localized impacts, both the City and the Virginia Paving facility performed dispersion modeling analyses of its emissions. The modeling analysis is discussed below.

TABLE 3
Emissions Comparison for Air Pollution Sources
City of Alexandria, Virginia

Pollutant	Mirant PRGS*	Covanta WTE	VA Paving	Transportation Sources	
				On-Road Vehicles	Road Dust
PM-10	606	106	**18**	11	18
NOx	5,750	830	**22**	484	n/a
CO	257	146	**78**	3,434	n/a
VOC	36	9	**16**	191	n/a
SO_2	15,139	206	**52**	15	n/a

* Actual emissions for PRGS from 2003.

As evident from Table 3, there are a variety of air emission sources around Cameron Station, Virginia Paving being one among them. Transportation sources and other industrial facilities in the City are a larger source of air pollution when compared to emissions from Virginia Paving.

Dispersion Modeling Analysis

The Virginia Paving facility is a minor source of air pollution under EPA and VDEQ regulations. As such, it is not required to perform a dispersion modeling analysis of its emissions. However, based on concerns raised by the residents living in the facility's neighborhood, the City requested Virginia Paving to perform a dispersion modeling analysis to assess its compliance with the NAAQS. At the same time, the City began discussion with Virginia Paving regarding its Special Use Permit (SUP) in order to establish best management practices (BMPs), to control emissions and mitigate air quality impacts from the facility. Based on those discussions, Virginia Paving modeled a future configuration of the facility reflecting these BMPs, emission reductions and changes to source parameters.

In addition to the modeling performed by Virginia Paving, the City performed modeling analyses of both the current configuration (baseline scenario) and the future configuration (SUP scenario) (See Appendices) The City's analyses were performed independently from the Virginia Paving analysis, i.e., the calculation of potential emissions, source parameter definitions, and all model inputs were developed independently by the City based on our understanding of the facility's operations and conservative assumptions.

In addition to modeling criteria pollutants, the City also evaluated hazardous air pollutant (HAP) emissions because several of the units at the facility are allowed to burn recycled oil. The City estimated potential emissions of several HAPs, (including VOCs of concern) based on worst-case assumptions and calculated the ambient impacts of these HAPs. Virginia Paving also modeled two of the HAPs in their analysis. Table 4 provides a summary of the modeling results for criteria and hazardous air pollutants from both analyses.

A comparison of the City's baseline and SUP scenarios in Table 4 shows that the ambient impacts from the Virginia Paving facility will improve considerably if all conditions of the proposed SUP are met. While the baseline scenario shows several exceedances of the NAAQS, the City's SUP scenario only shows exceedances of two standards, i.e., PM-2.5 (annual) and SO_2 (3-hour) standards. Both of these exceedances are about 7% above the standards and are reflective of the conservative nature of the analysis. The modeled exceedances were shown to occur at or very close to the facility's boundaries and within a short distance (100 to 200 meters) beyond the boundaries, the impacts are shown to comply with NAAQS. Given that this was a conservative analysis and that the modeled exceedances are within the uncertainty of the model, the City is comfortable that the proposed SUP will result in compliance with the NAAQS.

It should be noted that, with some exceptions, the results of the City's and Virginia Paving's SUP scenarios are closely similar, i.e., within about 20% of each other. While Virginia Paving's analysis shows compliance with the SO_2 (3-hour) standard it shows an exceedance of the PM-2.5 (24-hour) standard. It also shows a modeled exceedance of the PM-2.5 (annual) standard similar to the City's analysis. The exceedances of the NAAQS shown in Virginia Paving's analysis were also found to occur at or near the facility boundaries, and only extended a short distance beyond the boundaries.

The modeling analyses of the HAP emissions show compliance with the Virginia DEQ's Significant Ambient Air Concentration (SAAC) guidelines for all pollutants. Detailed modeling reports for both the City's and Virginia Paving's analyses are provided in the appendices.

TABLE 4
Results of Dispersion Modeling Analysis
Virginia Paving Company, Alexandria, Virginia

Pollutant	Averaging Period	Monitored Background Concentration ($\mu g/m^3$)	City's Baseline Scenario ($\mu g/m^3$)	City's SUP Scenario ($\mu g/m^3$)	VA Paving's SUP Scenario ($\mu g/m^3$)	NAAQS or SAAC ($\mu g/m^3$)
CRITERIA POLLUTANTS*						
PM-10	24-Hour	43	**346**	124	102	150
	Annual	19	35	30	25	50
PM-2.5	24-Hour	35	**125**	58	**68**	65
	Annual	13	**18**	**16**	**16**	15
NOx	Annual	45	74	63	54	100
CO	1-Hour	4,580	7,467	5,817	5,202	40,000
	8-Hour	3,206	4,820	3,887	3,668	10,000
SO_2	3-Hour	238	**2,508**	**1,392**	534	1,300
	24-Hour	60	**648**	326	194	365
	Annual	16	58	56	54	80
Lead	Quarter	0.013	0.040	0.030	0.015	1.5

Pollutant	Averaging Period	Monitored Background Concentration (μg/m³)	City's Baseline Scenario (μg/m³)	City's SUP Scenario (μg/m³)	VA Paving's SUP Scenario (μg/m³)	NAAQS or SAAC (μg/m³)
HAZARDOUS AIR POLLUTANTS						
Lead	1-Hour	n/a	n/a	0.1	n/a	7.5
	Annual	n/a	n/a	0.007	n/a	0.3
Formaldehyde	1-Hour	n/a	n/a	22.6	14.6	62.5
	Annual	n/a	n/a	1.7	0.21	2.4
Acrolein	1-Hour	n/a	n/a	0.2	n/a	17.3
	Annual	n/a	n/a	0.02	n/a	0.46
1,3 Butadiene	1-Hour	n/a	n/a	0.09	n/a	1,100
	Annual	n/a	n/a	0.004	n/a	44
Benzene	1-Hour	n/a	n/a	2.9	n/a	1,600
	Annual	n/a	n/a	0.2	n/a	64
Acetaldehyde	1-Hour	n/a	n/a	9.3	n/a	6,750
	Annual	n/a	n/a	0.7	n/a	360
Quinone	1-Hour	n/a	n/a	9.1	0.73	22
	Annual	n/a	n/a	0.7	0.01	0.8

* Criteria pollutant impacts include monitored background concentrations. Results in **bold** indicate modeled exceedances of the NAAQS.

Odor

The liquid asphalt and the final asphalt product are sources of odorous emissions. The City has occasionally received complaints from the Cameron Station residents about the odors from the industrial area south of the rail road tracks. With the exception of asphalt odors, the source(s) of these odors have not been definitively established because of their infrequency and short duration. As a part of the SUP, the City will require Virginia Paving to mitigate odorous emissions from the facility. Specifically, Virginia Paving will be required to install (1) Blue Smoke Control system (a six-stage filtration system) at the asphalt load-out area capable of achieving 99% control efficiency, and (2) vent condensers and steel wool filters to control asphalt storage tank emissions. With the installation and routine maintenance of these control measures, the City expects the odorous emissions from the Virginia Paving facility to be significantly reduced.

Noise and Lights

The City has received complaints from residents near the Virginia Paving facility regarding noise emanating from the facility's operations, especially during night time. All of these complaints have been in the recent past. Historically, however, there were no complaints prior to 2000-01. In order to address residents' complaints, the City has proposed several measures in the facility's SUP that are designed to reduce or eliminate noise pollution and to maintain compliance with the City of Alexandria's Noise Control Code, Title 11, Chapter 5, which sets the maximum permissible noise level as measured at the property line. The measures in the proposed SUP will prohibit certain operations during night time (such as the RAP crusher, unloading of rail cars, etc.), limit asphalt production operations at night, reduce or eliminate tailgate banging, engine brakes and backup alarms from the trucks, and install signs requiring plant personnel to limit noise-generating activities. Virginia Paving will also be required to establish a 24-hour "Hotline" number for noise complaints and resolve all complaints received at this number. In addition, two years after the approval of the proposed SUP, the City will evaluate the need for further measures based on the level of noise mitigation achieved by the above measures. One of the reasons for this provision was to have the ability to evaluate impacts on the new residential units that are currently being built, but are not yet occupied.

The proposed SUP also requires Virginia Paving to reduce light pollution during night time operations. Any lights that are not essential for plant operations will be required to be turned off. Any lights that are necessary to facilitate operations will be required to be directed downward so as to minimize glare on adjacent properties.

Stormwater

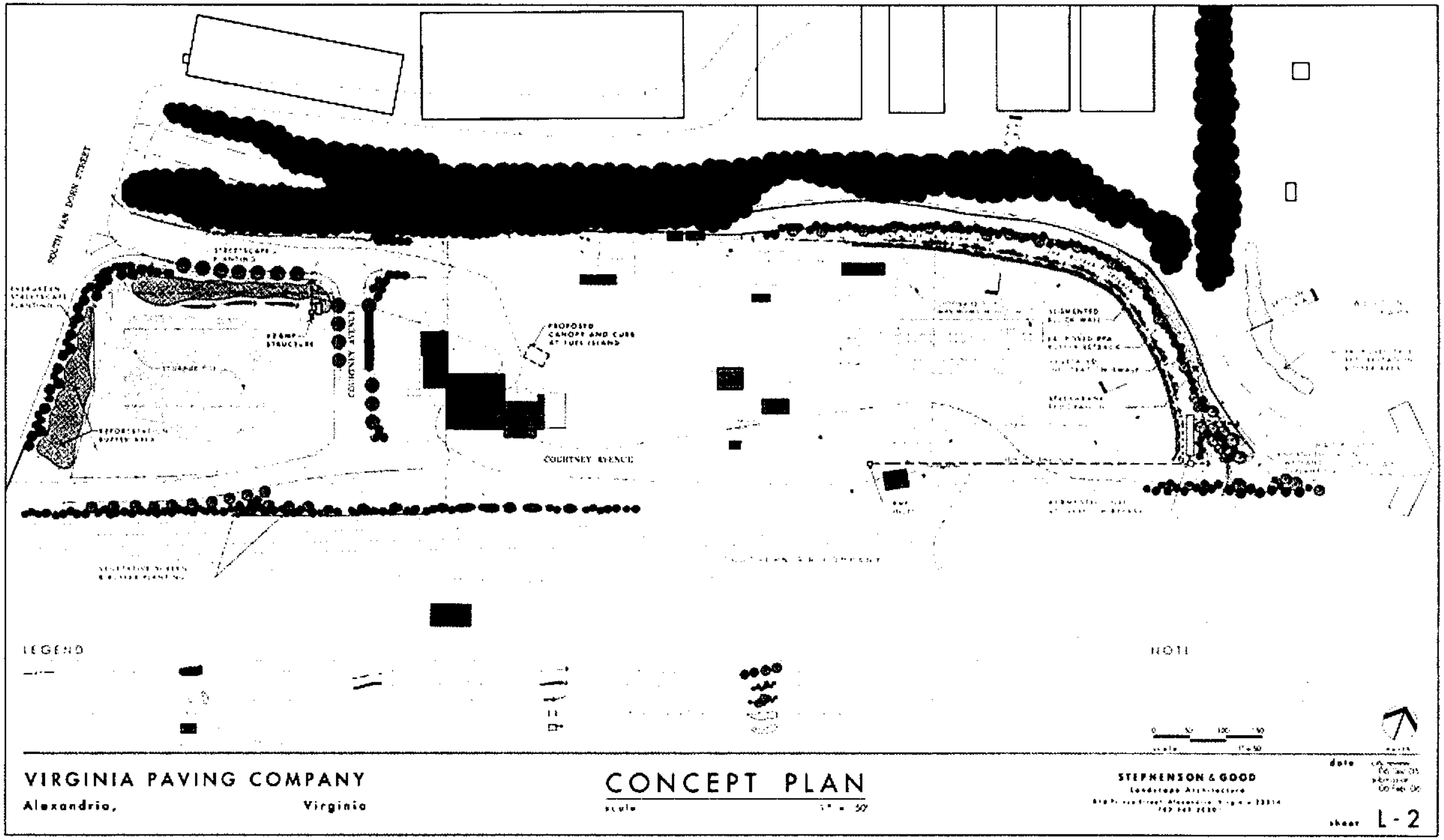
The facility's current SUP, issued by the City of Alexandria in 1960, requires on-site settling basins to prevent discharges of silt, asphalt, etc. into the Back Lick Run stream that runs along the north and east boundaries of the facility. In the past, the facility had provided settling ponds for this purpose. However, over the years, the ponds were filled with aggregate and RAP due to limited availability of space. As a part of this proposed SUP, the City is requiring Virginia Paving to develop a Stormwater Management Plan that includes building a Stormwater Management Facility (SWMF), to treat storm or contact water and storm water prior to its discharge into Back Lick Run. The City will prescribe the requirements for the SWMF and the plan for the SWMF will be require City approval. Virginia Paving will be required to establish a maintenance contract for the SWMF and follow standard operation and maintenance procedures.

In addition to the SWMF, Virginia Paving will be required to pull back its current asphalt pile away from Back Lick Run and stabilize the stream bank. Furthermore, Virginia Paving will be required to install a vegetative buffer along the West Park. Following these requirements, Virginia Paving has prepared a Concept Plan for stormwater management, shown in Figure 2, which has been approved. A plot plan, currently under review by the City staff, has been submitted that incorporates these stormwater improvements. The SUP condition requires that these improvements be installed by Dec. 31, 2006.

Landscaping and Open Space

In addition to showing the stormwater management plan, Figure 2 shows the landscaping that the City will require in the proposed SUP. The landscaping will restore the stream bank, better screen the property, and provide several additional trees. Staff also proposes a condition that the applicant work with the City on an easement to use a portion of its property along Backlick Run for a bike trail, a vital connection in the West End trail envisioned in the City's Open Space Master Plan.

FIGURE 2
Stormwater Management Concept Plan
Virginia Paving Company, Alexandria, Virginia



21

Land Use Issues

Planning for Industrial Uses in the West End

The subject property and surrounding area has historically been occupied by industrial uses. In addition to the asphalt plant, long time industrial uses in the area include the City's Waste-to-Energy Plant, UPS Shipping, railway operations, Police Firing Range, and Vulcan Materials. There are also recycling, storage, and trucking operations in the vicinity. The asphalt plant is located in the Landmark-Van Dorn Small Area Plan and is on land annexed from Fairfax County in 1952.

The 1974 Consolidated Master Plan for the City identified the Eisenhower Avenue West area for continued industrial uses, and encouraged the relocation of industrial uses from other parts of the City to this area. Most of the areas south of Pickett Street, including Cameron Station, were designated for industrial uses. Cameron Station at that time was a military base and compatible with the industrial uses in the area. The area where Summer's Grove is now located was vacant land, although recommended for a commercial-industrial employment area. The 1974 Master Plan indicated industry in this area because of its relative isolation from residential uses. This reflects the historical approach of zoning as a tool to separate incompatible uses. In designing a city, heavy industrial uses that have impacts such as noise, odors and traffic inherent to their operations would traditionally be separated from residential neighborhoods.

In 1986, a Small Area Plan was adopted for the Landmark-Van Dorn Area. In the Plan, the Cameron Station area was changed from Industrial to Mixed Use to reflect the desired type of redevelopment after the relocation of the military uses. The Virginia Paving land retained its industrial designation.

The Landmark/Van Dorn Small Area Plan was updated in 1992, with few changes. The industrial parcels retained the industrial designation of the 1986 plan, including Virginia Paving's property, and discouraged office development on these properties. Cameron Station was designated a Coordinated Development District, and Summer's Grove as an opportunity for high density commercial development.

Applicable Land Use Principles

The history of land use planning in this area of Alexandria reflects two traditional land use principles: (1) that industrial uses are positive and provide a balanced allocation of land for a community and (2) that industrial and residential uses should be separated physically.

Industrial and service uses in Alexandria have been reduced over time, because of the changing demographic land patterns and the high price of land. Despite their value to the employment and economic base, the City has increasingly seen its industrial uses pushed out of the eastern part of the City, especially with the development of Carlyle, Eisenhower East and Potomac Yard. Historically the City has been able to accommodate industrial uses in the western part of the City but there is little if any industrial land remaining outside the far southwestern corner of the City, including west Eisenhower Avenue and South Van Dorn Street. With the closing of the Cameron Station U.S.

Army facility and the construction of Cameron Station residential community on what had been industrial land, that trend, to allow industrial and service uses to remain and to be built in the southwestern part of the City, may need to be reexamined.

The original purpose of zoning was to separate all incompatible uses. Thus, commercial and residential areas have typically been mapped to be apart from each other, as were industrial and residential uses, and even different forms of residential, such as single family, townhouse, and apartment uses. While more recent planning and zoning trends encourage a mix of uses, to reflect and support the vitality that more historic building patterns provide, such as in Old Town, and on Mount Vernon Avenue, in Alexandria, it remains important to ensure that impacts from disparate uses are controlled.

In Alexandria, the SUP process provides one mechanism by which to review and require conditions to mitigate impacts from a potentially incompatible use. The City often uses this mechanism in the context of commercial uses, such as restaurants, near residential uses. It has also used the SUP process to address the concern about placing residential and industrial uses in close proximity. For example, there was discussion in the staff reports for both Summer's Grove and Cameron Station about the presence of industrial uses in the vicinity, and conditions were added in each case to address some of the issues of incompatibility. For Summer's Grove, the developer was required to disclose the proximity of the industrial uses to potential buyers, and include information in marketing materials about heavy industries and an incinerator in the vicinity. The development approval for Cameron Station Phases V, VI, and VII included requirements to mitigate noise levels from surrounding industrial activities through higher quality windows and building materials.

Although current residents continue to experience impacts from the industrial uses in the area and their concerns are real and justified, the area has historically been occupied by industrial uses and is one of the few areas of the city that industry continues to be permitted. Adding to the complexity, the draft Landmark-Van Dorn Area plan currently underway to the north has already stated that the city strives to retain its industrial uses, which includes the subject property. The future of industrial uses in this area will be have to be studied comprehensively as part of the West Eisenhower Planning process.

<u>Consideration on Review</u>
According to Section 11-504 of the City's Zoning Ordinance, the City Council may approve an application for a Special Use Permit, provided all regulations and provisions of law have been complied with, if it finds that the use for which the permit is sought:

(1) Will not adversely affect the health or safety of persons residing or working in the neighborhood of the proposed use;
(2) Will not be detrimental to the public welfare or injurious to property or improvements in the neighborhood; and
(3) Will substantially conform to the master plan of the city.

IV. ANALYSIS

Staff has conducted a comprehensive analysis of Virginia Paving's asphalt plant operations. Specific citizen concerns regarding emissions, odors, and other environmental issues have resulted in in-depth testing and analysis from Virginia Paving and review of various industrial facilities in the area. Beginning in October 2004, staff from several City departments began meeting with representatives of Virginia Paving, discussing and requiring significant environmental information from them, and, consistent with the opportunity presented by this SUP application, requiring the development of a short and long term action plan to address all concerns cited by neighbors.

Impacts experienced by residents in Cameron Station and Summer's Grove are real, even though they may not be definitively linked to Virginia Paving. There are many sources of air emissions, odors, and noise in the area including the Beltway, the Waste-To-Energy Plant, a crematorium located in the vicinity in Fairfax County, Vulcan Materials, the Norfolk Southern Railroad staging area, and other uses that have occupied this area for decades.

With the Virginia Paving application before the City, staff has the opportunity to fashion an extensive set of environmental conditions to update and upgrade the asphalt plant facility, and the specificity of the requirements and the extent of the investment necessary to meet them will result in a state of the art asphalt plant. If the application is approved, it will result in a plant that is a model of environmental protection and second to none in the area.

Proposed SUP Conditions

To ensure continued compliance with the pollution control measures identified in this report, the City has proposed several conditions to be included in the facility's SUP. These conditions are designed to reduce or eliminate pollution, secure control measures that are not otherwise required under Virginia DEQ regulations, and address concerns raised by the City's residents. Under the proposed SUP, Virginia Paving will be required to monitor their operations and control measures, and maintain records to document compliance. In addition, Virginia Paving will be required to apply for and obtain all necessary construction and operating permits from Virginia DEQ prior to making these upgrades.

In addition to several new monitoring, recordkeeping and reporting requirements, the proposed SUP specifies several limits that are more stringent than the facility's current State Operating Permit. Table 5 lists these limits and compares them to the current State limits.

TABLE 5
Comparison of State Limits and Proposed SUP Limits
Virginia Paving Company, Alexandria, Virginia

Parameter	State Limit	SUP Limit
Production	1,500,000 tons/year	1,200,000 tons/year*
	No daily limit	10,000 tons/day
	No day/night restriction	Only one dryer at night
Hot Oil Heater	No. 2 & recycled oil	No. 2 oil only
No. 2 Oil	0.5% sulfur	0.05% sulfur
Recycled Oil		
Sulfur	0.5%	0.5%
Arsenic	5 ppm	3 ppm
Cadmium	2 ppm	2 ppm
Chromium	10 ppm	7 ppm
Lead	100 ppm	50 ppm
Halogens	1,000 ppm	1,000 ppm
PCB	49 ppm	2 ppm
Baghouse PM	0.04 gr/dscf	0.03 gr/dscf
RAP Crusher Opacity	15%	10%

* Note that this production limit only goes into effect after installation of major control technology. Prior to the completion of such controls, production is capped at 900,000 tons per year, which is essentially holding the plant at it's historical production level over the last several years.

Enforcement

Through an interdepartmental strategy, staff is committed to enforcement of the proposed conditions. Staff proposes a comprehensive enforcement strategy, with conditions that require frequent interdepartmental inspections and opportunities for review by City Council; stricter penalties for violations of significant conditions with impact on air quality, including loss of privilege for nighttime vehicular operations and a mandatory review by City Council within 30 days; and a community liaison and biannual community meetings for improved communication. These enforcement conditions go beyond the enforcement procedures outlined in the zoning ordinance. Condition #27 also allows staff to require the plant to cease operations if it finds that it is creating a public nuisance or health problem, reinforcing the existing authority of Code Enforcement to require the plant to cease operations if it finds issues threatening public safety, life or health.

Conclusion

Staff attempted to develop a series of physical and operational improvements to the plant that would allow it to less intrusively coexist with its residential neighbors. Moreover, even though the plant is currently in compliance with all State and Federal environmental regulations, the City has negotiated, as part of the SUP process, additional restrictions on and improvements to the plant, such that it properly respects and coexists with the residential neighborhoods that have been built nearby.

With regard to trucks coming and going from the site, staff believes that the limitations to which Virginia Paving will agree in the context of the amended SUP are more restrictive than the current condition from the 1960 SUP, and the limited nighttime work will not have a negative impact on nearby residents. Essentially, since the overall production of the plant is capped, traffic should be more evenly distributed over the course of the day and evening, rather than concentrated only during daylight hours. Moreover, staff sees as significant the benefits that accrue to commuters in the region and in Alexandria from the reduced impact on peak traffic hours achieved through nighttime paving operations.

In assessing the application, staff has considered the potential impacts of its recommendation on the applicant, area residents, the City at large, and the region. These impacts include the following:

1) If the application is denied, the operation could continue under its current SUP#398, which prohibits exit or entrance of vehicles after hours of darkness or during inclement weather or on Sundays or holidays. There are few conditions in the SUP, with little regulation on environmental issues. The operations of the plant and resulting truck traffic would be concentrated during daytime hours, and paving jobs would require daytime lane closures or other traffic interruptions that would impact a wide range of citizens. Environmental concerns of area residents would not be addressed through negotiated conditions.

2) If the application is approved, the operation will be allowed to continue, and trucks coming and going will be limited to the hours specified by the applicant. Conditions requiring extensive capital improvements with extensive environmental controls would be imposed. Although allowing nighttime operations, impacts to the larger citizenry and region would be less since paving could be done outside of peak traffic hours.

On balance, staff finds that the consequences from approving the application, with its reduced traffic impact for commuters, and its extensive modernization, environmental controls and aesthetic improvements, provides greater benefits for all stakeholders, including the area residents. The improvements make this plant state of the art and one the most environmentally sensitive of its kind in the area, if not the United States. These benefits could not be obtained it the plant is simply allowed to operate under its existing SUP.

V. RECOMMENDED CONDITIONS

Staff recommends **approval** subject to compliance with all applicable codes and ordinances and the following conditions:

AIR

1. Virginia Paving Company (hereinafter, VA Paving) shall limit its hot mix asphalt production to a yearly maximum of 900,000 tons per year until all air pollution controls have been installed as scheduled in this Special Use Permit. Thereafter, the hot mix asphalt production shall be limited to 1,200,000 tons per year. (T&ES)

   Discussion: The production limit VA Paving is currently subject to is the limit of 1,500,000 tons/year in the State Operating Permit. The existing SUP does not have any production limitation. A lower limit of 1,200,000 tons/year will cap potential emissions of all pollutants. Similarly, the interim limit of 900,000 tons/year will limit emissions of all pollutants.

2. VA Paving shall limit its hot asphalt production rate to a maximum of 1,000 tons per hour and 10,000 tons in any 24 hour period, not to exceed 5,000 tons in any one nighttime shift. (T&ES)

   Discussion: This condition is in response to the community's concerns that the proposed SUP will enable 24 hr. a day production at this plant. The 1,000 tons/hour limit represents the combined total rated capacity for the two asphalt plants at the facility. Therefore, the limit of 10,000 tons/day limit will restrict the facility's potential production on a daily basis. This provides for potential emission cap on a short-term basis.

3. VA Paving shall control odors, smoke and any other air pollution from operations at the site, and prevent them from leaving the property or becoming a nuisance to neighboring properties, as determined by the Department of T&ES, in coordination with the Director of Department of Health. (T&ES)

   Discussion: This condition is similar to the standard language condition derived from City ordinance, and is designed to protect the neighboring properties from being adversely affected due to the operations at the facility by reducing all air pollutant emissions including of odors and smoke.

4. Virginia Paving shall limit its nighttime work to 130 nighttime shifts per calendar year. A record shall be maintained on site for the days/shifts on which nighttime work was conducted. Work conducted from 9 pm to 5 am will be considered as nighttime shift. A

partial shift work will be counted as 1 nighttime shift work for the purposes of this condition. (T&ES)

Discussion: This condition is in response to community's concerns that the proposed SUP will enable 365 days a year of night time production at the plant. The asphalt plant production is season dependent and it is reflected in the limitation on the maximum number of nighttime shifts allowed under this condition.

5. All night time production at VA Paving shall be limited for government customers only (Federal, State transportation agencies or local governments). Night time production and servicing of non-government entities from this facility is not permitted. (T&ES)

   Discussion: This condition is in response to community's concerns that the proposed SUP will enable increase in night time production at the plant to serve non government entities.

6. For control of odors, VA Paving shall use low-odorous additive or, upon proposal to and approval by the Department of T&ES, another equally effective approach such that odors from the facility are not detectable beyond facility boundaries. Since effectiveness of these additives is highly dependent of their usage in manufacturer's recommended quantities, VA Paving shall maintain records on site that demonstrate that these additives are being used as per manufacturer's recommendations. The records will include amount of additive used, compared to production and use of asphalt cement. (T&ES)

   Discussion: This condition targets the mitigation of odor emissions from the asphalt production and transport process.

7. VA Paving shall only burn No. 2 virgin fuel oil or better in the hot oil heaters. The annual consumption of No. 2 fuel oil in the hot oil heater shall be limited to 100,000 gallons based on a rolling twelve month total. Only one of the two currently permitted hot oil heaters shall operate at any one time. VA Paving shall clearly mark this requirement on the heaters and train the operators so that they are aware of this condition. (T&ES)

   Discussion: Under the current State Operating Permit, VA Paving is allowed to operate both its hot oil heaters simultaneously and can burn up to 200,000 gallons of recycled oil and up to 25,000 gallons of No. 2 oil in these heaters. The purpose of this condition is to ensure that only clean fuel is used, reduce the annual fuel usage, and prohibit simultaneous operation of both heaters. This will result in lower emissions and impacts from the facility.

8. VA Paving shall only utilize No. 2 fuel oil or specification recycled oil as fuel for the drum dryers. The recycled oil shall meet the following specification.

Constituent	Maximum Allowed Level	Typical Level
Sulfur	0.5 % by weight	0.4 % by weight
Arsenic	3 ppm	< 2 ppm
Cadmium	2 ppm	< 2 ppm
Chromium	7 ppm	5 ppm
Lead	50 ppm	20 ppm
Total Halogens	1,000 ppm	700 ppm
PCB	2 ppm	<2 ppm
Flash Point	100 °F minimum	100 °F minimum

Further, for sulfur content, the applicant will target .40 by weight, and if specification is not achieved for a particular shipment, the applicant will meet with the supplier and take action to ensure that target can be achieved. For every shipment of recycled oil received, VA Paving shall maintain on site, for a period of five years, fuel supplier records showing concentrations of the above constituents, as well as daily and monthly consumption of the same. The records shall be provided to the City upon request. (T&ES)

Discussion: *The constituent limits for recycled oil in this condition are more stringent than the Federal and State regulations and their existing state operating permit. These limits will reduce potential emissions of hazardous air pollutants from the asphalt plants.*

9. VA Paving shall only utilize low-sulfur No. 2 distillate oil as fuel for the drum dryers on days when the Air Quality Index value for Alexandria/Region exceeds 100 (Codes Orange, Red and Purple) for ozone and particulate matter, as identified on EPA's AIRNow web site. A record shall be maintained that documents appropriate fuel usage. (T&ES)

Discussion: *This condition is designed to require the use of cleaner fuel on the worst air quality days in the Alexandria area. On days with high Air Quality Index, the facility will not be allowed to use recycled fuel oil. This will help the region wide attempt to reduce emissions on Ozone action days.*

10. The No. 2 distillate oil used as fuel by VA Paving shall be the same as is approved for use in on-road diesel vehicles. The sulfur content of this oil shall be limited to 0.05% by weight. For every shipment of No. 2 distillate oil received, VA Paving shall maintain on

site, for a period of five years, fuel supplier records certifying the fuel type and sulfur content. The records shall be provided to the City upon request. (T&ES)

Discussion: The fuel approved for use in on-road diesel vehicles is the cleanest form of No. 2 oil approved by EPA. This condition ensures that the facility burns the cleanest No. 2 fuel in its hot oil heaters and drum dryers.

11. VA Paving shall install, operate, and maintain Blue Smoke Control system (six-stage filtration or ventilation to drum dryer burner: Butler-Justice, Inc.) to achieve 99% control efficiency for particulate emissions within the capture zone at the top of the silos per vendor specification. VA Paving or the vendor shall test the system to demonstrate that the system will meet its efficiency rating for captured PM-2.5 and PM-10 emissions within 90 days of startup of the system. The installation and testing for the top of the silos for Plant 1 shall be completed by December 31, 2006. For Plant 2, the fugitive emission control system shall be installed at the top of the silos by July 30, 2007. (T&ES)

Discussion: The odorous emissions from the VA Paving facility are not regulated under the current State Operating Permit. A large portion of odorous emissions from the asphalt plant are emitted as fine droplets, which are classified as particulate matter emissions, during asphalt transfer and load out operations. Under the SUP, the facility will be required to install a six-stage filtration system to capture and control these droplets, and therefore reduce odorous emissions.

12. VA Paving shall install and maintain low-NOx burners on both drum drier units. The installation of low-NOx burners shall be completed no later than October 30, 2006 for Plant 2 and no later than December 31, 2007 for Plant 1. (T&ES)

Discussion: In the hot mix asphalt industry, low-NOx burners are considered to be Best Available Control Technology (BACT). A new asphalt plant that is required to apply BACT, would generally select low-NOx burners to meet the BACT requirement. VA Paving is not a major source of air pollution under EPA and Virginia DEQ regulations and would not be required to apply BACT. However, under the proposed SUP, VA Paving will be required to install low-NOx burners to reduce NOx emissions and impacts.

13. VA Paving shall install and maintain tank vent condensers which may include steel wool filters, or other alternate control approved by the Director of T&ES, to control asphalt storage tank emissions no later than September 30, 2006. (T&ES)

Discussion: This condition targets the control of VOC and odor emissions from the asphalt storage tanks.

14. VA Paving shall install Fugitive Emissions Control Systems to capture and control fugitive emissions from the hot mix asphalt conveyors and loadouts. The systems shall be vented to the drum dryer burner or the six-stage filtration collection unit. For Plant 1,the system shall be installed no later than September 30, 2007. For Plant 2, the system shall be installed no later than June 30, 2008. Both systems shall be certified within 180 days of startup. (T&ES)

<u>Discussion:</u> *This condition targets the mitigation of VOC, odor emissions, and other fugitive emissions from the loadout and asphalt mix conveyor system.*

15. The particulate matter (TSP) emissions from the drum dryer baghouses and the lime storage silo baghouse shall not exceed 0.03 gr/dscf of exhaust gas as measured by EPA Method 5. VA Paving shall demonstrate compliance with this limit once every two years by conducting performance tests for each baghouse. Results of performance tests and compliance status report shall be submitted to the City within thirty (30) days of the completion of the tests. Visible Emissions testing (VE) shall be conducted monthly by a Certified Visible Emissions inspector with results available for review at the plant site. (T&ES)

<u>Discussion:</u> *The limit of 0.03 gr/dscf is more stringent than the limit in the facility's current State permit for the drum dryer, thereby reducing the potential emissions of particulate matter. Also, this condition places a limit on the lime storage silo when none exists in the current State permit.*

16. All on-site diesel engines, front end loaders, trucks and other diesel engine equipment owned or operated by VA Paving shall install 90% efficient particle traps. The installation of particle traps on half (50%) of this equipment shall be completed no later than September 30, 2006, starting with the largest engines, and on the remaining equipment no later than December 31, 2006. (T&ES)

<u>Discussion:</u> *VA Paving operates several mobile and non-mobile diesel fuel-burning equipments at its facility, such as diesel engines, front end loaders, and trucks. While the combined particulate matter emissions from this equipment is significant, they are not regulated under the facility's current State Operating Permit. The purpose of this condition is to control 90% of these particulate matter emissions and to reduce the associated ambient impacts.*

17. VA Paving shall increase the height of the drum dryer exhaust stacks to 20 meters no later than January 31, 2007, pending approval by Virginia DEQ. (T&ES)

Discussion: As indicated by the dispersion modeling (City and VA Paving Consultants), raising the stack height will result in better dispersion of pollutant emissions and reduce impacts.

18. VA Paving shall increase the height of hot oil heater exhaust stack 6 meters no later than October 31, 2006. (T&ES)

    Discussion: As indicated by the dispersion modeling (City and VA Paving Consultants), raising the stack height will result in better dispersion of pollutant emissions and reduce impacts.

19. Virginia Paving shall install and maintain a particulate matter emission control system at the Recycled Asphalt Pavement (RAP) crusher. Such system shall be installed no later than December 31, 2006, and must consist of water sprays and drop enclosures (housing at the end of the conveyer). (T&ES)

    Discussion: This condition targets the control of fugitive dust (particulate matter) emissions from the RAP crusher.

20. Visible emissions from the Recycled Asphalt Pavement (RAP) crusher shall not exceed 10% opacity as measured using EPA Method 9. This condition shall apply at all times except during startup, shutdown and malfunction. The duration of each startup and each shutdown of the RAP crusher shall be limited to no more than 10 minutes. A log of each malfunction shall be maintained indicating cause of malfunction, duration of malfunction, and corrective action taken to eliminate the malfunction and avoid future malfunctions. (T&ES)

    Discussion: This condition reduces the current limit of 15% opacity in the State permit down to 10% opacity. The condition also ensures that startups and shutdowns are limited in duration so that any excess opacity during these times is not unnecessarily prolonged.

21. Effective immediately, VA Paving shall spray water using a water truck on all on-site paved roadways at least twice daily. More frequent water spraying shall be conducted if necessary to effectively control fugitive dust emissions from the paved roads. All paved roads shall be wet-vacuumed at least once daily. VA Paving shall maintain a daily log of water spraying and wet-vacuuming operations, and shall make the log available to the City for review upon request. (T&ES)

    Discussion: This condition targets the control of fugitive dust (particulate matter) emissions resulting from truck traffic on the paved roads within the facility.

22. VA Paving shall pave the truck access areas at the eastern end of the facility for trucks receiving product from Plant 2 no later than October 31, 2006. (T&ES)

<u>Discussion:</u> *This condition targets the control fugitive dust (particulate matter) emissions resulting from truck traffic on the paved roads within the facility. Paved areas result in less fugitive emissions as compared to unpaved areas.*

23. VA Paving shall install and maintain water sprays, and construct enclosures, as modeled, on all transfer points as identified in the modeling no later than December 31, 2006. (T&ES)

<u>Discussion:</u> *This condition targets the control of fugitive dust (particulate matter emissions from conveyor and other transfer points.*

24. VA Paving shall incorporate into a Long Term Control Plan (LTCP) and operations manual specifying the Best Management Practices (BMPs) to be employed for control of fugitive dust sources as outlined in this Special Use Permit. The BMPs in the LTCP shall include, but not be limited to, vacuum sweeping and water flushing of paved access areas (e.g, roads, parking, etc.), paving of any unpaved access areas, wetting and/or chemical stabilization of aggregate handling and storage including RAP, and enclosures for all conveyor to conveyor transfer points. To demonstrate compliance with the BMPs, VA Paving shall maintain appropriate records including (1) frequency of vacuum sweeping, (2) frequency and quantity of water application, (3) frequency, quantity and type of chemical suppressant applied, and (4) periodic inspection of conveyor to conveyor transfer points to ensure integrity. The records as required by this annual inspection shall be submitted to the City every six months, first submittal no later than April 30, 2007. (T&ES)

<u>Discussion:</u> *This condition targets the control of fugitive dust (particulate matter) emissions from all aggregate handling and fugitive dust sources at the facility. The recordkeeping requirement will ensure that the facility maintains compliance with this condition.*

25. <u>**CONDITION AMENDED BY PLANNING COMMISSION:**</u> VA Paving shall conduct stack tests for <u>PM2.5,</u> PM10, NOx, SOx, and CO emissions <u>at the outlined schedule</u>. The test shall be completed prior to August 31, <u>2007</u> ~~2008~~. A second test shall be conducted within two years of the first test and must be completed prior to August 31, 2009 ~~2010~~. Thereafter the tests ~~may~~ <u>must</u> be conducted at a frequency of <u>not less than</u> once every five years. The results of the stack tests shall be submitted to the City within 90 days of the tests. <u>(PC)</u> ~~(T&ES)~~

Discussion: The current State permit does not require any routine or periodic monitoring or testing of stack emissions from the facility. This condition ensures that actual emissions from the stack are measured and documented on periodic basis.

26. VA Paving shall obtain all necessary construction permit(s) and revisions to the operating permit from the Virginia Department of Environmental Quality (DEQ). (T&ES)

    Discussion: Several of the above conditions require construction activities, e.g., low-NOx burners, increasing stack heights, Blue Smoke control, etc. By including these requirements in the State permit, these conditions will also become State-enforceable.

27. In the event that the plant is found to be creating a public nuisance or a public health problem, as determined by the City of Alexandria, VA Paving shall suspend all operations until satisfactory corrections are made in accordance with further recommendation of the Director of Transportation and Environmental Services in consultation with the Director of Alexandria Health Department. (T&ES)

    Discussion: This condition is carried over and similar to a condition of facility's current SUP and requires the facility to take immediate action to mitigate adverse impacts on the public, including shutting down the facility until all necessary corrections are made.

28. **CONDITION AMENDED BY PLANNING COMMISSION:** In the event that the National Ambient Air Quality Standards are modified or new ones are added, the City reserves the right to require Virginia Paving to perform an analysis that provides all technical data to demonstrate that the facility is not causing the exceedance of the National Ambient Air Quality standard in place at that time. In particular, since the 24-hr. standard for the PM2.5 NAAQS has been revised from 65 *ug*/m3 to 35 *ug*/m3 (determined as the 98th percentile of three years of valid data), although this NAAQS is not enforceable by EPA until the year 2015, the following conditions shall apply:

28a. The City shall continue operating the PM10 monitor at Samuel Tucker School until three years of valid data have been collected. The City shall determine the 98th percentile of these data, per the NAAQS, and then multiply that value by 75%, to impute a 98th percentile value for PM2.5.

28b. If the imputed value exceeds 35 *ug*/m3, then the City reserves the right to require VA Paving to demonstrate that the facility is not causing this imputed exceedance, pursuant to the deadlines to be set by the City, but in no circumstance to be less than 90 days from the date of notice by the City. (PC) ~~(T&ES)~~

<u>*Discussion:*</u> *This condition insures that the facility will be required to demonstrate that it is not causing any exceedances of any new or modified National Ambient Air Quality Standards* <u>*and address the newly adopted standard for PM2.5 ahead of EPAs schedule.*</u>

WATER

29. VA Paving shall install a Stormwater Management Facility (SWMF) to treat stormwater runoff and contact water from its entire site no later than December 31, 2006. The stormwater management facility shall be designed and constructed to address pollutants of concern i.e. sediment and petroleum based products. The SWMF shall be located within the boundaries of the VA Paving facility. The design and location of the SWMF shall meet the satisfaction of the Department of T&ES. (T&ES)

    <u>*Discussion:*</u> *This condition makes the facility responsible for treatment of stormwater runoff from its property prior to any off-site discharge. This is also a requirement from the existing SUP and a plot plan submitted by VA Paving is under review. The requirement of Stormwater Management facility must be complied regardless of the approval of this SUP.*

30A. VA Paving shall execute a maintenance agreement with the City for all installed stormwater Best Management Practices (BMPs). VA Paving shall secure a maintenance contract with the vendor of the installed SWMF and provide a copy of the contract to the City or the applicant shall obtain certification from the vendor that appropriate maintenance has been performed by the employees of the applicant. (T&ES)

30B. The stormwater BMPs required for this project shall be constructed and installed under the direct supervision of the design engineer or his designated representative. The design engineer shall make a written certification to the City that the BMP(s) are constructed and installed as designed and in accordance with the approved Plan. (T&ES)

30C. VA Paving shall develop or obtain an Operations and Maintenance Manual from the designer or manufacturer of the SWMF. The Manual shall include (1) an explanation of the functions and operations of each BMP and any supporting utilities, (2) catalog cuts on any mechanical or electrical equipment, (3) a schedule of routine maintenance for the BMP(s) and supporting equipment, and (4) a copy of the maintenance agreement with the City. VA Paving shall maintain the SWMF in accordance with the procedures prescribed in the Manual. The maintenance records shall be maintained at the facility for five years and shall be provided to the Department of T&ES once every year or upon request. (T&ES)

Discussion: *This condition supplements the above condition requiring SWMF. The BMPs, and the associated maintenance, recordkeeping and reporting requirements, are designed to ensure continued compliance. The certification requirement ensures a professional installation of the Stormwater Treatment appurtenances. These are also the City requirements for all BMPs.*

31. VA Paving shall maintain the existing Asphalt Pile that has been pulled back from the stream (Back Lick Run) and shall maintain a minimum distance of 35 feet between the pile and the top of the bank. This buffer shall be vegetated to the satisfaction of Department of Planning and Zoning, Department of Parks and Recreation, and Department of T&ES, and maintenance access shall be provided. (T&ES)

    Discussion: *Over the years, the facility had expanded operations such that the aggregate storage piles were located adjacent to the Backlick Run and causing degradation of the stream buffer. This condition is designed to restore a vegetated buffer between VA paving operations and Backlick Run.*

32. VA Paving shall be responsible for conducting a bank stabilization project in the section of the stream that is on its property as generally depicted on the Concept Plan dated February 6, 2006. Such restoration project must be to the satisfaction of Department of T&ES. (T&ES)

    Discussion: *Stabilization of the stream bank reduces the amount of sediment entering and other associated impacts on the Back Lick Run.*

NOISE

33. The applicant shall comply with the City of Alexandria's Noise Control Code, Title 11, Chapter 5, which sets the maximum permissible noise level as measured at the property line. (T&ES)

    Discussion: *This is a standard City condition and requires the facility to comply with the City ordinance regarding noise control.*

34. No amplified sound, such as intercom speakers, shall be audible at the property line. (T&ES)

    Discussion: *To respond to citizen complaints of noise pollution, the City is requiring the facility to minimize all amplified sounds such that they are not audible at any off-site location.*

35. VA Paving shall limit its night time operations to only one dryer unit, one loader, one skid steer and one mobile crane, and trucks as needed between the hours of 9 pm and 6 am. (T&ES)

<u>Discussion:</u> *This condition aims to reduce noise pollution at night and limits the amount of equipment that can be used for night work.*

36. VA Paving shall continue to work with Norfolk Southern to encourage all deliveries to be made only between the hours of 7 am and 6 pm (Monday-Friday). (T&ES)

<u>Discussion:</u> *The delivery operation is not completely under VA Paving control and the condition encourages them to work with Norfolk Southern to provide as many day time deliveries as possible.*

37. Operation of VA Paving locomotive engine, unloading of rail cars and operation of the RAP crusher shall be limited to the hours of 7 am to 6 pm (Monday-Friday), and 9 am to 6 pm on Saturdays. No unloading shall occur on Sundays, New Years Day, Memorial Day, the Fourth of July, Labor Day, Thanksgiving or Christmas. VA Paving shall maintain a log of the timing of arrival of deliveries, use of their locomotive engine, unloading operations, and RAP crusher operations. (T&ES)

<u>Discussion:</u> *This condition is designed to prohibit certain activities at night to address citizen complaints about nighttime operations and the associated noise. The condition also prohibits certain activities on Sundays and major holidays.*

38. VA Paving will not be permitted to dump on the top of the RAP (Recycled Asphalt Pavement) pile at night. When necessary to deliver RAP to site during night time operations, only the eastern storage area will be utilized. The practice of dumping at the ground level will make use of RAP stockpile as noise buffer. Access to the top of the pile will be blocked daily to eliminate access. (T&ES)

<u>Discussion:</u> *This condition aims to further minimize noise pollution from unloading of RAP during nighttime operations.*

39. All on-site trucks and equipment owned and operated by VA paving shall be equipped with ambient noise level sensing backup alarms within six months of the approval of this Special Use Permit. VA Paving shall also adjust route trucks and other equipment on its site in such a manner that minimizes the need to use back-up alarms. (T&ES)

<u>Discussion:</u> *This condition aims to further reduce noise from the trucks at the facility.*

40. VA Paving shall take active measures including use of on-site personnel to direct the unloading of milled material on the site without use of tailgate banging. The measures may include, but shall not be limited to, permanently installing signs on the property instructing truck drivers, in English and Spanish, to not bang their tailgates and to not use engine brakes. Posting of signs alone is not sufficient to be in compliance with this condition. (T&ES)

<u>*Discussion:*</u> *This condition ensures that on-site personnel are aware of, responsible for, and trained in best operating procedures to minimize noise pollution from truck unloading operations.*

41. VA Paving shall establish a 24 hour "Hotline" number. The number, and the name of the person responsible for this number at the plant, shall be provided to the City, and the community, and updated on a regular basis. All complaints received at this number shall be logged, followed up and responded. (T&ES)

<u>*Discussion*</u>*: With this condition, the City intends to provide the public a direct line for registering complaints and ensure that the complaints are properly addressed.*

42. VA Paving shall install signs on its property to limit engine idling to a maximum of five minutes. Use of engine brakes shall be prohibited while on VA Paving property and appropriate signs shall be installed to make operators aware of this requirement. (T&ES)

<u>*Discussion:*</u> *This condition targets the reduction of all air pollutant emissions resulting from fuel combustion in vehicle engines and to reduce noise pollution by prohibiting the use of engine brakes while on-site.*

43. VA Paving shall install noise reducing mufflers on plant air cylinder exhaust ports where possible. These shall be installed by November 30, 2006. (T&ES)

<u>*Discussion*</u>*: This condition targets the mitigation of noise pollution.*

44. <u>**CONDITION AMENDED BY PLANNING COMMISSION:**</u> Two years after the approval of the Special Use Permit, the Department of T&ES shall review any noise complaints and actual measurements at the nearby properties, and the frequency, duration and timing of the impacting noise, and may require reasonable additional measures, including sound barriers <u>or requiring all privately operated trucks and equipment to be equipped with ambient noise level sensing back-up alarms</u>, necessary to address any outstanding issues. <u>(PC)</u> ~~(T&ES)~~

<u>Discussion:</u> *With this condition, the City reserves the right to require further noise abatement measures if warranted based on actual experience over a two-year period following the implementation of the above measures.*

OTHER

45. All waste products including, but not limited to, organic compounds (such as solvents), motor oil, compressor lubricant and antifreeze shall be disposed of in accordance with all local, state and federal ordinances or regulations and shall not be discharged to the sanitary or storm sewers, or onto the ground. (T&ES)

    <u>Discussion:</u> *This is standard City condition and it targets the prevention of any air, ground or water contamination resulting from the facility's usage and handling of potentially hazardous chemicals.*

46. VA Paving shall comply with the City of Alexandria Best Management Practices manual for automotive related industries. A copy can be obtained by contacting the Department of T&ES, Division of Environmental Quality at 703-519-3400, ext. 166. (T&ES)

    <u>Discussion:</u> *This is a standard City condition and requires that all automotive related industries follow certain best management practices to minimize adverse impacts on public health and welfare.*

47. All repairs of motor vehicles or equipment shall be conducted inside a building or structure that is approved by the Department of Planning and Zoning, except in the limited cases where the large size of the equipment is prohibitive. (T&ES)

    <u>Discussion:</u> *This conditions ensures that most vehicle and equipment are repaired in a controlled environment to prevent air, ground and water contamination.*

48. At the intersections where pavement has been impacted by tack deposits from VA Paving's operations, VA Paving shall be responsible for restoration or removal of tack deposits of the impacted intersections or roadway pavement as determined and to the satisfaction of the Department of T&ES. Upon being notified by the Department of T&ES and identification of the impacted intersections, VA Paving shall make the repairs within ninety (90) days of the date of the notice. (T&ES)

    <u>Discussion:</u> *This condition ensures that any potential damage to public road by VA Paving related operations will be the responsibility of the company.*

49. VA Paving shall not use the outdoor lighting of its property, which are so arranged that the illumination and glare there from is thrown upon the adjacent property occupied for residential purposes, in an amount of illumination which measures more than point twenty-five hundredths footcandles measured at any point seven feet beyond the property line of the adjacent property used for residential purposes.

Discussion: This condition is to minimize any potential impacts on the neighboring properties of the nighttime operations. This condition addresses citizen complaints and aims to reduce glare and other light pollution due to facility's operations during nighttime.

50. All lights used by VA Paving shall be shielded or directed so as to confine the area of diffusion to the property, which it is intended to illuminate.

Discussion: This condition addresses citizen complaints and aims to reduce glare and other light pollution due to facility's operations during nighttime.

51. VA Paving shall take all necessary measures to ensure that its locomotive engine is not leaking any oil. In the event that the current engine continues to leak oil, lubricants or fuels, VA Paving shall take additional measures deemed necessary to prevent oil, lubricants or fuels leaks and to eliminate any environmental impacts. VA Paving shall replace its locomotive engine no later than December 31, 2009.

Discussion: This condition addresses issues related to oil leak from the locomotive engine.

52. VA Paving shall maintain all on-site equipment, including pollution control equipment, in an optimum working condition. Any applicable maintenance records shall be kept on-site. In the event that an air pollution control equipment is not operational, the City will be notified immediately.

Discussion: This condition ensures that pollution control equipments is maintained in a manner that maintains their effectiveness.

53. VA Paving shall maintain records on site on plant mix temperature readings of asphalt mix in drum dryers on a daily basis and such records shall be available to be reviewed by the Department of T&ES to ensure stack test records submitted by VA Paving are accurate and reflect such temperature readings. These records shall be maintained for a period of five years.

Discussion: These records will support stack test data that is required to be submitted along with each stack test.

54. VA Paving shall maintain records on site describing any failures or pressure drops in the baghouses in accordance with guidelines established by VDEQ under their Air Permit and shall notify the Department of T&ES within twenty-four (24) hours of such failures or pressure drops. VA Paving shall promptly take corrective actions to repair the baghouse in question and notify the City upon completion of repairs and resumption of normal operations.

 Discussion: This condition will ensure that the City is aware of any malfunctions and will allow it to undertake appropriate follow-up.

55. VA Paving shall maintain all records required by this special use permit and shall keep such records on site for at least the most recent 5 year period. All records shall be available to the City upon request.

 Discussion: This condition addresses the documentation and record keeping requirements.

56. VA Paving shall copy the City on all of their correspondence with Virginia DEQ including, but not limited to, its Air and Water permits and permit applications.

 Discussion: This condition requires VA Paving to keep the City informed of any regulatory actions or any equipment or operational changes are being planned by VA Paving.

57. VA Paving plant site shall be available for inspection by City staff during all hours of operation.

 Discussion: This condition ensures access for inspection purposes.

ENFORCEMENT

Reporting to the City

58. VA Paving shall maintain daily production and site activity information and provide it to the City on a monthly basis. Reports must be submitted within 2 weeks of the month ending.

Discussion: *This condition, by requiring maintenance and sharing of production and activity records will enable the City to utilize the information for responding to complaints and in the analysis of any PM10 data collected at the nearby monitoring station.*

59. VA Paving shall provide the City a Quarterly report that provides status of all projects required by the SUP. Also the records that are required by the conditions will be submitted along with this quarterly report. After all the Capital projects are installed, the BMP reporting requirements shall be made annually.

Discussion: *This condition addresses the reporting requirements. The reporting is more frequent until all proposed controls are in-place.*

Review

60. **CONDITION AMENDED BY PLANNING COMMISSION:** The Director of Planning and Zoning shall review compliance with the conditions of the special use permit, as part of a coordinated inspection with the Department of Transportation and Environmental Services and Code Enforcement, as well as the Alexandria Health Department who shall identify any health concerns, including at Samuel Tucker Elementary School, every six months for the first two years after approval, then annually thereafter, and shall docket the matter for consideration by the Planning Commission and City Council if (a) there have been documented violations of the permit conditions which were not corrected immediately, constitute repeat violations or which create a direct and immediate adverse zoning impact on the surrounding community; (b) the director has received a request from any person to docket the permit for review as the result of a complaint that rises to the level of a serious violation of the permit conditions, (c) the director has determined that there are problems with the operation of the use and that new or revised conditions are needed. (PC) ~~(P&Z)~~

Penalty for Violation of Specific Conditions

61. **CONDITION AMENDED BY PLANNING COMMISSION:** If the applicant fails to comply with installation dates set forth for Conditions #11, #12, #13, #14, #17 and #18, without prior advance notice of a reasonable basis for delay, it shall cease all operations involving the night-time exit and entrance of vehicles from the site, and within 30 days, staff will docket the case for review and potential action by City Council on the next available docket. (PC) ~~(P&Z)~~

Community Outreach

62. The applicant shall designate an employee whose responsibility will be to assure compliance with all conditions of the Special Use Permit. The name and phone number of this employee will be provided to the Department of Planning and Zoning and to a representative(s) of the residential surrounding community. (P&Z)

63. The applicant shall establish a community relations function as part of their operation. This function shall include regularly scheduled meetings to discuss operations and to attempt to resolve any problems, conflicts or issues identified by the community related to the plant's operations. The meetings shall be held with representatives from the surrounding residential communities, and notice of such meetings will be given to these communities as well as to the Department of Planning and Zoning and Transportation and Environmental Services, and shall be held twice each year. (P&Z)

LANDSCAPING

64. Provide and implement a comprehensive landscape plan to the satisfaction of the directors of Planning and Zoning, Transportation & Environmental Services and Recreation, Parks & Cultural Activities. The applicant shall continue to work with City staff to develop a site planting strategy consistent with Concept Development Plan drawings dated 06 December, 2005 The landscape plan shall include:

    a. Crown area coverage calculations in compliance with City of Alexandria Landscape Guidelines. Provide pre-site disturbance and post-site disturbance calculations.

    b. An exhibit that demonstrates open space calculations. Provide pre-site disturbance and post-site disturbance calculations for on-site open space.

    c. Detailed material, scale massing and character elevation views and sections for all proposed fences and/or walls. Indicate above/below grade conditions, and existing/proposed grade conditions, including top/bottom of wall grades.

    d. An enhanced level of detail plantings throughout the site (in addition to trees). Plantings shall include a mixture of seasonally variable, evergreen and deciduous shrubs, ornamental and shade trees and herbaceous groundcovers that are horticulturally acclimatized to the Mid-Atlantic and Washington, DC National Capital Region.

    e. Identification of limits of grassing operations and limits of work.

f. Provide additional screen plantings along Van Dorn Street.

g. Planting details including sections, for all site landscape conditions.

h. Information that fixes and describes the design, scale, dimension, massing and character of stormwater management facilities; stream buffer area plantings; slope stabilization; recreation trail reservation; stream restoration activities, retaining and/or sound walls, and any above/below grade utility structures.

i. Provide a phasing plan and narrative that clearly indicates a time line for implementation and completion of the landscape plan. Provide the following information:

   1). Coordinated work with construction of stormwater management facilities.

   2). Specific dates and planting seasons of phased implementation.

   3). Limits of work, quantities of plantings and maintenance requirements by phase.

   4). Details and specifications for a by-phase watering/irrigation plan to maintain proposed plantings.

j. Provide an agreement stating that the property owner shall maintain all items depicted and proposed in the landscape plan in a safe, healthy, thriving condition.

   1). Submit a maintenance plan that depicts the scope, intensity and frequency of landscape maintenance activities during planting establishment periods and normally scheduled maintenance thereafter including any on and improvements.

   2). Plantings that expire or are deemed in an unhealthy condition must be replaced during the next successive planting season. (RP&CA)

65. Provide notes on the Landscape Plan indicating the following:

a. All plant specifications shall be in accordance with the current and most up-to-date edition of the American Standard for Nursery Stock (ANSI Z60.1) as produced by the American Association of Nurserymen; Washington, DC."

b. "Unless more strenuous specifications are provided, all landscape related work shall be performed in accordance with the latest edition of Landscape Specification Guidelines as produced by the Landscape Contractors Association (LCA) of Maryland, District of Columbia and Virginia; Gaithersburg, Maryland."

c. "Prior to commencement of landscape installation/planting operations, a pre-installation/construction meeting will be scheduled and held with the City's Arborist and Landscape Architects to review plant installation procedures and processes." (RP&CA)

66. Provide note on demolition, sediment and erosion control, site plan and landscape drawings that indicates:
    a. "All tree protection shall be approved in-field by the City Arborist prior to commencement of any site disturbing activities." (RP&CA)

67. The Landscape Plan and all related phasing and maintenance materials shall be prepared and certified by a Landscape Architect certified/licensed to practice in the Commonwealth of Virginia. (RP&CA)

68. To the satisfaction of the directors of Planning and Zoning, Transportation & Environmental Services and Recreation, Parks & Cultural Activities, demonstrate coordination with the following:
    a. City of Alexandria Open Space Master Plan

    b. City of Alexandria Bicycle Trail Master Plan, including establishment of a connection to adjacent Fairfax County and the Van Dorn Metro Station area.

    c. City of Alexandria Landmark/Van Dorn Small Area Planning process and study. (RP&CA)

69. Virginia Paving Company shall grant the City of Alexandria an option, for recordation in the land records of the City of Alexandria, for a public access easement for continuation of a multi-use trail on Virginia Paving property along the property line. The necessity for, specific location, construction and orientation of any such trail will be determined by the City pursuant to its normal processes and procedures, after completion of which the City may exercise its option to have Virginia Paving grant the public access easement. This option must be recorded upon approval of the amended SUP for Virginia Paving operations. *All reservations shall be depicted on a subdivision plat and approved by the City Attorney.* (RP&CA)

SITE MAINTENANCE

70. The asphalt storage pile located on Parcel B of the site plan and which faces South Van Dorn Street shall not exceed the height of the South Van Dorn Bridge. Visibility shall be minimized to the extent possible from South Van Dorn Street. (P&Z)

71. All asphalt and gravel piles shall not spill or encroach onto Backlick Run at any time. (P&Z)

72. All equipment and trucks shall be stored on the property in an orderly fashion at all times. (P&Z)

73. The applicant shall remove the parking area from the city right-of-way, or shall apply for an encroachment or vacation. (P&Z)

HOURS OF OPERATION

74. **CONDITION AMENDED BY PLANNING COMMISSION:** The hours of operation for the asphalt plant shall be limited to 5:00 a.m. to 9:00 p.m. Monday through Saturday. In addition, when undertaking State or Local Government projects during the paving season (April 1 to November 1), the facility may also operate from 9:00 p.m. to 5:00 a.m. Sunday through Friday. During nighttime hours, the application shall not engage in private paving. (PC) ~~(P&Z)~~

STAFF: Eileen Fogarty, Director, Department of Planning and Zoning;
Rich Baier, Director, Transportation and Environmental Services;
Richard Josephson, Deputy Director, Department of Planning and Zoning;
William Skrabak, Division Chief, Environmental Quality;
Aimee Vosper, Landscape Architect Supervisor;
Christopher Spera, Assistant City Attorney;
Ron Kagawa, Urban Planner/Landscape Architect;
Lalit Sharma, Program Supervisor, Environmental Quality;
Laura Durham, Open Space Coordinator;
Valerie Peterson, Urban Planner III.

Staff Note: In accordance with Section 11-506©) of the Zoning Ordinance, construction or operation shall be commenced and diligently and substantially pursued within 18 months of the date of granting of a special use permit by City Council or the special use permit shall become void.

IV. CITY DEPARTMENT COMMENTS

Legend: C - code requirement R - recommendation S - suggestion F - finding

Code Enforcement:

F-1 Staff from Code Enforcement conducted a reinspection of the facility on September 14, 2006. All fire code violations cited during previous permit inspections have been complied with and the facility's annual Fire Prevention Permit was issued. The facility is presently in compliance with C-1 through C-14 below.

C-1 The applicant shall provide an updated Spill Prevention Control and Countermeasures Plan (SPCC) to the Code Enforcement Bureau - Fire Prevention Section which includes updated contact and remediation measures.

C-2 All above ground stationary tanks used for the storage of hazardous materials shall be located and protected in accordance with the VSFPC.

C-3 Empty containers and tanks previously used for storage of hazardous materials shall be free of residue material and vapors as defined by DOT Resource and Recovery Act (RCRA) and other related state and local regulatory requirements.

C-4 Hazardous Materials in any quantity shall not be released into a sewer, storm drain, ditch, drainage canal, etc. as stipulated by the VSFPC

C-5 The Code Official shall be promptly notified of release of hazardous materials in reportable quantities under federal, state or local regulations

C-6 Individual hazardous materials containers and structures containing hazardous materials shall be conspicuously marked in accordance with the VSFPC.

C-7 Visible Hazard Identification Signs as specified by NFPA 704 shall be placed on all stationary containers and above ground storage tanks and other locations as specified by the VSFPC.

C-8 Responsible persons shall be trained to be the fire department liaison as specified by the VSFPC.

C-9 Storage and dispensing areas for hazardous materials shall be secured against unauthorized entry.

C-10 Guard posts and other approved means shall be installed to protect storage tanks, piping, dispensing areas from vehicular damage in accordance with the VSFPC

C-11 Secondary containment and spill control shall be installed in all rooms and structures used for storage of liquid or solid hazardous materials in accordance with the VSFPC.

C-12 Plumbing drains in hazardous materials storage areas shall conform to approved designs as specified by the VSFPC

C-13 Hazardous materials storage areas and structures shall be designed in accordance with the USBC and VSFPC requirements.

C-14 Combustible waste materials shall not be allowed to accumulate within structures so as to present a fire hazard.

Health Department:

F-1 No comments.

REPORT ATTACHMENTS AND APPENDICES

Referenced Attachments

1) Special Use Permit #398
2) Virginia Paving Chronology
3) October 26, 2004 letter to applicant
4) Results of an Emission and Air Dispersion Modeling Study and Public Health Evaluation dated December 7, 2005
5) Memoranda on Formaldehyde and Fugitive Dioxin dated August 28, 2006
6) Memoranda on Low Wind Speed dated September 13, 2006

Appendices

A) Cambridge Environmental Responses to December 7, 2005 report
B) Emission Estimates for the Virginia Paving Company dated August 22, 2005
C) Summary Results of an Emission and Air Dispersion Modeling Study dated September 30, 2006
D) Ambient Air Quality Analysis-Proposed SUP Scenario dated March 2006
E) March Addendum to Air Quality Report
F) Total VOC emission estimated from Virginia Paving dated July 18, 2006

AMENDED

APPLICATION for SPECIAL USE PERMIT # 2005-0042

PROPERTY LOCATION: 5601 Courtney Ave., Alexandria, VA 22304

TAX MAP REFERENCE: 67.04-02-12, -17, -8, -20 ZONE: I

APPLICANT Name: Virginia Paving Co., a division of Lane Construction Corp.

Address: 5601 Courtney Ave., Alexandria, VA 22304

PROPERTY OWNER Name: Lane Construction Corp.

Address: 965 E. Main Street, Meriden CT 06450

PROPOSED USE: Amend the condition of the Existing Asphalt Plant SUP to permit certain nighttime Operations and permit stack height of 20 meters pursuant to Section 4-1205(C).

THE UNDERSIGNED hereby applies for a Special Use Permit in accordance with the provisions of Article XI, Section 11-500 of the 1992 Zoning Ordinance of the City of Alexandria, Virginia.

THE UNDERSIGNED, having obtained permission from the property owner, hereby grants permission to the City of Alexandria to post placard notices on the property for which this application is requested, pursuant to Article XI, Section 11-301(B) of the 1992 Zoning Ordinance of the City of Alexandria, Virginia.

THE UNDERSIGNED hereby attests that all of the information herein provided and specifically including all surveys, drawings, etc., required to be furnished by the applicant are true, correct and accurate to the best of their knowledge and belief. The applicant is hereby notified that any written materials, drawings or illustrations submitted in support of this application and any specific oral representations made to the Planning Commission or City Council in the course of public hearings on this application will be binding on the applicant unless those materials or representations are clearly stated to be non-binding or illustrative of general plans and intentions, subject to substantial revision, pursuant to Article XI, Section 11-207(A)(10), of the 1992 Zoning Ordinance of the City of Alexandria, Virginia.

Mary Catherine Gibbs Print Name of Applicant or Agent	Mary Catherine Gibbs Signature
HART, CALLEY, GIBBS & KARP, P.C. Mailing Address	(703) 836-5757 Telephone # (703)548-5443 Fax#
307 N. Washington St., Alex. VA 22314 City and State Zip Code	Date

============DO NOT WRITE BELOW THIS LINE - OFFICE USE ONLY=======

Application Received:__________ Date & Fee Paid:__________ $______

ACTION - PLANNING COMMISSION:__________

ACTION - CITY COUNCIL:__________

Special Use Permit#
2005-0042

All Applicants must complete this form. Supplemental forms are required for child care facilities, restaurants, automobile oriented uses and freestanding signs requiring special use permit approval.

1. The Applicant is (*check one*) [ ] the Owner [ ] Contract Purchaser

[ ] Lessee or [X] Other: a division of the owner of the subject property.

State the name, address and percent of ownership of any person or entity owning an interest in the applicant, unless the entity is a corporation or partnership in which case identify each owner of more than ten percent.

100% Lane Construction Corp.,

965 E. Main Street, Meriden CT 06450

If property owner or applicant is being represented by an authorized agent such as an attorney, realtor, or other person for which there is some form of compensation, does this agent or the business in which the agent is employed have a business license to operate in the City of Alexandria, Virginia?

[**X**] Yes. Provide proof of current City business license.

[ ] No. The agent shall obtain a business license prior to filing application, if required by the City Code.

2. Submit a floor plan and a plot plan with parking layout of the proposed use. One copy of the plan is required for plans that are 8 1/2" x 14" or smaller. Twenty-four plans are required for larger plans or if the plans cannot be easily reproduced. The planning director may waive requirements for plan submission upon receipt of a written request which adequately justifies a waiver. This requirement does not apply if a Site Plan package is required.

A site plan has been submitted showing the layout of the entire site. Please let us know if additional copies are necessary.

Special Use Permit# 2005-0042

NARRATIVE DESCRIPTION

4. The applicant shall describe below the nature of the request in detail so that the Planning Commission and City Council can understand the nature of the operation and the use, including such items as the nature of the activity, the number and type of patrons, the number of employees, the hours, how parking is to be provided for employees and patrons, and whether the use will generate any noise. (Attach additional sheets if necessary.)

The Applicant has operated the asphalt plant at this location since 2001. Prior to that date, an asphalt plant had been operated at this site since at least 1960 when SUP # 398 was obtained by Newton Asphalt, Inc. The Applicant believes that an asphalt plant was operated at this location even prior to that.

Hot Mix Asphalt is made at this location by heating up and mixing various raw materials: aggregate (small rocks), sand, liquid asphalt and recycled asphalt milled from surfaces the company is paving. After heating the material in the production process, the material is stored in a silo and then dumped into trucks owned either by Virginia Paving or by other companies who are doing their own paving. Virginia Paving employs 150 people either in an administrative capacity or on its paving crews out of this location.

Virginia Paving is requesting two changes: 1) a change in the condition language from 1960 that prohibits operation of the plant "that requires exit or entrance of vehicles after hours of darkness or during inclement weather or on Sundays or holidays"; and 2) an increase in stack height to 20 meters pursuant to Section 4.1205(C). Operation of the plant doesn't actually require the entrance or exit of vehicles. Trucks enter or exit the site only to deliver material to paving locations or to deliver the raw materials for the production process. Aggregate material, which is merely small rocks, is delivered by rail cars on the Norfolk Southern tracks adjacent to the south property line of the site. Aggregate from the rail cars is only offloaded to the site during daylight hours.

The Applicant is seeking to change the condition language to permit it to operate its plant and the entry and exit of trucks via Van Dorn Street during its regular, historical business hours including when supplying asphalt materials to government projects, ie., for VDOT and the City of Alexandria, that require night work. Currently, their contracts with VDOT, either as a contractor or subcontractor, and with the City of Alexandria, require paving at night on certain arterial roads to limit interruption to commuters and in fact, if their trucks block lanes of traffic on certain main arteries during daylight hours, their crews can be arrested. As much as 60% of their contract work for the City is done at night. Approximately 20% of their overall work is required to be done at night by VDOT or the City based upon the realities of traffic in our region. As a result, they need to operate the plant to generate asphalt for these projects at night and trucks need to be able to deliver the hot mix asphalt at night during the paving season, which occurs from April 1 through November 1.

The condition from 1960 is out of date and was based, the Applicant believes, on the traffic safety concerns at the time as Van Dorn Street was at grade with the railroad and the street was much more rural, having no street lights and limited traffic signals. The need for the condition, therefore, is gone as there are now street lights, a bridge over the railroad tracks and a traffic signal at its intersection with Van Dorn Street. In addition, the truck traffic leaves the site on the opposite end of its site from the recently built residences nearby. Virginia Paving has contracted out several studies of both noise and environmental issues and will present those studies to the City upon their completion.

Virginia Paving is committed to being a good neighbor, and the plant has been for over 45 years. The paving industry simply has evolved to require paving on main arterials to occur at night. Virginia Paving's location inside the Beltway creates a unique situation that allows them to provide paving services at a lower price to the City, VDOT and other jurisdictions in the area, thereby keeping road maintenance and construction costs down for all involved. Bringing paving material from other locations outside the Beltway requires an increased trucking distance which increases costs, air pollution and traffic on the City's and the region's roads and neighborhoods.

Special Use Permit# 2005-0042

USE CHARACTERISTICS

4. The proposed special use permit request is for: (check one)

   [ ] a new use requiring a special use permit,

   [ ] a development special use permit,

   [ ] an expansion or change to an existing use without a special use permit,

   [X] an expansion or change to an existing use with a special use permit,

   [ ] other. Please describe: ______________________

5. Please describe the capacity of the proposed use:

   A. How many patrons, clients, pupils and other such users do you expect? Specify time period (i.e., day, hour, or shift).

   20 patrons between the hours of 7:00am-5:00pm Monday through Saturday

   B. How many employees, staff and other personnel do you expect? Specify time period (i.e. day, hour, or shift).

   Currently Permitted: 12 office staff, Monday – Friday, 5:00 am – 7:00 pm;
   100 employees, Monday – Saturday, 5:00am - 7:00 pm
   Proposed Add'tl Hours: 40 employees, Sunday – Friday, 7:00 pm - 5:00 am

6. Please describe the proposed hours and days of operation of the proposed use:

   *** The Proposed Additional Hours requested in this SUP Application would result in the plant operating according to the following schedule, *only during the paving season*, (April 1 through Nov. 1), and, within that period, *only when undertaking State or Local Government projects* (i.e. VDOT, City of Alexandria, etc...). Upon request by those government bodies, operations might also occasionally include extended weekend hours during the paving season in consideration of regional traffic impacts.**

Day:	Hours:
Sunday	7:00pm-11:59pm
Monday – Thursday	12:00am-11:59pm
Friday	12:00am-7:00 pm
Saturday	12:00am-7:00pm

**** For standard operational hours outside the paving season, please see "Currently Permitted" (#5B) above.**

Special Use Permit# 2005-0042

7. Please describe any potential noise emanating from the proposed use:

A. Describe the noise levels anticipated from all mechanical equipment and patrons.

Noise test results from noise study have been forwarded to City Staff.

B. How will noise from patrons be controlled?

The plant provides an enclosed air burner designed to capture most of the noise from the production process and absorb it internally. Additionally, sound attenuators or mufflers on batchers have been installed to diminish noise from the plant. Virginia Paving has taken other steps to limit the noise associated with its operation at night by not unloading from freight cars during nighttime hours. Virginia Paving has also installed signs at its site ordering the truck drivers to take care to limit noise from their own trucks on the site at night.

8. Describe any potential odors emanating from the proposed use and plans to control them:

Va. Paving began using an odor suppressing agent in June 2005. The agent, Ecosorb, is automatically introduced by injection into the liquid asphalt at a rate of 0.6 gallons per 10, 000 gallons of virgin liquid asphalt. The system consists of a automated pump that blends the Ecosorb with the virgin liquid asphalt per the Engineers Recommendations. Then the liquid asphalt is put into the drum to mix with the aggregate to produce the final product.

9. Please provide information regarding trash and litter generated by the use:

A. What type of trash and garbage will be generated by the use?

Office waste, miscellaneous construction debris.

B. How much trash and garbage will be generated by the use.?

Approximately 30 cy every two weeks

C. How often will trash be collected?

Every two weeks or as needed.

D. How will you prevent littering on the property, streets and nearby properties?

Garbage cans are located at various locations throughout the property. Yard persons conduct garbage cleanup on a weekly basis.

10. Will any hazardous materials, as defined by the state or federal government, be handled, stored, or generated on the property?

    [ ] Yes. [ ] No.

    If yes, provide the name, monthly quantity, and specific disposal method below:

    All Material storage locations were disclosed in the Environmental Baseline Study that was submitted in March 2005.

11. Will any organic compounds, for example, paint, ink, lacquer thinner, or cleaning or degreasing solvent, be handled, stored, or generated on the property?

    [x] Yes. [ ] No.

    If yes, provide the name, monthly quantity, and specific disposal method below:

    Parts Cleaning Tank is used on site. It is maintained by Safety Kleen and product is removed per the agreement for this service. Minor amount of parts cleaning products are used, typically in an aerosol cans. They are stored in Hazardous material storage cabinets.

12. What methods are proposed to ensure the safety of residents, employees and patrons?

    Our operations are permitted to be in compliance with Federal and State regulations. We are in compliance with all of our permits. Current inspection dated January 2006 attached showing full compliance with air permits.

ALCOHOL SALES

13. Will the proposed use include the sale of beer, wine, or mixed drinks?

    [ ] Yes. [**X**] No.

    If yes, describe alcohol sales below, including if the ABC license will include on-premises and/or off-premises sales. Existing uses must describe their existing alcohol sales and/or service and identify any proposed changes in that aspect of the operation.

Special Use Permit#
2005-0042

PARKING AND ACCESS REQUIREMENTS

14. Please provide information regarding the availability of off-street parking:

A. How many parking spaces are required for the proposed use pursuant to section 8-200 (A) of the zoning ordinance?

30

B. How many parking spaces of each type are provided for the proposed use:

42 Standard spaces

______ Compact spaces

______ Handicapped accessible spaces.

27 Other.

C. Where is required parking located? [X] on site [ ] off-site *(check one)*

If the required parking will be located off-site, where will it be located?

27 spaces located across City's right-of-way of Courtney Ave. on property owned by RR.

Pursuant to section 8-200 (C) of the zoning ordinance, commercial and industrial uses may provide off-site parking with 500 feet of the proposed use, provided that the off-site parking is located on land zoned for commercial or industrial uses. All other uses must provide parking on-site, except that off street parking may be provided within 300 feet of the use with a special use permit.

D. If a reduction in the required parking is requested, pursuant to section 8-100(A)(4) or (5) of the zoning ordinance, complete the PARKING REDUCTION SUPPLEMENTAL APPLICATION.

15. Please provide information regarding loading and unloading facilities for the use:

A. How many loading spaces are required for the use, per section 8-200 (B) of the zoning ordinance? N/A

B. How many loading spaces are available for the use? N/A

C. Where are off-street loading facilities located? N/A

D. During what hours of the day do you expect loading/unloading operations to occur?

N/A

E. How frequently are loading/unloading operations expected to occur, per day or per week, as appropriate?

N/A

16. Is street access to the subject property adequate or are any street improvements, such as a new turning lane, necessary to minimize impacts on traffic flow?

Street access is more than adequate.

SITE CHARACTERISTICS

17. Will the proposed uses be located in an existing building? [X] Yes. [ ] No.

Do you propose to construct an addition to the building? [ ] Yes. [X] No.

How large will the addition be? ________ square feet.

18. What will the total area occupied by the proposed use be?

12158 sq. ft. (existing) + _______ sq. ft. (addition if any) = _______ sq. ft. (total)

21. The proposed use is located in *(check one)*:

[X] a stand alone building [ ] a house located in a residential zone [ ] a warehouse

[ ] a shopping center. Please provide name of the center: ________________

[ ] an office building. Please provide name of the building: ________________

[X] other, please describe: Two stand alone plants (Plant I and II.)

City of Alexandria, Virginia

MEMORANDUM

DATE: OCTOBER 3, 2006

TO: CITY OF ALEXANDRIA PLANNING COMMISSION

FROM: RICH JOSEPHSON, ACTING DIRECTOR, PLANNING AND ZONING

SUBJECT: UPDATE TO CONDITIONS FOR VIRGINIA PAVING SUP#2005-0042

On September 27, 2006, City staff received an email from the Cameron Station Civic Association (CSCA) to amend a number of the proposed conditions outlined in the staff report for SUP#2005-0042, and to add several new conditions. In response to that request, staff proposes amending the following conditions:

CSCA pointed out that Conditions #5 and #74 were inconsistent in their reference to the government contracts that were permitted for nighttime paving. To correct this inconsistency, staff proposes to amend Conditions #74 to state:

> 74. The hours of operation for the asphalt plant shall be limited to 5:00 a.m. to 9:00 p.m. Monday through Saturday. In addition, when undertaking <u>Federal,</u> State or Local Government <u>roadway</u> projects during the paving season (April 1 to November 1), the facility may also operate from 9:00 p.m. to 5:00 a.m. Sunday through Friday.

Regarding compliance with Conditions #12, #13 and #22, staff will verify that these conditions have been met prior to City Council's hearing on October 14th.

CSCA stated that Condition #27, regarding suspending operations of the plant if the plant is found to be creating a public nuisance, should be incorporated into the enforcement conditions for the entire SUP, rather than pertain only to the Air conditions. Although the conditions is grouped with the Air conditions, it is a condition that is applicable to the entire operation. For clarity purposes, this condition will be incorporated into the Enforcement conditions.

CSCA also asked that Condition #61 regarding added penalty for violation of specific conditions be expanded to include Conditions #13 and #14, in addition to Conditions #11, #12, #17 and #18. The original conditions identified were those that require the highest investment and make the greatest impact on environmental quality. Although Conditions #13 and #14 do not reach the level of those conditions already identified, staff does not object to adding them. Staff proposes the following amendment:

61. If the applicant fails to comply with installation dates set forth for Conditions #11, #12, #13, #14, #17 and #18, without prior advance notice of a reasonable basis for the delay, it shall cease all operations involving the night-time exit and entrance of vehicles from the site, and within 30 days, staff will docket the case for review and potential action by City Council on the next available docket. (P&Z)

With respect to the remaining recommended amendments and additions to the proposed conditions set forth in the CSCA email, staff finds that the remaining issues raised by those proposals are either adequately addressed in existing conditions, are items to which the applicant has previously indicated that they will not agree under any circumstances, or are based upon information that is not factually correct.

Other Amended Conditions

In addition to amendments proposed in response to the CSCA letter, staff also proposes amendments to Conditions #25 and #28, providing additional controls:

Staff recommends that Condition #25 be modified to add PM2.5 to the list of emissions for which stack tests are required and test dates are moved 1 year ahead of the previously proposed schedule. The new condition is to be read as follows:

25. VA Paving shall conduct stack tests for PM2.5, PM10, NOx, SOx, and CO emissions at the outlined scheduled. The test shall be completed prior to August 31, 2007 ~~2008~~. A second test shall be conducted within two years of the first test and must be completed prior to August 31, 2009 ~~2010~~. Thereafter the tests ~~may~~ must be conducted at a frequency of not less than once every five years. The results of the stack tests shall be submitted to the City within 90 days of the tests. (T&ES)

Due to recent changes in EPA standards for PM2.5, staff recommends that Condition #28 be amended, and #28a and #28b be added, as follows:

28. In the event that the National Ambient Air Quality Standards are modified or new ones are added, the City reserves the right to require Virginia Paving to perform an analysis that provides all technical data to demonstrate that the facility is not causing the exceedance of the National Ambient Air Quality standard in place at that time. In particular, since the 24-hr. standard for the PM2.5 NAAQS has been revised from 65 *ug*/m3 to 35 *ug*/m3 (determined as the 98th percentile of three years of valid data), although this NAAQS is not enforceable by EPA until the year 2015, the following conditions shall apply:

28a. The City shall continue operating the PM10 monitor at Samuel Tucker School until three years of valid data have been collected. The City shall determine the 98th percentile of these data, per the NAAQS, and then multiply that value by 75%, to impute a 98th percentile value for PM2.5.

28b. If the imputed value exceeds 35 *u*g/m3, then the City reserves the right to require VA Paving to demonstrate that the facility is not causing this imputed exceedance, pursuant to the deadlines to be set by the City, but in no circumstance to be less than 90 days from the date of notice by the City.

Discussion: *This condition insures that the facility will be required to demonstrate that it is not causing any exceedances of any new or modified National Ambient Air Quality Standards and address the newly adopted standard for PM2.5 ahead of EPAs schedule.*

Addendum to Ambient Air Quality Analysis

In order to address recent changes to EPA's modeling guidelines, City staff conducted a sensitivity analysis to assess the effects of using meteorological site-specific versus source-specific surface characteristics for Virginia Paving. An addendum to the March 2006 *Ambient Air Quality Analysis-Proposed SUP Scenario* summarizing the conclusions of this sensitivity analysis is attached.

Addendum (October, 2006) – Ambient Air Quality Analysis – Proposed SUP Scenario – Virginia Paving (March, 2006)

Sensitivity Analysis to Assess the Effect of Using Meteorological Site-Specific versus Source-Specific Surface Characteristics for Virginia Paving

The ambient air quality analysis of the Virginia Paving facility that AERO Engineering Services initiated in September, 2005 used meteorological data that derive from the National Weather Service station at Reagan National Airport. The motive in using Reagan National data was to satisfy existing guideline procedures (as described in US EPA's Guideline on Air Quality Models, CFR Part 51, Appendix W, 7-1-03 Edition) that meteorological data should derive from a nearby, representative location. Given the lack of onsite meteorological data for this source, proximity and general similarity in terrain characteristics, e.g., mixture of urban/rural land use, relatively modest vertical elevation scales compared to horizontal scales, led to the choice of Reagan National as the source for meteorological data.

In applying meteorological data within dispersion models, the general practice was to characterize the underlying surface characteristics within the model as they exist at the pollution source. Additionally, user guidance for the meteorological processor for AERMOD recommends this procedure ("Revis ed Draft User's Guide for the AERMOD Meteorological Preprocessor (AERMET), November, 2004). However, recent correspondence with US EPA Region III's modeler Dennis Lohman indicates that AERMOD developers are concerned that, in some cases, differences in surface characteristics between the pollution source and the NWS meteorological station may affect results. Currently, US EPA suggests that in order to determine that degree of effect, modelers should assess impacts using both the source's and meteorological station's surface chara cteristics.

More specifically, the parameters that characterize the surface in within the AERMET processor are albedo, Bowen ratio and surface roughness. As described, AERO previously calculated land-use weighted values of these parameters for input to AERMET for sectors of similar geographical features, with the Virginia Paving as the center of three-kilometer land use area. Now, AERO has re-calculated these parameters, again on a land-use weighted basis for sectors of similar geographical features, but with Reagan National as the center of the three-kilometer land use area. These results show that the effect of the change in underlying surface characteristics is on the order of 5% to 10%. The trend toward higher or lower results varies between source categories, i.e., plants, heater, load-out, storage silos, vehicles, aggregate handling, and piles. However, while the margin between the maximum expected potential impacts and air standards for the proposed SUP scenario decreases slightly for some pollutants due only to this change in surface characteristics, there are several other assumptions of the analysis that err on the side of overestimation, i.e., source particle apportionment for aggregate handling and baghouse emissions, and maximum annual throughput. For example, this analysis incorporates the assumption that fine PM2.5 emissions from the baghouse are equal to PM10 emissions, while for combustion processes, PM2.5 emissions are a subset of PM10 emissions. Additionally, recently issued US EPA AP-42 updates reduce the PM2.5 fraction of aggregate and roadway emissions based on observations. Considering all of these factors, the conclusions regarding compliance with air standards do not vary from the previous assessment.

PC Docket Item # 6
Case Number(s) SUP2005-0042

"Kathleen Burns"
<burnskathy@earthlink.net>
09/25/2006 05:42 PM
Please respond to burnskathy@earthlink.net

To Kendra.jacobs@alexandriava.gov
cc
bcc
Subject FW: community issue

Dear Ms. Jacobs,

Would you please forward a copy of this letter to the members of the Planning Commission, prior to their Sept. 26 Joint Work Session with the City Council?

thank you very much. If you need any additional information, please contact me at 703-824-1799

Sept. 25, 2006

Dear BSVCA Board Members and BSVCA Block Captains,

On Sept. 18, the City of Alexandria held a Community Meeting at Samuel Tucker School to provide background information on the request by **Virginia Paving Co.** to update its special use permit (SUP). I refer you to the Power Point presentation that was given by Derek Argust, who served as facilitator/moderator for the lengthy session. Unfortunately, there has been minimal coverage of this contentious issue by the Washington Post, so there has been an opportunity for fact to occasionally be overrun by fiction and for science to be trumped by opinion. This has been coupled by strong emotions tied to questions of health, safety, commercial vi

Since you are the grassroots network for our organization, I wanted to send some information to you from this hearing. The mission of a civic association is to provide such information in a timely fashion, but we don't have a quarterly meeting coming up until Oct. 16 and by then the process will have moved on.

The two websites related to this hearing:
---Alexandria Planning Department staff report, issued Sept. 23, 2006
http://dockets.alexandriava.gov/icons/pz/pc/cy06/100306/di06.pdf

---Power Point Presentation from Sept. 15 meeting, given by facilitator, Derek Argust, of the Alexandria City Manager's Office
http://Alexandriava.gov/planningandzoning/vapaving_sup.php

For the past 20 months, a major portion of the staffs from the Alexandria Transportation and Environmental Services department (TES) and the Alexandria Planning Commission have been dealing with VA Paving issues and listening to all points of view. All parties have literally spent thousands of hours and dollars on this process. There have been numerous public forums. Officials from Virginia Paving also offered free tours of the facilities to any interested resident. As Mike Cote, vice president of mechanical, Lane Construction, observed at the hearing, the "unprecedented scrutiny this facility has received will make this [company] a better" member of the community.

In 2001, VA Paving had purchased Newton Asphalt Co., which had been operating at its current location since 1960. Lane Construction, headquartered in Meriden, CT, is the parent company of Lane.

But in spite of all the meetings and forums and discussions, some confusion still exists. And I wanted our BSVCA community to be able to assess the information, to ask questions and to draw their own conclusions. I'd also encourage anyone who wants first-hand knowledge to tour the VA Paving facility, during daytime or night-time, to make your own observations.

There will be a joint work session between the Alexandria Planning Commission and the Alexandria City Council at 5:30 p.m. on Tuesday, Sept. 26, in Council Chambers. The public does not offer comments. The Planning Commission will hear the VAP request for an amended SUP at a hearing slated for 9:30 a.m. on Saturday, Oct. 14.

I call your attention to the various scientific charts in the Power Point presentation which try to simplify the testing that has been done and what the air quality requirements are at the federal, state and local levels and how VA Paving meets that criteria. I was very surprised to see that VA Paving went significantly beyond the minimum requirements in reducing pollution levels, and the charts document this effort.

As a result of the extensive review process, VA Paving has agreed to 72 conditions as a requirement for receiving an updated special use permit. They have agreed to spend an additional $2 million to install a variety of environmental controls to make the plant one of the few nationally that would have such state-of-the-art improvements.

At the Sept. 18, I found the clarifications provided by the outside scientific experts useful, along with comments from City Officials, as to what had been done in the past and what should be done in the future. Because the air floating over Alexandria affects us all, this is a community problem, not one limited to neighbors of the plant. Regrettably, some residents attacked the messenger if they presented views they did not share. In a civil society, we need to be able to disagree without being disagreeable, and this did not occur as some speakers went beyond such boundaries.

I wanted to share some of the observations from the meeting with you (since much of the information was new to me). I also found the comments from various Cameron Station residents helpful to see what they saw as problems and what they wanted as solutions. And I urge you to get additional information to answer any questions you may have. The contact for the city's Planning Staff is Valerie Peterson at 703-838-4666; for VA Paving, it is Chris Monaghan at 703-751-7100. For the Cameron Station homeowners association and civic association, contact is Mindy Lyle, at mindylyle@comcast.net

If you wish to get more information from any of the outside scientific experts who spoke, contact:
David Sullivan (who was hired by Cameron Station as an outside expert on air quality and paid

for by city funds), at sull_env@ix.netcom.com
Outside consultants to the City are: Dr Maureen Barrett, maureen@aeroengineering.com
Dr. Laura Green, green@cambridgeenvironmental.com

An expert who did not testify at the hearing, but whom I contacted later for clarification is Erica Vannerman, Alexandria's air pollution specialist for the Planning staff. She can be reached at 703-519-3400, ext. 165, at erica.vannerman@alexandriava.gov

1. This 10-acre plant was initially opened in 1960, and set in the industrial park on Van Dorn Street. The original permit did not specifically allow them to operate after 5 p.m. Valerie Peterson, city Planning staff, said the main reason was that there was not a central overhead street lighting system in that area and they were concerned about driving accidents. She said it has no bearing on the current request since a majority of asphalt paving contracts now require companies to do work in the evenings----so as to minimize upheavals on city and state roads during daytime traffic. VA Paving's main clients in the government sector are the city of Alexandria, Arlington
2. City officials readily agreed at the Sept. 18 hearing that they had never enforced the 1960s requirement to avoid night-time paving, because it was no longer a health and safety issue.

3. As to allegations that the City was totally lax on all phases of environmental enforcement regarding VA Paving, City officials said the system is complaint driven and there were very few complaints filed prior to 2000---when Cameron Station started the process of becoming a major housing community.

4. Based on the extensive debates and discussions of the past months with VA Paving, the Alexandria Planning process will be revised and apply throughout the City, not just to VA Paving. It will now require that every SUP be renewed every three years. The amended format gives the City much greater control of SUPs, especially regarding air quality, than would be required under state and federal laws.

   The City will also apply to VA Paving and other businesses operating in Alexandria an enforcement hierarchy that will include: a notice of the investigation for alleged violations; the prospect of mandatory fines; a public hearing; and the revocation of the SUP

   With VA Paving, under the new proposals tied to the SUP request, the City will review and inspect the facilities every 6 months for the next two years, and then conduct the review annually, with implementation-specific dates for insuring compliance.

