

# CITY OF ALEXANDRIA

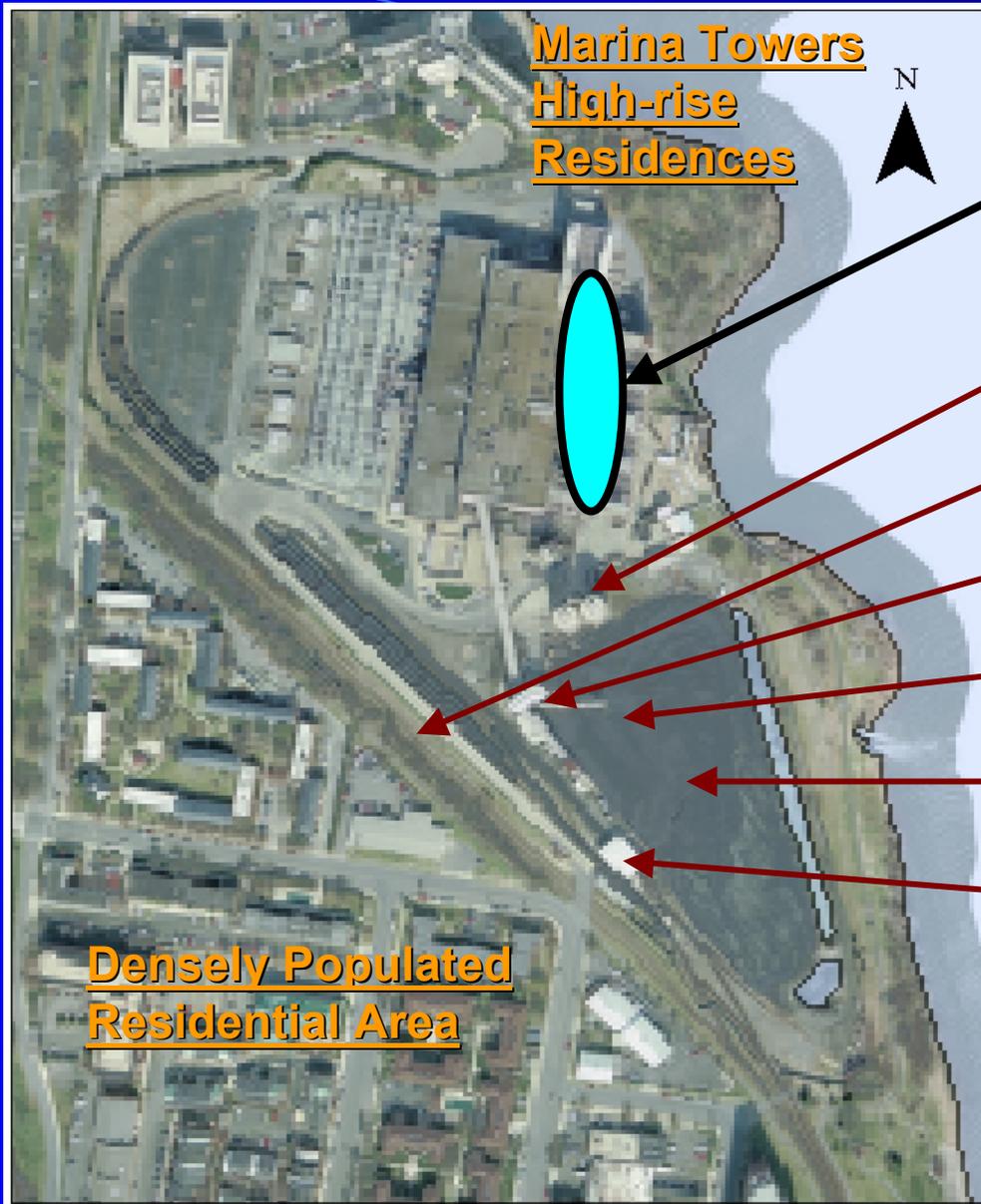
## ***PRGS -- CITY'S PERSPECTIVE OF ENVIRONMENTAL IMPACTS***



# MIRANT Potomac River Power Plant

- Built app. 1949 to 1955 on City's waterfront (28 acres)
- Short stacks designed to meet FAA requirements, not GEP
- Located in densely populated residential area.
- 482 MW (smallest of Mirant's DC area power plants and represents less than 0.5% of PJM's load)
- Plant is owned by Mirant and the land is owned by Pepco
- Some of the upgrades in the proposed consent decree are underway. These do not resolve downwash nor NAAQS compliance issues.