   Never before has the city instituted such strict penalties, according to City officials, who spoke at the meeting. If VA Paving fails to comply with the new

SUP requirements, it will result in the cessation of night-time entry and exit to the plant. The SUP will be docketed for review by the City Council within 30 days. Similarly, VA Paving is required to have a compliance officer on its staff, who provides community outreach and is available as needed. The company will be required to schedule meetings with the community, at least every six months, and to update them on their operations.

5. Dioxin
   Four different times, speakers from Cameron Station kept referring to the threat of Dioxin emissions from the VA Plant. Each time, either a City official or an outside scientific expert noted that this was not true.
   According to City officials, in their testing, they "found no evidence" of Dioxin currently being generated by the VA Paving plant, and the only residues on the Cameron Station soils were traced to when the pesticide/herbicide was used on the grounds when it was an active military base, in 1993. City officials and outside experts said this current testing was done according to strict EPA standards. As part of the Cameron Station construction process, 4 to 14 ft. of clean fill was applied to the soil surface for the construction area, City officials said.

   Dr. Maureen Barrett, the outside air quality consultant who has worked with the City since August 2005, emphasized that the VA Paving plant was "not a significant source of dioxin,." with less than one measurable gram per year. She further noted that there were "no violations of health-based standards for formaldehyde or for particulates. The three outside consultants/scientists added that the "level of peer review and scrutiny" [of VA Paving] by the Alexandria Planning team has been extraordinary." As to allegations that some of the data was being kept "secret," the group noted that scientists and engineers can disagree with various inputs "but it has not been a secret process."

6. Volatile Organic Compounds (VOC)
   Again, Dr.Barrett assured the audience that the "impacts are insignificant" when it comes to such particulates measured at VA Paving. When asked whether proposed tougher national standards would affect VA Paving operations, she said no because of the established scientific criteria it met.

7. City Monitoring Station
   To protect all citizens and to insure that high standards are met regarding air quality and minimizing pollution, the City opened a special Air Monitoring Station at Tucker School in June 2006. The monitor runs for 24 hours, every three days, year round, to compile data. Previously, the City had done routine air quality measurements, based on Virginia's Department of Environmental Quality standards, from 1991-1996 and again in August 2004.

   Dave Sullivan, the outside Cameron Station consultant paid by the City, said regarding VA Paving, and the ongoing air quality measurements, there was "not a problem with meeting national standards set by the National Academy of Sciences." When asked about any toxic air pollution emissions from the VA Paving facility, he added that there would be "nothing approaching anything that would be toxic."

8. Long-Range Planning Process for the West End
Rich Josephson, acting director of Alexandria's Planning and Zoning Department, said at the hearing that the Landmark/Van Dorn redevelopment plans, along with the Eisenhower expansion plans, are all part of the ongoing discussions for growth and development in the West End.

The issue is not only how VA Paving will operate, but also how any of the many businesses along the Van Dorn corridor will operate. [Current plans for the proposed Landmark redevelopment now include an estimated 1500 condominium units and a 500-room hotel, but there are few specific proposals for a significant expansion in the commercial and retail base in that corridor.]

After the hearing, one of the local residents who presented a statement said the goal of some residents was to shut down the VA Paving Co. altogether, along with other West End industrial properties, in order to add more housing stock. This is part of the ongoing controversy as to what direction the Eisenhower Avenue expansion should take.

However, at the Sept. 18 hearing, City officials repeatedly stated that VA Paving is a legally operated business and not a renegade plant. An inspection two years ago found 22 minor infractions, none of which were considered suitable for civil or criminal penalties, officials said.

Similarly, the facility contributes an estimated $350,000 to the Alexandria tax base on an annual basis.

While you cannot speak before the Joint Session on Sept. 26, you are invited to submit any of your comments to members of the City Council (jackie.henderson@alexandriava.gov) and to the Planning Commission (kendra.jacobs@alexandriava.gov). Let these staffers know that you want your comments forwarded to the respective governmental bodies.

You can speak at the Oct. 3 City Council session for up to 3 minutes. Be sure to fill out a form and turn it in to the clerk when you arrive.

I am neither a stenographer nor a court reporter, so I don't mean these remarks to be seen as a comprehensive summary. My concern is that this is a very confusing issue, and the press has not covered it in the depth and detail that is needed. Obviously, Katie Couric isn't going to tackle this topic nor are her counterparts, so we all need to find out as much information as we can on our own, and then draw our own conclusions. Talk about the issues I have raised with your neighbors and local friends. Look for the facts.

Sincerely,

Kathleen M. Burns
1036 N. Pelham St.
Alexandria, VA 22304

18Sept06BSVCAremarks.doc

Hon. Chairman and Members of Planning Commission
Hon. Mayor and Members of City Council
Alexandria, Virginia

Re: Virginia Paving Company SUP Amendment October 2006 — September 26, 2006

We urge you to approve Virginia Paving Company's request for an SUP amendment to allow vehicles to exit and enter the plant at 5601 Courtney Avenue at night, on Sundays and holidays, and permit an increase in the height of the stack to 20 meters.

Through measurements, modeling, and analysis, at least three sets of independent experts have shown that the plant's operations pose no threat to public health and safety.

City staff has worked diligently during the past year and half to review the plant's operations and recommend more than 70 conditions that give the City unprecedented control and authority over the plant's emissions and operating characteristics.

Virginia Paving Company has worked with the surrounding community in numerous meetings, offering information and plant tours, as well as providing a 24-hour contact number for use by anyone in our city.

The SUP amendment for night-time use of trucks allows the City to ask for major capital investments that will improve air and water quality as well as reduce noise, odors, and other perceptible effects of an industrial use. Without the SUP amendment, the plant would remain in operation, but would not be able to justify the level of investment that would be made as a result of approval of the SUP, and the City would have few mechanisms available to it in regulating the plant.

In summary, we believe the scientific studies and the staff assessments. We also believe that the conditions listed in the staff report are sufficient to ensure that the Virginia Paving Company's Alexandria plant will operate as a good neighbor using sound environmental and business practices. Finally, we believe that City staff and Virginia Paving staff will make sure that the conditions are enforced.

We therefore conclude that approving the SUP amendment request has great potential benefits to the City of Alexandria, while not approving the request would be to lose a huge opportunity to improve an industrial use. We request approval of the SUP amendment.

Respectfully submitted:

Signature	Printed Name	Date
[signature]	Scott C. Humphrey	9-27-06
Roger Machanic	Roger Machanic	9-28-06
Donald F. Simpson, Sr.	Donald F. Simpson, Sr.	9-27-06
[signature]	Don Simpson Jr	9-28-06
[signature]	Mel Fortney	9-28-06
[signature]	Fred Zamer	10-2-06

Planning Commission
City Council
September 26, 2006

Continuation Page

Signature	Printed Name	Date
Anita A. Slaymaker	ANITA A. SLAYMAKER	10-2-06
Mark S. Allen	MARK S. ALLEN	10-2-06
[illegible]	Andres Domayko.	10-3-06
Monty Duncan	Monty DUNCAN	10-3-06

Hon. Chairman and Members of Planning Commission
Hon. Mayor and Members of City Council
Alexandria, Virginia

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We therefore conclude that approving the SUP amendment request has great potential benefits to the City of Alexandria, while not approving the request would be to lose a huge opportunity to improve an industrial use. We request approval of the SUP amendment.

Respectfully submitted:

Signature	Printed Name	Date
[signature]	FRANK R. SCHEER	10/2/06
[signature]	SAM DICKENS	10/2/06
[signature]	HEDE H CHU	10/3/06
[signature]	GUY THRIFT	10/3/06
[signature]	DOMINIC FRIMPONG	10/3/06
[signature]	MAHER EZZEDINE	10/3/06

Planning Commission
City Council
September 26, 2006

Continuation Page

Signature	Printed Name	Date
	BING ZHAO	10/03/06
	Robert Tonkins	10/03/06
	MICHAEL GAYLORD	10-3-06
	Reginald L Mitchell	10-3-06
	DON ALLEN JR	10-3-06
	GAIL RINALDI	10-3-06
	Virginia Allen	10-3-06
	Joseph Goff	10-3-06
	Carlos Flores	10-3-06

PC Docket Item # 6
Case Number(s) SUP2005-0042

"Willis Reilly"
<reillyw@erols.com>
09/27/2006 11:02 AM

To <pnzfeedback@alexandriava.gov>
cc
bcc
Subject Virginia Paving SUP

Dear Commission Members:

I write to you as a resident of the Cameron Station community (Address: 281 Cameron Station Blvd.)

I understand that there is a measure of emotion over this SUP, owing to night work at the plant, inter alia. The company has clearly been in violation of the current standing SUP, but it is also clear that the State of Virginia and the City of Alexandria have been complicit in the violations over night work as they have set a policy toward laying of asphalt at night in the interest of the general good of traffic management - which I happen to believe is a common sense approach.

With that having been said, it strikes me that the real issue at hand comes down to the problems it has caused in the surrounding communities. I have visited the Virginia Paving Company and read various community comments on the issue. I believe that Virginia Paving Company is a responsible corporate entity which wants to do the correct thing. The terms of the proposed SUP seem to take care of all the possible problems that need to be attended to. Granted there is further work to be done by Virginia Paving, but it appears that they can reasonably satisfy those remaining requirements within the next year and that they are fully committed to doing so. Also, the placement of the sensors in the vicinity of Tucker ES seem to have satisfactorily ascertained that they are maintaining standards concerning air pollution.

Although some in my community claim to have detected noxious odors attributable to the plant in our area, I vae not. For that matter I have also not been offended by noises in the night that could be traced to the plant. My greatest concern would be over stream pollution, but I have not seen compelling evidence that this is a problem and Virginia Paving is planning further action to ensure that they do not pollute that stream. Since it becomes a matter of testing and enforcement, I assume that the city and state authorities will do their part to ensure that this does not become a problem.

I recommend that you approve and forward to the City Council the proposed SUP affecting Virginia Paving Company.

Sincerely,

Willis J. Reilly

August 29, 2006

The Honorable William D. Euille, Mayor
City Hall
301 King Street
Alexandria, VA 22314

The Townes at Cameron Parke Homeowners Association
3810 Dominion Mill Drive
Alexandria, VA 22304

Re: SUP for the Virginia Paving Company—Alexandria Branch

Dear Mayor Euille:

On August 22, 2006, the Board of Directors of the Townes at Cameron Parke Homeowners Association, located on Eisenhower Avenue in the City of Alexandria, agreed that we do not have any issues with the Alexandria branch of the Virginia Paving Company as it relates to smell, sound or truck traffic.

Thank you for considering the position of TCP's Board of Directors on this issue.

Sincerely,

Katharine Medina, President
The Townes at Cameron Parke Homeowners Association

Cc: Members of City Council

Richard Josephson/Alex
10/02/2006 07:49 PM

PC Docket Item # 6
Case Number(s) SUP2005-0042

bcc

Subject Fw: Re: Virginia Paving

please copy for distribution to PC members

-----Forwarded by Richard Josephson/Alex on 10/03/2006 07:45PM -----

To: <kramer2006@comcast.net>
From: Rich Baier/Alex
Date: 10/02/2006 08:27AM
cc: JGuess@C-O-R.COM, Richard Josephson/Alex@ALEX
Subject: Re: Virginia Paving

Thank you for this email--I will share it with staff from the Planning Dept. and I would advise you to copy the Planning Commission and City Council via our website.

Richard J. Baier, P.E.
Director
Transportation and Environmental Services
City of Alexandria
301 King Street
Alexandria, VA 22314
(703) 838.4966
Fax: (703) 519.3356

<kramer2006@comcast.net>

<kramer2006@comcast.net>

10/01/2006 09:51 AM

To<Rich.Baier@alexandriava.gov>

cc<JGuess@C-O-R.COM>

SubjectVirginia Paving

I just want to let you know they are a good neighbor! I live in the Summers Grove townhome development across from the Van Dorn Metro.
Virginia Paving was not even on the map until Cameron Station was built out. Now the people want to make them jump through hoops
because they bought right at thier back door. When I bought in Summers Grove the builder informed me of the rail lines on both sides
of the property. So no surprise that you can hear a train now and again. The idea that someone would

have the nerve to think they could
make Virginia Paving change their operation is absurd! Better yet make them move is insane. Alexandria has always had its share of NIMBY'S
(NOT IN MY BACK YARD). Virginia Paving should at the very least have a Grandfather status and not have to change a thing. If its a noise
problem the builder at Cameron Station should have provided sound barriers. I think it take alot of nerve to have Virginia Paving make the
changes. They have been there for around fourty years. How long have these big mouths in Cameron Station been there?

Sincerely,

James R. Guess
955 Harrison Circle
Alexandria, VA. 22304
703-461-0377

EISENHOWER PARTNERSHIP

PC Docket Item # 6
Case Number(s) SUP2005-0042

October 2, 2006

The Honorable Chairman and Members of the Planning Commission
City Hall
Alexandria, VA 22314

RE: Docket of October 3, 2006, Item # 6. SPECIAL USE PERMIT #2005-0042

Dear Chairman Wagner and Planning Commission Members:

On behalf of the Board of Directors of the Eisenhower Partnership, I am writing to indicate we agree with the staff recommendation in support of the SUP amendment by Virginia Paving Company.

Our Board had representatives from Virginia Paving and Cameron Station present their views on the SUP amendment at Board meetings this spring. In addition, we have reviewed materials from other interested parties and materials provided by the city. While we appreciate the concerns of residents residing near Virginia Paving, we believe that the SUP amendment should be approved.

Virginia Paving is a valued business in Alexandria. It provides significant tax revenues to the city, is a major employer and also contracts with the city for its paving projects. In addition, Virginia Paving has demonstrated its strong commitment to being a good corporate citizen by offering to make substantial improvements to its facilities above and beyond what is needed considering that 3 separate air quality firms have concluded that the plant poses no hazard to public health or safety. A number of these improvements have already been made, and others are pending approval of the SUP.

Virginia Paving has met regularly with community groups to discuss the situation, identify concerns and develop solutions where appropriate. Looking ahead, when the city begins its long-awaited study of Eisenhower West in a few months, the question of land use and compatibility in that part of Alexandria will be an important component of that study. We look forward to working with city staff and consultants on this critically important study for the future of Eisenhower Valley.

Again, we urge you to approve the SUP amendment by Virginia Paving. The end result will be an improved facility that will be as clean and efficient as those of any plant in California, site of the nation's strictest operating standards. If the SUP is not approved, the plant will continue to operate but with only those upgrades already made.

Sincerely yours,

Janet R. Gregor

Janet R. Gregor
Executive Director

EISENHOWER

Janet R. Gregor
Executive Director

Eisenhower Partnership

2121 Eisenhower Avenue, Suite 200, Alexandria, VA 22314
703.684.5124 FAX 703.684.7887
Email: info@eisenhowerpartnership.org
www.eisenhowerpartnership.org

"Heath, Maureen (Space Technology)" <maureen.heath@ngc.com>

10/02/2006 02:54 PM

PC Docket Item # 6
Case Number(s) SUP 2006-0042

bcc

Subject FW: The West End

Please consider the following.

From: Heath, Maureen (Space Technology)
Sent: Monday, October 02, 2006 10:42 AM
To: 'alexvamayor@aol.com'; 'MacdonaldCouncil@msn.com'; 'councilmangaines@aol.com'; 'rob@krupicka.com'; 'delpepper@aol.com'; 'PaulCSmedberg@aol.com'; 'timlovain@timlovain.com'
Subject: The West End

Dear Mayor and City Council:

The West End has undergone significant development and change in the last 10 years becoming substantially more residential and bringing Alexandria hundreds of new homes, a new school, a new library and several new parks.

The City approved and encouraged all this development and the resulting addition of these new homes and has increased the City's tax and voter base substantially.
We are doing our part to improve Alexandria now it's your turn to do your part and keep your part of the bargain. The West End cannot be both a nice residential community and an industrial area and dumping ground.

What you need to do:

1. **Vote NO on Virginia Paving SUP**. In fact it's time for them to find a new home. The city has markedly changed around them. They may have been here first but the City approved and encouraged this development. You can't have it both ways. VA paving is a health hazard and needs to shut down.
2. **Increase the maintenance of the Parks and recreation areas in the West End.** The maintenance in Ben Bremen Park has improved from last year but there are still significant dead plantings and the numbers of trees called for in the original plan were never installed. There are also numerous street lamps that are broken or burned out constituting a safely hazard.
3. **Increase the police presence.** We need more patrols and speed tables installed along Cameron Station Blvd. There are also big rigs parked along Picket St. between Cameron Station Blvd and Van Dorn in clear NO Parking areas and abandoned tractor trailers in an empty lot on the east side of Picket near the intersection of Cameron St. Blvd and Pickett. This is within walking distance of an elementary school and a heavy trafficked area.

Your assistance in the continuing improvement of the West End is appreciated. We are now a significant voting block.

Thanks
Maureen Heath
5250 Bessley Place
Alexandria, VA 22304

PC Docket Item # 6
Case Number(s) SUP 2005-0042

"John Johnson" <john@johnsonassociates.biz>

10/02/2006 08:59 PM

Please respond to <john@johnsonassociates.biz>

To <richard.josephson@alexandriava.gov>
cc
bcc
Subject Virginia Paving SUP Request

History: This message has been replied to.

I wish to voice my objection to the request by Virginia Paving Company for a new Special Use Permit that is scheduled to come before the Planning Commission on Tuesday, October 3, 2006.

Since buying the existing facility in 2001, Virginia Paving has been in violation of its current SUP by working outside permitted hours, violating EPA Clean Water Act standards, dumping waste illegally, discharging waste into a state waterway, various fire code infringements, and other violations. Although they have not complied with the current SUP, they now want a new one that will make conditions even worse. There is something terribly wrong with this picture.

If Virginia Paving is granted the new SUP, they plan to increase production from about 600 thousand tons to 1 million, 200 thousand tons of asphalt per year. This means increased pollution that is already health threatening, significant increases in truck traffic on an already congested South Van Dorn Street, increased unpleasant asphalt odor, and increased truck and manufacturing noise, all of which will affect our living conditions 24 hours a day, seven days a week.

It has been reported frequently that there is interest by various groups to see the West End of Alexandria developed with increased retail shops, restaurants, residential and other commercial establishments. It is rather doubtful that any restaurant or shop owner would want to invest in a location that is in close proximity to an asphalt plant that is operating 24/7.

I regret that my family is exposed to the existing pollution, noise and odor caused by Virginia Paving, but I regret even more that the children who attend Tucker Elementary School are more exposed because they are closer to the asphalt plant. I shudder to think what we all will be facing if the new Special Use Permit request is granted and we see the Virginia Paving asphalt plant spewing forth pollution, noise and odors every day and every night.

I strongly urge the Planning Commission to reject the request by Virginia Paving for a new SUP.

Sincerely,

E. G. (John) Johnson, CAE
Johnson & Associates
5242 Tancreti Lane
Alexandria, VA 22304-8702
Ph/Fax: 703-549-7870
Mobile: 571-215-3028
john@johnsonassociates.biz

PC Docket Item # 6
Case Number(s) SUP 2005-0042

"mrjtjs" <mrjtjs@comcast.net>
10/03/2006 01:14 PM

To <richard.josephson@alexandriava.gov>
cc
bcc
Subject VA Paving SUP

As residents of 334 Cameron Station Blvd, Michelle Judson and I do not support the VA Paving SUP. We do not support further industrialization of this already overdeveloped area.

PC Docket Item # 6
Case Number(s) SUP 2005-0042

"Boomerang Promotions, Inc"
<sales@boomerangpromos.com>
10/03/2006 12:45 PM

To <richard.josephson@alexandriava.gov>
cc
bcc
Subject VA Paving SUP

This email is to express my concerns about the upcoming VA Paving SUP and subsequent hearing.

I would like to request denial of the VA Paving SUP.

Thanks

Chris Bauernshub
Cameron Station Resident
Alexandria, VA

PC Docket Item # 6
Case Number(s) SUP 2005-0042

<katemmacdonald@comcast.net>
10/03/2006 11:43 AM

To <jim.hartmann@alexandriava.gov>, <richard.josephson@alexandriava.gov>, <alexvamayor@aol.com>, <MacdonaldCouncil@msn.com>,
cc
bcc
Subject Request denial of VA Paving SUP

To the members of the Planning Commision and Council,

My husband and I respectfully request denial of Virginia Paving Special Use Permit (SUP). We are unable to make it to the Council Chambers for this evenings meeting, but want to express our position.

Sincerely,
Kate

PC Docket Item # 6
Case Number(s) SUP 2005-0042

"Marjorie K. Conner" <kayeconner@earthlink.net>
10/03/2006 11:36 AM

To <jim.hartmann@alexandriava.gov>, <richard.josephson@alexandriava.gov>
cc <alexvamayor@aol.com>, <MacdonaldCouncil@msn.com>, <councilmangaines@aol.com>, <rob@krupicka.com>, <delpepper@aol.com>, <PaulCSmedberg@aol.com>,
bcc
Subject Virginia Paving SUP hearing

Planning Commission:

I understand that the Planning Commission will hear Virginia Paving's plans to expand this plant to produce 1.2 million tons up from 600,000 tons this evening. As I understand it, in order to expand its production as planned, Virginia Paving would have to work 24/7 – and produce pollution 24/7.

I also understand that in order to meet EPA acceptable levels Virginia Paving must raise its stack heights from 16 meters to 20 meters. Logically, this increase in height will cause the soot, etc to be spread over a larger area. Virginia Paving's pollution is bad enough as it is. Please deny the special use permit.

Thanks,

Marjorie K. Conner
700 West View Terrace
Alexandria, Virginia 22301
(703) 706-5917 (tel)
(703) 997-2518 (fax)
(703) 626-6980 (mob)
kayeconner@earthlink.net

This transmission, including any attachments, may contain privileged or confidential information. It is intended only for the use of the person(s) addressed above. If you are not the intended recipient, you are hereby notified that any review, dissemination, distribution or duplication of this communication is strictly prohibited. If you are not the intended recipient, please advise the sender by reply email and destroy all copies of the original message.

PC Docket Item # 6
Case Number(s) SUP 2005-0042

lise_lyles@comcast.net
10/03/2006 11:30 AM

To richard.josephson@alexandriava.gov
cc
bcc
Subject Cameron Station VA Paving SUP

I request denial of the VA Paving SUP at Cameron Station.

Thank you,

Lise Lyles

PC Docket Item # 6
Case Number(s) SUP 2005-0042

"Mildred Starek"
<stareks@comcast.net>
10/03/2006 11:29 AM

To <richard.josephson@alexandriava.gov>
cc
bcc
Subject SUP for Virginia Paving

Please know that my husband and I, residents of Cameron Station, are adamantly opposed to a SUP for Virginia Paving.

Please deny their request.

Thank you.

Mildred and Roscoe Starek
241 Somervelle Street
Alexandria, VA 22304

PC Docket Item # 6
Case Number(s) SUP 2005-0012

"Sottile, P.J." <psottile@steptoe.com>
10/03/2006 11:26 AM

To <richard.josephson@alexandriava.gov>, <jim.hartmann@alexandriava.gov>, <alexvamayor@aol.com>, <MacdonaldCouncil@msn.com>,
cc
bcc
Subject Virginia Paving SUP--request for denial

To the Planning Commission and the City Council,

Due to work commitments, I am unable to attend the Planning Commission meeting this evening. As a Cameron Station resident, I urge denial of the Virginia Paving SUP request.

Thank you,
Patricia J. Sottile
5120 Donovan Dr. # 307
Alexandria, VA 22304

PC Docket Item #6
case number SUP 2005-004

"Heath, Maureen (Space Technology)" <maureen.heath@ngc.com>
10/03/2006 11:18 AM

To <richard.josephson@alexandriava.gov>, <jim.hartmann@alexandriava.gov>
cc
bcc
Subject The West End

Dear Planning Commission Members:

The West End has undergone significant development and change in the last 10 years becoming substantially more residential and bringing Alexandria hundreds of new homes, a new school, a new library and several new parks.

The City approved and encouraged all this development and the resulting addition of these new homes and has increased the City's tax and voter base substantially.
We are doing our part to improve Alexandria now it's your turn to do your part and keep your part of the bargain. The West End cannot be both a nice residential community and an industrial area and dumping ground.

What you need to do:

1. **Vote NO on Virginia Paving SUP**. In fact it's time for them to find a new home. The city has markedly changed around them. They may have been here first but the City approved and encouraged this development. You can't have it both ways. VA paving is a health hazard and needs to shut down.
2. **Increase the maintenance of the Parks and recreation areas in the West End.** The maintenance in Ben Bremen Park has improved from last year but there are still significant dead plantings and the numbers of trees called for in the original plan were never installed. There are also numerous street lamps that are broken or burned out constituting a safely hazard.

Your assistance in the continuing improvement of the West End is appreciated. We are now a significant voting block.

Thanks
Maureen Heath
5250 Bessley Place
Alexandria, VA 22304

PC Docket Item #6
Case number SUP 2005-0042

charles_lyles@comcast.net
10/03/2006 11:13 AM

To richard.josephson@alexandriava.gov
cc
bcc
Subject Cameron Station VA Paving SUP

I request denial of the VA Paving SUP.

Thank you,

Charles Lyles

PC Docket Item #6
Case number SUP 2005-001

"Heider, Elizabeth" <Elizabeth.Heider@skanskausa.com>

10/03/2006 11:05 AM

To <jim.hartmann@alexandriava.gov>

cc <richard.josephson@alexandriava.gov>

bcc

Subject Please DENY VA Paving SUP

Dear Mr. Hartmann

As a resident of Rosemont, I strongly urge you to deny VA Paving their request to expand production from 1.2 million tons up from 600,000 tons. In order to meet their increased production goals, VA Paving would have to work around the clock. Furthermore, in order to meet EPA requirements, I understand that they must raise the stack heights from 16 meters to 20 meters causing their pollution to be spread over a larger area affecting all of Alexandria. Have you noticed the increase in filth that blankets your house? Not only do we have to wash windows bi-annually, we now have to scrub the mullions to rid them of the sticky black filth. Imagine what this is doing to our lungs. Imagine what this is doing to our children's lungs. Please deny VA Paving this SUP. I can not imagine that the short term gain for VA Paving or any revenue the City would gain would be worth the toll on our environment and our health.

Sincerely,

Elizabeth J. Heider AIA
Alexandria Office
600 Johnston Place
Alexandria, VA 22301

elizabeth.heider@verizon.net
703.519.0136 Office/Cell
866.540.0206 FAX

METROPOLITAN WASHINGTON AIRPORTS AUTHORITY

October 3, 2006

Planning Commission
City of Alexandria
P.O. Box 178
Alexandria, Virginia 22313

To the Members of the Planning Commission:

I am writing on behalf of the Metropolitan Washington Airports Authority (Authority) in support of a Special Use Permit for Virginia Paving.

Construction is difficult in this region. Quite often work needs to happen on nights and weekends to minimize the impact on commuter traffic, the traveling public, and even Airport operations. It is important for the Authority and other businesses to be able to access construction material including concrete at all hours, including holidays and weekends.

The Authority supports granting Virginia Paving the special use permit.

Sincerely,

Jonathan Gaffney
Vice President for Communications

JG:dlm

1 Aviation Circle, Washington, DC 20001-6000 • www.mwaa.com

Community Forum: Oct.3, 2006
Statement from individuals-----Kathleen M. Burns, 1036 N. Pelham St., Alex., VA 22304

Thank you for this opportunity to speak.
On occasion, it seems that some urban myths have taken on a life of their own and that simply repeating a false assumption, over time, makes it come true. These are some of the comments I have heard which disturbed me.

1. Virginia Paving is equal to the Mirant Power Plant in generating pollution and both should be closed. Erica Vannerman, Alexandria's air pollution specialist, noted that Mirant produces a 100 tons of pollution a year and is considered a "major" Title 5 producer of pollution .

Using the same national scale, Ms. Vannerman said VA Paving is considered a "minor" source of pollution, generating 3 to 4 times less than Mirant.

That is not to say that both facilities shouldn't be required to meet rigorous local, state and federal environmental rules. But Mirant does not appear to have done that, and, unfortunately, the federal government's EPA currently is opposing the recomendations by Virginia's own Department of Environmental Quality and the recommendations by the Alexandria City Council.

2. Virginia Paving has no business in Alexandria.
This is somewhat arbitrary. I can see the objection to Alexandria having pornography outlets (which used to line 14th Street in Washington, DC) or places of prostitution (which are legal in Europe.) But this is a viable business that has been operating in Alexandria since 1960. It is in the midst of an industrial park, which is designed for such businesses. No, it is not as clean at the Coca Cola plant or Editorial Experts---both Alexandria businesses---but it is operating legally. And VA Paving does significantly contribute to the West End tax base, with an estimated $350,000 in annual payments.

3.Why should VA Paving be allowed to operate at night?
When the company opened in 1960---according to a City staffer---the regulations had said it should operate in daylight----because of the absence of adequate street lighting.
That is quite a different thing today. Also, the nature of the asphalt business requires companies to operate at night-----since daytime paving would further cripple traffic. The City staffer said asphalt contacts REQUIRE them to operate at night----and this is true for Virginia Paving's 4 main clients: Alexandria, Arlington, the Commonwealth of Virginia and the state/federal Wilson Bridge project. The staffer noted that: "night time paving is the norm today" in the asphalt business, and not some inappropriate request. The staffer added that the city was not aware of any violation of the operating hours requirement stated back in 1960 until they did the 2004 inspection, and that there was no intent to ignore any operating regulations.

4.Alexandria's Code Enforcement department has the ability to close down ANY city facility if there are serious health and safety violations, and thus they should close down VA Paving.
According to the City staffer, "numerous small problems" were found during an inspection of VA Paving two years ago. None of the violations were considered civil or criminal violations. According to the City, there were 22 violations cited, and corrective action has been taken to resolve all of them.
Yes, close down immediately anything that is an imminent hazard and a proven risk to the community's health and safety, but quantify other risks and mandate procedures to remedy them.

5. Noise is an annoying problem.

Yes, it is. But when I went for a tour of the facility, the noise seemed to be coming from 3 major train lines that service this area: Amtrak, Virginia Rail Express and Metro. (I went for a daylight inspection.) I understand that some accommodations have been reached with both sides regarding other sources of noise.

Given that the plant had been there, in an industrial park, since 1960, and the residents are a relatively recent development, it seems akin to moving next to Dulles Airport and then being angry about the noise of planes overhead.

6. Odors?
Here, I would fault the previous Planning staff, from more than 10 years back, when discussions began to convert a military base into a housing complex. It was a serious error in judgment for the City not to require any buffer zone, between Cameron Station and all its neighbors. The City made it perfectly legal for developers to build right up to the drainage ditch/storm sewer that runs through the community---instead of mandating a substantial setback area, where no construction could occur. The buffer area could have also been landscaped with shrubs and trees to deaden sound, but the City did not require that. [The new SUP conditions do deal with this aspect.]

7. Storm Water issues
After the July deluge, this has become a MAJOR concern throughout Alexandria, and not just near Virginia Paving. There was extensive flooding in the Brookville-Seminary Valley area and it turns out that an extensive study is needed to see how we can cope with the influx of residential, commercial and industrial development in our city and its sewer/water/treatment systems.

Hopefully, storm water issues are among the 74 conditions imposed by the City in a way that will benefit both residential consumers and VA Paving. No one wants to be a victim of flooding or sewer back-up.

8. Traffic
As far as I know, traffic generated by the trucks in and out of the VA Paving facility on Van Dorn has not been discussed extensively in our community. I vastly prefer commercial vehicles traveling down Van Dorn, in easy reach of the Beltway interchange, than going down Alexandria's secondary streets.

Since the City is now studying the overall Landmark Corridor extension, the industrial park area which includes VA paving and all the other businesses along that corridor should be included in the proposals for study. And Fairfax should be intimately involved since the traffic in this corridor is not limited to Alexandrians.

Thank you for this hearing. We look forward to successful resolution of the issues that have been raised.

Remarks by Matthew Natale, 10/03/06 Planning Commission Meeting, Item #6, Va Paving SUP

Hello, my name is Matthew Natale, 3401 Martha Custis Drive. Good evening Mr. Chairman, commission members and staff. I appreciate your service to Alexandria.

With all that be said and reported about Va Paving, it's important to point out what issues won't be resolved tonight.

Many citizens want the Va Paving shut down entirely. That won't be resolved tonight. Va Paving has knowingly operated in violation of its SUP. That won't be resolved tonight.

The City has not fully enforced the SUP, allowing many critical violations to continue. Won't be resolved tonight either.

Nor will be the serious fears about the harmful environmental impact of allowing this type of industrial use near residential areas.

So there is a great deal that won't be resolved. However what you recommend to Council tonight is hugely important because if this SUP is approved - all those issues would be essentially be resolved in favor of Va Paving and against the citizens. And that would be premature.

It's fair to say that we all know that the City would never allow asphalt plant to be located so close to a residential area. Never.

It is only so because of a quirk of history that occurred when Cameron Station was developed as a residential community.

That being case, quite frankly, let's not compound these problem by approving this SUP and doubling the use of this industrial facility.

Further more, with VA Paving continuing to violate its

SUP, it's vital you do not reward negative behavior. Rewarding negative behavior is the worst thing that could happen. It set a precedent with implications well beyond this one situation.

With that thought in mind, frankly, I find this over reaching SUP application to be over the top. I understand it from a business perspective. It lacks a sense of boundaries or regard for the big picture.

This application has only served to mobilize the community. Now it is turning a community issue into a referendum. This evolution will only accelerate should the SUP gain approval.

And when this issue gets to Council, it won't take long for that body to calculate that the status quo - which is in between those who want the plant shut down permanently and a company that wants to double their production - is the where they want to stand. Or maybe it's crazy genius tactics with the ultimate goal of re-casting the unacceptable status quo into a so-called compromise position. And the theorizing can on and on.

I commend the citizens of Cameron Station. They do not have the funds to hire a national public relations firm and conduct professional public opinion polling.

But they have each other and a steely determination to see this fight through to the end. Still, where do citizens turn when faced such money and power? The government, which is, or should be, the great equalizer. Tonight we are turning to you.

Ultimately, as you know, this is a Council decision, so even this matter won't be fully resolved. But what message will be sent tonight?

Rewarding Va Paving's negative behavior sends the wrong message. I urge you to send the right message to Council with a unanimous NO vote.

RECEIVED
JUL 29 2005
INTERSTATE

COMMONWEALTH of VIRGINIA

DEPARTMENT OF TRANSPORTATION
14685 Avion Parkway
Chantilly, VA 20151
(703) 383-VDOT (8368)

GREGORY A. WHIRLEY
ACTING COMMISSIONER

July 26, 2005

The Honorable William D. Euille
Mayor, City of Alexandria
106 East Nelson Avenue
Alexandria, VA 22301-2036

Dear Mayor Euille:

This is to follow up on our phone conversation today regarding the City Council's action in June restricting any night-time paving by Virginia Paving Company from its Courtney Avenue plant, with the exception of paving related to the Wilson Bridge Project. As you know, Virginia Paving Company is VDOT's contractor for this year's interstate paving work.

Heavy traffic volumes on our interstate system along with major construction at the Springfield Interchange and Wilson Bridge make daytime paving operations practically impossible. Therefore, we strongly encourage our contractor to work at night.

We currently have about $2.5 million worth of work remaining on portions of I-395 and the Beltway that will require 70 nights to complete. Limiting paving operations to mid-day and weekends would require 110 days to get the same work done. That means the contractor would be working into November when temperatures can drop below 50 degrees, the minimum temperature needed to pave. In addition, if Virginia Paving is not permitted to use the Courtney Avenue plant at night, they will have to haul the asphalt from considerable distances. The closest plant is in Sterling, some 30 miles and 45 minutes from I-395. Hauling hot asphalt 45 minutes or longer seriously compromises the quality of the asphalt.

In closing, we request that Virginia Paving Company be permitted to continue night-time paving operations using the Courtney Avenue plant to complete scheduled work on I-395 and the Beltway. In addition, we ask that all interstate projects within or adjacent to the City of Alexandria be permitted to use the Courtney Avenue plant for night-time operations under the revised Special Use Permit scheduled for consideration in September.

Thank you and please let me know if there is additional information I can provide.

Sincerely,

Dennis C. Morrison

Dennis C. Morrison
District Administrator
Northern Virginia District

Copy: Renée Hamilton
Albert Rollins

WE KEEP VIRGINIA MOVING

9.4

VA Paving Staff Report
Attachment #1

9-12-60 # 398 ... 4-12-60 3-22-60 398

APPLICATION
for
SPECIAL USE PERMIT, ART. X, ORD. 708

Alexandria, Va., February 10 ~~19~~ 1960

TO THE CITY MANAGER:

The undersigned hereby applies for a Special Use Permit under the provisions of Article X, Ordinance 708, as follows:

Name of Applicant: Newton Asphalt Company, Incorporated

Name of Owner: Contract owner - Alexandria Bituminous Corporation

Premises located at: Courtney Avenue, Alexandria, Va. (Map No.46, Lots ~~4~~, ~~4~~, 5, 6 & 7) (Legal lots 4-4 & 5 of Courtney Subd.)

Use requested: Asphalt Plant MAP 37

miller 11-4-1800

John Thorpe Richards
(Signature of Applicant) John Thorpe Richards,
Atty. for Alexandria Bituminous Corp.
102 N. Fairfax St., Alex., Va.
(Address)
Te6-7400
(Telephone Number)

(DO NOT WRITE BELOW THIS LINE)

Application received 2/18/60 Fee Paid 2/18/60 Amount $40.00 Date of Council Hearing 3/8/60

Advertised on .... Adjoining property owners notified ....

Referred to Planning Commission .... Report received ....

Traffic Board 2/18/60 Report received 2/23/60

Health Dept. 2/18/60 Report received 3/1/60

Fire Prevention 2/18/60 Report received 2/23/60

Building Inspector 2/18/60 Report received 2/23/60

Public Works 2/18/60 Report received 2/23/60

March 8, 1960 -- referred to Planning Commission for further reports in re Health and public nuisance aspects.

APPROVED BY COUNCIL: .... DENIED ON: ....
March 22, 1960 see over for motions

SPECIAL USE PERMIT
ISSUED UNDER THE PROVISIONS OF ARTICLE X, ORD. 708

No. 398

Permission is hereby granted to .... to use

property located at ....

....

RECEIVED
CITY CLERK'S OFFICE
... 7 1960
From ...
For Docket 3-8-60

for the following purpose: ....

and under the following conditions: ....

....

(Date) CITY MANAGER

Applicant

1 95

March 22, 1960
1st motion -- in view of the action on Item No. 11 it would not be proper
to consider this application.

2nd motion -- Deferred action on SUP #398 until the next Regular Meeting of
Council on April 12, 11960 at which time the Public Hearing will
be held on the above emergency rezoning Ordinance

April 12, 1960 -- Granted, subject to the recommendations and requirements
of the various City departments.

96

- 3 -

SPECIAL USE PERMIT REQUIREMENTS SHEET

Applicant: Newton Asphalt Company, Inc. Application No. 398

Location: Lots 2, 3, 4 & 5 of Courtney Avenue North side of Courtney Ave., 600' east of South Van Dorn Street. Date: February 26, 1960

Use Requested: Asphalt plant

RECOMMENDATIONS:

Department of Traffic Control: If request is granted, it be granted subject to the following: That exits and entrances to the property be approved by the Directors of Public Works and Traffic. That, if in the opinion of the Director of Public Works, a bond should be required for the damages to street and keeping same clean, that it be required. That all trucks serving this asphalt plant comply with maximum load limits. That such signs that may be deemed appropriate by the Director of Traffic be supplied and the cost for installation and maintenance of same be born by the applicant. (over)

Department of Health: This company has a good record of cooperation and compliance with Health Department recommendations. Their plant presently located on Mill Road was installed in July 1956. Control of dust, smoke, odor and industrial waste has been satisfactory since that time. If request is granted, it be granted subject to the following: (1) Detail plans for installation must receive approval of the Alexandria Health Department in consultation with the Bureau of Industrial Hygiene of the Virginia (over)

Department of Public Works: If request is granted, it be granted subject to the following:

1. Applicant to make necessary arrangements with Fairfax County Sanitary Sewer Dept. for sewer service.
2. Any realignment, dredging, or improvement of Back Lick Run to be subject to approval of Director of Public Works. (over)

Fire Prevention Bureau: Approved to location only - Any buildings to be constructed plans must be submitted.

Department of Construction & Inspection: At such time as drawings are presented of the subject installation, they will be reviewed for the purpose of ascertaining if they are in compliance with all the applicable regulations which are enforced by this department.

Alexandria Planning Commission: Recommend granted to Newton Asphalt Company, Inc., subject to the recommendations of the various interested departments; and if approved by City Council, the special use permit to held in abeyance until a certificate of occupancy has been issued bearing a certification of compliance with their recommendations by all city departments.

Others:

Application was denied by City Council on ______________________.

Application was approved by City Council on 3/12/60 subject to compliance with recommendations of the various City Departments, Commissions and Boards as outlined above. The Department Heads shall certify that all work recommended by them has been completed on the application for Certificate of Occupancy.

NOTE: Granting of a special use permit by Council does not constitute issuance or permission to operate. A Certificate of Occupancy must be issued by the Department of Construction and Inspection and all necessary licenses and other permits must be obtained.

97

Traffic Department

Operation of this plant requiring exit or entrance of vehicles be [illegible]ted after hours of darkness or during inclement weather or on Sundays [or h]olidays.

Continued Public Works Department

3. Arrangements to be made with City Manager for paving of Courtney Drive.
4. Satisfactory settling basins to be provided to prevent discharge of silt, asphalt, etc. into Back Lick Run.

Continued Health Department

State Health Department. (2) Environmental sanitation factors in this operation shall be checked periodically by Health Department Sanitarians. (3) In the event that the plant is found to be creating a public nuisance or a public health problem, operations will be suspended by the company until satisfactory corrections are made in accordance with further recommendation of the Virginia State Bureau of Industrial Hygiene and the Alexandria Health Department.

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SPECIAL USE PERMIT REPORT

From: Department of Planning

Application No. 398

To: Traffic
(Department)

Date February 18, 1960

Applicant Newton Asphalt Company, Incorporated - John Thorpe Richards, Atty. for Alexandria, Bituminous Corp., 102 N. Fairfax St. Te 6-7400

Location Lots 2, 3, 4, & 5 of Courtney Avenue - north side of Courtney Avenue 400 feet east of South Van Dorn Street

Use Requested Asphalt Plant

This request has been set for hearing before City Council on March 8, 1960 and it is requested that you submit a report and recommendation on this request to this office not later than February 23, 1960.

Denis H. Cahill
Denis H. Cahill
Director of Planning.

ACTION OF DEPARTMENT

Date: February 23, 1960

Facts pertaining to request

Recommendations: If request is granted, it be granted subject to the following

That exits and entrances to the property be approved by the Directors of Public Works and Traffic.

That, if in the opinion of the Director of Public Works, a bond should be required for the damages to street and keeping same clean, that it be required.

That all trucks serving this asphalt plant comply with maximum load limits.

That such signs that may be deemed appropriate by the Director of Traffic be supplied and the cost for installation and maintenance of same be born by the applicant.

That no operation of this plant requiring exit or entrance of vehicles be permitted after hours of darkness or during inclement weather or on Sundays or holidays.

RECEIVED
FEB 23 1960
PLANNING DEPARTMENT
ALEXANDRIA, VA.

Kenneth W. Smith
K.W.Smith, Director of Traffic
Department Head

99

SPECIAL USE PERMIT REPORT

From: Department of Planning Application No. 398

To: Public Works (Department) Date February 18, 1960

Applicant Newton Asphalt Company, Incorporated - John Thorpe Richards, Atty. for Alexandria Bituminous Corp., 102 N. Fairfax St. Te 6-7400

Location Lots 2, 3, 4, & 5 of Courtney Avenue - north side of Courtney Avenue 400 feet east of South Van Dorn Street

Use Requested Asphalt Plant

This request has been set for hearing before City Council on March 8, 1960 and it is requested that you submit a report and recommendation on this request to this office not later than February 23, 1960.

Denis R. Cahill

Denis R. Cahill
Director of Planning.

ACTION OF DEPARTMENT

Date: February 19, 1960

Facts pertaining to request

Recommendations: If request is granted, it be granted subject to the following

1. Applicant to make necessary arrangements with Fairfax County Sanitary Sewer Dept. for sewer service.
2. Any realignment, dredging, or improvement of Back Lick Run to be subject to approval of Director of Public Works.
3. Arrangements to be made with City Manager for paving of Courtney Drive.
4. Satisfactory settling basins to be provided to prevent discharge of silt, asphalt, etc. into Back Lick Run.

RECEIVED
FEB 23 1960
PLANNING DEPARTMENT
ALEXANDRIA, VA.

Department Head

100

6

SPECIAL USE PERMIT REPORT

From: Department of Planning

Application No. 398

To: Fire Prevention (Department)

Date February 18, 1960

Applicant Newton Asphalt Company, Incorporated - John Thorpe Richards, Atty. for Alexandria Bituminous Corp., 102 N. Fairfax Street Te 6-7400

Location Lots 2, 3, 4, & 5 of Courtney Avenue - north side of Courtney Avenue 400 feet east of South Van Dorn Street

Use Requested Asphalt Plant

This request has been set for hearing before City Council on March 8, 1960 and it is requested that you submit a report and recommendation on this request to this office not later than February 23, 1960.

Denis H. Cahill

Denis H. Cahill
Director of Planning.

ACTION OF DEPARTMENT

Date: Feb. 23, 1960

Facts pertaining to request

Recommendations: If request is granted, it be granted subject to the following

Approved to location only- Any buildings to beconstructed - plans must be submitted.

RECEIVED
FEB 23 1960
PLANNING DEPARTMENT
ALEXANDRIA, VA.

L. Tullos
Department Head

101

7

SPECIAL USE PERMIT REPORT

From: Department of Planning | Application No. 398

To: Health (Department) | Date February 18, 1960

Applicant Newton Asphalt Company, Incorporated - John Thorpe Richards, Atty. for Alexandria Bituminous Corp., 102 N. Fairfax Street To 6-7400

Location Lots 2, 3, 4, & 5 of Courtney Avenue - north side of Courtney Avenue 400 feet east of South Van Dorn Street

Use Requested Asphalt Plant

This request has been set for hearing before City Council on March 8, 1960 and it is requested that you submit a report and recommendation on this request to this office not later than February 23, 1960.

Denis H. Cahill
Denis H. Cahill
Director of Planning.

ACTION OF DEPARTMENT

Date: February 25, 1960

Facts pertaining to request
This company has a good record of cooperation and compliance with Health Department recommendations. Their plant presently located on Mill Road was remodeled in July 1956. Control of dust, smoke, odor and industrial waste has been satisfactory since that time.
Recommendations: If request is granted, it be granted subject to the following

(1) Detail plans for installation must receive approval of the Alexandria Health Department in consultation with the Bureau of Industrial Hygiene of the Virginia State Health Department.

(2) Environmental sanitation factors in this operation shall be checked periodically by Health Department Sanitarians.

(3) In the event that the plant is found to be creating a public nuisance or a public health problem, operations will be suspended by the company until satisfactory corrections are made in accordance with further recommendation of the Virginia State Bureau of Industrial Hygiene and the Alexandria Health Department.

T. J. McGough
Department Head

102

8

VIRGINIA PAVING CHRONOLOGY

Staff meetings with the community:

- June 30, 2004–Senior T&ES staff meet with Cameron Station community leaders and discussed air quality and potential sources, specifically the Waste-to-Energy Facility and Virginia Paving.
- November 17, 2004–T&ES presents results of short term particulate monitoring.
- May 18, 2005–P&Z staff attend Cameron Station Civic Association to discuss SUP application.
- June 22, 2005–Staff meets with Cameron Station Civic Association members to discuss status of application, process, and enforcement.
- August 17, 2005–Staff meets with Cameron Station Civic Association members to discuss status of application, process, and enforcement.
- October 4, 2005–Staff meets with Cameron Station Civic Association members, David Sullivan (the community's environmental consultant), representatives of Virginia Paving to discuss air quality issues.
- May 9, 2006–Staff meets with community leaders from Cameron Station Civic Association, Cameron Station Community Association, Holmes Run Park Committee, Summers Grove Homeowners Association, Brookville-Seminary Valley Civic Association and the Alexandria Federation of Civic Associations for a briefing on the community-wide meeting.
- May 15, 2006–Staff holds community-wide meeting. Staff, applicant, scientists and community leaders make presentations. Information from meeting, including audio of entire meeting, posted on City's website.
- August 7, 2006–Staff attend community meeting hosted by Virginia Paving to respond to questions. Meeting held in open house format.
- August 8, 2006–Staff meet with Cameron Station Civic Association leaders.
- August 17, 2006–Staff meet with Cameron Station Civic Association leaders and residents regarding environmental issues.
- September 18, 2006–Staff holds community-wide meeting. Staff, applicant, scientists and community leaders make presentations. Information from meeting, including audio of entire meeting, posted on City's website.

- Staff speaks with Cameron Station Civic Association members on a frequent basis, and has responded by email or phone to numerous citizens.

*Staff has met a number of times with the City Manager to keep him informed of the status of the application, and seek his direction. Staff has had numerous inter-departmental meetings regarding this application. Staff has also met several times with the applicant.

On April 12, 1960, City Council approves Special Use Permit #398 for an asphalt plant. The applicant was Newton Asphalt Company. The current operator is Virginia Paving Co., a division of Lane Construction Corp., who is the applicant of SUP#2005-0042.

June 30, 2004	Senior T&ES staff meet with Cameron Station community leaders and discussed air quality and potential sources, specifically the Waste-to-Energy Facility and Virginia Paving. Staff shared with the community information regarding the upgrades and improvements that occurred at the WTE Facility in 2000. Staff agreed to perform short term monitoring of particulates.
July 20, 2004	Based upon community's concerns, T&ES raised VA Paving at the City Environmental Coordination Group meeting, which included representatives from T&ES, Code Enforcement, City Attorney, Planning and Zoning and Health Department. A multi-departmental inspection/review of the facility was recommended.
August 24, 2004	Short term monitoring of particulates completed. Results indicated air quality was meeting the National Ambient Air Quality Standard for PM 10. Impact from VA Paving inconclusive, but results warranted further study.
September 30, 2004	A joint inspection of VA Paving was conducted which included representatives from Code Enforcement, Planning and Zoning and T&ES.
October 26, 2004	City sends letter to Virginia Paving outlining violations of state and city codes and the special use permit resulting from the inspection.
November 17, 2004	Staff attends Cameron Station community meeting and presented results of the monitoring. Staff agreed to pursue additional resources to do additional monitoring in Cameron Station. [*Council approved funding for an additional PM 10 monitoring station in the FY 2006 Budget.*]
February 4, 2005	Virginia Paving submits Report of Immediate Environmental Concerns and a Short Term Work Plan outlining what actions will be taken to

	remedy the environmental concerns and dates within which each will be addressed, as requested by staff.
March 29, 2005	Virginia Paving files SUP application to amend SUP#398 (SUP#2005-0042).
March 31, 2005	Virginia Paving submits Full Environmental Baseline Study, as requested by staff.
May 18, 2005	P&Z staff attends Cameron Station citizen's association to discuss application. Applicant is present and makes presentation.
June 20, 2005	Virginia Paving submits Storm Water Management Plan for review and comment, as requested by staff.
June 22, 2005	Staff meets with Cameron Station association members.
June 27, 2005	City Council received memo from City Manager regarding citizen complaints regarding vehicular traffic at the Virginia Paving asphalt plant in violation of the conditions of the plant's Special Use Permit.
June 28, 2005	City Council limits Virginia Paving's nighttime vehicular activity to paving projects for the City of Alexandria or for Woodrow Wilson Bridge project while application pending.
July 25, 2005	Staff tours plant facility.
August 16, 2005	Staff meets with Virginia Paving and its emissions consultant Laura Green to discuss potential conditions.
August 17, 2005	Staff meets with Cameron Station members.
August 2005	Monitoring results provided to Cameron Station community.
September 14, 2005	Alexandria Fire Marshal releases Re-inspection Report on Virginia Paving, following up on Code violations cited in October 26, 2004 letter to Virginia Paving. The Re-inspection Report states that following reinspection, Code violations referenced in the October 26, 2004 letter had either been cleared or were part of the overall remediation plan that Virginia Paving is working on with staff in the context of the application to amend the SUP.
September 28, 2005	City Attorney's office submits memo to City Council responding to issues raised by Cameron Station Civic Association members at the September

	19, 2005 City Council public hearing on Virginia Paving.
October 4, 2005	Staff meets with Cameron Station Civic Association members, David Sullivan, the community's environmental consultant), and representatives of the applicant to discuss air quality issues.
October 25, 2005	Staff meet at Virginia Paving to view the stream buffer area and potential landscaping, trail, and screening opportunities.
December 2005	Cambridge Environmental, the applicant's consultant, submit to staff its *Air Quality and Public Health Evaluation* of Virginia Paving. Report provided to Cameron Station's consultant, David Sullivan.
February 2006	City completes "benchmark" modeling and provided draft report of results to applicant and Mr. Sullivan.
March 2006	Staff receives *Ambient Air Quality Analysis* (air dispersion modeling), prepared by the City's consultant, AERO Engineering Services. Copies of the report provided to Cameron Station representatives.
April 2006	Staff received copy of letter from David Sullivan Environmental, Cameron Station's consultant, regarding *Results of an Emission and Air Dispersion Modeling Study.*
May 9, 2006	Staff meets with community leaders from Cameron Station Civic Association, Cameron Station Community Association, Holmes Run Park Committee, Summers Grove Homeowners Association, Brookville-Seminary Valley Civic Association and the Alexandria Federation of Civic Associations for a briefing on the community-wide meeting.
May 15, 200	Staff holds community-wide meeting. Staff, applicant, scientists and community leaders make presentations. Information from meeting, including audio of entire meeting, posted on City's website.
May 19, 2006	Applicant submits letter requesting deferral of application from June Planning Commission and City Council dockets stating that it would be appropriate to discuss its application and environmental testing already completed in more detail with the community.
May 22, 2006	City staff provides briefing to Environmental Policy Commission on the modeling results and potential air quality and other environmental improvements that could be obtained through conditions proposed by Virginia Paving in the context of its application to amend its SUP.

June 4, 2006	The City began monitoring ambient concentrations of particulate matter in the 10 micron range or less (PM10) in Cameron Station after extensive consultation with the Virginia Department of Environmental Quality (VADEQ) and David Sullivan, the community's environmental consultant regarding the site-selection and monitoring process.
June 9, 2006	City Council authorizes night-time operations at Virginia Paving for priority City projects, and reaffirms approval for night-time operations for the Woodrow Wilson Bridge project while application pending.
August 7, 2006	Staff attend community meeting hosted by Virginia Paving to respond to questions. Meeting held in open house format.
August 8, 2006	Staff meets with Cameron Station Civic Association leaders.
August 17, 2006	Staff meet with Cameron Station Civic Association leaders and residents regarding environmental issues.
September 18, 2006	Staff holds community-wide meeting. Staff, applicant, scientists and community leaders make presentations. Staff, applicant and scientists respond to community questions. Information from meeting, including audio of entire meeting, posted on City's website.

VA Paving Staff Report
Attachment #3

OCT 27 2004

OFFICE OF THE CITY ATTORNEY

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CATHERINE RICHARDS CLEMENT
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JOANNA C. FRIZZELL
GEORGE McANDREWS
KAREN S. SNOW

October 26, 2004

Dennis A. Luzier, Plant Manager
Virginia Paving Company
5601 Courtney Ave
Alexandria, Virginia 22304

RE: Violations of State and City Codes at 5601 Courtney Avenue

Dear Mr. Luzier:

Recently, City of Alexandria Departments having responsibility to enforce state and city codes did an inspection of the Virginia Paving Company plant. Those inspections showed numerous violations of state and city codes as well as of the Special Use Permit governing this plant. The specific violations are detailed in the enclosed document.

In an effort to resolve the problems discovered at the plant, we would like to set up a meeting with you to discuss the situation and the action that needs to be taken to remedy the violations and any damage that has been caused by the violations. It is our hope that we can discuss a voluntary resolution to this matter including an acceptable remediation plan. However in the event Virginia Paving Company is unwilling to resolve the problem to the City's satisfaction, will take further legal action which may include revoking the Special Use Permit currently in place and obtaining court orders preventing Virginia Paving Company from continuing to violate the state and city codes.

Please contact me as soon as possible to set up a time in the next couple weeks for you to meet with the different City Departments involved in this enforcement action. Given the magnitude of these violations, we request that relevant decision makers for your company or your parent corporation attend this meeting. I can be reached at (703) 838-4433. We would like to hear from you within 10 days from the date of this letter as these violations present public health issues that need to be addressed without delay.

We look forward to working with you to resolve this matter expeditiously.

Yours very truly,

Joanna C. Frizzell
Assistant City Attorney

Enclosure

cc: R.E. Alger, President, The Lane Construction Corporation, 965 East Main Street, Meriden, CT, 06450
CT Corporation System, Registered Agent for The Lane Construction Corporation, 4701 Cox Road, Suite 301, Glen Allen, Virginia, 23060
Philip Sunderland, City Manager
Arthur Dahlberg, Director, Code Enforcement
Mike Connor, Chief Fire Marshal
Rich Baier, Director, Transportation and Environmental Services
Hal Phipps, Division Chief, Planning and Zoning
William Skrabak, Division Chief, Environmental Quality
Ignacio Pessoa, City Attorney

Violations at 5601 Courtney Avenue determined as of October 26, 2004

State Water Control Law, Virginia State Code Title 62.1, Chapter 3.1

1. 62.1-44.5 – Discharge into state waters sewage, industrial wastes, other wastes, or any noxious or deleterious substances.

State Fire Code, Virginia State Code Title 27, Chapter 9

1. 2703.4.2 – Above ground stationary tanks used for the storage of hazardous materials shall be located and protected in accordance with the requirements for outdoor storage of the particular material involved and shall be marked as required by Section-2703.5.

2. 2703.2.5 – Empty containers and tanks previously used for storage of hazardous materials shall be free from residual material and vapor as defined by DOTn, the Resource Conservation and Recovery Act (RCRA) or other regulating authority or maintained as specified for the storage of hazardous material.

3. 2703.3 – Hazardous materials in any quantity shall not be released into a sewer, storm drain, ditch, drainage canal, creek, stream, river, lake or tidal waterway or on the ground, sidewalk, street, highway or into the atmosphere.

4. 2703.3.1 – When hazardous materials are released in quantities reportable under state, federal, or local regulations, the code official shall be notified.

5. 2703.5 – Visible hazard identification signs as specified by *NFPA 704* for the specific material contained shall be placed on stationary containers and above-ground tanks and at entrances to locations where hazardous materials are stored, dispensed, used or handled in quantities requiring a permit and at specific entrances and locations designated by the code official.

6. 2703.5.1 – Individual containers, cartons or packages shall be conspicuously marked or labeled in an approved manner. Rooms or cabinets containing compressed gases shall be conspicuously labeled: COMPRESSED GAS.

7. 2703.9.1.1 – Responsible persons shall be designated and trained to be liaison personnel to the fire department. These persons shall aid the fire department in preplanning emergency Reponses and identifying the locations where hazardous materials are located, and shall have access to Material Safety Data Sheets and be knowledgeable in the site emergency response procedures.

8. 2703.9.2 – Storage, dispensing, use and handling areas shall be secured against unauthorized entry and safeguarded with such protective facilities as public safety requires.

9. 2703.9.3 – Guard posts or other approved means shall be provided to protect storage tanks and connected piping, valves and fittings; dispensing areas; and use areas subject to vehicular damage in accordance with Section 312.

10. 2704.2 – Rooms, buildings or areas used for the storage of liquid or solid hazardous material shall be provided with spill control and secondary containment.

11. 2704.2.1 – Rooms, buildings or areas used for the storage of hazardous material liquids in individual vessels having a capacity of more than 55 gallons (208L), or in which the aggregate capacity of multiple vessels exceeds 1,000 gallons (3785L), shall be provided with spill control to prevent the flow of liquids to adjoining areas. Floors in indoor locations and similar surfaces in outdoor locations shall be constructed to contain a spill from the largest single vessel.

12. 2704.2.2.1 – The building, room or area shall contain or drain the hazardous materials and fire protection water through an approved method such as sumps, liquid tight floors, liquid tight sloped or recessed floors or other approved engineered systems.

13. 304.1 – Combustible waste material creating a fire hazard shall not be allowed to accumulate in buildings or structures or upon premises.

14. 2210.2.2 – Waste oil, motor oil and other Class-IIIB liquids shall be stored in approved tanks or containers, which are allowed to be stored in and dispensed from repair garages.

15. 2210.2.3 – Garage floors drains shall drain to approved oil separators or traps discharging to a sewer in accordance with the *International Plumbing Code*. Contents of oil separators, traps and floor drainage systems shall be collected at sufficiently frequent intervals and removed from the premises to prevent oil from being carried into the sewers.

Special Use Permit Number 399 issued February 10, 1960

Conditions of the Special Use Permit that are currently not in compliance:

- operations of the plant that require exit or entrance of vehicles from the plant are prohibited during hours of darkness or inclement weather or Sundays and holidays.
- satisfactory settling basins to be provided to prevent discharge of silt, asphalt, etc into Back Lick Run. Our inspection showed that they do not have these required settling basins.
- Possible intensification of the use if the State grants the current application for an amendment to the state permit to increase their throughout from 840K ton to 1 Million ton.

City of Alexandria Environmental Offenses Ordinance, City Code Title 11, Chapter 13

1. **Sec. 11-13-2 Illegal dumping prohibited**: It shall be unlawful for any person to dump any waste on any property, in any waters or in any sanitary sewer or stormwater system, except as authorized by law or by applicable permit. It shall be the burden of the alleged violator to show proof of any applicable permits.

Miscellaneous Offenses

- Possible encroachment onto City owned property bordering the Virginia Paving plant.
- Damage to City right of way at various intersections caused by asphalt spillover and accumulation.

VA Paving Staff Report
Attachment #4

Results of an Emission and Air Dispersion Modeling Study and Public Health Evaluation of the Virginia Paving Company Facility 5601 Courtney Avenue Alexandria, Virginia

Michael R. Ames, Sc.D., Stephen G. Zemba, Ph.D., P.E., and
Laura C. Green, Ph.D., D.A.B.T.
Cambridge Environmental Inc.

December 7, 2005

112

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113

Summary

This report predicts and evaluates impacts from the Virginia Paving Company — a facility that manufactures hot mix asphalt in Alexandria, Virginia. In particular, the report presents the results of our emissions and air quality modeling study of the site and its operations. Our study evaluated airborne emissions from multiple point sources[1] and fugitive sources[2] at the site, and focused on both "criteria pollutants"[3] and "toxic air pollutants."[4] We found that, with some specific upgrades and permit limitations (described herein), the facility can continue to operate in its current setting, during the day and at night, and pose no significant risk to the public health.

Introduction

This study is submitted as part of the Virginia Paving Company's application for a new special use permit (SUP). The new SUP would explicitly allow the facility to transport materials to and from the site at night.

To evaluate the impacts of day-time and night-time operations on the neighborhoods immediately surrounding the facility, we applied standard scientific and engineering techniques for modeling airborne emissions from the site and its operations. We generally followed the approach laid out in our Protocol of September 13, 2005

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[1] In air pollution modeling, a "point source" is an exhaust stack or other discrete, typically ducted source of airborne emissions. For this facility, the main emission sources of each plant are the exhaust stacks of the aggregate dryers, which generate heat by burning oil (principally on-specification waste oil, or "spec oil"). The other ducted emission source at the facility is the hot oil heater, which burns a smaller quantity of oil to warm the liquid asphalt cement and spec oil.

[2] In air pollution modeling, a "fugitive source" is a non-ducted airborne emission, such as dust from plowed fields, or material re-suspended from roads by traffic. For this facility, some vapors will escape control devices, and/or emanate from the loading of hot-mix asphalt onto trucks. Fugitive particulate matter (PM) emissions arise from the handling of aggregate as it is dropped from conveyors, loaded onto and out of trucks, and moved and dropped by front-end loaders. PM emissions also arise from travel on roads and surfaces and from wind erosion of storage piles.

[3] "Criteria pollutants" are the seven airborne substances (or mixtures) for which U.S. EPA, *per* the Clean Air Act, has established National Ambient Air Quality Standards (NAAQS) for safe levels of exposure. The current criteria pollutants are carbon monoxide, lead, nitrogen oxides, ozone, particulate matter (both PM_{10} and $PM_{2.5}$), and sulfur dioxide.

[4] "Toxic air pollutants" are chemicals (such as benzene or formaldehyde) or mixtures that, at sufficiently high concentrations, harm health, but that are not regulated *via* national ambient air standards. Virginia DEQ, like many other state agencies, has set guidelines for acceptably small ambient concentrations for these pollutants.

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(provided here as Appendix A), modified by subsequent discussions with, and input from, Lalit Sharma and William Skrabak (City of Alexandria), Dennis Hlinka and David Sullivan (Sullivan Environmental Consulting), Maureen Barrett (Aero Engineering Services), and engineers and operators at Virginia Paving and its parent company, Lane Construction.

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Methods

Emissions modeling

Emissions were modeled based on the following conditions and limitations.

Table 1. Conditions and limitations.

Operation / Condition	Limit / specification	Source / basis
Hot mix asphalt production — yearly maximum	1,200,000 tons per year	Proposed SUP
Hot mix asphalt production — daily and hourly maxima	10,000 tons per day; 1,000 tons per hour	Proposed SUP
Hot oil heater (#2 fuel oil) usage — yearly maximum	100,000 gallons per year	Proposed SUP
Height of dryer exhaust stacks	20 meters	Proposed SUP
Height of hot oil heater exhaust stack	6 meters	Proposed SUP
Stack gas concentration of total suspended particles (TSP) — maximum	0.03 grains per dry standard cubic foot	Proposed SUP
Installation, operation, and maintenance of Blue Smoke Control system (six-stage filtration; Butler-Justice, Inc.)	99% control efficiency for particulate emissions within capture zone	Vendor specification
Watering of on site paved roadways	Twice daily	Proposed SUP
Truck access areas at the eastern end of the facility, for trucks receiving product from plant #2	To be paved	Proposed SUP
On-site diesel engines in front end loaders	Installation of 90% efficient particle traps	Proposed SUP
Rock and aggregate processing	Water sprays and enclosure of transfer points	Proposed SUP
Asphalt storage tank emissions	Tank vent condensers	Proposed SUP
NO_x emissions from driers	Low NO_x burners	Proposed SUP

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Additional details regarding emissions modeling inputs (and air modeling) are found in our spreadsheets and accompanying documentation (available upon request).

Air quality modeling

Air quality modeling was performed using the AERMOD modeling system. *Per* U.S. EPA (see http://www.epa.gov/ttn/scram/dispersion_prefrec.htm and associated links), AERMOD is "a steady-state plume model that incorporates air dispersion based on planetary boundary layer turbulence structure and scaling concepts, including treatment of both surface and elevated sources, and both simple and complex terrain." It is the regulatory model that EPA currently prefers for this type of application.

Our initial modeling, reported on September 30, 2005 (please see Appendix B), utilized receptors at residences, schools, parks, and elsewhere, and used the ISC modeling system, as described and plotted in our September 13, 2005 Protocol (please see Appendix A). Additional modeling, using AERMOD and reported here, utilized receptor coordinates and elevations provided by Maureen Barrett, as depicted below in Figure 1. These receptors include (1) an outer polar grid that extends from distances of 300 m to 2,000 m (~1,000 ft to 1¼ miles) from the main asphalt plant, (2) an intermediate Cartesian grid set at a spacing of 50 m (160 ft) at locations close to the asphalt plant property, and (3) a fenceline grid of locations along the perimeter of the asphalt plant property. Receptors are spaced at close intervals so that the highest modeled impacts of the facility may be identified.

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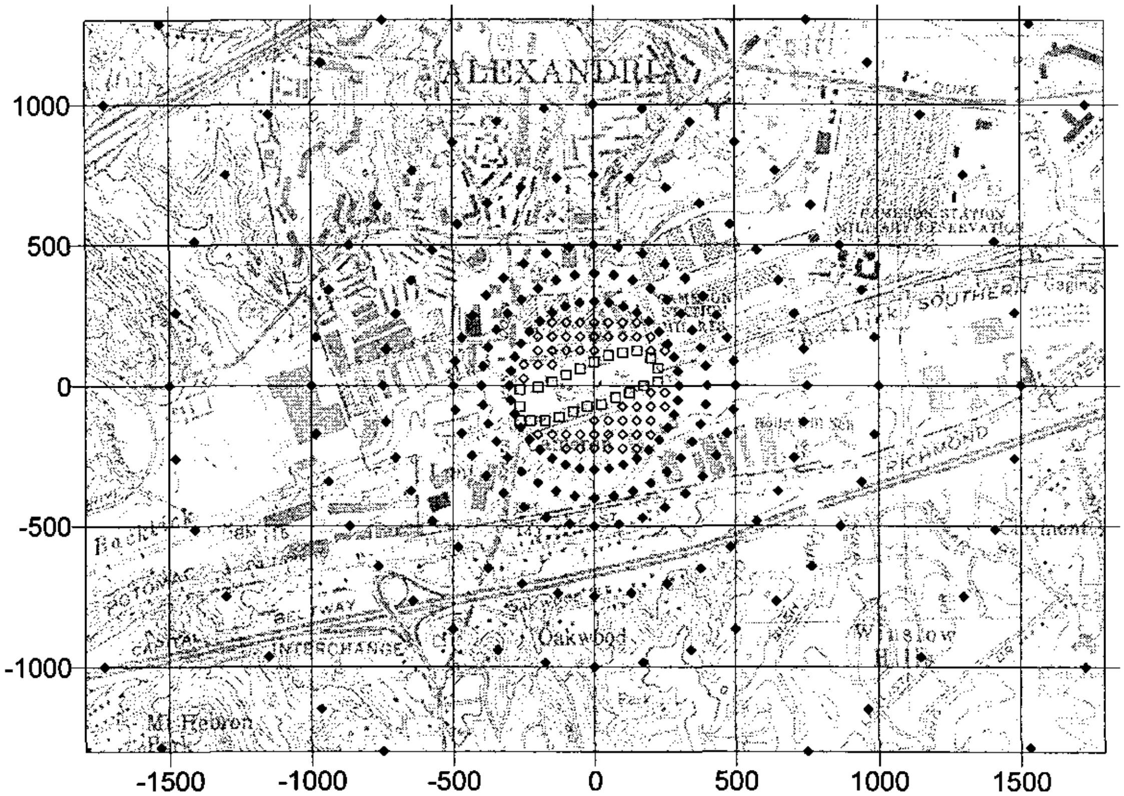

Figure 1. Receptors used for air modeling. The open squares (□) represent the fenceline grid of locations along the perimeter of the asphalt plant property; the open diamonds (◊) represent an immediate grid set at a spacing of 50 m (160 ft) at locations close to the asphalt plant property; and the solid diamonds (♦) represent the gridded receptors that extend from distances of 300 m to 2,000 m (~1,000 ft to 1¼ miles) from the main asphalt plant (the outer most of which fall beyond the boundaries of this map).

For criteria pollutants, estimated impacts from the facility were added to impacts from all other sources in or near Alexandria, as measured by air quality monitors nearby. By convention, these measurements are taken to be an indication of "background" air quality (even though, of course, they represent both background and some increment from the facility itself, since the facility was typically operating when the monitors were sampling). Background air quality data used here are tabulated below.

118

Table 2. Background air quality, in or near Alexandria.

Pollutant and Averaging time	Background ($\mu g/m^3$)	Source of data: monitor at:
CO - 8-hour	3,206	Alexandria Health Dept., Alexandria
CO - 1-hour	4,580	Alexandria Health Dept., Alexandria
Lead (Pb) - Quarterly	0.013	Doctor's Exchange, Springfield
NO_x - Annual	45.1	Alexandria Health Dept., Alexandria
PM_{10} - annual	19.3	Doctor's Exchange, Springfield
PM_{10} - 24-hour	43.0	Doctor's Exchange, Springfield
$PM_{2.5}$ - annual	13.4	Lee District Park, Franconia
$PM_{2.5}$ - 24-hour	35.3	Lee District Park, Franconia
SO_2 - Annual	15.7	Alexandria Health Dept., Alexandria
SO_2 - 24-hour	60.2	Alexandria Health Dept., Alexandria
SO_2 - 3-hour	238.3	Alexandria Health Dept., Alexandria

Per City staff request, we also modeled and added in impacts from maximum permitted emissions of sulfur oxides and nitrogen oxides from two other facilities in the area — the Alexandria/Arlington Covanta waste-to-energy combustor, and the Washington Gas Light Company. (Again, this technique partially "double counts" pollutant concentrations, since the measurements of background were typically made when these facilities were operating).

Evaluation of Toxic Air Pollutants

Toxic air pollutants were evaluated according to guidance provided by Virginia DEQ in its *New Source Review Permits Program Manual* (available at http://www.deq.virginia.gov/air/pdf/air/airguide.pdf). In particular, we followed procedures listed in Appendix FF of the Manual, and, for each relevant pollutant, compared facility emission rates to DEQ's emission rate exemption levels.[5] For three pollutants —acrolein, formaldehyde, and quinone — facility emission rates exceeded the exemption levels. Thus, ambient air impacts from these three compounds were modeled, and the estimated impacts were compared to the DEQ's Significant Ambient Air Concentrations (SAACs).

[5] Exemption levels are established by the Virginia DEQ as emission rates that, with a high level of confidence, will result in no significant risks to human health. Emission rates lower than the exemption levels are thus deemed safe.

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We also evaluated risks to public health using conventional methods of quantitative health risk assessment, as reported in our earlier document, "Summary Results of an Emission and Air Dispersion Modeling Study and Public Health Evaluation of the Virginia Paving Company Facility, Alexandria, Virginia" (Ames *et al.*, September 30, 2005), provided here as Appendix B.[6]

[6] Please note that our earlier modeling relied on ISC for dispersion modeling, not AERMOD, and used some different conditions and receptors, so that results reported in Appendix B are not directly comparable to those reported here. Nonetheless, the qualitative conclusions of our earlier work and this work agree.

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Results

Criteria Pollutants

The results of the emissions and air quality modeling for the criteria pollutants are presented in the tables below. As shown, for the gaseous pollutants, lead, and PM_{10}, all estimated impacts at all receptors are acceptably small. As also shown, modeled impacts for $PM_{2.5}$, when added to background, slightly exceed the NAAQS, but only at a few fenceline receptors, and not at any receptors beyond the fenceline. As discussed below, for several reasons and in several respects, these modeled impacts are likely to be overestimates. Moreover, the modeled impacts decline rapidly away from the site, such that impacts at receptors at all nearby parks, residences, schools, and other public properties are all acceptably small.

Table 3. Modeling results, carbon monoxide, 1-hour averaging period.

Pollutant	**Carbon monoxide**		
Averaging period	1-hour		
Statistical metric	Maximum second highest value at each receptor		
Sources	VA Paving: Dryer stacks, loadout, yard, silos, asphalt storage tanks, hot oil heater, and diesel exhaust Other: U.S. Filter		
Maximum predicted concentration (at any receptor)			
Modeling year	Concentration ($\mu g/m^3$)	Coordinates relative to Plant 1 dryer stack (m)	
		x (east-west)	*y* (north-south)
2000	597	103	282
2001	622	103	282
2002	602	103	282
2003	535	50	108
2004	528	50	108
Highest of all	622	103	282
Background	4,580		
Background plus highest increment	**5,202**		
National Ambient Air Quality Standard (NAAQS)	**40,000**		

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Table 4. Modeling results, carbon monoxide, 8-hour averaging period.

Pollutant	**Carbon monoxide**		
Averaging period	8-hour		
Statistical metric	Maximum second highest value at each receptor		
Sources	VA Paving: Dryer stacks, loadout, yard, silos, asphalt storage tanks, hot oil heater, and diesel exhaust Other: U.S. Filter		
Maximum predicted concentration (at any receptor)			
Modeling year	Concentration ($\mu g/m^3$)	Coordinates relative to Plant 1 dryer stack (m)	
		x (east-west)	y (north-south)
2000	383	50	108
2001	379	50	108
2002	452	50	108
2003	388	50	108
2004	462	50	108
Highest of all	462	50	108
Background	3,206		
Background plus highest increment	**3,668**		
National Ambient Air Quality Standard (NAAQS)	**10,000**		

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Table 5. Modeling results, lead (Pb).

Pollutant	**Lead (Pb)**		
Averaging period	Quarterly		
Statistical metric	Highest quarterly average value		
Sources	VA Paving: Dryer stacks, hot oil heater		
Maximum predicted concentration (at any receptor)			
Modeling year (Max. quarter)	Concentration ($\mu g/m^3$)	Coordinates relative to Plant 1 dryer stack (m)	
		x (east-west)	*y* (north-south)
2000 (2^{nd})	0.00093	0	225
2001 (3^{rd})	0.00199	-25	-75
2002 (3^{rd})	0.00235	50	108
2003 (2^{nd})	0.00217	50	108
2004 (4^{th})	0.00183	50	175
Highest of all	0.00235	50	108
Background	0.013		
Background plus highest increment	**0.015**		
National Ambient Air Quality Standard (NAAQS)	**1.5**		

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Table 6. Modeling results, nitrogen oxides.

Pollutant	**Nitrogen oxides**		
Averaging period	Annual		
Statistical metric	Annual average value at each receptor		
Sources	VA Paving: Dryer stacks, hot oil heater, diesel exhaust Other: U.S. Filter, Covanta and Washington Gas		
Maximum predicted concentration (all sources combined at any receptor)			
Modeling year	Concentration ($\mu g/m^3$)	Coordinates relative to Plant 1 dryer stack (m)	
		x (east-west)	*y* (north-south)
2000	8.3	100	118
2001	9.1	100	118
2002	8.3	100	118
2003	7.4	100	118
2004	7.6	100	118
Highest of all	9.1	100	118
Background	45.1		
Background plus highest increment	**54.2**		
National Ambient Air Quality Standard (NAAQS)	**100**		

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Table 7. Modeling results, PM_{10}, annual averaging period.

Pollutant	**PM_{10}**		
Averaging period	Annual		
Statistical metric	Annual average at each receptor		
Sources	VA Paving: Dryer stacks, hot oil heater, silos, loadout, yard, liquid asphalt storage, diesel exhaust, paved roads, unpaved surfaces, batch dropping, wind erosion, RAP crushing Other: U.S. Filter		
Maximum predicted concentration (all sources combined at any receptor)			
Modeling year	Concentration ($\mu g/m^3$)	Coordinates relative to Plant 1 dryer stack (m)	
		x (east-west)	*y* (north-south)
2000	5.4	125*	-25*
2001	5.5	125*	-25*
2002	5.0	150*	125*
2003	5.0	125*	-25*
2004	4.8	125*	-25*
Highest of all	5.5	125*	-25*
Background	19.3		
Background plus highest increment	**24.8**		
National Ambient Air Quality Standard (NAAQS)	**50.0**		

* As would be expected, the maximum predicted concentration is at the facility fenceline. Please see Figure 2, which displays isopleths of predicted concentrations.

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Table 8. Modeling results, PM_{10}, 24-hour averaging period.

Pollutant	**PM_{10}**		
Averaging period	24-hour		
Statistical metric	Maximum fourth-highest value at each receptor		
Sources	VA Paving: Dryer stacks, hot oil heater, silos, loadout, yard, liquid asphalt storage, diesel exhaust, paved roads, unpaved surfaces, batch dropping, wind erosion, RAP crushing Other: U.S. Filter		
Maximum predicted concentration (all sources combined at any receptor)			
Modeling year	Concentration ($\mu g/m^3$)	Coordinates relative to Plant 1 dryer stack (m)	
		x (east-west)	*y* (north-south)
2000	54.6	150*	125*
2001	57.5	150*	125*
2002	59.1	150*	125*
2003	53.8	125*	-25*
2004	52.6	125*	-25*
Highest of all	59.1	150*	125*
Background	43.0		
Background plus highest increment	**102.1**		
National Ambient Air Quality Standard (NAAQS)	**150**		

* As would be expected, the maximum predicted concentration is at the facility fenceline. Please see Figure 3, which displays isopleths of predicted concentrations.

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Table 9. Modeling results, $PM_{2.5}$, annual averaging period.

Pollutant	**$PM_{2.5}$**		
Averaging period	Annual		
Statistical metric	Annual average value at each receptor		
Sources	VA Paving: Dryer stacks, hot oil heater, silos, loadout, yard, liquid asphalt storage, diesel exhaust, paved roads, unpaved surfaces, batch dropping, wind erosion, RAP crushing Other: U.S. Filter		
Maximum predicted concentration (all sources combined at any receptor)			
Modeling year	Concentration ($\mu g/m^3$)	Coordinates relative to Plant 1 dryer stack (m)	
		x (east-west)	*y* (north-south)
2000	2.4	-50*	60*
2001	2.5	-50*	60*
2002	2.1	-50*	60*
2003	2.2	125*	-25*
2004	2.0	50*	108*
Highest of all	2.5	-50*	60*
Background	13.4		
Background plus highest increment	**15.9***		
National Ambient Air Quality Standard (NAAQS)	**15.0**		

* As would be expected, the maximum predicted concentration is at the facility fenceline. Please see Figures 4a and 4b, which display isopleths of predicted concentrations and modeled impacts at receptors.

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Table 10. Modeling results, $PM_{2.5}$, 24-hour averaging period.

Pollutant	$PM_{2.5}$		
Averaging period	24-hour		
Statistical metric	Maximum fourth-highest value at each receptor		
Sources	VA Paving: Dryer stacks, hot oil heater, silos, loadout, yard, liquid asphalt storage, diesel exhaust, paved roads, unpaved surfaces, batch dropping, wind erosion, RAP crushing Other: U.S. Filter		
Maximum predicted concentration (all sources combined at any receptor)			
Modeling year	Concentration ($\mu g/m^3$)	Coordinates relative to Plant 1 dryer stack (m)	
		x (east-west)	*y* (north-south)
2000	30.9	125*	-25*
2001	33.2	125*	-25*
2002	24.2	125*	-25*
2003	30.1	125*	-25*
2004	29.1	125*	-25*
Highest of all	33.2	125*	-25*
Background	35.3		
Background plus highest increment	**68.5***		
National Ambient Air Quality Standard (NAAQS)	**65**		

* As would be expected, the maximum predicted concentration is at the facility fenceline. Please see Figures 5a and 5b, which display isopleths of predicted concentrations and modeled impacts at receptors.

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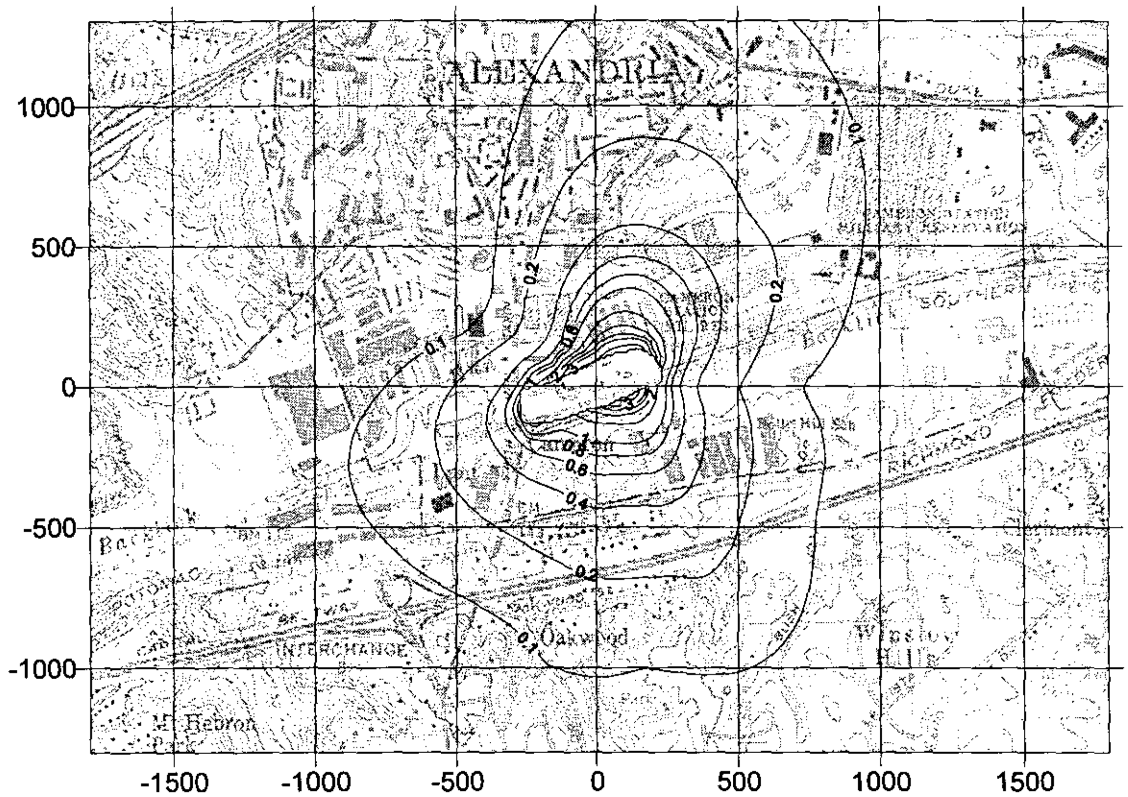

Figure 2. PM10: annual average modeled increments, µg/m3, isopleths. Axes are in meters.

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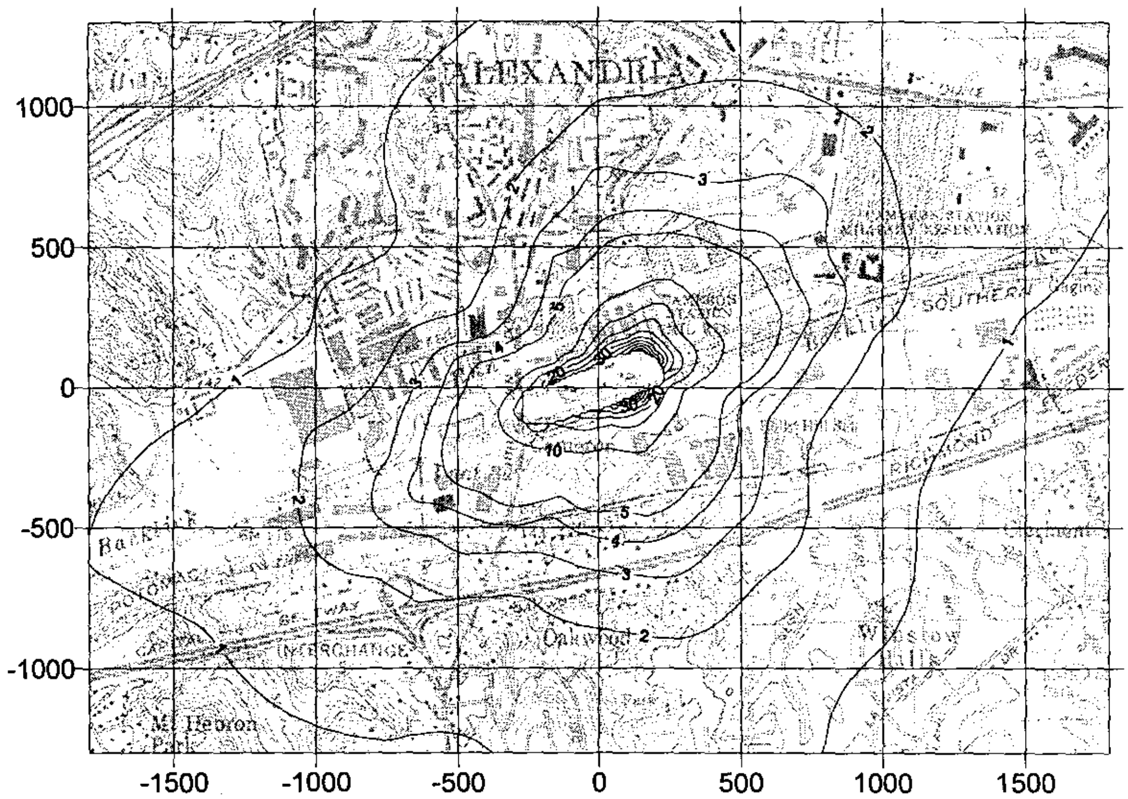

Figure 3. PM10: maximum, fourth-highest, 24-hour average modeled increments, µg/m3, isopleths. Axes are in meters.

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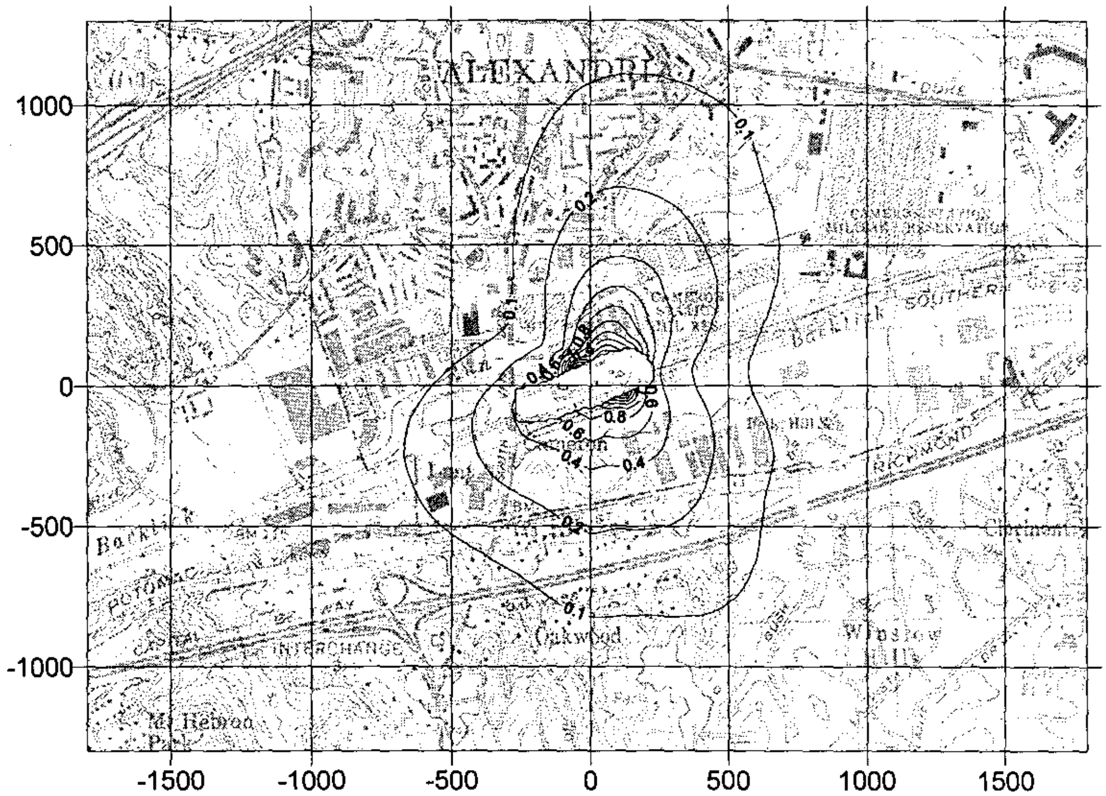

Figure 4a. PM2.5: annual average modeled increments, µg/m3, isopleths. Axes are in meters.

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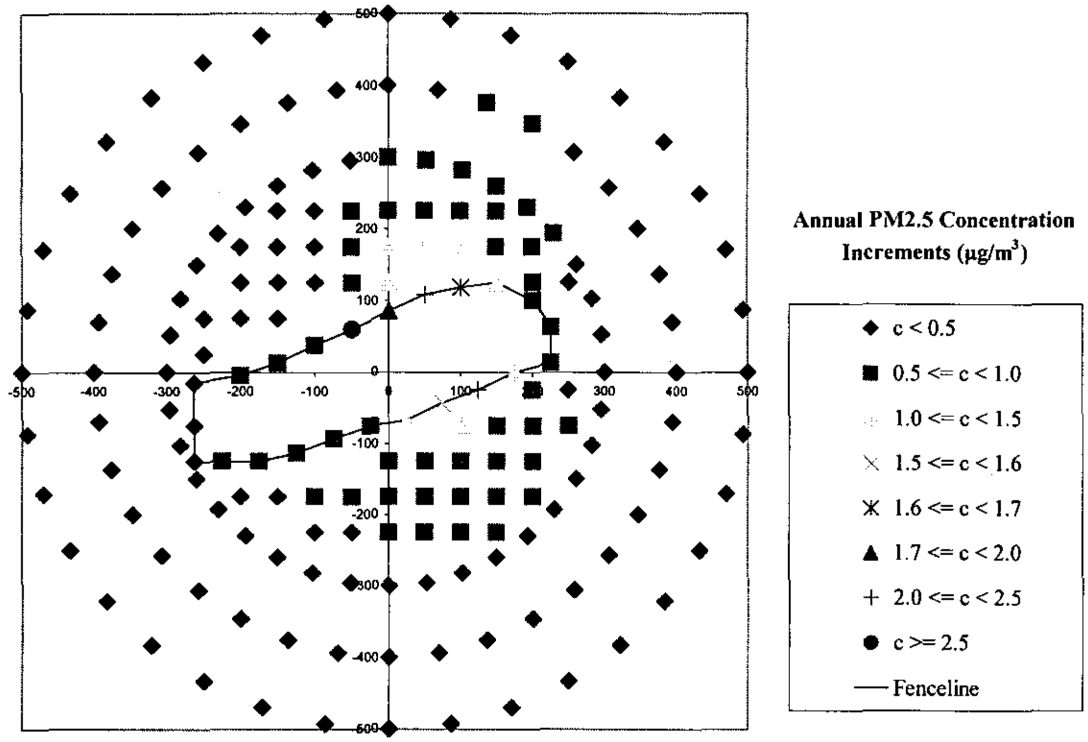

Figure 4b. Modeled, incremental, PM2.5 impacts, annual, at receptors. Axes are in meters.

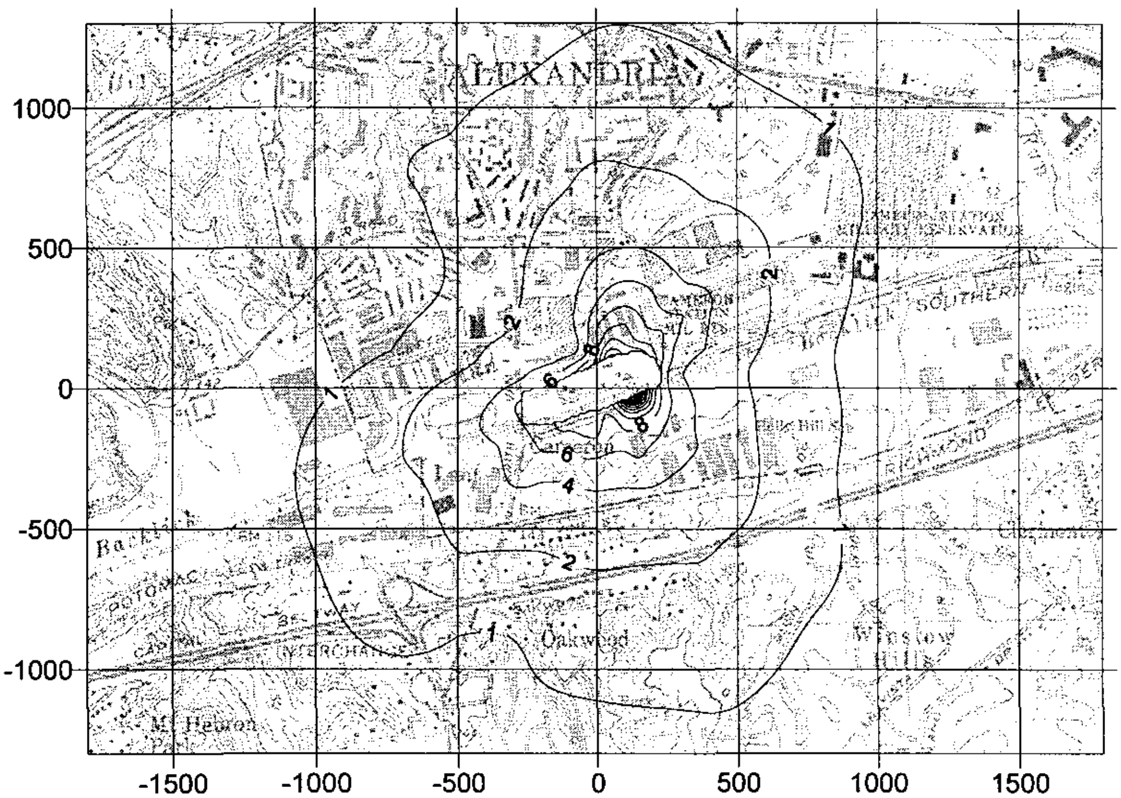

Figure 5a. PM2.5: maximum, 4th highest, 24-hour average modeled increments, µg/m3, isopleths. Axes are in meters.

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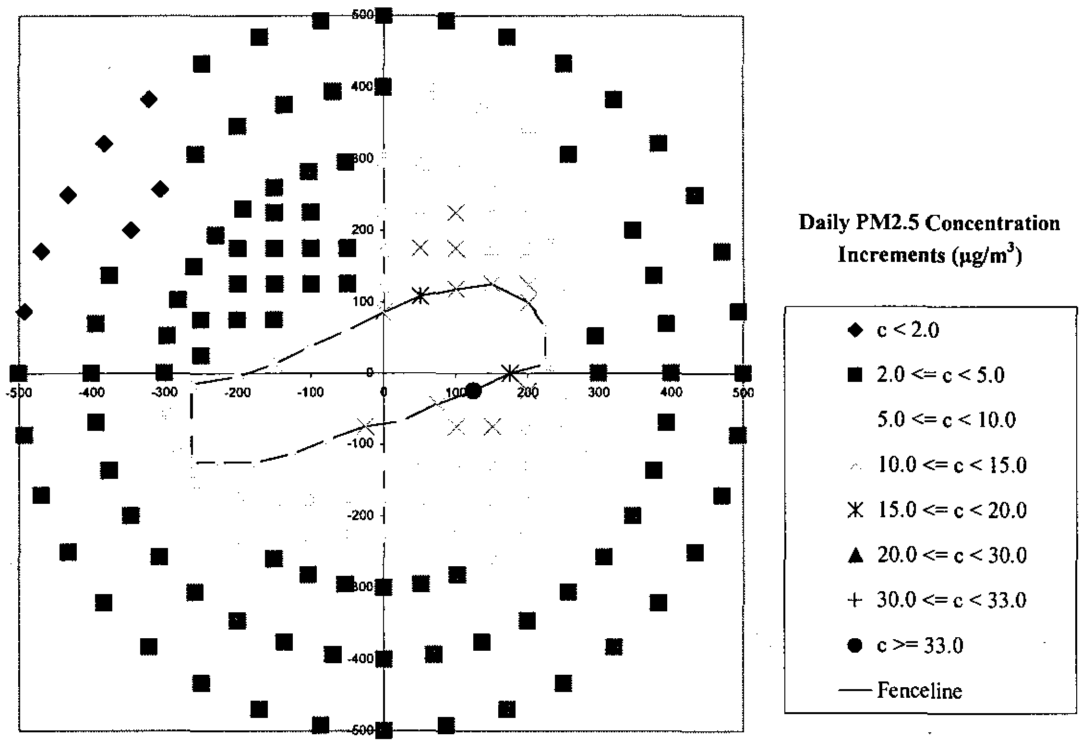

Figure 5b. Modeled, incremental, PM2.5 impacts, 24-hour, at receptors. Axes are in meters.

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Table 11. Modeling results, sulfur dioxide, 3-hour averaging period.

Pollutant	**Sulfur dioxide**		
Averaging period	3-hour		
Statistical metric	Maximum second highest value at each receptor		
Sources	VA Paving: Dryer stacks, hot oil heater, diesel exhaust Other: U.S. Filter, Covanta, and Washington Gas		
Maximum predicted concentration (all sources combined at any receptor)			
Modeling year	Concentration ($\mu g/m^3$)	Coordinates relative to Plant 1 dryer stack (m)	
		x (east-west)	*y* (north-south)
2000	271	-50	60
2001	270	-50	60
2002	250	50	108
2003	294	-50	60
2004	296	-50	60
Highest of all	296	-50	60
Background	238.3		
Background plus highest increment	**534.3**		
National Ambient Air Quality Standard (NAAQS)	**1300**		

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Table 12. Modeling results, sulfur dioxide, 24-hour averaging period.

Pollutant	Sulfur dioxide		
Averaging period	24-hour		
Statistical metric	Maximum second highest value at each receptor		
Sources	VA Paving: Dryer stacks, hot oil heater, diesel exhaust Other: U.S. Filter, Covanta, and Washington Gas		
Maximum predicted concentration (all sources combined at any receptor)			
Modeling year	Concentration ($\mu g/m^3$)	Coordinates relative to Plant 1 dryer stack (m)	
		x (east-west)	*y* (north-south)
2000	134	-50	60
2001	114	-50	60
2002	115	-50	60
2003	131	-50	60
2004	116	-50	60
Highest of all	134	-50	60
Background	60.2		
Background plus highest increment	**194.2**		
National Ambient Air Quality Standard (NAAQS)	**365**		

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Table 13. Modeling results, sulfur dioxide, annual averaging period.

Pollutant	**Sulfur dioxide**		
Averaging period	Annual		
Statistical metric	Annual average value at each receptor		
Sources	VA Paving: Dryer stacks, hot oil heater, diesel exhaust Other: U.S. Filter, Covanta and Washington Gas		
Maximum predicted concentration (all sources combined at any receptor)			
Modeling year	Concentration ($\mu g/m^3$)	Coordinates relative to Plant 1 dryer stack (m)	
		x (east-west)	*y* (north-south)
2000	36.6	-50	60
2001	38.3	-50	60
2002	31.8	-50	60
2003	27.8	-50	60
2004	28.5	-50	60
Highest of all	38.3	-50	60
Background	15.7		
Background plus highest increment	**54.0**		
National Ambient Air Quality Standard (NAAQS)	**80**		

Toxic Air Pollutants

As summarized in Appendix B, our quantitative health risk assessment, performed using conventional methods, found that the toxic air pollutants emitted from this site posed no significant risks to health. More generally, these pollutants are primarily products of incomplete combustion, and so are the same as those emitted by gasoline or diesel powered cars, trucks, buses, and other vehicles, by other combustion of fuel (such as in residential and commercial furnaces and boilers), and by fossil-fueled power plants. At high concentrations, of course, these pollutants can harm health, but at the very low concentrations of interest here, they are neither known nor expected to do so.

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Following Virginia DEQ guidance, toxic air pollutants were also found to be emitted at low rates, such that only three substances —acrolein, formaldehyde, and quinone — required modeling *per* Appendix FF of the Virginia DEQ *New Source Review Permits Program Manual* (available at http://www.deq.virginia.gov/air/pdf/air/airguide.pdf). The results of this modeling appear below, and show that impacts from these three substances are also acceptably small.

Table 14. Modeling results, acrolein.

Pollutant	**Acrolein**		
Averaging period	1-hour*		
Statistical metric	Highest hourly value at each receptor		
Sources	Dryer stacks		
Maximum predicted concentration (at any receptor)			
Modeling year	Concentration ($\mu g/m^3$)	Coordinates relative to Plant 1 dryer stack (m)	
		x (east-west)	*y* (north-south)
2000	0.12	-193	-230
2001	0.12	0	750
2002	0.11	0	750
2003	0.11	100	118
2004	0.11	100	118
Highest of all	**0.12**	0	750
Significant Ambient Air Concentration (SAAC)	**17.25**		

* The yearly emission rate for this compound is smaller than the VDEQ yearly emission exemption level, so only hourly impacts are modeled.

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Table 15. Modeling results, formaldehyde, 1-hour averaging period.

Pollutant	**Formaldehyde**		
Averaging period	1-hour		
Statistical metric	Highest hourly value at each receptor		
Sources	Dryer stacks, loadout, yard, and silos, asphalt storage tanks and hot oil heater		
Maximum predicted concentration (at any receptor)			
Modeling year	Concentration ($\mu g/m^3$)	Coordinates relative to Plant 1 dryer stack (m)	
		x (east-west)	*y* (north-south)
2000	14.5	-193	-230
2001	14.6	103	282
2002	13.9	103	282
2003	13.3	100	118
2004	14.2	-193	-230
Highest of all	**14.6**	103	282
Significant Ambient Air Concentration (SAAC)	**62.5**		

Table 16. Modeling results, formaldehyde, annual averaging period.

Pollutant	**Formaldehyde**		
Averaging period	Annual		
Statistical metric	Annual average at each receptor		
Sources	Dryer stacks, loadout, yard, and silos, asphalt storage tanks and hot oil heater		
Maximum predicted concentration (at any receptor)			
Modeling year	Concentration ($\mu g/m^3$)	Coordinates relative to Plant 1 dryer stack (m)	
		x (east-west)	*y* (north-south)
2000	0.153	50	108
2001	0.159	50	108
2002	0.198	50	108
2003	0.147	50	108
2004	0.213	50	108
Highest of all	**0.213**	50	108
Significant Ambient Air Concentration (SAAC)	**2.4**		

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Table 17. Modeling results, quinone, 1-hour averaging period.

Pollutant	Quinone		
Averaging period	1-hour		
Statistical metric	Highest hourly value at each receptor		
Sources	Dryer stacks		
Maximum predicted concentration (at any receptor)			
Modeling year	Concentration (μg/m^3)	Coordinates relative to Plant 1 dryer stack (m)	
		x (east-west)	*y* (north-south)
2000	0.720	-193	-230
2001	0.730	0	750
2002	0.684	0	750
2003	0.673	100	118
2004	0.705	100	118
Highest of all	**0.730**	0	750
Significant Ambient Air Concentration (SAAC)	**22**		

Table 18. Modeling results, quinone, annual averaging period.

Pollutant	Quinone		
Averaging period	Annual		
Statistical metric	Annual average at each receptor		
Sources	Dryer stacks		
Maximum predicted concentration (at any receptor)			
Modeling year	Concentration (μg/m^3)	Coordinates relative to Plant 1 dryer stack (m)	
		x (east-west)	*y* (north-south)
2000	0.00659	50	108
2001	0.00689	50	175
2002	0.00890	50	108
2003	0.00641	50	108
2004	0.00978	50	108
Highest of all	**0.00978**	50	108
Significant Ambient Air Concentration (SAAC)	**0.88**		

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Discussion

Comparison between modeled and measured impacts

In August 2004, measurements of ambient PM_{10} were taken at an air quality monitor located at the Armistead Boothe Park, about 1,000 feet to the east-northeast of the Virginia Paving property (see "Draft Report on Ambient Air Quality Monitoring Cameron Station Alexandria, Virginia" by Marshall Miller & Associates Inc.) The average of the nine, 24-hour measurements of PM_{10} at this site was 49 $\mu g/m^3$, and the maximum was 71 $\mu g/m^3$. These measurements were collected on days when the PM levels were expected to be highest.

Our modeled results are quite consistent[7] with these August 2004 measurements: our highest, modeled, 24-hour, incremental impacts from the site and its operations, at receptors near this location, are 10 – 20 $\mu g/m^3$, which, combined with the highest background measurements at Doctor's Exchange in August 2004 of about 50 $\mu g/m^3$, give total maxima of about 70 $\mu g/m^3$.

Comparison between our results and the results of other models of the impacts of hot mix asphalt facilities.

The results of our study are similar to results reported by others. In particular, U.S. EPA has extensively tested, or overseen the testing of, hot mix asphalt production,[8] and the Agency and others have used these test results to assess environmental and public health impacts. U.S. EPA's study of hot mix asphalt production led the Agency to conclude that these facilities are minor sources of pollution.[9] Because emissions were found to be acceptably small, U.S. EPA withdrew its plans to develop National Emission Standards for Hazardous Air Pollutants from hot-mix asphalt plants (which standards would have been required if emissions had been larger). In other words, U.S. EPA

[7] For several reasons, model predictions would not be expected to precisely match measured concentrations. Background levels fluctuate, meteorologic and other local factors vary, emissions scenarios do not perfectly mimic actual emissions, and dispersion models may tend to over-predict impacts, even given accurate input information.

[8] Many of these test results are available on the web at http://www.epa.gov/ttn/chief/ap42/ch11/related/c11s01.html and associated links, especially in the *Emission Assessment Report* at http://www.epa.gov/ttn/chief/ap42/ch11/related/ea-report.pdf.

[9] See *Federal Register*: February 12, 2002, Volume 67, Number 29, Pages 6521-6536, "National Emission Standards for Hazardous Air Pollutants: Revision of Source Category List Under Section 112 of the Clean Air Act," available at http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=2002_register&docid=02-3348-filed.pdf.

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140.1

determined that additional controls or emissions reductions, beyond those already in place, were not required.[10]

Community concerns

Our analyses have been geared toward addressing specific concerns raised both by community members and by City of Alexandria staff. Among these concerns are the following.

First, some residents in or near the Cameron Station development have reported malodors from time to time, especially noticeable in the early morning hours. The odors parse into two categories. First, there seems to be a "natural gas odorant" smell that arises occasionally, but Virginia Paving does not use natural gas: various investigations have been performed to try to identify the odor and track its source, but these have not been successful, and the odor at Cameron Station remains a mystery. Second, an asphalt-like odor is sometimes noticeable in the immediate area. Virginia Paving, and commercial trucks carrying hot mix asphalt, are the likely sources of this odor. Use of Ecosorb additives by the facility have partially mitigated the problem, and additional controls on site are expected to further reduce these odors.

Second, the use of spec oil as a fuel by this facility leads to somewhat higher levels of some air pollutants than would be emitted were the facility to burn natural gas, for example. Fortunately, the air quality modeling analyses reported here indicate that existing levels are still acceptably small, and so pose no significant risk to the environment or public health. More generally, the recycling and use of spec oil in hot mix asphalt production is an efficient, well-established method of handling this locally generated waste product.[11]

Third, dust from the facility has been raised as a concern by some. Dust control measures have been — and will be further — improved at the site, and measurements of PM emissions from the dryer stacks, silt-loading measurements on paved surfaces at the site, and modeling results indicate acceptably small impacts, both for total dust and for

[10] In its *Federal Register* notice (p. 6522), U.S. EPA explained, "Emissions data, along with emission factors, were used to estimate hazardous air pollutant (HAP) emissions from eleven asphalt concrete manufacturing plants employing various production processes and different fuels. . . . Based on the above information, we have concluded that no asphalt concrete manufacturing facility has the potential to emit HAP approaching major source levels."

[11] *Per* U.S. EPA 530-F-94-008 *Collecting Used Oil for Recycling/Reuse*, "In the United States alone, an estimated 200 million gallons of used motor oil are improperly disposed of by being dumped on the ground, tossed in the trash (ending up in landfills), and poured down storm sewers and drains. Just one gallon of used oil has the potential to contaminate up to one million gallons of drinking water."

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inhalable particulate matter. Additional landscaping will further reduce off site dust migration.

Fourth, some community members have wondered whether the production of hot mix asphalt is compatible with nearby residential land uses. Although Alexandria is an increasingly densely occupied city, air quality modeling and measurements indicate that, with the exception of occasional ozone problems in the summer, primarily associated with the high volume of motor vehicles in and around the City (which problems plague large areas of the urban and suburban U.S.), air quality is good. With regard to hot mix asphalt production in general, there are some 3,600 hot mix asphalt plants in the U.S. (U.S. EPA, 2000, available at http://www.epa.gov/ttn/chief/ap42/ch11/related/ea-report.pdf), and many of these operate in or near residential neighborhoods.[12]

[12] Hot-mix asphalt is typically produced at temperatures of between 300 and 325 degrees Fahrenheit, and needs to be applied at no less than about 250 degrees. It must therefore be produced relatively close to where it is needed. This is why hot-mix asphalt is produced at many small facilities near population centers and roadways, rather than at a few large facilities at distant locations.

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Uncertainties and overestimates

Like all modeling exercises, ours is not, and cannot be, entirely accurate. When modeling air quality, analysts attempt to over-predict impacts, and so to err on the side of public health. We have done so here.

In particular, we have overestimated impacts of fine particulate matter ($PM_{2.5}$). We and many others in the scientific and engineering community believe that regulatory compliance modeling of $PM_{2.5}$ is premature and likely to be especially inaccurate — particularly when modeled impacts are dominated by poorly characterized fugitive emissions of ordinary crustal material. Indeed, we know of no other hot mix asphalt facility that has been the subject of fugitive $PM_{2.5}$ impact modeling.

Regarding some of the special uncertainties involved in fugitive PM modeling, Dr. Thompson Pace (2003; at http://www.cleanairnet.org/caiasia/1412/articles-58212_resource_5.pdf) of U.S. EPA has noted:

> For a number of years air quality analysts have recognized that fugitive dust emission inventories, when coupled with air quality models, substantially overestimate $PM_{2.5}$ ambient crustal material when compared to the crustal material found in ambient samples. In the mid 1990's, the U.S. Environmental Protection Agency's (EPA) Office of Air Quality Planning and Standards (OAQPS) began to use, as an interim measure, a factor to 'adjust' the fugitive dust emission estimates in regional modeling analyses to obtain better agreement between the regional model results and ambient data. This adjustment was an ad hoc 'one value fits all' approach to reduce the disparity between modeling and ambient data but it did not address possible regional differences in the adjustment factor. The adjustment factor was conceived with the acknowledgement that an investigation was needed to identify what specific problems in the inventory and model were causing the discrepancy. Since the late '90s, the EPA has been actively working to understand the nature of those specific problems. Emphasis has been on developing a conceptual model of the potential dust removal processes near the source and on field work to evaluate the removal effectiveness. Much work has been accomplished and refinements to the 'divide-by-four' national factor are proposed, even as work continues to refine both the inventory methodology and models.

More recently, Pace (2004; at http://www.epa.gov/ttn/chief/conference/ei14/session5/pace.pdf) summarized the problems:

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> . . . the emissions inventory suggests that about one half of primary $PM_{2.5}$ emissions are from fugitive dust, and these emissions contribute to the overestimation of ambient $PM_{2.5}$ concentrations by air quality models. This overestimation creates problems for those involved in $PM_{2.5}$, regional haze and PM Coarse analyses. Most experts agree that this overestimation is due to a combination of shortcomings in the inventory-modeling process: 1) the multiplier used to "scale" or infer $PM_{2.5}$ from PM_{10} emissions in the inventory, 2) faulty emission factor algorithms, 3) imprecise or difficult to obtain activity data to apply these algorithms (including inability to account for the effect of actual meteorological conditions on emissions), and 4) modeling deficiencies (especially in the treatment of particles near their point of emissions).

Research in this area is extensive, ongoing, and unlikely to resolve the inaccuracies and over-estimates any time soon.

More generally, our modeling is based on several unrealistic assumptions, namely: (1) the facility will generate as much asphalt as it is legally permitted to produce, on an hourly, daily, and yearly basis (although actual production is less than these limits); (2) these maximal generation rates will coincide both with worst-case meteorologic conditions (so that dispersion is poorest) and with maximal generation of pollution from U.S. Filter, the Alexandria/Arlington Covanta waste-to-energy combustor, and the Washington Gas Light Company, combined; (3) the #2 fuel oil and spec oil used at the facility will contain that highest levels of impurities legally allowed (despite actual test data indicating cleaner-than-required quality); and (4) the air pollution control devices (such as the baghouses) will operate at the poorest efficiency legally allowed (although test results indicate better-than-permit performance).

Overall, then, the modeling results reported here, together with local and site-specific measurements, indicate that operations at the Virginia Paving Co. facility, *per* the proposed special use permit, result in no significant impacts on local air quality or public health.

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Appendix A

Protocol for Emission and Air Dispersion Modeling and Public Health Evaluation of the Virginia Paving Company Facility, Alexandria, Virginia

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Laura C. Green, Ph.D., D.A.B.T.
Cambridge Environmental Inc.

September 13, 2005

Introduction

We plan to perform an emission and air dispersion modeling study to estimate pollutant concentrations in ambient air resulting from operation of the Virginia Paving Company's hot-mix asphalt plants, located at 5601 Courtney Avenue in Alexandria, Virginia. Like all industrial and commercial processes, the production of asphalt results in the emission of some amounts of pollutants to the atmosphere. Pollutant emissions disperse and are transported to locations away from the facility. The concentrations of pollutants in ambient air depend upon the rates of emission, the dispersion characteristics of the atmosphere, and various facility-specific and site-specific features.

Regulatory agencies such as the U.S. EPA and Virginia Department of Environmental Quality (DEQ) require major sources of air pollution to conduct modeling studies to demonstrate that emissions will not lead to unacceptable air quality impacts (such as exceedances of National Ambient Air Quality Standards, or NAAQS). Hot-mix asphalt plants are generally exempt from modeling requirements because they do not exceed emission thresholds that identify major sources. The assumption for minor air pollution sources, such as hot-mix asphalt plants, is that they are too small to cause unacceptable air pollution impacts.

The U.S. EPA has compiled extensive test data and information in reaching its determination that hot-mix asphalt plants are minor air pollution sources. These data and the same types of procedures used to evaluate major air pollution sources may be applied to minor air pollution sources such as hot-mix asphalt plants. Two basic steps are involved. First, sources of pollution are identified, and quantitative estimates of emissions are calculated based on facility-specific operating data (such as the amount of asphalt produced) and emission factors that reflect industry-wide testing of hot-mix asphalt plants. Second, dispersion modeling is used to estimate the concentrations of pollutants in ambient air that will result from emissions at the facility.

Standard procedures are used to estimate pollutant emissions and dispersion from the Virginia Paving Company facility, tailored to the extent possible to simulate typical operating procedures of the facility. For example, facility-specific data on asphalt production volumes are used to apportion emissions among various months of the year, and emissions tied to asphalt production are weighted toward the plant's daily production schedule (including both day and night operations). Additionally, two sets of calculations are modeled, one set based on likely asphalt production volumes, and another set based on maximum permitted production volumes.

Emission Sources

Various processes and activities at hot-mix asphalt plants emit pollutants. The Virginia Paving Company operates two asphalt production plants (Plant 1 and Plant 2) at its Alexandria site. Each of these plants produces hot-mix asphalt by heating and drying aggregate material (stone and sand) and combining it with liquid asphalt cement and recycled asphalt pavement (RAP, as recovered from existing roads or other asphalt surfaces). Once produced, the hot-mix asphalt is transferred into storage silos. The hot-mix asphalt is dropped into delivery trucks stationed under the silos, and then transported to its point of application. Figure 1 depicts a process schematic for a hot-mix asphalt plant (as taken from the U.S. EPA's Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, commonly referred to as "AP42"), and Figure 2 delineates the components of the two plants at the of the Virginia Paving Company facility.

The main emission source of each plant is the exhaust stack of the aggregate dryer, which generates heat by burning oil (principally on-specification waste oil, or "spec oil"). The other ducted emission source at the facility is the hot oil heater, which burns a smaller quantity of spec oil to keep the liquid asphalt cement and spec oil above ambient temperature.

In addition to the ducted sources, there are several fugitive emission sources relevant to the Virginia Paving Company facility. Fugitive emissions include vapors and particulate matter (PM, some of which is inhalable, or PM10, PM2.5, etc., and some of which is too large to inhale, such as visible dust). The major emission sources of vapors are (1) the vent effluents located at the tops of the asphalt storage silos, (2) vent effluents from the asphalt cement storage tanks, and (3) emanations from the loadout of hot-mix asphalt onto trucks and additional escape of vapors from the freshly loaded trucks. Fugitive PM emissions arise from the handling of aggregate as it is dropped from conveyors, loaded onto and out of trucks, and moved and dropped by front-end loaders. PM emissions also arise from travel on roads and surfaces and from wind erosion of storage piles.

Emission Quantification

Pollutants of potential concern vary among the emission sources, as do the techniques and data used to estimate their emission rates from the Virginia Paving Company facility. Most of the emission sources are tied directly to the level of asphalt production at the facility. Two different production scenarios are considered. First, a baseline scenario is designed to simulate as close as possible the manner in which the facility has historically operated (and is expected to continue to operate). An assumed production volume of 900,000 tons of hot-mix asphalt, as achieved in calendar year 2004, is assumed for the baseline scenario, accompanied by the consumption of 65,000 gallons of spec fuel in the hot oil heater. Although these quantities are not likely to increase, they are legally allowed to do so by the provisions of the air emissions permit held by the Virginia Paving Company facility. Consequently, a permit limit scenario is also developed to estimate potential air quality impacts associated with hypothetical facility operation at its permit limits, which allow for annual production of 1,500,000 tons of hot-mix asphalt and consumption of 225,000 gallons of spec oil in the hot oil heater.

Both seasonal and diurnal variation of emissions are considered to match the actual operating patterns of the Virginia Paving Company facility. The seasonal pattern is captured by assuming that emissions are proportional to monthly production volume. A plot of the monthly production rates for plants 1 and 2 is provided in Figure 3, as based on actual operations from January 2002 through June 2004. Additionally, emissions during the day and night are tied to typical hours of operation. The Virginia Paving Company normally produces hot-mix asphalt during three periods: a daytime production run from 5:30 AM to 4:00 PM, an evening production run from 6:00 PM to 10:00 PM, and a nighttime production run from 1:00 AM to 3:00 AM. Asphalt deliveries from the silos occur over somewhat different periods, a daytime period from 7:00 AM to 5:00 PM, an evening period from 7:00 PM to 11:00 PM, and a nighttime period from 2:00 AM to 3:30 AM. This cycle, of course, relates to historical operations prior to the recent cessation of nighttime production. Current daytime-only operations will also be modeled. Activities such as RAP crushing and aggregate unloading from train cars are assigned to daytime hours, as these activities are not normally undertaken at night. Sources such as the hot oil heater operate more or less continuously independent of production.

Table 1 summarizes the major emission sources of the Virginia Paving Company facility and provides information on the data to be used to estimate pollutant emissions for each. Emission rates will be estimated based on AP42 emission factors, with facility-specific data used when possible.

Dispersion Modeling

The Industrial Source Complex Short Term (ISCST3) model will be used to predict pollutant dispersion. ISCST3 is recommended by the U.S. EPA as a refined air dispersion model. Regulatory default settings will be used. The rural land use option will likely be used based on initial examination of local land use characteristics, pending application of Auer's method for land use determination and discussion with VADEQ on the use of urban parameters. Point (stack) emission sources will be evaluated for plume downwash. The stack/building-specific dimensions required by the ISCST3 model will be determined using the U.S. EPA's BPIP preprocessor program. A five-year set of meteorological data for the Washington National Airport (the closest meteorological station to Alexandria) will be considered to capture the long-term array of meteorological data. The Washington National Airport surface observations will be processed along with upper air data collected at Sterling, Virginia within the U.S. EPA's PCRAMMET program.

Since there are multiple pollutants to be modeled, the ISCST3 model will be run with nominal emission rates for each source and the results will be scaled according to pollutant-specific emission rates. Output will be generated for a variety of different averaging periods (1-hour, 3-hour, 8-hour, 24-hour, and long-term) consistent with pollutant-specific standards and toxicity data and assumptions.

Pollutant concentrations will be modeled at a variety of receptor locations in the vicinity of the Virginia Paving Company facility. Categories of receptors to be distinguished include residential, industrial/commercial, and special interest (schools and parks). The nearby residential and industrial/commercial receptor areas will be modeled using a small grid of locations; special receptors will be modeled at single locations. The base elevation of each receptor will be determined using the electronic topographic maps and TOPO! software (National Geographic Society). Additionally, flagpole receptors will be considered at various locations, as much of the housing stock in the Cameron Station and Summer's Grove developments is multi-story. A preliminary figure of receptor locations is provided in Figure 3.

Public Health Evaluation

The predicted pollutant concentrations due to emissions from the Virginia Paving Company facility will be evaluated in two ways. For criteria pollutants, total pollutant concentrations, calculated as the *sum* of facility-specific impacts plus representative background levels, will be compared to the appropriate National Ambient Air Quality Standards. Background concentrations will be selected from recent, nearby monitoring data. Background locations within a few miles of the Virginia Paving Company facility at which ambient air quality data are collected include the Alexandria Health Department,. Lee District Park, Doctor's Exchange, the Mt. Vernon Fire Station.

Hazardous Air Pollutants (HAPs) and other air toxics (non-criteria pollutants) will be evaluated according to standard human health risk assessment practices. Calculations will be developed for chronic health effects (typically the most sensitive endpoints) based on long-term exposure considerations. Two types of calculations will be performed.

First, theoretical, incremental, lifetime risks of cancer will be estimated for pollutants that are known or suspected to be human carcinogens (at much larger concentrations or exposures). Estimates of the carcinogenic potencies of each chemical will be derived from standard sources, such as U.S. EPA's Integrated Risk Information System (IRIS). A 30-year exposure period to facility-generated pollutant concentrations will be assumed, in accordance with standard risk assessment practices. Incremental risk estimates smaller than 1 in 100,000 will be assumed to be insignificant.

Second, risks of chronic health effects *other* than cancer will be estimated, again using standard practices. In particular, predictions of long-term concentrations of pollutants due to Virginia Paving Company emissions will be compared with "reference concentrations," which by design represent concentrations that can be safely breathed on a continuous basis with no appreciable risk of adverse health effects. This comparison will yield a "hazard ratio," which is simply the predicted incremental pollutant concentration divided by the reference concentration. For any individual pollutant, a hazard ratio less than one indicates that adverse health risks are unlikely, while a hazard ratio greater than one indicates a potential for concern (though not necessarily a likelihood of health risk, depending upon the levels of safety embodied in the reference concentration).

Conclusion

The purpose of this exercise, of course, is to determine whether impacts from the site, as it currently operates, are or are not acceptably small with regard to protection of public health. If they are not, modeling of altered conditions (such as a taller exhaust stack, reduced hot mix asphalt production, or reduced reliance on spec oil) may be conducted.

Table 1 Summary of emission sources from the Virginia Paving Company facility

Source description		Modeled location (center)[A]	Source type (for modeling)	Pollutants of concern[B]	Relevant parameters		Diurnal pattern[E]
Dryer stacks	Plant 1	314,968E 4,297,096N	Point	Criteria pollutants CO, NO_x, TSP, PM_{10}, and $PM_{2.5}$ from recent stack test data; other criteria pollutants and HAPs per AP42 Tables 11.1-7, 8, 10, and 12	Stack parameters: 367°K, 1.89 m effective diameter, flow velocity 8.24 m/s (stack test)	Downwash analysis to include the following buildings/structures: Plant 1 baghouse, Plant 1 silos, Plant 2 baghouse, Plant 2 silos, lime silo, asphalt storage tanks and liquid fuel tanks, aggregate storage structure, and US Filter storage tanks	Day/night production
	Plant 2	315,016E 4,297,163N			Stack parameters: 396°K, 1.19 m effective diameter, flow velocity 11.41 m/s (stack test)		Day/night production
Hot oil heater stack		315,015E 4,297,137N	Point	Criteria pollutants & HAPs per AP42 in Chapter 1.11	Stack parameters: 589°K, 0.43 m effective diameter, flow velocity 0.047 m/s (estimated)[D]		Continuous
Loadout and yard emissions from asphalt vapors	Plant 1	314,977E 4,297,083N	Fugitive volume	Criteria pollutants & HAPs per AP42 Tables 11.1-13 through 11.1-16	An source reduction factor will be applied to loadout emissions to account for addition of "Blue Smoke" control system.		Day/night operations
	Plant 2	314,982E 4,297,150N					
Storage silo vents	Plant 1	314,974E 4,297,088N	Fugitive volume	Criteria pollutants & HAPs per AP42 Tables 11.1-13 through 11.1-16	An source reduction factor will be applied to silo venting emissions to account for addition of "Blue Smoke" control system.		Day/night operations
	Plant 2	314,973E 4,297,148N					
Asphalt cement tank vents		315,028E 4,297,153N	Fugitive volume	Criteria pollutants & HAPs per AP42 Tables 11.1-13 through 11.1-16			Continuous

Table 1 Summary of emission sources from the Virginia Paving Company facility

Source description	Modeled location (center) [A]	Source type (for modeling)	Pollutants of concern [B]	Relevant parameters	Diurnal pattern [E]
Recycled asphalt pavement (RAP) crushing	315,152E 4,297,165N	Fugitive area	Particulate matter[C] AP42 Table11.19.2-1	AP42 factor for controlled tertiary crushing: TSP: 0.0006 kg/Mg PM_{10}: 0.00027 kg/Mg $PM_{2.5}$: 0.00005 kg/Mg	Daytime
Material handing (batch or continuous drop operations)	Aggregate storage piles in, and to the south of the Stone Bins (Figure 2); rail loadout, conveyors, hoppers and	Fugitive area	Particulate matter[C] AP42 section 13.2.4.3	AP42 equation : $Ed(kg/Mg)=0.35\times0.0016\times(\frac{U}{2.2})^{1.3}\times(\frac{M}{2})^{1.4}$ Utilize material-specific moisture content, M, for each type of aggregate. Wind speed, U, and hour of operation dependent.	Day/night dependent on production
Material handing (bulldozing)	Aggregate storage piles in, and to the south of the stone bins. RAP storage piles are to the west of Courtney Ave. and at the eastern end of the facility.	Fugitive area	Particulate matter[C] AP42 Table11.9-2	AP42 equation for overburden inTable11.9-2: $Ed(kg/hr)=k\times(\frac{s}{2.2})^{a}\times(\frac{M}{2})^{b}$ Utilize material-specific silt content, s, and moisture content, M, for each type of aggregate. Parameters k, a, and b are particle size dependent. Hour of operation dependent.	Daytime
Wind erosion from storage piles	Same areas as Material Handling (bulldozing) above.	Fugitive area	Particulate matter[C] AP42 section 13.2.5.3	AP42 equations 13.2.5.3 (1) and (3) [F]: $u(z)=\frac{u*}{0.4}\ln\frac{z}{z_o}$ $Ew=k\times(58(u^*-u_t^*)^2+25(u^*-u_t^*))$ Threshold velocity, u_t*, is dependent on storage pile roughness; no emission occur at wind speeds below threshold velocity. Parameter k is particle size dependent.	Evaluated every hour, emissions only occur during high winds

150

Table 1 Summary of emission sources from the Virginia Paving Company facility

Source description	Modeled location (center) [A]	Source type (for modeling)	Pollutants of concern [B]	Relevant parameters	Diurnal pattern [E]
Paved area travel	Paved area emissions will be modeled as being to be to the west of the Stone Bins (Figure 2)	Fugitive area	Particulate matter[C] AP42 section 13.2.1.3	AP42 equation 13.2.1.3 (1): $Ep(g/VMT)=k\times(\frac{sL}{2})^{0.65}\times(\frac{W}{3})^{1.5}$ Factor k is particle size specific multiplier. Emission reduction factor of 0.5 will be applied to account for roadway sweeping and wetting.	Day/night dependent on production
Unpaved area travel	Paved area emissions will be modeled as being to be to the east of the western end of the Stone Bins (Figure 2)	Fugitive area	Particulate matter[C] AP42 section 13.2.2.2	AP42 equation 13.2.2, (1a): $Ep(g/VMT)=k\times(\frac{sL}{12})^{a}\times(\frac{W}{3})^{b}$ Parameter s k, a, and b are particle size dependent.	Daytime

Notes:

[A] Values are UTM zone 18, NAD83 coordinates, in meters.

[B] Criteria pollutants include particulate matter, nitrogen oxides, sulfur dioxide, carbon monoxide, and lead, for which National Ambient Air Quality Standards have been established. HAPs include pollutants that have been designated as Hazardous Air Pollutants in the context of the Clean Air Act as well as other non-criteria pollutants that have been measured in hot-mix asphalt plant emissions.

[C] Particulate matter includes Total Suspended Particulate (TSP), PM_{10} (particulate matter less than 10 µm aerodynamic diameter), and $PM_{2.5}$ (particulate matter less than 2.5 µm aerodynamic diameter).

[D] The flow velocity of the hot oil heater was estimated using Equation 2.4-2 from EPA AP42 Chapter 1.3 Related EIIP Document. The hot oil heater stack is covered to keep out rainwater, forcing the flow around the lid. The effective diameter is estimated by assuming the area of the emitted gas doubles to go around the lid.

[E] Day/night dryer production from 5:30AM to 4:00PM, 6:00PM to 10:00PM, 1:00AM to 3:00AM; day/night silo and loadout from 7:00AM to 5:00PM, 7:00PM to 11:00PM, 2:00AM to 3:30AM; Continuous 24 hours per day.

[F] Fastest mile of the day wind speeds area only available from Washington National Airport for the modeled year 1984; fastest mile of the day speeds for other years will be estimated on the fastest hourly speed for each day and a correlation between fastest mile of the day speeds and fastest hourly speeds from the available 1984 data.

151

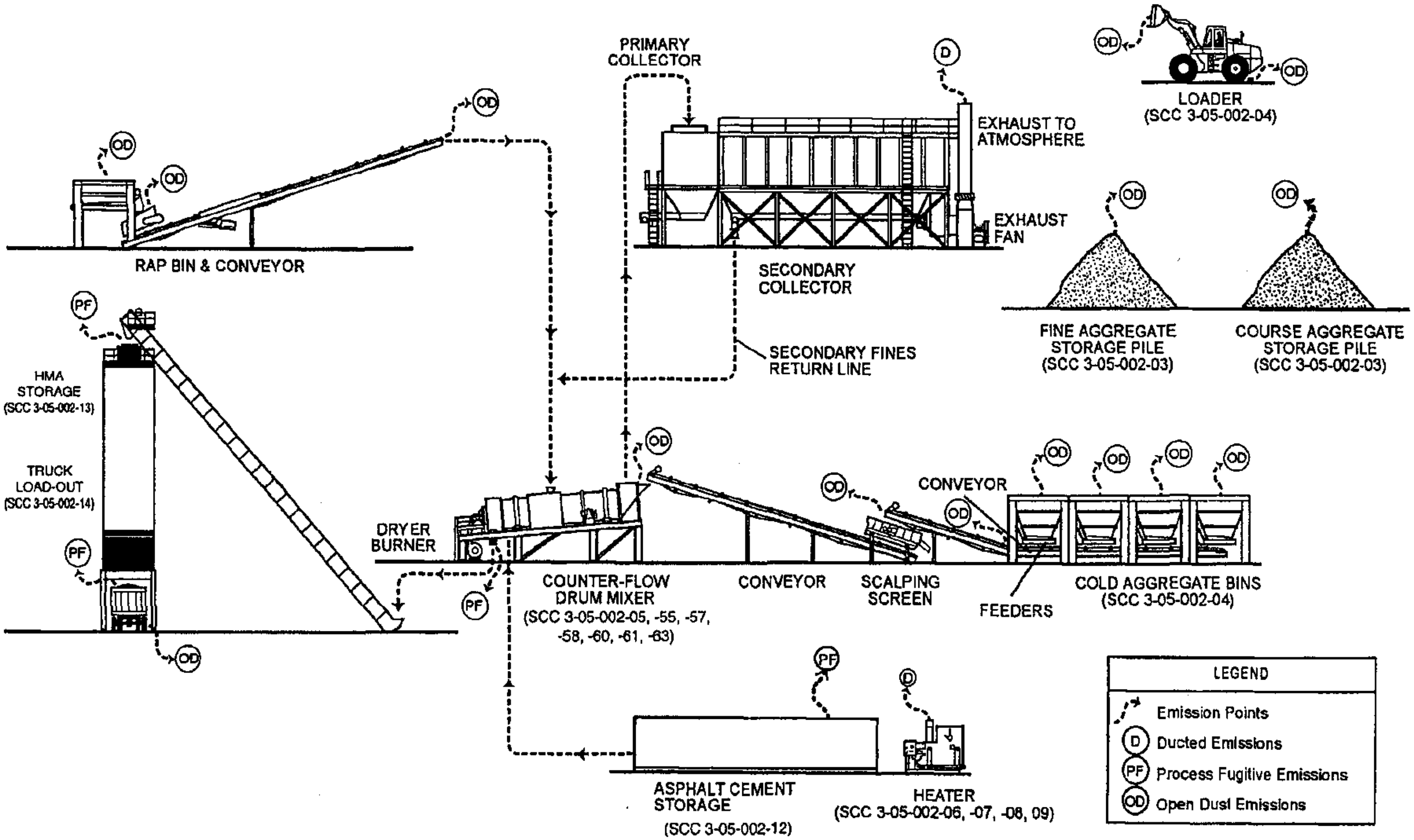
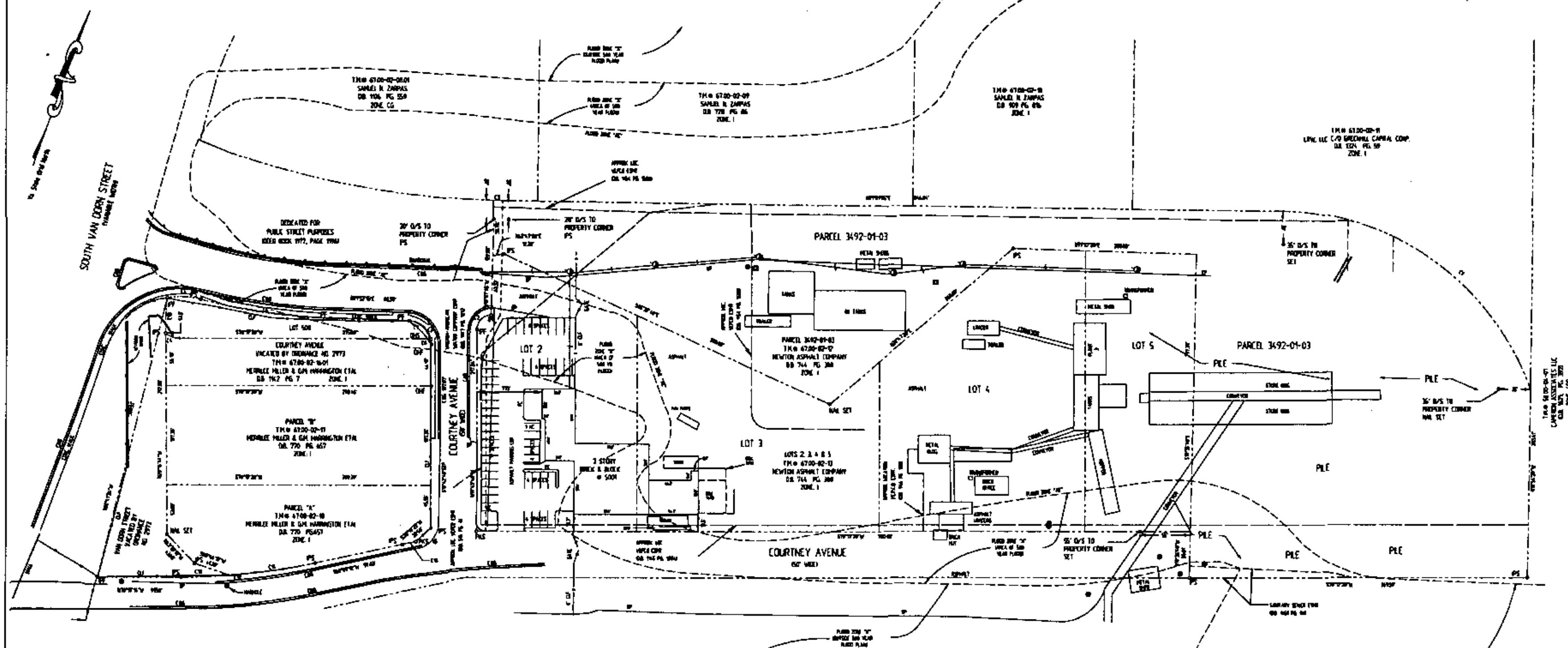


Figure 1 Schematic of a hot-mix asphalt plant (Figure 11.1-2 from U.S. EPA's AP42 document).

152



AREA TABULATION

PARCEL 3492-01-03	213,500	S.F.	OR	4.9013	AC.
LOTS 2, 3, 4 & 5	188,347	S.F.	OR	4.3239	AC.
LOT 501	7,828	S.F.	OR	0.1797	AC.
COURTNEY AVENUE VACATED	14,559	S.F.	OR	0.3342	AC.
PARCEL "B"	31,124	S.F.	OR	0.7145	AC.
PARCEL "A"	23,023	S.F.	OR	0.5285	AC.
VAN DORN STREET VACATED	12,416	S.F.	OR	0.2850	AC.
TOTAL AREA	490,797	S.F.	OR	11.2671	AC.

CURVE TABLE

CURVE	RADIUS	LENGTH	TANGENT	CHORD	BEARING	DELTA
1	292.00'	350.30'	199.69'	329.67'	S74°36'56"E	68°44'05"
2	15.00'	23.97'	15.47'	21.50'	N26°04'48"E	91°30'26"
3	1,800.00'	16.16'	8.07'	16.16'	N11°27'33"E	00°30'52"
4	25.00'	16.38'	8.50'	16.09'	S89°02'19"W	37°32'38"
5	89.00'	37.37'	18.96'	37.12'	N72°40'49"E	24°03'25"
6	631.00'	163.28'	72.08'	163.08'	N78°27'36"E	17°58'57"
7	25.00'	32.70'	19.16'	30.42'	S16°29'44"E	74°56'06"
8	75.00'	5.80'	2.90'	5.87'	S26°27'09"E	0°29'05"
9	75.00'	38.58'	26.32'	36.46'	S63°38'12"E	88°25'08"
10	696.20'	53.65'	26.84'	53.64'	S48°06'47"W	04°24'54"
11	696.20'	93.79'	46.97'	93.72'	S42°09'46"W	07°43'08"
12	696.20'	147.44'	74.00'	147.17'	S44°13'13"W	12°08'04"
13	380.00'	36.71'	18.37'	36.70'	N17°32'45"W	05°32'08"
14	736.20'	16.67'	8.34'	16.67'	S58°43'26"W	01°08'37"

NOTES

1. NO TITLE REPORT FURNISHED. THE PROPERTY DELINEATED HEREON IS SUBJECT TO EASEMENTS AND RESTRICTIONS OF RECORD.
2. THE PROPERTY DELINEATED HEREON IS SHOWN ON THE CITY OF ALEXANDRIA TAX ASSESSMENT MAP AS PARCELS 67.00-02-12, 13, 17, 18 & 20. ALL OF WHICH ARE ZONED I - INDUSTRIAL.
3. THE PROPERTY DELINEATED HEREON IS LOCATED IN FLOOD ZONE "AE" (AREA OF 100 YEAR FLOOD, BASE FLOOD ELEVATION DETERMINED), FLOOD ZONE "X" (AREA OF 500 YEAR FLOOD), AND FLOOD ZONE "X" (AREA OUTSIDE THE 500 YEAR FLOOD PLAIN) AS SHOWN ON THE FLOOD INSURANCE RATE MAP OF ALEXANDRIA AS PREPARED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY, COMMUNITY PANEL NUMBER 515519-0005 D, DATED MAY 15, 1991.

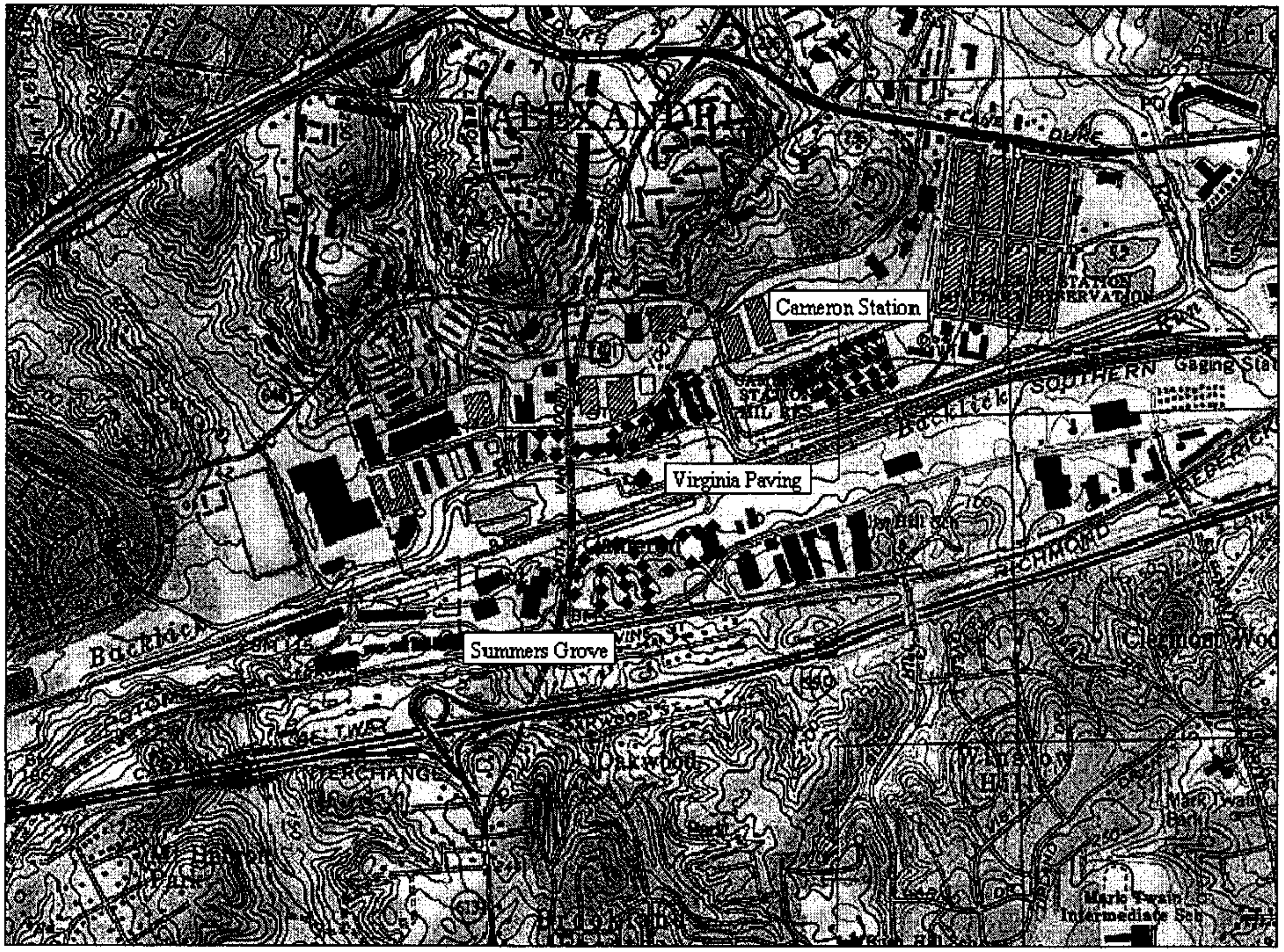
LEGEND

DHF	DRILL HOLE FOUND
IPF	IRON PIPE FOUND
IPS	IRON PIPE SET
PKS	PK NAIL SET
O/S	OFFSET
D.B.	DEED BOOK
PG.	PAGE
EP	EDGE OF PAVEMENT
FC	FACE OF CURB
C&G	CURB & GUTTER
TM	TAX MAP
APPROX.	APPROXIMATE
LOC.	LOCATION
VEPCO	VIRGINIA ELECTRIC & POWER COMPANY
ESMT	EASEMENT
HC	HANDICAP SPACE
CLF	CHAIN LINK FENCE

GRAPHIC SCALE

Figure 2 11-3-05

A-9



Map created with TOPO!® ©2003 National Geographic (www.nationalgeographic.com/topo)

154

Figure 3. Receptor locations for ISC modeling.

Appendix B

Summary Results of an Emission and Air Dispersion Modeling Study and Public Health Evaluation of the Virginia Paving Company Facility, Alexandria, Virginia

Michael R. Ames, Sc.D., Stephen G. Zemba, Ph.D., P.E., and
Laura C. Green, Ph.D., D.A.B.T.
Cambridge Environmental Inc.

September 30, 2005

Per our Protocol of September 13, 2005, dispersion modeling of criteria pollutants was performed separately for each of the various sources at Virginia Paving, and the maximum predicted incremental concentrations were identified. For the gaseous criteria pollutants and lead all or almost all of the emissions are from the dryer stacks and the hot oil heater vent. For these pollutants the maximum predicted increments from each source were summed to derive a screening-level maximum increment, ignoring potential time and space incongruities (*i.e.*, the fact that the maximum impacts from the different sources may occur at different locations and time periods). The maximum impacts of gaseous criteria pollutants emitted from the Virginia Paving facilities are shown in Tables 1 for typical operating conditions and in Table 2 for maximum permitted operating conditions. The Tables also show the applicable National Ambient Air Quality Standards (NAAQS), locally measured levels and the sum of the plant's impact and measured background levels.

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Table 1. Maximum gaseous criteria pollutant impacts from Virginia Paving emissions compared with applicable NAAQS, measured background levels and total of impacts plus background. Impacts assume day, evening, and night operating schedule at current typical annual and daily production rates (900,000 tons per year, 675 tons per hour, 16.5 hours per day).

Pollutant and averaging time ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	Background ($\mu g/m^3$)	Virginia Paving Impact ($\mu g/m^3$)	Total ($\mu g/m^3$)
NO_x - Annual	100	45.1	1.2	46.3
CO - 8-hour	10000	2290	955	3240
CO - 1-hour	40000	5710	3030	8740
SO_2 - Annual	80	15.7	1.2	16.9
SO_2 - 24-hour	365	55	72	127
SO_2 - 3-hour	1300	159	336	496
Pb - Quarterly (annual)	1.5	0.013	0.002	0.015

Table 2. Maximum gaseous impacts from Virginia Paving emissions of gaseous criteria pollutants and lead compared with applicable NAAQS, measured background levels and total of impacts plus background. Impacts assume day, evening, and night operating schedule at current permitted annual and daily production rates (1,500,000 tons per year, 1,000 tons per hour, 24 hours per day).

Pollutant and averaging time ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	Background ($\mu g/m^3$)	Virginia Paving Impact ($\mu g/m^3$)	Total ($\mu g/m^3$)
NO_x - Annual	100	45.1	2.3	47.3
CO - 8-hour	10,000	2,290	1,395	3,685
CO - 1-hour	40,000	5,710	4,390	10,100
SO_2 - Annual	80	15.7	2.4	18.1
SO_2 - 24-hour	365	55	165	220
SO_2 - 3-hour	1,300	159	575	734
Pb - Quarterly (annual)	1.5	0.013	0.006	0.019

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Because emissions of particulate matter from Virginia Paving come from a wide variety of sources which are spread around the facility's property, the impacts of these pollutants were estimated at each special receptor location and averaging period. The maximum, annual average facility impacts of these particulate pollutants at the residential receptor locations are shown in Table 3; the maximum 24-hour average facility impacts of these particulate pollutants are shown in Table 4. The PM emission rates used to predict these impacts were based on reasonable but still fairly conservative (*i.e.*, overpredictive) modeling assumptions. These assumptions include the use of a flat surface to model windblown dust emissions and a maximum estimate of the distance trucks travel over paved surfaces at the facility. A default efficiency of 90% for the silo, loadout, and storage control system (the 'blue smoke' system) has been applied in the revised maximum operating conditions cited in Table 4. The values in Tables 3 and 4 do not include emissions from diesel engines at the facility, or from the oil heater at US Filter.

Table 3. Maximum annual $PM_{2.5}$ and PM_{10} impacts of the total Virginia Paving emissions at current typical annual production rate (900,000 tons per year) and measured stack gas TSP concentrations (0.014 grains per dry standard cubic foot); and at revised maximum annual operations (1,500,000 tons per year); taller stacks of 20 meters for each of the dryers (current heights are 14.1 m and 14.6 m), and 6 m for the hot oil heater (current height is 2.95 m); 125,000 gallons per year hot oil heater fuel usage; and maximum stack gas TSP concentrations of 0.03 grains per dscf (current level is 0.014 grains per dscf).

Pollutant and averaging time ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	Background ($\mu g/m^3$)	Virginia Paving Impact ($\mu g/m^3$)	Total ($\mu g/m^3$)
TSP - annual current typical operations	75*	—*	15	—
TSP - annual revised maximum operations	75*	—*	25	—
PM_{10} - annual current typical operations	50	21	4	25
PM_{10} - annual revised maximum operations	50	21	6	27
$PM_{2.5}$ - annual current typical operations	15	13.4	0.8	14.2
$PM_{2.5}$ - annual revised maximum operations	15	13.4	1.3	14.7

* Total Suspended Particulate Matter is no longer a criteria pollutant. The former annual NAAQS for TSP is 75 $\mu g/m^3$. Ambient TSP measurements have not been taken in Virginia as part of the NAAQS program since 1990.

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Table 4. Maximum 24-hour $PM_{2.5}$ and PM_{10} impacts of the total Virginia Paving impacts for selected pollutants, plant operating conditions, and modeling conditions. Taller stacks are 20 meters tall for each of the dryers (current heights are 14.1 m and 14.6 m), and 6 m for the hot oil heater (current height is 2.95 m). Revised maximum emission conditions are 0.03 grains/dscf total stack PM gas concentration (current level is 0.014 grains/dscf), 125,000 gallons per year hot oil heater fuel usage, and 13,000 tons per day asphalt production.

Pollutant and averaging time ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	Background ($\mu g/m^3$)	Total Virginia Paving Impact ($\mu g/m^3$)	Total ($\mu g/m^3$)
$PM_{2.5}$ - 24-hour current typical operations	65	35.3	20.5	55.8
$PM_{2.5}$ - 24-hour current typical operations, urban dispersion conditions	65	35.3	9.3	44.6
$PM_{2.5}$ - 24-hour, taller stacks, revised maximum emission conditions	65	35.3	28.5	64
PM_{10} - 24-hour current typical operations	150	52	54	106
PM_{10} - 24-hour current typical operations, urban dispersion conditions	150	52	15	67
PM_{10} - 24-hour, taller stacks, revised maximum emission conditions	150	52	67	119

Particulate matter emissions from the facility were also modeled over a 6 km square centered at the facility with receptors spaced on a 100 meter grid. The 5-year average increments to the PM levels were estimated. Figure 1 shows the annual average PM_{10} due to the facility's emissions over the 6 km grid.

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A comparison of the increments due to dryer and heater stack emissions, and from the venting and loadout emissions was made for the facility's operating under its previous schedule which included evening and nighttime operations, and under its current schedule which includes only daytime operation. The difference between these two operating schedules was small. PM_{10} impacts averaged over the entire 6km grid for day/night operations were slightly lower (97%) compared with the average impacts for day only operations. The maximum ratio of day/night to day only impacts was 1.07; the minimum ratio was 0.87.

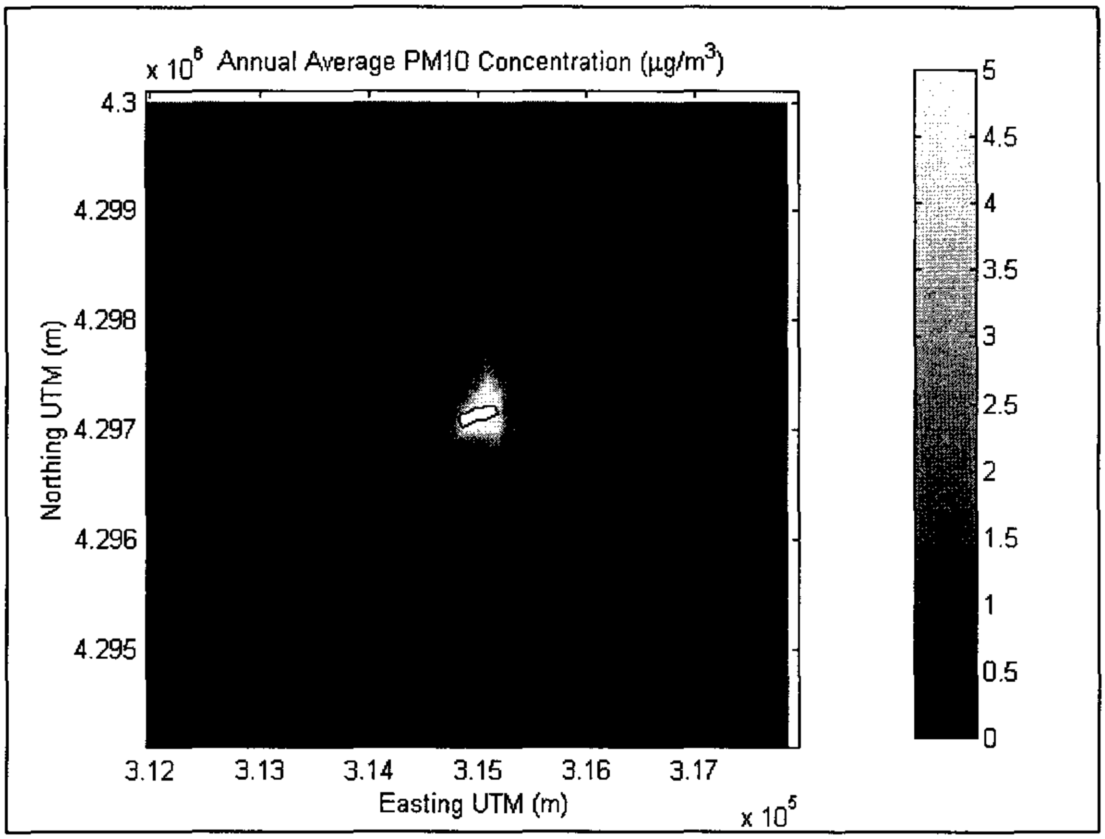

Figure 1. Estimated annual average PM_{10} impacts from the Virginia Paving facility in Alexandria, Virginia. Impacts are based on typical facility operating conditions. The facility property is within the white area in the center of the figure.

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The PM_{10} impacts of the facility were also modeled at 21 locations along the facility's property boundary or fenceline. This model included refined estimates for some of the facility's emissions as well as somewhat more restrictive operating conditions. The conditions described with Table 4 were applied with the addition of the use of the following

- use of #2 fuel oil in the hot oil heater,
- a limit of 100,000 gallons of fuel for the hot oil heater per year,
- the application of a 99% control efficiency for the 'blue smoke' system (as cited by the system's vendor),
- the addition of enclosures at all but one of the locations where the aggregate is dropped from conveyors or vehicles,
- a more realistic estimate of the total vehicle miles traveled per day by truck on the facility property,
- the application of a 75% control efficiency watering and vacuuming of the paved roadways,
- the application of a 90% control efficiency watering unpaved surfaces,
- the inclusion of a emission reduction factor of 0.2 in estimating windblown dust emissions to account for the fact that the aggregate piles are conical rather than flat,
- the addition of emissions from diesel engines at the facility, as well as from the hot oil heater at U.S. Filter.

With these additional refinements and conditions, the maximum estimated 24-hour PM_{10} impact at the facility fenceline is 84 $\mu g/m^3$ which when added to the maximum measured value of 24-hour PM_{10} in Alexandria of 52 $\mu g/m^3$ gives a total of 136 $\mu g/m^3$, which is below the 24-hour PM_{10} NAAQS of 150 $\mu g/m^3$.

The emissions and dispersion conditions employed for modeling gaseous criteria pollutants in Tables 1 and 2 were also applied to assess the potential health effects of hazardous pollutants emitted from the facility. The maximum hazard indices and incremental lifetime cancer risks for various exposure scenarios are given in Table 5.

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Table 5. Maximum Hazard Indices and incremental lifetime cancer risks due to emissions from Virginia Paving.

Receptor	Maximum Hazard Index	Maximum incremental lifetime cancer risk
Maximum residence current production rate	0.08	1.2E-06
Maximum residence permitted annual production rate	0.2	2.4E-06
Maximum Commercial/industrial current production rate	0.6	1.8E-06
Maximum Commercial/industrial permitted annual production rate	1	3.5E-6
Nearest school current production rate	0.04	1.1E-07
Nearest school permitted annual production rate	0.07	2.2E-07
Nearest park current production rate	0.03	1.1E-07
Nearest park permitted annual production rate	0.08	2.6E-07

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Addendum to

Results of an Emission and Air Dispersion Modeling Study and Public Health Evaluation of the Virginia Paving Company Facility 5601 Courtney Avenue Alexandria, Virginia

Michael R. Ames, Sc.D., Stephen G. Zemba, Ph.D., P.E., and
Laura C. Green, Ph.D., D.A.B.T.
Cambridge Environmental Inc.

December 7, 2005

162

Evaluation of Toxic Air Pollutants

Upon detailed review of our spreadsheets, we discovered that another toxic air pollutant, namely, lead, exceeded an hourly (but not yearly) emission exemption limit, as set forth by Virginia DEQ in its *New Source Review Permits Program Manual* (available at http://www.deq.virginia.gov/air/pdf/air/airguide.pdf). Thus, hourly ambient air impacts from lead were modeled, and the estimated impacts compared to the DEQ's hourly Significant Ambient Air Concentration (SAAC) for lead. The results of this modeling appear below, and show that impacts from lead are also acceptably small.

Table 19. Modeling results, lead (Pb), 1-hour averaging period

Pollutant	**Lead (Pb)**		
Averaging period	1-hour		
Statistical metric	Highest hourly value at each receptor		
Sources	Dryer stacks and hot oil heater		
Maximum predicted concentration (at any receptor)			
Modeling year	Concentration ($\mu g/m^3$)	Coordinates relative to Plant 1 dryer stack (m)	
		x (east-west)	*y* (north-south)
2000	0.068	-193	-230
2001	0.068	0	750
2002	0.065	-193	-230
2003	0.063	100	118
2004	0.066	-193	-230
Highest of all	**0.068**	0	750
Significant Ambient Air Concentration (SAAC)	**7.5**		

Files on the CD, VA Paving Assessment

The main directory of the CD contains our report and a short addendum thereto (which addresses a SAAC analysis for lead). Also included is the spreadsheet used to determine whether the toxic air pollutants (TAPs) are emitted at rates exceeding the exemption levels established by the Virginia DEQ. Additional supporting files are contained in subdirectories, as described in the following modeling summary.

Dispersion Modeling Summary

Our compliance modeling analysis is based on AERMOD, a U.S. EPA model recently recommended as a guideline model for regulatory applications. The switch from ISCST3 (used in the analyses described in our September 30th memo) to AERMOD was prompted by discussions with the City of Alexandria staff, who, along with their consultant, Maureen Barrett, consider AERMOD to be a more appropriate model for use in this matter. To facilitate review and encourage a commonly agreeable approach, the AERMOD analysis includes significant elements provided by the City staff and Ms. Barrett. Specifically, we were provided (and are using) a five-year meteorological data set, a building downwash analysis, and a receptor network provided by Ms. Barrett. Generally, this information is used as received. A few minor exceptions are noted as follows, all of which are considered of minor importance.

1. The receptor network contained erroneous coordinates for one fenceline receptor. Coordinates were corrected by averaging the parameters (x, y, z, hill) at the two adjacent receptors on the western property line boundary. Since maxima are not predicted in this area, no significant errors are introduced.

2. Meteorological data for the 2004 calendar year were short by one day. Failure to have a complete year of data interfered with AERMOD's ability to process output with the PM10 pollutant designation. This problem was solved by adding a day of meteorological data to the 2004 data file -- specifically, December 31, 2002 data were reproduced. (this involved a change in the year field for the 24 1-hour entries). Data from the 2002 year were used because it was believed that the 2002 data represented the "worst-case" modeling year. This procedure is not likely to have any significant impact on the model predictions given that it covers only a single day of the year.

3. The AERMET data files as received contain a small number of "missing" data. Model output files indicate that the percentage of missing data records averages about 2.8% per year over the 2000 to 2004 period. As a result, the model results are based on a slightly smaller number of hours than a full data set. Again, however, the model results are not likely affected in any significant manner by this level of missing data.

A variety of different sources are included in the modeling runs. The AERMOD designations of these sources and their descriptions follow:

Sources associated with the Virginia Paving facility:

P1_STK	Dryer stack for hot-mix asphalt Plant 1 (point source)
P2_STK	Dryer stack for hot-mix asphalt Plant 2 (point source)
HOT_OIL	Hot oil heater used to heat liquid asphalt (point source)
P1_SILO	Venting emissions from asphalt Plant 1 storage silos (volume source)
P2_SILO	Venting emissions from asphalt Plant 2 storage silos (volume source)
P1_LO	Fugitive loadout emissions from asphalt Plant 1 (volume source)
P2_LO	Fugitive loadout emissions from asphalt Plant 2 (volume source)
P1_YD	Fugitive yard emissions from asphalt Plant 1 (volume source)
P2_YD	Fugitive yard emissions from asphalt Plant 2 (volume source)
AC_TANKS	Venting emissions from liquid asphalt and fuel oil tanks (volume source)
DESELW	Diesel exhaust from on-site equipment, western RAP (area source)
DESELE	Diesel exhaust from on-site equipment, eastern RAP (area source)
DESELS	Diesel exhaust from on-site equipment, sand pile (area source)
DESELA	Diesel exhaust from on-site equipment, aggregate area (area source)
DROPAGGR	Material drop dust emissions, aggregate (area source)
DROPSAND	Material drop dust emissions, sand (area source)
DROPRAPW	Material drop dust emissions, RAP west pile (area source)
DROPRAPE	Material drop dust emissions, RAP east pile (area source)
CRUSHER	RAP crusher emissions (area source)
EROSSAND	Wind erosion of the sand pile (area source)
EROSAGGR	Wind erosion of the aggregate piles (area source)
PAVED1	Paved road emissions, Plant 1 (area source)
PAVED2A	Paved road emissions, Plant 2, 1 of 4 portions (area source)
PAVED2B	Paved road emissions, Plant 2, 1 of 4 portions (area source)
PAVED2C	Paved road emissions, Plant 2, 1 of 4 portions (area source)
UNPAVED	Unpaved road emissions

Sources outside the Virginia Paving facility:

COVANTA	Covanta waste-to-energy facility (point source)
WAGASLTE	Washington Gas Light Company (point source)
USF_OIL	Stack emissions from the U.S. Oil Filter facility (point source)

Finally, please note that our CD contains three areas. First is a series of emissions spreadsheets. Second are the processed meteorologic data developed from Ms. Barrett's meteorologic files. Third are the model runs themselves, with sections organized according to averaging periods and pollutants. Each directory in this area contains all of the files needed to run AERMOD and to produce the output files provided.

MEMORANDUM

To: David Sullivan, CCM

From: Mike Ames, Sc.D. and Laura Green, Ph.D., D.A.B.T.

Subject: Maximum 1-hour formaldehyde modeling and fugitive dioxin emission estimates

Date: August 28, 2006

At the August 17, 2006 meeting among representatives from Virginia Paving, Cambridge Environmental, the City of Alexandria, and Cameron Station, it was requested that we provide some additional information regarding (1) meteorological conditions that lead to maximum modeled 1-hour formaldehyde impacts at ground level and at a range of elevations at the locations of the buildings currently under construction near Virginia Paving, and (2) an estimate of the fugitive emissions of dioxins from the Virginia Paving storage silos and asphalt loadout areas. We write to provide you with this information.

Maximum 1-hour formaldehyde modeling

The maximum 1-hour formaldehyde impacts from Virginia Paving were modeled previously as part of our December 2005 air quality report. The maximum modeled 1-hour impact at any receptor over the complete 5 years of meteorological conditions was 14.6 $\mu g/m^3$. The location of this maximum is 103 meters east and 282 meters north of Virginia Paving's Plant 1 dryer stack. The hour for which this concentration was predicted was 11:00 p.m. to 12:00 midnight on February 20, 2001 when the wind was blowing at a speed of 2.1 m/s under stable conditions (a Monin-Obukhov length of 17.5 m) with a mechanical-only mixing height of 141 meters.

As requested at the August 17, 2006 meeting, an additional set of models was run at the locations of the two new buildings at Cameron Station using receptors elevated above ground level (the modeling performed for the December report used only ground level receptors). The maximum 1-hour impacts and associated meteorological conditions for this modeling are summarized below in Table 1. As you will see, none of these impacts are greater than the previously reported maximum of 14.6 $\mu g/m^3$. The maximum modeled impacts for ground level and fairly low receptors occurred at a wind speed of 2.1 meters per second, while the maximum modeled impacts at the upper elevations occurred at a wind speed of 1.5 meters per second. Due to the way the measured wind speeds are reported and converted, the lowest wind speed in the modeling is 1.5 meters per second, and the next highest speed is 2.1 meters per second.

Because wind speeds less than 1.5 meters per second do occur, of course, concerns were raised that higher impacts might occur at lower wind speeds which were not included in the modeling. The facts that (1) the wind speeds that match the maximum 1-hour impacts decrease with

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elevation and (2) it is only at the upper elevations that the minimum modeled wind speed gives the maximum impact, imply that if all possible wind speeds were modeled, the maximum impacts would be seen at wind speeds slightly higher than the minimum 1.5 meters per second used in the modeling.

To test whether this is the case, a single day of modeling was run using the meteorological conditions that produced the maximum modeled formaldehyde impact shown in Table 1, but with the wind speed varied in increments of 0.1 meter per second above and below 1.5 meters per second. This sensitivity model tests whether the maximum modeled impacts increase or decrease as a function of wind speed near the previous minimum modeled wind speed of 1.5 meters per second. The maximum impacts in this sensitivity model were at slightly higher wind speeds than those shown in Table 1. For example, at the receptor 400 meters east, 200 meters north, at an elevation of 21 meters, the maximum impact was for a wind speed of 1.8 meters per second. At elevations of 15 and 18 meters, the maximum impact was at a wind speed of 1.9 meters per second.

Therefore, if wind speeds below 1.5 meters per second had been included in the previously performed modeling it would not have led to higher modeled 1-hour maximum impacts.

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Table 1. Maximum modeled 1-hour formaldehyde impacts and associated meteorological conditions at various elevations for the locations of two new buildings in Cameron Station. The mixing heights are all mechanically driven because the maximum hours all occur during nighttime conditions when there is assumed to be no convective mixing. All of the Monin-Obukhov lengths indicate stable conditions.

East (m)	North (m)	Elevation (m)	Maximum 1-hour formaldehyde impact ($\mu g/m^3$)	Wind speed (m/s)	Monin-Obukhov length (m)	Mixing height (m)
350	100	0	3.8	2.1	22.8	156
350	100	3	4.3	2.1	22.8	156
350	100	6	4.8	2.1	22.8	156
350	100	9	5.2	2.1	22.8	156
350	100	12	6.0	2.1	22.8	156
350	100	15	7.1	1.5	14.1	124
400	200	0	6.1	2.1	17.2	129
400	200	3	6.8	2.1	17.2	129
400	200	6	6.9	2.1	17.2	129
400	200	9	7.2	2.1	17.2	129
400	200	12	7.6	2.1	17.2	129
400	200	15	8.0	2.1	17.2	129
400	200	18	9.2	1.5	13.8	85
400	200	21	10.7	1.5	13.8	85

Fugitive dioxin emission estimates

Additional information was also requested about potential emissions of polychlorinated-*p*-dioxins and furans (dioxins) from portions of the Virginia Paving facility that were not evaluated for dioxin emissions in our air quality and health impact report of September 2005. In brief, dioxin emissions had been estimated in our previous modeling of the dryer stacks and hot oil heater at Virginia Paving using emission factors from the U.S. EPA's *Compilation of Air Pollutant Emission Factors* (AP42). Because there are no emission factors for dioxins from an

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asphalt plant's hot-mix storage silos, load out area, liquid asphalt storage tanks, or from trucks loaded with hot-mix asphalt (yard emissions), no dioxin emission estimates were made for these sources.

At the meeting on August 17, it was suggested that the 4-ring PAH compound pyrene might serve as a suitable surrogate for dioxins, and that a simple estimate of fugitive dioxin emissions could be made by using the ratio of fugitive to stack emissions for pyrene. Based on AP42 emission factors and operating conditions and limits at Virginia Paving, the fugitive emissions of pyrene are estimated to be 35% of the stack emissions. If the dioxins behave as pyrene, then it would be expected that fugitive dioxin emissions from Virginia Paving would also be 35% of the stack emissions, and therefore the previous dioxin emission estimates should be increased by 35%. Because the estimated dioxin impacts on nearby concentrations in the atmospheric and soil are so far below background levels and below concentrations that might lead to public health concerns, this increase would not have a significant effect on the overall results and conclusions of the previous air quality and health impact reports.

Upon further review of the relevant properties of pyrene and the dioxin congeners of interest, it became apparent that pyrene is significantly more volatile than any of the PCDD/Fs of interest, and so might not be the best surrogate available for the relevant PCDD/F congeners. A more valid estimate of fugitive dioxin emissions can instead be made based on two slightly different sets of assumptions regarding the partitioning of dioxins among the vapor, liquid, and particle phases of the asphalt and exhaust streams.

The first estimate is based on the assumptions that (1) dioxins in the stack exhaust upstream of the baghouse are in equilibrium with respect to partitioning among vapor, liquid, and particle phases and (2) the liquid aerosol phase at this location is similar in composition to the liquid material in the silo and at the loadout. This implies that the dioxin content of the vapor phase upstream of the baghouse is also equivalent to the dioxin content of the vapor phase in the silo and at the loadout. The bag house removes most of the particulate matter but is kept hot enough to prevent condensation, so it should not significantly affect the composition of the vapor phase material. Therefore the dioxin content of the vapor phase at the baghouse exit should be comparable to the dioxin content of the vapor phase at the silo and loadout areas. Dioxins at the baghouse outlet will be either in the form of condensable vapors or adsorbed to filterable particulate matter, whereas emissions from the silos and loadout areas are predominantly made up of condensed vapors. The ratio of dioxin emissions from fugitive sources to dioxin emissions from the stacks can thus be estimated by simply calculating the ratio of total particulate emissions from fugitive plant sources to total particulate emissions from the dryer stacks. This estimate is likely to overestimate the fugitive dioxin emissions because emissions from the stacks

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include a greater fraction of filterable particulate than emissions from the silos and loadout areas. The emission factor for total particulate matter (filterable plus condensable) from drum mix hot mix asphalt dryers with fabric filters is 0.033 pounds of emissions per ton of asphalt; the emission factor for total particulate matter from the silos, loadout, and yard areas of Virginia Paving is 0.001 pounds of emissions per ton of asphalt. Therefore, the fugitive dioxin emissions are estimated to be approximately 3% of the stack dioxin emissions.

The second estimate is based on the assumptions that (1) dioxins are emitted from the stacks and fugitive sources as a component of the facility's organic particulate matter emissions (both filterable and condensable) and (2) the dioxin content of the organic particulates is the same in both the stack and fugitive emissions. An estimate of the ratio of fugitive dioxin emissions to stack dioxin emissions can then be made using a similar method as above, but considering only organic particulate emissions rather than total particulate emissions. The emission factor for condensable organic particulate matter from drum mix hot mix asphalt dryers is 0.012 pounds of emissions per ton of asphalt. The emission factor for total particulate matter from the silos, loadout, and yard areas of Virginia Paving is 0.0004 pounds of emissions per ton of asphalt. Therefore, the fugitive dioxin emissions as estimated by this method are also approximately 3% of the stack dioxin emissions.

These two estimates differ in terms of which portion of the stack and silo emissions are assumed to be similar (liquid phase material *vs*. organic particulate matter), but both produce estimates of fugitive dioxin emissions that are approximately 3% of stack dioxin emissions. This estimate is about ten times lower than the pyrene-based estimate given above.

Finally, as was the case for the pyrene-based estimate, because the modeled air quality and potential public health impacts caused by stack emissions of dioxins from Virginia Paving are vastly smaller than levels of concern, the addition of dioxins possibly emitted from fugitive sources has no significant effect on our previously reported conclusions.

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MEMORANDUM

To: David Sullivan, CCM; Maureen Barrett, PE

From: Michael Ames, ScD

Subject: Potential air quality impacts at wind speeds lower than the minimum used in the AERMOD runs for Virginia Paving

Date: September 13, 2006

At the August 17, 2006 meeting among representatives from Virginia Paving, the City of Alexandria, and Cameron Station, questions were raised about the minimum wind speeds used in the recent air dispersion modeling of emissions from Virginia Paving, and whether the use of lower wind speeds would lead to higher estimated air quality impacts. Maureen Barrett of AERO Engineering, (the City of Alexandria's air quality consultant) agreed to examine this issue. On August 30, 2006 she sent an e-mail confirming that the minimum wind speed used in the recent dispersion modeling was 1.5 meters per second (m/s), and suggesting an approach for evaluating whether the modeling that has already been performed sufficiently predicts the maximum facility impacts under low wind speed conditions.

On August 31, 2006, the City of Alexandria requested that Cambridge Environmental (rather than AERO Engineering) perform the additional modeling and/or calculations needed to determine whether dispersion modeling performed using meteorological data containing wind speeds below 1.5 m/s would predict higher ambient air impacts than those estimated in the recent modeling efforts. Prior to the City of Alexandria's request to finalize the low wind speed analyses, Cambridge Environmental performed several analyses of the potential effects of low wind speeds on the modeling of emissions from Virginia Paving. After the City's request of August 31 , Cambridge Environmental also confirmed that ISCST3 modeling performed in September 2005 employed meteorological data with a minimum wind speed of 1 m/s rather than the 1.5 m/s minimum used in the more recent AERMOD modeling. After consulting with David Sullivan, it was agreed that sufficient modeling had already been performed to assess what the impacts of Virginia Paving might be if the minimum modeled wind speed was less than 1.5 m/s. This memo summarizes the previous modeling results that relate to predicted impacts at low wind speeds, and estimates the potential for some of these impacts to increase if lower wind speeds were included in the modeling.

The first step in assessing the potential for the AERMOD modeling results included in the December 2005 report to have underestimated impacts under low wind conditions is to examine the meteorological conditions that produced the maximum short-term impacts in this modeling. If the maximum impacts did not occur during periods when the winds speeds were at the minimum used in the modeling (1.5 m/s), then the impacts have not been underestimated due to

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exclusion of lower wind speeds from the modeling. If the maximum impacts for a source were found at the minimum AERMOD wind speed, then the ISCST3 results from September 2005 are examined to see if the maximum impacts from this modeling occur at the lower minimum wind speed used in ISCST3 modeling (1.0 m/s). If a source's maximum impacts occur at this lower wind speed, then the potential for greater impacts to occur at even lower wind speeds is assessed.

Two different pollutants were evaluated in the recent analyses: (1) PM_{10} which is emitted by both the combustion sources and a variety of fugitive dust sources, and which is currently being measured at a new ambient air monitor near the Tucker School; and (2) formaldehyde which is primarily emitted from the asphalt dryer stacks but is also emitted from fugitive sources (*e.g.*, the asphalt silo and loadout areas), and which is the toxic air pollutant for which the modeled impacts are closest to the Virginia DEQ's 1-hour and annual Significant Ambient Air Concentrations (SAAC).

The modeling results indicate that:

- The maximum short-term PM_{10} impacts from significant sources at Virginia Paving occur when the wind speeds are greater than minimum speed of 1.5 m/s. Therefore, it is not expected that higher maximum impacts would have been predicted if wind speeds of less than 1.5 m/s were included in the modeling.
- The maximum formaldehyde impacts from the sum of all sources at Virginia Paving, and from the stack emissions only, occur at wind speeds that are slightly higher than the minimum; however, the maximum formaldehyde impacts from the fugitive sources do occur at the minimum modeled wind speed.
- The best estimate of the maximum formaldehyde impacts of Virginia Paving emissions indicates that the 1-hour impact might increase by 10% and the annual impact might increase by 1% if modeled wind speeds of 1.0 m/s are assumed during the hours identified as calms in the AERMOD modeling.
- The most conservative estimate (*i.e.*, one that is likely to be too large) of the maximum formaldehyde impacts of Virginia Paving emissions indicates that the 1-hour impact might increase by 40% and the annual impact might increase by 4% if modeled wind speeds of 0.5 m/s are assumed during the hours identified as calms in the AERMOD modeling.
- Even using the conservatively estimated maximum fugitive formaldehyde estimates, the total impacts are well below the Virginia DEQ's 1-hour and annual SAACs.

Analysis of meteorological conditions for maximum modeled PM_{10} impacts using AERMOD

Prior to the August 17, 2006 meeting, two analyses were performed to supplement the PM_{10} modeling used for the report issued in December 2005. The first test was designed to determine the meteorological conditions that lead to the maximum modeled PM_{10} impacts at the new monitoring site near the Tucker School. The second test was used to evaluate the potential for the maximum PM_{10} impacts at the two new buildings at Cameron Station to be higher than those impacts reported in December 2005. The latter analysis included the modeling of receptor locations above ground level (*i.e.*, flagpole receptors). Both analyses were run using AERMOD and the emission rates developed for the December 2005 report and subsequent addenda. The results of these tests were described at the August 17, 2006 meeting and are summarized below.

The first PM_{10} analysis evaluated the conditions that result in the maximum modeled PM_{10} impact at the new monitor near the Tucker School. Modifications to the previous modeling were simply to add a single receptor at the monitor location, and to produce an additional model run for the maximum impact date that would provide hour-by-hour impact estimates. Of the five years of meteorological data used in the modeling, the maximum 24-hour impact of 14.6 $\mu g/m^3$ at the school occurred on December 31, 2003, with the maximum 1-hour impact of 77.4 $\mu g/m^3$ on this date occurring in hour 23. The hourly surface wind speed and direction data and the hourly PM_{10} impacts are given in Table 1. As is done in the AERMOD model, the hours of calm winds are not included in the average (*i.e.*, the 24- hour average for this date is calculated using only the impacts for the hours 1-3 and 6-24). The average wind speed for the day is 2.7 m/s if the periods when the model assumed calm conditions (hours 4, 5, and 6) are included with as assumed speed of 0 m/s; the average wind speed for the non-calm hours of the day is 3.1 m/s. The wind speed for the maximum impact hour on this date is 2.1 m/s. It is notable that the periods during the day when the wind speeds were at the minimum wind speed of 1.5 m/s did not lead to significant PM_{10} impacts.

The second PM_{10} analysis modeled the maximum of the fourth-highest annual 24-hour PM_{10} impacts, and maximum annual average impacts at the new buildings at Cameron Station. Table 2 shows the results of this modeling. The maximum impacts for both locations and for both 24-hour and annual time periods are at elevations of 3 to 6 meters. The impacts at the lower elevations do not differ by a significant amount although the impacts at the upper elevations are somewhat lower, presumably because the influences of non-stack sources decreases at the upper heights. The reported 24-hour PM_{10} impacts in Table 2 are the maximum of the fourth-highest 24-hour values for each year at each receptor location; they are not the maximum values over the entire five years of modeled results. This selection of the fourth-highest value for evaluating impacts is based on the guidelines for NAAQS compliance, and allowed these flagpole results to be compared with the 24-hour PM_{10} impacts previously reported in December 2005. In addition to providing evidence that the PM_{10} impacts at elevated receptors are not significantly higher than for receptors at ground level, this modeling included maximum PM_{10} impact results for individual source groups. For most of the significant elevated and ground-level sources of PM_{10} at Virginia Paving (*i.e.*, stack emissions, dropping of fine aggregate and sand, and fugitive emissions from truck traffic on paved and unpaved surfaces), the maximum 24-hour impacts at these receptors occurred on the same date as the maximum for the Tucker School model, December 31, 2003. As described above, because the wind speeds for this day were generally well above the minimum speed of 1.5 m/s, it is unlikely that higher PM_{10} impacts from these sources would have been estimated if the meteorological data used in the modeling had included wind speeds lower than 1.5 m/s.

Maximum formaldehyde impacts

The maximum 1-hour and annual average formaldehyde impacts from Virginia Paving were modeled as part of Cambridge Environmental's December 2005 air quality report. The maximum modeled 1-hour impact at any receptor over the complete 5 years of meteorological conditions was reported as 14.6 $\mu g/m^3$. The location of this maximum is 103 meters east and 282 meters north of Virginia Paving's Plant 1 dryer stack. The hour for which this concentration was predicted was 11:00 p.m. to 12:00 midnight on February 20, 2001 when the wind was blowing at a speed of 2.1 m/s.

As requested at the August 17, 2006 meeting, an additional set of models was run at the locations of the two new buildings at Cameron Station using receptors elevated above ground level (the modeling performed for the December report used only ground level receptors). This results of this analysis were sent to meeting attendees on August 28, 2006. The maximum 1-hour impacts and associated wind speeds for this modeling are summarized in Table 3. The maximum modeled impacts for ground level and fairly low receptors occurred at a wind speed of 2.1 m/s, while the maximum modeled impacts at the upper elevations occurred at the minimum modeled wind speed of 1.5 m/s. The maximum annual average impacts are give in Table 3 as well.