Marina Towers  
High-rise  
Residences



Stacks - tons (2004) :

<u>SO<sub>2</sub></u> = 15,139	<u>HCl</u> = 609
<u>PM<sub>10</sub></u> = 606	<u>HF</u> = 76
<u>PM<sub>2.5</sub></u> = app. 400	<u>NO<sub>2</sub></u> = 5,750

- Ash silos
- Ash hauling
- Coal breaker
- Coal dump
- Coal pile
- Railcar dump

Densely Populated  
Residential Area

Stack heights slightly  
exceed Marina Towers  
height.





# Views from Surrounding Public Areas From Marina Towers



# Views from Surrounding Public Areas

From Recreation Path w.  
app. 250,000 Users-



# 1998 to 2000

- Title V application submitted (still no permit).
- 2000 S.O.P. stipulates 1,019 tons NO2 per season.
- City enters comments that particulate emissions are impacting the community and trading may not benefit.
- Mirant purchases plant from PEPCO.
- Was due diligence review performed for a facility with downwash and emission problems?



## 2001

- **Community raised concerns about health impacts from the plant. City added monitoring station.**
- **Mirant's consultant states that 29 tons of fly ash and 10 tons of coal dust leave the site per year as fugitive, non-stack, uncontrolled emissions.**
- **The City begins to work with VADEQ and Mirant to address the issues.**



2002

## Increased Public Awareness of TRI Releases and PM2.5

- HCI 2.56 million lbs per year
- HF 94,000 lbs per year
- Acid aerosols sulfuric acid 97,000 lbs per year
- 71 lbs per year mercury compounds
- Solely due to Mirant's releases, 2002 TRI data show the City ranked 9th in Virginia.
- Levy, 2002 five-power plant study of PM2.5 shows 59 premature deaths, 66 hospital admissions, 870 ER visits, 4,600 asthma attacks attributed to PRGS.



## 2003

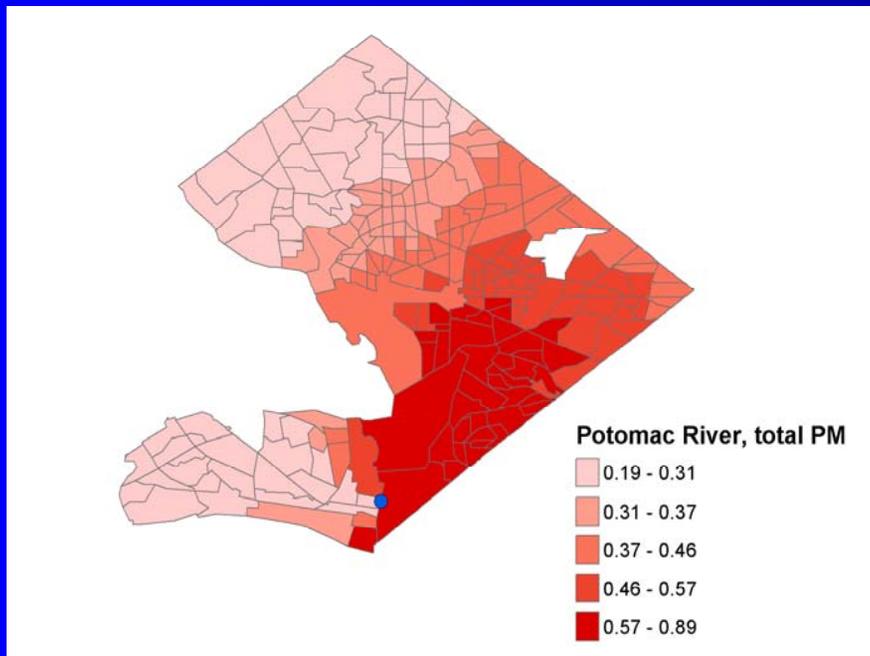
- June: VDEQ collects samples in adjacent residences – results show up to 50% of collected dust is coal dust, up to 10% is partially-combusted coal or ash.
- August 12: VDEQ memo dismisses concerns.
- August: E. Chimento and P. Hortel submit compendium report on potential impacts
- City begins additional studies of impacts.



# 2003, Continued

December: the City hires Dr. Jonathan Levy of Harvard School of Public Health to study emissions from Mirant's Potomac Plant and its impacts on the City. Among his conclusions in (April 2004):

- Contributes to negative health effects within the City and regional based on  $< 1$  microgram per cubic meter. This study did not include local downwash impacts.



Current (reduced load) impacts  
from Potomac River ( $\mu\text{g}/\text{m}^3$ ,  
annual average, primary only)  
**= 29!**



# 2004

- January: NOVs issued by both USEPA and VDEQ for exceedances.
- March: Community hires Sullivan Environmental - releases report identifying downwash as serious problem.
- March: draft SOP issued for comment w. 1,019 tons per season as a hard cap – no trading allowed.
- April 12: City and community enter comments strongly supporting 1,019 as hard cap and raise concerns about particulates.



## 2004, continued

- May/June: City adopts short term goal (cleanest plant possible) and long-term goal (closure of facility).
- September: prop. Consent Decree relaxes 1,019 limit.
- September: Mirant signs Consent Order that requires AAQS compliance with SO<sub>2</sub>, PM<sub>10</sub>, NO<sub>2</sub> and mercury.
- City hires modeling consultant.
- October: City comments on draft SOP asking that PM<sub>2.5</sub> and HAP impacts be assessed, and 1,019 be considered as hard cap.
- October: City forms Mirant Community Monitoring Group.
- November: VDEQ commits to performing the HAPs analysis (still no analysis) but does not respond to PM<sub>2.5</sub> request.