Because some of the maxima occurred at 1.5 m/s, a sensitivity analysis was performed to evaluate whether these maxima would occur at slightly higher or lower wind speeds if continuous wind speed data were available and modeled. A single day of modeling was run using the meteorological conditions that produced the maximum modeled formaldehyde impact shown in Table 3, but with the wind speed varied in increments of 0.1 m/s above and below 1.5 m/s. This sensitivity test found that the maximum impacts were at slightly higher wind speeds than those shown in Table 3. For example, at the receptor 400 meters east, 200 meters north, at an elevation of 21 meters, the maximum impact was for a wind speed of 1.8 m/s. At elevations of 15 and 18 meters, the maximum impact was at a wind speed of 1.9 m/s.

Following this sensitivity analysis, separate models were run for formaldehyde emissions from the elevated stack sources (which dominate the emissions and impacts), and for the fugitive formaldehyde emissions from the liquid and hot mix asphalt storage silos and tanks, and from the hot mix loadout areas. The maximum impacts from the stack sources were close in magnitude to the total impacts and occurred during the same hours. Therefore, modeling of formaldehyde from these sources using lower minimum wind speeds would not lead to greater estimated impacts. However, the maximum impacts of formaldehyde emissions from the fugitive sources were found to occur during hours when the wind speeds are at the minimum value of 1.5 m/s. The results of these model runs and the associated wind speeds are shown in the rightmost columns in Table 3. Therefore, the previous ISCST3 modeling results for the emissions from the fugitive sources was examined. Although the previous ISCST3 modeling did not include modeling of impacts at the specific locations of thee new buildings at Cameron Station, the maximum modeled 1-hour fugitive formaldehyde impacts for ground level receptors near these locations are in the range of 0.9 to 1.0 $\mu g/m^3$ which is somewhat higher than the maximum ground level impacts modeled in AERMOD of 0.71 and 0.75 $\mu g/m^3$. The wind speeds that lead to these maximum ISCST3 modeled impacts are 1.0289 m/s (this speed is equal to 2 knots and is the lowest commonly reported speed used in the ISCST3 modeling). Because it is clear that maximum formaldehyde impacts from the fugitive sources can occur at the minimum modeled wind speeds for both AERMOD and ISCST3, it is necessary to assess of how high the overall maximum impacts might be if a lower minimum wind speed were used in the modeling.

To predict how the maximum formaldehyde impacts might increase if lower wind speeds were modeled, it is necessary to assess or estimate (1) how much of the currently modeled total impacts are due to sources for which the impacts should increase at lower wind speeds, (2) assume what wind speeds might occur during periods previously identified as calm, (3) how much the impacts from the relevant sources might increase at lower wind speeds, and (4) for long-term impacts, how often these lower wind speeds occur.

Using the data in Table 3, the maximum fugitive formaldehyde impacts are between 7% and 20% of the maximum total impact. It should be noted that the fugitive impacts do not vary as much as the total impacts so for the maximum total impact levels the fugitive impacts comprise a lower percentage. A conservative assumption for the periods modeled as calms would be that the wind speeds for these periods are 0.5 m/s. A more realistic assumption is that most of the hours when wind speeds are considered calm in the AERMOD modeling, the actual wind speeds are approximately 1.0 m/s. This second assumption is supported by the meteorological data used in the ISCST3 modeling. Over the five years of meteorological data used for the ISCST3 modeling (1984-1988), which has a minimum wind speed threshold of 1.0 m/s, only 0.9% of the wind speeds are reported as calms. If it is assumed that at low wind speeds the maximum impact is inversely proportional to the wind speed, then for the hours when the wind speed is below 1.5 m/s, if the wind speed is assumed to be 1 m/s the impacts will 1.5 times the previously modeled levels, and if the wind speed is assumed to be 0.5 m/s the impacts will be 3 times previously modeled levels. Over the five years of hourly meteorological data (2000-2004) used in the AERMOD modeling, 9.7% of the hours have wind speeds recorded as calm[1] (below the minimum wind speed of 1.5 m/s), and an additional 0.2% have missing wind speed data. Therefore approximately 10% of the period being modeled has no positive recorded wind speed.

Estimates of the potential increase in the total maximum modeled 1-hour formaldehyde impacts were calculated in two steps: (1) The maximum 1-hour formaldehyde impacts from the fugitive sources estimated in AEROMOD were increased by a factor equal to the AERMOD minimum wind speed of 1.5 m/s divided by the assumed calm wind speeds of 0.5 or 1.0 m/s. (2) The difference between this increased impact estimate and the previous maximum fugitive impact is added to the previous maximum total impact. Table 4 shows the estimated maximum 1-hour impacts for the flagpole receptors shown in Table 3 using assumed 'AERMOD calm condition' wind speeds of both 0.5 and 1.0 m/s and the percent increases from the previous AERMOD maxima. The affect these increased 1-hour impacts would have on the annual average impacts are then calculated by assuming that the increased 1-hour impacts occur during the 10% of hours when the AERMOD assumes calm wind conditions. The estimated annual average impacts for both assumed calm condition wind speeds are given in the right most columns of Table 4, again with the percent increases. For the most likely 'AERMOD calm condition' wind speed of 1.0 m/s, the 1-hour maximum total formaldehyde impacts might increase by about 5 to 10 %, while the annual impacts would increase by only 1% or less. Under the most conservative assumptions, the 1-hour maximum total formaldehyde impacts might increase by almost 40%, while the annual impacts might increase by 4%. Applying these percentage increases to the previous AERMOD modeled maxima gives a likely potential maxima of 16.1 $\mu g/m^3$ for a 1-hour average, and 0.215 $\mu g/m^3$ for an annual average; and conservatively estimated potential maxima of 20.3 $\mu g/m^3$ for a 1-hour average, and 0.222 $\mu g/m^3$ for an annual average. These values are

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[1] The tendency for more recently collected meteorological data (Automated Surface Observing System or ASOS data) to contain a higher frequency of calms than previously collected conventional observer data has been noted by the U.S. EPA. The recently collected data also tends to have lower wind speeds than the conventional observer wind speed data. (Analysis of The Affect of ASOS-Derived Meteorological Data On Refined Modeling, United States Environmental Protection Agency, Office of Air Quality Planning and Standards, Research Triangle Park, NC 27711. EPA-454/R-97-014, November 1997).

well below the Virginia DEQ SAACs of 62.5 μg/m^3 for a 1-hour average, and 2.4 μg/m^3 for an annual average

Because the periods when the maximum impacts from formaldehyde emitted from the stacks are not the same as the periods as when the maximum impacts occur for formaldehyde emitted from the fugitive sources, these estimated total impacts are overestimated. It should also be noted that it was assumed in the modeling of volatile compounds from Virginia Paving that the air pollution control devices to be installed on the facility's silos and loadout areas would not reduce these volatile emissions, although some reduction is likely to occur. Under the assumption of no volatile control, the fugitive emissions are a small fraction of the total emissions, with the implementation of various control technologies, the actual fraction will be even smaller, and therefore the overall effect of low wind speeds on nearby impacts will be lower than estimated above.

Conclusion
Cambridge Environmental has conducted a wide range of air quality modeling for Virginia Paving including: ISCST3 modeling of the entire facility performed for a September 2005 air quality report, AERMOD modeling of the entire facility performed for a December 2005 air quality report, and several additional AERMOD models to clarify and amend the results of these works. The recent analyses have focused on PM_{10} and formaldehyde. PM_{10} is of interest because it is emitted by a wide range of sources at the facility and because a new PM_{10} monitor was installed this summer near the Tucker School. Formaldehyde is of interest because it is the toxic air pollutant for which modeled impacts of Virginia Paving's emissions come closest to reaching the Virginia DEQ's SAAC levels.

Several of these model runs and analyses provide information on the likely effects that the models' exclusion of conditions below a minimum wind speed might have on the maximum predicted impacts (the minimum wind speed used in the AERMOD runs was 1.5 m/s while the minimum speed in the ISCST3 runs was 1.0 m/s). Based on this previous work, it has been shown that the maximum short-term PM_{10} impacts for significant sources of PM_{10} at Virginia Paving do not occur under low wind speed conditions and therefore the modeled impacts would not increase if meteorological data with a lower minimum wind speed were used. In contrast, the maximum 1-hour impacts of Virginia Paving's total formaldehyde emissions occur at fairly low wind speeds, although not at the minimum speed. However, the maximum impacts of formaldehyde emissions from the fugitive sources at Virginia Paving do occur at the minimum modeled wind speed and therefore the impacts from these source might be higher if the model had used a lower minimum speed. The best estimate of the how the maximum modeled formaldehyde impacts might change if lower wind speeds were included in the modeling is that the 1-hour maximum total formaldehyde impacts might increase by about 5 to 10 %, while the annual impacts would increase by 1% or less. Under the most conservative assumptions, the 1-hour maximum total formaldehyde impacts might increase by almost 40%, while the annual impacts might increase by 4%

Because the previously modeled 1-hour maximum formaldehyde impact of 14.6 $\mu g/m^3$ and the maximum annual average impact of 0.213 $\mu g/m^3$ are well below the respective Virginia DEQ's SAAC standards of 62.5 and 2.4 $\mu g/m^3$, even with the additional impact of the most conservative estimates, the totals would still be significantly below the standards. Therefore, if the previous modeling had used meteorological data with a minimum wind speed lower than 1.5 m/s, the overall finding would not have changed, namely that emissions from Virginia Paving do not lead to exceedances of any air quality standards.

Table 1. Hourly wind speed and direction, and modeled PM_{10} impact at the Tucker School for the date with the highest modeled 24-hour impact for the years 2000 – 2004 (December 31, 2003). The hour in bold is the maximum impact hour for the day.

Hour	Wind speed m/s	Wind direction degrees	Modeled PM_{10} impact ($\mu g/m^3$)
1	2.1	267	0.3
2	2.1	252	25.7
3	1.5	265	0.4
4	0	0	—
5	0	0	—
6	0	0	—
7	1.5	223	0.3
8	2.6	244	23.2
9	2.6	243	12.0
10	2.1	209	0
11	4.1	203	0
12	4.6	210	0
13	4.6	213	0
14	3.6	221	0
15	6.2	225	0
16	4.6	224	0
17	4.6	230	6.3
18	4.1	227	4.4
19	2.6	233	10.2
20	2.1	237	45.6
21	2.6	239	20.1
22	2.1	252	26.6
23	**2.1**	**244**	**77.4**
24	2.1	238	53.2

Table 2. Maximum of the fourth-highest annual 24-hour PM_{10} impacts, and maximum annual average impacts for flagpole receptors at the locations of the new buildings at Cameron Station.

Meters east of Virginia Paving Plant 1	Meters north of Virginia Paving Plant 1	Meters above ground level	Maximum fourth highest annual 24-hour PM_{10} impact ($\mu g/m^3$)	Maximum annual average PM_{10} impact ($\mu g/m^3$)
350	100	0	11.4	0.40
350	100	3	11.7	0.41
350	100	6	11.7	0.40
350	100	9	11.6	0.38
350	100	12	10.2	0.35
350	100	15	8.3	0.31
400	200	0	11.0	0.39
400	200	3	11.2	0.40
400	200	6	11.2	0.39
400	200	9	11.0	0.37
400	200	12	10.4	0.35
400	200	15	8.9	0.31
400	200	18	7.5	0.28
400	200	21	7.4	0.25

Table 3. Maximum modeled annual, and 1-hour formaldehyde impacts and associated 1-hour wind speeds at various elevations for the locations of two new buildings in Cameron Station.

East (m)	North (m)	Elevation (m)	All Sources			Fugitive sources only	
			Maximum annual average impact (μg/m^3)	Maximum 1-hour impact (μg/m^3)	Wind speed (m/s)	Maximum 1-hour impact (μg/m^3)	Wind speed (m/s)
350	100	0	0.026	3.8	2.1	0.75	1.5
350	100	3	0.026	4.3	2.1	0.83	1.5
350	100	6	0.026	4.8	2.1	0.86	1.5
350	100	9	0.026	5.2	2.1	0.87	1.5
350	100	12	0.026	6.0	2.1	0.90	1.5
350	100	15	0.026	7.1	1.5	0.85	1.5
400	200	0	0.031	6.1	2.1	0.71	1.5
400	200	3	0.031	6.8	2.1	0.79	1.5
400	200	6	0.031	6.9	2.1	0.77	1.5
400	200	9	0.031	7.2	2.1	0.89	1.5
400	200	12	0.031	7.6	2.1	0.90	1.5
400	200	15	0.031	8.0	2.1	0.86	1.5
400	200	18	0.031	9.2	1.5	0.83	1.5
400	200	21	0.031	10.7	1.5	0.79	1.5

Table 4. Estimated maximum 1-hour and annual formaldehyde impacts assuming wind speeds of either 0.5 or 1.0 m/s for hours when the meteorological data previously used in AERMOD indicated calm conditions.

East (m)	North (m)	Elevation (m)	Estimated maximum 1-hour formaldehyde impacts ($\mu g/m^3$) for assumed 'AERMOD calm condition' wind speeds of 0.5 an 1 m/s (% increase)		Estimated maximum annual formaldehyde impacts ($\mu g/m^3$) for assumed 'AERMOD calm condition' wind speeds of 0.5 an 1 m/s (% increase)	
			1.0 m/s	0.5 m/s	1.0 m/s	0.5 m/s
350	100	0	4.2 (10%)	5.3 (39%)	0.026 (1%)	0.027 (4%)
350	100	3	4.7 (10%)	6.0 (39%)	0.026 (1%)	0.027 (4%)
350	100	6	5.2 (9%)	6.5 (36%)	0.026 (0.9%)	0.027 (4%)
350	100	9	5.6 (8%)	6.9 (33%)	0.026 (0.8%)	0.027 (3%)
350	100	12	6.5 (7%)	7.8 (30%)	0.026 (0.8%)	0.026 (3%)
350	100	15	7.5 (6%)	8.8 (24%)	0.026 (0.6%)	0.026 (2%)
400	200	0	6.5 (6%)	7.5 (23%)	0.031 (0.6%)	0.032 (2%)
400	200	3	7.2 (6%)	8.4 (23%)	0.031 (0.6%)	0.032 (2%)
400	200	6	7.3 (6%)	8.4 (22%)	0.031 (0.6%)	0.032 (2%)
400	200	9	7.6 (6%)	9.0 (25%)	0.031 (0.6%)	0.032 (2%)
400	200	12	8.1 (6%)	9.4 (24%)	0.031 (0.6%)	0.032 (2%)
400	200	15	8.4 (5%)	9.7 (22%)	0.031 (0.5%)	0.032 (2%)
400	200	18	9.6 (5%)	10.9 (18%)	0.031 (0.4%)	0.031 (2%)
400	200	21	11.1 (4%)	12.3 (15%)	0.031 (0.4%)	0.031 (1%)

Appendix A

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David Sullivan and Dennis Hlinka,
Sullivan Environmental Consulting, Inc.
Alexandria, VA 22308

and,

Lalit Sharma and William Skrabak
City of Alexandria
Division of Environmental Quality
Transportation and Environmental Services

David Sullivan *et al.*,

Attached to this letter please find Cambridge Environmental's responses to Sullivan Environmental Consulting's comments on our December 7, 2005 report "Results of an Emission and Air Dispersion Modeling Study and Public Health Evaluation of the Virginia Paving Company Facility 5601 Courtney Avenue Alexandria, Virginia." The main efforts described in our response involve the modeling of PM_{10} emissions from Virginia Paving for the nine days in August 2004 when ambient PM_{10} samples were collected at two parks in the Cameron Station area. Figures showing the modeled PM_{10} increments for each of the nine days are included in our responses. In brief, the modeled increments of PM_{10} due to operations at Virginia Paving are comparable to the levels that might be inferred from a comparison of the measurements at the two sampling sites.

If you have any additional questions or comments, please feel free to contact me by e-mail at Ames@CambridgeEnvironmental.com, or by phone at 617-225-0810, extension 24.

Thank you and regards,

Michael Ames

Michael Ames, Sc.D.
Senior Engineer

Cambridge Environmental Responses to: Review Comments on Dispersion Modeling Analysis of Virginia Paving

Cambridge Environmental has reviewed the comments Sullivan Environmental recently submitted regarding our December 7, 2005 report "Results of an Emission and Air Dispersion Modeling Study and Pulic Health Evaluation of the Virginia Paving Company Facility, 5601 Courtney Avenue Alexandria, Virginia." We have discussed several of the comments with Sullivan Environmental by phone, and have performed some additional air quality modeling to address one of Sullivan Environmental's primary concerns. Below are Sullivan Environmental's comments followed by our responses where needed.

Sullivan Environmental Comment:

We have summarized our comments below. In general, the methods followed in this modeling were clear and appropriate, however, there were some areas where there are questions that need to be clarified. The most significant issue, from our perspective, is that a baseline modeling analysis was not done. On this basis, it has not been demonstrated that the modeling of existing conditions is reasonably consistent with observed, nearby measured concentrations. Although of limited duration, the measured particulate data collected in August 2004 in two nearby parks provide a point of reference, especially the monitoring at Boothe Park, which is adjacent to the Virginia Paving facility. In our judgment, a baseline review is needed to confirm that these modeling procedures are reasonably consistent with observed concentrations. This is especially important because of the relatively small particulate levels modeled based on the current emission controls relative to past measured values.

In our judgment, the available measured PM_{10} concentrations near the facility are not necessarily consistent with the current modeling. Virginia Paving is showing very small **average** impacts at the Picnic Shelter at Boothe Park where PM_{10} was measured **on average** to be about 49 $\mu g/m^3$ compared to regional levels of approximately 20-25 $\mu g/m^3$ for this time of the year. The most significant concern I have is that they are showing very small impacts at the Picnic Shelter at Boothe Park, e.g. less than 1 $\mu g/m^3$, which is approximately 20 to 25-fold lower than the potential incremental increase that would have been expected based on baseline controls.[1] Unless a baseline demonstration is made the shows the current modeling methods can reasonably replicate the order of magnitude of impacts measured in 2004, we would be concerned that the potential for understating the fugitive particulate emissions would be too high. It is our recommendation that Virginia Paving run the modeling files for the specific days monitored for PM_{10} in August 2004 to produce the baseline runs and produce isopleth analyses for PM_{10}. In my judgment, this step is essential to reaching closure.

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[1] Virginia Paving is not the only source of particulates that contributed to the measured concentrations at Boothe Park. Considering the proximity of the facility to the park, however, it would be reasonable to expect that the facility would have a high potential of being a major contributor to the measured concentrations.

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Cambridge Environmental Response:

Cambridge Environmental has performed the requested supplemental modeling of PM_{10} emissions from Virginia Paving on the nine dates when samples were collected in Boothe and Brenman Parks. The PM_{10} emission rates used in this modeling are based on emission factor equations and basic parameters used in the modeling for the December 7 report with changes to the site-specific emission factor input data that reflect operating conditions present at Virginia Paving on the dates being modeled. These changes include:

- The use of actual asphalt production data for plants 1 and 2 on the specific modeling dates (daily tonnages are given in Table 1).
- No PM emission reductions were assumed for emissions from the silos, liquid asphalt storage, or load out (the 'Blue Smoke' system was not in place in 2004).
- Modeled stack heights were those in place at the time.
- It was assumed that the area to the east of the stone storage bins was unpaved.
- Additional enclosures for aggregate transfer by conveyor were not included.
- Watering of paved areas was assumed to occur once per day; watering of unpaved areas was assumed to occur four times per month when the areas were otherwise dry.

Emissions that relate directly to asphalt production rates (*i.e.*, emissions from the dryer stack emissions, silo emissions, load out, and traffic related emissions due to asphalt pickup trucks) were calculated on a day-by-day basis . Emissions that relate to general asphalt production rates (*i.e.*, those due to general aggregate handling, RAP crushing, truck traffic on storage piles, onsite truck diesel emissions) were calculated based on the average asphalt production rate for each of the nine dates included in the modeling. It is assumed for this second set of emission estimates are not directly tied to daily production at one or both of the plants on a given day, that, even on low production days, aggregate may still be transported by truck and/or conveyor. Asphalt production related emissions were assumed to occur only during three shifts: 5:30 AM to 4:00 PM, 6:00 to 10:00 PM, and 1:00 to 3:00 AM. Other emissions were assumed to occur 24 hours per day.

Table 1. Daily asphalt production tonnages for Virginia Paving Plants 1 and 2.

Daily asphalt production (tons)	August 6, 2004	August 9, 2004	August 10, 2004	August 11, 2004	August 16, 2004	August 17, 2004	August 18, 2004	August 23, 2004	August 24, 2004	Average
Plant 1	4,016.17	4,319.77	5,369.97	4,980.57	3,636.67	5,204.35	5,713.38	5,294.61	4,455.23	4,776.75
Plant 2	217.07	602.51	865.96	355.62	1,191.97	1,595.11	109.4	0	92.53	558.91
Total	4,233.24	4,922.28	6,235.93	5,336.19	4,828.64	6,799.46	5,822.78	5,294.61	4,547.76	5,335.65

Dispersion modeling was performed for each of the nine days when sampling occurred using AERMOD and the same meteorological and topographic data described the Cambridge Environmental report of December 7, 2005. Figures 1 through 9, attached to this document, show the estimated incremental PM_{10} concentrations in due to emissions from Virginia Paving. Figure 10 shows the PM_{10} concentrations measured at Boothe and Brenman Parks, and the concentrations measured during the same period at the three U.S. EPA PM_{10} monitoring site in Fairfax County. No dates have concurrent data for the parks and the EPA sites.

The estimated impacts at Boothe Park range from essentially zero on August 6 (when the winds were blowing from the north, from Virginia Paving to the south away from the park) up to about 20 $\mu g/m^3$ on August 23, with most of the modeled days having impacts on the order of 10 $\mu g/m^3$. The estimated impacts at Brenman Park are all below 1 $\mu g/m^3$ except for the estimate on August 24 when the impact is estimated to be around 1.5 $\mu g/m^3$.

In brief, the predicted impacts at Boothe Park are well in the range which might be inferred from the PM_{10} measurements. Examination of Figure 10 might place this contribution in the range of about 0 to 20 $\mu g/m^3$ if one considers the differences between the measurements at Boothe and Brenman Parks, and the EPA sites (allowing for the uncertainties associated with interpolation between dates). There are other potential sources of PM_{10} in the area around Virginia Paving and Boothe and Brenman Parks, that may have contributed to the PM_{10} level measured in August 2004. Because the Virginia Paving site is much closer to the Boothe Park sampling location than the Brenmna Park location, it is reasonable to assume that Boothe Park receives a greater contribution of PM_{10} from Virginia Paving, and that some of the PM_{10} measured at Brenman Park above the levels at the EPA sites is due to other nearby sources. This notion is supported by the concentration gradients depicted in Figures 1-9Thus, in using the measured PM_{10} concentrations to estimate the PM_{10} contributions from Virginia Paving, a comparison of the measurements at the two park sites may be more appropriate than a comparison of the park sites with the EPA sites.

These results serve to support the general validity of the methods and data used to model emissions from Virginia Paving as reported on December 7, 2005. They further serve to demonstrate that contribution to PM_{10} levels from Virginia Paving have not led to an exceedance of the 24-hour NAAQS for PM_{10}, which standard, at a level of 150 $\mu g/m^3$, is more than twice any of the measured PM_{10} concentrations.

Sullivan Environmental Comment:

Another general comment involves the reference to the article written by Tom Pace of EPA, which indicated that modeling of regional emissions inventories can lead to model over-predictions. Mr. Pace was referring to regional assessments, such as based on county-wide emissions inventory. It is agreed that modeling localized emission factors on the regional scale leads can lead to model over-predictions. There are numerous factors, including greater loss through filtering, electric charges, and other factors not accounted for by models, but nonetheless, factors that deplete particles from the plume. But the matter at hand, this is a sub-neighborhood scale assessment that is more similar to the scales used for the empirical research that generated the emission rates. There is insufficient time to substantially reduce particulates from the plume relative to modeled impacts when the scale of analysis is in the range of 100 to 500m to the closest residential receptors. Mr. Pace's position needs to be viewed in proper context, with consideration for the scale of analysis. It should not be concluded, therefore, that the modeling will be conservative on this basis.

Cambridge Environmental Response:

While it is true the Mr. Pace's research was prompted by inconsistencies between regional-scale PM modeling and monitoring data, several of the factors which he identifies are applicable to modeling PM dispersion on more local scales. For example, Mr. Pace notes that vegetation in the immediate vicinity of a fugitive dust source acts to reduce dust levels downwind. Regardless of the applicability of his general comments to the modeling of fugitive emissions from Virginia Paving, the only part of Pace's data that was used in the modeling was the updated value for the parameter that describes the portion of PM_{10} emissions from paved roadways that is comprised of $PM_{2.5}$. The data that was used by Pace to generate this updated value $PM_{2.5}$ fraction was collected using near-field samplers, so it is appropriate to use this $PM_{2.5}$ fraction for modeling neighborhood level impacts. The updated $PM_{2.5}$ fraction was also employed in Cambridge Environmental's summary report of September 30, 2005.

<u>Specific Comments on the Modeling Analysis</u>:

Sullivan Environmental Comment:

<u>Wind Erosion</u> – Their threshold friction velocity values seem reasonable, but it looks like they may have reversed the "k" values in the spreadsheet between PM2.5 and PM10. Hence the error is simply of a typographical nature that does not affect the calculations or results.

Cambridge Environmental Response:

The above noted error in the "k" values for wind erosion is contained in the Excel file "Fugitive Dust Emissions.xls" in the sheet "wind erosion" (cells B21:B22). This sheet was produced to document the calculations that went into the emissions modeling. However, the correct "k" values were used in the spreadsheet where the actual calculations were performed (Excel file "Hourly winds and fugitives.xls", sheet "scaling factors", cells F6:F9).

Sullivan Environmental Comment:

<u>Exposed Area for Wind Erosion Potential</u>: The statement that the exposed area can be multiplied by 0.2 is not supportable in our judgment. About 60 percent of the area they referred to in the AP-42 table is in the range of a factor of 0.6 to 0.9 of the reference 10 m wind speed. More recent research than this EPA method have shown, contrary to scaling as they have done, that the turbulence generated

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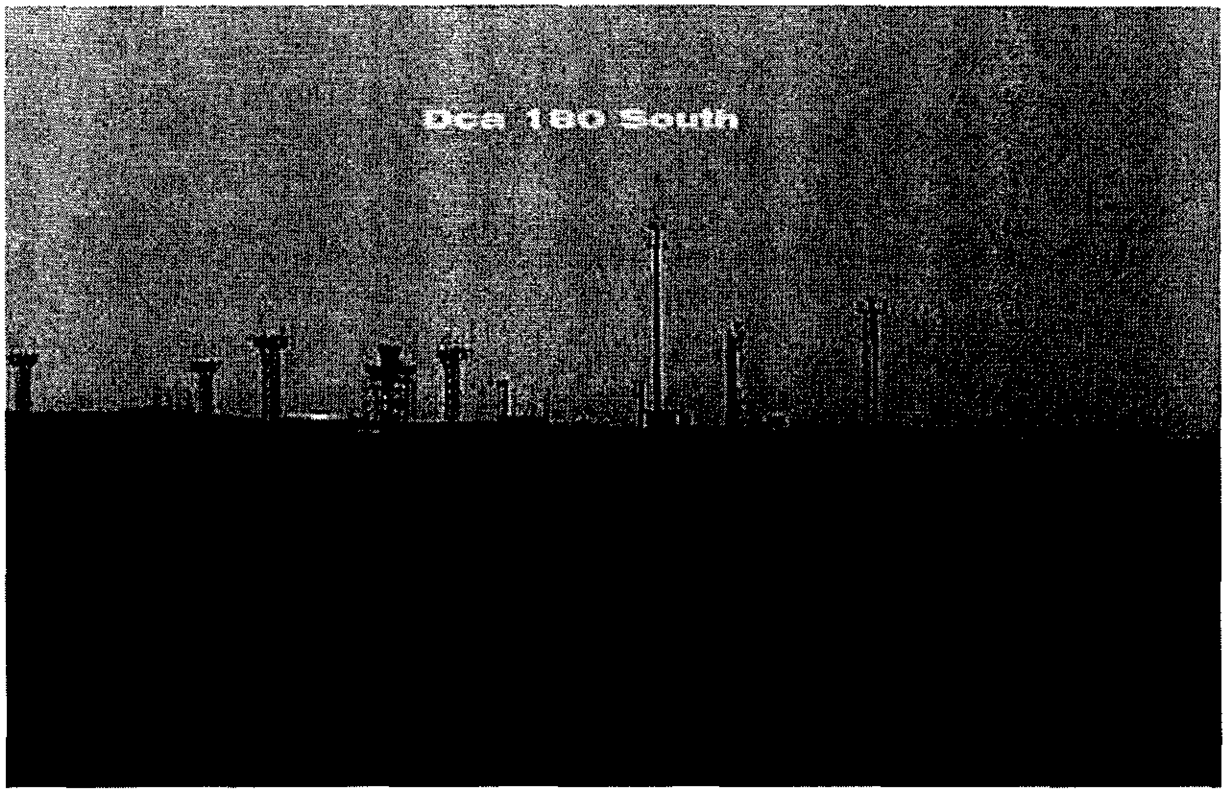
by coal piles creates substantial **enhancement** of wind erosion: "*The test results show that turbulence and complex terrain significantly affect dust emissions and depositions from coal piles. In comparison with studies which do not take account of these factors, it is observed that: (1) the threshold wind speed significantly decreases, (2) the emissions of dust considerably increases, (3) the mean deposition level increases, and (4) the deposition distribution changes*" (Xuan & Robins, 1994). In other words, although the wind speed is reduced in some zones within the area of the pile, the enhanced turbulent intensities can substantially increase the amount of wind erosion, i.e. wind speed alone is not the only determining factor. Our recommendation would be to not apply the scale-back factor because of such uncertainty associated with enhanced turbulence. In our judgment, scaling back by a factor of 5 is too much.

Cambridge Environmental Response: below S.E. Comment on Friction Velocity.

Sullivan Environmental Comment:
Friction Velocity – The friction velocity during neutral conditions, which are relevant to wind erosion, is a function of both the wind speed and the surface roughness. When the method they are using scales wind speed to the 10m reference height and then computes friction velocity as a function of wind speed, height, and surface roughness, they assume (per the EPA method) a surface roughness value of 0.5 cm. The source of the wind data is Reagan National Airport. The following photo shows an example of the surface conditions around the ASOS meteorological monitoring system where these wind speeds are measured:



The surface conditions are much rougher than would be compatible with a smooth surface of 0.5 cm (0.005 m). For example, the following table was extracted from Page 121 of Panofsky & Dutton, 1984)[2]:

Ground Cover	Roughness Length (m)
Water or smooth ice	0.0001
Mown grass	0.01
Long grass, rocky ground	0.05
Pasture land	0.20
Suburban housing	0.60
Forests, cities	1-5

Based on review of the photograph shown above, a value in the range of 0.05 to 0.10 would be a much more reasonable estimate for computing the friction

[2] Panofsky, Hans A., and John A. Dutton, "Atmospheric Turbulence: Models and Methods for Engineering Applications," John Wiley & Sons, New York, 1984.

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velocity at the source of the meteorological data. The value of 0.005 that was used is consistent with the EPA method that was used, but clearly is not reasonable for this specific application (as applies to many applications). The selection of 0.005 m for roughness length appears to be a carryover from Table 13.2.5-2 in the EPA industrial wind erosion equation. These values were computed from research where wind speed was measured at 15 cm above the ground. The wind at this level adjusted to the smooth surface features of the idealized piles. Surface roughness at extremes scale, e.g. very close to the ground (15 cm = 6 inches) at great heights in complex terrain, can be a strong function of height. The use of 0.005 m roughness length instead of using a value in the range of 5-10cm acts to understate the friction velocity by a substantial degree, i.e. using the same logarithmic wind profile as used in the method, the friction velocity would increase from 0.05 times the reference wind speed at 10m to a value of 0.08 to 0.09 if more realistic roughness lengths were used to scale the wind speed at Reagan National Airport. Instead of using the relationship of $u_* = 0.053\ u_{10m}$, it would be more appropriate to use the following relationship for this specific application:

$$u_* = 0.085\ u_{10m}$$

<u>**Computation of Fastest Mile of Wind**</u> - They have used the regression equation they computed for 1984 fastest mile of wind in comparison to the maximum daily hourly wind speed, to come up with the relationship that the fastest mile (m/sec) = 1.2722 x fastest hourly wind speed – 0.5657. This relationship had a good R^2 (0.78), and really is only applicable to wind speeds where the negative term would not be a big factor (the negative values they show in the spreadsheet for low wind speed periods is just an artifact). They have (I believe incorrectly) assumed that the wind data collected at National Airport is based on a 10 m exposure. If that were correct, they would have no need to scale the winds. The anemometer height, however, is 6.1 m. Therefore, using the method they are following, the wind speeds would need to be scaled up by a factor of 1.07. This factor would be multiplicative to the increase in friction velocity caused by roughness length (described above). Together, these two terms would approximately double the friction velocity.

Cambridge Environmental Response:

The primary purpose of the modeling performed for the December 7, 2005 report was to demonstrate to the City of Alexandria that permit limit operations at Virginia Paving would not lead to exceedances of the NAAQS in the surrounding neighborhoods. Because the City was reviewing the modeling from the perspective of a regulatory agency, very few deviations from U.S. EPA referenced methods or parameters were included in the modeling, and these deviations were based on data and methods developed for, or referenced by, the U.S. EPA. Over the course of developing the emission and dispersion models, these deviations were reviewed and approved by the City's consultants. While it may be true that higher friction velocities occur over portions of the piles, and that a higher assumed value for surface roughness might be appropriate for modeling wind erosion at Virginia Paving, Cambridge Environmental used the methods and values cited by the U.S. EPA and approved by the City of Alexandria.

The anemometer height at Reagan National Airport is actually at 10 meters as modeled in the emission and dispersion modeling. Cambridge Environmental had originally believed that the height was 6.1 meters (as the Sullivan Environmental comment states) when we first reviewed dispersion modeling files we received from the City of Alexandria's air modeling consultant Maureen Barrett of Aero Engineering Services. After we inquired about this, the 10 meter height was verified with operators at the airport, and with the National Climate Data Center (NCDC). Thus, no correction is necessary because the anemometer of 10 meters used in the calculations is in fact correct. [N.B. The moisture content used in all of the fugitive source emissions was included in the spreadsheets sent with the September and December reports.]

Furthermore, threshold friction velocities used in the modeling of wind erosion potentials were based on assumed aggregate pile particle size distributions that have been shown to underestimate the threshold velocities based on AP42 Table 13.2.5-1. The mode in the aggregate size distribution for the sieved sand pile material was assumed to be 1 mm, and the mode for the coarse aggregate was assumed to be 2 mm. Actual sieve measurements of these materials found that the particles are larger than assumed and hence the threshold friction velocities should be higher than assumed (the sieve data and friction velocities are contained in the spreadsheet "Aggregate Sieve" in the Excel file "Fugitive Dust Emissions.xls"). Because these measurements were conducted after the modeling had progressed fairly far, and because the assumed size distributions and friction velocities were conservative (*i.e.*, they would lead to overestimates of the emissions), the originally assumed default values were retained. Thus, any tendency for the models to have underestimated emissions because of the factors described by Sullivan Environmental would be offset by the model's overestimation of these emissions because of the conservatively assumed threshold velocity.

Regardless of the specific treatment of PM emissions due to wind erosion, the impact of this source on the overall modeling results is fairly minor. Because wind erosion only occurs under high wind conditions when the emissions are well dispersed, the impacts, though sometimes high very near the source, decrease rapidly as one moves further away. To a large extent, the revised production and operational permit limits and conditions modeled in the December 7 report were set by the impact Virginia Paving's emissions have on the annual average $PM_{2.5}$

levels. The average contribution of the wind erosion source to these impacts was 6.7% of the total impact at the facility's fenceline, 4.5% over the inner grid of receptors within 250 meters of the facility's plant 1 stack, and only 2.1% over the outer grid of receptors extending from 250 to 2000 meters from the stack (see Figure 1 of the December 7 report for receptor locations). Thus, even if the emissions due to wind erosion were underestimated by the modeling, use of a higher emission rate would not have a significant impact on the overall results.

Sullivan Environmental Comment:
Drop Sources – A review of the AP-42 emission factors for drop sources confirms they used these emission factors correctly, and will assume that the throughput values used will become permit limits.

Rap Crushing – The values they have used for $PM_{2.5}$ and PM_{10} match the AP-42 for tertiary crushing controlled emissions. If they were to model the current (uncontrolled) operations their emission rates would be four times higher. We reviewed the references for the emission factor and confirmed they applicable to the conditions at this facility. We were not able to confirm the throughput rates of 150,000 tons/year used in these calculations. We will assume that these throughput rates will become permit limits.

Cambridge Environmental Response:
The value of 150,000 tons per year as an annual RAP crushing rate is based on the typical past operation of facility. Because the typical past asphalt production rate is 900,000 tons per year, for purposes of emissions modeling, the RAP crushing rate was assumed to be one-sixth of the asphalt production rate. Therefore, the permit limit-based, effective RAP crushing rates used in the modeling are 200,000 tons per year, and 1,667 tons per day. Although these values do not appear in the spread sheet "RAP crushing" in the Excel file "Fugitive Dust Emissions.xls", the scaling of RAP crushing emissions from typical to permit limit asphalt production levels is performed cells B36:C37of this spreadsheet. The contribution of RAP crushing emissions to the overall air quality impacts was very minor, and the RAP crushing rates were not varied independently of the asphalt production rates. Therefore the effective annual RAP crushing rate of 200,000 tons per year need not be imposed as a permit limit.

Sullivan Environmental COMMENT:
Roads (Paved and Unpaved) - A review of the AP-42 emission factors for paved and unpaved roads confirms they used these emission factors correctly. We also confirmed that the silt values were used properly in their equations.

Model Files – a review of the land use information in the meteorological preprocessing input files indicates that four separate sectors were defined with the northern sector (310 – 76 degrees) had the highest albedo and bowen ratios. It would be helpful for Cambridge Environmental to clarify how the land use categories were defined in these four sectors and how the meteorological parameters were determined based on this breakdown.

A comparison of the PM_{10} emissions from the current AERMOD and the earlier ISCST3 modeling showed some significant differences. For example, P1_STK was currently modeled with a 4.87E-1 g/sec emission while in the earlier ISCST3 model runs the emission rate was 8.73E-01 g/sec. That means the current emission rate is 56% of the previous ISCST3 modeling emission rate. The equivalent emissions differences are noted for sources P2_STK (53.7%) and AC_TANKS (52.8%). Cambridge Environmental provided an explanation of the reasons for these changes, namely updated source testing results and differences in assumed throughput assumptions. Based on our assumption that the throughput values used in the modeling will be permit enforceable, this explanation resolved our question.

Cambridge Environmental Response:

The land use categorizations employed in the modeling were developed by the City of Alexandria's air quality modeler Maureen Barrett of Aero Engineering Services. Cambridge Environmental used much of Aero Engineering's preliminary modeling files in developing our AERMOD files because this allowed us to generate the necessary models in the short period of time available, and because this work had already been accepted by the City. Cambridge Environmental has provided Sullivan Environmental with Aero Engineering's description of the land use categorizations.

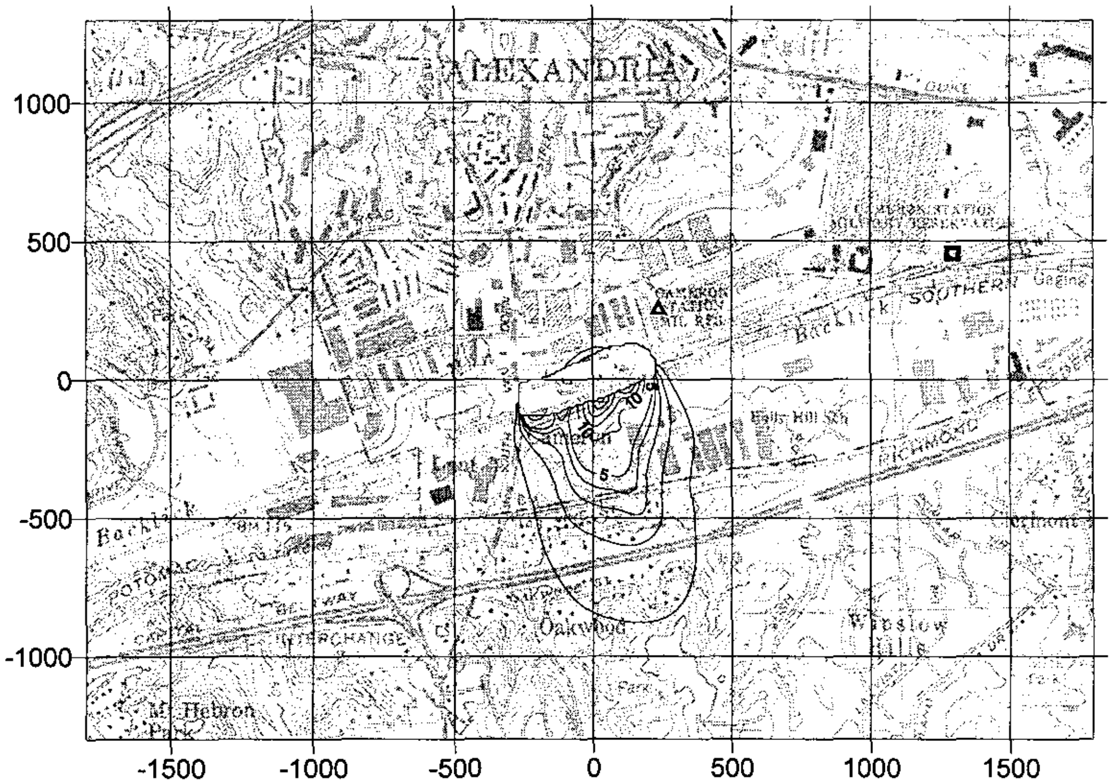

Figure 1. Modeled incremental PM_{10} concentrations ($\mu g/m^3$) due to emissions from Virginia Paving, August 6, 2004. Isopleths are shown at 1 $\mu g/m^3$ increments up to 5 $\mu g/m^3$ and in 5 $\mu g/m^3$ increments above 5 $\mu g/m^3$. The measured PM_{10} concentration at Boothe Park (open triangle) that day was 18.9 $\mu g/m^3$; the measured PM_{10} concentration at Brenman Park (open square) that day was 19.4 $\mu g/m^3$.

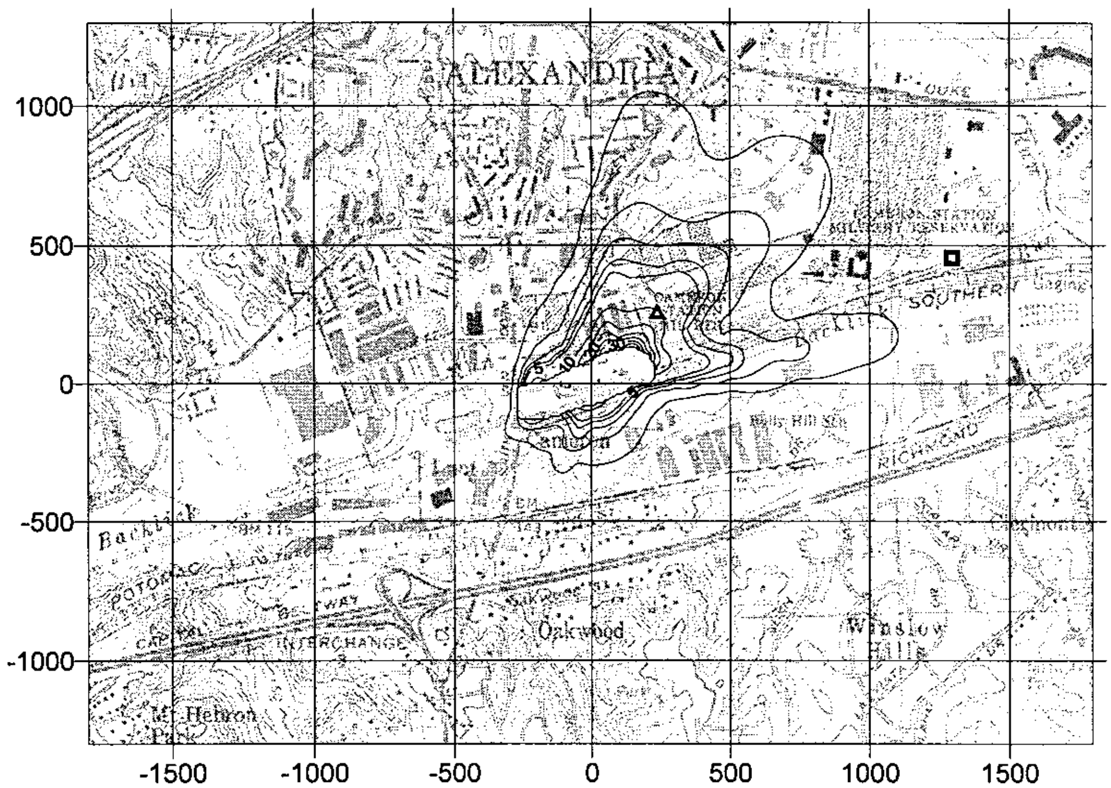

Figure 2. Modeled incremental PM_{10} concentrations ($\mu g/m^3$) due to emissions from Virginia Paving, August 9, 2004. Isopleths are shown at 1 $\mu g/m^3$ increments up to 5 $\mu g/m^3$ and in 5 $\mu g/m^3$ increments above 5 $\mu g/m^3$. The measured PM_{10} concentration at Boothe Park (open triangle) that day was 51.2 $\mu g/m^3$; the measured PM_{10} concentration at Brenman Park (open square) that day was 43.0 $\mu g/m^3$.

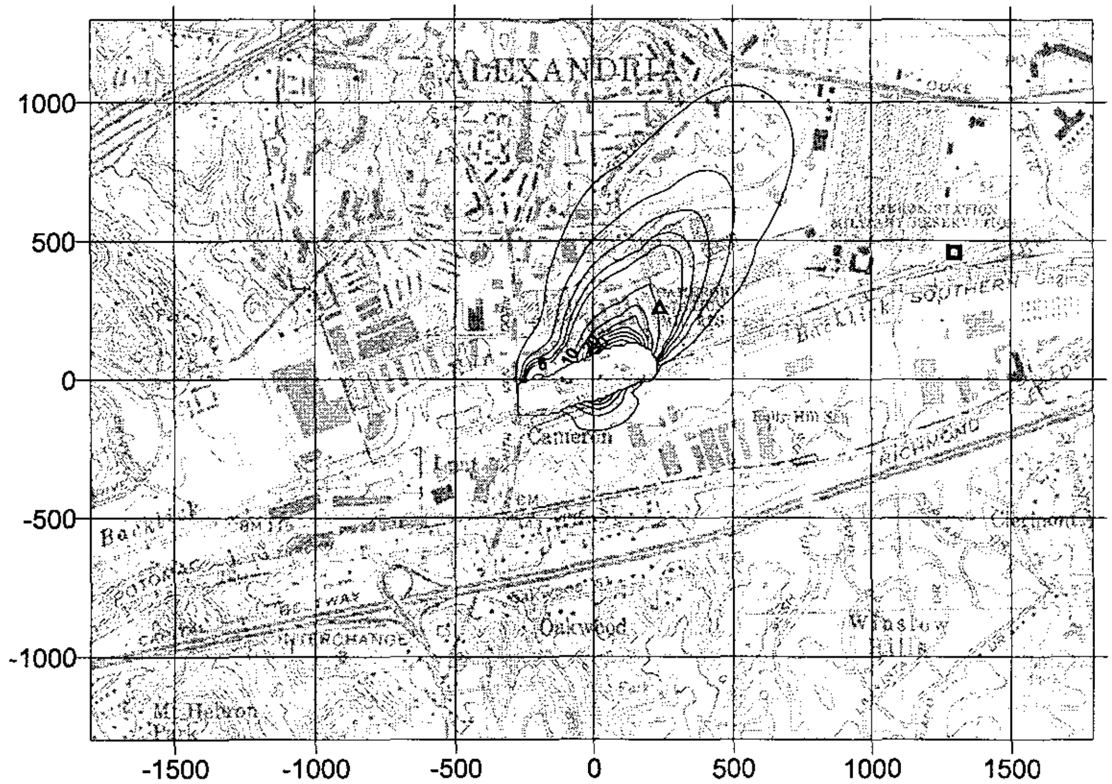

Figure 3. Modeled incremental PM_{10} concentrations ($\mu g/m^3$) due to emissions from Virginia Paving, August 10, 2004. Isopleths are shown at 1 $\mu g/m^3$ increments up to 5 $\mu g/m^3$ and in 5 $\mu g/m^3$ increments above 5 $\mu g/m^3$. The measured PM_{10} concentration at Boothe Park (open triangle) that day was 66.5 $\mu g/m^3$; the measured PM_{10} concentration at Brenman Park (open square) that day was 59.4 $\mu g/m^3$.

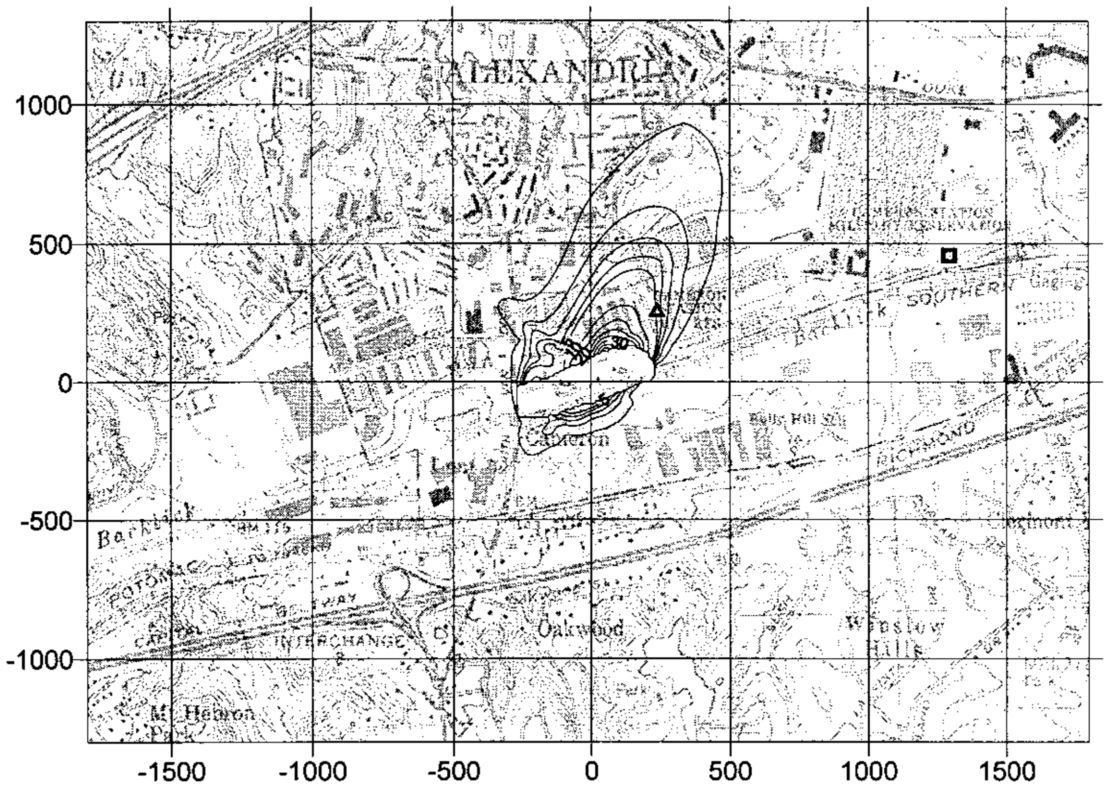

Figure 4. Modeled incremental PM_{10} concentrations ($\mu g/m^3$) due to emissions from Virginia Paving, August 11, 2004. Isopleths are shown at 1 $\mu g/m^3$ increments up to 5 $\mu g/m^3$ and in 5 $\mu g/m^3$ increments above 5 $\mu g/m^3$. The measured PM_{10} concentration at Boothe Park (open triangle) that day was 31.3 $\mu g/m^3$; the measured PM_{10} concentration at Brenman Park (open square) that day was 17.9 $\mu g/m^3$.

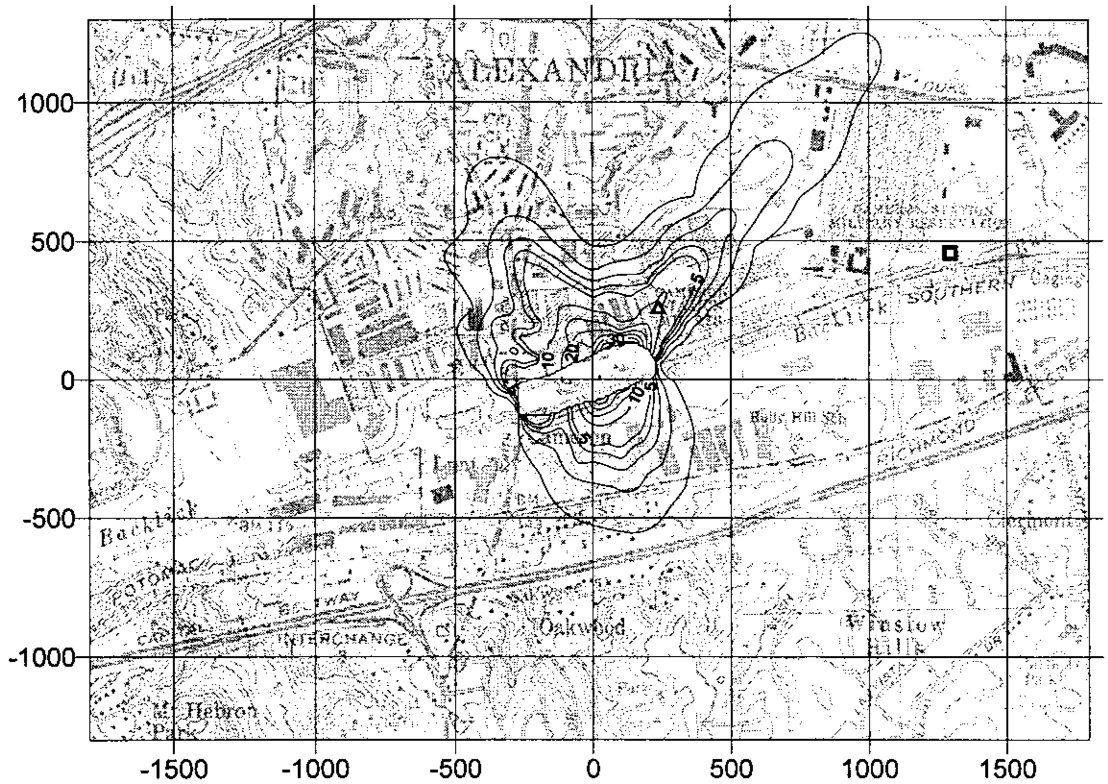

Figure 5. Modeled incremental PM_{10} concentrations ($\mu g/m^3$) due to emissions from Virginia Paving, August 16, 2004. Isopleths are shown at 1 $\mu g/m^3$ increments up to 5 $\mu g/m^3$ and in 5 $\mu g/m^3$ increments above 5 $\mu g/m^3$. The measured PM_{10} concentration at Boothe Park (open triangle) that day was 53.9 $\mu g/m^3$; the measured PM_{10} concentration at Brenman Park (open square) that day was 53.0 $\mu g/m^3$.

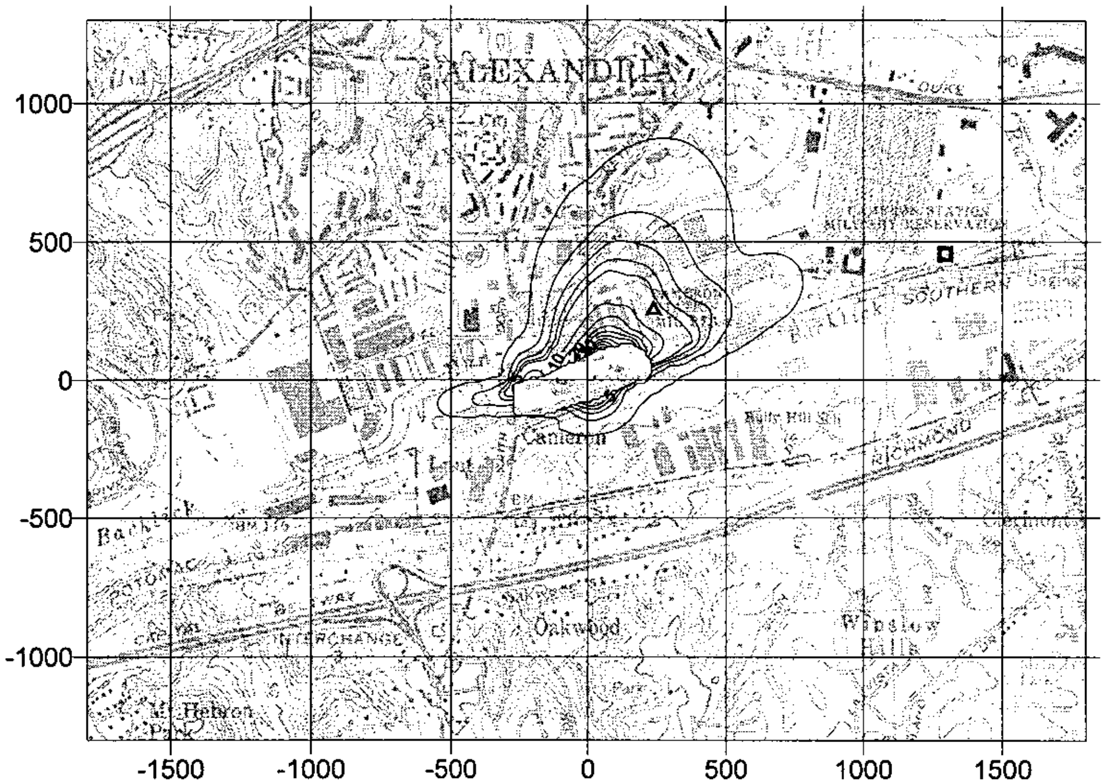

Figure 6. Modeled incremental PM_{10} concentrations ($\mu g/m^3$) due to emissions from Virginia Paving, August 17, 2004. Isopleths are shown at 1 $\mu g/m^3$ increments up to 5 $\mu g/m^3$ and in 5 $\mu g/m^3$ increments above 5 $\mu g/m^3$. The measured PM_{10} concentration at Boothe Park (open triangle) that day was 50.7 $\mu g/m^3$; the measured PM_{10} concentration at Brenman Park (open square) that day was 31.9 $\mu g/m^3$.

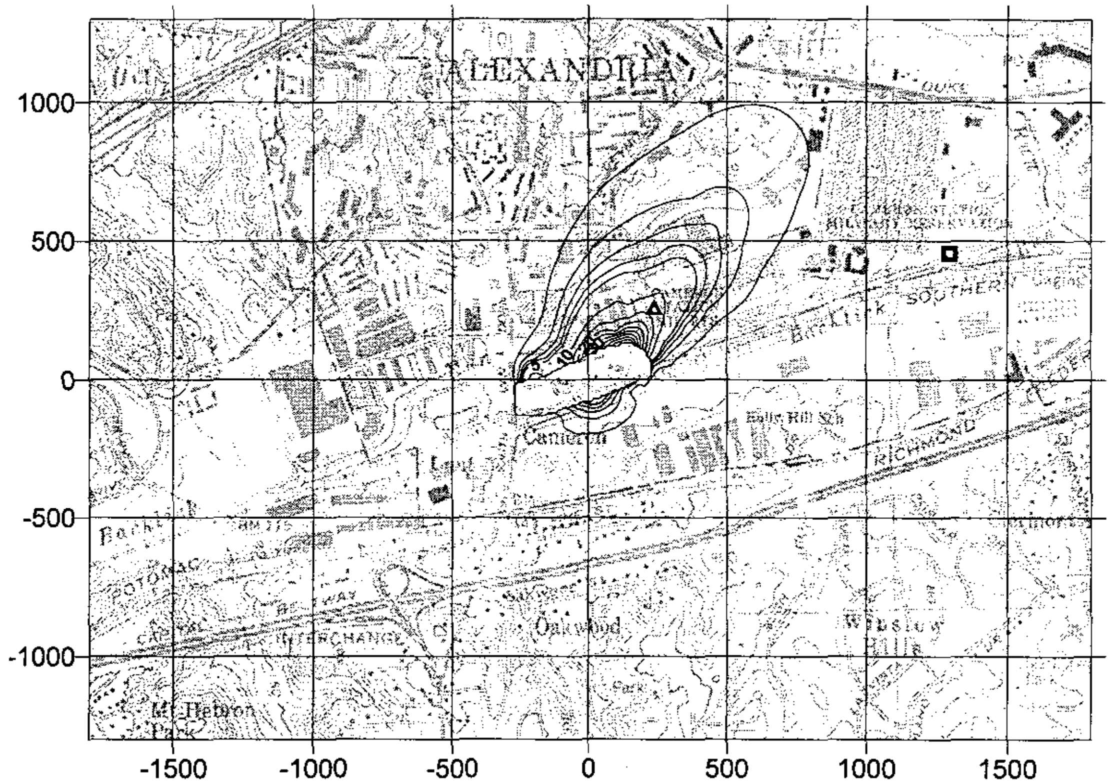

Figure 7. Modeled incremental PM_{10} concentrations ($\mu g/m^3$) due to emissions from Virginia Paving, August 18, 2004. Isopleths are shown at 1 $\mu g/m^3$ increments up to 5 $\mu g/m^3$ and in 5 $\mu g/m^3$ increments above 5 $\mu g/m^3$. The measured PM_{10} concentration at Boothe Park (open triangle) that day was 40.4 $\mu g/m^3$; the measured PM_{10} concentration at Brenman Park (open square) that day was 25.7 $\mu g/m^3$.

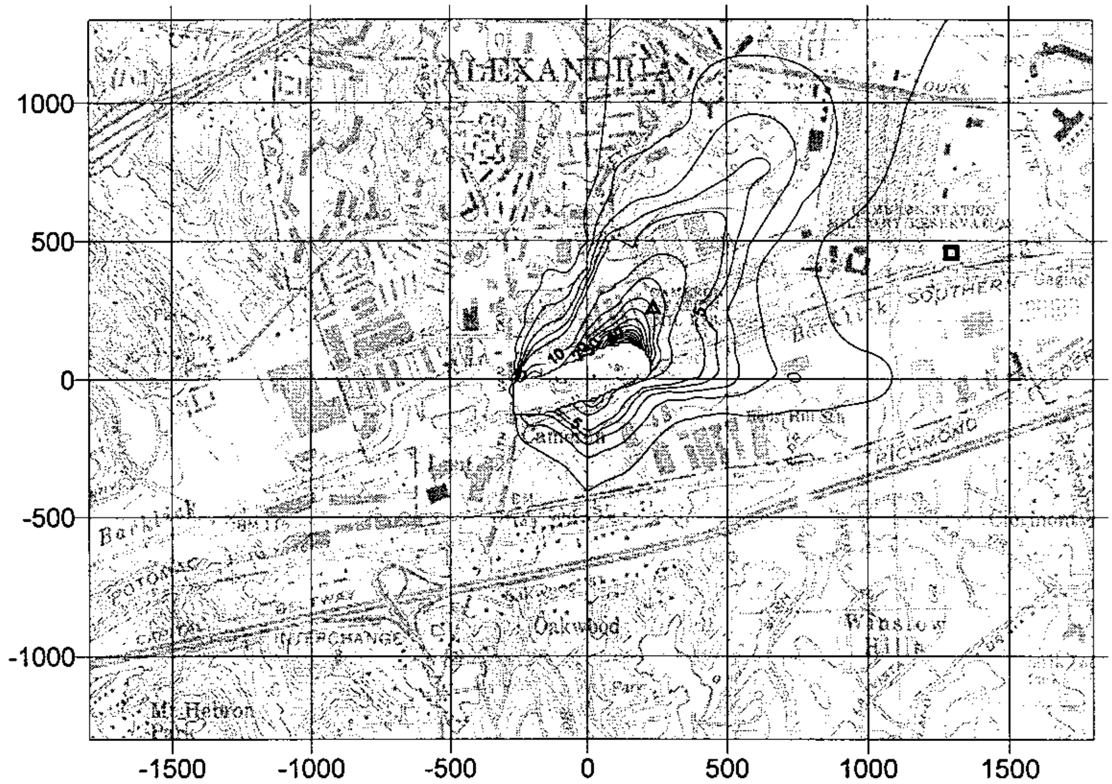

Figure 8. Modeled incremental PM_{10} concentrations ($\mu g/m^3$) due to emissions from Virginia Paving, August 23, 2004. Isopleths are shown at 1 $\mu g/m^3$ increments up to 5 $\mu g/m^3$ and in 5 $\mu g/m^3$ increments above 5 $\mu g/m^3$. The measured PM_{10} concentration at Boothe Park (open triangle) that day was 56.4 $\mu g/m^3$; the measured PM_{10} concentration at Brenman Park (open square) that day was 45.4 $\mu g/m^3$.

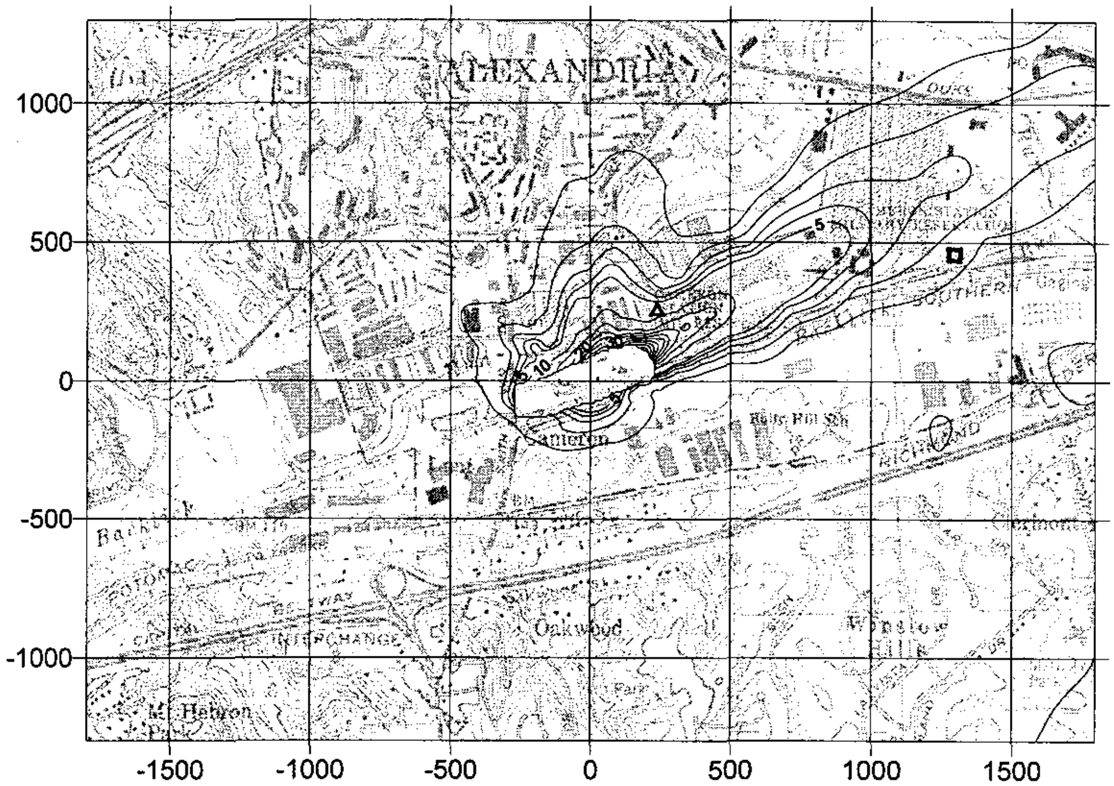

Figure 9. Modeled incremental PM_{10} concentrations ($\mu g/m^3$) due to emissions from Virginia Paving, August 24, 2004. Isopleths are shown at 1 $\mu g/m^3$ increments up to 5 $\mu g/m^3$ and in 5 $\mu g/m^3$ increments above 5 $\mu g/m^3$. The measured PM_{10} concentration at Boothe Park (open triangle) that day was 70.8 $\mu g/m^3$; the measured PM_{10} concentration at Brenman Park (open square) that day was 65.2 $\mu g/m^3$.

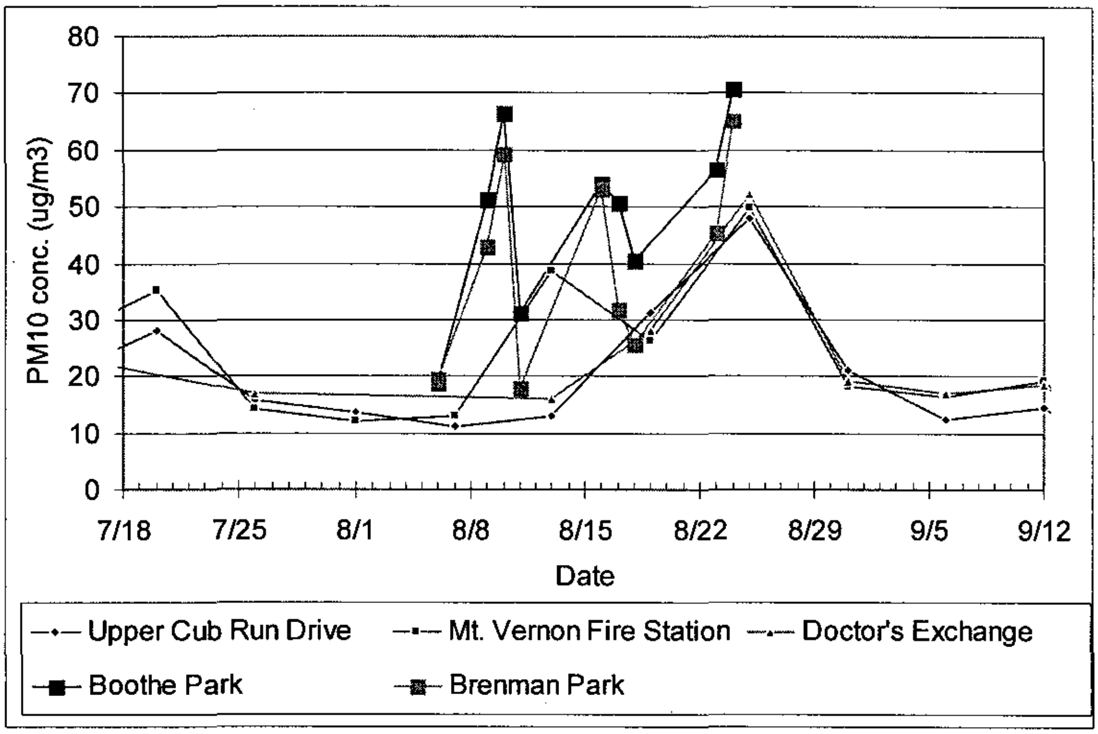

Figure 10. Measured PM_{10} concentrations in the summer of 2004, at Boothe Park, Brenman Park, and at the three U.S. EPA PM_{10} monitoring sites in Fairfax County.

Appendix B

MEMORANDUM

To: Lalit Sharma, P.E., City of Alexandria, Department of Transportation and Environmental Services

From: Stephen Zemba, Ph.D., P.E., Michael Ames, Sc.D., and Laura C. Green, Ph.D., D.A.B.T. Michael Ames

Subject: Emission estimates for the Virginia Paving Company's Alexandria, VA, hot mix asphalt facility

Date: August 22, 2005

As you know, The Virginia Paving Company operates two hot-mix asphalt plants at its facility in Alexandria, Virginia. The plants are fueled with recycled oil, and the burning of the recycled oil in the aggregate dryers and hot oil heater results in emissions of various pollutant to the atmosphere. The company has been requested to evaluate the potential benefits of switching to combustion of #2 fuel oil. Information about the composition of the recycled fuel and U.S. EPA emission factors for hot-mix asphalt plants are used to estimate pollutant emissions from the combustion of both recycled oil and #2 fuel oil at the facility. These calculations are fairly similar to the ones that you provided to us, with a few differences described below.

As detailed below — and as one would expect — the specific differences in emissions between using #2 fuel oil and recycled oil vary by pollutant. In terms of tons of reduction, the largest change would be expected for the pollutant sulfur dioxide (SO_2), while the emissions for some other pollutants (*e.g.*, carbon monoxide and total organic compounds) would change very little. However, SO_2 concentrations in ambient air in and around Alexandria VA are already acceptably small, and well within health-based, air quality standards set by the U.S. EPA. Thus, the reduction in SO_2 impacts would not be expected to confer any benefit to the public health.

Moreover, none of the current emissions, based on the use of recycled oil, are sufficiently large as to constitute a "major source" of air pollution within the meaning of the federal Clean Air Act. The plants are currently "minor sources," and would remain "minor sources" if the fuel were switched to #2 oil or natural gas. In other words, the emission estimates for the present case of fueling with recycled oil do not constitute significant levels within the context of the Clean Air Act (which are 100 tons per year for any "criteria pollutant," and 10 tons per year for any "hazardous air pollutant").

Per communication with the Virginia Paving Company, assumptions concerning asphalt production and associated fuel use at the Alexandria facility are as follows:

- Annual average hot-mix asphalt production of 900,000 tons from both plants combined;
- An average of 1.7 gallons of fuel used in the dryers to produce each ton of asphalt;
- Average consumption of 6,500 gallons of recycled oil per month to heat the recycled oil, for a period of 10 months of the year; and

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- Average consumption of 4600 gallons of #2 oil per month for plant heating needs if recycled oil is not used, for a period of 10 months of the year.

On-specification recycled oil, such as that used by the Virginia Paving Company, must satisfy several not-to-exceed limits specified by the Virginia Department of Environmental Quality (VDEQ). The average concentrations of trace and minor components of recycled oil combusted at Virginia Paving between July 1 and August 16, 2005 are summarized in Table 1 along with the VDEQ not-to-exceed specification limits. The measured values of arsenic, cadmium, chromium, lead, and total halogens (expressed as chloride) all fall below the allowable limits. More sensitive tests (*i.e.*, tests with a lower detection limit) of the arsenic concentrations in the recycled oil are pending and are expected to lead to lower estimates of the arsenic emission rates.

Emission factors from three sections of the U.S. EPA AP-42 document are used in conjunction with the recycled oil data: Section 11.1 for hot-mix asphalt plants, Section 1.11 for recycled oil combustion, and Section 1.3 for distillate (*e.g.*, #2) oil combustion. Relevant emission factors are drawn from these sections in an effort to compare emissions from the two fuels. In many cases, the U.S. EPA provides equivalent emission factors for both fuels because the test data do not indicate discernable differences, as emissions are largely governed by factors other than fuel (such as combustion practices and aggregate dust loading).

The emissions estimates herein differ from those you provided to us in several ways. First, our estimates are based on the facility's average annual asphalt production level of 900,000 tons rather than its operational limit of 1,500,000 tons, and on its annual average consumption of 65,000 gallons of oil to heat the recycled oil rather than its annual operational limit of 225,000 gallons. Second, the non-criteria pollutants included in these estimates are only those for which the emissions factors differ between #2 fuel oil and waste oil-fired dryers (*i.e.*, benzene and formaldehyde emission are not included because the AP42 emission factors for these pollutants are identical for all fuel types). Third, the AP42 emission factors used here for the recycled oil-fired hot oil heater are those for an atomizing burner rather than a small boiler (AP42 Tables 1.11-1, 1.11-2, 1.11-3, and 1.11-5). Fourth, measured metals concentrations in the waste oil are used to estimate emissions from the hot oil heaters and measured sulfur concentrations in the waste oil are used to estimate sulfur dioxide emissions from the aggregate dryer. Also, these final estimates are based on mass balance rather than default AP42 emission factors.

Most of the calculations are based on U.S. EPA emission factors. The generic calculation for a pollutant emitted from the dryer stacks is:

$$\begin{aligned}\text{Annual emission (in lbs pollutant/year)} &= \text{Emission factor (lbs pollutant/ton asphalt)}\\ &\times \text{Annual asphalt production (900,000 tons/year)}\end{aligned}$$

For the hot oil heater, the U.S. EPA emission factors are based on the amount of oil consumed:

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Annual emission (in lbs pollutant/year) = Emission factor (lbs pollutant/1,000 gallons oil) × Oil consumption (thousands of gallons/year)

Based on the data for the Virginia Paving facility, annual consumption of recycled oil by the hot oil heater (the latter factor in the above equation) totals 65,000 gallons/year (6,500 gallons per month times 10 months per year). If recycled oil were not used for this heating, #2 oil would be used for facility heating requirements at an average consumption rate of 46,000 gallons/year (4,600 gallons per month times 10 months per year). Some of the EPA's #2 oil combustion emission factors are expressed in pounds of pollutant per 10^{12} Btu; these were converted to units of pounds of pollutant per 1,000 gallons oil by multiplying by the heat value of #2 oil of 140 MMBtu/1000 gal (AP42 page 1.3-8).

Some U.S. EPA emission factor calculations for the hot oil heater rely on data for the recycled oil, specifically its ash, sulfur, and lead content. The average values of these parameters measured in recycled fuel are used for these parameters (as indicated in Table 1). A sulfur content of the #2 oil is taken as the default value of 0.5% for the SO_2 emission factor for non-dryer #2 oil combustion, the actual sulfur content and emissions are likely lower.

Table 1 Parameters measured in samples of recycled oil used at the Alexandria facility

Parameter	Average concentration from 7/1/05 to 8/16/05	Limit for On-specification Recycled Oil
Arsenic (ppm)	ND (< 5) assumed value = 2.5[a]	5
Cadmium (ppm)	1.11	2
Chromium (ppm)	0.52	10
Lead (ppm)	29	100
Total Halogens (ppm Cl)	773	1000
Percent Ash (%)	0.42	
Percent Sulfur (%)	0.35	

a Arsenic was not detected in any of the tests at a detection limit of 5 ppm. The assumed average concentration for arsenic is based on half of the detection limit. More sensitive tests are pending which are expected to lower this value.

Table 2 lists the various emission factors used to estimate pollutant emissions. The specific tables from the U.S. EPA AP-42 sections that serve as the source of each emission factor are referenced. Per the explanatory notes, several of the values reflect percentage fuel composition measurements (as taken from, and expressed as percentages by mass).

Table 2 Emission factors and notes on recycled oil and #2 fuel oil calculations

Pollutant	Emission factors for aggregate dryer (stack) (lbs pollutant/ton asphalt)[a]				Emission factor for heaters (lbs pollutant/1000 gal. fuel)[a]			
	Recycled Fuel		#2 Fuel Oil		Recycled Fuel		#2 Fuel Oil	
Criteria pollutants								
Particulate matter (PM)	0.033	b	0.033	b	66*A*	c	3.3	d
Particulate matter < 10 μm (PM_{10})	0.023	b	0.023	b	57*A*	c	2.3	d
Carbon monoxide (CO)	0.13	e	0.13	e	2.1	f	5	d
Nitrogen oxides (NO_x)	0.055	e	0.055	e	16	f	20	d
Sulfur dioxide (SO_2)	0.30%	g	0.011	e	107*S*	f	142*S*	d
Total Organic Compounds	0.044	h	0.044	h	1	i	0.252	j
Lead	0.000015	k	0.000015	k	50*L*	c	0.00126	l
Other pollutants								
Arsenic	0.00000056	k	0.00000056	k	0.00025%	m	0.00056	l
Cadmium	0.00000041	k	0.00000041	k	0.000114%	m	0.00042	l
Chromium	0.0000055	k	0.0000055	k	0.000047%	m	0.00042	l
Hydrogen chloride (HCl)	0.00021	h	No data		0.067%	m	No data	
Polycyclic aromatic hydrocarbons (PAHs)	0.00088	n	0.00088	n	0.0002	o	No data	
All hazardous air pollutants (including PAHs)	0.01	n	0.0087	n	0.00026	o	No data	
Other organic pollutants	0.026	n	0.024	n	No data		No data	

a Except for factors expressed as a % which are based on mass balance and are unitless
b AP42 Table 11.1-3
c AP42 Table 1.11-1; "*A*" and "*L*" indicate ash and lead content of recycled fuel, respectively (as % values)
d AP42 Table 1.3-1; total PM includes filterable and condensable PM, 50% of filterable PM is PM-10 (Table 1.3-6), "*S*" indicates sulfur content, taken as default level of 0.5%, actual value is likely lower
e AP42 Table 11.1-7
f AP42 Table 1.11-2. "*S*" indicates sulfur content of recycled fuel (as % value).
g Mass balance based on annual production and % *S* measured in fuel; emission factor reflects % S in recycled fuel and 50% removal
h AP42 Table 11.1-8
i AP42 Table 1.11-3
j AP42 Table 1.3-3
k AP42 Table 11.1-12
l AP42 Table 1.3-10
m Mass balance based on recycled fuel use in hot oil burner and %metals measured in recycled fuel
n AP42 Table 11.1-10
o AP42 Table 1.11-5 for atomizing burner, includes the sum of emissions factors for the PAHs naphthalene, phenanthrene/anthracene, and pyrene, and the additional HAPs phenol and dibutylphthalate

Mass balance emission calculations for recycled oil are calculated as:

Annual emission (lbs pollutant/year) = Fraction of pollutant in recycled oil (lbs pollutant/lb oil)
× Volume of recycled oil (gallons/yr)
× Density of recycled oil (lbs oil/gallon)

The density of the recycled oil is 7.64 lbs/gallon.[1] For the hot oil heater, the volume of oil is simply the annual total of 65,000 gallons/year. For the dryer stack, the volume of recycled oil is the product of the annual asphalt production volume (900,000 tons/year) times the oil used to produce each ton of asphalt (1.7 gallons/ton), or 1,530,000 gallons/year. Two additional factors are used in the mass balance calculations:

- In calculating the emissions of sulfur dioxide from the dryer stack, a factor of 0.5 is used to account for the estimate that half of the sulfur is incorporated into the asphalt product and/or captured in the baghouse, and a second factor of 2 is used to convert the emissions from sulfur to sulfur dioxide (based on a molecular weight ratio of 64:32); and
- In calculating the emissions of hydrogen chloride from the hot oil heater, a factor of 36.5/35.5 is applied to convert the chloride emissions to hydrogen chloride (again, based on the ratio of relative molecular weights).

Table 3 provides the results of the emission calculations. All emission estimates are expressed in tons per year (the lb/year estimates described above are simply divided by 2000 lb/ton). As noted above, regulatory agencies treat hot-mix asphalt plants as minor sources of air pollution since emissions from these plants — even from very large facilities — fail to trigger the emission thresholds for major sources. When asphalt plant emissions are evaluated for regulatory purposes, the expected pollutant concentrations in air are smaller than levels of regulatory concern with regard to environmental impact or public health.

Please contact us with any questions, and thank you for the opportunity to work with you on this matter.

[1] A specific gravity SG of 0.88 is found by converting the recycled oil's API gravity of 29.5 with the formula $SG = 141.5 \div (API + 131.5)$, and the corresponding density of 0.88 kg/l converts to 7.64 lbs/gallon.

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Table 3 Emission comparison between use of recycled oil and #2 fuel oil

Pollutant	Emissions (tons/year)	
	Recycled Fuel	#2 Fuel Oil
Criteria pollutants		
Particulate matter (PM)	16	15
Particulate matter < 10 µm (PM_{10})	11	10
Carbon monoxide (CO)	59	59
Nitrogen oxides (NO_x)	25	25
Sulfur dioxide (SO_2)	22	6.6
Total Organic Compounds	20	20
Lead	0.011	0.007
Other pollutants		
Arsenic	0.0009	0.0003
Cadmium	0.0005	0.0002
Chromium	0.0026	0.0025
Hydrogen chloride (HCl)	0.29	No data
Polycyclic aromatic hydrocarbons (PAHs)	0.40	0.40
All hazardous air pollutants (including PAHs)	4.5	3.9
Other organic pollutants	12	11

Summary Results of an Emission and Air Dispersion Modeling Study and Public Health Evaluation of the Virginia Paving Company Facility, Alexandria, Virginia

Michael R. Ames, Sc.D., Stephen G. Zemba, Ph.D., P.E., and
Laura C. Green, Ph.D., D.A.B.T.
Cambridge Environmental Inc.

September 30, 2005

Per our Protocol of September 13, 2005, dispersion modeling of criteria pollutants was performed separately for each of the various sources at Virginia Paving, and the maximum predicted incremental concentrations were identified. For the gaseous criteria pollutants and lead, essentially all of the emissions are from the dryer stacks and the hot oil heater vent. For these pollutants the maximum predicted increments from each source were summed to derive a screening-level maximum increment, ignoring potential time and space incongruities (*i.e.*, the fact that the maximum impacts from the different sources may occur at different locations and time periods). The maximum impacts of gaseous criteria pollutants emitted from the Virginia Paving facilities are shown in Table 1 for typical operating conditions, and in Table 2 for maximum permitted operating conditions. The Tables also show the applicable National Ambient Air Quality Standards (NAAQS), locally measured levels, and the sum of the plant's impact and measured background levels.

Table 1. Maximum gaseous criteria pollutant impacts from Virginia Paving emissions compared with applicable NAAQS, measured background levels and total of impacts plus background. Impacts assume day, evening, and night operating schedule at current typical annual and daily production rates (900,000 tons per year, 675 tons per hour, 16.5 hours per day).

Pollutant and averaging time ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	Background ($\mu g/m^3$)	Virginia Paving Impact ($\mu g/m^3$)	Total ($\mu g/m^3$)
NO_x - Annual	100	45.1	1.2	46.3
CO - 8-hour	10000	2290	955	3240
CO - 1-hour	40000	5710	3030	8740
SO_2 - Annual	80	15.7	1.2	16.9
SO_2 - 24-hour	365	55	72	127
SO_2 - 3-hour	1300	159	336	496
Pb - Quarterly (annual)	1.5	0.013	0.002	0.015

Table 2. Maximum gaseous impacts from Virginia Paving emissions of gaseous criteria pollutants and lead compared with applicable NAAQS, measured background levels and total of impacts plus background. Impacts assume day, evening, and night operating schedule at current permitted annual and daily production rates (1,500,000 tons per year, 1,000 tons per hour, 24 hours per day).

Pollutant and averaging time ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	Background ($\mu g/m^3$)	Virginia Paving Impact ($\mu g/m^3$)	Total ($\mu g/m^3$)
NO_x - Annual	100	45.1	2.3	47.3
CO - 8-hour	10,000	2,290	1,395	3,685
CO - 1-hour	40,000	5,710	4,390	10,100
SO_2 - Annual	80	15.7	2.4	18.1
SO_2 - 24-hour	365	55	165	220
SO_2 - 3-hour	1,300	159	575	734
Pb - Quarterly (annual)	1.5	0.013	0.006	0.019

Because emissions of particulate matter (PM) from Virginia Paving come from several sources spread around the facility's property, the impacts of these pollutants were estimated at each special receptor location and averaging period. The maximum, annual average facility impacts of PM at the residential receptor locations are shown in Table 3; the maximum, 24-hour average facility impacts of PM are shown in Table 4. The PM emission rates used to predict these impacts were based on reasonable but still fairly conservative (*i.e.*, over-predictive) modeling assumptions. These assumptions include the use of a flat surface to model windblown dust emissions, and a maximum estimate of the distance trucks travel over paved surfaces at the facility. A default efficiency of 90% for the silo, loadout, and storage control system (the 'blue smoke' system) has been applied in the revised maximum operating conditions cited in Table 4.[1] The values in Tables 3 and 4 do not include emissions from diesel engines at the facility's, or from the oil heater at US Filter.

[1] Please note that we have since received measured efficiencies from the equipment vendor indicating that 99%, rather than 90%, is the capture efficiency. Thus, 99% is used in more refined modeling, presented below.

Table 3. Maximum annual $PM_{2.5}$ and PM_{10} impacts of the total Virginia Paving emissions at current typical annual production rate (900,000 tons per year) and measured stack gas TSP concentrations (0.014 grains per dry standard cubic foot); and at revised maximum annual operations (1,500,000 tons per year); taller stacks of 20 meters for each of the dryers (current heights are 14.1 m and 14.6 m), and 6 m for the hot oil heater (current height is 2.95 m); 125,000 gallons per year hot oil heater fuel usage; and maximum stack gas TSP concentrations of 0.03 grains per dscf (current measured level is 0.014 grains per dscf).

Pollutant and averaging time ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	Background ($\mu g/m^3$)	Virginia Paving Impact ($\mu g/m^3$)	Total ($\mu g/m^3$)
TSP - annual current typical operations	75*	—*	15	—
TSP - annual revised maximum operations	75*	—*	25	—
PM_{10} - annual current typical operations	50	21	4	25
PM_{10} - annual revised maximum operations	50	21	6	27
$PM_{2.5}$ - annual current typical operations	15	13.4	0.8	14.2
$PM_{2.5}$ - annual revised maximum operations	15	13.4	1.3	14.7

* Total Suspended Particulate Matter (TSP) is no longer a criteria pollutant. The former annual NAAQS for TSP is 75 $\mu g/m^3$. Ambient TSP measurements have not been taken in Virginia as part of the NAAQS program since 1990.

Table 4. Maximum 24-hour $PM_{2.5}$ and PM_{10} impacts of the total Virginia Paving impacts for selected pollutants, plant operating conditions, and modeling conditions. Taller stacks are 20 meters tall for each of the dryers (current heights are 14.1 m and 14.6 m), and 6 m for the hot oil heater (current height is 2.95 m). Revised maximum emission conditions are 0.03 grains/dscf total stack PM gas concentration (current level is 0.014 grains/dscf), 125,000 gallons per year hot oil heater fuel usage, and 13,000 tons per day asphalt production.

Pollutant and averaging time (μg/m^3)	NAAQS (μg/m^3)	Background (μg/m^3)	Total Virginia Paving Impact (μg/m^3)	Total (μg/m^3)
$PM_{2.5}$ - 24-hour current typical operations	65	35.3	20.5	55.8
$PM_{2.5}$ - 24-hour current typical operations, urban dispersion conditions	65	35.3	9.3	44.6
$PM_{2.5}$ - 24-hour, taller stacks, revised maximum emission conditions	65	35.3	28.5	64
PM_{10} - 24-hour current typical operations	150	52	54	106
PM_{10} - 24-hour current typical operations, urban dispersion conditions	150	52	15	67
PM_{10} - 24-hour, taller stacks, revised maximum emission conditions	150	52	67	119

Particulate matter emissions from the facility were also modeled over a 6 km square centered at the facility with receptors spaced on a 100 meter grid. The 5-year average increments to the PM levels were estimated. Figure 1 shows the annual average PM_{10} due to the facility's emissions over the 6 km grid.

A comparison of the increments due to dryer and heater stack emissions, and from the venting and loadout emissions, was made for the facility's operating under its previous schedule which **included evening and nighttime** operations, and under its current schedule which includes **only daytime** operation. The difference between these two operating schedules was found to be small. PM_{10} impacts averaged over the entire 6km grid for day/night operations were slightly lower (97%) compared with the average impacts for day only operations. The maximum ratio of day/night to day only impacts was 1.07; the minimum ratio was 0.87.