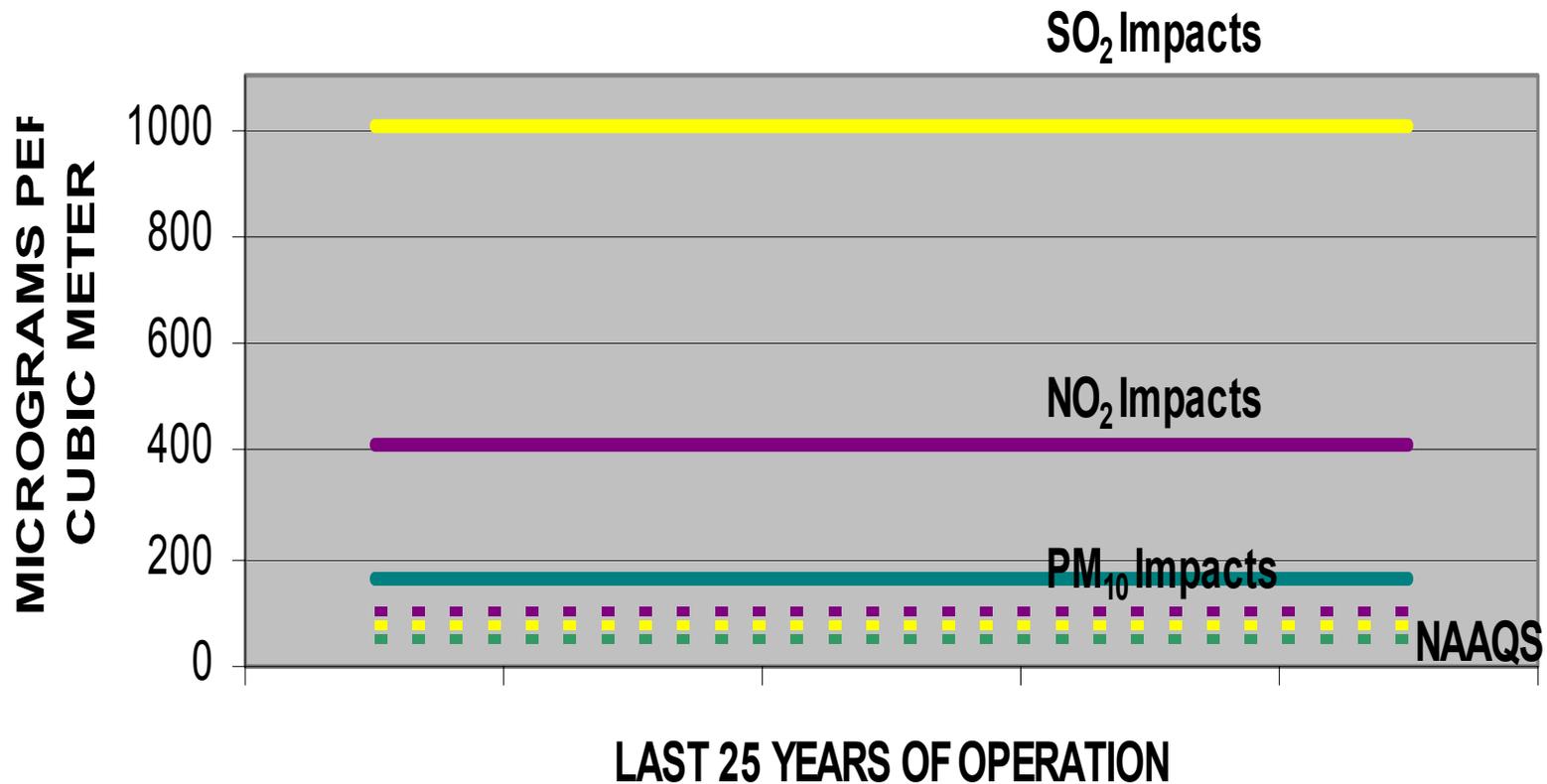


# 2005

- Modeling protocol developed by open process between Mirant, VDEQ and City.
- April: **Mirant tests lime injection process** for SO<sub>2</sub> control without VDEQ notice or approval (no results disclose, ceased due to excessive opacity).
- **August 19, 2005**: Mirant submits its own modeling study and VADEQ immediately requests it to take steps to address NAAQS (National Ambient Air Quality Standards) violations.
- City's parallel modeling analysis is submitted to VDEQ, confirming Mirant's results. The City's analysis also found exceedances of VA HAP and PM<sub>2.5</sub> standards, at multiple times the standards.
- **August 22, 2005**: Mirant responds by lowering the production and then proceeded to close the plant temporarily on August 24, 2005.
- Fall: Mirant re-opens under **limited, one-boiler operational scenario**.



# PRGS ANNUAL IMPACTS VS NAAQS - USING MIRANT'S OWN REPORTED EMISSIONS



## US EPA: On Average, AERMOD Under-predicts

- AERMOD is US EPA's own extensively peer-reviewed model, developed by American Meteorological Society and US EPA.
- Large-scale evaluation study shows that on average, AERMOD under-predicts in settings with downwash.
- Inputs are actual emissions, actual meteorology, actual plant configuration, USGS digitized geography.