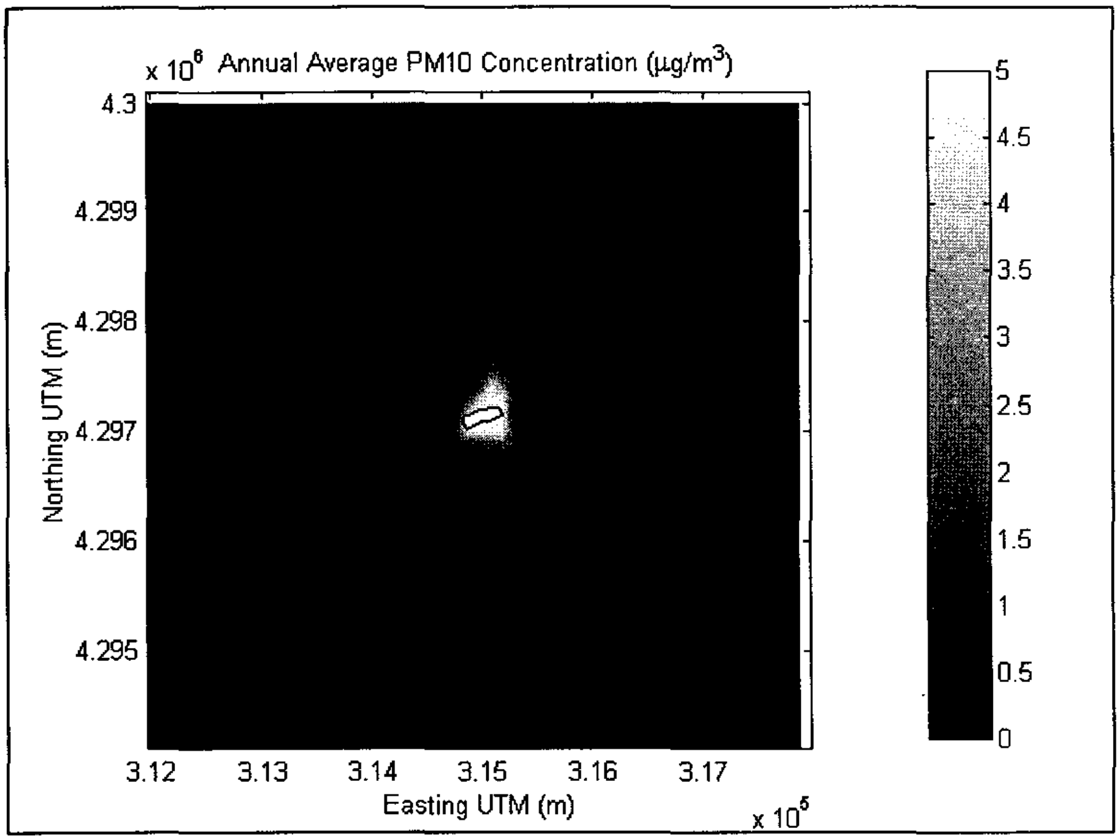

Figure 1. Estimated annual average PM_{10} impacts from the Virginia Paving facility in Alexandria, Virginia. Impacts are based on typical facility operating conditions. The facility property is within the white area in the center of the figure.

The PM_{10} impacts of the facility were also modeled at 21 locations along the facility's property boundary or fenceline. This model included refined estimates for some of the facility's emissions as well as somewhat more restrictive operating conditions. The conditions described with Table 4 were applied with the addition of the use of the following

- use of #2 fuel oil in the hot oil heater,
- a limit of 100,000 gallons of fuel for the hot oil heater per year,
- the application of a 99% control efficiency for the 'blue smoke' system (as cited by the system's vendor),
- the addition of enclosures at all but one of the locations where the aggregate is dropped from conveyors or vehicles,

- a more realistic estimate of the total vehicle miles traveled per day by truck on the facility property,
- the application of a 75% control efficiency watering and vacuuming of the paved roadways,
- the application of a 90% control efficiency watering unpaved surfaces,
- the inclusion of a emission reduction factor of 0.2 in estimating windblown dust emissions to account for the fact that the aggregate piles are conical rather than flat,
- the addition of emissions from diesel engines at the facility, as well as from the hot oil heater at U.S. Filter.

With these additional refinements and conditions, the maximum estimated 24-hour PM_{10} impact at the facility fenceline is 84 $\mu g/m^3$ which when added to the maximum measured value of 24-hour PM_{10} in Alexandria of 52 $\mu g/m^3$ gives a total of 136 $\mu g/m^3$, which is below the 24-hour PM_{10} NAAQS of 150 $\mu g/m^3$.

The emissions and dispersion conditions employed for modeling gaseous criteria pollutants in Tables 1 and 2 were also applied to assess the potential health effects of hazardous pollutants emitted from the facility. The maximum hazard indices and incremental lifetime cancer risks for various exposure scenarios are given in Table 5.

Table 5. Maximum Hazard Indices and incremental lifetime cancer risks due to emissions from Virginia Paving.

Receptor	Maximum Hazard Index	Maximum incremental lifetime cancer risk
Maximum **residence** current production rate	0.08	1.2E-06
Maximum **residence** permitted annual production rate	0.2	2.4E-06
Maximum commercial/industrial current production rate	0.6	1.8E-06
Maximum commercial/industrial permitted annual production rate	1	3.5E-6
Nearest **school** current production rate	0.04	1.1E-07
Nearest **school** permitted annual production rate	0.07	2.2E-07
Nearest **park** current production rate	0.03	1.1E-07
Nearest **park** permitted annual production rate	0.08	2.6E-07

EMISSIONS AND MODELING FILES:

The ISC input files (.inp) are for 1984; there are similar files for 1985-1988.
STK indicates stack emissions (point sources).
VOL indicates venting/loadout emissions (volume sources).
FUG indicates fugitive dust emissions (area sources).

VPG files are for 6km gridded recepor.
VPF files are for fenceline receptors.

RMPM2484 is for all sources 24-hour PM2.5 modeling.

FL102484 is for all sources 24-hour PM10 fenceline modeling.

Fugitive Emission factors.xls has the emission factors and parameters for fugitive PM.

emission and risk calcs.xls has the emission factors and calculations for criteria pollutants and
HAPs from the stacks and venting/loadout sources.

PM10 fenceline.xls has all of the 24-hour PM10 fenceline results.

6 km PM grid.xls has all of the annual average PM gridded receptor results.

Appendix D

AMBIENT AIR QUALITY ANALYSIS - PROPOSED S.U.P. SCENARIO - VIRGINIA PAVING

Presented to:
City of Alexandria
Department of Transportation and Environmental Services
301 King Street
Alexandria VA 22314

March 2006

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217

Ambient Air Quality Analysis – Proposed S.U.P. Scenario – Virginia Paving
Executive Summary

This analysis calculates the ambient air quality impacts of the Virginia Paving (VP) facility, an asphalt batch plant in Alexandria, Virginia and compares results against health-based National and Virginia ambient air quality standards (AAQS) for criteria pollutants and Virginia's Significant Ambient Air Concentration (SAAC) guidelines for hazardous pollutants. Impacts were calculated for two operational scenarios. The first, called the baseline scenario here, assumes constraints and limitations specified in the facility's current air permit, using current annual production. The second assumes conditions and limitations that have been proposed as Special Use Permit (SUP) terms.

This analysis uses procedures prescribed by US EPA for ambient air quality compliance demonstrations. This analysis uses AERMOD-PRIME, a US EPA-approved model for calculating air impacts from industrial sources, including facilities where downwash of plumes due to the presence of onsite and offsite structures affects results. A US EPA-approved algorithm that was recently reformulated for use in AERMOD-PRIME was used to calculate the dimensions of down-washing structures at the facility. Emissions derive from application of US EPA factors, and site-specific characteristics for the wide variety of sources that operate at the plant, including hot mix asphalt batch plants, a hot oil heater, load-out and asphalt storage processes, aggregate handling processes, operation of on-road heavy duty diesel trucks and off-road aggregate handling trucks, and wind erosion of aggregate storage piles.

Impacts were calculated for the baseline scenario assuming total facility asphalt throughput limitations of 24,000 and 900,000 tons per day and year, respectively. Other baseline assumptions include stack heights for each of the asphalt plants equal to 14 meters, hot oil heater stack height equal to 3 meters, and an annual fuel limitation of 125,000 gallons of no. 5 oil in the hot oil heater. Assumptions within the proposed SUP scenario include total facility throughput limitations for asphalt of 10,000 and 1.2 million tons per day and year, respectively. Other assumptions include stack height increases to 20 meters and 6 meters for the asphalt plant stacks and hot oil heater, respectively, and an annual fuel use limitation of 100,000 gallons of no. 2 oil for the hot oil heater. Within the proposed SUP scenario, additional add-on controls and emission mitigation techniques are also assumed, including the Blue Smoke© control and condenser system for the load-out and asphalt storage processes, add-on particulate control for onsite diesel vehicles, commitment to use lower sulfur fuel (to 500 ppm) in onsite equipment one year ahead of the requirements of the federal off-road diesel rule, increased frequency of watering of onsite roadways, wet-spray particulate control of RAP crushing operations, and enclosures around aggregate transfer points at Plant 2.

Impacts were calculated at receptors along the fence line, placed approximately 50 meters apart, at discrete receptors extending from the fence line to distances of approximately 300 meters, at approximately 50 meter spacing, and along radials at ten degree increments extending from 300 meters to two kilometers distance from the facility. Impacts for years 2000 through 2004 were simulated for each of the baseline and proposed SUP scenarios using local meteorological conditions, topography and surface conditions representative of the immediate and surrounding area and worst-case regional background contributions derived from Virginia air monitors. Contributions from the nearby sources of the Covanta municipal solid waste incinerator, Washington Gas and Light, and US Filter were also included in the AAQS analysis

The proposed SUP scenario represents significant short-term improvements in air quality impacts, with short-term maximum impacts from the facility reduced from approximately 10% to 80% from the baseline scenario's impacts, depending on pollutant and averaging period. Annual impacts for the proposed SUP scenario also represent improvements, but to a lesser extent, ranging up to 40% reduction from the baseline scenario's maximum impacts. Results show that for the proposed SUP scenario, maximum potential impacts comply with the respective AAQS for all pollutants except $PM_{2.5}$ (annual) and SO_2 (3-hour). For SO_2, 3-hour impacts exceed the AAQS by 7% at only a limited area immediately on the fenceline. For $PM_{2.5}$, annual impacts exceed the AAQS by no more than 1.3 micrograms per cubic meter; this area of noncompliance is also limited, extending to approximately 150 meters from the northeast fence line, along an arc of approximately 200 meters. However, the facility's contribution to these exceedances is minimal; interacting source contributions and background constitute 15.6 of the 16.3 total micrograms per cubic meter maximum impact. Comparison between nine days of observations from a PM_{10} monitor located closely to this site and AERMOD results shows that for almost all observations, predicted results using AERMOD exceed actual impacts with significant margin, suggesting that application of AERMOD for the baseline and proposed SUP scenarios provides maximum potential facility impacts while also assuring a margin of protection. Results also show that for HAPs, impacts comply with SAAC guidelines for the proposed SUP scenario, in most cases with ample margin.

1. Introduction

This report presents the procedures and results of an analysis to determine ambient air impacts of the Virginia Paving (VP) facility in southwest Alexandria, Virginia. This analysis responds to the interest by the City of Alexandria in evaluating the facility's compliance with federal and Virginia ambient air quality standards (AAQS) for an expansion scenario and special use permit (SUP) request that includes an increase in annual throughput and physical changes and proposed operational procedures intended to mitigate impacts. The expansion scenario's limitations and conditions that this emissions analysis incorporates are listed in the report of a parallel analysis of the facility's impacts by Cambridge Environmental, Inc.[1]

To assure a comprehensive review, this analysis generally follows guidelines and procedures stipulated by the United States Environmental Protection Agency's (US EPA) Guideline on Air Quality Models[2] and New Source Review Workshop Manual.[3] This analysis applies the American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD), Version 04300, to determine the ambient air impacts by VP.[4] Results of this analysis include an assessment of VP's compliance with National and Virginia Ambient Air Quality Standards (AAQS) for criteria pollutants. Table 1-1 below shows these AAQS and significant guideline values. Results of this analysis include an assessment of VP's compliance with National and DEQ Ambient Air Quality Standards (AAQS) for criteria pollutants.

The facility's processes also emit hazardous air pollutants (HAPs). Stationary sources' impacts of these pollutants are regulated through Virginia Department of Environmental Quality's (VDEQ) significant ambient air concentration (SAAC) guidelines, prescribed in 9 VAC 5-60-230. These guidelines derive from the Threshold Limit Ceiling (C), Short-term Exposure Limit (STEL) and Time Weighted Average (TWA) exposure criteria developed by the American Conference Governmental and Industrial Hygienists, with scaling factors applied to account for chronic versus worker-based exposure scenarios.[5] Maximum potential emissions of HAPs were determined, and impacts by those HAPs with the greatest potential to exceed guidelines were evaluated.[6]

Table 1-1. National and Virginia Ambient Air Quality Standards (µg/cu.m.).

	CO	NO_2	Lead	$PM_{2.5}$	PM_{10}	SO_2
1-hour	40,000[(d)]	--	--	--	--	--
3-hour	--	--	--	--	--	1300[(d)]
8-hour	10,000[(d)]	--	--	--	--	--
24-hour	--	--	--	65[(a)]	150[(a)]	365[(d)]
Quarter			0.15			
Annual	--	100[(c)]	--	15[(b]	50	80[(c)]

Notes:(a) The fourth highest concentration provides an unbiased estimate of the 99th percentile value; compliance is met when fourth highest value in area is less than or equal to this value (see "User's Guide for the AMS/EPA Regulatory Model – AERMOD").
(b) Compliance is met using average of three consecutive years' values.
(c) Compliance met using highest of years' values.
(d) Compliance met using highest second highest value.

[1] "Results of an Emission and Air Dispersion Modeling Study and Public Health Evaluation of the Virginia Paving Company – 5601 Courtney Avenue – Alexandria, Virginia," Cambridge Environmental, Inc., December, 7, 2005.
[2] "Appendix W to Part 51 – Guideline on Air Quality Models," 40 CFR Ch. 1 (7-1-03 Edition).
[3] "New Source Review Workshop Manual, Prevention of Significant Deterioration and Nonattainment Area Permitting," Draft, US EPA, October, 1990.
[4] AERMOD incorporates recent US EPA improvements in air modeling capability, including PRIME.
[5] Impacts for lead are also evaluated against the DEQ significance guideline for 1-hour and annual periods.
[6] 9 VAC 5 Chapter 50, Hazardous Air Pollutant Sources, Part II, Emission Standards, Article 4.

2. Procedures

2.1 Facility Description

Virginia Paving's facility in Alexandria includes two counterflow drum mix asphalt plants, labeled Plant 1 and 2, rated at 600 and 400 tons per hour, respectively, two liquid asphalt heaters, rated at 5.64 and 2.5 million Btu per hour, and associated ancillary equipment. Processes produce both stack and fugitive emissions, including emissions from asphalt storage silos, load-out and yard processes, the handling and storage of recycled asphalt pavement (RAP), sand and stone, and truck traffic on onsite paved and unpaved road sections.

2.2 Stack Emission Sources: Plants 1 and 2; Heaters 1 and 2; Emissions and Exhaust Characteristics

Stack air emission sources at the site are limited to each plant's dryer, each controlled by a baghouse, and the two asphalt heaters. Distillate and waste fuel oil are combusted within the dryers. Emissions of these sources are currently limited by maximum daily and annual throughput totals stipulated within the facility's Stationary Source Permit to Operate and Modify (PTO) prescribes.[7]

Stack emission factors for the dryers and heaters derive from test data submitted to the City of Alexandria by Cambridge Environmental in August, 2005[8] and US EPA emission factors, respectively. Modeling parameters and downwash building dimensions for these sources were determined using data submitted to the City of Alexandria by Cambridge Environmental in September and October, 2005 and ortho-photography of the facility. [9]

2.3 Fugitive Process Emissions and Modeling Parameters

The fugitive process emissions at the facility derive from RAP, sand and stone handling and storage, asphalt storage silos and load-out of the asphalt product, including on-site emissions deriving from the off-gassing of the asphalt immediately after loading, truck traffic, including combustion emissions, and wind erosion processes. The hydrated lime silo is excluded from the analysis; although this process is listed with corresponding opacity limits in the facility's PTO, recent correspondence indicates that this process is no longer used at the facility.[10]

Factors for asphalt storage, load-out and yard emissions derive from US EPA's AP-42 "Compilation of Air Pollutant Emission Factors" for hot mix asphalt plants (Section 11.1); data specific to drum mix plants were used where available. US EPA's AP-42 factors were also used for calculating emissions from aggregate handling and storage, paved and unpaved roads, crushed stone and mineral processing,[11] open fugitive dust sources, [12] US EPA's MOBILE6.2 emission factor model for combustion emissions from heavy-duty diesel vehicle traffic, and US EPA AP-42 emission factors for diesel engines for onsite diesel-powered equipment (front-end loaders, cats, fork lifts).[13] Site-specific characteristics were used where available, including

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[7] "Stationary Source Permit to Modify and Operate," Virginia Paving Company – Alexandria Plant, The Lane Construction Company, February 17, 2005.

[8] Stephen Zemba, Cambridge Environmental to Lalit Sharma, City of Alexandria, August 22, 2005

[9] "GIS Data CD," City of Alexandria, Spring, 2004, Tile F2.

[10] M. Ames of Cambridge Environmental to M. Barrett of Aero Engineering, October 21, 2005.

[11] US EPA's AP-42, "Compilation of Air Pollutant Emission Factors," Section 13.2.1 Paved Roads and Section 13.2.4 Aggregate Handling and Storage Pile, December, 2003, www.epa.gov/ttn/chief/ap42.

[12] "Control of Open Fugitive Dust Sources," Section 4.1.3, EPA-450/3-98-008.

[13] "Mobile Source Emission Factor Model," EPA-420-R-03-010, August, 2003.

220

process characteristics and site vehicle emission factors described by Cambridge Environmental and local meteorological observations.[14]

Figure 2-1 shows all of the facility processes, approximately to scale as they were defined within AERMOD, on a planview of the facility.[15] Table 2-1 below summarizes some of the key assumptions in the calculation of emissions for the facility.

Table 2-1. Key Emission Assumptions.

Plant Dryers No. 1 and 2	-PM_{10} and $PM_{2.5}$ derive from results of stack tests conducted in August, 2005, scaled to reflect 0.03 gr/dscf for total PM.[16] -Emission factors for other pollutants derive from maximum cited within AP-42,[17] Section 11.1 "Hot Mix Asphalt Plants" for drum mix plants for all other pollutants.
Asphalt Heaters No.'s 1 and 2	-Short-term and annual emissions use use distillate oil rates. - Short-term emissions unlimited; annual emissions consistent with fuel limit. - Simultaneous operation excluded.
Storage Silos, Load-out, Yard	- Used factors for PM_{10}, $PM_{2.5}$, CO and VOC from AP-42, Section 11.1 "Hot Mix Asphalt Plants;" assumed loss factor of –0.5. -Assumed control efficiency equal to 99% for PM_{10} and $PM_{2.5}$ for Blue Smoke© system for storage and load-out processes only, for proposed scenario only. - Assumed yard emissions equal to 50% of loadout emissions; asphalt storage tank emissions equal to 10% of silo filling emissions.
Aggregate Handling	- For drop and reclaim operations, applied lb-per-ton factor from AP-42's Section 1.3.2.4, "Aggregate Handling and Storage Piles." - For rap crusher, used AP-42's tertiary crushing factor, assuming controls, from AP-42's Section 11.19.2, "Crushed Stone Processing and Pulverized Mineral Processing" at rated capacity for short-term. -Assumed rap/sand/stone total handling rates equivalent to rates for plant throughput; silt content and moisture consistent of aggregate consistent with facility-specific data provided by CE.[18]
Truck Traffic	- For particulate emissions on paved and unpaved site roadways, applied AP-42's Sections 13.2.1 and 13.2.2, "Paved Roads" and "Unpaved Roads," respectively. -Includes travel and idle combustion emission factors derived from

[14] NCDC SAMSON data for DC National Airport, 1986 to 1990.
[15] With Tile F2 as base map, from "GIS Data CD," City of Alexandria, Spring, 2004.
[16] "Source Sampling for Particulate Emissions – Hot Mix Asphalt Plant," Virginia Paving Company, Alexandria Virginia, August 11-12, 2005 (gr/dscf refers to grains per dry standard cubic foot).
[17] AP-42, "Compilation of Air Pollutant Emission Factors," US EPA, www.epa.gov/ttn/chief/ap42.
[18] Spreadsheet labeled "Fugitive Emissions factors silt" and "Fugitive Emissions factors moisture" relayed to AERO Engineering from M. Ames of Cambridge Environmental, September 30, 2005 via email.
[19] "User's Guide to MOBILE 6.1 and MOBILE 6.2, Mobile Source Emission Factor Model," US EPA, 420-R-03-010, August 2003.

221

Table 2-1. Key Emission Assumptions.

	US EPA's MOBILE6.2 model for the HDDV6 vehicle class, derived for January conditions (expected worst-case for CO and PM emissions), assuming 15 ppm sulfur in the fuel, consistent with US EPA's "Clean Diesel Trucks and Buses Rule."[19] -Truck trips for asphalt hauling equals 555 for peak daily rates; reduced to annual value according to throughput. - Reduced emissions by 50% to account for application of water; this requires watering every two to three hours. - For paved roadways, applied a reduced $PM_{2.5}/PM_{10}$ factor from the AP-42 value, in accordance with observations for unpaved roads.[20]
On-site Equipment	-Included reduced $PM_{10/2.5}$ and SO_2 rates to reflect US EPA's "Clean Air Nonroad Diesel Rule," that will require fuel sulfur reductions to 500 ppm from 3,000 ppm in 2007 and to 15 ppm by 2010.[21] - Used AP-42 diesel engine emission factors and usage hours provided by CE.[22]
Wind Erosion	- Used meteorological observations of wind speed and rainfall from DC Reagan Airport and SAMSON data. -Applied wind erosion relationship dependent on coal pile size, average height, silt content (as above), and days with precipitation. - Worst-case daily rate of erosion uses maximum daily average wind speed that is reduced from hourly value. - Applied a reduced $PM_{2.5}/PM_{10}$ factor from the AP-42 value, in accordance with observations for construction sites.[23]

2.4 Baseline Scenario

This analysis presents the results for the baseline scenario, simulating the facility's maximum potential short-term and annual impacts under the existing physical configuration and historical operation of each of the dryer stacks, at 14.1 and 14.6 meters height, and heater no. 1's stack, at 2.9 meters. Annual emissions derive from the assumption of annual throughput equal to 900,000 tons total (610,000 and 290,000 tons, for Plants 1 and 2, respectively), and fuel oil consumption in the hot oil heater equal to 125,000 gallons. No Blue Smoke© system control was assumed. Annual emissions for storage, load-out, yard, aggregate handling and truck traffic reflect historical annual throughput levels. Heater no. 2 is not simulated here due to its description as strictly a backup unit.[24]

For this scenario, Table 2-2 shows the facility's and each process's maximum potential short-term and annual emission rates for each of the criteria pollutants (CO, NO_2, $PM_{2.5}$, PM_{10}, SO_2 and VOC),[25] and the corresponding emission release characteristics and source coordinates that were input to AERMOD for the baseline scenario. Total annual emissions for source

[20] "Examination of the Multiplier Used to Estimate PM2.5 Fugitive Dust Emissions from PM10," Thompson G. Pace, US EPA.
[21] "New Clean Diesel Rule Major Step in Decade of Progress," EPA Newsroom, www.epa.gov.
[22] Spreadsheet labeled "Fugitive Emissions factors diesel US Filt," relayed to AERO Engineering from M. Ames of Cambridge Environmental, September 30, 2005 via email.
[23] "Examination of the Multiplier Used to Estimate PM2.5 Fugitive Dust Emissions from PM10," Thompson G. Pace, US EPA.
[24] Correspondence with M. Ames of Cambridge Environmental, October, 2005. While the facility's PTO currently does not constrain the facility from simultaneous operation of Heaters no. 1 and 2, a new permit should contain that limitation.
[25] While there is no AAQS for VOC, that pollutant is regulated under source permitting requirements on the basis of tons per year; therefore, annual emissions are estimated for it here.

222

categories and the facility are also shown on Table 2-2. Tables A-1 through A-5 of Appendix A detail the emission factors and rates for each of the facility's processes for the baseline scenario.

2.5 Proposed SUP Scenario

This analysis simulates the facility's maximum potential impact under proposed physical changes to each of the dryer stacks, i.e., height increases to 20 meters, and to heater no. 1's stack, to a height of 6.0 meters. Maximum hourly rates for $PM_{2.5}$ and PM_{10} emissions for this and the baseline scenarios are calculated using total PM levels of 0.03 grains per dry standard cubic foot (dscf). However, annual emissions derive from the assumption of an increase in annual limitation for this proposed SUP scenario equal to 1.2 million tons, with apportionment to each of Plant 1 and 2 at levels equal to 720,000 and 480,000 tons, respectively, while a new daily limitation of 10,000 tons, total, decreases daily emissions from Plants 1 and 2. Additionally, this scenario assumes the application of the Blue Smoke© control system at a rate of 99% to reduce emissions of $PM_{2.5}$ and PM_{10} from the asphalt storage and load-out processes.[26] Table 2-3 summarizes the differences in process limitations, controls and physical configuration from the baseline scenario to the proposed SUP scenario.

Table 2-3. Difference between Baseline and Proposed SUP Conditions and Limitations.

Source Group	Baseline Operation	Proposed SUP Operation	Impact
Hot Mix Plants – Stack Heights	14 m. Height	20 m. Height	*Mitigation of impacts- all pollutants.*
Asphalt Heater Stack Height	3 m. Height	6 m. Height	*Mitigation of impacts – all pollutants.*
Plants 1 and 2 Hourly Throughput	600 tons and 400 tons per hour, resp.	No change.	*-Hourly emissions change only through emission controls and tighter limits.*
Plants 1 and 2 Daily Throughput	14,400 tons and 9,600 tons per day, resp.	6,000 tons and 4,000 tons per day, resp.	*Mitigation in total per day emissions and impacts.*
Total Facility Annual Throughput	900,000 tons	1.2 million tons	*Increase in annual emissions from all source groups.*
Asphalt Heater	-125,000 gallons of no. 5 or no. 2. -No limit on simultaneous operation.	-100,000 gals. No.2 oil. -Limit on simultaneous operation required.	*-Reduction in all pollutants.* *-Mitigation of impacts.*

223

[26] Correspondence dated October, 20, 2005 via email, from M. Ames of Cambridge Environmental to M. Barrett of Aero Engineering; with vendor's description (R. Hoffman) of the capability of the Blue Smoke™ system to achieve greater than 98% control of $PM_{1.8}$

Table 2-3. Difference between Baseline and Proposed SUP Conditions and Limitations.			
Source Group	**Baseline Operation**	**Proposed SUP Operation**	**Impact**
Load-out and Silo Storage	-No add-on controls.	-Blue Smoke™ at 99% control.	*-Mitigation of fugitive $PM_{2.5}$ and PM_{10}.*
Combustion Emissions from Onsite Vehicles[27]	-No add-on controls.	-Add-on particulate control, at 90% reduce. -Commitment to use lower sulfur fuel in onsite equipment (to 500 ppm S) in 2006, one year ahead of off-road diesel rule's effect.	*-Mitigation of tailpipe $PM_{2.5}$ and PM_{10}.* *-Reduction in tailpipe SO_2 by 50%.*
Fugitive Dust from Paved Roads	-Best Management Practices.	-Commitment to watering every two to three hours. -Unpaved section next to Plant 2 to be paved.	*-50% reduction in fugitive $PM_{2.5}$ and PM_{10}.* *-Mitigation in fugitive $PM_{2.5}$ and PM_{10}.*
Aggregate Handling	-No controls.	-Addition of enclosure around aggregate transfer points around Plant 2.	*-Mitigation in fugitive $PM_{2.5}$ and PM_{10}.*
Asphalt Storage Tank	-No controls.	-Addition of condensor to control VOCs and PM.	*-Mitigation in $PM_{2.5}$ and PM_{10} and VOCs.*

For the proposed SUP scenario, Table 2-4 shows the facility's and processes' maximum potential emission rates for each of the criteria pollutants (CO, NO_2, $PM_{2.5}$, PM_{10}, SO_2 and VOC), and the corresponding emission release characteristics and source coordinates that were input to AERMOD for each of the processes. Table 2-4 also shows the facility-wide and source categories' annual emissions for the proposed SUP scenario. Table 2-5 below summarizes the differences in emissions on a ton-per-day and ton-per-year basis between the baseline and proposed SUP scenarios, for pollutants with 24-hour ambient standards. These results show that while tons-per-day of each pollutant will be reduced significantly for the revised proposed SUP scenario, emissions on a ton-per-year basis increase or remain the same. These results are expected considering the decrease in daily plant throughput that the revised proposed SUP scenario reflects, and while the annual plant throughput increases significantly for the proposed SUP scenario, proposed controls, lower sulfur fuels and more stringent emission limits mitigate the resulting increase in annual emissions. Tables A-6 through A-9 detail emission rates for each of the facility's processes for the proposed SUP scenario.

Table 2-5. Daily and Annual Emissions (tons) for $PM_{2.5}$, PM_{10} and SO_2 – Baseline vs. Proposed SUP Scenario						
	PM_{10}		$PM_{2.5}$		SO_2	
	Daily	Annual	Daily	Annual	Daily	Annual
Baseline	0.25	14	0.18	8	0.85	36
Proposed	0.09	14	0.07	9	0.37	43

[27] For off-road vehicles, $PM_{10/2.5}$ and SO_2 emissions are assumed to be 50% and 66% lower, respectively, in the baseline case than in modeling representative of the previous years' operation. Baseline emissions represent an operational year of 2006, without the limits and modifications for the proposed revised SUP. Therefore, due to the staggered changes in diesel sulfur fuel oil that the on-road and off-road diesel rules will produce, even for the baseline scenario, emissions for these sources will be lower than emissions for previous years.

Emissions for wind erosion reflect the assumption that the stockpiles remain essentially the same size in total acreage for both the baseline and proposed scenarios. Therefore, Table A-5 of the baseline scenario presents wind erosion emissions for both scenarios.

2.6 HAP Emissions for Proposed SUP Scenario

For each of the facility's processes, emissions of HAPs were determined using AP-42 emission factors for hot mix asphalt plants, MOBILE6.2 emission factors for onroad diesel trucks, and AP-42 diesel engine factors for diesel-powered onsite equipment. The HAPs for which the ratios of emission factors to SAAC guidelines are greatest for each source category were selected for full impact evaluations with AERMOD (see Table A-10). These pollutants include formaldehyde, acrolein, 1,3 butadiene, benzene, acetaldehyde, quinone and lead. Table 2-6 shows the facility's and processes' maximum potential emission rates for each of these pollutants, and the facility-wide annual emissions for these pollutants for the proposed SUP scenario. Tables A-11 through A-13 in Appendix A detail each process's HAP emission factors and inputs for each of the plant, load-out and vehicle processes. Wind erosion and aggregate handling processes have no emissions of HAPs.

2.7 Structure Downwash Dimensions

Downwash dimensions were input for the structures that influence each of the dryers' and Heater 1's plume behavior; these structure include the baghouse housings for Plants 1 and 2, the lime silo, the asphalt storage silos for each of Plants 1 and 2, and the stone bins. Dimensions for these structures derive from Cambridge Environmental's coordinates,[28] while the layout of structures also derives from inspection of ortho-photography of the site.[29] No downwash dimensions were input to AERMOD for the silo storage, load-out, yard, aggregate handling, wind erosion and truck traffic emissions because these sources are defined as area or volume sources; currently BPIP-PRIME and AERMOD do not have the capability to calculate wake effects on area or volume sources.

The US EPA's Building Profile Input Program with Prime[30] was applied to determine the height, width, and length of down-washing structures, and distance to adjacent structures, for each of the potential 36 wind directions.[31]

Table 2-7 lists each of the facility stack sources and the maximum projected height and width of the structure affecting the source, as calculated by BPIP-PRIME. Appendix B includes a printed listing of the BPIP-PRIME input and output files for this analysis.

Table 2-7. BPIP-PRIME Downwash Dimension Program's calculations of Maximum Height and Widths affecting each Stack, with Associated Structure Indicated.

Source	Maximum Height Affecting Source and Controlling Structure	Maximum Projected Width and Associated Structure
Baghouse 1	19.9 m.: Plant 1 Storage Silos	33.9 m.: Stone Bins
Baghouse 2	19.9 m.: Plant 1 Storage Silos	64.7 m.: Stone Bins
Heater 1	19.9 m.: Plant 1 Storage Silos	33.9 m.: Stone Bins

[28] Spreadsheet labeled "sources and buildings buildings," relayed to Aero Engineering from M. Ames of Cambridge Environmental, October 6, 2005.

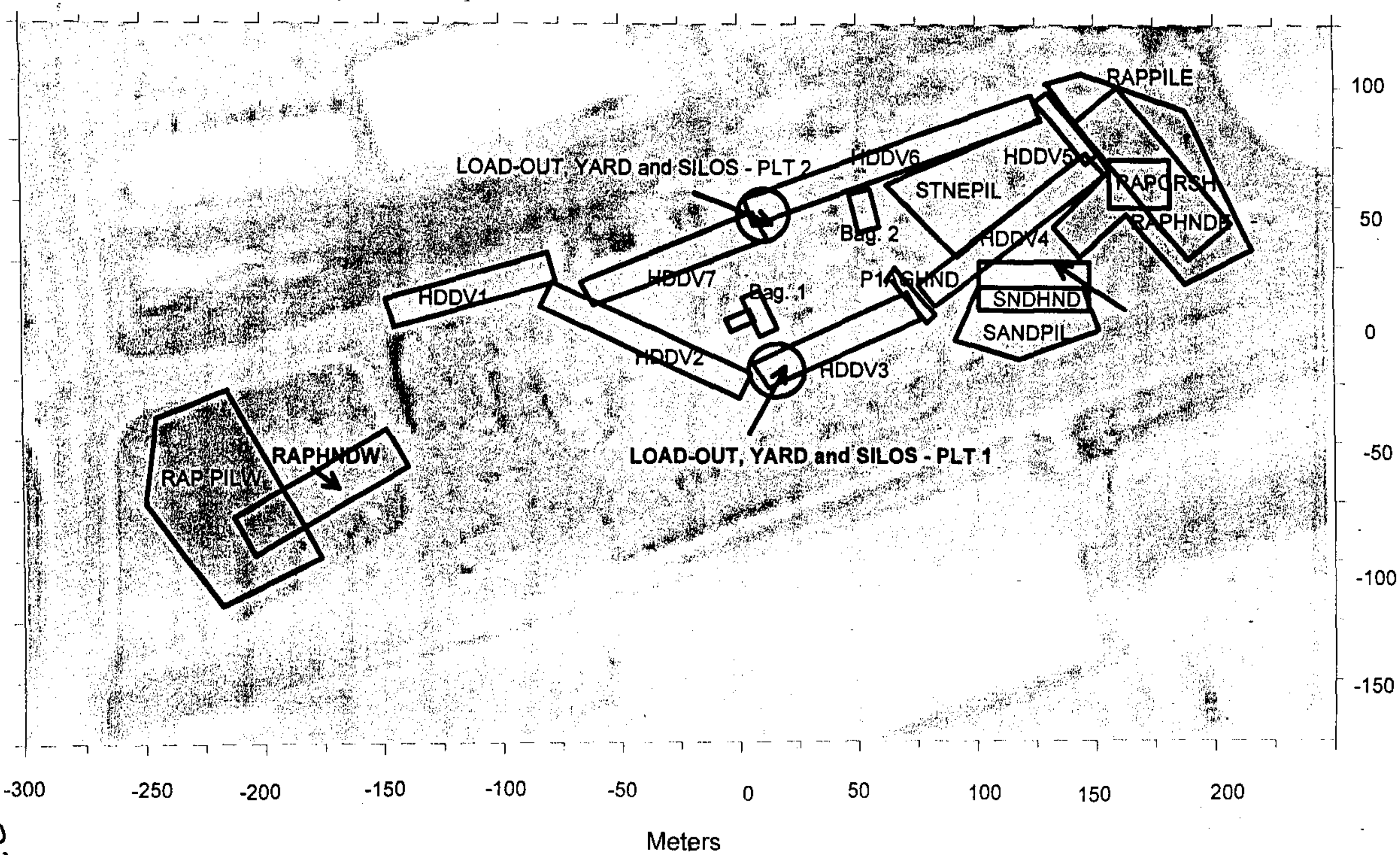
[29] "GIS Data CD," City of Alexandria, Spring, 2004 (Tile F2).

[30] http://www.epa.gov/ttn/scram.

[31] "User's Guide to the Building Profile Input Program," US EPA, October, 1993, www.epa.gov/ttn/scram. The BPIP-PRIME program also determines the distance between adjacent structures for each wind orientation.

225

Figure 2 - 1. Facility processes and locations as modeled in AERMOD.



226

ble 2-2. AERMOD Source Inputs for all Processes - Baseline Scenario - Criteria Pollutants (continued).

			LOCATION (OR VERTICES, FOR AREACIRC SOURCE)[c]			AREACIRC INPUTS	MAXIMUM SHORT-TERM EMISSIONS						ANNUAL EMISSIONS						SOURCE INPUTS		POINT SOURCE INPUTS			AREA OR VOL. INPUTS			
NAME	AERMOD Source Type	DESCRIPTION	EAS,M	NOR,M	B.ELEV, M	RADIUS, M	PM_{10}	$PM_{2.5}$	CO	Pb-1hr	SO2-3hr	SO2-24hr	PM_{10}	$PM_{2.5}$	CO	NO_2	SO2	VOC	EMIS UNITS	HT, M[d]	TMP K	VEL., MPS	DIA, M	X,INIT,M	Y,INIT, M	ROT ANG, DEG.	TOT.AREA, SQ.M.
G1	POINT	BAG1	0	0	25.9		1.17	1.15	9.82	1.1E-03	4.91	4.91	0.15	0.15	1.29	0.21	0.64	0.03	g/sec	14.1	364	7.41	1.7				
G2	POINT	BAG2	48	67	25.9		0.46	0.44	0.60	7.6E-04	3.27	3.27	0.03	0.03	0.04	0.07	0.20	0.01	g/sec	14.1	366	4.48	1.2				
IESIL	POINT	LIMESILO	61	33	25.9		--	--	--	--	--	--	--	--	--	--	--	--	g/sec	no data	293	no data	nd				
'R1	POINT	HTR1	47	41	25.9		1.7E-02	1.7E-02	6.1E-03	6.1E-06	0.36	0.36	5.9E-03	5.9E-03	2.2E-03	2.2E-06	0.13	0.13	g/sec	2.9	589	0.001	0.4				
'R2	POINT	HTR2	no data	no data	25.9		--	--	--	--	--	0.00	--	--	--	--	--	--	g/sec	no data	589	no data	nd				
		TOTAL TONS					***57.4***	***55.8***	***363***	***0.1***	***297.2***	***297***	***6.5***	***6.4***	***46.2***	***9.7***	***33.7***	***5.6***									
)ADYD1	AREACIRC	Load-out and yard emissions at Plant 1.	9	-13	25.9	25.0	2.1E-05	2.1E-05	4.2E-05	0	0	0	2.7E-06	2.7E-06	5.5E-06	0	0	1.7E-05	g/(sec*m^2)	3.0							1963.4
TOR1	AREACIRC	Hot mix storage emissions - Plant 1.	6	-8	25.9	25.0	5.9E-06	5.9E-06	2.7E-05	0	0	0	7.8E-07	7.8E-07	3.5E-06	0	0	3.6E-05	g/(sec*m^2)	19.9							1963.4
DADYD2	AREACIRC	Load-out and yard emissions at Plant 2.	14	54	25.9	25.0	1.4E-05	1.4E-05	2.8E-05	0	0	0	8.3E-07	8.3E-07	1.7E-06	0	0	5.1E-06	g/(sec*m^2)	3.0							1963.4
TOR2	AREACIRC	Hot mix storage emissions - Plant 2.	5	52	25.9	25.0	3.9E-06	3.9E-06	1.8E-05	0	0	0	2.4E-07	2.4E-07	1.1E-06	0	0	1.1E-05	g/(sec*m^2)	21.6							1963.4
		TOTAL TONS					***3.0***	***3.0***	***7.8***	***0***	***0***	***0***	***0.3***	***0.3***	***0.8***	***0.0***	***0.0***	***4.7***									
APHNDW	AREA	RAP Drops (twice) - West plus 20% of unpaved (fug., comb., site) emissions.	-225	-75	25.9		1.3E-05	5.0E-06	9.6E-05	0	3.7E-05	3.7E-05	4.8E-06	1.1E-06	1.4E-05	2.7E-05	5.5E-06	2.9E-06	g/(sec*m^2)	2.0				25	75	60	1875.0
APHNDE	AREA	RAP Drops (twice) - East plus 20% of unpaved (fug., comb., site) road emissions.	150	88	25.9		1.3E-05	5.0E-06	9.6E-05	0	3.7E-05	3.7E-05	4.8E-06	1.1E-06	1.4E-05	2.7E-05	5.5E-06	2.9E-06	g/(sec*m^2)	2.0				25	75	135	1875.0
ANDHND	AREA	Sand Drops (twice) plus 20% of unpaved road (fug., comb, site) emissions	100	25	25.9		3.1E-05	1.2E-05	1.4E-04	0	5.5E-05	5.5E-05	7.9E-06	1.9E-06	2.2E-05	4.1E-05	8.3E-06	4.4E-06	g/(sec*m^2)	2.0				25	50	90	1250.0
RAPCRSH	AREA	RAP Crusher plus 20% of unpaved (fug., comb., site) road emissions	152	69	25.9		1.6E-04	3.9E-05	4.5E-04	0	1.7E-04	1.7E-04	3.4E-05	7.2E-06	6.8E-05	1.3E-04	2.6E-05	1.4E-05	g/(sec*m^2)	2.0				20	20	90	400.0
P1AGHND	AREA	Agg. Dump at P1 plus 20% of unpaved (fug., comb., site) road emissions.	65	25	25.9		3.9E-04	1.3E-04	3.8E-04	0	1.5E-04	1.5E-04	3.7E-05	1.0E-05	5.8E-05	1.1E-04	2.2E-05	1.2E-05	g/(sec*m^2)	3.0				13	38	135	468.8
		TOTAL TONS					***11.6***	***3.8***	***31.2***	***0***	***12.0***	***12.0***	***2.1***	***0.5***	***4.7***	***8.9***	***1.8***	***1.0***									
HDDV1	AREA	Paved Fugitive and Combustion - Seg. 1	-143	8	25.9		3.7E-05	3.7E-06	2.0E-06	0	5.1E-09	5.1E-09	6.7E-06	6.8E-07	4.7E-07	9.7E-07	1.2E-09	9.7E-08	g/(sec*m^2)	2				20	63	75	1250.0
HDDV2	AREA	Paved Fugitive and Combustion - Seg. 2	-78	18	25.9		3.6E-05	3.7E-06	1.9E-06	0	5.1E-09	5.1E-09	6.6E-06	6.8E-07	4.7E-07	9.7E-07	1.2E-09	9.6E-08	g/(sec*m^2)	2				20	113	135	2250.0
HDDV3	AREA	Paved Fugitive and Combustion - Seg. 3 and Idling Emissions from Plt. 1	5	-13	25.9		3.7E-05	4.8E-06	8.9E-05	0	3.3E-06	3.3E-06	6.7E-06	8.0E-07	1.0E-05	6.6E-06	3.7E-07	4.6E-07	g/(sec*m^2)	2				20	75	70	1500.0
HDDV4	AREA	Paved Fugitive and Combustion - Seg.4	75	13	25.9		3.6E-05	3.7E-06	1.9E-06	0	5.1E-09	5.1E-09	6.6E-06	6.8E-07	4.7E-07	9.7E-07	1.2E-09	9.6E-08	g/(sec*m^2)	2				20	113	50	2250.0
HDDV5	AREA	Paved Fugitive and Combustion - Seg. 5	120	100	25.9		3.6E-05	3.7E-06	1.9E-06	0	5.1E-09	5.1E-09	6.6E-06	6.8E-07	4.7E-07	9.6E-07	1.2E-09	9.6E-08	g/(sec*m^2)	2				20	50	140	1000.0
HDDV6	AREA	Paved Fugitive and Combustion - Seg. 6 and Idling Emissions form Plt. 2	8	50	25.9		3.7E-05	4.1E-06	3.7E-05	0	1.3E-06	1.3E-06	6.7E-06	7.2E-07	3.6E-06	2.8E-06	1.2E-07	2.1E-07	g/(sec*m^2)	2				20	125	70	2500.0
HDDV7	AREA	Paved Fugitive and Combustion - Seg. 7	-63	13	25.9		3.6E-05	3.7E-06	1.9E-06	0	5.1E-09	5.1E-09	6.6E-06	6.8E-07	4.7E-07	9.6E-07	1.2E-09	9.6E-08	g/(sec*m^2)	2				20	75	70	1500.0
		TOTAL TONS					***15.6***	***1.7***	***8.4***	***0***	***0.3***	***0.3***	***2.8***	***0.3***	***1.0***	***0.9***	[illegible]	***0.1***									
RAPPILW	AREAPOLY	Wind Erosion of RAP Pile - West - Represented by four-sided source - Vertice 1 (to correspond with location)	-218	-33	25.9		7.8E-06	7.8E-07	0.00	0.00	0.00	0.00	7.8E-06	7.8E-07	0.00	0.00	0.00	0.00	g/(sec*m^2)	5.0							4078
		Vertice 2 (CW)	-180	-105	25.9																						
		Vertice 3 (CW)	-225	-120	25.9																						
		Vertice 4 (CW)	-250	-80	25.9																						
		Vertice 4 (CW)	-245	-43	25.9																						
RAPPILE	AREAPOLY	Wind Erosion of RAP Pile - East - Represented by seven-sided source - Vertice 1 (to correspond with location)	130	95	25.9		7.8E-06	7.8E-07	0.00	0.00	0.00	0.00	7.8E-06	7.8E-07	0.00	0.00	0.00	0.00	g/(sec*m^2)	5.0							4078
		Vertice 2 (CW)	150	100	25.9																						

227

ble 2-2. AERMOD Source Inputs for all Processes - Baseline Scenario - Criteria Pollutants (continued).

			LOCATION (OR VERTICES, FOR AREACIRC SOURCE)[c]			AREACIRC INPUTS	MAXIMUM SHORT-TERM EMISSIONS						ANNUAL EMISSIONS						SOURCE INPUTS		POINT SOURCE INPUTS			AREA OR VOL. INPUTS			
NAME	AERMOD Source Type	DESCRIPTION	EAS,M	NOR,M	B.ELEV, M	RADIUS, M	PM_{10}	$PM_{2.5}$	CO	Pb-1hr	SO2-3hr	SO2-24hr	PM_{10}	$PM_{2.5}$	CO	NO_2	SO2	VOC	EMIS UNITS	HT, M[d]	TMP K	VEL., MPS	DIA, M	X,INIT,M	Y,INIT, M	ROT ANG, DEG.	TOT.AREA, SQ.M.
		Vertice 3 (CW)	163	90	25.9																						
		Vertice 4 (CW)	213	33	25.9																						
		Vertice 5 (CW)	188	20	25.9																						
		Vertice 6 (CW)	163	45	25.9																						
		Vertice 7 (CW)	143	30	25.9																						
		Vertice 8 (CW)	130	65	25.9																						
		Vertice 9 (CW)	155	63	25.9																						
NDPIL	AREAPOLY	Wind Erosion of Sand Pile - Represented by four-sided source - Vertice 1 (to correspond with location)	145	15	25.9		6.6E-06	6.6E-07	0.00	0.00	0.00	0.00	6.6E-06	6.6E-07	0.00	0.00	0.00	0.00	g/(sec*m^2)	5.0							1359
		Vertice 2 (CW)	153	0	25.9																						
		Vertice 3 (CW)	120	-13	25.9																						
		Vertice 4 (CW)	93	-5	25.9																						
		Vertice 5 (CW)	100	15	25.9																						
NEPIL	AREAPOLY	Wind Erosion of Stone Pile - Represented by four-sided source - Vertice 1 (to correspond with location)	113	83	25.9		2.0E-06	2.0E-07	0.00	0.00	0.00	0.00	2.0E-06	2.0E-07	0.00	0.00	0.00	0.00	g/(sec*m^2)	5.0							2719
		Vertice 2 (CW)	138	55	25.9																						
		Vertice 3 (CW)	90	30	25.9																						
		Vertice 4 (CW)	68	68	25.9																						
		TOTAL TONS					*2.7*	*0.3*	*0.0*	*0.0*	*0.0*	*0.0*	*2.7*	*0.3*	*0.0*	*0.0*	*0.0*	*0.0*									

	Maximum Potential Emissions:						*Maximum Potential Controlled*					
	PM_{10}	$PM_{2.5}$	CO	Pb	SO2-3hr	SO2-24hr	PM_{10}	$PM_{2.5}$	CO	NO_2	SO2	VOC
Grand Total, by Subtotals for all Processes	90	65	410	0.066	309	309	14	8	53	19	36	11

228

ble 2-4. AERMOD Source Inputs for all Processes for Proposed SUP Scenario for Criteria Pollutants (continued).

			LOCATION (OR VERTICES, FOR AREACIRC SOURCE)[c]			AREACIRC INPUTS	MAXIMUM SHORT-TERM EMISSIONS						ANNUAL EMISSIONS						SOURCE INPUTS		POINT SOURCE INPUTS			AREA OR VOL. INPUTS			
NAME	AERMOD Source Type	DESCRIPTION	EAS,M	NOR,M	B.ELEV, M	RADIUS, M	PM_{10}	$PM_{2.5}$	CO	Pb-1hr	SO2-3hr	SO2-24hr	PM_{10}	$PM_{2.5}$	CO	NO_2	SO2	VOC	EMIS UNITS	HT, M[d]	TMP K	VEL., MPS	DIA, M	X,INIT,M	Y,INIT, M	ROT ANG, DEG.	TOT.AREA, SQ.M.
31	POINT	BAG 1	0	0	25.9		0.49	0.48	9.82	1.1E-03	4.91	2.04	0.16	0.16	1.34	0.22	0.67	0.03	g/sec	20.0	384	7.41	1.7				
32	POINT	BAG2	48	67	25.9		0.19	0.18	0.60	7.6E-04	3.27	1.36	0.06	0.06	0.08	0.16	0.45	0.01	g/sec	20.0	366	4.48	1.2				
ESIL	POINT	LIMESILO	61	33	25.9		--	--	--	--	--	--	--	---	--	--	--	--	g/sec	no data	293	no data	nd				
R1	POINT	HTR 1	47	41	25.9		1.7E-02	1.7E-02	6.1E-03	6.1E-06	0.36	0.36	4.7E-03	4.7E-03	1.7E-03	0.029	0.10	0.00	g/sec	6.0	589	0.001	0.4				
R2	POINT	HTR2	no data	no data	25.9		--	--	--	--	--	0.00	--	--	--	--	--	--	g/sec	no data	589	no data	nd				
		TOTAL TONS					24.3	23.6	363	0	297.2	131	8.0	7.7	49.7	14.1	42.6	1.5									
ADYD1	AREACIRC	Load-out and yard emissions at Plant 1.	9	-13	25.9	25.0	2.9E-06	2.9E-06	4.2E-05	0	0	0	9.7E-07	9.7E-07	5.7E-06	0	0	1.7E-05	g/(sec*m^2)	3.0							1963.4
OR1	AREACIRC	Hot mix storage emissions - Plant 1.	6	-8	25.9	25.0	2.5E-08	2.5E-08	2.7E-05	0	0	0	8.1E-09	8.1E-09	3.7E-06	0	0	3.8E-05	g/(sec*m^2)	19.9							1963.4
ADYD2	AREACIRC	Load-out and yard emissions at Plant 2.	14	54	25.9	25.0	2.0E-06	2.0E-06	2.8E-05	0	0	0	6.4E-07	6.4E-07	3.8E-06	0	0	1.2E-05	g/(sec*m^2)	3.0							1963.4
TOR2	AREACIRC	Hot mix storage emissions - Plant 2.	5	52	25.9	25.0	1.6E-08	1.6E-08	1.6E-05	0	0	0	5.4E-09	5.4E-09	2.4E-06	0	0	2.5E-05	g/(sec*m^2)	21.6							1963.4
		TOTAL TONS					0.3	0.3	7.8	0.0	0.0	0.0	0.1	0.1	1.1	0.0	0.0	6.3									
APHNDW	AREA	RAP Drops (twice) - West plus 20% of unpaved (fug., comb., site) emissions.	-225	-75	25.9		4.3E-06	1.1E-06	9.6E-05	0	1.8E-05	7.6E-06	2.1E-06	4.2E-07	8.0E-06	1.5E-05	1.5E-06	1.6E-06	g/(sec*m^2)	2.0				25	75	60	1875.0
APHNDE	AREA	RAP Drops (twice) - East plus 20% of unpaved (fug., comb., site) road emissions.	150	88	25.9		4.3E-06	1.1E-06	9.6E-05	0	1.8E-05	7.6E-06	2.1E-06	4.2E-07	8.0E-06	1.5E-05	1.5E-06	1.6E-06	g/(sec*m^2)	2.0				25	75	135	1875.0
ANDHND	AREA	Sand Drops (twice) plus 20% of unpaved road (fug., comb, site) emissions	100	25	25.9		1.2E-05	3.4E-06	1.4E-04	0	2.8E-05	1.1E-05	4.1E-06	9.1E-07	1.2E-05	2.3E-05	2.3E-06	2.5E-06	g/(sec*m^2)	2.0				25	50	90	1250.0
APCRSH	AREA	RAP Crusher plus 20% of unpaved (fug., comb., site) road emissions	152	69	25.9		2.1E-05	4.0E-06	4.5E-04	0	8.6E-05	3.6E-05	1.2E-05	2.1E-06	3.8E-05	7.1E-05	7.2E-06	7.7E-06	g/(sec*m^2)	2.0				20	20	90	400.0
1AGHND	AREA	Agg. Dump at P1 plus 20% of unpaved (fug., comb., site) road emissions.	65	25	25.9		9.8E-05	3.0E-05	3.8E-04	0	7.3E-05	3.1E-05	2.2E-05	6.0E-06	3.2E-05	6.1E-05	6.1E-06	6.6E-06	g/(sec*m^2)	3.0				13	38	135	468.8
		TOTAL TONS					2.9	0.8	31.2	0.0	6.0	2.5	1.0	0.2	2.6	5.0	0.5	0.6									
HDDV1	AREA	Paved Fugitive and Combustion - Seg. 1	-143	8	25.9		7.8E-06	8.1E-07	2.0E-06	0	5.1E-09	2.1E-09	4.1E-06	4.3E-07	4.3E-07	8.8E-07	1.1E-09	8.7E-08	g/(sec*m^2)	2				20	63	75	1250.0
HDDV2	AREA	Paved Fugitive and Combustion - Seg. 2	-78	18	25.9		7.8E-06	8.1E-07	1.9E-06	0	5.1E-09	2.1E-09	4.1E-06	4.3E-07	4.3E-07	8.7E-07	1.1E-09	8.7E-08	g/(sec*m^2)	2				20	113	135	2250.0
HDDV3	AREA	Paved Fugitive and Combustion - Seg. 3 and Idling Emissions from Plt. 1	5	-13	25.9		8.2E-06	1.3E-06	8.9E-05	0	3.3E-06	1.4E-06	4.3E-06	5.9E-07	1.3E-05	8.4E-06	4.9E-07	5.7E-07	g/(sec*m^2)	2				20	75	70	1500.0
HDDV4	AREA	Paved Fugitive and Combustion - Seg.4	75	13	25.9		7.8E-06	8.1E-07	1.9E-06	0	5.1E-09	2.1E-09	4.1E-06	4.3E-07	4.3E-07	8.7E-07	1.1E-09	8.7E-08	g/(sec*m^2)	2				20	113	50	2250.0
HDDV5	AREA	Paved Fugitive and Combustion - Seg. 5	120	100	25.9		7.8E-06	8.1E-07	1.9E-06	0	5.1E-09	2.1E-09	4.1E-06	4.3E-07	4.2E-07	8.7E-07	1.1E-09	8.7E-08	g/(sec*m^2)	2				20	50	140	1000.0
HDDV6	AREA	Paved Fugitive and Combustion - Seg. 6 and Idling Emissions form Plt. 2	8	50	25.9		8.0E-06	9.9E-07	3.7E-05	0	1.3E-06	5.5E-07	4.1E-06	4.8E-07	4.6E-06	3.3E-06	1.6E-07	2.4E-07	g/(sec*m^2)	2				20	125	70	2500.0
HDDV7	AREA	Paved Fugitive and Combustion - Seg. 7	-63	13	25.9		7.8E-06	8.1E-07	1.9E-06	0	5.1E-09	2.1E-09	4.1E-06	4.3E-07	4.2E-07	8.7E-07	1.1E-09	8.7E-08	g/(sec*m^2)	2				20	75	70	1500.0
		TOTAL TONS					3.4	0.4	8.4	0	0.3	0.1	1.8	0.2	1.2	1	0.0	0.1									
RAPPILW	AREAPOLY	Wind Erosion of RAP Pile - West - Represented by four-sided source - Vertice 1 (to correspond with location)	-218	-33	25.9		7.8E-06	7.8E-07	0	0	0	0	7.8E-06	7.8E-07	0	0	0	0	g/(sec*m^2)	5.0							4078
		Vertice 2 (CW)	-180	-105	25.9																						
		Vertice 3 (CW)	-225	-120	25.9																						
		Vertice 4 (CW)	-250	-80	25.9																						
		Vertice 4 (CW)	-245	-43	25.9																						

229

Table 2-4. AERMOD Source Inputs for all Processes for Proposed SUP Scenario for Criteria Pollutants (continued).

NAME	AERMOD Source Type	DESCRIPTION	LOCATION (OR VERTICES, FOR AREACIRC SOURCE)[c] EAS,M	NOR,M	B.ELEV, M	AREACIRC INPUTS RADIUS, M	MAXIMUM SHORT-TERM EMISSIONS PM_{10}	$PM_{2.5}$	CO	Pb-1hr	SO2-3hr	SO2-24hr	ANNUAL EMISSIONS PM_{10}	$PM_{2.5}$	CO	NO_2	SO2	VOC	SOURCE INPUTS EMIS UNITS	HT, M[d]	POINT SOURCE INPUTS TMP K	VEL., MPS	DIA, M	AREA OR VOL. INPUTS X,INIT,M	Y,INIT, M	ROT ANG, DEG.	TOT.AREA, SQ.M.
APPILE	AREAPOLY	Wind Erosion of RAP Pile - East - Represented by seven-sided source - Vertice 1 (to correspond with location)	130	95	25.9		7.8E-06	7.8E-07	0.00	0.00	0.00	0.00	7.8E-06	7.8E-07	0.00	0.00	0.00	0.00	g/(sec*m^2)	5.0							4078
		Vertice 2 (CW)	150	100	25.9																						
		Vertice 3 (CW)	163	90	25.9																						
		Vertice 4 (CW)	213	33	25.9																						
		Vertice 5 (CW)	188	20	25.9																						
		Vertice 6 (CW)	163	45	25.9																						
		Vertice 7 (CW)	143	30	25.9																						
		Vertice 8 (CW)	130	65	25.9																						
		Vertice 9 (CW)	155	63	25.9																						
SANDPIL	AREAPOLY	Wind Erosion of Sand Pile - Represented by four-sided source - Vertice 1 (to correspond with location)	145	15	25.9		6.6E-06	6.6E-07	0.00	0.00	0.00	0.00	6.6E-06	6.6E-07	0.00	0.00	0.00	0.00	g/(sec*m^2)	5.0							1359
		Vertice 2 (CW)	153	0	25.9																						
		Vertice 3 (CW)	120	-13	25.9																						
		Vertice 4 (CW)	93	-5	25.9																						
		Vertice 5 (CW)	100	15	25.9																						
STNEPIL	AREAPOLY	Wind Erosion of Stone Pile - Represented by four-sided source - Vertice 1 (to correspond with location)	113	83	25.9		2.0E-06	2.0E-07	0.00	0.00	0.00	0.00	2.0E-06	2.0E-07	0.00	0.00	0.00	0.00	g/(sec*m^2)	5.0							2719
		Vertice 2 (CW)	138	55	25.9																						
		Vertice 3 (CW)	90	30	25.9																						
		Vertice 4 (CW)	68	68	25.9																						
		TOTAL TONS					2.7	0.3	0.0	0.0	0.0	0.0	2.7	0.3	0.0	0.0	0.0	0.0									

	Maximum Potential Emissions: PM_{10}	$PM_{2.5}$	CO	Pb	SO2-3hr	SO2-24hr	Maximum Potential Controlled PM_{10}	$PM_{2.5}$	CO	NO_2	SO2	VOC
Grand Total, by Subtotals for all Processes	34	25	410	7.E-02	304	134	14	9	55	20	43	8

230

ble 2-6. AERMOD Source Inputs for all Processes - Proposed SUP Scenario - HAPs (continued).

			LOCATION (OR VERTICES, FOR AREACIRC SOURCE)[(c)]			AREACIRC INPUTS	MAXIMUM SHORT-TERM EMISSIONS						ANNUAL EMISSIONS						SOURCE INPUTS		POINT SOURCE INPUTS			AREA OR VOL. INPUTS			
NAME	AERMOD Source Type	DESCRIPTION	EAS,M	NOR,M	B.ELEV, M	RADIUS, M	form.	acrol	1,3 bu	benz	aceta.	quin.	form.	acrol	1,3 bu	benz	aceta.	quin.	EMIS UNITS	HT, M[(d)]	TMP K	VEL, MPS	DIA, M	X,INIT,M	Y,INIT, M	ROT ANG, DEG.	TOT.AREA, SQ.M.
31	POINT	BAG1	0	0	25.9		2.3E-01	2.0E-03	0	3.0E-02	9.8E-02	9.8E-02	3.2E-02	2.7E-04	0	4.1E-03	1.3E-02	2.9E-02	g/sec	20.0	364	7.41	1.7				
32	POINT	BAG2	48	67	25.9		1.6E-01	1.3E-03	0	2.0E-02	6.5E-02	6.5E-02	2.1E-02	1.8E-04	0	2.8E-03	9.0E-03	1.9E-02	g/sec	20.0	366	4.48	1.2				
ESIL	POINT	LIMESILO	61	33	25.9		--	--	--	--	--	--	--	--	--	--	--	--	g/sec	no data	293	no data	nd				
R1	POINT	HTR1	47	41	25.9		1.7E-04	0	0	1.1E-06	0	0	4.7E-05	0	0	3.1E-07	0	0	g/sec	6.0	589	0.001	0.4				
R2	POINT	HTR2	no data	no data	25.9		--	--	--	--	--	--	--	--	--	--	--	--	g/sec	no data	589	no data	nd				
		TOTAL TONS					13.6	0.1	0	2	5.7	5.7	1.9	0.0	0.0	0.2	0.8	1.7									
ADYD1	AREACIRC	Load-out and yard emissions at Plant 1.	9	-13	25.9	25.0	4.7E-08	0	0	4.E-09	0	0	6.5E-09	0	0	5.E-10	0	0	g/(sec*m^2)	3.0							1963.4
OR1	AREACIRC	Hot mix storage emissions - Plant 1.	6	-8	25.9	25.0	1.2E-07	0	0	9.2E-09	0	0	1.7E-08	0	0	1.3E-09	0	0	g/(sec*m^2)	19.9							1963.4
ADYD2	AREACIRC	Load-out and yard emissions at Plant 2.	14	54	25.9	25.0	3.2E-08	0	0	2.4E-09	0	0	4.3E-09	0	0	3.3E-10	0	0	g/(sec*m^2)	3.0							1963.4
OR2	AREACIRC	Hot mix storage emissions - Plant 2.	5	52	25.9	25.0	8.1E-08	0	0	6.1E-09	0	0	1.1E-08	0	0	8.4E-10	0	0	g/(sec*m^2)	21.6							1963.4
		TOTAL TONS					0.019	0	0	0.001	0	0	0.003	0	0	0.000	0	0									
APHNDW	AREA	RAP Drops (twice) - West plus 20% of unpaved (fug., comb., site) emissions.	-225	-75	25.9		9.4E-08	7.3E-09	3.2E-09	7.2E-08	6.0E-08	0	2.1E-08	1.6E-09	8.2E-10	1.5E-08	1.3E-08	0	g/(sec*m^2)	2.0				25	75	60	1875.0
APHNDE	AREA	RAP Drops (twice) - East plus 20% of unpaved (fug., comb., site) road emissions.	150	88	25.9		9.4E-08	7.3E-09	3.2E-09	7.2E-08	6.0E-08	0	2.1E-08	1.6E-09	8.2E-10	1.5E-08	1.3E-08	0	g/(sec*m^2)	2.0				25	75	135	1875.0
ANDHND	AREA	Sand Drops (twice) plus 20% of unpaved road (fug., comb, site) emissions	100	25	25.9		9.4E-08	7.3E-09	3.2E-09	7.2E-08	6.0E-08	0	2.1E-08	1.6E-09	8.2E-10	1.5E-08	1.3E-08	0	g/(sec*m^2)	2.0				25	50	90	1250.0
APCRSH	AREA	RAP Crusher plus 20% of unpaved (fug., comb., site) road emissions	152	69	25.9		9.4E-08	7.3E-09	3.2E-09	7.2E-08	6.0E-08	0	2.1E-08	1.6E-09	8.2E-10	1.5E-08	1.3E-08	0	g/(sec*m^2)	2.0				20	20	90	400.0
1AGHND	AREA	Agg. Dump at P1 plus 20% of unpaved (fug., comb., site) road emissions.	65	25	25.9		9.4E-08	7.3E-09	3.2E-09	7.2E-08	6.0E-08	0	2.1E-08	1.6E-09	8.2E-10	1.5E-08	1.3E-08	0	g/(sec*m^2)	3.0				13	38	135	468.8
		TOTAL TONS					0.019	0.001	0.001	0.015	0.012	0	0.004	3.E-04	2.E-04	0.003	0.003	0									5868.8
HDDV1	AREA	Paved Fugitive and Combustion - Seg. 1	-143	8	25.9		1.4E-08	6.3E-10	1.1E-09	1.9E-09	5.2E-09	0	7.4E-09	3.3E-10	5.8E-10	1.0E-09	2.7E-09	0	g/(sec*m^2)	2				20	63	75	1250.0
HDDV2	AREA	Paved Fugitive and Combustion - Seg. 2	-78	18	25.9		1.4E-08	6.3E-10	1.1E-09	1.9E-09	5.2E-09	0	7.4E-09	3.3E-10	5.8E-10	9.9E-10	2.7E-09	0	g/(sec*m^2)	2				20	113	135	2250.0
HDDV3	AREA	Paved Fugitive and Combustion - Seg. 3 and Idling Emissions from Plt. 1	5	-13	25.9		1.4E-07	6.3E-09	1.1E-08	1.9E-08	5.2E-08	0	5.3E-08	2.4E-09	4.1E-09	7.1E-09	2.0E-08	0	g/(sec*m^2)	2				20	75	70	1500.0
HDDV4	AREA	Paved Fugitive and Combustion - Seg.4	75	13	25.9		1.4E-08	6.3E-10	1.1E-09	1.9E-09	5.2E-09	0	7.4E-09	3.3E-10	5.8E-10	9.9E-10	2.7E-09	0	g/(sec*m^2)	2				20	113	50	2250.0
HDDV5	AREA	Paved Fugitive and Combustion - Seg. 5	120	100	25.9		1.4E-08	6.2E-10	1.1E-09	1.9E-09	5.1E-09	0	7.4E-09	3.3E-10	5.7E-10	9.9E-10	2.7E-09	0	g/(sec*m^2)	2				20	50	140	1000.0
HDDV6	AREA	Paved Fugitive and Combustion - Seg. 6 and Idling Emissions form Plt. 2	8	50	25.9		6.5E-08	2.9E-09	5.1E-09	8.8E-09	2.4E-08	0	2.2E-08	9.9E-10	1.7E-09	3.0E-09	8.1E-09	0	g/(sec*m^2)	2				20	125	70	2500.0
HDDV7	AREA	Paved Fugitive and Combustion - Seg. 7	-63	13	25.9		1.4E-08	6.2E-10	1.1E-09	1.9E-09	5.1E-09	0	7.4E-09	3.3E-10	5.7E-10	9.9E-10	2.7E-09	0	g/(sec*m^2)	2				20	75	70	1500.0
		TOTAL TONS					0.017	0.001	0.001	0.002	0.006	0	0.007	3.E-04	0.001	0.001	0.003	0							613		12250
RAPPILW	AREAPOLY	Wind Erosion of RAP Pile - West - Represented by four-sided source - Vertice 1 (to correspond with location)	-218	-33	25.9		0	0	0	0	0	0	0	0	0	0	0	0	g/(sec*m^2)	5.0							4078
	231	Vertice 2 (CW)	-180	-105	25.9																						
		Vertice 3 (CW)	-225	-120	25.9																						
		Vertice 4 (CW)	-250	-80	25.9																						
		Vertice 4 (CW)	-245	-43	25.9																						
RAPPILE	AREAPOLY	Wind Erosion of RAP Pile - East - Represented by seven-sided source - Vertice 1 (to correspond with location)	130	95	25.9		0	0	0	0	0	0	0	0	0	0	0	0	g/(sec*m^2)	5.0							4078

able 2-6. AERMOD Source Inputs for all Processes - Proposed SUP Scenario - HAPs (continued).

			LOCATION (OR VERTICES, FOR AREACIRC SOURCE)[c]			AREACIRC INPUTS	MAXIMUM SHORT-TERM EMISSIONS						ANNUAL EMISSIONS						SOURCE INPUTS		POINT SOURCE INPUTS			AREA OR VOL. INPUTS			
NAME	AERMOD Source Type	DESCRIPTION	EAS,M	NOR,M	B.ELEV, M	RADIUS, M	form.	acrol	1,3 bu	benz	aceta.	quin.	form.	acrol	1,3 bu	benz	aceta.	quin.	EMIS UNITS	HT, M[d]	TMP K	VEL., MPS	DIA, M	X,INIT,M	Y,INIT, M	ROT ANG, DEG.	TOT.AREA, SQ.M.
		Vertice 2 (CW)	150	100	25.9																						
		Vertice 3 (CW)	163	90	25.9																						
		Vertice 4 (CW)	213	33	25.9																						
		Vertice 5 (CW)	188	20	25.9																						
		Vertice 6 (CW)	163	45	25.9																						
		Vertice 7 (CW)	143	30	25.9																						
		Vertice 8 (CW)	130	65	25.9																						
		Vertice 9 (CW)	155	63	25.9																						
ANDPIL	AREAPOLY	Wind Erosion of Sand Pile - Represented by four-sided source - Vertice 1 (to correspond with location)	145	15	25.9		0	0	0	0	0	0	0	0	0	0	0	0	g/(sec*m^2)	5.0							1359
		Vertice 2 (CW)	153	0	25.9																						
		Vertice 3 (CW)	120	-13	25.9																						
		Vertice 4 (CW)	93	-5	25.9																						
		Vertice 5 (CW)	100	15	25.9																						
TNEPIL	AREAPOLY	Wind Erosion of Stone Pile - Represented by four-sided source - Vertice 1 (to correspond with location)	113	83	25.9		0	0	0	0	0	0	0	0	0	0	0	0	g/(sec*m^2)	5.0							2719
		Vertice 2 (CW)	138	55	25.9																						
		Vertice 3 (CW)	90	30	25.9																						
		Vertice 4 (CW)	68	68	25.9																						
		TOTAL TONS					0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0									

	Maximum Potential Emissions:						Maximum Potential Permitted					
	form.	acrol	1,3 bu	benz	aceta.	prop.	form.	acrol	1,3 bu	benz	aceta.	prop.
Grand Total, by Subtotals for all Processes	14	0.1	0.002	2	6	6	2	0.016	0.001	0.2	0.79	1.88

2.8 Receptors

Significance impact levels are defined by federal guidelines for ambient air quality standards analyses for each of the criteria pollutants; a source's impacts do not have to be reviewed against the AAQS in areas where its impacts fall below these significance levels.[32] Table 2-8 below shows the significant impact levels for each of the criteria pollutants of this analysis. Previous simulation of ambient impacts for this facility showed that for these pollutants, impacts either fall below or are equal to significance levels at the two-kilometer radius.[33]

Table 2-8. Criteria Pollutants' Significant Impact Levels (µg/cu.m.)

CO		NO_2	$PM_{2.5}$		PM_{10}		SO_2		
1-hr	8-hr	Ann.	24-hr	Ann.	24-hr	Ann.	3-hr	24-hr	Ann.
2,000	500	1.0	5.0	1.0	5.0	1.0	25.0	5.0	1.0

The receptor grid of this analysis is defined in polar coordinates, with receptors placed at 300, 400, 500, 750, 1000, 1500 and 2000 meters distance, along every 10 degree radial from the facility. Due north is equivalent to 0/360 degrees. Plant 1's baghouse stack location represents (0,0) on the coordinate system. Discrete receptors were placed along the facility's fence line, and in areas between the fencline and the first radial ring, at approximately 50-meter spacing. Figure 2-2 also shows these discrete and fenceline receptors.

The AERMAP[34] processor was used to determine geographic elevations for all receptors using United State Geological Services (USGS) digital elevation models for the 'Anacostia' quadrangle and quadrangles for the surrounding areas[35] ('Alexandria, VA-DC-MD,' 'Mount Vernon' and 'Fort Belvoir').

2.9 Nearby Source Contributions

Sources of NO_2, PM_{10} and SO_2 provided by DEQ located within 10 kilometers from the facility were reviewed for possible inclusion in the modeling analysis. Sources with potential-to-emit levels less than the major source threshold of 100 tons per year were eliminated. Additionally, major sources were eliminated when their ratios between actual emissions and potential to emit were very low, and for which sources consist of boilers and generators providing strictly backup power. Emissions from the Potomac River Generating Station in Alexandria exceed major source thresholds and also show high annual capacity factors; however, results of a separate analysis show that its emissions of NO_2, PM_{10} and SO_2 are insignificant beyond approximately 7 kilometers; distance between it and Virginia Paving is greater than 8 kilometers. While its impacts may be slightly over significant impact levels at the outer edge of this modeling domain, its permitted emission levels are expected to decrease in the future as a result of VDEQ-issued Order by Consent.

32 "New Source Review Workshop Manual," US EPA, October, 1990.
33 "Ambient Air Quality Analysis – Virginia Paving – Alexandria, Virginia," Aero Engineering Services, October, 2005. See Table 3-4.
34 "Revised Draft for the User's Guide for the AERMOD Terrain Preprocessor (AERMAP)," US EPA, April 24, 2004.
35 Digital elevation model data are available in 7.5 minute quadrangles; AERMAP reads these data to determine elevation and hill height scales for AERMOD processing. Digital elevation models were relayed to AERO on November 3, 2004 by Steve Reiter of USGS via file transfer protocol.

Consequently, only contributions by the nearby interacting major sources of the Covanta municipal solid waste incinerator and Washington Gas Light Company, and the adjoining US Filter plant, were included in this analysis. While annual emissions of SO_2 from Covanta are very low compared to its potential to emit, its potential to emit may reflect permitted combustion with oil and should therefore was included in the short-term analysis. For both of the major facilities, annual and potential emissions of PM_{10} are very low; these emissions were therefore not included. However, due to the proximity of US Filter, its emissions of PM_{10}, NO_2 and SO_2 were also included. Table 2-9 lists these interacting sources and their emission and exhaust parameters.

2.9 Minor and Area Source Contributions (Background Air Quality)

Background ambient air concentrations are attributable to the many minor and area sources of pollutants in a given area.[36] The existing background ambient concentrations of this analysis derive from DEQ monitoring results for years 2002, 2003 and 2004[37]. For short-term averaging periods, the analysis uses the highest-monitored concentration from the nearest monitor within the three-year period. For annual averaging periods, the analysis uses the average of annual observations over the three-year period. Table 2-10 shows the resulting selected background concentrations for each of the criteria pollutants.[38]

2.10 Meteorological Input Data

As US EPA guidelines stipulate, a period of analysis of five years is sufficient but necessary to account for meteorological variability on impacts;[39] therefore, this analysis will assess compliance using for the full five-year period. Surface observations derive from the National Weather Service's meteorological records for Ronald Reagan Airport for the years 2000 through 2004. Corresponding upper air measurements derive from the National Weather Service's observations from Sterling, Virginia, the closest location for which upper air data are available. Both sets of data were obtained through the National Climatic Data Center in Asheville, North Carolina.[40] The AERMET preprocessor (Version 02222) [41] was used to process and merge these data prior to application of AERMOD, with VP's coordinates specified as the source location.

For input to the preprocessor AERMET, surface characteristics for the three-kilometer area around VP were determined using terrain and surface features shown on theUSGS's Alexandria and Annandale quadrangles.[42] Figure 2-3 shows how the sectors were divided;

[36] "Appendix W to Part 51 – Guideline on Air Quality Models," 40 CFR Ch. I (7-1-03 Edition).
[37] "Virginia Ambient Air Monitoring 2003 Data Report," Department of Environmental Quality (parallel report for years 2002 and 2001), from www.state.deq.gov/airmon/publications.html.
[38] Background values for HAPs are not included in this analysis.
[39] "Appendix W to Part 51 – Guideline on Air Quality Models," 40 CFR Ch. I (7-1-03 Edition).
[40] Five years of observations from each of the Ronald Reagan Airport and Sterling, Virginia stations were transferred to AERO Engineering Services by Sharon Capps-Hill of the National Climatic Data Center on March 14, 2005 through file transfer protocol.
[41] "Revised Draft for the User's Guide for the AERMOD Meteorological Preprocessor (AERMET)," November, 1998. An updated version of AERMET (Version 04300) was released in mid-June of 2005. However, due to the very recent date of that version's release, this analysis uses data processed according to version 02222. Personal correspondence with Warren Peters of US EPA indicates that AERMET Version 04300 produces meteorological data that for this analysis's purposes that are equivalent to data from Version 02222. As suggested by Mr. Peters, the headers of the AERMET meteorological data file of this analysis were modified to allow them to be read by AERMOD 04300.
[42] "Alexandria Quadrangle," Virginia-District of Columbia-Maryland, 7.5 Minute Series (Topographic-Bathymetric), United States Geological Survey, 1994.

sectors were selected to group areas with maximally common characteristics. Table 2-11 below shows the resulting land use apportionment per sectors, and Table 2-12 shows the resulting sector values for albedo, surface roughness and Bowen ratio that were input to AERMET. Selection of sectors and assignment of surface characteristics conforms to guidance procedures stipulated for the AERMET preprocessor. Inspection of Figure 2-3 and Table 2-11 shows that the area within the three-kilometer radius circle around VP encompasses land uses that are mixed, including water, deciduous forest, grassland and urban settings.[43]

Table 2-11. Land Use Types

Sector	Degrees	Water	Deciduous Forest	Grassland	Urban
1	301 - 76	0.05	0.45	0.25	0.25
2	76 - 118	0.05	0.30	0.30	0.35
3	118 - 210	0.05	0.50	0.20	0.25
4	210 - 301	0.05	0.65	0.15	0.15

[43]Although the area immediately surrounding the facility to the west and south is dominated by urban land uses, urban land uses do not form a majority of the three kilometer area.

235

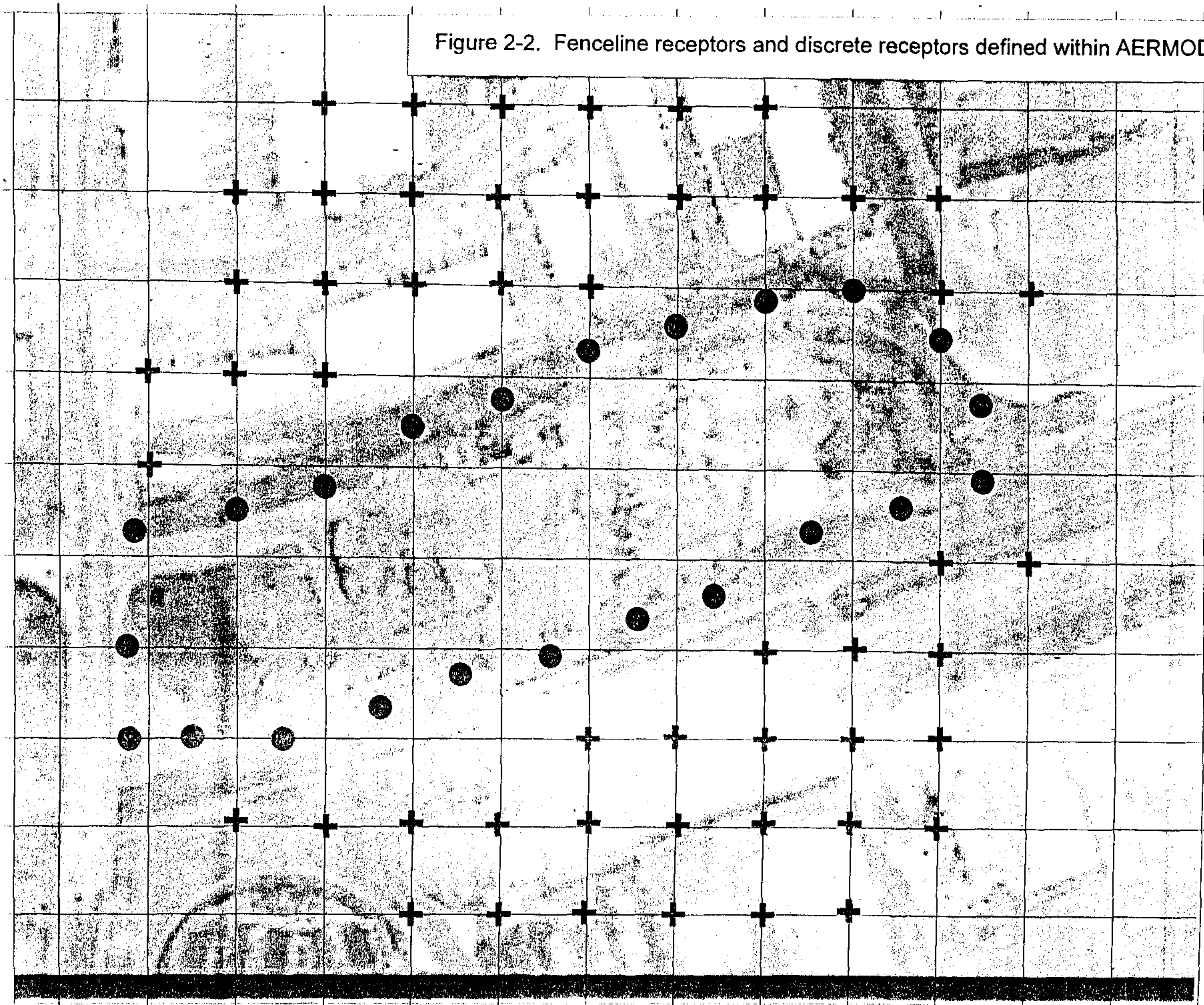


Figure 2-2. Fenceline receptors and discrete receptors defined within AERMOD.

ble 2-9. Interacting Sources of Criteria Pollutants Included within AAQS Analysis[b]

Facility	Units	Location (m) X	Location (m) Y	Base Elev. m	Stack Height m	Stack Diam. m	Stack Temp. K	Stack Velocity mps	POTENTIAL TO EMIT[d] SO2 TPY	SO2 GPS	NO2 TPY	NO2 GPS	PM10 TPY	PM10 GPS	ACTUAL EMISSIONS SO2 TPY	SO2 GPS	NO2 TPY	NO2 GPS	PM10 TPY	PM10 GPS
S Filter		-43.00	33.00	25.00	6.00	0.4	589.00	0.2		0.2		0.01		0.01		0.2		0.01		0.01
ovanta MSW Stack 1	MSW Unit 1			33.5	64	1.6	457	15.6	68.7		--		1.3		4.6		178.3		1.3	
	MSW Unit 2			33.5	64	1.6	457	15.6	68.7		--		0.5		4.0		191.6		0.5	
	MSW Unit 3			33.5	64	1.6	457	15.6	68.7		--		0.7		4.0		178.1		0.7	
ovanta -- Stacks Combined		**400**	**-200**	**33.5**	**64**	**1.6**	**457**	**15.6**		**5.9**	(e)	(e)		**0.1**		**0.4**		**15.7**		**0.1**
Vashington Gas Light Co.	Eng.'s 1 & 2; Boiler 1		4.1	70.1	18	0.6	322	2.4	64.7		--		1.7		64.7		19.1		1.7	
	Eng.'s 3 & 4, Boiler 2		4.1	70.1	18	0.6	322	2.4	64.5		--		1.4		64.5		19.1		1.4	
	Eng.'s 4 & 5; Boiler 3		4.1	70.1	18	0.6	322	2.4	74.2		--		1.8		74.2		21.9		1.8	
Vash. Gas Light Co. -- Stacks Combined		-4,100	-500	**70.1**	**18**	**0.6**	**322**	**2.4**		**5.8**	(e)	(e)		**0.1**		**5.8**		**1.7**		**0.1**

237

Notes:

b) DEQ sources were provided in response to a request for all NOx, SO2, PM10 major sources within 20 kilometers of the Potomac River Generating Station in Alexandria, for the purposes of an unrelated ambient air quality analysis. This list was then revised to provide distances of sources from Virginia Paving.

c) GPS = grams per second.

d) For Covanta PM10 and SO2 emissions, potential to emit were assumed equal to actual emissions for PM10, no pte data are available, and for SO2, actual exceed pte values.

e) NO2 is modeled on an annual basis only, using actual emissions.

Table 2-10. Criteria Pollutant Ambient Background Concentrations (micrograms per cubic meter).[e]

	CO[a,b]		NO_2[d]	Pb[f]	$PM_{2.5}$[a]		PM_{10}[a]		SO_2[a,d]		
	517 N. St. Asaph St., Alexandria		517 N. St. Asaph St., Alexandria	from US EPA's NATA program	Fairfax County, Lee District Park		6120 Brandon Ave., Springfield		517 N. St. Asaph St., Alexandria		
	1-hour	8-hour	annual	annual	24-hour	annual	24-hour	annual	3-hour	24-hour	annual
2002	4,580	2,748	47.0	0.013	37.9	13.2	41.0	19.0	238.3	55.0	15.7
2003	4,008	3,206	43.3	0.013	32.6	13.2	38.0	20.0	185.9	60.2	15.7
2004	3,321	2,290	45.1	0.013	35.3	13.9	43.0	19.0	141.4	55.0	15.7
Selected Value [b,c]	4,580	3,206	45.1	0.013	35.3	13.4	43.0	19.3	238.3	60.2	15.7

238

Notes:

a) Short-term values shown are 2nd maximum values, except for PM2.5, for which values shown are 98th percentile.

b) For CO, NOx, PM10 and SO2, selected concentration is the greatest among the monitor's values for the three years.

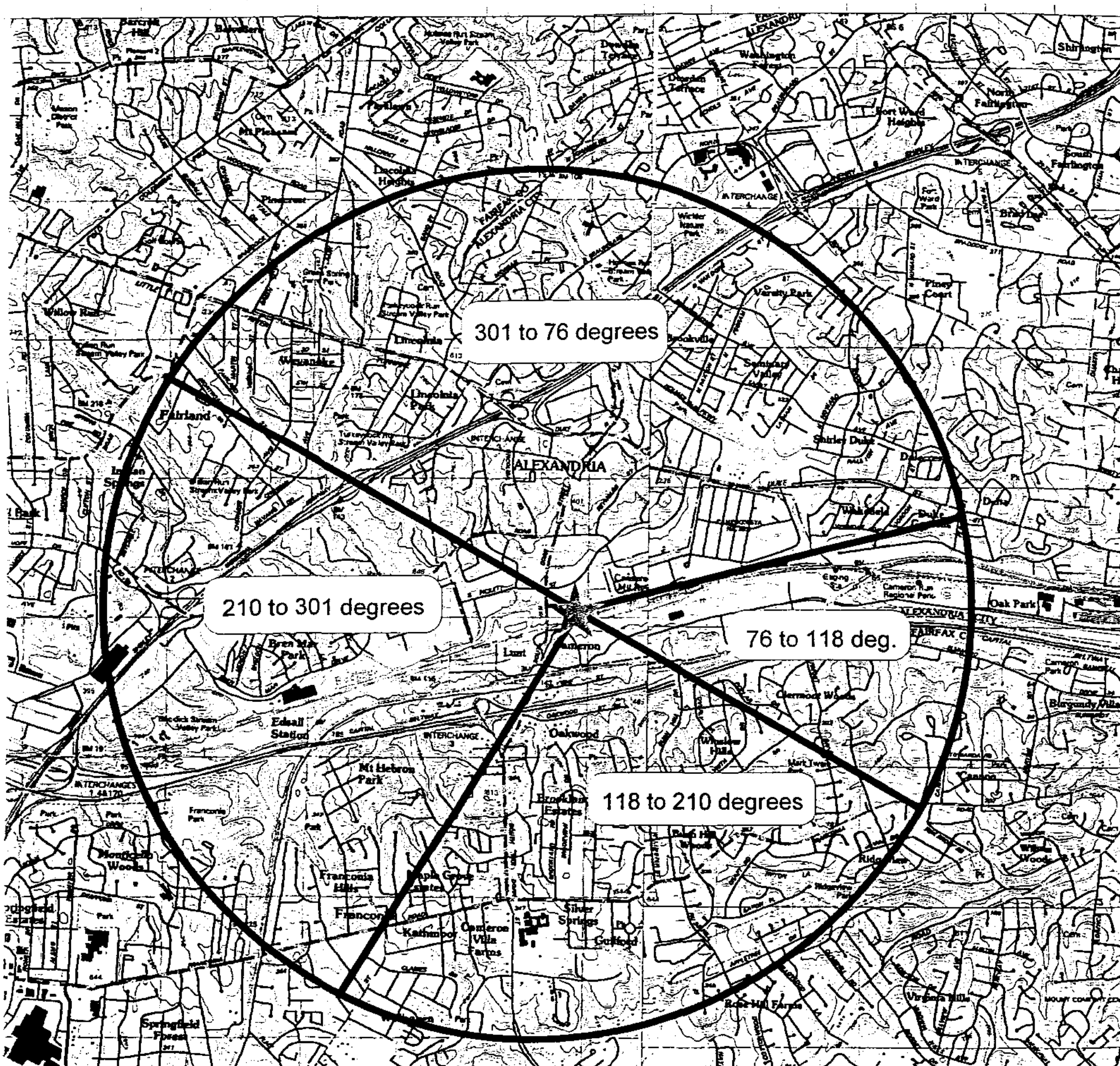
c) For PM2.5, selected concentration is the average of the monitor's values for the three years.

d) CO, NO2 and SO2 converted assuming 1 ppm of CO equals 1,145 micrograms per cubic meter; 1 ppm of NO2 equals 1,881 micrograms per cubic meter; and 1 ppmv of SO2 = 2,619 micrograms per cubic meter.

e) Source for concentrations: "Virginia Ambient Air Monitoring 2003 Data Report," Department of Environmental Quality, www.state.deq.gov/airmon/publications.html (and parallel reports for years 2002 and 2001 also).

f) "Estimated Annual Average Ambient Concentrations for Virginia," October 2001 version, Results: Map of 1996 Modeled Ambient Concentrations, Technology Transfer Network, National Air Toxics Assessment on http://www.epa.gov/ttn.

Figure 2-3. Three Kilometer Radius for Purposes of Surface Classification around Virginia Paving Facility.



239

Table 2-12. Surface Characteristics of Sectors Defined within AERMET for Three-Kilometer Radius Around Virginia Paving(a,b)

		Land Type Portion of Sector				Albedo				Bowen Ratio				Roughness			
Sector	Degrees	Water	Deciduos Forest	Grassland	Urban	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall
1	301 - 76	0.05	0.45	0.25	0.25	0.31	0.14	0.14	0.16	1.21	0.67	0.84	1.21	0.54	0.71	0.86	0.61
2	76 - 118	0.05	0.30	0.30	0.35	0.31	0.15	0.15	0.17	1.29	0.69	1.04	1.31	0.55	0.67	0.77	0.59
3	118 - 210	0.05	0.50	0.20	0.25	0.31	0.14	0.14	0.15	1.19	0.69	0.82	1.21	0.58	0.76	0.92	0.65
4	210 - 301	0.05	0.65	0.15	0.15	0.31	0.13	0.13	0.14	1.11	0.67	0.62	1.11	0.57	0.81	1.01	0.67

240

Notes:

a) suburban-type settings are assumed to split evenly to deciduous forest, grassland and urban characteristics.

b) See Tables 4-1(a), 4-1(b), 4-2 and 4-3 within "Revised Draft....Preprocessor (AERMET)," November, 1998 for each season's surface parameter value.

As recommended by AERMAP guidance, values for each land type for winter equal mid-point of fall/winter values to account for milder winter conditions (see Chapter 4 of AERMAP manual, Table 4-1, 4-2-b, and 4-3). Winter, spring, summer and fall are labeled as 1, 2, 3, and 4 in AERMET, respectively.

3. Results and Conclusions

3.1 Maximum Potential Impacts of Criteria Pollutants

Results of maximum short-term and annual impacts for CO, NO_2, Lead, $PM_{2.5}$, PM_{10}, and SO_2 are shown in Table 3-1 for the proposed SUP scenario for each of the five years of simulation. Table 3-2 shows impacts from each of the facility's processes for the year resulting with the highest total facility impact for each pollutant. Table 3-2 also shows the receptor at which each process's, and the facility's maximum impact occurs. The maximum impact of each source category frequently occurs at a different receptor than the receptor for which the facility's total impact occurs; therefore, each process's maximum impact does not necessarily equal its contribution to the facility's maximum impact. Table 3-3 shows the maximum short-term and annual impacts for the baseline scenario for each pollutant for the year for which the proposed SUP scenario's impacts are greatest.

Results show that for the proposed SUP scenario maximum impacts comply with the respective AAQS for all pollutants except $PM_{2.5}$ (annual) and SO_2 (3-hour). However, maximum short-term impacts for the proposed SUP scenario are generally significantly improved over the baseline scenario. Table 3-4 compares these impacts between the baseline and proposed SUP scenario, showing the relationship between maximum impacts and the AAQS for each of the pollutants except CO and lead (for which impacts are significantly less than the AAQS).

Table 3-4. Summary of Maximum Impacts (µg/cu.m.) - Proposed SUP vs. Baseline.

NO_2	$PM_{2.5}$		PM_{10}		SO_2		
Ann.	24-hr	Ann.	24-hr	Ann.	3-hr	24-hr	Ann.
AAQS							
100.	65.	15.	150.	50.	1,300.	365.	80.
Proposed SUP Scenario vs. Baseline Scenario - Impacts							
63 vs. 74	58 vs.125	16.2 vs.18	124 vs. 346	30 vs. 35	1,392 vs. 2,508	326 vs. 648	56 vs. 58.
Proposed SUP vs. Baseline - Ratio of Impact to Standard							
<1 (both)	<1 vs. 1.9	1.1 vs. 1.2	<1 vs. 2.3	<1 (both)	1.1 vs. 1.9	<1 vs. 1.8	<1 (both)

Four sets of contour plots display impacts for NO_2, PM $_{2.5}$, PM_{10} and SO_2: a) Figures 3-1 through 3-8 show plots of maximum total impacts for the baseline scenario, b) Figures 3-9 through 3-16 show plots of maximum total impacts for the proposed SUP scenario, c) Figures 3-17 through 3-24 show plots of the total impacts for the proposed SUP scenario, as a fraction of the total impacts for the baseline scenario, and d) Figures 3-25 through 3-32 show plots of the percent reduction in the facility's contribution to impacts that the proposed SUP scenario provides from the baseline scenario. These figures show that exceedances of PM $_{2.5}$ and SO_2 occur in fairly limited areas.

3.2 Maximum Potential Impacts of HAPs

Table 3-5 shows the maximum potential short-term and annual facility impacts for HAPs. Results show that for these pollutants, which represent the HAPs with the greatest potential for exceedances, impacts comply with SAAC guidelines, in most cases with ample margin.

241

3.3 Conclusions

Based on the identified emissions and site characteristics, these AERMOD results show that VP's proposed SUP scenario results in significant improvements in predicted air quality adjacent to the facility. Areas of non-compliance for the proposed SUP scenario are limited, occurring for $PM_{2.5}$ and SO_2 for the annual and 3-hour time periods only, with levels ranging to 10% over the AAQS.

Review of Table 3-2 shows that the hot oil heater represents a relatively large component of total facility impacts for the pollutants which exceed the AAQS. Therefore, if additional mitigation of impacts is required, potential remedies to achieve compliance might include, for the hot oil heater, raising the stack height and a commitment to combustion of lower sulfur fuel oil (below the 0.05% level), which would reduce $PM_{2.5}$ and SO_2 impacts by this source.

Comparison between observations on nine days from a PM_{10} monitor located closely to this site and the results of the AERMOD baseline scenario for these same nine days, shows that the AERMOD results exceed observations for almost all days with a large margin (see Table 3-6). This suggests that application of AERMOD for the baseline and proposed SUP scenarios, both of which derive from similar modeling configurations, provides results of the maximum potential facility impacts while also assuring a margin of protection.

Table 3-6. PM_{10} Monitoring Results from Armistead Booth Park and Baseline Scenario's Predicted PM_{10} Result (micrograms per cubic meter).[44]

Date (2004)	Primary Wind Direction	PM_{10} Monitored Result	Baseline Scenario's PM_{10} Result at Monitor's Approximate Location with Background.[45]
Aug. 6	N	18.9	44 to 44[(46)]
Aug. 9	SW - ENE	51.2	69 to 95
Aug. 10	S - SSW	66.5	71 to 81
Aug. 11	S- SSW	31.3	62 to 78
Aug. 16	NNW - S	53.9	55 to 84
Aug. 17	S - SSW	50.7	65 to 75
Aug. 18	SSW - S	40.4	68 to 96
Aug. 23	N - SSW	56.4	81 to 122
Aug. 24	S - ESE	70.8	63 to 127

[44] "COA123Tables PM Monitoring Results PM10_TSP Results," Relayed via e-mail from L. Sharma, City of Alexandria to M. Barrett, AERO Engineering Services, February 16, 2006.
[45] AERMOD results are for an arc extending from 20 to 60 degrees at the approximate distance of the monitor from the model's center point, i.e., 300 meters.
[46] Modeling results equal less than one microgram per cubic meter at these locations, while maximum background equals 44 micrograms per cubic meter.

242

Table 3-1. Maximum Impacts for Years 2000 - 2004 inc. Background vs. Ambient Air Quality Standards (microg. per cubic meter). Proposed SUP Scenario[e].

	CO[a]		NO_2	Pb[e]	$PM_{2.5}$[b]		PM_{10}[b]		SO_2[a]		
	1-hour	8-hour	annual	quart.	24-hour	annual	24-hour	annual	3-hour	24-hour	annual
2000	1230.7	638.0	17.4	0.013	22.6	2.8	72.6	9.2	1153.6	257.8	38.2
2001	1236.8	680.8	17.4	0.010	22.2	2.9	81.0	10.5	888.5	207.8	39.9
2002	1236.7	612.7	16.2	0.011	21.8	2.8	74.6	9.4	1056.0	233.2	33.5
2003	1162.8	484.5	15.8	0.013	21.8	2.4	76.0	8.7	961.9	265.8	29.7
2004	1121.6	578.7	15.4	0.017	23.2	2.7	62.9	8.2	849.1	254.5	29.9
Maximum Facility and Interacting Source Impact	1236.8	680.8	17.4	0.017	22.3	2.7	81.0	10.5	1153.6	265.8	39.9
Background Value	4,580	3,206	45	0.013	35.3	13.4	43	19	238	60	15.7
Total Maximum Impact [c,d]	**5,817**	**3,887**	**63**	**0.03**	**58**	**16.2**	**124**	**30**	**1,392**	**326**	**56**
National and DEQ Ambient Air Quality Standards	*40,000*	*10,000*	*100*	*0.15*	*65*	*15*	*150*	*50*	*1,300*	*365*	*80*

243

Notes:

a) For SO_2 and CO, maximum short-term values equal the highest-second-highest value among all receptors.

b) To allow year-by-year processing rather than multiyear processing, this analysis presents the highest fourth-highest among all receptors for each year for $PM_{2.5}$ and PM_{10}.

c) Total maximum impacts for CO, NO_2, PM_{10} and SO_2 equals highest among years' values added to background.

d) Total maximum impacts for $PM_{2.5}$ equals the average of the maximum values among years added to background.

e) Lead impacts were modeled using hourly rates and monthly averages. Therefore, impacts presented here overstate expected quarterly impacts.

Table 3-2. Maximum Impacts for Worst-case Year[e] inc. Background vs. Ambient Air Quality Standards (micrograms per cubic meter). Proposed SUP Scenario[e] - Locations of Maximum Impacts are Shown in Parantheses.

Facility Process	$CO^{(a)}$		NO_2	$Pb^{(g)}$	$PM_{2.5}^{(b)}$		$PM_{10}^{(b)}$		$SO_2^{(a)}$		
	2001		*2001*	*2004*	*2004*	*2001*	*2001*	*2001*	*2000*	*2003*	*2001*
	1-hour	8-hour	annual	quarter	24-hour	annual	24-hour	annual	3-hour	24-hour	annual
Dryer Stacks on Plants	703 (100,225)	427 (50,108)	5.0 (50,108)	0.017	16.3 (50,108)	0.9 (50,175)	12.2 (50,108)	0.9 (50,175)	266.6 (-25,-75)	77.9 (50,108)	4.5 (50,175)
Heater				0.010	8.0 (100,118)	0.61 (50,108)	7.5 (100,118)	0.6 (50,108)	1053.5 (100,118)	201.3 (100,118)	12.9 (50,108)
Load-out, Yard, Storage Silos	505 (0,85)	221 (0,85)	--	--	5.3 (0,85)	0.6 (0,85)	6.2 (0,85)	0.6 (0,85)	--	--	--
Unpaved Roads and Agg. Handling	1140 (200,100)	533 (225,63)	14.7 (200,100)	--	11.3 (75,-43)	0.6 (125,25)	44.6 (75,-43)	2.7 (125,-25)	328.3 (200,100)	50.3 (200,100)	1.5 (200,100)
Vehicles on Paved Roads	262 (25,-68)	118 (25,-68)	2.6 (75,-43)	--	2.9 (25,-75)	0.4 (100,118)	35.5 (-25,75)	4.0 (-25,-75)	13.2 (25,-68)	2.0 (100,118)	0.14 (75,-43)
Material Storage Piles	--	--	--	--	1.5 (200,100)	0.43 (200,100)	17.3 (200,100)	4.3 (200,100)	--	--	--
Interacting Off-site Sources	33.3 (-50,60)	15.4 (0,85)	3.9 (-50,60)	--	4.9 (-50,60)	2.2 (-50,60)	6.4 (-50,60)	2.2 (-50,60)	269. (-50,60)	113. (-50,60)	36.9 (-50,60)
Total Facility and Interacting Source Impact	1236.8	680.8	17.4	0.017	23.2	2.9	81.0	10.5	1153.6	233.2	39.9
Location of Maximum, meters	(200, 100)	(225, 63)	(200,100)	(50,108)	(50,108)	(-50,60)	(200,100)	(150, 125)	(100,118)	(100, 118)	(-50,60)
Background Value	4,580	3,206	45	0.013	35.3	13.4	43	19	238	60	15.7
Total Maximum Impact (c,d)	**5,817**	**3,887**	**63**	**0.03**	**58**	**16.3**	**124**	**30**	**1,392**	**293**	**56**
National and DEQ Ambient Air Quality Standards	***40,000***	***10,000***	***100***	***0.15***	***65***	***15.0***	***150***	***50***	***1,300***	***365***	***80***

Notes:

a) For SO_2 and CO, maximum short-term values equal the highest second highest value among all receptors.

b) To allow year-by-year processing rather than multiyear processing, this analysis presents the highest fourth-highest among all receptors for each year for $PM_{2.5}$ and PM_{10}.

c) Total maximum impacts for CO, NO_2, PM_{10} and SO_2 equals highest among years' values added to background.

d) Total maximum impacts for $PM_{2.5}$ equals the average of the maximum values among years added to background.

e) Worst-case year evaluated on the basis of total facility impact, which may be different for separate source processes.

f) Values shown only for processes with non-zero emissions of each particular pollutant.

e) Lead impacts were modeled using hourly rates and monthly averages. Therefore, impacts presented here overstate expected quarterly impacts.

Table 3-2(a). Maximum Impacts for Worst-case Year[e,g] inc. Background vs. Ambient Air Quality Standards (micrograms per cubic meter). Proposed SUP Scenario[e] - Locations of Max.Impacts are Shown in Parantheses (includes results at Cameron Station Flagpole Rec's)

	$CO^{(a)}$		NO_2	$Pb^{(g)}$	$PM_{2.5}^{(b)}$		$PM_{10}^{(b)}$		$SO_2^{(a)}$		
	2001		*2001*	*2004*	*2004*	*2001*	*2001*	*2001*	*2000*	*2003*	*2001*
Facility Process	1-hour	8-hour	annual	quarter	24-hour	annual	24-hour	annual	3-hour	24-hour	annual
Dryer Stacks on Plants	703 (100,225)	427 (50,108)	5.0 (50,108)	0.017	16.3 (50,108)	0.9 (50,175)	12.2 (50,108)	0.9 (50,175)	266.6 (-25,-75)	77.9 (50,108)	4.5 (50,175)
Heater				0.010	8.0 (100,118)	0.61 (50,108)	7.5 (100,118)	0.6 (50,108)	105.4 (100,118)	22.1 (100,118)	1.3 (50,108)
Load-out, Yard, Storage Silos	505 (0,85)	221 (0,85)	--	--	5.3 (0,85)	0.6 (0,85)	6.2 (0,85)	0.6 (0,85)	--	--	--
Unpaved Roads and Agg. Handling	1140 (200,100)	533 (225,63)	14.7 (200,100)	--	11.3 (75,-43)	0.6 (125,25)	44.6 (75,-43)	2.7 (125,-25)	328.3 (200,100)	-50.3 (200,100)	1.5 (200,100)
Vehicles on Paved Roads	262 (25,-68)	118 (25,-68)	2.6 (75,-43)	--	2.9 (25,-75)	0.4 (100,118)	35.5 (-25,75)	4.0 (-25,-75)	13.2 (25,-68)	2.0 (100,118)	0.14 (75,-43)
Material Storage Piles	--	--	--	--	1.5 (200,100)	0.43 (200,100)	17.3 (200,100)	4.3 (200,100)	--	--	--
Interacting Off-site Sources	33.3 (-50,60)	15.4 (0,85)	3.9 (-50,60)	--	4.9 (-50,60)	2.2 (-50,60)	6.4 (-50,60)	2.2 (-50,60)	269. (-50,60)	113. (-50,60)	36.3 (-50,60)
Total Facility and Interacting Source Impact	1236.8	680.8	17.4	0.017	23.2	2.9	81.0	10.5	345.1	132.6	36.3
Location of Maximum, meters	(200, 100)	(225, 63)	(200,100)	(50,108)	(50,108)	(-50,60)	(200,100)	(150, 125)	(200,100)	(-50,60)	(-50,60)
Background Value	4,580	3,206	45	0.013	35.3	13.4	43	19	238	60	15.7
Total Maximum Impact [c,d]	**5,817**	**3,887**	**63**	**0.03**	**58**	**16.3**	**124**	**30**	**583**	**193**	**52**
National and DEQ Ambient Air Quality Standards	***40,000***	***10,000***	***100***	***0.15***	***65***	***15.0***	***150***	***50***	***1,300***	***365***	***80***

Notes:

a) For SO_2 and CO, maximum short-term values equal the highest second highest value among all receptors.
b) To allow year-by-year processing rather than multiyear processing, this analysis presents the highest fourth-highest among all receptors for each year for $PM_{2.5}$ and PM_{10}.
c) Total maximum impacts for CO, NO_2, PM_{10} and SO_2 equals highest among years' values added to background.
d) Total maximum impacts for $PM_{2.5}$ equals the average of the maximum values among years added to background.
e) Worst-case year evaluated on the basis of total facility impact, which may be different for separate source processes.
f) Values shown only for processes with non-zero emissions of each particular pollutant.
e) Lead impacts were modeled using hourly rates and monthly averages. Therefore, impacts presented here overstate expected quarterly impacts.
g) Impacts of criteria pollutants at Cameron Station elevated receptors are below the maximum potential impacts.
h) assumes hot oil heater is constrained to burn only 0.05% sulfur fuel oil.

Table 3-3. Maximum Impacts for 2002 inc. Background vs. Ambient Air Quality Standards (micrograms per cubic meter). Baseline Scenario[e]

	$CO^{(a)}$		NO_2	$Pb^{(e)}$	$PM_{2.5}^{(b)}$		$PM_{10}^{(b)}$		$SO_2^{(a)}$		
Year Simulated	*2001*		*2001*	*2002*	*2004*	*2001*	*2001*	*2001*	*2000*	*2003*	*2001*
Facility Process	1-hour	8-hour	annual	quarter	24-hour	annual	24-hour	annual	3-hour	24-hour	annual
Dryer Stacks on Plants	1598.5	642.9	2.7	0.027	60	1.6	55.7	1.6	563.5	355.0	7.9
Heater				0.001	14.5	1.0	14.2	1.0	2027.3	443.2	21.2
Load-out, Yard, Storage Silos	505.3	220.8	--	--	37.2	1.0	43.9	1.0	--	--	--
Unpaved Roads and Agg. Handling	2703.3	1267.1	26.6	--	48.7	1.4	173.6	6.0	657.2	187.5	5.4
Vehicles on Paved Roads	634.4	284.9	2.2	--	13.0	0.7	154.3	6.4	13.2	3.3	0.1
Material Storage Piles	--	--	--	--	1.5	0.4	17.3	4.3	--	--	--
Interacting Off-site Sources	33.3	15.4	3.9	--	4.9	2.2	6.4	2.2	269.8	127.0	36.3
Total Facility and Interacting Source Impact	2887.2	1614.1	28.8	0.028	89.7	4.5	303.0	15.7	2269.5	588.2	42.3
Location of Maximum, meters	(200,100)	(225,63)	(200,100)	(50,108)	(100,118)	(50,108)	(200,100)	(150,125)	(100,118)	(100,118)	(-50,60)
Background Value	4580.0	3206.0	45.1	0.013	35.3	13.4	43.0	19.3	238.3	60.2	15.7
Total Maximum Impact [c,d]	**7,467**	**4,820**	**74**	**0.04**	**125**	**18**	**346**	**35**	**2,508**	**648**	**58**
National and DEQ Ambient Air Quality Standards	***40,000***	***10,000***	***100***	***0.15***	***65***	***15***	***150***	***50***	***1,300***	***365***	***80***

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Notes:

a) For SO_2 and CO, maximum short-term values equal the highest second highest value among all receptors.

b) To allow year-by-year processing rather than multiyear processing, this analysis presents the highest fourth-highest among all receptors for each year for $PM_{2.5}$ and PM_{10}.

c) Total maximum impacts for CO, NO_2, PM_{10} and SO_2 equals highest among years' values added to background.

d) Total maximum impacts for $PM_{2.5}$ equals the average of the maximum values among years added to background.

e) Lead impacts were modeled using hourly rates and monthly averages. Therefore, impacts presented here overstate expected quarterly impacts.

Table 3- 5. Maximum Potential Impacts of HAPs for Year 2002 vs. SAAC Guidelines (micrograms per cubic meter) Proposed SUP Scenario

Facility Process[i]	formaldehyde		acrolein		1,3 butadiene		benzene		acetaldehyde		quinone		lead[h,j]	
	1-hour	annual (f)	1-hour	annual	1-hour	annual	1-hour	annual	1-hour	annual	1-hour	annual	1-hour	annual
Plant Dryer Stacks(a)	22.0	1.7	0.18	0.014	--	--	2.80	0.22	9.1	0.7	9.1	0.72	0.10	0.009
Heater	1.3	0.02	--	--	--	--	0.01	0.000	--	--	--	--	0.04	0.001
Load-out, Yard, Storage Silos	0.6	0.03	--	--	--	--	0.04	0.002	--	--	--	--	--	--
Unpaved Roads and Agg. Handling	1.3	0.1	0.10	0.004	0.04	0.002	1.00	0.04	0.81	0.03	--	--	--	--
Vehicles on Paved Roads	1.0	0.04	0.05	0.002	0.08	0.003	0.13	0.01	0.38	0.02	--	--	--	--
Material Storage Piles(b)	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Facility Impact	22.6	1.7	0.200	0.016	0.09	0.004	2.9	0.22	9.3	0.7	9.1	0.70	0.11	0.007
Location of Maximum, meters	(230,193)	(50,175)	(230,193)	(50,108)	(-25,-75)	(75,-43)	(230,193)	(50,175)	(230,193)	(50,175)	(230,193)	(50,175)	(230,193)	(50,175)
Total Maximum Impact[c,d]	22.6	1.7	0.20	0.02	0.09	0.004	2.9	0.2	9.3	0.7	9.1	0.70	0.1	0.007
DEQ SAAC Guideline	*62.5*	*2.4*	*17.3*	*0.46*	*1100*	*44*	*1600*	*64*	*6750*	*360*	*22*	*0.8*	*7.5*	*0.3*

Notes:

a) The dryer stacks also emit HCL. However, the ratio between emission rate to standard is more than two orders of magnitude less for HCL than it is for for formaldehyde. Therefore, if the facility complies for formaldehyde, the facility complies for HCL.

b) Material storage piles do not emit HAPs.

d) Annual background concentrations are not included within the total impact. While monitoring results of HAPs are scarce, the US EPA's National Air Toxics Assessment program estimated modeled background concentrations of HAPs. This program's results for HAPs in Arlington (results for Alexandria were not derived show background values, in micrograms per cubic meter, of 1.96 for formaldehyde, 0.18 for acrolein, 0.13 for 1,3 butadiene, 2.0 for benzene, 1.1 for acetaldehyde, 4.5e-8 for quinone, and 0.013 for lead compounds, respectively.

f) Annual impacts derived using 1-hour rates; therefore, these results overstate maximum impacts for all processes.

g) SAAC guidelines based on 1991/1992 TLVs and STEL's. These values are generally much less protective than SAAC guidelines based on 2005 TLVs and STELs.

h) Values for lead are for the year 2000. Variation between the five years is much less than the difference between this maximum value and the standard.

I) Values are shown only for processes with emissions of each particular pollutant.

j) Lead impacts were modeled using hourly rates and monthly averages. Therefore, impacts presented here overstate expected quarterly impacts.

Table 3-5 (revised). Maximum Potential Impacts of HAPs for Year 2002 vs. SAAC Guidelines (micrograms per cubic meter)
Proposed SUP Scenario - Cameron Station Flagpole Receptors Included (indicated as Phase VII or VI)

	formaldehyde		acrolein		1,3 butadiene		benzene		acetaldehyde		quinone		lead[h,j]	
Facility Process[i]	1-hour	annual[k]	1-hour	annual[f]	1-hour	annual[f]	1-hour	annual[f]	1-hour	annual[f]	1-hour	annual[f]	1-hour	annual[f]
Plant Dryer Stacks(a)	23.2	0.23	0.18	0.014	--	--	3.00	0.22	9.7	0.7	1.5	0.72	0.12	0.009
Heater	0.2	0.005	--	--	--	--	0.001	0.000	--	--	--	--	0.007	0.001
Load-out, Yard, Storage Silos	0.1	0.003	--	--	--	--	0.01	0.002	--	--	--	--	--	--
Unpaved Roads and Agg. Handling	1.3	0.01	0.10	0.004	0.04	0.002	0.37	0.04	0.31	0.03	--	--	--	--
Vehicles on Paved Roads	0.3	0.015	0.05	0.002	0.08	0.003	0.04	0.01	0.11	0.02	--	--	--	--
Material Storage Piles(b)	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Facility Impact	23.4	0.24	0.200	0.016	0.09	0.004	3.0	0.22	9.7	0.7	1.5	0.72	0.12	0.007
Location of Maximum, meters	(400,200)	(50,175)	(230,193)	(50,108)	(-25,-75)	(75,-43)	(400,200)	(50,175)	(400,200)	(50,175)	(230,193)	(50,175)	(400,200)	(50,175)
Receptor Description	CAM.STA 6th Flr, Ph. VII	Office Bldgs. to North	NW corner of ball field	north fenceline	south fenceline	south fenceline	CAM.STA 6th Flr, Ph. VII	Office Bldgs. to North	CAM.STA. 6th Flr, Ph. VII	Office Bldgs. to North	NW corner of ball field	Office Bldgs. to North	CAM.STA. 6th Flr, Ph. VII	Office Bldgs. to North
Annual Background Value	--	1.96	--	0.18	--	0.13	--	2.0	--	1.1	--	4.5E-08	--	0.01
Total Maximum Impact [c,d]	**23.4**	**2.2**	**0.20**	**0.20**	**0.09**	**0.13**	**3.0**	**2.2**	**9.7**	**1.8**	**1.5**	**0.72**	**0.12**	**0.02**
DEQ SAAC Guideline	*62.5*	*2.4*	*17.3*	*0.46*	*1100*	*44*	*1600*	*64*	*6750*	*360*	*22*	*0.8*	*7.5*	*0.3*

Notes:

a) The dryer stacks also emit HCL. However, the ratio between emission rate to standard is more than two orders of magnitude less for HCL than it is for for formaldehyde. Therefore, if the facility complies for formaldehyde, the facility complies for HCL.

b) Material storage piles do not emit HAPs.

d) Annual background concentrations are shown and included here within the annual 'total maximum impact.' While monitoring results of HAPs are scarce, the US EPA's National Air Toxics Assessment program estimated modeled annual background concentrations of HAPs. This program's results for estimated ambient levels of HAPs in Arlington (results for Alexandria were not derived for NATA), in micrograms per cubic meter, equal 1.96 for formaldehyde, 0.18 for acrolein, 0.13 for 1,3 butadiene, 2.0 for benzene, 1.1 for acetaldehyde, 4.5e-8 for quinone, and 0.013 for lead compounds, respectively. Short-term background HAP levels are not included here.

f) For all pollutants except formaldehyde, annual impacts were derived using 1-hour rates; therefore, these results overstate maximum impacts for all processes.

g) SAAC guidelines based on 1991/1992 TLVs and STEL's. These values are generally much less protective than SAAC guidelines based on 2005 TLVs and STELs.

h) Values for lead are for the year 2000. Variation between the five years is much less than the difference between this maximum value and the standard.

i) Values are shown only for processes with emissions of each particular pollutant.

j) Lead impacts were modeled using hourly rates and monthly averages. Therefore, impacts presented here overstate expected quarterly impacts.

k) formaldehyde annual impacts derive from annual emission rates.

Figure 3-1.
Total PM2.5 short-term impacts including background (micrograms per cubic meter) of the Baseline Scenario (year 2004).

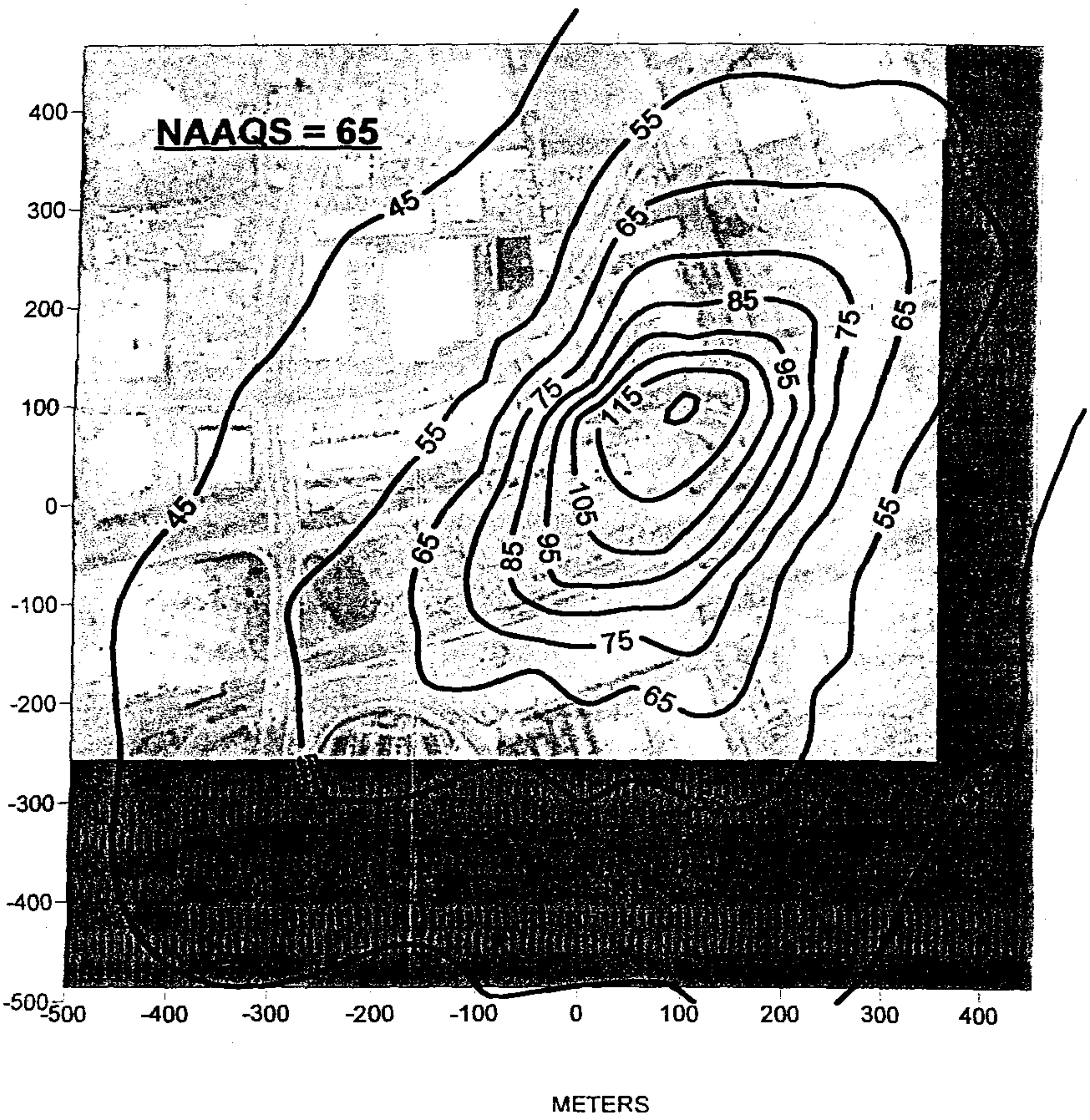
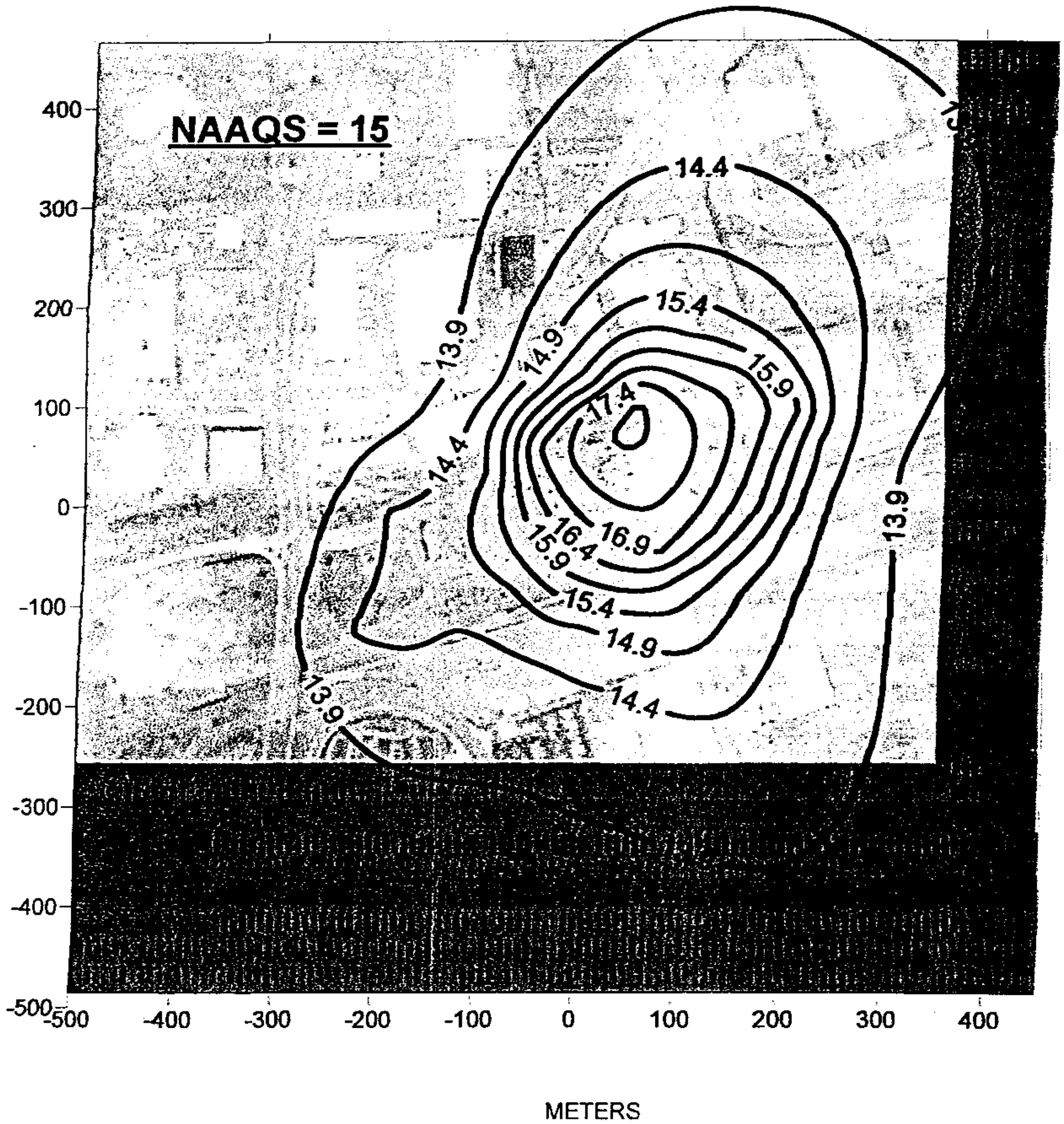
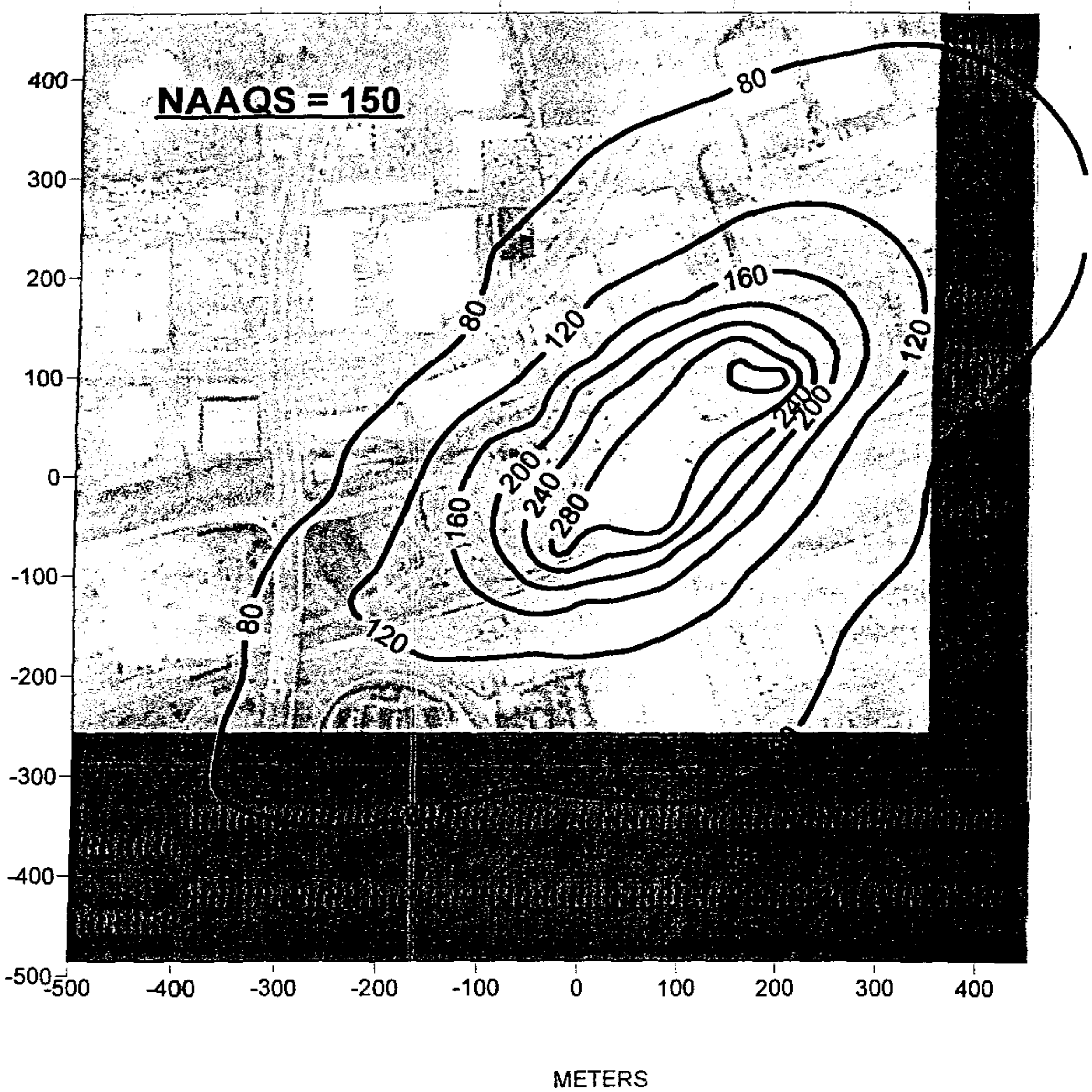


Figure 3-2.
Total PM2.5 annual impacts including background (micrograms per cubic meter) of the Baseline Scenario (year 2001).



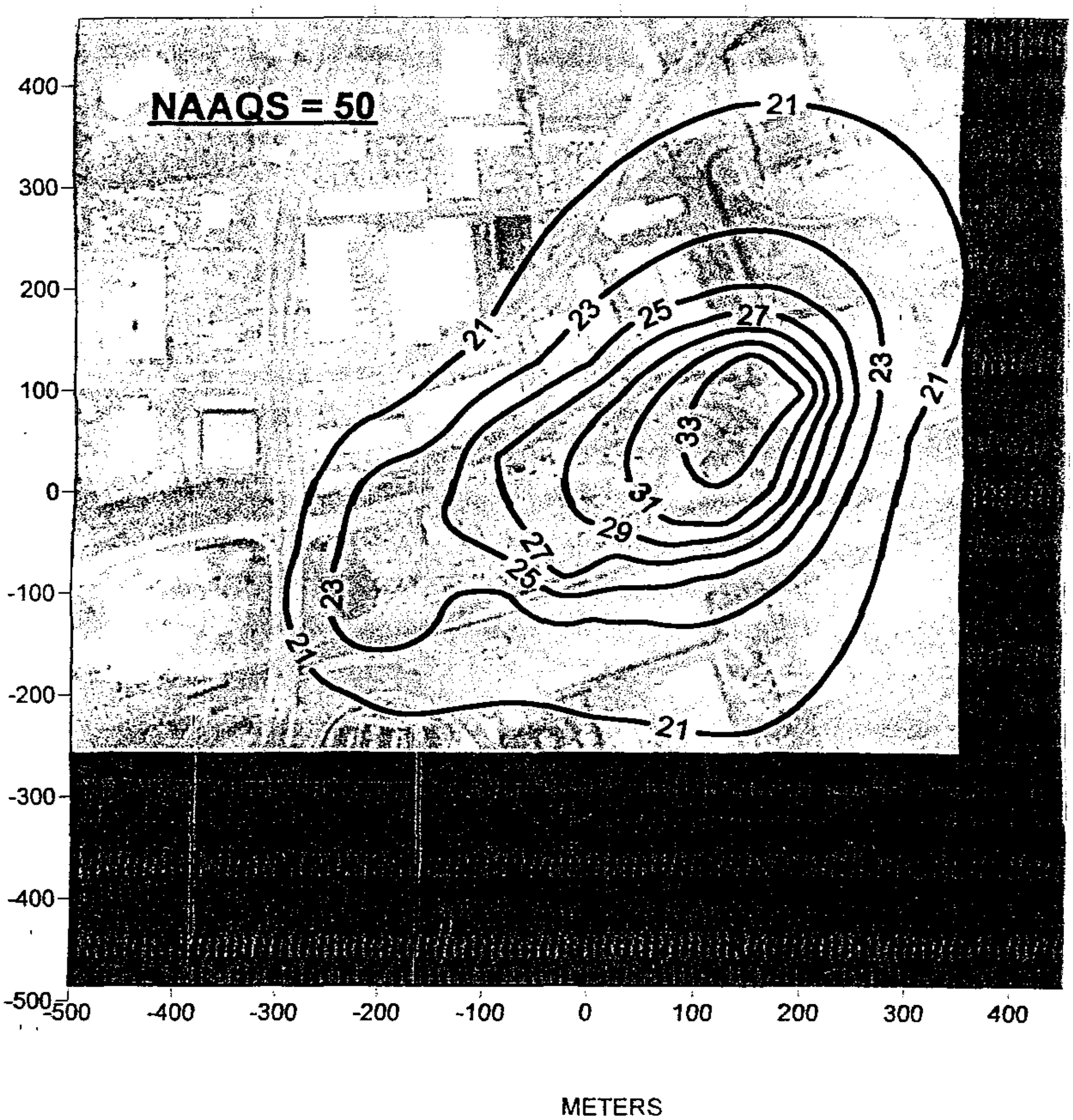
250

Figure 3-3.
Total PM10 short-term impacts including background (micrograms per cubic meter) of the Baseline Scenario (year 2001).



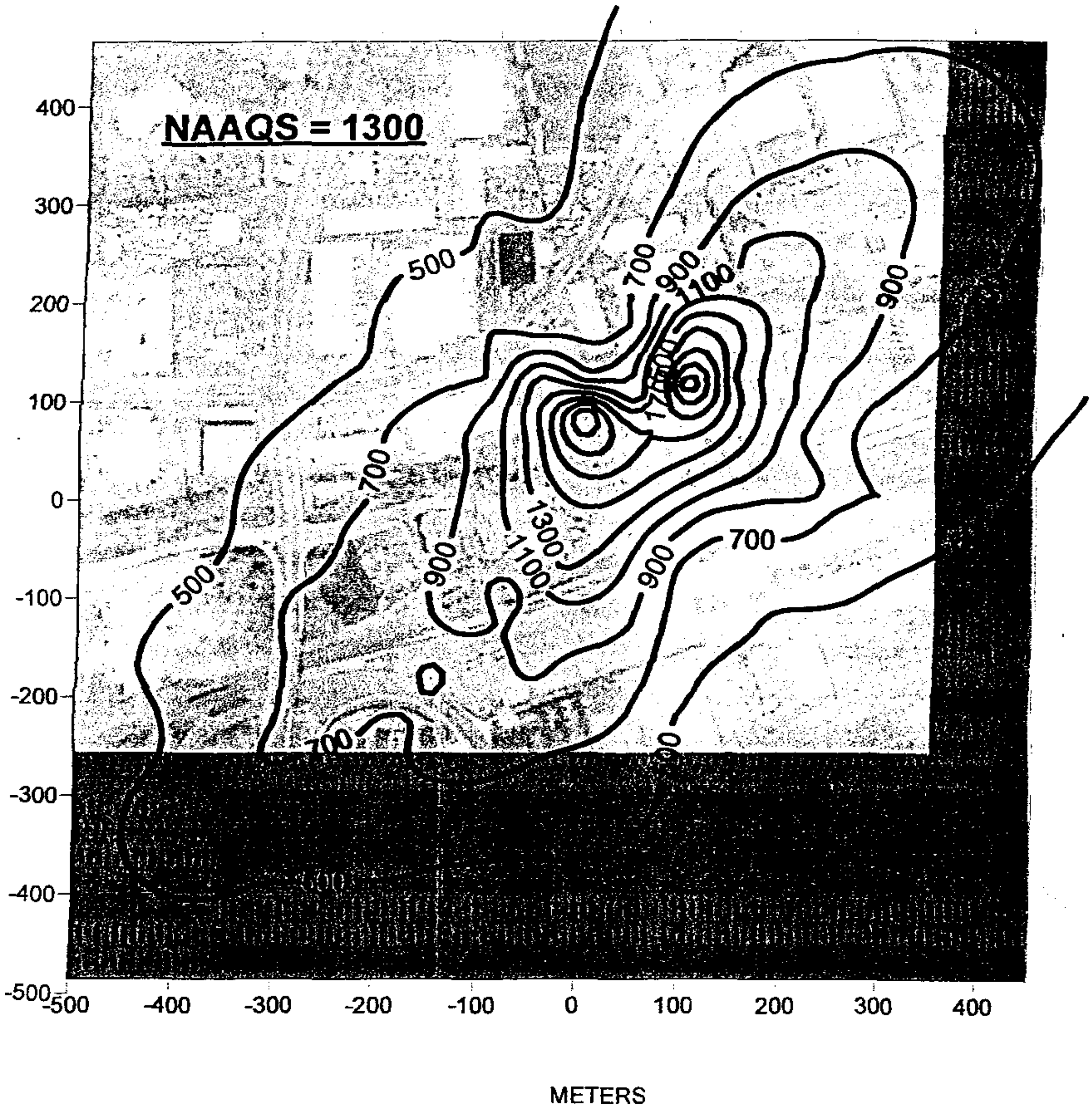
251

Figure 3-4.
Total PM10 annual impacts including background (micrograms per cubic meter) of the Baseline Scenario (year 2001).



252

Figure 3-5.
Total SO2 3-hour impacts including background (micrograms per cubic meter) of the Baseline Scenario (year 2000).



253

Figure 3-6.
Total SO2 24-hour impacts including background (micrograms per cubic meter) of the Baseline Scenario (year 2003).

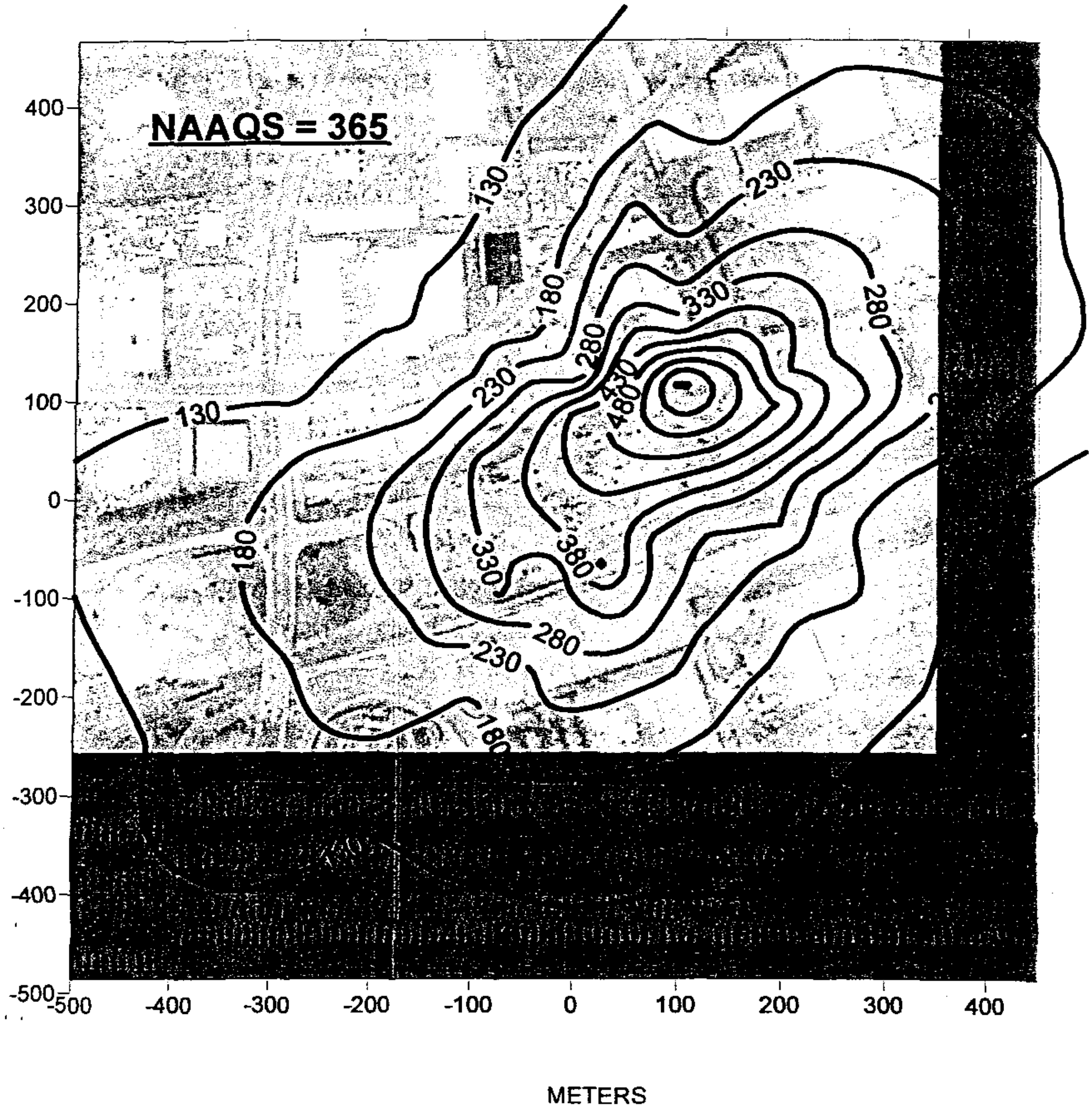
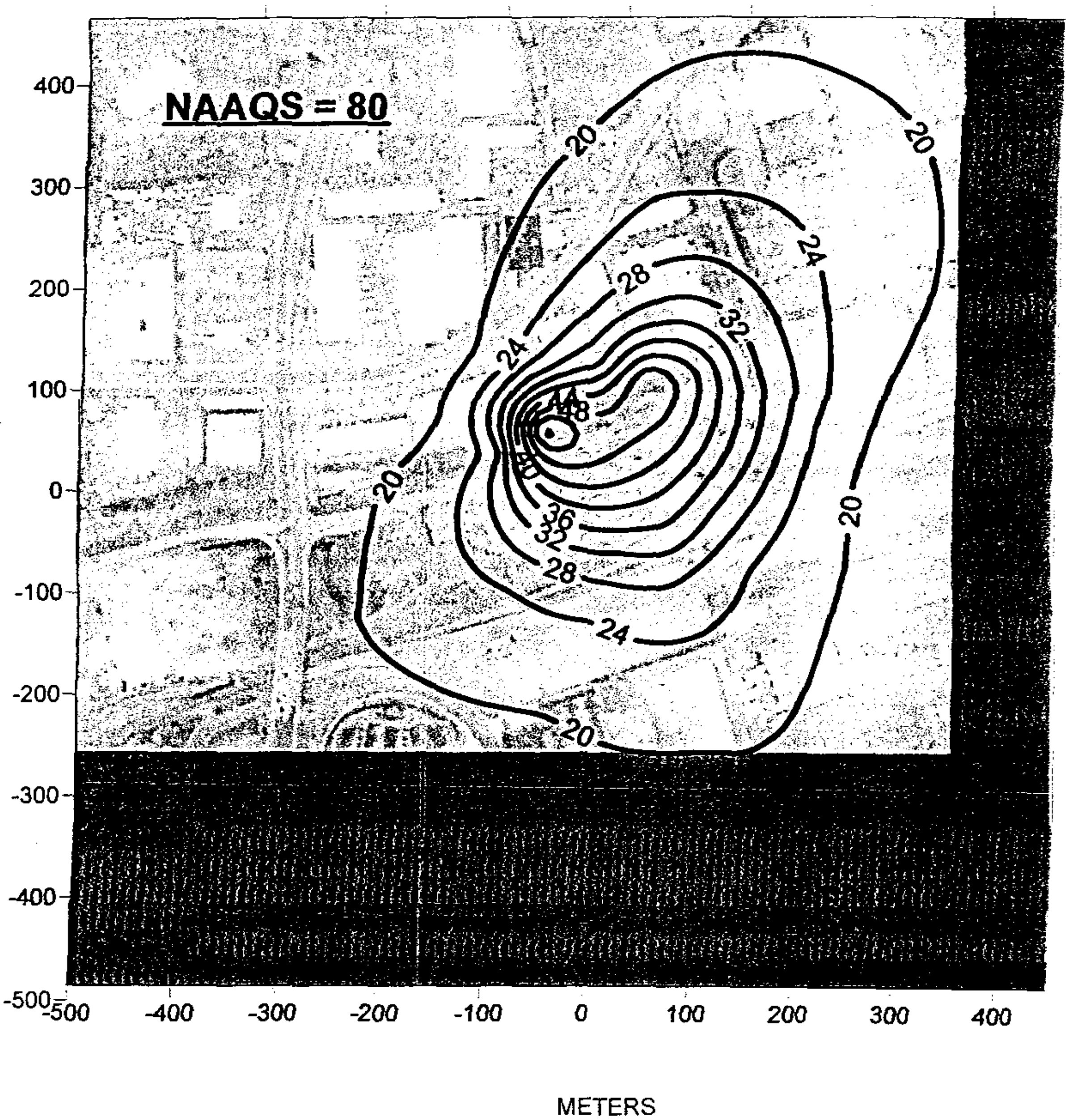
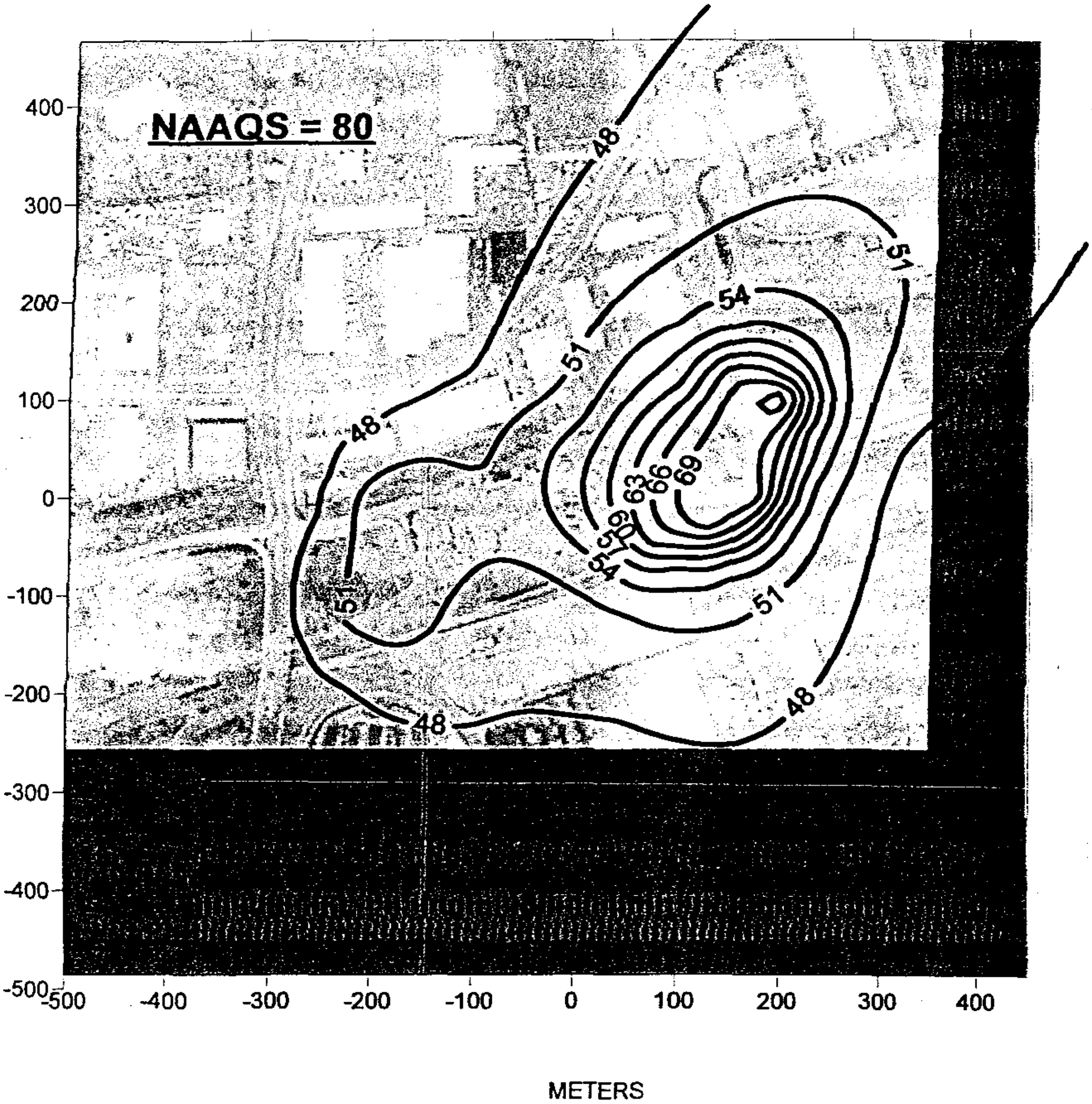


Figure 3-7.
Total SO2 annual impacts including background (micrograms per cubic meter) of the Baseline Scenario (year 2001).



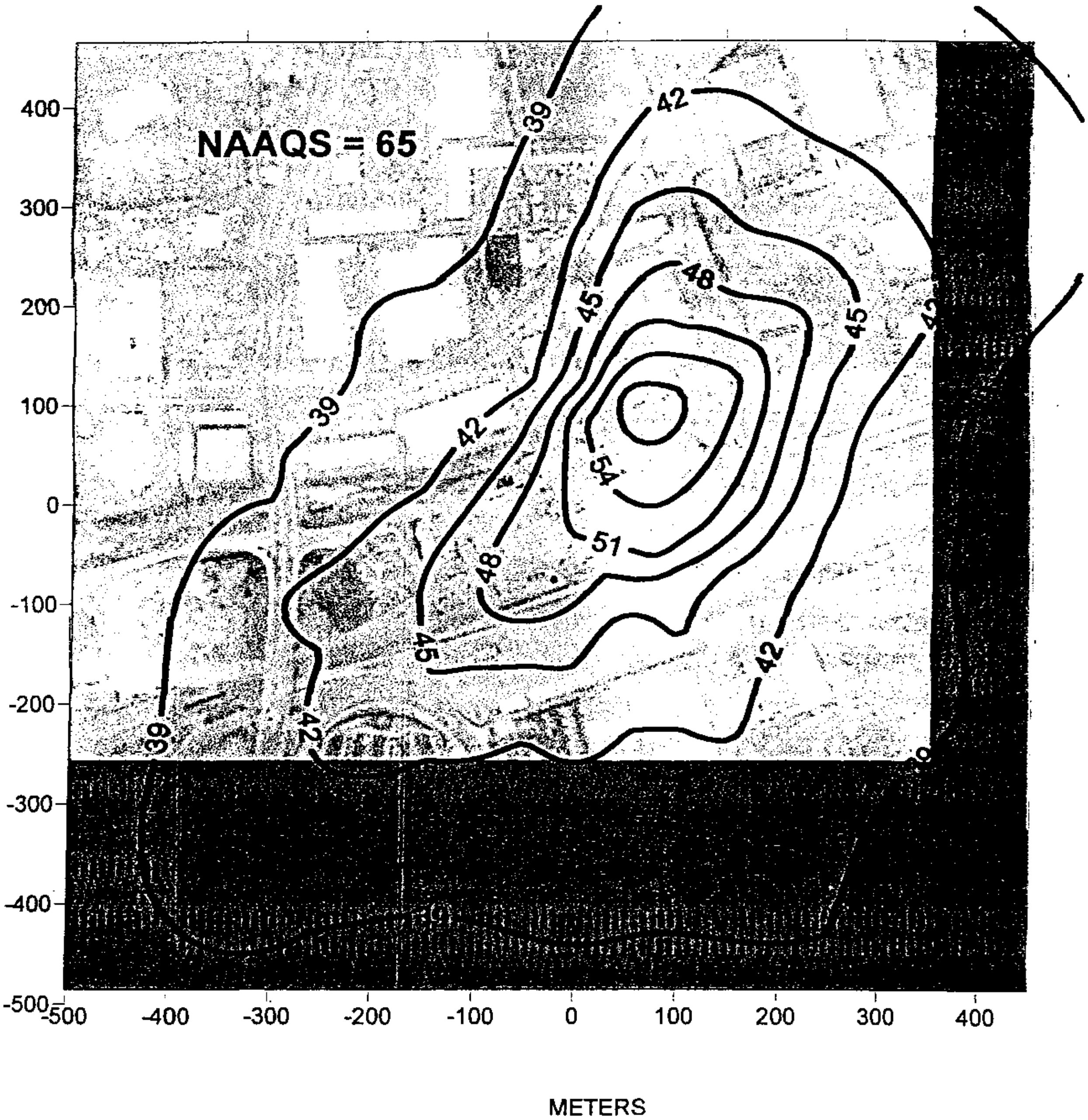
255

Figure 3-8.
Total NO2 annual impacts including background (micrograms per cubic meter) of the Baseline Scenario (year 2001).



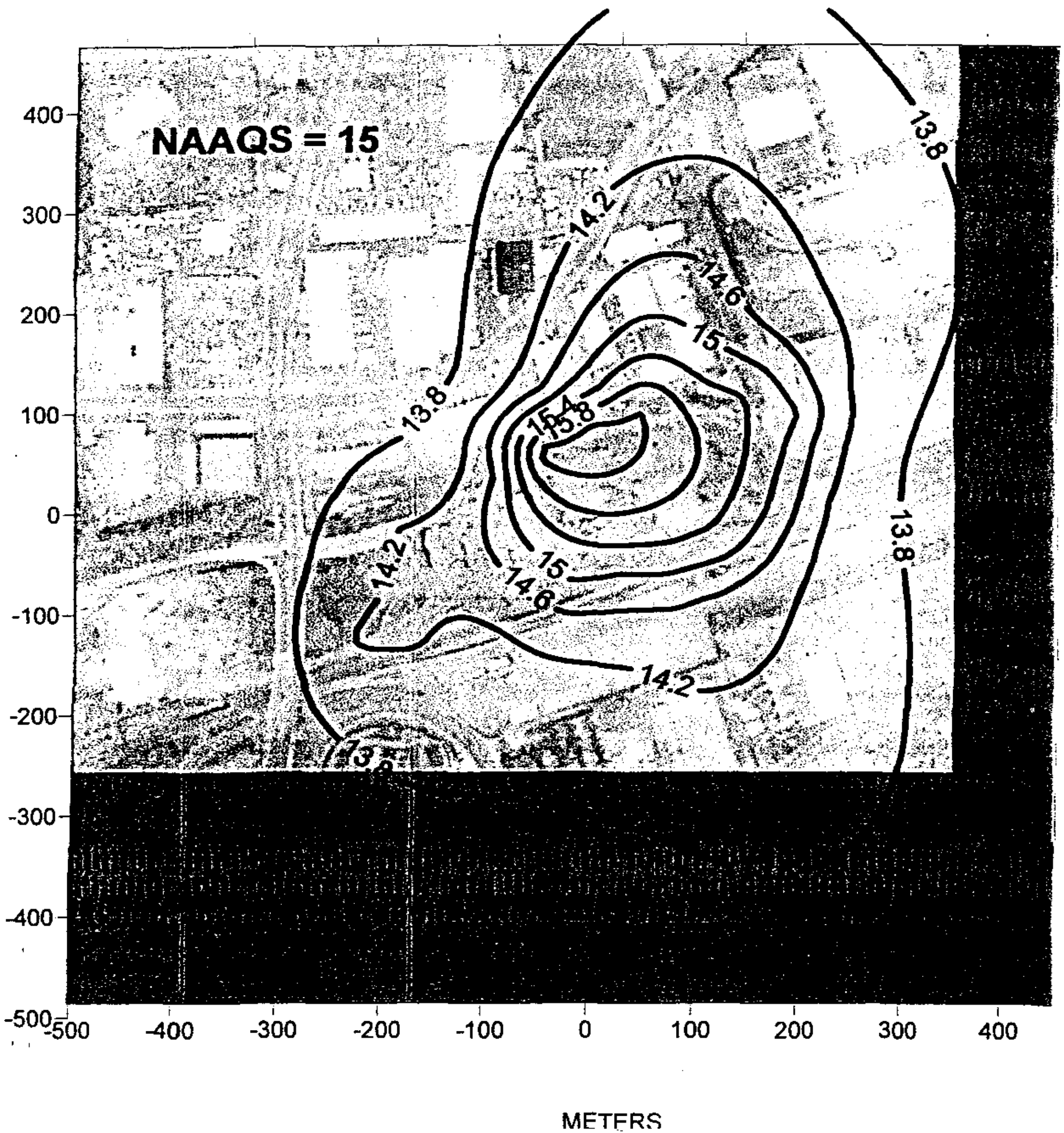
256

Figure 3-9.
Total PM2.5 short-term impacts including background (micrograms per cubic meter) for the Proposed SUP Scenario (year 2004).



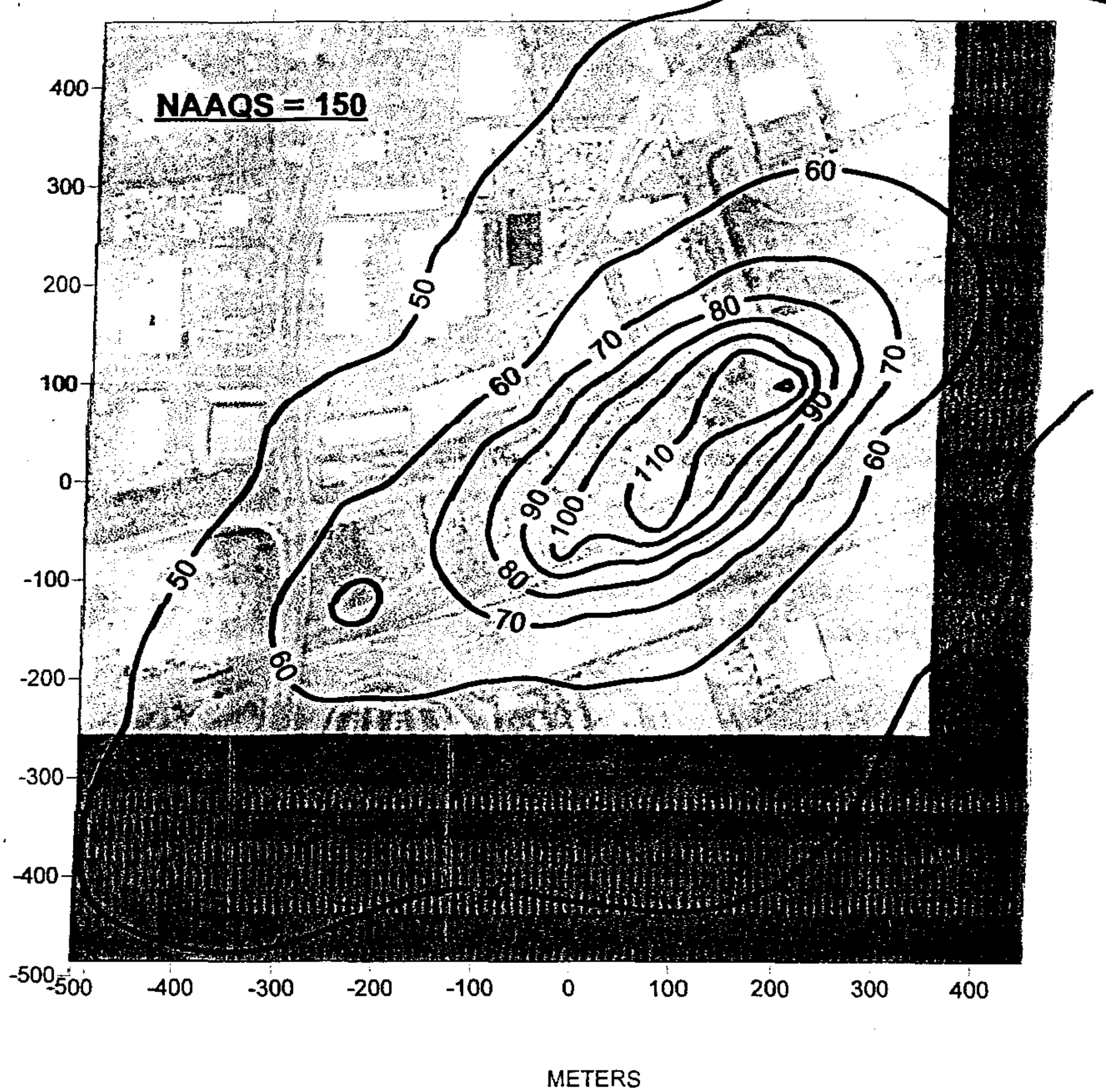
257

Figure 3-10.
Total PM2.5 annual impacts including background (micrograms per cubic meter) for the Proposed SUP Scenario (year 2001).



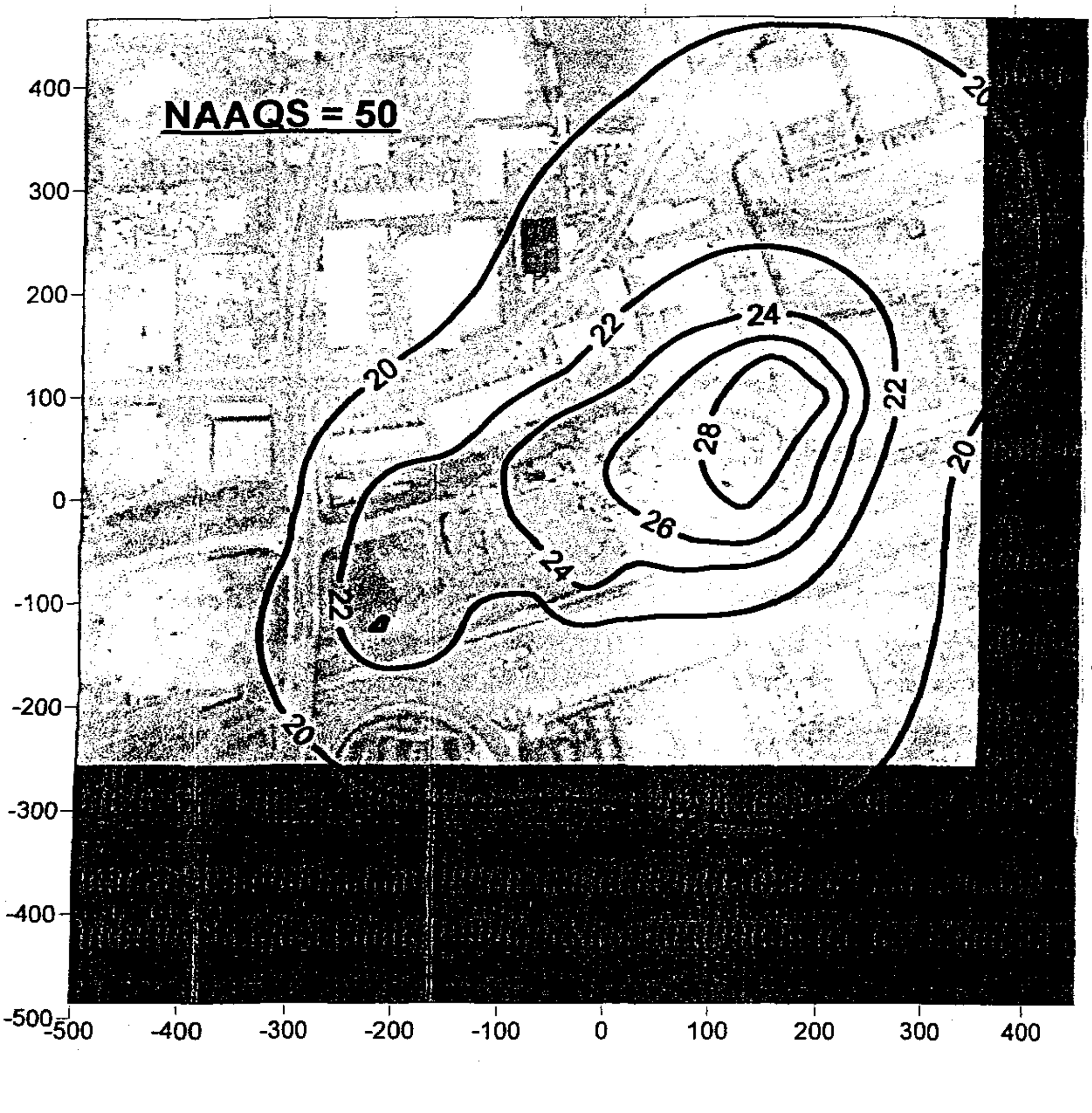
258

Figure 3-11.
Total PM10 short-term impacts including background (micrograms per cubic meter) for the Proposed SUP Scenario (year 2001).



259

Figure 3-12.
Total PM10 annual impacts including background (micrograms per cubic meter) for the Proposed SUP Scenario (year 2001).



260

Figure 3-13.
Total SO2 3-hour impacts including background (micrograms per cubic meter) for the Proposed SUP Scenario (year 2000).

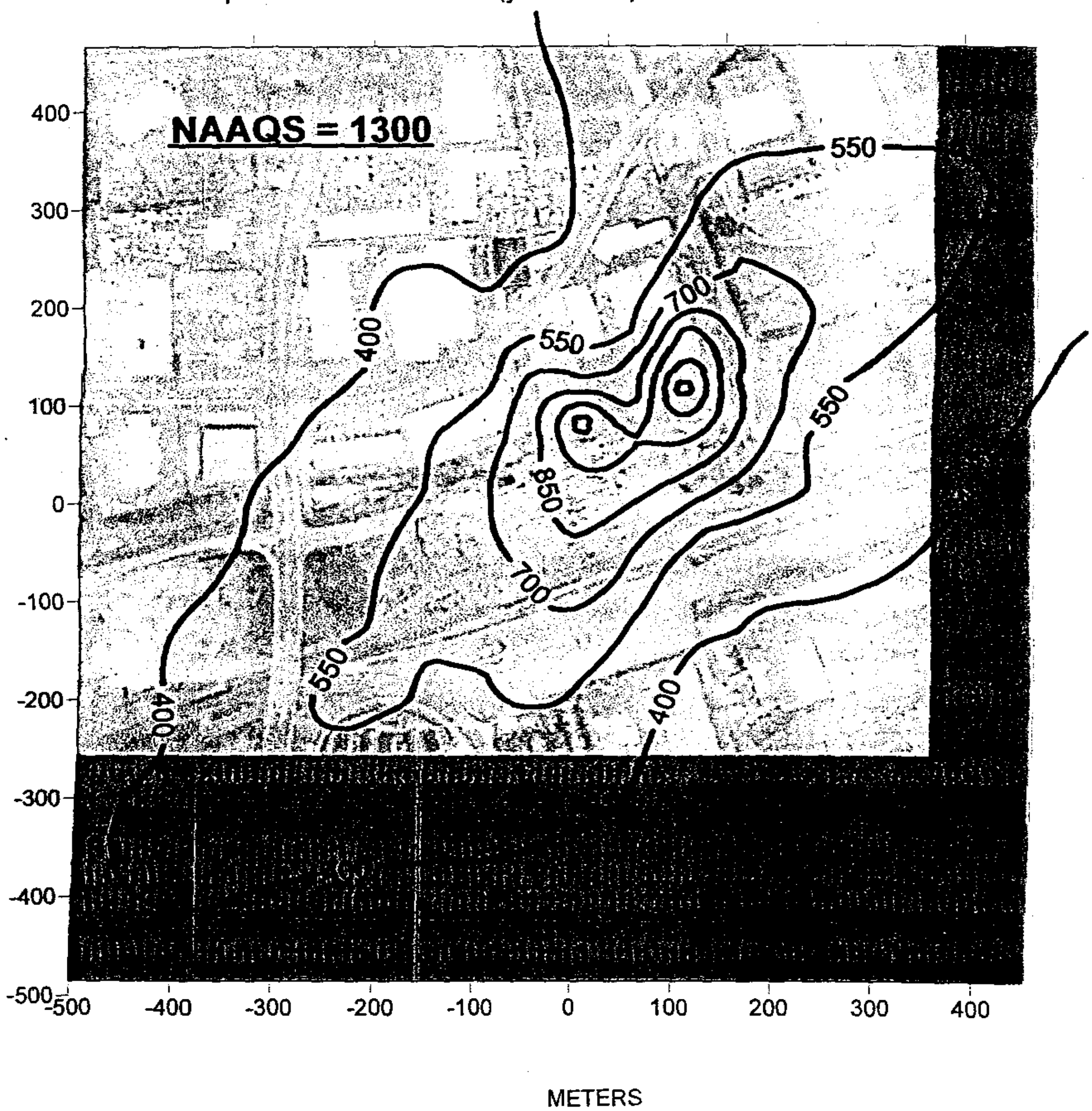
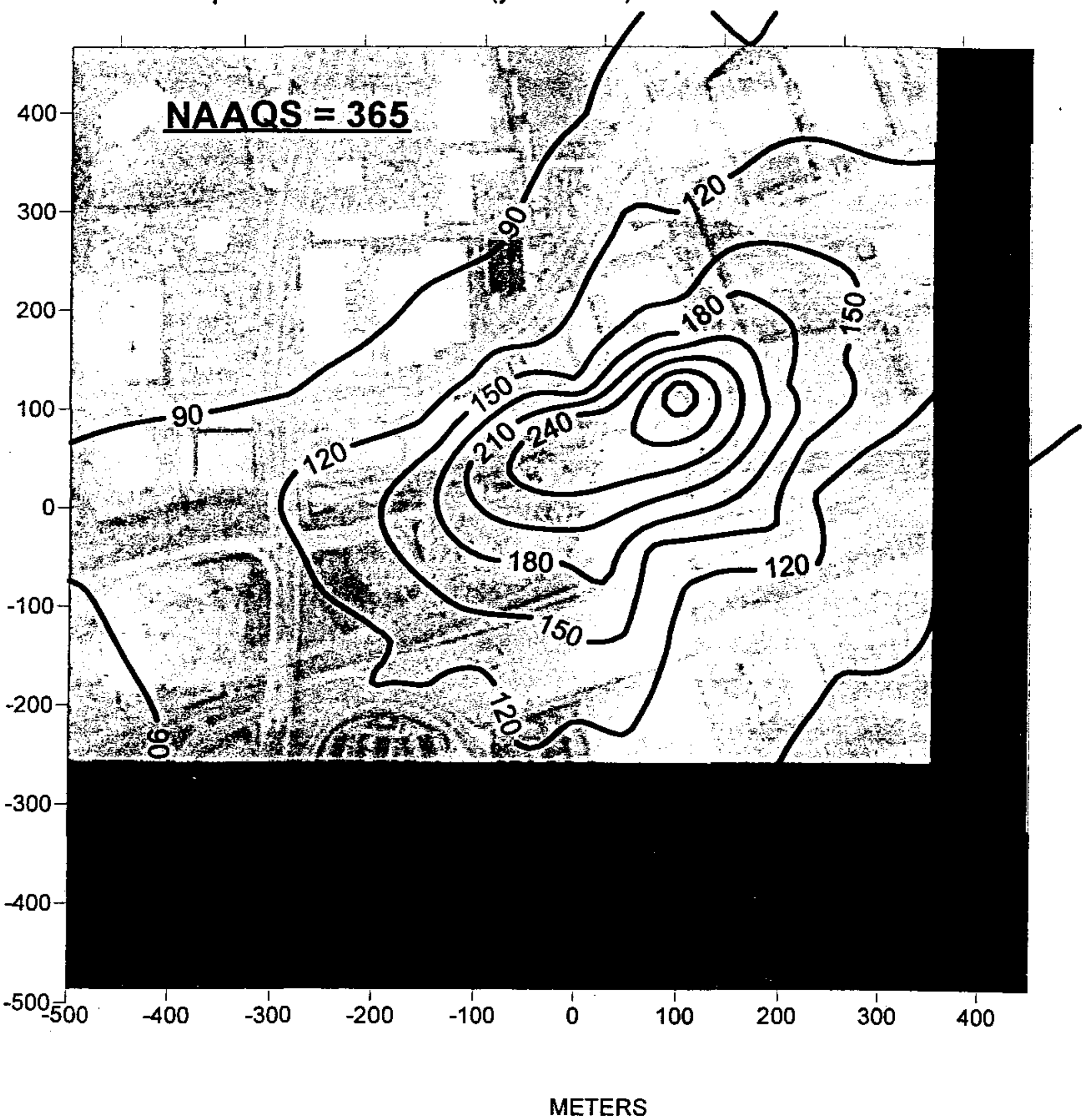


Figure 3-14.
Total SO2 24-hour impacts including background (micrograms per cubic meter) for the Proposed SUP Scenario (year 2003).



262

Figure 3-15.
Total SO2 annual impacts including background (micrograms per cubic meter) for the Proposed SUP Scenario (year 2001).

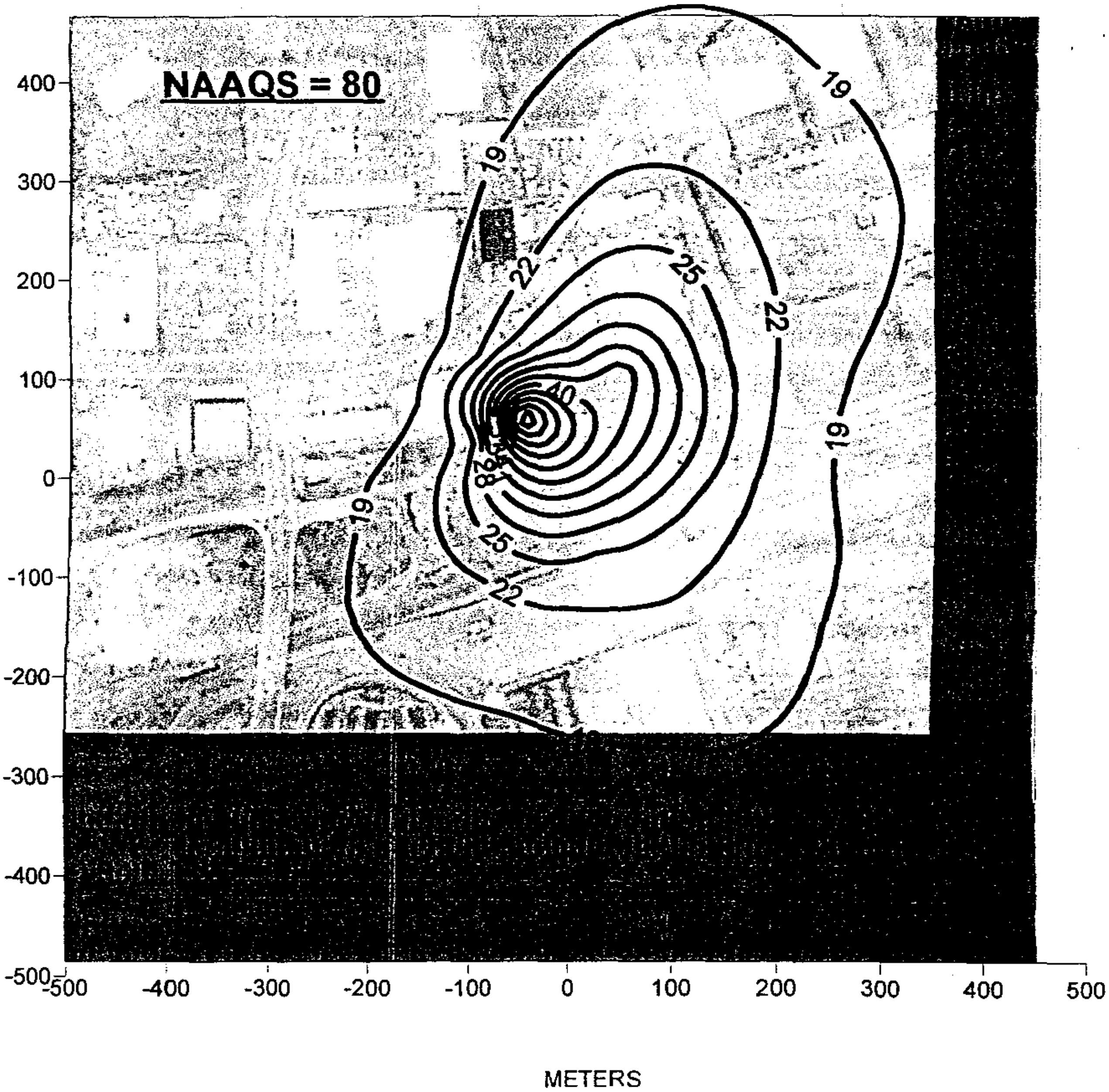
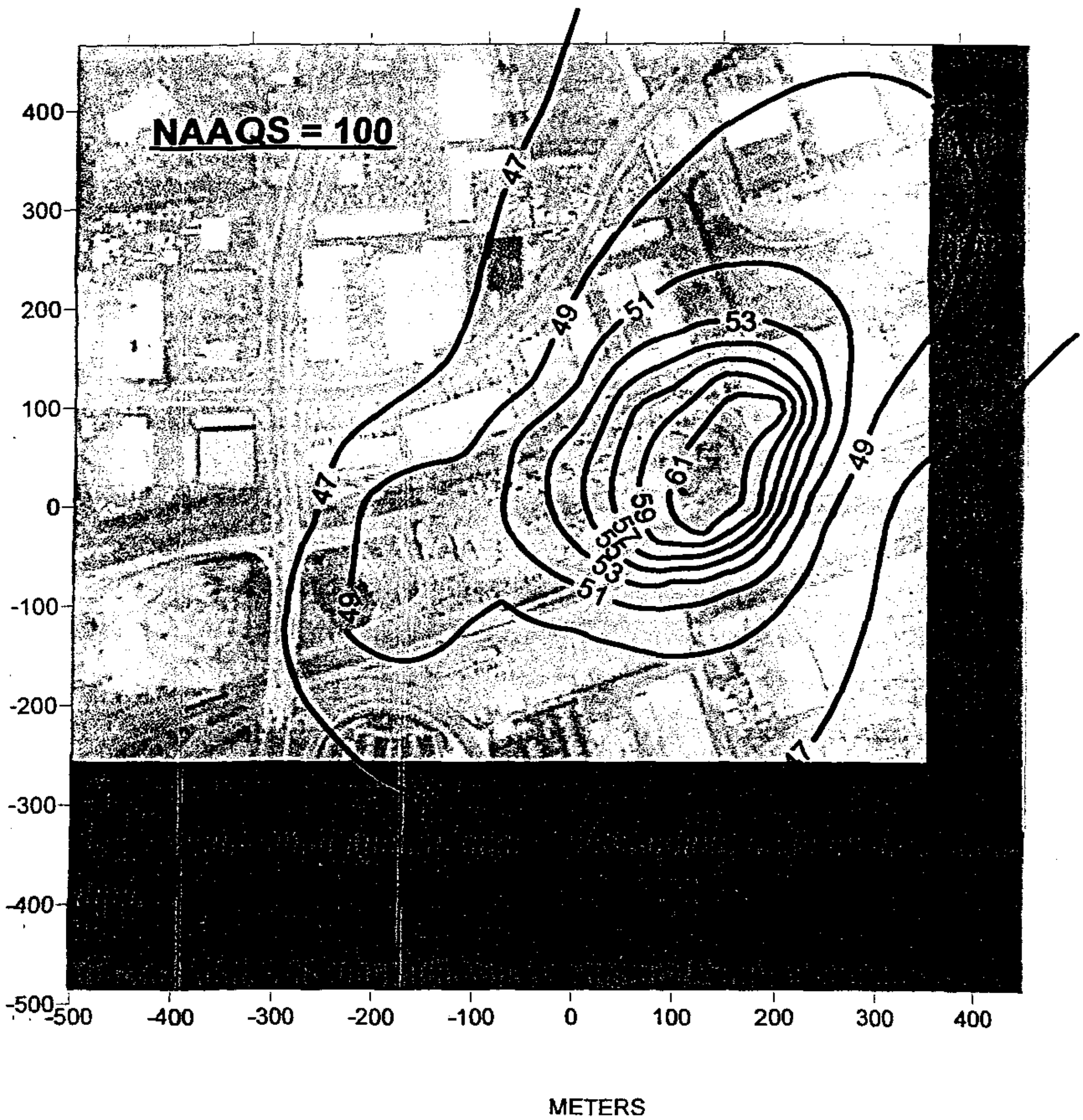
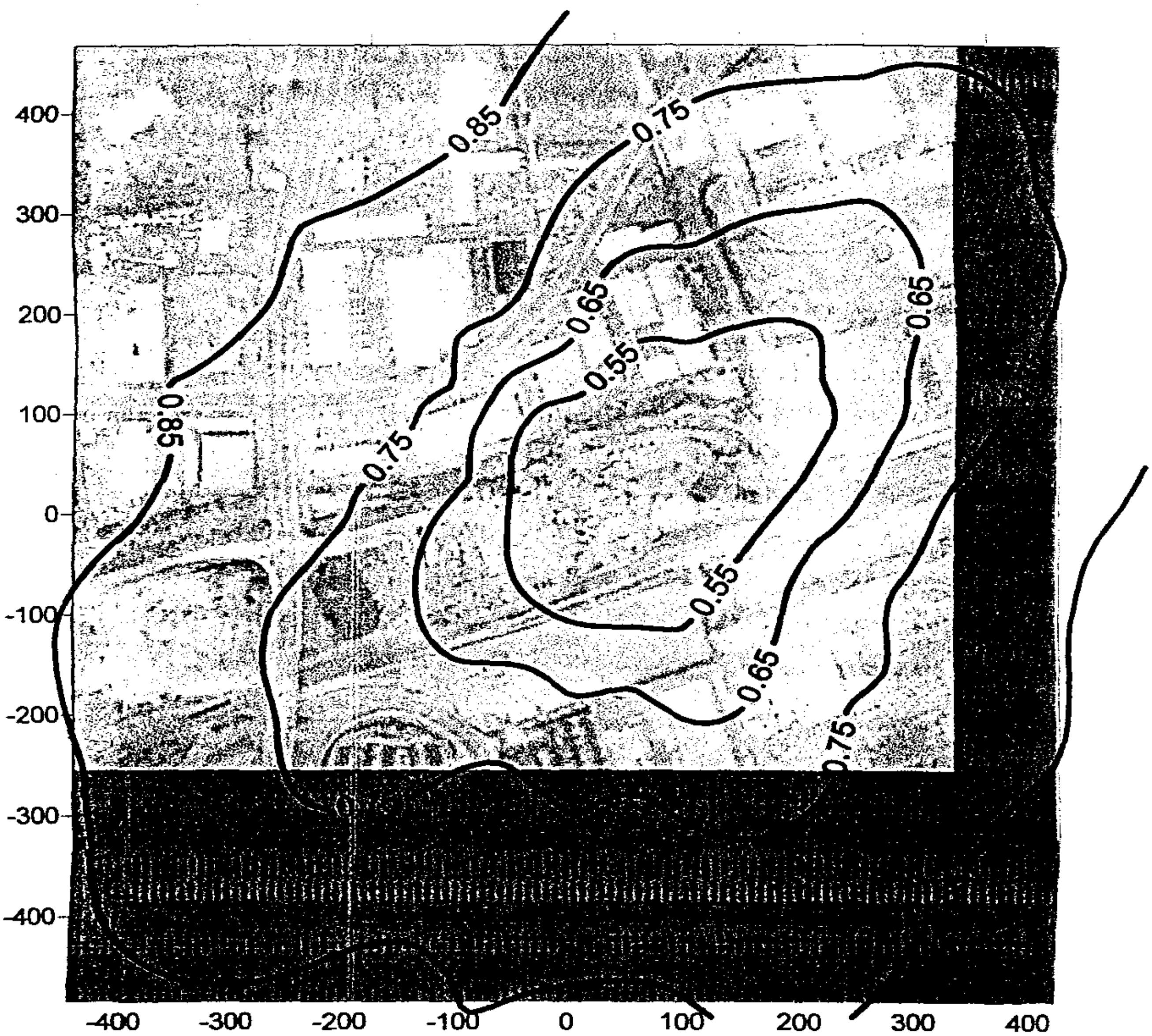


Figure 3-16.
Total NO2 annual impacts including background (micrograms per cubic meter) of the Proposed SUP Scenario (year 2001).