# What did the baseline modeling study show?

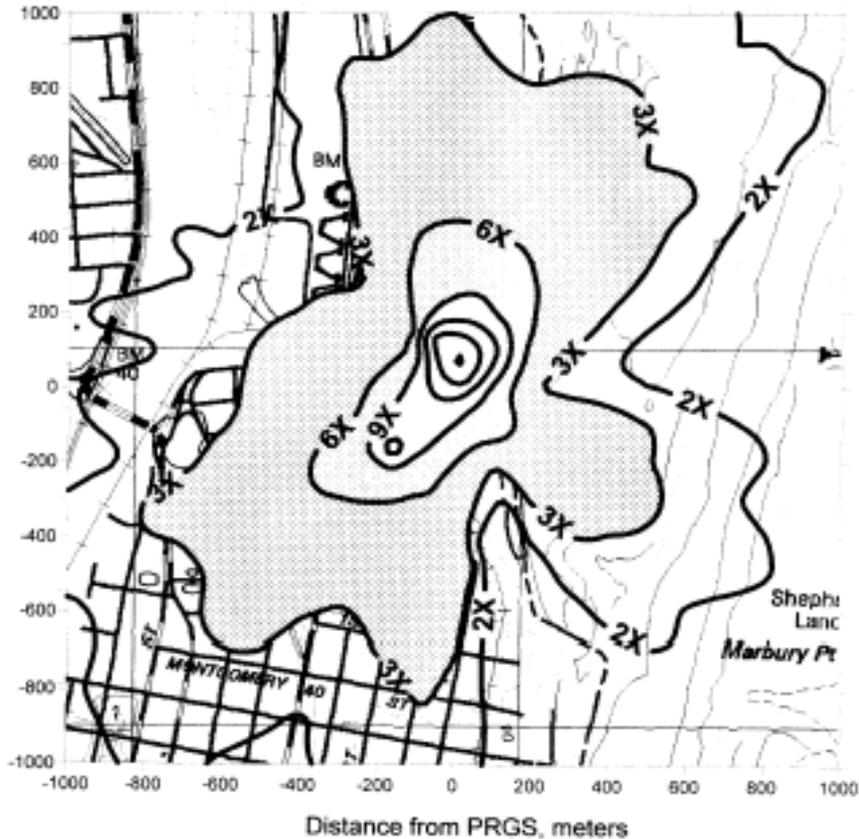
- For PM10, PM2.5 and SO2, maximum short term impacts exceed the NAAQS by 5-18 times
- For annual impacts for NO2, PM2.5, PM10, and SO2, chronic exposure levels exceeded NAAQS by 3-12 times
- For toxic emissions such as hydrogen chloride and hydrogen fluoride, impact exceeded Virginia guidelines by up to 5 times.