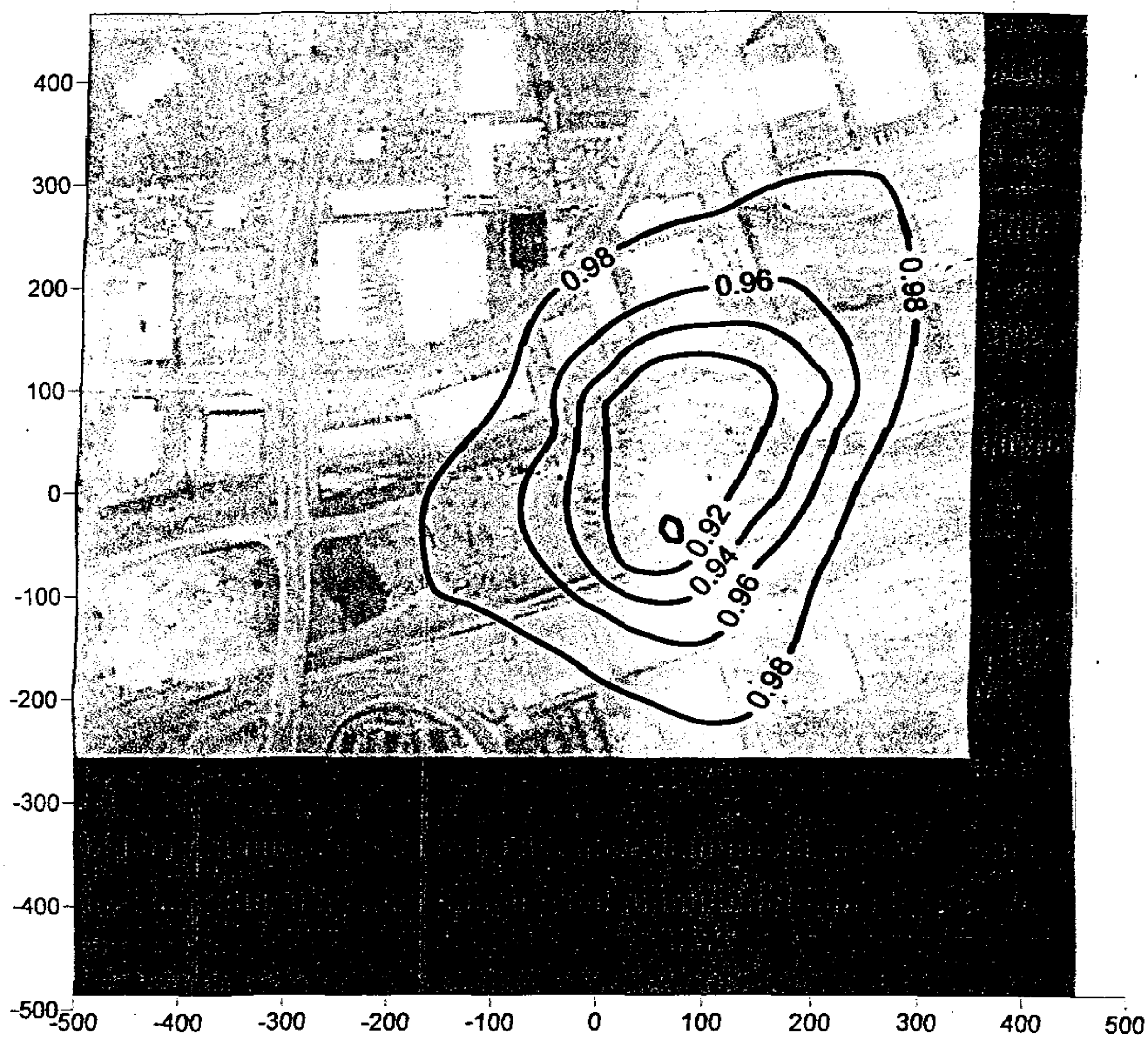
264

Figure 3-17.
Total PM2.5 short-term impacts (with background) of the Proposed SUP Scenario versus the Baseline Scenario (year 2004).



265

Figure 3-18.
Total PM2.5 annual impacts (including background) of the Proposed SUP Scenario versus Baseline Scenario (year 2001).



266

Figure 3-19.
Total PM10 short-term impacts (including background) of the Proposed SUP Scenario versus Baseline Scenario (year 2001).

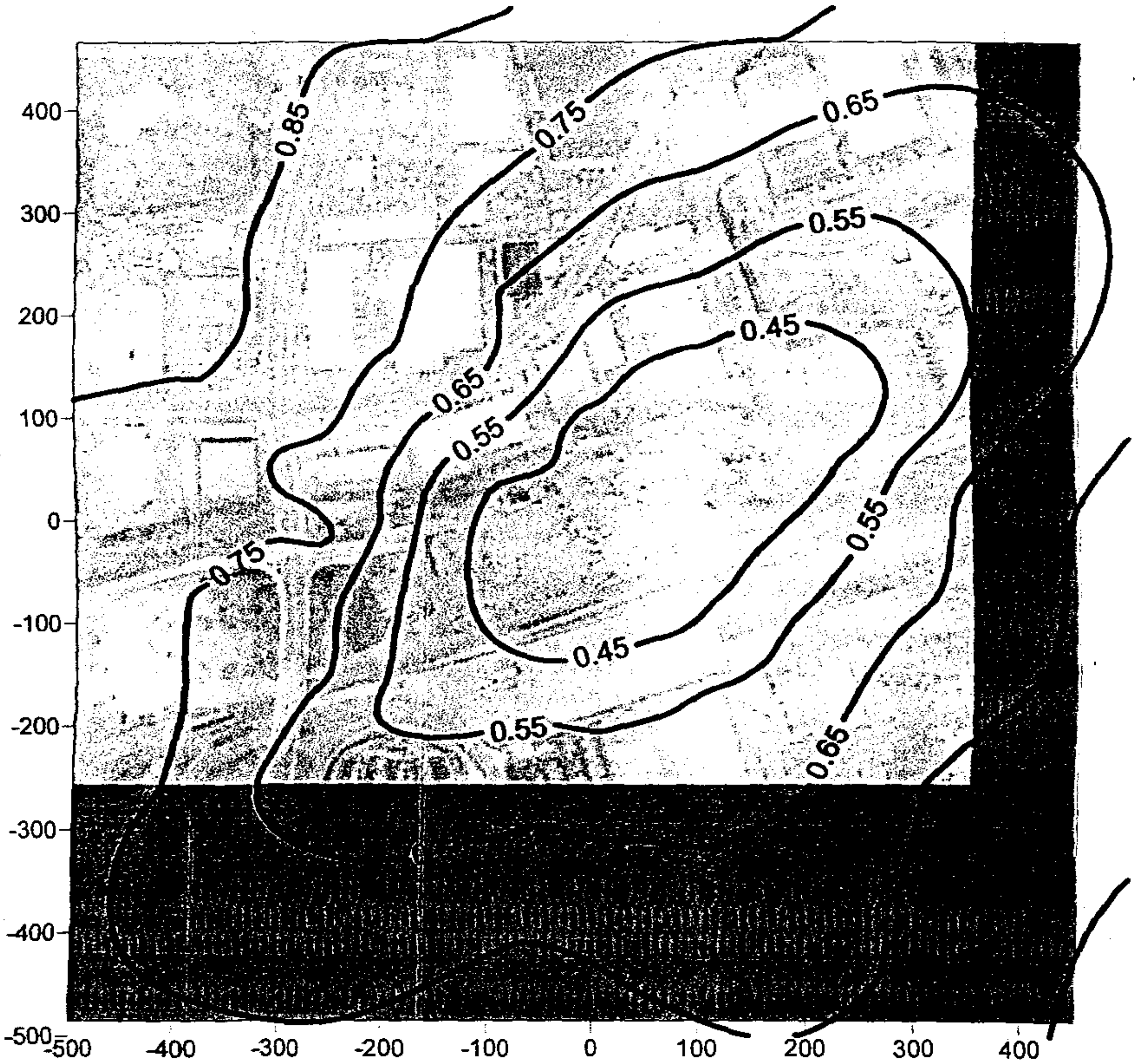
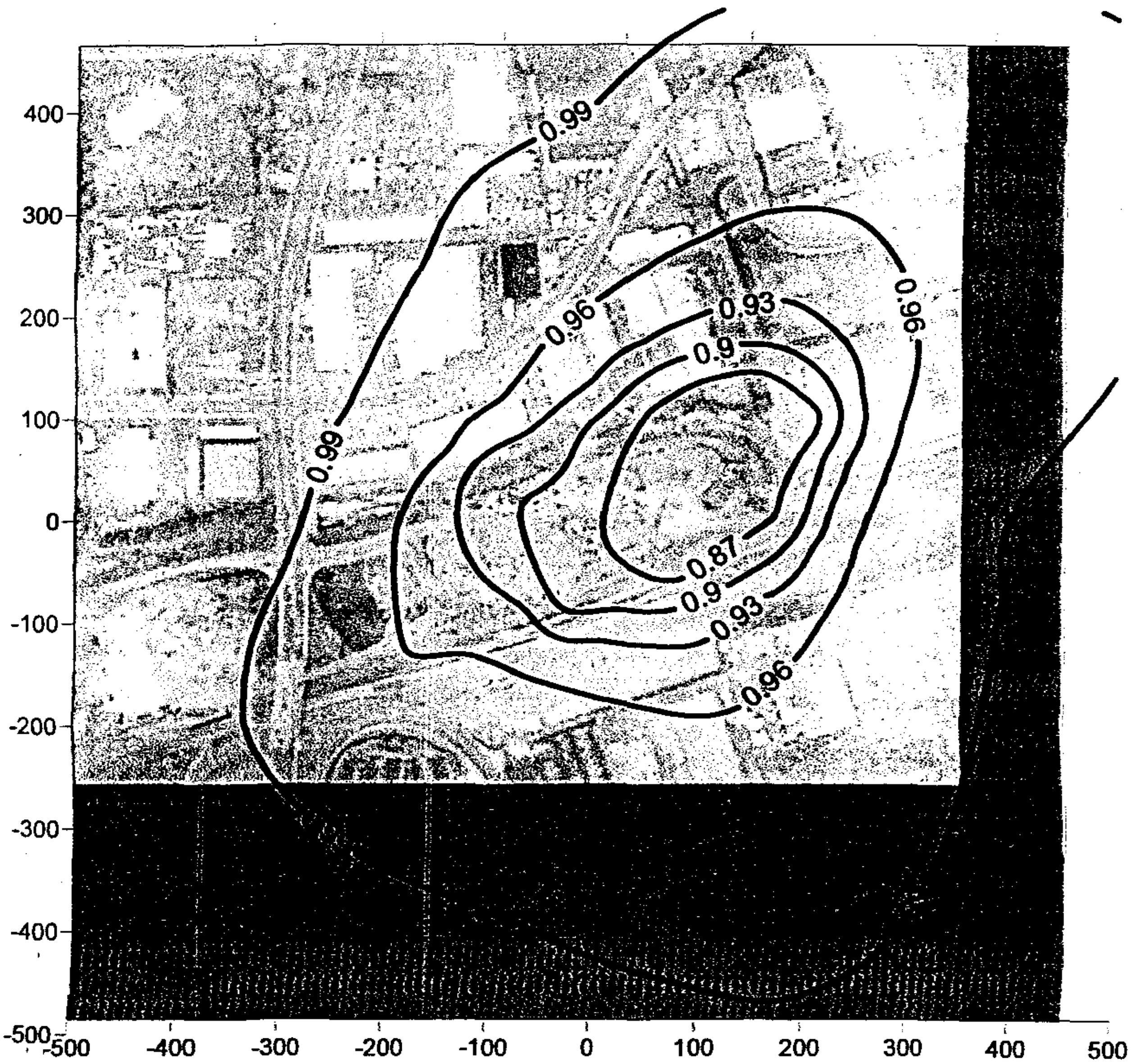
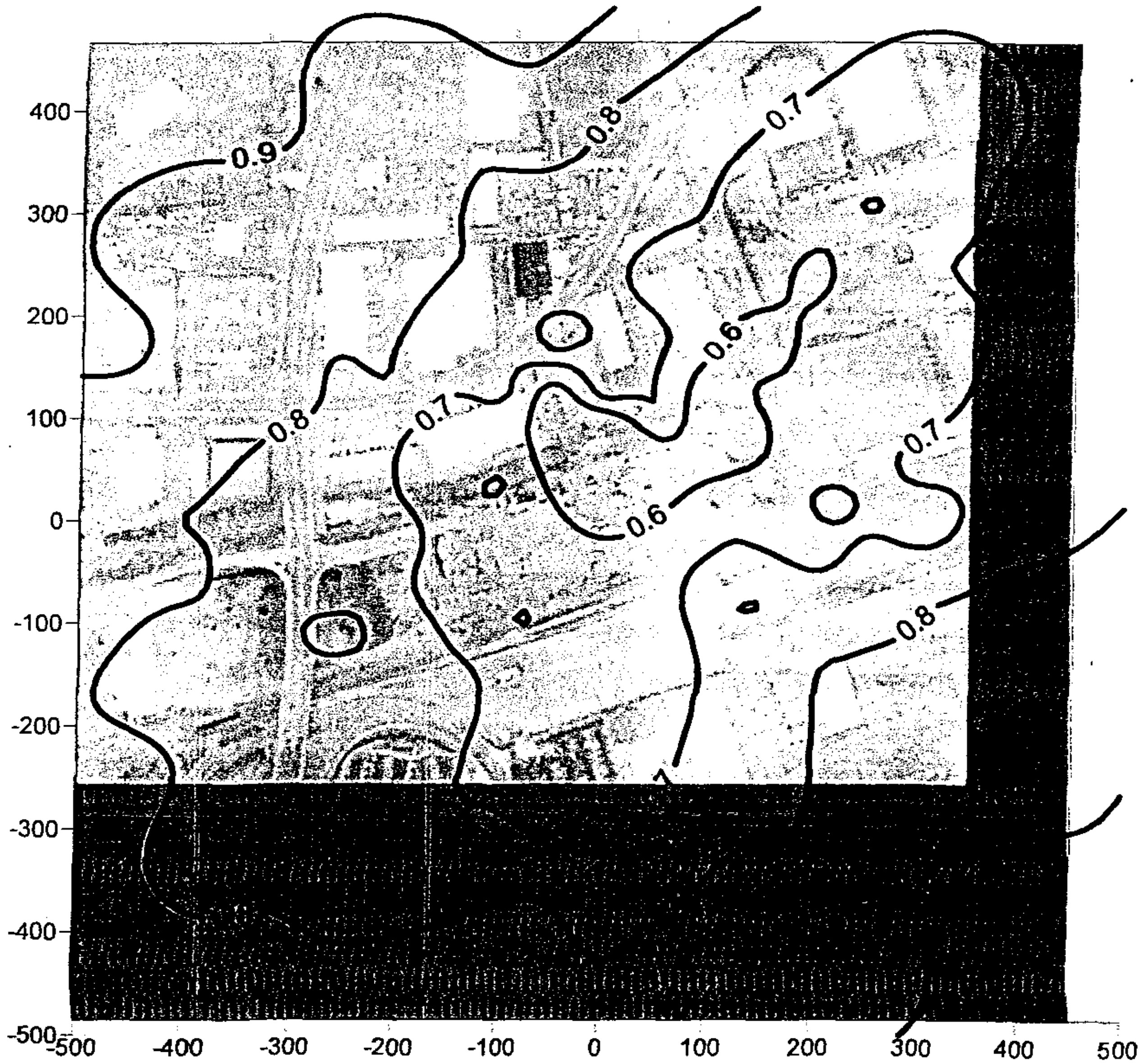


Figure 3-20 .
Total PM10 annual impacts (background included) for the Proposed SUP Scenario versus the Baseline Scenario (year 2001).



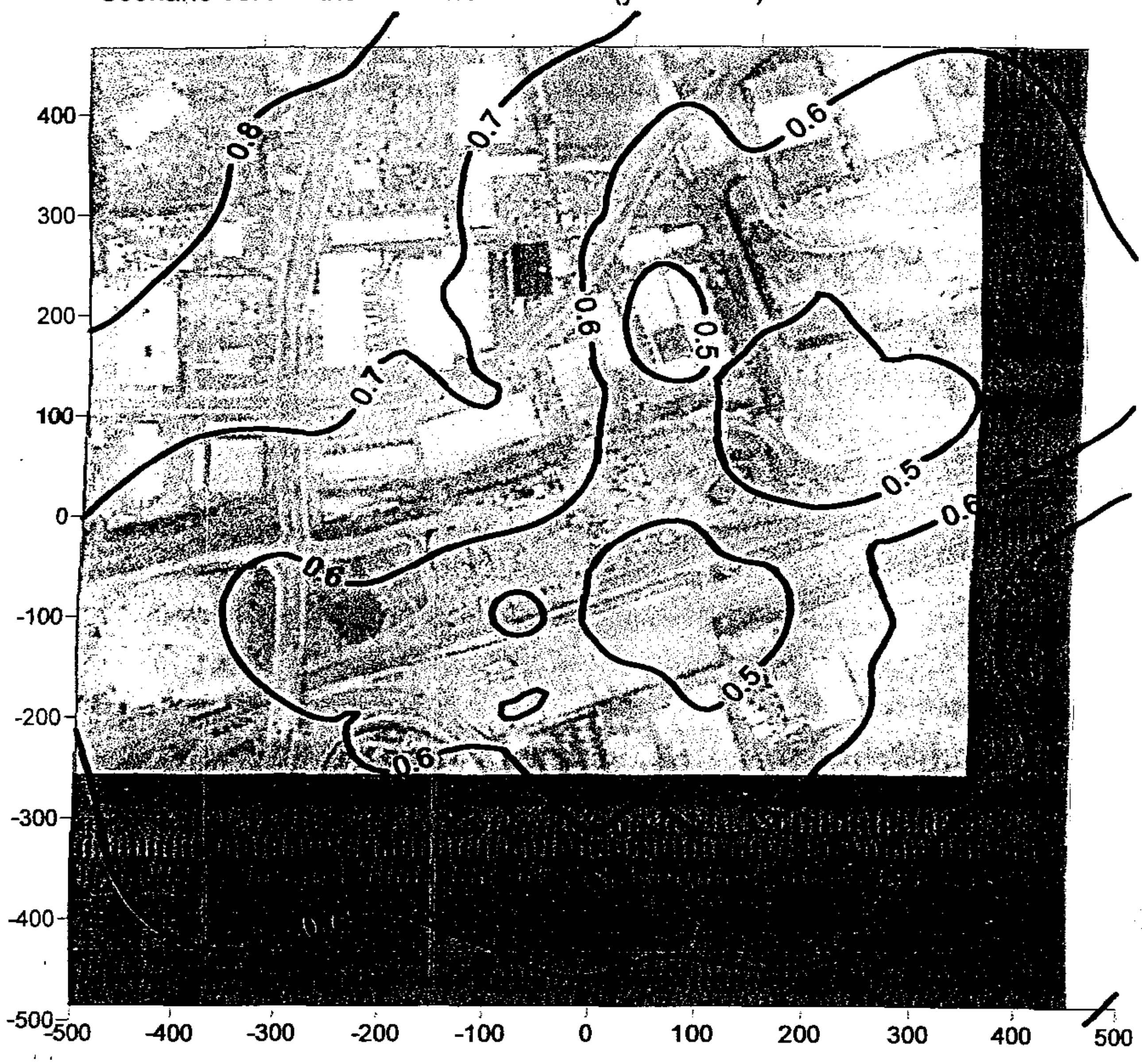
268

Figure 3-21.
Total SO2 3-hour Impacts (including background) for the Proposed SUP Scenario versus the Baseline Scenario (year 2000).



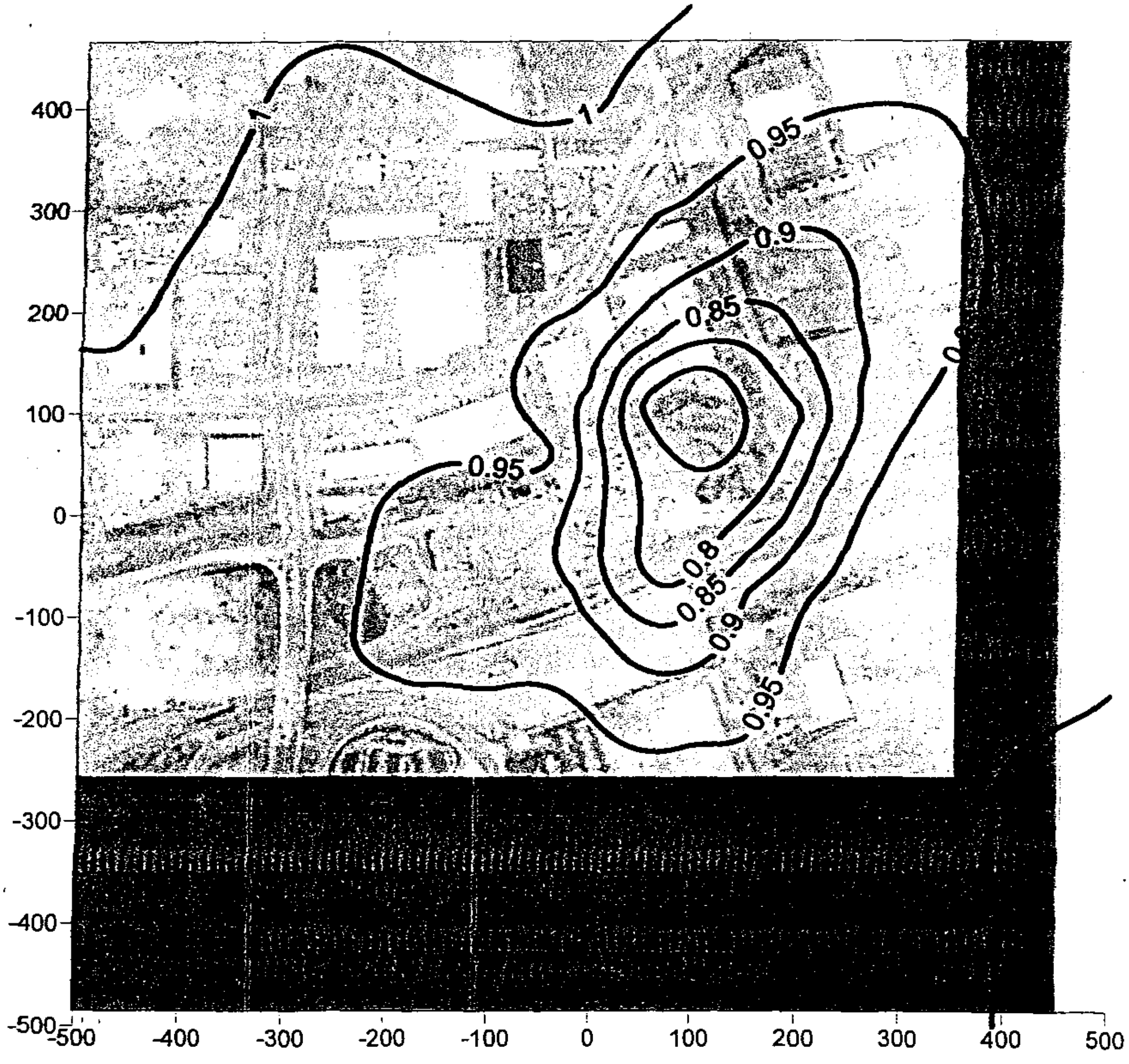
269

Figure 3-22.
Total SO2 24-hour Impacts (including background(of the Proposed SUP Scenario versus the Baseline Scenario (year 2003).



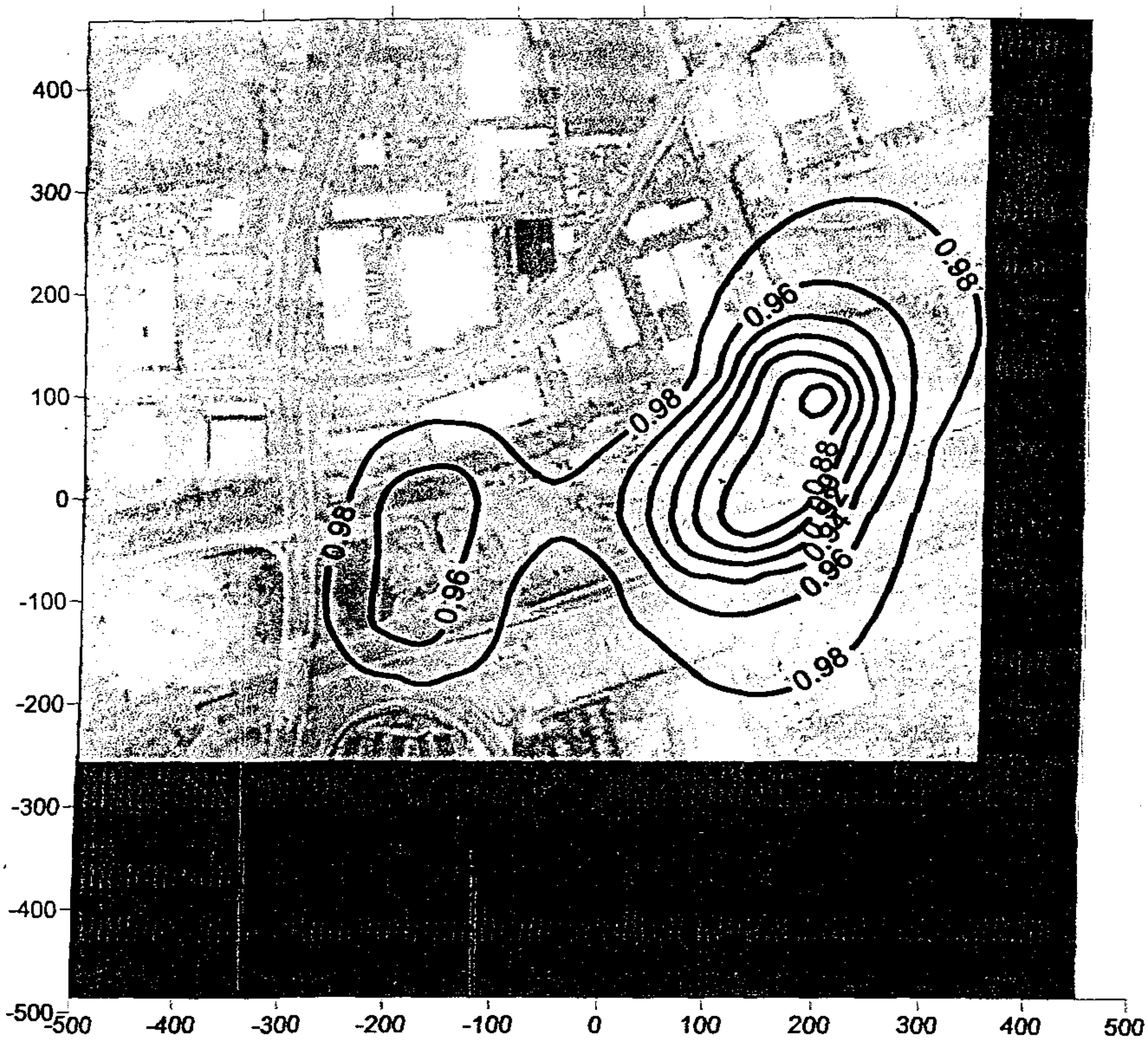
270

Figure 3-23.
Total SO2 Annual Impacts (including background) of the Proposed SUP Scenario versus Baseline Scenario (year 2001).



271

Figure 3-24.
Total NO2 annual impacts (including background) of the Proposed SUP Scenario versus Baseline Scenario (year 2001).



272

Figure 3-25.
Percent reduction in facility's contribution to PM2.5 short-term impacts for the Proposed SUP Scenario from the Baseline Scenario (year 2004).

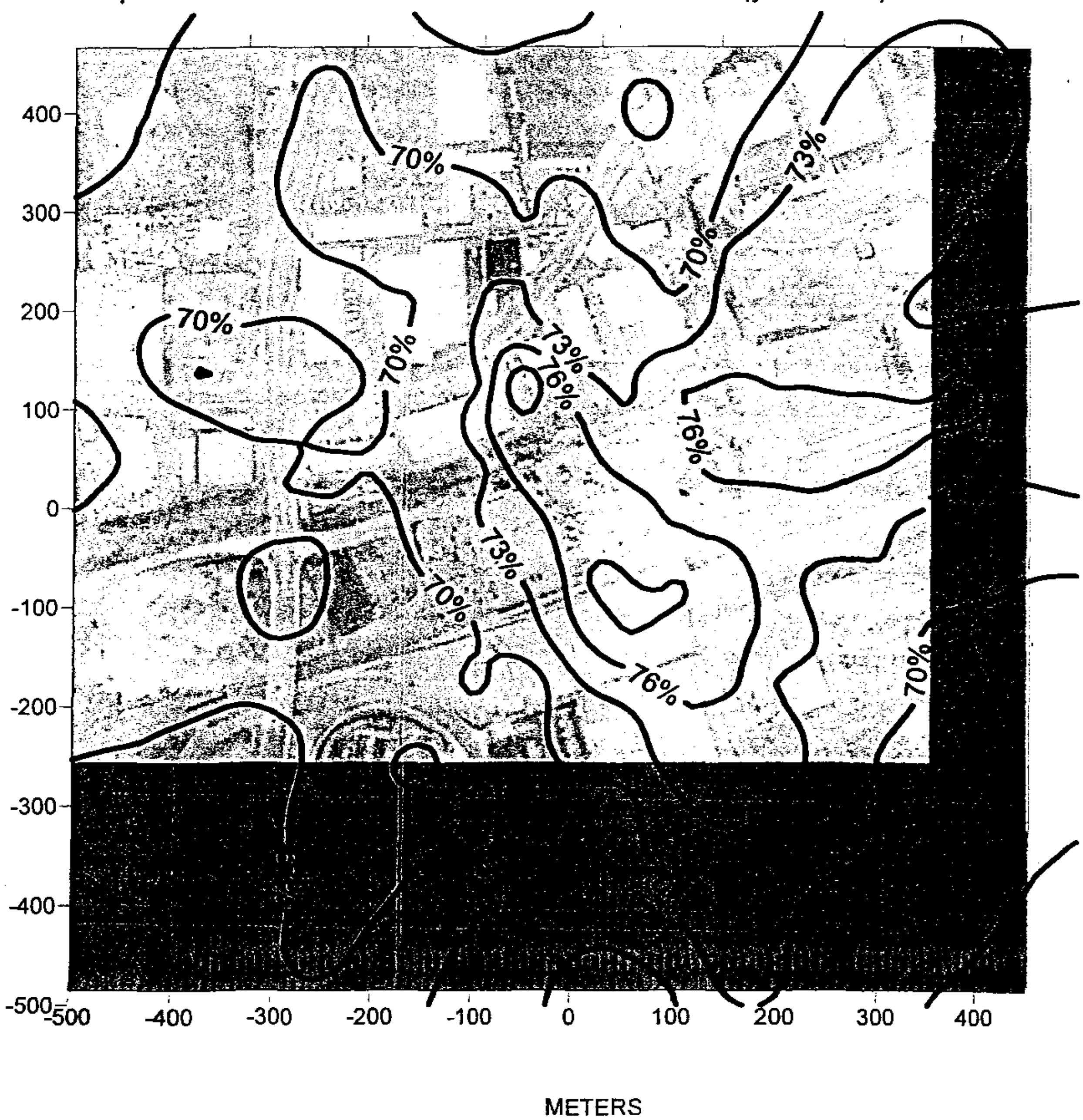


Figure 3-26.
Percent reduction in facility's contribution to PM2.5 annual impacts for the Proposed SUP Scenario from the Baseline Scenario (year 2001).

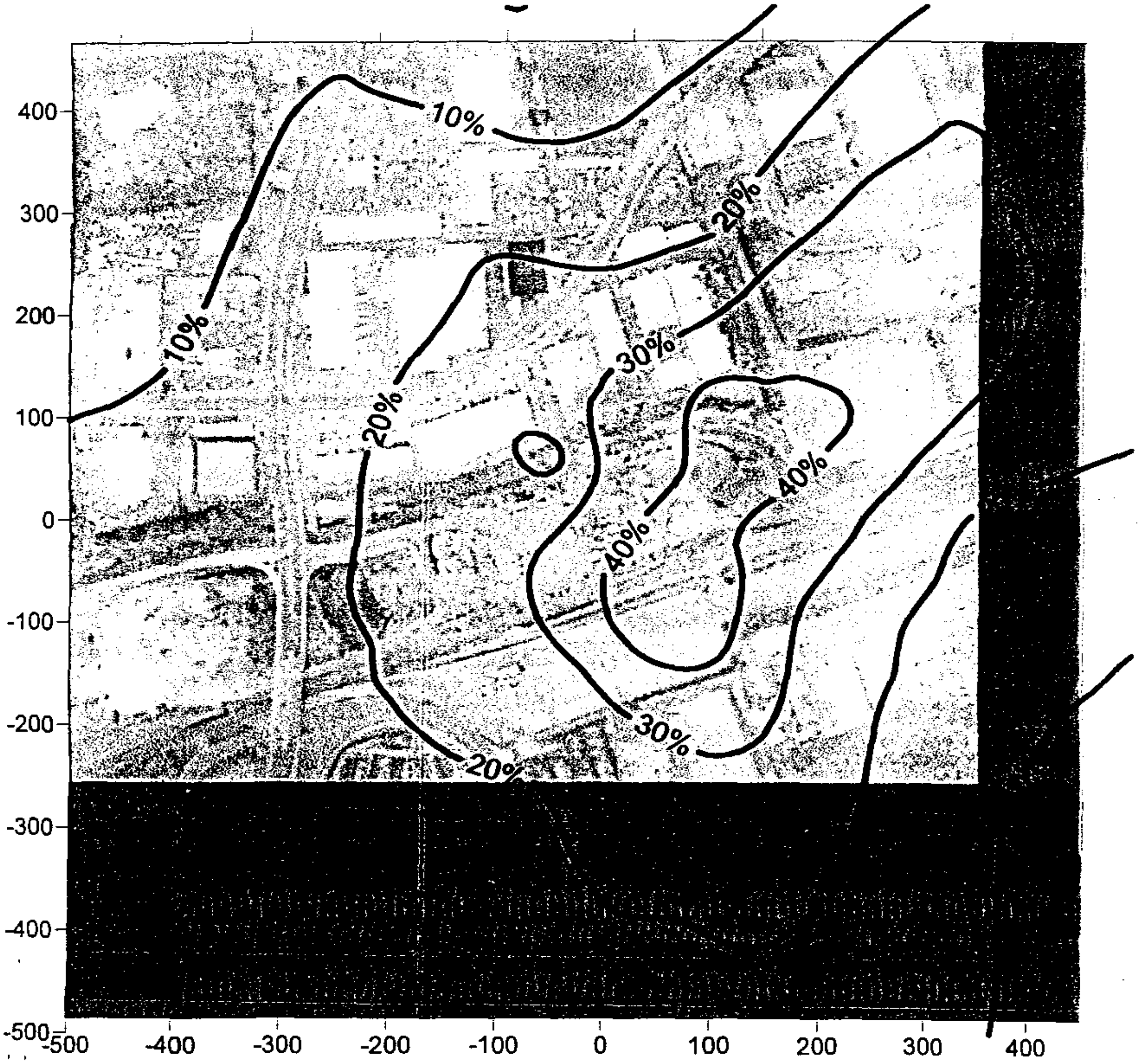


Figure 3-27.
Percent reduction in facility's contribution to PM10 short-term impacts for the Proposed SUP Scenario from the Baseline Scenario (year 2001).

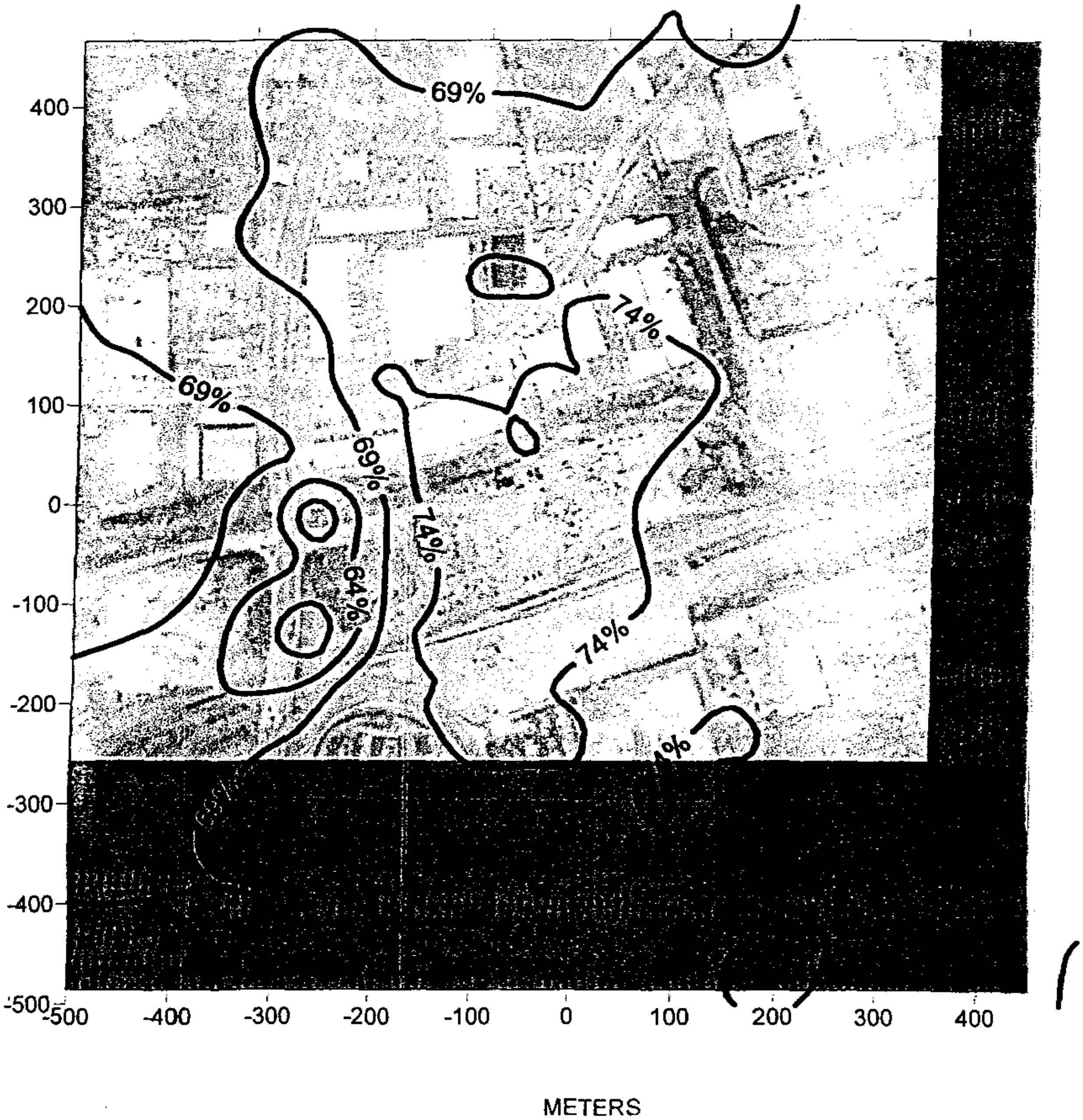
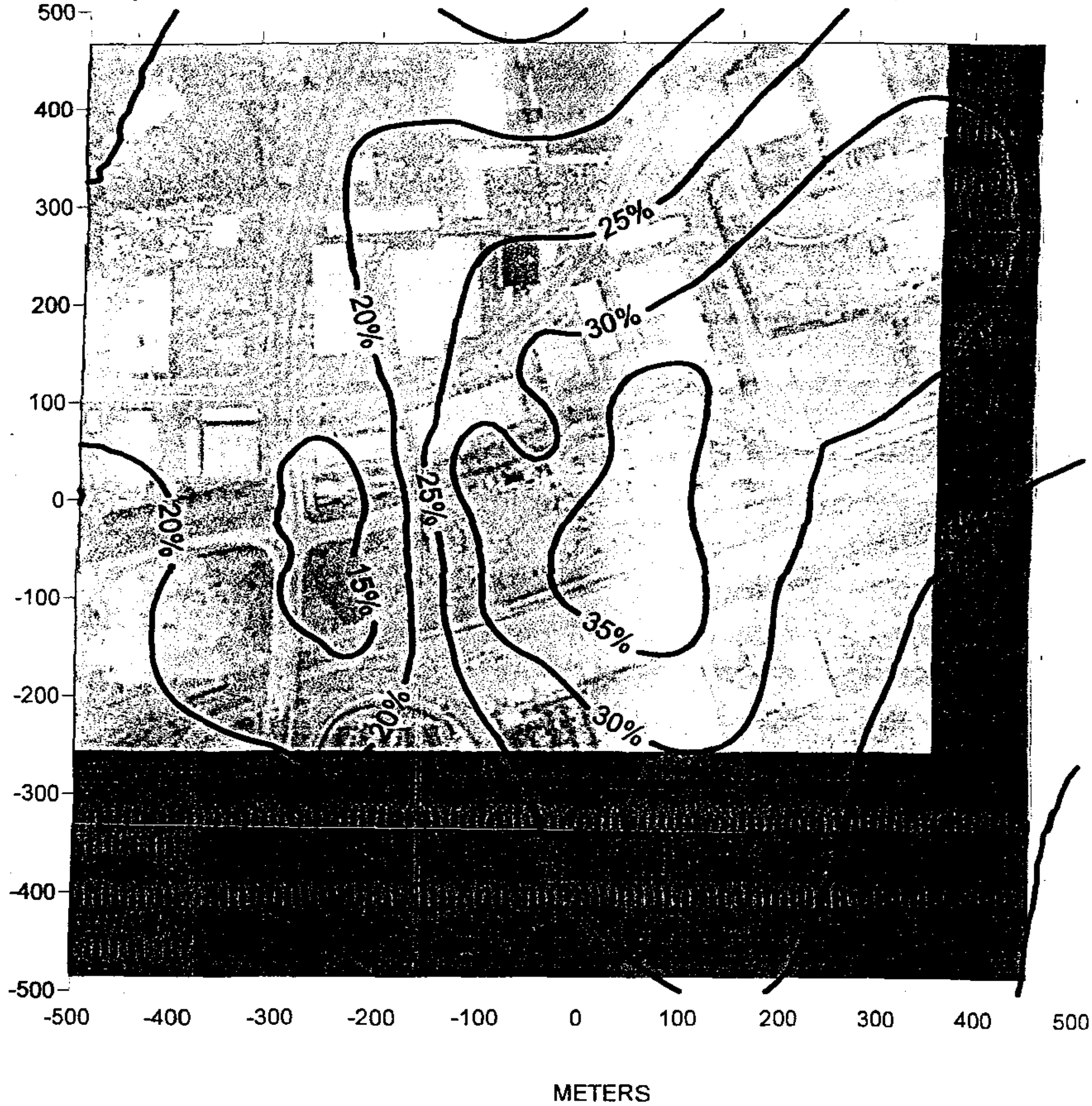
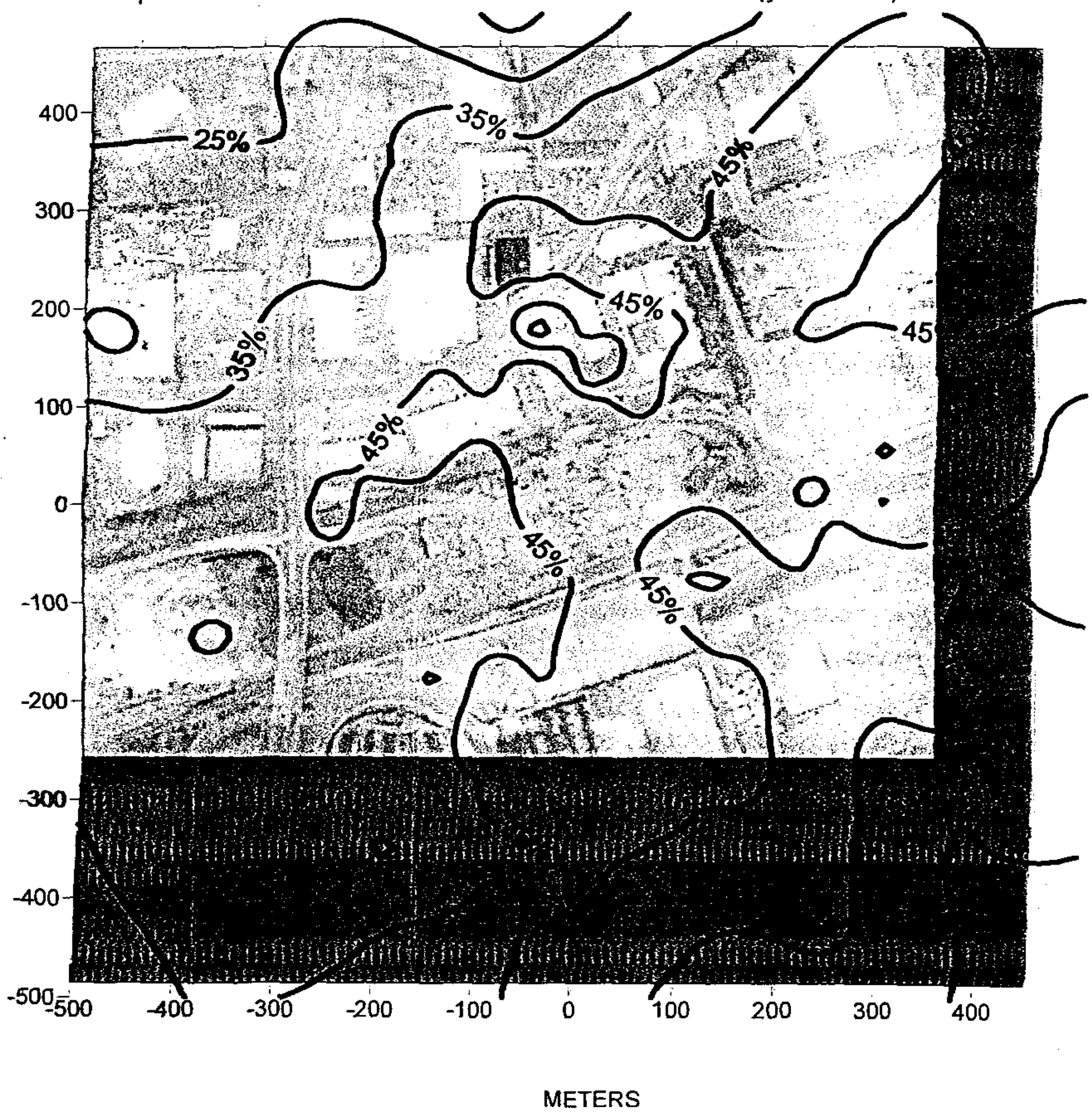


Figure 3-28.
Percent reduction in facility's contribution to PM10 annual impacts for the Proposed SUP Scenario from the Baseline Scenario (year 2001).



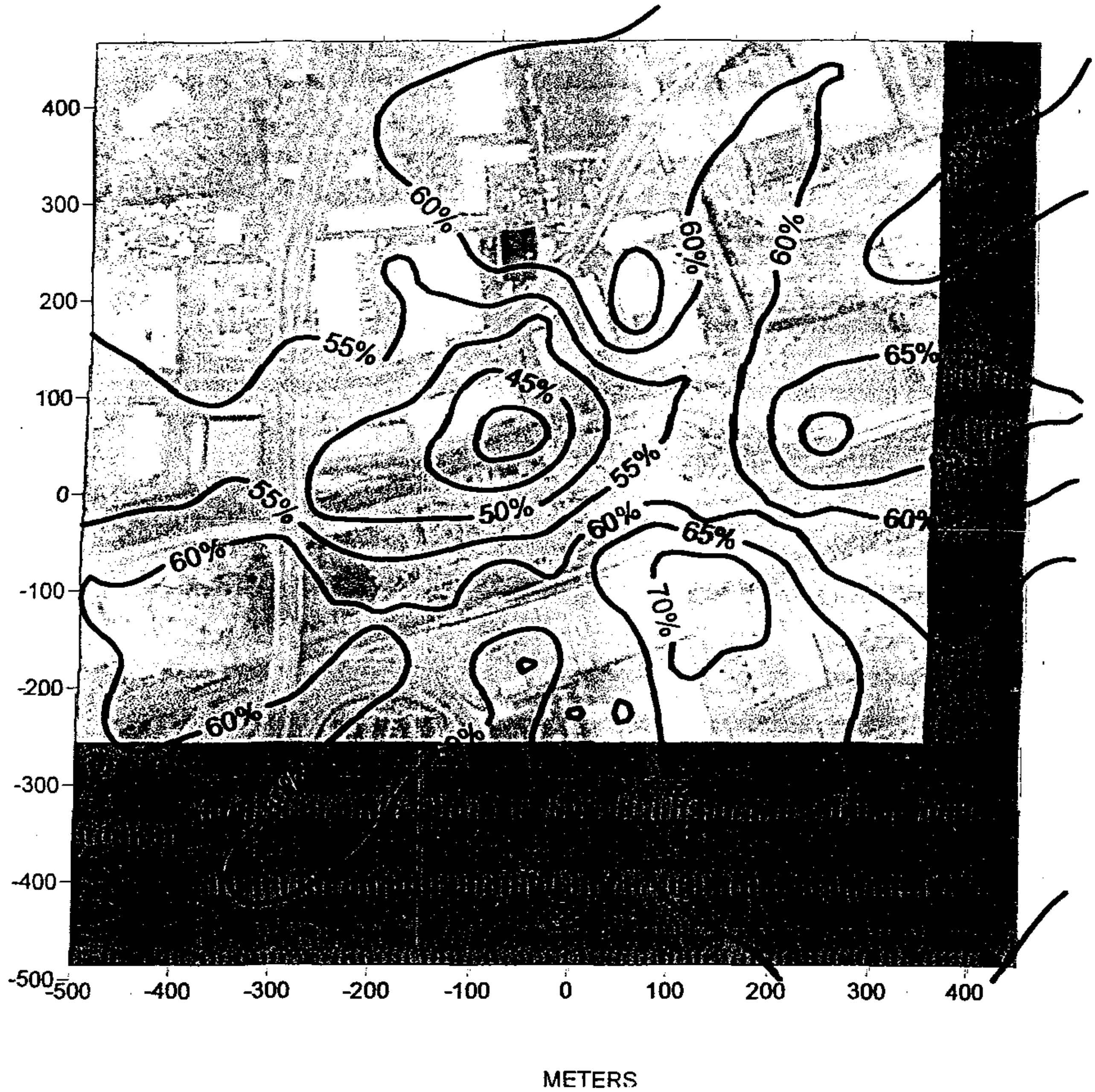
276

Figure 3-29.
Percent reduction in facility's contribution to SO2 3-hour impacts for the Proposed SUP Scenario from the Baseline Scenario (year 2000).



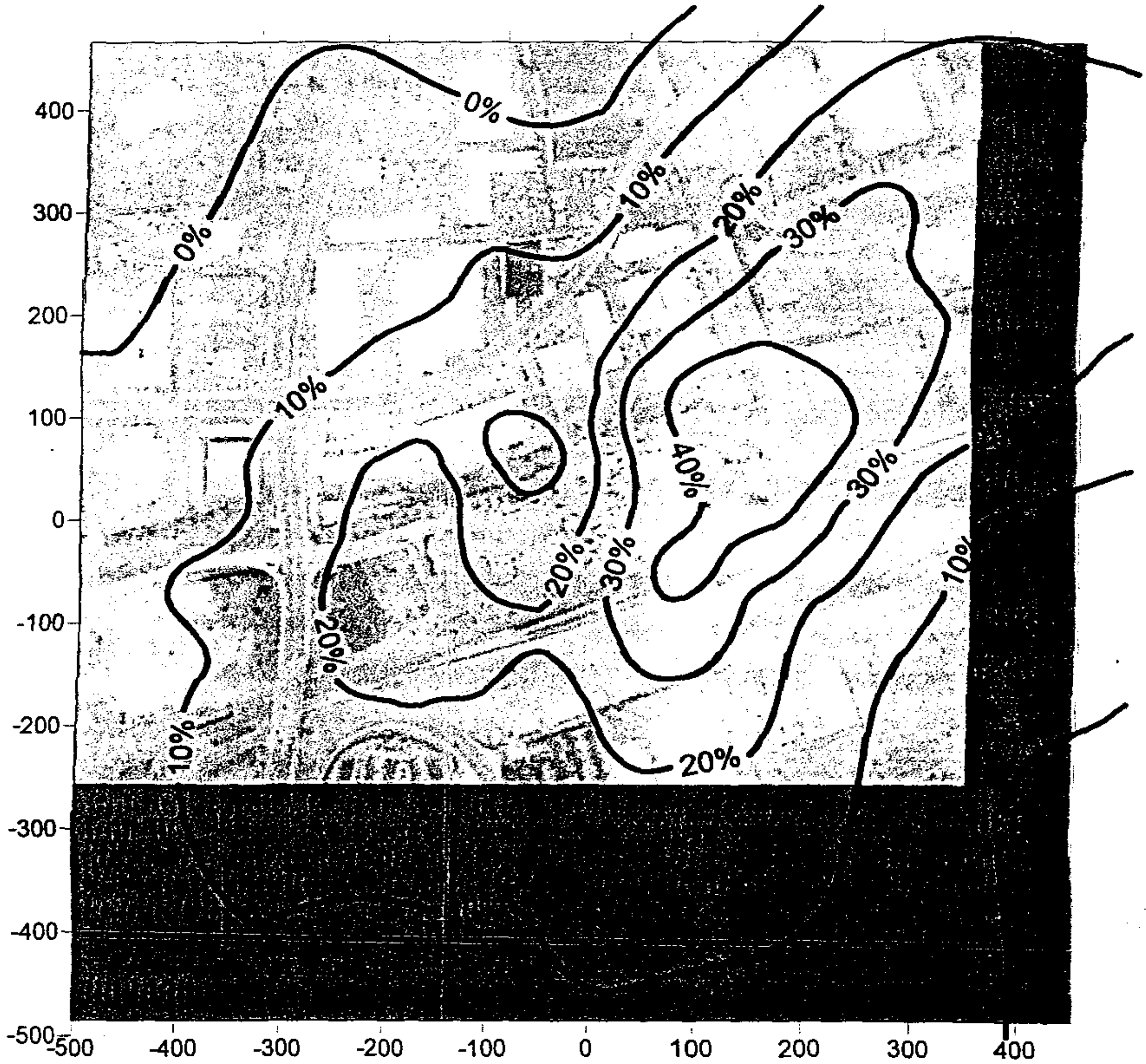
277

Figure 3-30.
Percent reduction in facility's contribution to SO2 24-hour impacts for the Proposed SUP Scenario from the Baseline Scenario (year 2003).



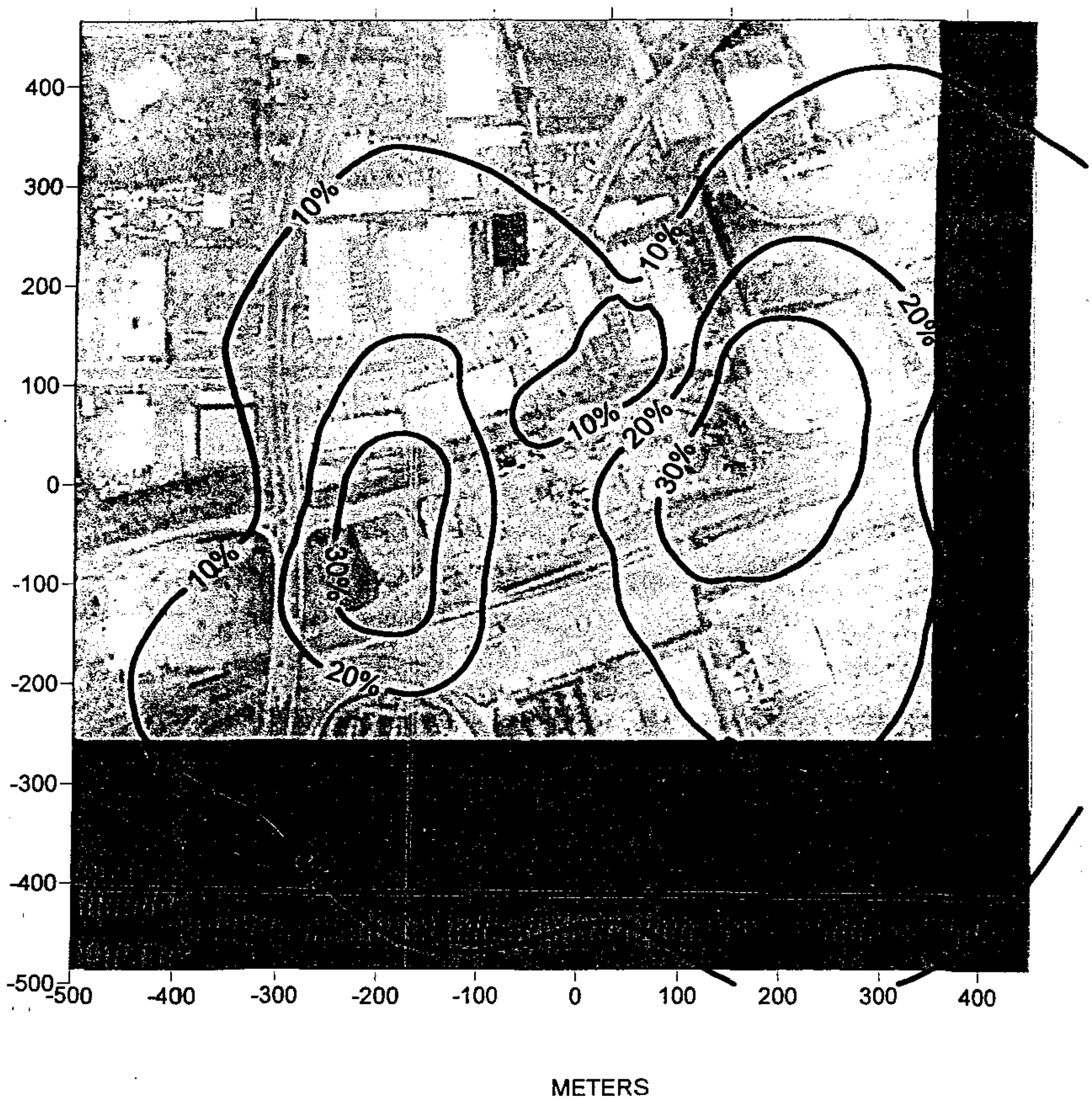
278

Figure 3-31.
Percent reduction in facility's contribution to SO2 annual impacts for the Proposed SUP Scenario from the Baseline Scenario (year 2001).



275

Figure 3-32.
Percent reduction in facility's contribution to NO2 annual impacts for the Proposed SUP Scenario from the Baseline Scenario (year 2001).



280

'able A-1. Plant Dryers, Lime Silo and Asphalt Cement Heaters (all vented through stacks) - Baseline Scenario.

	Short-term Factors (AP-42 or CE/PM test data)						g-term Factors (lb/ton values equiv. to short-t					
	PM_{10}	$PM_{2.5}$	CO	Pb	SO_2	VOC	PM_{10}	$PM_{2.5}$	CO	NO_2	SO_2	VOC
	lb/ton						lb/ton					
Dryer 1	0.016	0.015	0.130	1.5E-05	0.065	0.003	0.016	0.015	0.130	0.021	0.065	0.003
Dryer 2	0.009	0.009	0.012	1.5E-05	0.065	0.002	0.009	0.009	0.012	0.023	0.065	0.002
	lb/1000 gals						lb/1000 gals					
Htr 1	--	--	--	--	--	--	--	--	--	--	--	--
Htr1or2	3.3	3.3	1.2	1.2E-03	71	0.252	3.3	3.3	1.2	20	71	0.252

Dryers

	Rating, tons		Annual Limits		Type of Cntr	Stack Parameters(a)				Test Result		Maximum Short-term Rates - gps						Annual Rates - gps					
	Per hr	Per day	tpy or gpy	App. Cap.		dscf/hr at 75% load(a)	Tem K	Dia. m.	Vel. mps	PM_{10} gr/dscf	$PM_{2.5}$ gr/dscf	PM_{10}	$PM_{2.5}$	CO	Pb	$SO_{2\text{-}3hr}$	SO_2-24	PM_{10}	$PM_{2.5}$	CO	NO_2	SO_2	VOC
P1 Dryer (a	600	14,400	690,000	0.13	Bag.	2040354	364	1.66	7.41	0.0028	0.0026	1.17	1.15	9.82	1.1E-03	4.91	4.91	0.15	0.15	1.29	0.21	0.64	0.028
P2 Dryer (a	400	9,600	210,000	0.06	Bag.	698504	366	1.25	4.48	0.0055	0.0050	0.46	0.44	0.60	7.6E-04	3.27	3.27	0.03	0.03	0.04	0.07	0.20	0.006
Lime Silo	25	tons	6,000	no emissions -- process not used.								--	--	--	--	--	--	--	---	--	--	--	--
											Permit Limits, Annual							*17.3*	*none*	*76.9*	*16.1*	*43.6*	*2.0*

Asphalt Heater(s)

	Rating		#5 Fuel Oil (gals/yr)	#2Fuel Oil (gals/yr)			Tem K	Dia. m.	Vel. mps			Maximum Short-term Rates - gps						Annual Rates - gps					
												PM_{10}	$PM_{2.5}$ (f)	CO	Pb	SO_2	SO_2-24	PM_{10}	$PM_{2.5}$	CO	NO_2	SO_2	VOC
Hot Oil Htr	5.64	MMBtu/ hr.	125,000	0	56.4	rain cap in place	589	0.43	0.001	--	--	0.017	0.017	0.006	6.1E-06	0.360	0.360	0.006	0.006	0.002	0.000	0.127	0.127
Alt. Hot Oil Htr (d)	2.5	MMBtu/ hr	0	0	25	no data	no flue gas data - assume Htr. 1 ops.			--	--	--	--	--	--	--		--	--	--	--	--	--
											Total Tons Per Year	0.6	0.6	0.2	2.E-04	12.5	12.5	0.2	0.2	0.1	0.0	4.4	4.4
											Permit Limits, Annual							*0.8*	*‾0.8*	*0.6*	*5.8*	*8.7*	*none*
											Total Tons Per Year	57.4	55.8	362.9	0.1	297.2	297.2	6.5	6.4	46.2	9.7	33.7	5.6

Notes:

ı) Used T. 11.1-8 and 11.1-9 for drum mix plants in AP-42 Section 11.1. Used TOC emissions factors for VOC.

:) Heater emission rates derive from memo, dated 8/22/05, S. Zemba from CE to L.Sharma, City; T. 2.; assumes 110,000 Btu per gallon for No. 5 fuel oil, respectively. .

:) from "Source Sampling for Particulate Emissions, Hot Mix Asphalt Plant, Virginia Paving Company, August 11-12, 2005," RAMCON Environmental, used worst-case result among both fuels for Plant 1. RAMCON stated that flow rate was average; flowrates used here were scaled by 100/75 to reflect approximate values at 75% load (see "Data on Facility Being Stack Tested" in report).

l) worst-case short-term emissions assume operation of only heater no. 1 in modeling analysis; annual emission derive from combustion of fuel limit.

) assumed that PM2.5 emissions for oil combustion in heaters was 75% of PM10 value.

Table A-2. Hot Mix Storage and Loadout Processes - Baseline Scenario.

Emissions associated with Loadout, Storage Tanks and Yard

Emission factor from AP-42, Section 11.1.2.5: Hot Mix Asphalt Plants; Production Operations.

Loadout (p.11.1-9 of AP-42 Section 11.1)

E =	0.00036 lb/ton	PM10 and PM2.5	assumes all PM is PM10/PM2.5; T. 11.1-14
	0.0022 lb/ton	TOC	T. 11.1-14
	0.00072 lb/ton	CO	T. 11.1-14
	7.30E-07 lb/ton	benzene	p. 11.1-9; re-evaluate for V = -0.5

Yard Emissions (p.11.1-9 of AP-42 Section 11.1)

E=	0.00018 lb/ton	PM10 and PM2.5	assumed 50% of loadout value
	0.00110 lb/ton	TOC	assumed 50% of loadout value
	0.00036 lb/ton	CO	assumed 50% of loadout value

Silo Filling (T. 11.1-14 of S. 11.1) and Asphalt Storage Tanks

E=	0.00015 lb/ton	PM10 and PM2.5	T. 11.1-14 for total PM
	0.00715 lb/ton	TOC	T. 11.1-14 f
	0.00070 lb/ton	CO	T. 11.1-4

Asphalt Storage Tanks (c) *assumed 10% of silo emissions; added to silo filling values*

283

					Maximum Short-term Rates (gps)						Maximum Long-term Rates (gps)					
Source Name	Max. Annual Process Rate (tpy)	Peak Process Rate (tph)	Daily Process Rate (tpd)	Control % (Blue Smoke©, for PM only)	PM10	PM2.5	CO	NO2	SO2-3hr	SO2 - 24hr	PM10	PM2.5	CO	NO2	SO2	VOC
Loadout and Yard Plant 1.	690000	600	14400	0	0.041	0.041	0.082	--	--	--	0.005	0.005	0.011	0.000	0.000	0.033
Silos Plant 1.	690000	600	14400	0	1.163E-02	1.163E-02	0.053	--	--	--	1.526E-03	1.526E-03	0.007	0.000	0.000	0.071
Loadout and Yard Plant 2.	210000	400	9600	0	0.027	0.027	0.054	--	--	--	0.002	0.002	0.003	0.000	0.000	0.010
Silos Plant 2.	210000	400	9600	0	7.751E-03	7.751E-03	0.035	--	--	--	4.645E-04	4.645E-04	0.002	0.000	0.000	0.022
				TOTAL TONS	3.0	3.0	7.8	0.0	0.0	0.0	0.3	0.3	0.8	0.0	0.0	4.7

Notes:

(a) 24-hour emissions are based on maximum hourly process rate and peak emission factor.

(b) Annual emissions are based on annual limited throughputs.

c) From Section 7.1 of AP-42 for VOC storage tanks.

Table A-3. Aggregate Handling Processes - Baseline Scenario.

Drop Operations(a): E= k (0.0032) (U/5)^1.3 / [(M/2)^1.4]

where:

k = 0.11 [particles < 2.5um]

k = 0.35 [particles < 10um]

U1 = 7.3 [mph, estimated daily avg. worst case wind speed, based on 8 hr @ 10mph and 16 hr @ 6 mph]

U3 = 4.38 [mph, annual average wind speed]

	RAP	Sand	Stone(a)
Moist., M =	5.00	6.5	1.30 %
Silt, S =	7.4		2.31 %
worst-case (short-term):			
E (lb $PM_{2.5}$ per ton material handled) =	1.60E-04	1.11E-04	1.05E-03
E (lb PM_{10} per ton material handled) =	5.08E-04	3.52E-04	3.35E-03
average (long-term):			
E (lb $PM_{2.5}$ per ton material handled) =	8.22E-05	5.69E-05	5.42E-04
E (lb PM_{10} per ton material handled) =	2.61E-04	1.81E-04	1.72E-03

RAP Crusher	PM_{10}	$PM_{2.5}$ (see Note b)
E (lb per ton) =		
Tertiary Crushing, no cont.	2.40E-03	4.44E-04

Materials Used, typical year (from 'silt and tpy', Cl

	Sand	Agg.	RAP-E	RAP-W	Asphalt	(Typ.tons/day)
Typical Tons	271,523	363,026	77,605	77,605	900,000	2,466
Max. Annual	362,031	484,035	103,473	103,473	1,200,000	
Max. Daily	3,017	4,034	862	862		10,000
Max. Daily	7,241	9,681	2,069	2,069		24,000

AP-42 Factor	Source Name	Daily Rate (ton/day)	Annual Rate (ton/year)	Control %	Maximum 24-hour Emissions - gps PM10	Maximum 24-hour Emissions - gps PM2.5	Long-term Emissions - gps (e) PM10	Long-term Emissions - gps (e) PM2.5	Control System
Drop (to Pile)	RAP Dump from Trucks - West Pile	2,069	77,605	0	0.0055	0.0017	0.0003	0.0001	none
Drop to Truck	RAP Pile Reclaim - drop into truck - West Pile	2,069	77,605	0	0.0055	0.0017	0.0003	0.0001	none
Drop to Pile	RAP Dump from Trucks - East Pile	2,069	77,605	0	0.0055	0.0017	0.0003	0.0001	none
Drop to Truck	RAP Pile Reclaim - drop into truck - East Pile	2,069	77,605	0	0.0055	0.0017	0.0003	0.0001	none
Drop to Pile	Sand Drop from Trucks	7,241	271,523	0	0.0134	0.0042	0.0007	0.0002	none
Drop to Truck	Sand Pile -drop into truck	7,241	271,523	0	0.0134	0.0042	0.0007	0.0002	none
Tertiary Crushing	RAP Crusher on RAP West	4,139	155,210	0	0.0521	0.0096	0.0054	0.0010	*must be equivalent to AP-42*
Drop	Aggregate Dump to Plant 1 and Plant 2	9,681	363,026	0	0.1699	0.0534	0.0090	0.0028	none
				TOTAL TONS=	9.4	2.7	0.6	0.2	

884

Notes:

a) Stone, RAP and sand dropping: *Emission factor from AP-42, Section 13.2.4: Aggregate Handling and Storage Piles (1/95), Equation (1) - batch or continuous drop operation*

b) RAP Crushing: : from AP-42, Section 11.19.2 - Crushed Stone Processing and Pulverized Mineral Processing; Table 11.19.2-2

c) Reclaim Operations: from AP-42 Section 11.9 - "Western Surface Coal Mining;" Table 11.9-1, for bulldozing of overburden (silt and moisture dependent, per hour of operation)

d) from CE spreadsheet "Fugitive Emission Factors Moisture" and "....Silt;" stone/(sand and rap) usage approximately 1:1.

e) assumed 25% capacity factor.

'able A-4. Truck Emissions - Engine and Roadway - Baseline Scenario.

'M_{10} and $PM_{2.5}$ from Roadway Travel

'aved Roads: *Emission factor from AP-42; Section 13.2.1; Paved Raods (12/03), Eqn. (1).*

Jnpaved Roads: *Emission factor from AP-42; Section 13.2.2; Eqn. (1a)*

E paved = [kp (sL/2)^.65 x (W/3)^ 1.5 - C] * (1 - P/4N)   lb per VMT

: unpaved = [ku * (s/12)^a * (W/3)^b]

where:

kp = 0.0016   ku = 0.23 [particles < 2.5um]   **kp revised to PM2.5/PM10 = 0.1**

kp = 0.016   ku = 1.5 [particles < 10um]

sL= road silt load, gr./sq. m., = 120 for asphalt batching   1 **sL revised per tests, Dec. 05**

s= silt content, %   5 representative of average for unpaved road areas between storage areas, as recommended by S. 13.2.2.

C = emission factor; exhaust, brake, tire wear, lb/VMT=   3.60E-04 $PM_{2.5}$

a = 0.90   4.70E-04 PM_{10}

b = 0.45

(1-P/4N) = 0.98   35.00 area-specific SAMSON data

W = Mean Veh. Weight, tons   Unpaved   20.00 29 tons full, 11 tons empty, CE, Dec. 05

Paved   33.50 CE, Dec. 05

N = No. of days in period (assume per year if use P based on year): ***assume watering as described.***

Resulting Factors:

	Trucks,Paved Roads(w. 50% red):	**Trucks, Unpaved (w. P/4N):**	**Site Veh. Unp. (w. P/4N):**
E (lb PM2.5 per VMT) =	0.009	= 0.24	= 0.30
E (lb PM10 per VMT) =	0.09	= 1.56	= 1.97

Internal Combustion Emissions (all pollutants)

Used MOBILE6.2 ef's for travel and idle PM; HMA no.'s for idle for other polls fo

MOBILE6 - Trv.		**HMA Rp - Trv.**	**HMA-Idle**	**Off-road Equip. (e)**
CO=	4.148	18.82 g/vmt	1.57 g/min	2.6 g/bhp-hr
SO2=	0.011	0.36 g/vmt	0.059 g/min	1.0 g/bhp-hr, revised
NO2=	8.486	8.5 g/vmt	0.917 g/min	4.9 g/bhp-hr
NMVOC	0.847	3.18 g/vmt	0.208 g/min	0.53 g/bhp-hr used CO,
PM10	0.259	2.53 g/vmt	0.02004 **M6.2:**gpm	0.07 g/bhp-hr as for tra
PM2.5	0.259	2.53 g/vmt	0.02004 **M6.2:**gpm	0.07 g/bhp-hr

Total Hp-hours of Off-road Equipment (e):		
(Used CE's e.f.'s, reduced for Off-road Rule)		**HP-hr/day**
Front-end Loader	=2 loaders * 300 HP*10hrs/day*2shifts	12,000
Bobcat	=45 hp * 4 hrs/day	180
Lift	=50 hp * 1 hr/day	50
Crane	=150 hp * 1 hr/day	150
		12,380
Total	=46 hours per day @ 5 mph;230 mpd	

285

Roadway Sections	**Source Name**	**Mean Veh. Weight (tons) or Idle Time per Truck(5)**	**Pk. Mi. x trips or idle mins per day(a)**	**hp-hr/day(see inset)**	**Avg. Mi. x trips or idle mins per day(a)**	**Control %**	**Maximum Short-term Emissions - gps** PM_{10}	$PM_{2.5}$	CO	Pb	SO_2 - 3hr(b)	SO2- 24 hr	**Long - term Emissions - gps** PM_{10}	$PM_{2.5}$	CO	NO_2	SO_2	VOC
HDDV1 - 7	Fug. PM from HDDVs on Paved Roadway (d)	20.0	495	--	90	50% req. water every 2 3 hrs	0.44	0.04	--	--	--	--	0.08	0.01	--	--	--	--
UPRW,UPRE, UPSND,UPSTN	Fug. PM on Unpaved Roadway(d)	33.5	47	--	14.6	90	0.04	0.01	--	--	--	--	0.04	0.01	--	--	--	--
HDDV1:7	Combustion Emissions on Paved roads	20.0	495	--	120	0	1.5E-03	1.5E-03	2.4E-02	0	6.2E-05	6.2E-05	3.6E-04	3.6E-04	5.8E-03	1.2E-02	1.5E-05	1.2E-03
UPRW,UPRE,UP SND,UPSTN	Combustion Emissions on Unpaved roads	33.5	46.8	--	19.5	0	1.4E-04	1.4E-04	2.2E-03	0	5.9E-06	5.9E-06	5.9E-05	5.9E-05	9.4E-04	1.9E-03	2.5E-06	1.9E-04
UPRW,UPRE, UPSND,UPSTN	On-site Equip: Comb. Emis.on Unpaved Roads	10	--	29,712	4,457	0	2.4E-02	2.4E-02	0.89	0	0.34	0.34	3.6E-03	3.6E-03	0.134	0.253	0.052	0.027
HDDV3	Idling Emissions from Loading HDDVs at Plt. 1	9 mins/veh.	7,200	--	801	0%	1.7E-03	1.7E-03	1.3E-01	0	4.9E-03	4.9E-03	1.9E-04	1.9E-04	1.5E-02	8.5E-03	5.5E-04	5.5E-04
HDDV6	Idling Emissions from Loading HDDVs at Plt. 2	9 mins/veh	4,800	--	432	0	1.1E-03	1.1E-03	8.7E-02	0	3.3E-03	3.3E-03	1.0E-04	1.0E-04	7.8E-03	4.6E-03	2.9E-04	2.9E-04
Notes:						**TOTAL TONS**	**17.8**	**2.7**	**39.6**	**0.0**	**12.3**	**12.3**	**4.3**	**0.6**	**5.7**	**9.7**	**1.8**	**1.0**

(a) Total of lengths of roadways of HDDV 1 through 7, with HDDV1 added twice; all roadways are assumed to be equal to 20 meters wide when modeled.
(b) Daily peak mile-trips, idle minutes and hp-hr/days were scaled to reflect hourly ratings versus daily ratings for SO_2 3-hr rates..

(e) Comb. emissions from.CE's "Fugitive Emission Factors diesel US Filt" s/s, w. no PM filters, and no SO2 red. for non-road diesel rule.
(f) from MOBILE 6.2 for HDDV6 for CO, NO2, SO2, VOC, and total PM10 (assumed equal to PM2.5) for travel at 10 mph; fuel sulfur = 15 ppm. Idle emissions used MOBILE6.2 values also (less than HMA).

Table A-5 Wind Erosion of Material Stock Piles - Baseline and Proposed SUP Scenarios.

Reference: Control of Open Fugitive Dust Sources, Section 4.1.3, EPA-450/3-88-008(a); Cowherd, C., Jr. et. al.

[Wind Erosion From Continuously Active Pile]

E (lb PM per day per acre) = 1.7 (s/1.5)* (365-p)/235* (f/15)

where:

s = dependent on material in pile

p = 35 number of days with >0.01 inches precip. per year

f = 12.6 percentage of time that wind speed exceeds 5.4 m/s at mean pile height

PM_{10}/PM 0.5

$PM_{2.5}$/PM10 0.1 midpoint of observations in T.G. Pace, US EPA

Silt

Specific to material per CE spreadsheet.

Meteorological Data: Inputs derive from Solar and Meteorological Surface Observation Network (SAMSON) data for DC National Airport for years 1986 to 1990, which show that p actual = 35 f actual = 12.6.

Source ID	Source Name	Silt Content(b)	E (lb PM_{10}/day-acre)©	E (lb $PM_{2.5}$/day-acre)	Pile size (acres)	% Control	Max. Short-term Emissions - gps PM10	Max. Short-term Emissions - gps PM2.5	Long-term Emissions - gps PM10	Long-term Emissions - gps PM2.5	Desc. Of Controls
RAP-WEST	Wind Erosion of RAP Pile West	9.0	6.0	0.6	1.0	0.00	0.03	0.003	0.03	0.003	none
RAP-EAST	Wind Erosion of RAP Pile East	9.0	6.0	0.6	1.0	0.00	0.03	0.003	0.03	0.003	none
SNDPILE	Wind Eroson of Sand Pile	7.6	5.1	0.5	0.3	0.00	0.01	0.001	0.01	0.001	none
STONE-BINS	Wind Erosion of Stone Piles	2.3	1.5	0.2	0.7	0.00	0.01	0.001	0.01	0.001	none
						TOTAL TONS =	2.7	0.3	2.7	0.3	

Notes:

(a) PM10 to PM2.5 ratio from AP-42, Section 13.2.4: Aggregate Handling and Storage Piles (1/95), Equation (1) - batch or continuous drop operation

(b) silt content from Cambridge Environmental for fine aggregate (sand and RAP) and coarse aggregate (stone).

able A-6. Plant Dryers, Lime Silo and Asphalt Cement Heaters (all vented through stacks) - Proposed Scenario.

mission Factors

	Short-term Factors (AP-42 or CE/PM test data)						g-term Factors (lb/ton values equiv. to short-t					
	PM_{10}	$PM_{2.5}$	CO	Pb	SO_2	VOC	PM_{10}	$PM_{2.5}$	CO	NO_2	SO_2	VOC
	lb/ton						lb/ton					
Plant 1	0.016	0.015	0.130	1.5E-05	0.065	0.003	0.016	0.015	0.130	0.021	0.065	0.003
Plant 2	0.009	0.009	0.012	1.5E-05	0.065	0.002	0.009	0.009	0.012	0.023	0.065	0.002
	lb/1000 gals						lb/1000 gals					
	--	--	--	--	--	--	--	--	--	--	--	--
Heater	3.3	3.3	1.2	1.2E-03	71	0.252	3.3	3.3	1.2	20	71	0.252

Dryers

	Rating, tons		Annual Limits		Type of Cntr	Stack Parameters(a) dscf/hr	Tem	Dia.	Vel.	Maximum Short-term Rates - gps						Annual Rates - gps					
	Per hr	Per day	tpy or gpy	App. Cap.		at 75% load(a)	K	m.	mps	PM_{10}	$PM_{2.5}$	CO	Pb	$SO_{2\text{-}3hr}$	SO_2-24	PM_{10}	$PM_{2.5}$	CO	NO_2	SO_2	VOC
P1 Dryer (a	600	6000	720,000	0.14	Bag.	2040354	364	1.66	7.41	0.49	0.48	9.82	1.1E-03	4.91	2.04	0.16	0.16	1.34	0.22	0.67	0.029
P2 Dryer (a	400	4000	480,000	0.14	Bag.	698504	366	1.25	4.48	0.19	0.18	0.60	7.6E-04	3.27	1.36	0.06	0.06	0.08	0.16	0.45	0.014
															Current Permit Limit	17.3	none	76.9	16.1	43.6	2.0

Asphalt Heater(s)

	Rating		#2 Fuel Oil (gals/yr)	#2 Fuel Oil (gals/yr)			Tem K	Dia. m.	Vel. mps	Maximum Short-term Rates - gps PM_{10}	$PM_{2.5}$ (f)	CO	Pb	SO_2	SO_2-24	Annual Rates - gps PM_{10}	$PM_{2.5}$	CO	NO_2	SO_2	VOC
Hot Oil Htr	5.64	MMBtu/hr	100,000	0	--	rain cap in place	589	0.43	0.001	0.017	0.017	0.006	6.1E-06	0.360	0.36	0.005	0.005	0.002	2.9E-02	0.102	3.6E-04
Alt. Hot Oil Htr (d)	2.5	MMBtu/hr	--	--	--	--	no flue gas data - assume Htr. 1 ops.			--	--	--	--	--		--	--	--	--	--	--
									tons:	0.6	0.6	0.2	0.0	12.5	12.5	0.2	0.2	0.1	1.0	3.6	0.0
																0.8	0.8	0.6	5.8	8.7	none
										Maximum Potential, w.out Limits						Maximum Potential Permited Emissions					
										24.3	23.6	362.9	0.1	297.2	131.2	8.0	7.7	49.7	14.1	42.6	1.5

287

Notes:

a) Used T. 11.1-8 and 11.1-9 for drum mix plants in AP-42 Section 11.1. Used TOC emissions factors for VOC.

c) Heater emission rates derive from memo, dated 8/22/05, S. Zemba from CE to L.Sharma, City; T. 2.; assumes 110,000 Btu per gallon for No. 5 fuel oil, respectively. .

e) from "Source Sampling for Particulate Emissions, Hot Mix Asphalt Plant, Virginia Paving Company, August 11-12, 2005," processed by CE.

d) worst-case short-term emissions assume operation of only heater no. 1 in modeling analysis; annual emission derive from combustion of fuel limit.

f) assumed that PM2.5 emissions for oil combustion in heaters was 75% of PM10 value.

Table A-7. Hot Mix Storage and Loadout Processes - Proposed Scenario.

Emissions associated with Loadout, Storage Tanks and Yard

Emission factor from AP-42, Section 11.1.2.5: Hot Mix Asphalt Plants; Production Operations.

Loadout (p.11.1-9 of AP-42 Section 11.1)

E =	0.00036	lb/ton	PM10 and PM2.5	assumes all PM is PM10/PM2.5; T. 11.1-14
	0.0022	lb/ton	TOC	T. 11.1-14
	0.00072	lb/ton	CO	T. 11.1-14
	7.30E-07	lb/ton	benzene	p. 11.1-9; re-evaluate for V = -0.5

Yard Emissions (p.11.1-9 of AP-42 Section 11.1)

E=	0.00018	lb/ton	PM10 and PM2.5	assumed 50% of loadout value
	0.00110	lb/ton	TOC	assumed 50% of loadout value
	0.00036	lb/ton	CO	assumed 50% of loadout value

Silo Filling (T. 11.1-14 of S. 11.1) and Asphalt Storage Tanks

E=	0.00015	lb/ton	PM10 and PM2.5	T. 11.1-14 for total PM
	0.00715	lb/ton	TOC	T. 11.1-14 f
	0.00070	lb/ton	CO	T. 11.1-4

Asphalt Storage Tanks (c) ***assumed 10% of silo emissions; added to silo filling values***

					Maximum Short-term Rates (gps)						Maximum Long-term Rates (gps)					
Source Name	Max. Annual Process Rate (tpy)	Peak Process Rate (tph)	Daily Process Rate (tpd)	Control % (Blue Smoke©, for PM only)	PM10	PM2.5	CO	Pb	SO2-3hr	SO2-24hr	PM10	PM2.5	CO	NO2	SO2	VOC
Loadout and Yard Plant 1.	720000	600	6000	99	0.006	0.006	0.082	--	--	--	0.002	0.002	0.011	0.000	0.000	0.034
Silos Plant 1.	720000	600	6000	99	4.845E-05	4.845E-05	0.053	--	--	--	1.593E-05	1.593E-05	0.007	0.000	0.000	0.074
Loadout and Yard Plant 2.	480000	400	4000	99	0.004	0.004	0.054	--	--	--	0.001	0.001	0.007	0.000	0.000	0.023
Silos Plant 2.	480000	400	4000	99	3.230E-05	3.230E-05	0.035	--	--	--	1.062E-05	1.062E-05	0.005	0.000	0.000	0.049
				TOTAL TONS	0.3	0.3	7.8	0.0	0.0	0.0	0.1	0.1	1.1	0.0	0.0	6.3

288

Notes:

(a) 3-hour emissions are based on maximum hourly process rate; 24-hour on limited daily rate.

(b) Annual emissions are based on annual limited throughputs.

Table A-8. Aggregate Handling Processes - Proposed Scenario.

Drop Operations(a); E= k (0.0032) (U/5)^1.3 / [(M/2)^1.4]

where:

k = 0.11	[particles < 2.5um]
k = 0.35	[particles < 10um]
U1 = 7.3	[mph, estimated daily avg. worst case wind speed, based on 8 hr @ 10mph and 16 hr @ 6 mph]
U3 = 4.38	[mph, annual average wind speed]

	RAP	Sand	Stone(a)	
Moist., M =	5.00	6.5	1.30	%
Silt, S =	7.4		2.31	%
worst-case (short-term):				
E (lb $PM_{2.5}$ per ton material handled) =	1.60E-04	1.11E-04	1.05E-03	
E (lb PM_{10} per ton material handled) =	5.08E-04	3.52E-04	3.35E-03	
average (long-term):				
E (lb $PM_{2.5}$ per ton material handled) =	8.22E-05	5.69E-05	5.42E-04	
E (lb PM_{10} per ton material handled) =	2.61E-04	1.81E-04	1.72E-03	

RAP Crusher	PM_{10}	$PM_{2.5}$ (see Note b)
E (lb per ton) =		
Tertiary Crushing, w. cont.	5.40E-04	1.00E-04

Materials Used, typical year (from 'silt and tpy', CE)						
	Sand	Agg.	RAP-E	RAP-W	Asphalt	Typ.tons/day)
Typ. Tons	271,523	363,026	77,605	77,605	900,000	2,466
Max. Annual	362,031	484,035	103,473	103,473	1,200,000	
Max. Daily	3,017	4,034	862	862		10,000

AP-42 Factor	Source Name	Daily Rate (ton/day)	Annual Rate (ton/year)	Control %	Maximum 24-hour Emissions - gps PM10	Maximum 24-hour Emissions - gps PM2.5	Long-term Emissions - gps PM10	Long-term Emissions - gps PM2.5	Control System
Drop (to Pile)	RAP Dump from Trucks - West Pile	862	103,473	0	0.0023	0.0007	0.0004	0.0001	none
Drop to Truck	RAP Pile Reclaim - drop into truck - West Pile	862	103,473	0	0.0023	0.0007	0.0004	0.0001	none
Drop to Pile	RAP Dump from Trucks - East Pile	862	103,473	0	0.0023	0.0007	0.0004	0.0001	none
Drop to Truck	RAP Pile Reclaim - drop into truck - East Pile	862	103,473	0	0.0023	0.0007	0.0004	0.0001	none
Drop to Pile	Sand Drop from Trucks	3,017	362,031	0	0.0056	0.0017	0.0009	0.0003	none
Drop to Truck	Sand Pile -drop into truck	3,017	362,031	0	0.0056	0.0017	0.0009	0.0003	none
Tertiary Crushing	RAP Crusher on RAP West	1,725	206,947	*app. 80%*	0.0049	0.0009	0.0016	0.0003	*must be equivalent to AP-42*
Drop	Aggregate Dump to Plant 1 (60% of agg. Total)	2,420	290,421	0	0.0425	0.0134	0.0072	0.0023	none
				TOTAL TONS=	2.4	0.7	0.4	0.1	

289

Notes:

a) Stone, RAP and sand dropping: *Emission factor from AP-42, Section 13.2.4: Aggregate Handling and Storage Piles (1/95), Equation (1) - batch or continuous drop operation*

b) RAP Crushing: : from AP-42, Section 11.19.2 - Crushed Stone Processing and Pulverized Mineral Processing; Table 11.19.2-2

(I) from CE spreadsheet "Fugitive Emission Factors Moisture" and "....Silt;" stone/(sand and rap) usage approximately 1:1.

Table A-9. Truck Emissions - Engine and Roadway - Proposed Scenario.

PM_{10} and $PM_{2.5}$ from Roadway Travel

Paved Roads: Emission factor from AP-42; Section 13.2.1; Paved Raods (12/03), Eqn. (1).

Unpaved Roads: Emission factor from AP-42; Section 13.2.2; Eqn. (1a)

E paved = [kp (sL/2)^.65 x (W/3)^ 1.5 - C] * (1 - P/4N) lb per VMT

E unpaved = [ku * (s/12)^a * (W/3)^b]

where:

kp =	0.0016	ku =	0.23 [particles < 2.5um]	**kp revised to PM2.5/PM10 = 0.1**
kp =	0.016	ku =	1.5 [particles < 10um]	
sL=	road silt load, gr./sq. m., = 120 for asphalt batching		1	**sL revised per tests, Dec. 05**
s=	silt content, %		5	representative of average for unpaved road areas between storage areas, as recommended by S. 13.2.2.
C =	emission factor; exhaust, brake, tire wear, lb/VMT=		3.60E-04	$PM_{2.5}$
			4.70E-04	PM_{10}
a =	0.90			
b =	0.45			
(1-P/4N) =	***to get 0.5 reduction: must water every 2 - 3 hrs***		35.00	area-specific SAMSON data
W =	Mean Veh. Weight, tons	Unpaved	20.00	29 tons full, 11 tons empty, CE, Dec. 05
		Paved	33.50	CE, Dec. 05
N =	No. of days in period (assume per year if use P based on year): ***assume watering as described.***			

Resulting Factors:

	Trucks,Paved Roads:	Trucks, Unpaved Roads:	Site Vehs, Unpaved:
E (lb PM2.5 per VMT) =	0.009	= 0.24	= 0.30
E (lb PM10 per VMT) =	0.09	= 1.56	= 1.97

Internal Combustion Emissions (all pollutants)

Used MOBILE6.2 ef's for travel and idle PM; HMA no.'s for idle for others.

	MOBILE6 - Trv.	HMA Rp - Trv.	HMA-Idle	Off-road Equip. (e)
CO=	4.148	18.82 g/vmt	1.57 g/min	2.6 g/bhp-hr
SO2=	0.011	0.36 g/vmt	0.059 g/min	0.5 g/bhp-hr, revised
NO2=	8.486	8.5 g/vmt	0.917 g/min	4.9 g/bhp-hr
NMVOC	0.847	3.18 g/vmt	0.208 g/min	0.53 g/bhp-hr used CO
PM10	0.259	2.53 g/vmt	0.02004 **M6.2:**gpm	0.07 g/bhp-hr as for tra
PM2.5	0.259	2.53 g/vmt	0.02004 **M6.2:**gpm	0.07 g/bhp-hr

Total Hp-hours of Off-road Equipment (e):		
(assumed annual/peak use = 20%)		**HP-hr/day**
Front-end Loader	=2 loaders * 300 HP*10hrs/day*2shifts	12,000
Bobcat	=45 hp * 4 hrs/day	180
Lift	=50 hp * 1 hr/day	50
Crane	=150 hp * 1 hr/day	150
		12,380
Total	=46 hours per day @ 5 mph;230 mpd	

290							Maximum Short-term Emissions - gps						Long - term Emissions - gps					
Roadway Sections	Source Name	Mean Veh. Weight (tons) or Idle Time per Truck(5)	Pk. Mi. x trips or idle mins per day(a)	hp-hr/day(see Inset)	Avg. Mi. x trips or idle mins per day(a)	Control %	PM_{10}	$PM_{2.5}$	CO (b)	Pb	SO_2 - 3hr(b)	SO2- 24 hr	PM_{10}	$PM_{2.5}$	CO	NO_2	SO_2	VOC
HDDV1 - 7	Fug. PM from HDDVs on Paved Roadway (d)	20.0	206	--	108	50% req. water every 2 3 hrs	0.09	0.01	--	--	--	--	0.05	0.00	--	--	--	--
UPRW,UPRE, UPSND,UPSTN	Fug. PM on Unpaved Roadway(d)	33.5	20	--	19.5	90	0.02	0.00	--	--	--	--	0.02	0.00	--	--	--	--
HDDV1:7	Combustion Emissions on Paved roads	20.0	206	--	108	0	6.2E-04	6.2E-04	2.4E-02	0	6.2E-05	2.6E-05	3.3E-04	3.3E-04	5.2E-03	1.1E-02	1.4E-05	1.1E-03
UPRW,UPRE,UPSND,UPSTN	Combustion Emissions on Unpaved roads	33.5	19.5	--	19.5	0	5.9E-05	5.9E-05	2.2E-03	0	5.9E-06	2.5E-06	5.9E-05	5.9E-05	9.4E-04	1.9E-03	2.5E-06	1.9E-04
UPRW,UPRE, UPSND,UPSTN	On-site Equip: Comb. Emis.on Unpaved Roads	10	--	12,380	2,476	90% for PM(e)	1.0E-03	1.0E-03	0.89	0	0.17	0.07	2.0E-04	2.0E-04	0.075	0.140	0.014	0.015
HDDV3	Idling Emissions from Loading HDDVs at Plt. 1	9 mins/veh.	3,000	--	1,068	0%	7.0E-04	7.0E-04	1.3E-01	0	4.9E-03	2.0E-03	2.5E-04	2.5E-04	1.9E-02	1.1E-02	7.3E-04	7.3E-04
HDDV6	Idling Emissions from Loading HDDVs at Plt. 2	9 mins/veh	2,000	--	575	0	4.6E-04	4.6E-04	8.7E-02	0	3.3E-03	1.4E-03	1.3E-04	1.3E-04	1.0E-02	6.1E-03	3.9E-04	3.9E-04
						TOTAL TONS	**3.9**	**0.5**	**39.6**	**0.0**	**6.3**	**2.6**	**2.3**	**0.3**	**3.8**	**5.9**	**0.5**	**0.6**

Notes:

(a) Total of lengths of roadways of HDDV 1 through 7, with HDDV1 added twice; all roadways are assumed to be equal to 20 meters wide when modeled.
(b) Daily peak mile-trips, idle minutes and hp-hr/days were scaled to reflect hourly ratings versus daily ratings for SO_2 3-hr rates..

(e) Comb. emissions from CE's "Fugitive Emission Factors diesel US Filt" s/s, w. PM red. by 90% for filters, and SO2 red. for non-road diesel rule (by 50% resp).
(f) from MOBILE 6.2 for HDDV6 for CO, NO2, SO2, VOC, and total PM10 (assumed equal to PM2.5) for travel at 10 mph; fuel sulfur = 15 ppm. Idle emissions used MOBILE6.2 values also (less than HMA).

Table A-10. Maximum Estimated Impacts of Hazardous Air Pollutants that are Present in Highest Quantities.

Toxic Air Pollutant	Emis. Factor Reference	Emis. Rate	Emission Rate	MW	Notes	Ceiling	STEL	TWA	ACGIH[c] Standard via 2005 Publication: Ceiling	STEL	TWA	VADEQ Standard or IRIS Standard (shown in italic)[e,f]: 1-hour	annual	Ratio of Emis. to 1-hr Std.: 1-hour
						ppm(3)			micrograms per cubic meter					
Offroad Diesels(a)		lb/mmbtu	mg/mile(g)											
acetaldehyde	AP-42 S. 3.3 (Diesels)	0.000767	60.670	44.05	Note6	25			45041			1126.0	no std.	5.4E-02
acrolein	as above	9.25E-05	7.317	56.06	Note6	0.1			229			5.7	*0.02*	1.3E+00
benzene		9.33E-04	73.800	78.11			2.5	0.5		7986.71	1597	199.7	3.19	3.7E-01
1.3 butadiene		3.91E-05	3.093	54.09				2			4425	44.2	8.85	7.0E-02
ethylbenzene(styrene)		--												
formaldehyde		1.18E-03	93.338	30.03	Note6	0.3			368			9.2	ns	1.0E+01
hexane		--												
isooctane		--												
MEK		--												
propionaldehyde		--		58.1		20			47526			1188.1	ns	
quinone		--												
methyl chloroform		--												
napthalene		8.48E-05	6.708	128.19			15	10		78644	52429	1966.1	*3.00*	3.4E-03
toluene		4.09E-04	32.352	92.13				50			188405	9420.2	376.81	3.4E-03
xylene		2.85E-04	22.544	106.16			150	100		651288	434192	16282.2	*100.00*	1.4E-03
Onroad Diesels - HDDV-6s			mg/mile											
acetaldehyde	from M6.2 for HDDV6		26.430	44.05	Note6	25			45041			1126.0	no std.	2.3E-02
acrolein	as above		3.210	56.06	Note6	0.1			229			5.7	*0.02*	5.6E-01
benzene			9.640	78.11			2.5	0.5		7986.71	1597	199.7	3.19	4.8E-02
1.3 butadiene			5.600	54.09				2			4425	44.2	8.85	1.3E-01
ethylbenzene														
formaldehyde			71.770	30.03	Note6	0.3			368			9.2	ns	7.8E+00
hexane														
isooctane														
MEK														
propionaldehyde			5.340	58.1		20			47526			1188.1	ns	4.5E-03
quinone														
methyl chloroform														
napthalene			0.303	128.19			15	10		78644	52429	1966.1	*3.00*	1.5E-04
toluene			2.800	92.13				50			188405	9420.2	376.81	3.0E-04
xylene			4.200	106.16			150	100		651288	434192	16282.2	*100.00*	2.6E-04
Dryer, Hot Screens and Mixer w. Fabric Filter (waste or no. 2 oil-fired)														
			lb/ton											
acetaldehyde	highest from T. 11.1-9		1.3E-03	44.05	Note6	25			45041			1126.0	no std.	1.2E-06
acrolein	highest from T. 11.1-9		2.6E-05	56.06	Note6	0.1			229			5.7	*0.02*	4.5E-06
benzene	highest from T. 11.1-9		3.9E-04	78.11			2.5	0.5		7986.71	1597	199.7	3.19	2.0E-06
ethylbenzene	highest from T. 11.1-9		2.2E-03	106.16			125	100		542740	434192	13568.5	868.38	1.6E-07
[illegible]	highest from T. 11.1-9		3.1E-03	30.03	Note6	0.3			368			9.2	ns	3.4E-04

891

Table A-10. Maximum Estimated Impacts of Hazardous Air Pollutants that are Present in Highest Quantities.

Toxic Air Pollutant	Emis. Factor Reference	Emis. Rate	Emission Rate	MW	Notes	Ceiling	STEL	TWA	ACGIH[c] Standard via 2005 Publication: Ceiling	STEL	TWA	VADEQ Standard or IRIS Standard (shown in italic)[e,f]: 1-hour	annual	Ratio of Emis. to 1-hr Std.: 1-hour
						ppm(3)			micrograms per cubic meter					
hexane	highest from T. 11.1-9		9.2E-04	86.18			1000	500		3524744	1762372	88118.6	3524.74	1.0E-08
hydrogen chloride			2.1E-04									75.0	*ns*	2.8E-06
isooctane	highest from T. 11.1-9		4.0E-05	114.2		300			1401227			35030.7	*ns*	1.1E-09
lead			1.5E-05								50	2.5	0.10	6.0E-06
MEK	highest from T. 11.1-9		2.0E-05	72.1			300	200		884663	589775	22116.6	1179.55	9.0E-10
propionaldehyde	highest from T. 11.1-9		1.3E-04	58.1		20			47526			1188.1	ns	1.1E-07
quinone	highest from T. 11.1-9		1.6E-04	108.09		0.1			442			11.1	ns	1.4E-05
methyl chloroform	highest from T. 11.1-9		4.8E-05	133.42			350	450		1909898	2455583	47747.4	4911.17	1.0E-09
napthalene	highest from T. 11.1-9		6.5E-04	128.19			15	10		78644	52429	1966.1	*3.00*	3.3E-07
toluene	highest from T. 11.1-9		2.9E-03	92.13				50			188405	9420.2	376.81	3.1E-07
xylene	highest from T. 11.1-9		2.7E-03	106.16			150	100		651288	434192	16282.2	*100.00*	1.7E-07
Load-out, Yard and Storage Silos (each HAP as % of Total Organic Compound Rate for process)														
		% of TOC	lb/ ton											
napthalene (emitted as PM, so is controlled)	as % of PM from T. 11.1-15; uses highest from load,yard,silo	1.82	1.1E-05	128.19			15	10		78644	52429	1966.1	*3.00*	5.5E-11
benzene	as above	0.052	3.1E-07	78.11			2.5	0.5		7986.71	1597	199.7	3.19	1.5E-09
bromomethane		0.0096	5.7E-08	94.95				1			3883	194.2	7.77	2.9E-10
2-butanone		0.049	2.9E-07	72.1			300	200		884663	589775	22116.6	1179.55	1.3E-11
carbon disulfide		0.016	9.4E-08	76.14				10			31141	1557.1	62.28	6.1E-11
chloromethane		0.023	1.4E-07	50.49			100	50		206503	103252	5163	206.50	2.6E-11
cumene		0.11	6.5E-07	120.19				50			245787	12289.4	*400.00*	5.3E-11
ethylbenzene		0.28	1.7E-06	106.16			125	100		542740	434192	13569	*868.38*	1.2E-10
formaldehyde		0.69	4.1E-06	30.03	Note6	0.3			368			9	ns	4.4E-07
n-hexane		0.15	8.9E-07	86.18			1000	500		3524744	1762372	88119	3525	1.0E-11
isooctane		0.018	1.1E-07	114.2		300			1401227			35031	*ns*	3.0E-12
methylene chloride		0.00027	1.6E-09	84.93				50.00			173681	8684	347.36	1.8E-13
styrene		0.0073	4.3E-08	104.16			40	20		170405	85202	4260	170.40	1.0E-11
tetrachloroethene		0.0077	4.5E-08	165.8			100	25		678119	169530	16953	339.06	2.7E-12
toluene		0.21	1.2E-06	92.13				50			188405	9420.2	376.81	1.3E-10
trichlorofluoromethane		0.0013	7.7E-09	137.4		1000			5619632			140491	*ns*	5.5E-14
m-/p-xylene		0.41	2.4E-06	106.16			150	100		651288	434192	16282	868.38	1.5E-10

Notes:

a) list of pollutants is equivalent to that for HDDV's and for Dryers, Hot Mix and Screens w. Fabric Filters. Storage silo HAP pollutants were not used to determine which pollutants to model because HAP emission factors in lb/ton vs. SAAC values are several of orders magnitude than the Hot Mix.. Values for the same pollutants.

b) "The Original List of Hazardous Air Pollutants as Follows," Technology Transfer Website, Air Toxics Website,(www.epa.gov/ttn/atw/orig189.html)

c) Threshold Limit Values for ceiling, short-term exposure limit and time-weighted averages from ACGIH's "2001 TLVs and BEIs."

d) TLV in micrograms/cu.m. = (TLVppm x MW, g/g-mole) / 24.45 x 1000.

e) 9VAC5-60-230 states that for pollutants with a TLV-C (ceiling value), that one-hour concentrations exceeding 1/40 of the TLV-C are significant; for pollutants with both a TLV-STEL and TLV-TWA, that one-hour and annual concentrations exceeding 1/40 of the TLV-STEL and 1/500 of the TLV-TWA are significant; while for pollutants with only a TLV-TWA, that one hour and annual concentrations in excess of 5% and 1/500 of the TLV-TWA, respectively, are significant.

ble A-11. Plant Dryers, Lime Silo and Asphalt Cement Heaters (all vented through stacks) - HAPs for Proposed Scenario.

	Short-term Factors (AP-42)						(AP-42)					
	form.	acrol	1,3 bu	benz	aceta.	quin.	form.	acrol	1,3 bu	benz	aceta.	quin.
	lb/ton						lb/ton					
Dryer 1	3.1E-03	2.6E-05	0	4.0E-04	1.3E-03	2.0E-04	3.1E-03	2.6E-05	0.0E+00	4.0E-04	1.3E-03	2.0E-04
Dryer 2	3.1E-03	2.6E-05	0	4.0E-04	1.3E-03	2.0E-04	3.1E-03	2.6E-05	0.0E+00	4.0E-04	1.3E-03	2.0E-04
	lb/1000 gals						lb/1000 gals					
Htr 1	--	--	--	--	--	--	--	--	--	--	--	--
Htr1or2	3.3E-02	0	0	2.1E-04	0	0	3.3E-02	0	0	2.1E-04	0	0

	Rating, tons		Annual Limits			Stack Parameters(a)					
	Per hr	Per day	tpy or gpy	App. Cap.	Type of Cntr	dscf/hr at 75% load(a)	Tem K	Dia. m.	Vel. mps		
1 Dryer (a	600	6000	720,000	0.14	Bag.	2040354	364	1.66	7.41		
2 Dryer (a	400	4000	480,000	0.14	Bag.	698504	366	1.25	4.48		
me Silo	25	tons	6,000	*no emissions -- process not used.*							
	Rating		*#2 Fuel Oil (gals/yr)*	*#2Fuel Oil (gals/yr)*							
ot Oil Htr	5.64	MMBtu/hr	100,000	0	*none*	*rain cap in place*	589	0.43	0.001	--	--
lt. Hot Oil tr (d)	2.5	MMBtu/hr	0	25,000	*none*	*no data*	*no flue gas data - assume Htr. 1 ops.*			--	--

	Maximum Short-term Rates - gps						Annual Rates - gps					
	formaldehyde	acrolein	1,3 butadiene	benzene	acetaldyde	quinone	formaldehyde	acrolein	1,3 butadiene	benzene	acetaldyde	quinone
1 Dryer (a	2.3E-01	2.0E-03	0	3.0E-02	9.8E-02	9.8E-02	3.2E-02	2.7E-04	0	4.1E-03	1.3E-02	2.9E-02
2 Dryer (a	1.6E-01	1.3E-03	0	2.0E-02	6.5E-02	6.5E-02	2.1E-02	1.8E-04	0	2.8E-03	9.0E-03	1.9E-02
me Silo	--	--	--	--	--	--	--	---	--	--	--	--
ot Oil Htr	1.7E-04	0	0	1.1E-06	0	0	4.7E-05	0	0	3.1E-07	0	0
lt. Hot Oil tr (d)	--	--	--	--	--		--	--	--	--	--	--
Total Tons Per Year	13.6	0.1	0	1.8	5.7	5.7	1.9	0.02	0	0.2	0.8	1.7

293

otes:

Used T. 11.1-8 and 11.1-9 for drum mix plants in AP-42 Section 11.1. Used TOC emissions factors for VOC.
Heater emission rates derive from memo, dated 8/22/05, S. Zemba from CE to L.Sharma, City; T. 2.; assumes 110,000 Btu per gallon for No. 5 fuel oil, respectively. .
from "Source Sampling for Particulate Emissions, Hot Mix Asphalt Plant, Virginia Paving Company, August 11-12, 2005," RAMCON Environmental, used worst-case result among both fuels for Plant 1.
AMCON stated that flow rate was average; flowrates used here were scaled by 100/75 to reflect approximate values at 75% load (see "Data on Facility Being Stack Tested" in report).
worst-case short-term emissions assume operation of only heater no. 1 in modeling analysis; annual emission derive from combustion of fuel limit.
assumed that PM2.5 emissions for oil combustion in heaters was 75% of PM10 value.

Table A-12. Hot Mix Storage and Loadout Processes - HAPs for Proposed Scenario.

Emissions associated with Loadout, Storage Tanks and Yard

Emission factor from AP-42, Section 11.1.2.5: Hot Mix Asphalt Plants; Production Operations.

Total HAPs for Loadout, Yard and Storage Silos (from AP-42 Table 11.1-15; apportionment = 20%, 10% and 70% to loadout, yard, silos per TOC ratios from AP-42)

E =	8.20E-07	lb/ton	formaldehyde
	0	lb/ton	acrolein
	0	lb/ton	1,3,buta
	6.20E-08	lb/ton	benzene
	0	lb/ton	acetaldehyde
	0	lb/ton	quinone

Yard Emissions

E=	4.10E-07	lb/ton	formaldehyde
	0	lb/ton	acrolein
	0	lb/ton	1,3,buta
	3.10E-08	lb/ton	benzene
	0	lb/ton	acetaldehyde
	0	lb/ton	quinone

Silo Filling

Includes Asphalt Storage Tanks, which are assumed 10% of silo emissions.

E=	3.16E-06	lb/ton	formaldehyde
	0	lb/ton	acrolein
	0	lb/ton	1,3,buta
	2.39E-07	lb/ton	benzene
	0	lb/ton	acetaldehyde
	0	lb/ton	quinone

294

					Maximum Short-term Rates (gps)						Maximum Long-term Rates (gps)					
Source Name	Max. Annual Process Rate (tpy)	Peak Process Rate (tph)	Daily Process Rate (tpd)	Control % (Blue Smoke©, for PM only)	formaldehyde	acrolein	1,3 butadiene	benzene	acetaldyde	quinone	formaldehyde	acrolein	1,3 butadiene	benzene	acetaldyde	quinone
Loadout and Yard Plant 1.	720000	600	6000	0	9.3E-05	0	0	7.0E-06	0	0	1.3E-05	0	0	9.6E-07	0	0
Silos Plant 1.	720000	600	6000	0	2.4E-04	0	0	1.8E-05	0	0	3.3E-05	0	0	2.5E-06	0	0
Loadout and Yard Plant 2.	480000	400	4000	0	6.2E-05	0	0	4.7E-06	0	0	8.5E-06	0	0	6.4E-07	0	0
Silos Plant 2.	480000	400	4000	0	1.6E-04	0	0	1.2E-05	0	0	2.2E-05	0	0	1.6E-06	0	0
				TOTAL TONS	0.019	0	0	0.001	0	0	0.003	0	0	0.0002	0.000	0

Notes:

(a) Short-term rates are based on maximum hourly process rate and peak emission factor.

(b) Annual emissions are based on annual limited throughputs.

c) From Section 7.1 of AP-42 for VOC storage tanks.

Table A-13. TruckEmissions - Engine and Roadway - HAPs for Proposed Scenario.

HAPs from Vehicles

To convert to g/bhp-hr, assumed 10 mph for 250 bhp trucks and onsite vehicles:

1 gr/b-hp-hr x 250 hp x 1 hr/ 10 miles = 25.00 g/miles

road silt load, gr./sq. m., = 120 for asphalt batching 1

silt content, % 5 representative of average for unpaved road areas between storage areas, as recommended by S. 13.2.2.

emission factor; exhaust, brake, tire wear, lb/VMT= 3.60E-04 $PM_{2.5}$

0.90 4.70E-04 PM_{10}

0.45

to get 0.5 reduction: must water every 2 - 3 hrs 35.00 area-specific SAMSON data

Mean Veh. Weight, tons Unpaved 20.00 29 tons full, 11 tons empty, CE, Dec. 05

Paved 33.50 CE, Dec. 05

No. of days in period (assume per year if use P based on year): ***assume watering as described.***

Trucks,Paved Roads:		**Trucks, Unpaved Roads:**		**Site Vehs, Unpaved:**	
E (lb PM2.5 per VMT) =	0.000	=	0.00	=	0.00
E (lb PM10 per VMT) =	0.00	=	0.00	=	0.00

Internal Combustion Emissions (all pollutants)

Used MOBILE6.2 ef's for travel and idle PM; HMA no.'s for idle for others.

	MOBILE6 - Trv.	**Idle=M6's Trv x PMidle/PMtrvl**	**Off-road Equip. (e)**
form.	71.8 mg/vmt	5.5 mg/min	3.7 mg/mile
acrol.	3.2 mg/vmt	0.2 mg/min	0.3 mg/bhp-hr
1,3 bu	5.6 mg/vmt	0.4 mg/min	0.1 mg/bhp-hr
benz.	9.6 mg/vmt	0.7 mg/min	3.0 mg/bhp-l used CO,
acetal	26.4 mg/vmt	2.0 mg/min	2.4 mg/bhp-l as for tra'
quin.	0.0 mg/vmt	0.0 mg/min	0.0 mg/bhp-hr

Total Hp-hours of Off-road Equipment (e):		
(assumed annual/peak use = 20%)		**HP-hr/day**
Front-end Loader	=2 loaders * 300 HP*10hrs/day*2shifts	12,000
Bobcat	=45 hp * 4 hrs/day	180
Lift	=50 hp * 1 hr/day	50
Crane	=150 hp * 1 hr/day	150
		12,380
Total	=46 hours per day @ 5 mph;230 mpd	

295

Roadway Sections	**Source Name**	**Mean Veh. Weight (tons) or Idle Time per Truck(5)**	**Pk. Mi. x trips or idle mins per day(a)**	**hp-hr/day(see inset)**	**Avg. Mi. x trips or idle mins per day(a)**	**Control %**	**Maximum Short-term Emissions - gps** formaldehyde	acrolein	1,3 butadiene	benzene	acetaldyde	quinone	**Long - term Emissions - gps** formaldehyde	acrolein	1,3 butadiene	benzene	acetaldyde	quinone
HDDV1 - 7	Fug. PM from HDDVs on Paved Roadway (d)	20.0	206	--	108	0%	0	0	0	0	0	0	0	0	0	0	0	0
UPRW,UPRE, UPSND,UPSTN	Fug. PM on Unpaved Roadway(d)	33.5	19.5	--	19.5	0%	0	0	0	0	0	0	0	0	0	0	0	0
HDDV1:7	Combustion Emissions on Paved roads	20.0	206	--	108	0%	1.7E-04	7.6E-06	1.3E-05	2.3E-05	6.3E-05	0	9.0E-05	4.0E-06	7.0E-06	1.2E-05	3.3E-05	0
UPRW,UPRE,UPSND,UPSTN	Combustion Emissions on Unpaved roads	33.5	19.5	--	19.5	0%	1.6E-05	7.2E-07	1.3E-06	2.2E-06	6.0E-06	0	1.6E-05	7.2E-07	1.3E-06	2.2E-06	6.0E-06	0
UPRW,UPRE, UPSND,UPSTN	On-site Equip: Comb. Emis.on Unpaved Roads	10	--	12,380	2,476	0%	5.3E-04	4.2E-05	1.8E-05	4.2E-04	3.5E-04	0	1.1E-04	8.4E-06	3.5E-06	8.5E-05	7.0E-05	0
HDDV3	Idling Emissions from Loading HDDVs at Plt. 1	9 mins/veh.	3,000	--	1,068	0%	1.9E-04	8.6E-06	1.5E-05	2.6E-05	7.1E-05	0	6.9E-05	3.1E-06	5.3E-06	9.2E-06	2.5E-05	0
HDDV6	Idling Emissions from Loading HDDVs at Plt. 2	9 mins/veh	2,000	--	575	0%	1.3E-04	5.7E-06	1.0E-05	1.7E-05	4.7E-05	0	3.7E-05	1.6E-06	2.9E-06	5.0E-06	1.4E-05	0
						TOTAL TONS	**0.036**	**0.002**	**0.002**	**0.017**	**0.019**	**0**	**0.011**	**0.001**	**0.001**	**0.004**	**0.005**	**0**

Notes:

(a) Roads travelled per number of trucks from CE's "Fugitive Dust Emisisons paved roads' worksheet; with distances corrected to roundtrip.
(b) Daily peak mile-trips, idle minutes and hp-hr/days were scaled to reflect hourly ratings versus daily ratings for SO_2 3-hr rates..

(e) uses lb/MMBtu values from AP-42's Table 3.3 for "Gasoline and Diesel and Industrial Engines," but converts using 7000 Btu/hp-hr and (250/10) bhp per mile.

296

VIRGINIA

DATE : 10/26/2005
TIME : 13:44:11
VIRGINIA

==========================
BPIP PROCESSING INFORMATION:
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The p flag has been set for preparing downwash related data for a model run utilizing the PRIME algorithm.

Inputs entered in METERS will be converted to meters using a conversion factor of 1.0000. Output will be in meters.

UTMP is set to UTMN. The input is assumed to be in a local X-Y coordinate system as opposed to a UTM coordinate system. True North is in the positive Y direction.

Plant north is set to 0.00 degrees with respect to True North.

VIRGINIA

PRELIMINARY* GEP STACK HEIGHT RESULTS TABLE
(Output Units: meters)

Stack Name	Stack Height	Stack-Building Base Elevation Differences	GEP** EQN1	Preliminary* GEP Stack Height Value
BAG1	20.00	0.00	48.56	65.00
BAG2	20.00	0.00	46.77	65.00
HTR	6.00	0.00	46.24	65.00

* Results are based on Determinants 1 & 2 on pages 1 & 2 of the GEP Technical Support Document. Determinant 3 may be investigated for additional stack height credit. Final values result after Determinant 3 has been taken into consideration.

** Results were derived from Equation 1 on page 6 of GEP Technical Support Document. Values have been adjusted for any stack-building base elevation differences.

Note: Criteria for determining stack heights for modeling emission limitations for a source can be found in Table 3.1 of the GEP Technical Support Document.

DATE : 10/26/2005
TIME : 13:44:11

VIRGINIA

BPIP output is in meters

SO	BUILDHGT	BAG1	16.20	16.20	16.20	16.20	16.20	16.20
SO	BUILDHGT	BAG1	16.20	16.20	19.90	19.90	19.90	19.90
SO	BUILDHGT	BAG1	19.90	19.90	19.90	19.90	19.90	16.20
SO	BUILDHGT	BAG1	16.20	16.20	16.20	16.20	16.20	16.20
SO	BUILDHGT	BAG1	16.20	16.20	19.90	19.90	19.90	19.90
SO	BUILDHGT	BAG1	19.90	19.90	19.90	19.90	19.90	16.20
SO	BUILDWID	BAG1	26.99	30.16	32.42	33.69	33.94	33.38
SO	BUILDWID	BAG1	32.46	32.73	14.00	16.04	17.60	18.62
SO	BUILDWID	BAG1	19.08	18.96	19.09	19.10	18.94	23.00
SO	BUILDWID	BAG1	26.99	30.16	32.42	33.69	33.94	33.38
SO	BUILDWID	BAG1	32.46	32.73	14.00	16.04	17.60	18.62
SO	BUILDWID	BAG1	19.08	18.96	19.09	19.10	18.94	23.00
SO	BUILDLEN	BAG1	30.30	27.68	24.21	20.01	18.96	19.09
SO	BUILDLEN	BAG1	19.31	19.87	18.00	18.07	17.60	16.59
SO	BUILDLEN	BAG1	15.07	13.10	10.73	8.71	11.53	32.00
SO	BUILDLEN	BAG1	30.30	27.68	24.21	20.01	18.96	19.09
SO	BUILDLEN	BAG1	19.31	19.87	18.00	18.07	17.60	16.59
SO	BUILDLEN	BAG1	15.07	13.10	10.73	8.71	11.53	32.00
SO	XBADJ	BAG1	-12.17	-8.97	-5.49	-1.85	1.85	4.66
SO	XBADJ	BAG1	6.66	7.53	10.00	11.24	12.13	12.66
SO	XBADJ	BAG1	12.80	12.56	11.93	10.52	5.85	-17.00
SO	XBADJ	BAG1	-18.13	-18.71	-18.72	-18.17	-20.81	-23.75
SO	XBADJ	BAG1	-25.97	-27.40	-28.00	-29.31	-29.73	-29.25
SO	XBADJ	BAG1	-27.88	-25.66	-22.66	-19.23	-17.38	-15.00
SO	YBADJ	BAG1	-15.82	-14.65	-13.04	-11.03	-8.69	-5.97
SO	YBADJ	BAG1	-2.99	-1.01	-8.00	-4.15	-0.16	3.82
SO	YBADJ	BAG1	7.69	11.33	14.20	16.32	17.93	16.50
SO	YBADJ	BAG1	15.82	14.65	13.04	11.03	8.69	5.97
SO	YBADJ	BAG1	2.99	1.01	8.00	4.15	0.16	-3.82
SO	YBADJ	BAG1	-7.69	-11.33	-14.20	-16.32	-17.93	-16.50

SO	BUILDHGT	BAG2	19.90	19.90	19.90	16.20	12.20	12.20
SO	BUILDHGT	BAG2	12.20	12.20	12.20	12.20	12.20	12.20
SO	BUILDHGT	BAG2	12.20	12.70	12.70	12.70	12.70	12.70
SO	BUILDHGT	BAG2	12.70	12.70	12.70	12.20	12.20	12.20
SO	BUILDHGT	BAG2	12.20	12.20	12.20	12.20	12.20	12.20
SO	BUILDHGT	BAG2	12.20	12.70	12.70	12.70	12.70	12.70
SO	BUILDWID	BAG2	17.92	17.60	16.59	33.69	55.01	43.60
SO	BUILDWID	BAG2	33.32	28.74	38.00	46.11	52.81	57.91
SO	BUILDWID	BAG2	61.25	11.89	12.76	13.24	13.61	14.00
SO	BUILDWID	BAG2	13.96	13.50	12.62	64.74	55.01	43.60
SO	BUILDWID	BAG2	33.32	28.74	38.00	46.11	52.81	57.91
SO	BUILDWID	BAG2	61.25	11.89	12.76	13.24	13.61	14.00
SO	BUILDLEN	BAG2	16.04	17.60	18.62	20.01	67.74	72.95
SO	BUILDLEN	BAG2	76.46	62.45	62.00	59.67	55.52	49.69
SO	BUILDLEN	BAG2	42.35	9.77	7.87	5.73	5.04	6.00
SO	BUILDLEN	BAG2	6.78	7.35	9.10	61.25	67.74	72.95

SO	BUILDLEN	BAG2	76.46	62.45	62.00	59.67	55.52	49.69
SO	BUILDLEN	BAG2	42.35	9.77	7.87	5.73	5.04	6.00
SO	XBADJ	BAG2	-86.48	-88.34	-87.51	-84.03	1.66	2.10
SO	XBADJ	BAG2	2.48	20.28	22.00	23.05	23.41	23.05
SO	XBADJ	BAG2	22.00	-1.01	-1.60	-2.14	-3.53	-5.00
SO	XBADJ	BAG2	-6.31	-7.43	-9.73	-61.63	-69.39	-75.05
SO	XBADJ	BAG2	-78.93	-82.72	-84.00	-82.72	-78.93	-72.75
SO	XBADJ	BAG2	-64.35	-8.75	-6.27	-3.59	-1.51	-1.00
SO	YBADJ	BAG2	15.36	1.26	-12.89	-17.33	-26.49	-20.20
SO	YBADJ	BAG2	-14.53	-13.14	-4.00	5.26	14.37	23.04
SO	YBADJ	BAG2	31.00	7.60	8.48	9.10	9.30	9.00
SO	YBADJ	BAG2	8.43	7.60	6.54	31.98	26.49	20.20
SO	YBADJ	BAG2	14.53	13.14	4.00	-5.26	-14.37	-23.04
SO	YBADJ	BAG2	-31.00	-7.60	-8.48	-9.10	-9.30	-9.00

SO	BUILDHGT	HTR	12.70	19.90	19.90	19.90	16.20	16.20
SO	BUILDHGT	HTR	12.20	12.20	12.20	21.60	21.60	21.60
SO	BUILDHGT	HTR	0.00	0.00	0.00	0.00	0.00	12.70
SO	BUILDHGT	HTR	12.70	12.70	12.70	12.20	12.20	12.20
SO	BUILDHGT	HTR	12.20	12.20	12.20	16.30	16.30	16.30
SO	BUILDHGT	HTR	16.30	0.00	0.00	0.00	0.00	12.70
SO	BUILDWID	HTR	13.96	17.56	16.59	15.07	33.94	33.38
SO	BUILDWID	HTR	33.32	31.05	38.00	8.11	8.97	9.56
SO	BUILDWID	HTR	0.00	0.00	0.00	0.00	0.00	14.00
SO	BUILDWID	HTR	13.96	13.50	12.62	42.35	33.72	24.07
SO	BUILDWID	HTR	18.61	28.74	38.00	7.07	6.92	6.56
SO	BUILDWID	HTR	6.01	0.00	0.00	0.00	0.00	14.00
SO	BUILDLEN	HTR	6.78	17.60	18.62	19.08	18.96	19.09
SO	BUILDLEN	HTR	76.46	80.23	62.00	9.04	8.80	8.29
SO	BUILDLEN	HTR	0.00	0.00	0.00	0.00	0.00	6.00
SO	BUILDLEN	HTR	6.78	7.35	9.10	61.25	62.73	62.30
SO	BUILDLEN	HTR	61.00	62.45	62.00	7.07	6.92	6.56
SO	BUILDLEN	HTR	6.01	0.00	0.00	0.00	0.00	6.00
SO	XBADJ	HTR	25.31	-63.57	-64.50	-63.47	-60.51	-56.54
SO	XBADJ	HTR	12.31	7.99	23.00	-39.85	-40.50	-39.91
SO	XBADJ	HTR	0.00	0.00	0.00	0.00	0.00	-31.00
SO	XBADJ	HTR	-32.09	-32.21	-32.75	-82.19	-86.87	-88.92
SO	XBADJ	HTR	-88.77	-88.22	-85.00	-18.13	-18.71	-18.72
SO	XBADJ	HTR	-18.17	0.00	0.00	0.00	0.00	25.00
SO	YBADJ	HTR	-4.90	9.21	-0.75	-10.69	-9.89	-17.98
SO	YBADJ	HTR	9.56	13.44	22.00	7.48	1.23	-5.06
SO	YBADJ	HTR	0.00	0.00	0.00	0.00	0.00	10.00
SO	YBADJ	HTR	4.90	-0.35	-5.59	27.23	17.86	7.95
SO	YBADJ	HTR	-2.20	-12.29	-22.00	5.04	2.43	-0.25
SO	YBADJ	HTR	-2.93	0.00	0.00	0.00	0.00	-10.00

VIRGINIA

BPIP (Dated: 04274)

DATE : 10/26/2005
TIME : 20:32:54
VIRGINIA

BPIP PROCESSING INFORMATION:

The p flag has been set for preparing downwash related data for a model run utilizing the PRIME algorithm.

Inputs entered in METERS will be converted to meters using a conversion factor of 1.0000. Output will be in meters.

UTMP is set to UTMN. The input is assumed to be in a local X-Y coordinate system as opposed to a UTM coordinate system. True North is in the positive Y direction.

Plant north is set to 0.00 degrees with respect to True North.

VIRGINIA

PRELIMINARY* GEP STACK HEIGHT RESULTS TABLE
(Output Units: meters)

Stack Name	Stack Height	Stack-Building Base Elevation Differences	GEP** EQN1	Preliminary* GEP Stack Height Value
BAG1	14.10	0.00	48.56	65.00
BAG2	14.60	0.00	46.77	65.00
HTR	3.00	0.00	46.24	65.00

* Results are based on Determinants 1 & 2 on pages 1 & 2 of the GEP Technical Support Document. Determinant 3 may be investigated for additional stack height credit. Final values result after Determinant 3 has been taken into consideration.

** Results were derived from Equation 1 on page 6 of GEP Technical Support Document. Values have been adjusted for any stack-building base elevation differences.

Note: Criteria for determining stack heights for modeling emission limitations for a source can be found in Table 3.1 of the GEP Technical Support Document.

DATE : 10/26/2005
TIME : 20:32:54

VIRGINIA

BPIP output is in meters

```
    SO BUILDHGT BAG1        16.20    16.20    16.20    16.20    16.20    16.20
    SO BUILDHGT BAG1        16.20    16.20    19.90    19.90    19.90    19.90
    SO BUILDHGT BAG1        19.90    19.90    19.90    19.90    19.90    16.20
    SO BUILDHGT BAG1        16.20    16.20    16.20    16.20    16.20    16.20
    SO BUILDHGT BAG1        16.20    16.20    19.90    19.90    19.90    19.90
    SO BUILDHGT BAG1        19.90    19.90    19.90    19.90    19.90    16.20
    SO BUILDWID BAG1        26.99    30.16    32.42    33.69    33.94    33.38
    SO BUILDWID BAG1        32.46    32.73    14.00    16.04    17.60    18.62
    SO BUILDWID BAG1        19.08    18.96    19.09    19.10    18.94    23.00
    SO BUILDWID BAG1        26.99    30.16    32.42    33.69    33.94    33.38
    SO BUILDWID BAG1        32.46    32.73    14.00    16.04    17.60    18.62
    SO BUILDWID BAG1        19.08    18.96    19.09    19.10    18.94    23.00
    SO BUILDLEN BAG1        30.30    27.68    24.21    20.01    18.96    19.09
    SO BUILDLEN BAG1        19.31    19.87    18.00    18.07    17.60    16.59
    SO BUILDLEN BAG1        15.07    13.10    10.73     8.71    11.53    32.00
    SO BUILDLEN BAG1        30.30    27.68    24.21    20.01    18.96    19.09
    SO BUILDLEN BAG1        19.31    19.87    18.00    18.07    17.60    16.59
    SO BUILDLEN BAG1        15.07    13.10    10.73     8.71    11.53    32.00
    SO XBADJ    BAG1       -12.17    -8.97    -5.49    -1.85     1.85     4.66
    SO XBADJ    BAG1         6.66     7.53    10.00    11.24    12.13    12.66
    SO XBADJ    BAG1        12.80    12.56    11.93    10.52     5.85   -17.00
    SO XBADJ    BAG1       -18.13   -18.71   -18.72   -18.17   -20.81   -23.75
    SO XBADJ    BAG1       -25.97   -27.40   -28.00   -29.31   -29.73   -29.25
    SO XBADJ    BAG1       -27.88   -25.66   -22.66   -19.23   -17.38   -15.00
    SO YBADJ    BAG1       -15.82   -14.65   -13.04   -11.03    -8.69    -5.97
    SO YBADJ    BAG1        -2.99    -1.01    -8.00    -4.15    -0.16     3.82
    SO YBADJ    BAG1         7.69    11.33    14.20    16.32    17.93    16.50
    SO YBADJ    BAG1        15.82    14.65    13.04    11.03     8.69     5.97
    SO YBADJ    BAG1         2.99     1.01     8.00     4.15     0.16    -3.82
    SO YBADJ    BAG1        -7.69   -11.33   -14.20   -16.32   -17.93   -16.50


    SO BUILDHGT BAG2        19.90    19.90    19.90    16.20    12.20    12.20
    SO BUILDHGT BAG2        12.20    12.20    12.20    12.20    12.20    12.20
    SO BUILDHGT BAG2        12.20    12.70    12.70    12.70    12.70    12.70
    SO BUILDHGT BAG2        12.70    12.70    12.70    12.20    12.20    12.20
    SO BUILDHGT BAG2        12.20    12.20    12.20    12.20    12.20    12.20
    SO BUILDHGT BAG2        12.20    12.70    12.70    12.70    12.70    12.70
    SO BUILDWID BAG2        17.92    17.60    16.59    33.69    55.01    43.60
    SO BUILDWID BAG2        33.32    28.74    38.00    46.11    52.81    57.91
    SO BUILDWID BAG2        61.25    11.89    12.76    13.24    13.61    14.00
    SO BUILDWID BAG2        13.96    13.50    12.62    64.74    55.01    43.60
    SO BUILDWID BAG2        33.32    28.74    38.00    46.11    52.81    57.91
    SO BUILDWID BAG2        61.25    11.89    12.76    13.24    13.61    14.00
    SO BUILDLEN BAG2        16.04    17.60    18.62    20.01    67.74    72.95
    SO BUILDLEN BAG2        76.46    62.45    62.00    59.67    55.52    49.69
    SO BUILDLEN BAG2        42.35     9.77     7.87     5.73     5.04     6.00
    SO BUILDLEN BAG2         6.78     7.35     9.10    61.25    67.74    72.95
```

SO	BUILDLEN	BAG2	76.46	62.45	62.00	59.67	55.52	49.69
SO	BUILDLEN	BAG2	42.35	9.77	7.87	5.73	5.04	6.00
SO	XBADJ	BAG2	-86.48	-88.34	-87.51	-84.03	1.66	2.10
SO	XBADJ	BAG2	2.48	20.28	22.00	23.05	23.41	23.05
SO	XBADJ	BAG2	22.00	-1.01	-1.60	-2.14	-3.53	-5.00
SO	XBADJ	BAG2	-6.31	-7.43	-9.73	-61.63	-69.39	-75.05
SO	XBADJ	BAG2	-78.93	-82.72	-84.00	-82.72	-78.93	-72.75
SO	XBADJ	BAG2	-64.35	-8.75	-6.27	-3.59	-1.51	-1.00
SO	YBADJ	BAG2	15.36	1.26	-12.89	-17.33	-26.49	-20.20
SO	YBADJ	BAG2	-14.53	-13.14	-4.00	5.26	14.37	23.04
SO	YBADJ	BAG2	31.00	7.60	8.48	9.10	9.30	9.00
SO	YBADJ	BAG2	8.43	7.60	6.54	31.98	26.49	20.20
SO	YBADJ	BAG2	14.53	13.14	4.00	-5.26	-14.37	-23.04
SO	YBADJ	BAG2	-31.00	-7.60	-8.48	-9.10	-9.30	-9.00

SO	BUILDHGT	HTR	12.70	19.90	19.90	19.90	16.20	16.20
SO	BUILDHGT	HTR	12.20	12.20	12.20	21.60	21.60	21.60
SO	BUILDHGT	HTR	0.00	0.00	0.00	0.00	0.00	12.70
SO	BUILDHGT	HTR	12.70	12.70	12.70	12.20	12.20	12.20
SO	BUILDHGT	HTR	12.20	12.20	12.20	16.30	16.30	16.30
SO	BUILDHGT	HTR	16.30	0.00	0.00	0.00	0.00	12.70
SO	BUILDWID	HTR	13.96	17.56	16.59	15.07	33.94	33.38
SO	BUILDWID	HTR	33.32	31.05	38.00	8.11	8.97	9.56
SO	BUILDWID	HTR	0.00	0.00	0.00	0.00	0.00	14.00
SO	BUILDWID	HTR	13.96	13.50	12.62	42.35	33.72	24.07
SO	BUILDWID	HTR	18.61	28.74	38.00	7.07	6.92	6.56
SO	BUILDWID	HTR	6.01	0.00	0.00	0.00	0.00	14.00
SO	BUILDLEN	HTR	6.78	17.60	18.62	19.08	18.96	19.09
SO	BUILDLEN	HTR	76.46	80.23	62.00	9.04	8.80	8.29
SO	BUILDLEN	HTR	0.00	0.00	0.00	0.00	0.00	6.00
SO	BUILDLEN	HTR	6.78	7.35	9.10	61.25	62.73	62.30
SO	BUILDLEN	HTR	61.00	62.45	62.00	7.07	6.92	6.56
SO	BUILDLEN	HTR	6.01	0.00	0.00	0.00	0.00	6.00
SO	XBADJ	HTR	25.31	-63.57	-64.50	-63.47	-60.51	-56.54
SO	XBADJ	HTR	12.31	7.99	23.00	-39.85	-40.50	-39.91
SO	XBADJ	HTR	0.00	0.00	0.00	0.00	0.00	-31.00
SO	XBADJ	HTR	-32.09	-32.21	-32.75	-82.19	-86.87	-88.92
SO	XBADJ	HTR	-88.77	-88.22	-85.00	-18.13	-18.71	-18.72
SO	XBADJ	HTR	-18.17	0.00	0.00	0.00	0.00	25.00
SO	YBADJ	HTR	-4.90	9.21	-0.75	-10.69	-9.89	-17.98
SO	YBADJ	HTR	9.56	13.44	22.00	7.48	1.23	-5.06
SO	YBADJ	HTR	0.00	0.00	0.00	0.00	0.00	10.00
SO	YBADJ	HTR	4.90	-0.35	-5.59	27.23	17.86	7.95
SO	YBADJ	HTR	-2.20	-12.29	-22.00	5.04	2.43	-0.25
SO	YBADJ	HTR	-2.93	0.00	0.00	0.00	0.00	-10.00

March Addendum to Air Quality Report

On December 7, 2005 Cambridge Environmental submitted to the City of Alexandria a report: "Results of an Emission and Air Dispersion Modeling Study and Public Health Evaluation of the Virginia Paving Company Facility, 5601 Courtney Avenue Alexandria, Virginia." Since that time, we have been contacted by the City, its consultant at Aero Engineering Services, and consultants at Sullivan Environmental with questions and comments regarding the details of the emission and dispersion modeling. We have responded to these questions as they were received. This addendum to the report of December 7, 2005 summarizes our response to an earlier request by the City for us to model an additional source at the Virginia Paving site, and also presents the results of revised particulate matter modeling that we performed to correct two errors in the previous modeling.

On December 22, 2005, after discussion with the City and the City's consultant at Aero Engineering Services, the City of Alexandria asked us to model the combustion related $PM_{2.5}$ emissions from the trucks that are not owned by Virginia Paving but which travel across the Virginia Paving site to pick up asphalt. These emissions had not been included in the modeling performed for the December 7 report. On December 23, 2005 we sent a summary of the results of this modeling to the City along with the calculations and modeling files to the City's consultant at Aero Engineering Services.

The December 23, 2005 modeling is re-summarized as follows. Based on the proposed permit limits and the average capacity of each truck, the maximum, annual-average number of asphalt trucks per day is 183. The annual average $PM_{2.5}$ impacts due to diesel emissions from these trucks are small relative to the impacts from other sources at the site. The average annual fenceline impact is less than 0.1 $\mu g/m^3$; the average, 4^{th}-highest, 24-hour fenceline impact is 1.5 $\mu g/m^3$. At receptor locations further away from the site the impacts of the added diesel emissions are substantially smaller. Overall, the additional impacts due to diesel emissions of asphalt delivery trucks do not affect the overall conclusions of the air modeling study or the recommended operating conditions.

In January 2006 we received comments on our report by Sullivan Environmental, and a draft air quality model by Aero Engineering Services. After our review of the comments and draft modeling, we identified two errors in our previous modeling of particulate matter emissions from the facility. One relates to minor errors in the modeled dryer and oil-heater stack parameters, the other relates to the omission of a particle size-dependent reduction factor in the modeling of wind blown erosion emissions. Correction of the former error led to slightly higher maximum PM impacts at some fenceline locations. Correction of the latter error led to reduced PM impacts, most significantly those for maximum 24-hour $PM_{2.5}$ levels. The results of $PM_{2.5}$ and PM_{10} annual average and 24-hour maximum modeling runs with both of these errors corrected are given in the tables and figures that follow.

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Pollutant	**PM_{10}**		
Averaging period	**Annual**		
Statistical metric	Annual average at each receptor		
Sources	VA Paving: Dryer stacks of Plants 1 & 2, hot oil heater, silos, loadout, yard, liquid asphalt storage, diesel exhaust, paved roads, unpaved surfaces, batch dropping, wind erosion, RAP crushing Other: U.S. Filter, Covanta and Washington Gas		
Maximum predicted concentration (all sources combined at any receptor)			
Modeling year	Concentration ($\mu g/m^3$)	Coordinates relative to Plant 1 dryer stack (m)	
		x (east-west)	*y* (north-south)
2000	5.0	125*	-25*
2001	5.3	150*	125*
2002	5.0	150*	125*
2003	4.5	150*	125*
2004	4.5	150*	125*
Highest of all	5.3	150*	125*
Background	19.3		
Background plus highest increment	24.6*		
National Ambient Air Quality Standard (NAAQS)	50.0		

* The maximum predicted concentration is at the facility fenceline. See Figure 1 for predicted concentrations away from the facility.

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Pollutant	PM_{10}		
Averaging period	**24-hour**		
Statistical metric	maximum fourth-highest value at each receptor		
Sources	VA Paving: Dryer stacks of Plants 1 & 2, hot oil heater, silos, loadout, yard, liquid asphalt storage, diesel exhaust, paved roads, unpaved surfaces, batch dropping, wind erosion, RAP crushing Other: U.S. Filter, Covanta and Washington Gas		
Maximum predicted concentration (all sources combined at any receptor)			
Modeling year	Concentration ($\mu g/m^3$)	Coordinates relative to Plant 1 dryer stack (m)	
		x (east-west)	*y* (north-south)
2000	55.1	150*	125*
2001	58.0	150*	125*
2002	59.1	150*	125*
2003	51.3	200*	100*
2004	45.8	200*	100*
Highest of all	59.1	150*	125*
Background	43.0		
Background plus highest increment	102.1		
National Ambient Air Quality Standard (NAAQS)	150		

* The maximum predicted concentration is at the facility fenceline. See Figure 2 for predicted concentrations away from the facility.

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Pollutant	**$PM_{2.5}$**		
Averaging period	**Annual**		
Statistical metric	Annual average at each receptor		
Sources	VA Paving: Dryer stacks of Plants 1 & 2, hot oil heater, silos, loadout, yard, liquid asphalt storage, diesel exhaust, paved roads, unpaved surfaces, batch dropping, wind erosion, RAP crushing Other: U.S. Filter, Covanta and Washington Gas		
Maximum predicted concentration (all sources combined at any receptor)			
Modeling year	Concentration ($\mu g/m^3$)	Coordinates relative to Plant 1 dryer stack (m)	
		x (east-west)	*y* (north-south)
2000	2.5	-50*	60*
2001	2.6	-50*	60*
2002	2.2	-50*	60*
2003	2.0	-50*	60*
2004	2.0	50*	108*
Highest of all	2.6	-50*	60*
Background	13.4		
Background plus highest increment	16.0*		
National Ambient Air Quality Standard (NAAQS)	15.0		

* The maximum predicted concentration is at the facility fenceline. See Figure 3 for predicted concentrations away from the facility.

Pollutant	**$PM_{2.5}$**		
Averaging period	**24-hour**		
Statistical metric	maximum fourth-highest value at each receptor		
Sources	VA Paving: Dryer stacks of Plants 1 & 2, hot oil heater, silos, loadout, yard, liquid asphalt storage, diesel exhaust, paved roads, unpaved surfaces, batch dropping, wind erosion, RAP crushing Other: U.S. Filter, Covanta and Washington Gas		
Maximum predicted concentration (all sources combined at any receptor)			
Modeling year	Concentration ($\mu g/m^3$)	Coordinates relative to Plant 1 dryer stack (m)	
		x (east-west)	*y* (north-south)
2000	15.3	50*	108*
2001	14.0	50*	108*
2002	15.6	50*	108*
2003	13.8	150*	125*
2004	16.1	50*	108*
Highest of all	16.1	50*	108*
Background	35.3		
Background plus highest increment	51.4*		
National Ambient Air Quality Standard (NAAQS)	65		

* The maximum predicted concentration is at the facility fenceline. See Figure 4 for predicted concentrations away from the facility.

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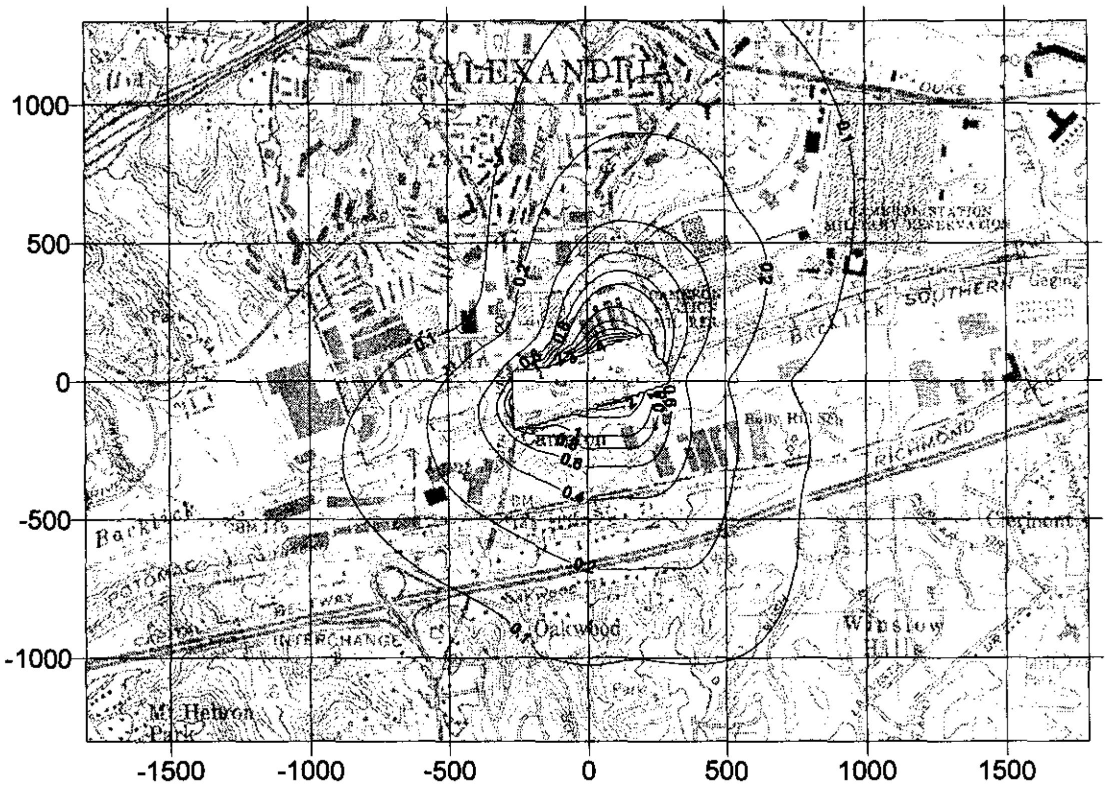

Figure1. PM10: annual average modeled increments.

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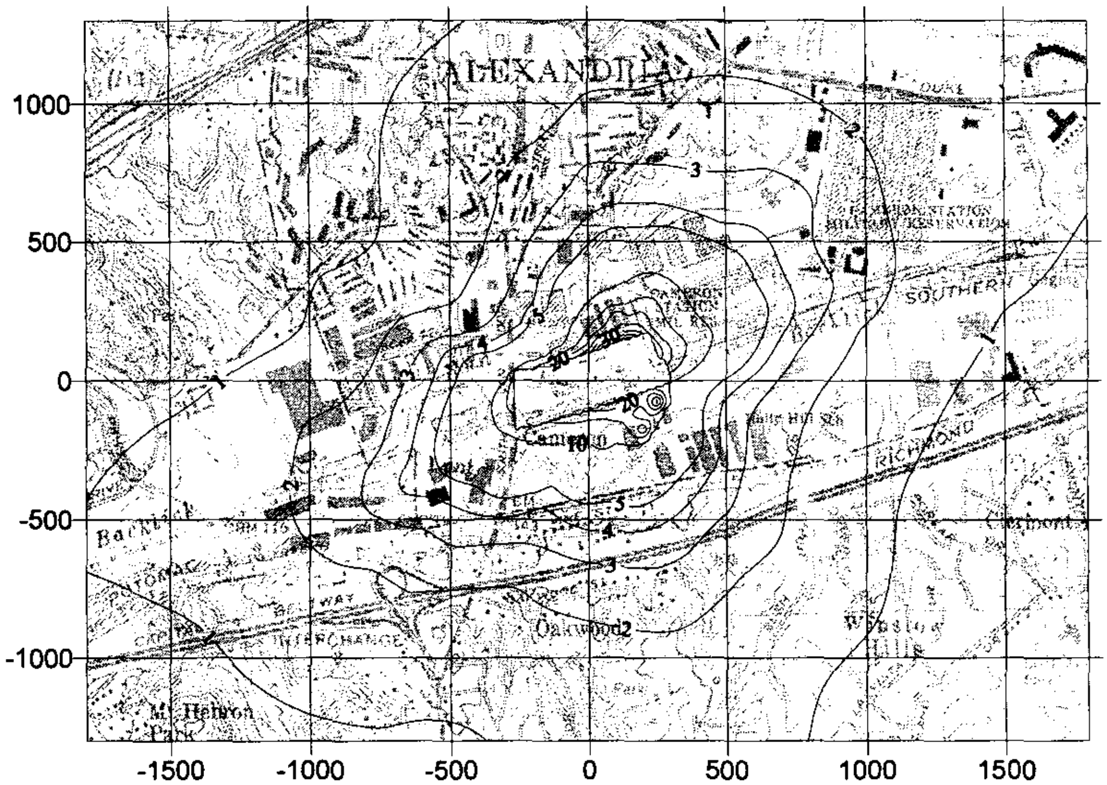

Figure 2. PM10: maximum, fourth-highest annual, 24-hour average modeled increments.

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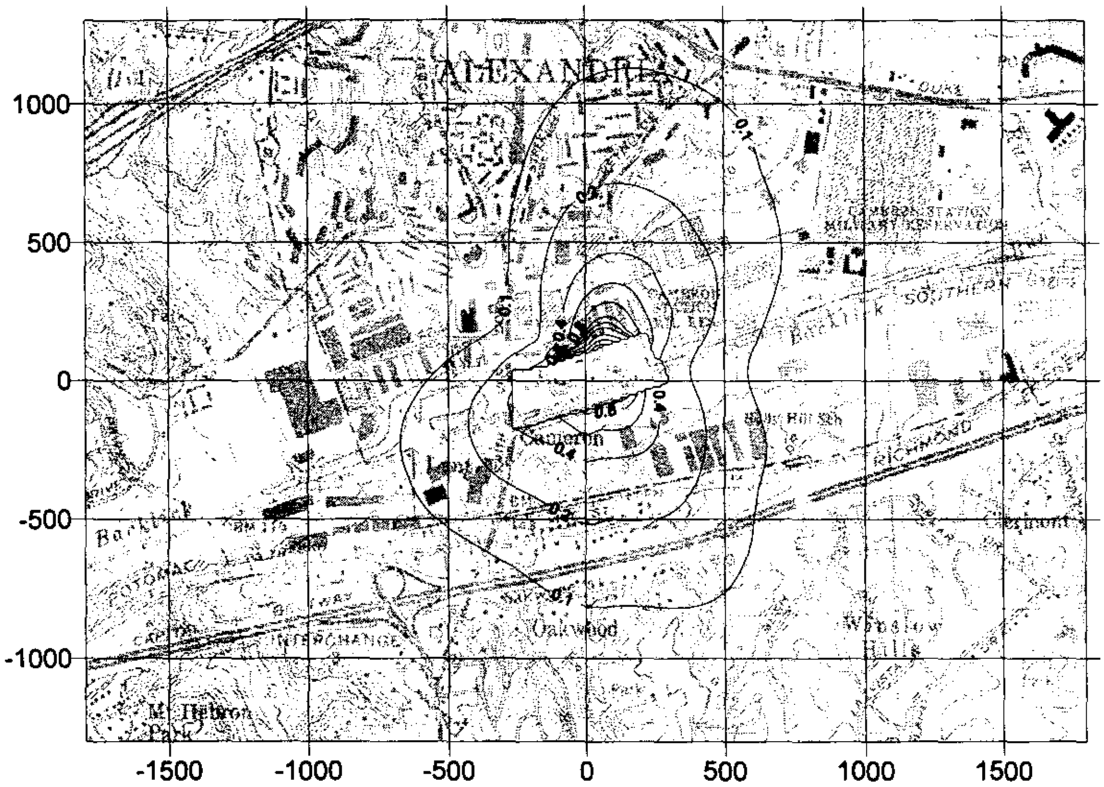

Figure 3. PM2.5: annual average modeled increments.

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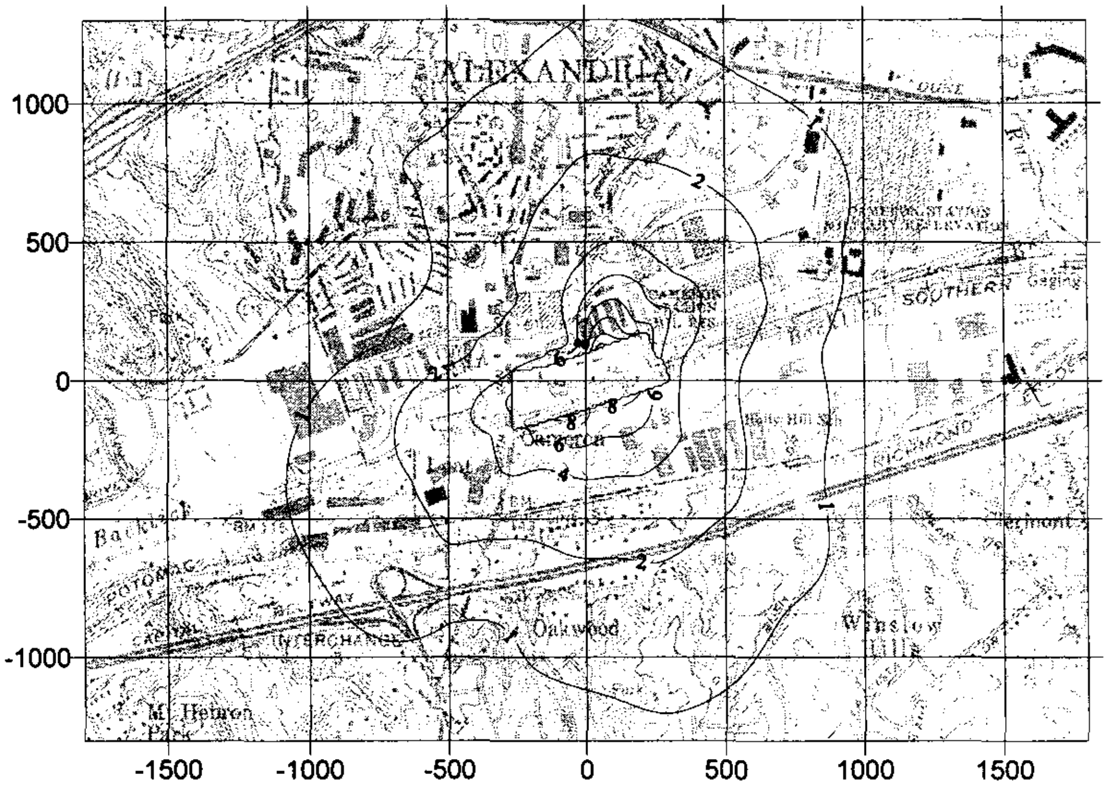

Figure 4. PM2.5: maximum, fourth-highest annual, 24-hour average modeled increments.

MEMORANDUM

To: Lalit Sharma, P.E., City of Alexandria, Department of Transportation and Environmental Services

From: Michael Ames, Sc.D.

Subject: Total VOC emission estimates from Virginia Paving

Date: July 18, 2006

On June 19, 2006, Cambridge Environmental received a question posed by Mr. Richard Ward regarding total VOC emissions from Virginia Paving. The question had originally been sent to you and Bill Skrabak; it was forwarded to Mary Catherine Gibbs, who then forwarded it to Virginia Paving and Cambridge Environmental. Cambridge Environmental had not responded to this question in writing previously because we were expecting to meet with Mr. Ward in Alexandria and to receive further questions. Unfortunately, Mr. Ward failed to appear. The relevant portion of e-mail from Richard Ward is:

> What I would like from you is the modeled total number of VOCs emitted from the entire facility under: 1) current operation; and 2) under projected operation using:
>
> 1) AP-42 emission factors, except those calculated from 2004 stack test results (e.g., the AERO report).
>
> 2) Emission factors calculated by using AP-42 factors (e.g., the Cambridge study, which according to their experts, used only AP-42 factors).
>
> Finding these four numbers should just be a matter of going into the respective reports, and pulling out their calculated values. The AERO report's numbers should exceed 10 tons of VOC, according to the data I have in my possession. The Cambridge report numbers should exceed 20 tons VOC, as evidenced by a waste oil study performed for your office earlier. If you would like, you could also include comments regarding your confidence in the 2004 stack test factors used.

Total VOC emission estimates and dispersion models are not part of Cambridge Environmental's December 7, 2005 report, "Results of an Emission and Air Dispersion Modeling Study and Public Health Evaluation of the Virginia Paving Company Facility." Estimates of <u>total</u> VOC emissions and dispersion are not relevant for the type of local-scale, air quality and public health evaluation that Cambridge Environmental performed because there are no applicable ambient air quality nor ambient air health standards for total VOCs. Total VOC emissions are estimated in some other types of air quality studies done by regional air quality modelers for the purpose of evaluating a facility's potential impacts on peak ozone concentrations. In particular, because ozone is not emitted as a primary pollutant (*i.e.* it is formed in the atmosphere over time from precursor compounds), it is evaluated as a regional-scale rather than a local-scale pollutant. Emission and dispersion of total VOCs do not necessarily lead to higher levels of ozone in the vicinity of the source being considered.

However, the emission and dispersion of specific VOCs for which ambient air quality and ambient air health standards do exist were indeed modeled as part of the public health evaluation portion of Cambridge Environmental's studies. The specific compounds included in the study are those listed in the EPA's AP42 emission factor tables for hot mix asphalt facilities and are listed in the report's supplemental information files which were sent on a CD-ROM to the City of Alexandria and its consultants.

The study first compared each compound's maximum one-hour and annual average emission rates with Virginia's Significant Ambient Air Concentration (SAAC) emission rate exemption levels. Modeled ambient air concentrations of those compounds for which the emission rates exceeded the exemption level were then compared with the SAAC standards. This analysis was included in the report's supplemental information files, and the modeled ambient air results for compounds that exceeded the exemption limit were included in the report and subsequent addendum. As noted in the report, all of the modeled one-hour and annual average ambient concentrations are below the SAAC limits.

Long-term exposure estimates of specific VOCs and other compounds listed in the AP42 emission factor tables were also compared with U.S. EPA health risk and hazard data. This analysis was performed in September 2005, with the overall results summarized in a brief report on September 30, 2005 (this report is appended to the report of December 2005) and the details of the analysis provided to the City of Alexandria and its consultants. This analysis found that long-term exposures to specific compounds emitted from Virginia Paving are below levels at which there is the potential for significant adverse health hazards or risks.

Although emission estimates of total VOCs were not included in Cambridge Environmental's reports, such estimates are fairly easy to perform using the U.S. EPA's emissions factors for hot mix asphalt facilities and related combustion sources. Total VOC emission factors for hot mix asphalt drum dryers are contained in AP42 Table 11.1-8, for load-out and silo filling operation in Table 11.1-14, and for yard emissions (*i.e.*, emissions from trucks that have been loaded with asphalt) on page 11.1-9 and Table 11.1-16. The emission estimates below assume a default asphalt volatility of -0.5. and a hot mix temperature of 300°F. Emission factors for the hot-oil heater are based on Table

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1.11-3 for the combustion of waste oil , and Table 1.3-3 for the combustion of #2 fuel oil. The emission factor for a waste oil-fired heater is actually for total organic compounds, and the factor for a #2 oil-fired heater is for non-methane organic compounds, so both of these factors *overestimate* the emissions of VOCs.

Table 1 lists the emission factors and annual emission estimates for total VOCs from the facility's dryer stacks, silos, loadout areas and yard, based on three annual asphalt production rates. Table 2 lists the emission factors and annual emission estimates for total VOCs from the facility's hot oil heater based on three annual heating oil consumption rates.

Table 1. Total VOC emission estimates, in tons per year, from dryer stacks and fugitive sources, at three annual asphalt production rates.

Source of emissions	Dryer Stacks	Silos	Loadout	Yard	Total Fugitive	Total Facility (without hot oil heater)
Million tons of asphalt per year	Emission factors (lb/ton)					
	0.032	0.00651	0.00209	0.00103		
1.5 (old permit limit)	24	4.88	1.57	0.78	7.2	31.2
1.2 (new permit limit)	19.2	3.90	1.25	0.62	5.8	25.0
0.9 (typical production)	14.4	2.93	0.94	0.47	4.3	18.7

Table 2. Organic compound emission estimates, in tons per year, from hot oil heaters for two fuel sources, at three annual fuel combustion rates.

	Hot oil heater #2 oil[1]	Hot oil heater waste oil[2]
Gallons of oil per year	Emission factors (lb/1,000 gallons)	
	0.2	1
225,000 (old permit limit)	0.0225	0.1125
100,000 (new permit limit, #2 oil only)	0.0100	—
65,000 (typical usage)	0.0065	0.0325

It should be noted that the above estimates are based on generic emission factors developed by the EPA to estimate emission rates when there are no site-specific measurements. Recent measurements of organic compound emissions from the dryer stacks at Virginia Paving are lower than the AP42 emission estimates. Also, the estimates for fugitive VOC emissions do not account for emission reductions that will occur due to air pollution control devices which are being installed on the asphalt silos

[1] Emission factor for hot oil heater burning #2 fuel oil is for non-methane organic compounds (NMOCs), which is a slightly larger group of compounds than VOCs.
[2] Emission factor for hot oil heater waste oil is for total organic compounds (TOCs), which includes methane emissions, and is larger than an emission factor for VOCs only would be.

and load out areas. Therefore actual emissions from Virginia Paving will be lower than the estimates shown above.

The 20 tons per year that Richard Ward mentions in the last paragraph of the question above as being contained in the "waste oil study" is probably citing a figure in a 6-page memorandum sent by us to you, dated August 22, 2005. The memorandum compares estimated emissions from Virginia Paving for the facility burning recycled oil and #2 fuel oil in its dryers and hot oil heater. The estimates are not for VOC emissions, but are for Total Organic Compound (TOC) emissions, as shown in Tables 2 and 3 of the memorandum. The memorandum compares emissions from only the dryer stacks and hot oil heater because fugitive organic emissions from the facility (those from the silo, loadout, and yard) are not dependent on the type of fuel used for the dryer or hot oil heater. Emissions of TOCs are somewhat higher that emissions of VOCs because the TOC emissions include contributions of methane and other compounds with negligible photochemical reactivity[3]. The calculations in the memorandum are based on typical operating conditions at the plant (*i.e.*, 900,000 tons of asphalt per year), as stated on memorandum pages 1 and 2.

I hope that this information is of use to you. Please call or write with any questions or concerns.

Thank you, and best regards.

[3] Table 2 of the memorandum lists the emission factor for TOCs and cites the source of this factor as AP42 Table 11.1-8. Footnote "d" of AP 42 Table 11.1-8 states that "The VOC emission factors are equal to the TOC factors minus the sum of the methane emission factors and the emission factors for compounds with negligible photochemical reactivity, and lists the VOC emission factor as 0.032 lb per ton of HMA produced for both #2 fuel oil and waste oil-fired dryers."

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7

SPEAKER'S FORM

DOCKET ITEM NO. 5

PLEASE COMPLETE THIS FORM AND GIVE IT TO THE CITY CLERK BEFORE YOU SPEAK ON A DOCKET ITEM.

PLEASE ANNOUNCE THE INFORMATION SPECIFIED BELOW PRIOR TO SPEAKING.

1. **NAME:** Mary Catherine Gibbs

2. **ADDRESS:** 307 N. Washington Street

   TELEPHONE NO. 703-836-5757 **E-MAIL:** mcg.hcgk@verizon.net

3. **WHOM DO YOU REPRESENT, IF OTHER THAN YOURSELF?**
   Virginia Paving

4. **WHAT IS YOUR POSITION ON THE ITEM?**
   For

5. **NATURE OF YOUR INTEREST IN ITEM (PROPERTY OWNER, ATTORNEY, LOBBYIST, CIVIC INTEREST, ETC.):**
   Attorney

6. **ARE YOU RECEIVING COMPENSATION FOR THIS APPEARANCE BEFORE COUNCIL?**
   Yes

This form shall be kept as a part of the permanent record in those instances where financial interest or compensation is indicated by the speaker.

A maximum of three minutes will be allowed for your presentation, except that one officer or other designated member speaking on behalf of each *bona fide* neighborhood civic association or unit owners' association desiring to be heard on a docket item shall be allowed five minutes. In order to obtain five minutes, you must identify yourself as a designated speaker, and identify the neighborhood civic association or unit owners' association you represent, at the start of your presentation. If you have a prepared statement, please leave a copy with the Clerk.

Additional time not to exceed 15 minutes may be obtained with the consent of the majority of the council present; provided notice requesting additional time with reasons stated is filed with the City Clerk in writing before 5:00 p.m. of the day preceding the meeting.

The public normally may speak on docket items only at public hearing meetings, and not at regular legislative meetings. Public hearing meetings are usually held on the Saturday following the second Tuesday in each month; regular legislative meetings on the second and fourth Tuesdays in each month. The rule with respect to when a person may speak to a docket item at a legislative meeting can be waived by a majority vote of council members present but such a waiver is not normal practice. When a speaker is recognized, the rules of procedures for speakers at public hearing meetings shall apply. If an item is docketed *for public hearing* at a regular legislative meeting, the public may speak to that item, and the rules of procedures for speakers at public hearing meetings shall apply.

1 5
10-14-06

HART, CALLEY, GIBBS & KARP, P.C.

ATTORNEYS AND COUNSELLORS AT LAW

307 NORTH WASHINGTON STREET
ALEXANDRIA, VIRGINIA 22314-2557

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hcgk.law@verizon.net

OF COUNSEL
CYRIL D. CALLEY

RETIRED
ROBERT L. MURPHY, 2001

October 13, 2006

Ms. Jackie M. Henderson, City Clerk
and Clerk of Council
City Hall, Room 2300
Alexandria, VA 22314

Re: Docket Item No. 5, SUP# 2005-0042, Virginia Paving Co.
October 14, 2006 City Council Public Hearing

Dear Ms. Henderson:

This letter is written to formally request additional time for Virginia Paving to speak for the above-referenced docket item. As the representative of the Virginia Paving Co., I would request that I be allowed 12-15 minutes to speak. That time includes time for myself, Dr. Laura Green and Mr. Bob Alger, President of Lane Construction, all of who will be speaking as part of Virginia Paving's presentation. We would additionally request that we be given the opportunity to respond to any comments, concerns or questions raised.

Thank you in advance for your attention to this request.

Very truly yours,

Mary Catherine Gibbs

Mary Catherine Gibbs

7

SPEAKER'S FORM

DOCKET ITEM NO. 5

PLEASE COMPLETE THIS FORM AND GIVE IT TO THE CITY CLERK BEFORE YOU SPEAK ON A DOCKET ITEM.

PLEASE ANNOUNCE THE INFORMATION SPECIFIED BELOW PRIOR TO SPEAKING.

1. **NAME:** Dr. Laura Green

2. **ADDRESS:** 58 Charles Street, Cambridge, MA 02141

   TELEPHONE NO. 617-225-0810 **E-MAIL:** green@cambridgeenvironmental.com

3. **WHOM DO YOU REPRESENT, IF OTHER THAN YOURSELF?**
   Virginia Paving/Cambridge Environmental

4. **WHAT IS YOUR POSITION ON THE ITEM?**
   For

5. **NATURE OF YOUR INTEREST IN ITEM (PROPERTY OWNER, ATTORNEY, LOBBYIST, CIVIC INTEREST, ETC.):**
   Environmental Consultant/Expert

6. **ARE YOU RECEIVING COMPENSATION FOR THIS APPEARANCE BEFORE COUNCIL?**
   Yes

This form shall be kept as a part of the permanent record in those instances where financial interest or compensation is indicated by the speaker.

A maximum of three minutes will be allowed for your presentation, except that one officer or other designated member speaking on behalf of each *bona fide* neighborhood civic association or unit owners' association desiring to be heard on a docket item shall be allowed five minutes. In order to obtain five minutes, you must identify yourself as a designated speaker, and identify the neighborhood civic association or unit owners' association you represent, at the start of your presentation. If you have a prepared statement, please leave a copy with the Clerk.

Additional time not to exceed 15 minutes may be obtained with the consent of the majority of the council present; provided notice requesting additional time with reasons stated is filed with the City Clerk in writing before 5:00 p.m. of the day preceding the meeting.

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Guidelines for the Public Discussion Period

(a) All speaker request forms for the public discussion period must be submitted by the time the item is called by the city clerk.

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(c) If more speakers are signed up than would be allotted for in 30 minutes, the mayor will organize speaker

(8)

SPEAKER'S FORM

DOCKET ITEM NO. 5

PLEASE COMPLETE THIS FORM AND GIVE IT TO THE CITY CLERK BEFORE YOU SPEAK ON A DOCKET ITEM.

PLEASE ANNOUNCE THE INFORMATION SPECIFIED BELOW PRIOR TO SPEAKING.

1. **NAME:** Mr. Bob Alger

2. **ADDRESS:** 965 E. Main Street, Meriden, Connecticut

   TELEPHONE NO. 203-235-3351 **E-MAIL:** realger@laneconstruct.com

3. **WHOM DO YOU REPRESENT, IF OTHER THAN YOURSELF?**
   Lane Construction Co.

4. **WHAT IS YOUR POSITION ON THE ITEM?**
   For

5. **NATURE OF YOUR INTEREST IN ITEM (PROPERTY OWNER, ATTORNEY, LOBBYIST, CIVIC INTEREST, ETC.):**
   Property Owner/Parent Company

6. **ARE YOU RECEIVING COMPENSATION FOR THIS APPEARANCE BEFORE COUNCIL?**
   Yes

This form shall be kept as a part of the permanent record in those instances where financial interest or compensation is indicated by the speaker.

A maximum of three minutes will be allowed for your presentation, except that one officer or other designated member speaking on behalf of each *bona fide* neighborhood civic association or unit owners' association desiring to be heard on a docket item shall be allowed five minutes. In order to obtain five minutes, you must identify yourself as a designated speaker, and identify the neighborhood civic association or unit owners' association you represent, at the start of your presentation. If you have a prepared statement, please leave a copy with the Clerk.

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DOCKET ITEM NO. 5

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PLEASE ANNOUNCE THE INFORMATION SPECIFIED BELOW PRIOR TO SPEAKING.

1. NAME: David Sullivan

2. ADDRESS: Sullivan Environmental, 1900 Elkin St, Suite 240, alex. VA 22308

TELEPHONE NO. 703-780-4580 E-MAIL ADDRESS: sull_env@ix.netcom.com

3. WHOM DO YOU REPRESENT, IF OTHER THAN YOURSELF? Consultant to Cameron Station Citizens Assoc.

4. WHAT IS YOUR POSITION ON THE ITEM?
FOR: ______ AGAINST: ______ OTHER: Independent Consultant

5. NATURE OF YOUR INTEREST IN ITEM (PROPERTY OWNER, ATTORNEY, LOBBYIST, CIVIC INTEREST, ETC.):
Consultant

6. ARE YOU RECEIVING COMPENSATION FOR THIS APPEARANCE BEFORE COUNCIL?
YES ✓ NO ______

This form shall be kept as a part of the permanent record in those instances where financial interest or compensation is indicated by the speaker.

A maximum of three minutes will be allowed for your presentation, except that one officer or other designated member speaking on behalf of each *bona fide* neighborhood civic association or unit owners' association desiring to be heard on a docket item shall be allowed five minutes. In order to obtain five minutes, you must identify yourself as a designated speaker, and identify the neighborhood civic association or unit owners' association you represent, at the start of your presentation. If you have a prepared statement, please leave a copy with the Clerk.

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(c) If more speakers are signed up than would be allotted for in 30 minutes, the mayor will organize speaker requests by subject or position, and allocated appropriate times, trying to ensure that speakers on unrelated subjects will also be allowed to speak during the 30 minute public discussion period.

(d) If speakers seeking to address council on the same subject cannot agree on a particular order or method that they would like the speakers to be called on, the speakers shall be called in the chronological order of their request forms' submission.

(e) Any speakers not called during the public discussion period will have the option to speak at the conclusion of the meeting, after all docketed items have been heard.

5

AMENDED

APPLICATION for SPECIAL USE PERMIT # 2005-0042

PROPERTY LOCATION: 5601 Courtney Ave., Alexandria, VA 22304

TAX MAP REFERENCE: 67.04-02-12, -17, -8, -20 ZONE: I

APPLICANT Name: Virginia Paving Co., a division of Lane Construction Corp.

Address: 5601 Courtney Ave., Alexandria, VA 22304

PROPERTY OWNER Name: Lane Construction Corp.

Address: 965 E. Main Street, Meriden CT 06450

PROPOSED USE: Amend the condition of the Existing Asphalt Plant SUP to permit certain nighttime Operations and permit stack height of 20 meters pursuant to Section 4-1205(C).

THE UNDERSIGNED hereby applies for a Special Use Permit in accordance with the provisions of Article XI, Section 11-500 of the 1992 Zoning Ordinance of the City of Alexandria, Virginia.

THE UNDERSIGNED, having obtained permission from the property owner, hereby grants permission to the City of Alexandria to post placard notices on the property for which this application is requested, pursuant to Article XI, Section 11-301(B) of the 1992 Zoning Ordinance of the City of Alexandria, Virginia.

THE UNDERSIGNED hereby attests that all of the information herein provided and specifically including all surveys, drawings, etc., required to be furnished by the applicant are true, correct and accurate to the best of their knowledge and belief. The applicant is hereby notified that any written materials, drawings or illustrations submitted in support of this application and any specific oral representations made to the Planning Commission or City Council in the course of public hearings on this application will be binding on the applicant unless those materials or representations are clearly stated to be non-binding or illustrative of general plans and intentions, subject to substantial revision, pursuant to Article XI, Section 11-207(A)(10), of the 1992 Zoning Ordinance of the City of Alexandria, Virginia.

Mary Catherine Gibbs
Print Name of Applicant or Agent

Mary Catherine Gibbs
Signature

HART, CALLEY, GIBBS & KARP, P.C.
Mailing Address

(703) 836-5757
Telephone #

(703)548-5443
Fax#

307 N. Washington St., Alex. VA 22314
City and State Zip Code

Date

DO NOT WRITE BELOW THIS LINE - OFFICE USE ONLY

Application Received: Date & Fee Paid: $

ACTION - PLANNING COMMISSION: Recommended Approval 10/3/06 6-1

ACTION - CITY COUNCIL: 10/14/06 -- CC deferred. SEE ACTION DOCKET.

3. SPECIAL USE PERMIT #2006-0072
216 EAST BELLEFONTE AVENUE
HOME DAY CARE
Public Hearing and Consideration of a request to operate a home child day care; zoned R-25/Residential. Applicant: Dawn Abate

PLANNING COMMISSION ACTION: Recommend Approval 7-0

4. SPECIAL USE PERMIT #2006-0078
1026 NORTH CHAMBLISS STREET
HOME DAY CARE
Public Hearing and Consideration of a request to operate a child home day care; zoned R-12/Residential. Applicant: Karina Suazanabar

PLANNING COMMISSION ACTION: Recommend Approval 7-0

END OF ACTION CONSENT CALENDAR

City Council approved the action consent calendar, with the removal of docket item #3, which was considered under separate motion. The approval was as follows:

3. City Council approved the Planning Commission recommendation. **(separate motion)**

4. City Council approved the Planning Commission recommendation.
Council Action:____

REPORTS OF BOARDS, COMMISSIONS AND COMMITTEES (continued)

Planning Commission (continued)

5. SPECIAL USE PERMIT #2005-0042
5601 COURTNEY AVENUE; 730 SOUTH VAN DORN STREET; 750 SOUTH VAN DORN STREET; 720 SOUTH VAN DORN STREET
VIRGINIA PAVING COMPANY
Public Hearing and Consideration of a request for a special use permit amendment to change the hours by which vehicles may exit and enter an existing asphalt plant and to permit a stack height of 20 meters; zoned I/Industrial. Applicant: Virginia Paving Company by Mary Catherine Gibbs, attorney

PLANNING COMMISSION ACTION: Recommend Approval 6-1

City Council deferred consideration of this item until a Council work session has been scheduled to discuss specific concerns and conditions and will bring the item back to a legislative meeting in November.
Council Action:____

Please Note: Docket Item #6 was considered following docket item #10.

6. DEVELOPMENT SPECIAL USE PERMIT #2004-0048
POTOMAC YARD LANDBAY H AND PARTIAL I
2501 JEFFERSON DAVIS HIGHWAY
Public Hearing and Consideration of a request for approval of a development special use permit, with site plan, for the construction of residential, retail and office uses on Landbay H and part of Landbay I; zoned CDD-10/Coordinated Development District. Applicant: Potomac Yard Development, LLC by Duncan Blair and M. Catharine Puskar, attorneys

PLANNING COMMISSION ACTION: Recommend Approval 7-0

5
10-14-06

Jan Chong
5152 California Lane
Alexandria, VA 22304

Alexandria City Council
301 King Street
Alexandria VA 22314

November 26, 2006

Dear Council Members:

Enclosed please find copies of a petition to deny the request by Virginia Paving to amend its Special Use Permit. The enclosed 60 signatures bring this petition close to a total of 1000 signatures - all by Cameron Station residents who are petitioning against this SUP.

Please deny the SUP. Do not let a heavy industry add night time production to it's current nuissance-creating production. As we residents stated to you in your hearing and numerous other times, this production has it's worse stench-creating effect on our community in the night time/early morning hours.

Surely VA Paving's other plant or other asphalt plants in the area can quickly and easily provide the asphalt needed for night-time road work in and around Alexandria - at night time there will be no traffic for them to get stuck in! We understand the city potentially saves money, but it comes at the cost of our right to enjoy the air we breathe at our homes. Please do not let your constituents down!

Thank you.

Sincerely,

Jan Chong

Petition to Deny the Request by Virginia Paving Company to Amend its Special Use Permit

BACKGROUND: The Virginia Paving Company facility at 5601 Courtney Avenue in Alexandria, Virginia (VA Paving) filed an application to change its Special Use Permit (SUP) to allow it to double its production and to essentially operate its asphalt plant 24/7. Its current 1960 SUP limits its hours of operation to Saturdays and to weekday daylight hours, but not including holidays. VA Paving is located just west of Tucker Elementary School, Boothe Park and Cameron Station. Intensification of asphalt production in such an area is clearly inappropriate and unhealthy.

VA Paving has publicly admitted being in violation of its SUP since it bought the plant in 2001. VA Paving had to pay fines to the EPA in late 2004 for two violations of the Clean Water Act and was cited by the City of Alexandria (City) in October 2004 for 22 violations relating to, among other things, water discharge, the fire code and dumping of waste. Six of these 22 violations have not been remedied. We believe VA Paving is a public nuisance and a potential health and safety hazard and should not be allowed to increase its hours of operation or increase its annual production.

PETITION: For the foregoing reasons, the undersigned respectfully request that Alexandria's Mayor and City Council deny VA Paving's request to amend its SUP, fully enforce its current SUP and take prompt action to ensure that VA Paving is currently in compliance with all City and state environmental and safety regulations.

Print Name	Signature	Address	Date
Peggy McGrath	[illegible]	191 Somerville St	11/4/06
[illegible]	[illegible]	4951 Brennan Pk Dr	11/5/06
Ann Friel	Ann Friel	171 Somerville St	11/6/06
Scott Williamson	[illegible]	225 Century Pl #205 Alex. 22304	11/9/06
Lily Fata	[illegible]	5113 O'Neill Lane Alx 22304	11/9/06
Candace Carson	[illegible]	171 Somerville St Unit 28 Alexandria VA 22304	11/10/06
Julie Patterson	Julie Patterson	5120 Donovan Dr. #107 Alex 22304	11-10-06
[illegible]	Rachel Gagnon	353 Livermore Lane 22304	11-10-06
Julie Hess	[illegible]	4901 [illegible]	
Stacey Smouse	[illegible]	332 Helmuth Ln	11-10-06
Louisa Ward	[illegible] Ward	5247 Tancreti Ln 22304	11-13-06
[illegible]	[illegible]	219 Somerville St Alex 22304	11/13/06
ROBERT KAROW	[illegible]	5006A BARBOUR DR ALEX, VA 22304	11/13/06

Petition to Deny the Request by Virginia Paving Company to Amend its Special Use Permit

BACKGROUND: The Virginia Paving Company facility at 5601 Courtney Avenue in Alexandria, Virginia (VA Paving) filed an application to change its Special Use Permit (SUP) to allow it to double its production and to essentially operate its asphalt plant 24/7. Its current 1960 SUP limits its hours of operation to Saturdays and to weekday daylight hours, but not including holidays. VA Paving is located just west of Tucker Elementary School, Boothe Park and Cameron Station. Intensification of asphalt production in such an area is clearly inappropriate and unhealthy.

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Print Name	Signature	Address	Date
Henry C. Norcom	[signature]	5113 Knapp Place Alexandria VA 22304	22 Nov 06
for Sandra Norcom	[signature]	5113 Knapp Place Alexandria VA 22304	22 Nov 06
Clara Hulkower	Clara Hulkower	133 Cameron Station Blvd	26 Nov 06

Petition to Deny the Request by Virginia Paving Company to Amend its Special Use Permit

BACKGROUND: The Virginia Paving Company facility at 5601 Courtney Avenue in Alexandria, Virginia (VA Paving) filed an application to change its Special Use Permit (SUP) to allow it to double its production and to essentially operate its asphalt plant 24/7. Its current 1960 SUP limits its hours of operation to Saturdays and to weekday daylight hours, but not including holidays. VA Paving is located just west of Tucker Elementary School, Boothe Park and Cameron Station. Intensification of asphalt production in such an area is clearly inappropriate and unhealthy.

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Print Name	Signature	Address	Date
Alexander L. Holder	A L Holder	327 Fucci Ct. Alexandria VA 22304	12 Oct 2006
Mitzi L. Holder	Mitzi L. Holder	327 Fucci Ct, Alex. VA 22304	12 OCT 2006
TIM NEALON	Tim Nealon	5199 BRAWNER 22304	10 Nov 2006
Nikolay Guorguiev	[illegible]	153 BARRETT PLACE	11 Nov. 2006
Laura East	Laura East	1650 Tremont Dr. Alex.	11. Nov.
Frankie East	Frank East	1650 Tremont Dr. Alex.	11. Nov

Petition to Deny the Request by Virginia Paving Company to Amend its Special Use Permit

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Print Name	Signature	Address	Date
Steve Gray	[illegible]	5236 Brawner Pl 22304	11/07/06
Alex Mejia	[illegible]	115 Cameron Station Blvd	11/08/06
[illegible]	[illegible]	145 Cameron Station	11-08-06
Arlene Hernandez	[illegible]	5272 Pocosin	11-8-06
E. Sweeney	E Sweeney	5116 Donovan Dr #206	11/8/06
Sharon Liebetreu	Sharon Liebetreu	269 Cameron Station Blvd.	11/8/06

Petition to Deny the Request by Virginia Paving Company to Amend its Special Use Permit

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Print Name	Signature	Address	Date
Julie Niemela	[illegible]	393 Cameron Station Blvd	11/7/06
Elizabeth Aschy	Elizabeth Aschy	513 Cameron Station Blvd	11/7/06
John Michalowski	[illegible]	513 Cameron Station Blvd	11/7/06
Adam Lawrence	[illegible]	134 Tull Pl.	11/7/06
[illegible]	Elizabeth F. Jones	4906 Gardner Dr.	11-7-06
Laura J. McKay	LAURA MCKAY	5103 Gardner Dr	11-7-06

Petition to Deny the Request by Virginia Paving Company to Amend its Special Use Permit

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Print Name	Signature	Address	Date
OSMA LADN	[signature]	—	—
Lauren Richards	[signature]	5706 Grimm 22304	11/15/06
Hayden Richards	[signature]	" " "	"
Hiep Hoang	[signature]	5185 Brawner Place	11/16/06
Joanna Wilcox	[signature]	274 Murtha St.	11/17/06
DARlene Drazenovich	[signature]	152 MARTIN LANE	11/17/06
Jametta Jenkins	[signature]	505 Cameron Station	11/18/06
Cynthia Lottering	[signature]	5807 Donovan	11/18/06
Don Birchler	[signature]	5121 KNAPP PL	11/18/06
RYAN BARNES	[signature]	5111 DONOVAN Dr.	11/18/06
John Cassady	[signature]	5120 DONOVAN-208	11/18/06
Jamie McLaury	[signature]	5232 Bessley Pl.	11/18/06
Larry McLaury	[signature]	5232 Bessley Pl.	11/18/06

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Print Name	Signature	Address	Date
Michelle DiGruttolo	[signature]	5229 Tancreti Ln	11-1-06
Jeff Bohling	[signature]	" "	" "
Colleen Jantzen	[signature]	5244 Brawner Pl	11-3-06
Nancy Fronckewicz	[signature]	5111 Grimm Drive	11-03-06
Colleen Adams	[signature]	5166 Brawner Pl. 22304	11-4-06
dee Lalley	[signature]	111 cameron station	11.04.06
MBeth Strausbaugh	[signature]	5255 Col Johnson	11-4-06
Derek Strausbaugh	[signature]	5255 Col Johnson	11-5-06
Joseph ALLing	[signature]	257 Medlock Ln	11-5-06
Stephen Lynn	[signature]	187 Cameron	11-6-06
Kamran Agha	[signature]	4951 Brenman Park Dr 216	11/06/06
Frank [illegible]	[signature]	5108 Donovan Dr #408	11/08/06
J. R. [illegible] JAMES R. STANFORD	[signature]	4901 DONOVAN DR.	11/08/06