# What did the baseline modeling study show?

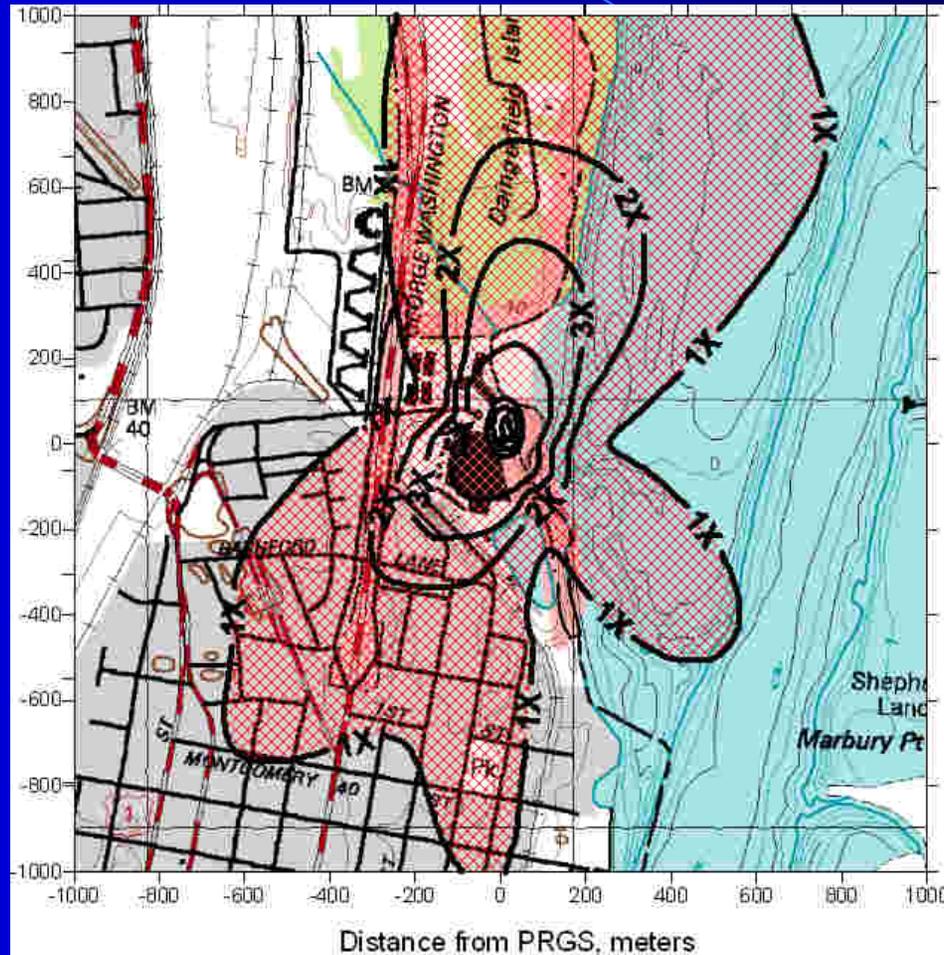
24 hr  
SO<sub>2</sub>

Figure 3-7. Maximum 24-hour SO<sub>2</sub> impacts (micrograms per cubic meter) including background shown as multiples of the standard. Impacts in shaded areas exceed the standard by three or more times.



# What did the baseline modeling study show?

Annual  
SO<sub>2</sub>



City of Alexandria

# Current Concerns

- Operations under DOE'S and VDEQ's AAQS Consent Order.
- Trona use and testing and NSR.
- PM2.5 impacts.
- Amended Consent Decree.



# Concerns with DOE Order

- DOE orders plant to operate for reliability purposes, in compliance with NAAQS, with exceptions for maintenance/emergencies.
- VDEQ requires compliance with NAAQS Consent Order.
- City is not aware that VDEQ or USEPA has approved existing operational scenarios.
- Mirant has submitted and is operating under additional scenarios without approval by any agency.
- City's modeling shows violations of NAAQS and HAPs for Option A and other scenarios.



# Concerns with Trona Use and Testing

- Trona process is experimental: not a single US EPA Control Technology Clearinghouse entry for it.
- Only 2 US electrical generating stations using it, at 20% vs. 80+% reduction requirement.
- DOE-sponsored tests documented soot-buildup (slagging) problems.
- DOE-sponsored test under optimal short-term test conditions does not show 80% SO<sub>2</sub> removal.
- No health studies of potential impacts for this process.



# Trona Process Increases Potential PM2.5 and PM10 Emissions

- 4.5 to 5.0 tons or more trona per hour per boiler required.
- Trona increases PM to stack exhaust by almost 20-fold.
- Additional PM either goes out the stack or is hauled off-site.
- Handling and hauling also increase PM10 and PM2.5 emissions.



# NSR Concerns

- City believes that trona triggers NSR while VDEQ grants approval with grossly inadequate testing and review.
- November trona test results not disclosed.
- Using first baseline result, trona appears to increase PM10 emissions.
- True baseline still not established.
- Supposed-baseline study did not use historical coal (ash content much higher).
- Ash content not disclosed without VDEQ intervention.



# Trona: Tests vs. the Real World

## Mirant's Trona Test Report

- “no [opacity] spikes of any kind...”
- “opacity consistently below 4%...”
- “ESP improvement...was demonstrated...”

## Sample Opacity CEM Record for April 18 to 21

- Opacity ranges from 3.95% to 29.2%
- Opacity is below 4% for only three 6-minute periods for entire 4-day record for stack 3.
- Opacity offers no means of compliance with PM limits.



# Possible Evidence of Trona Operational Problems Occurring Now

- VDEQ has documented opacity violations – **potential NOV forthcoming.**
- **Ash silo failure** – large release of ash.
- Facility attempting to **repair boiler** during recent test, invalidating results.
- Problem with **re-entrainment of flyash emissions** into ESP.



# PM2.5 Concerns

- City located in PM2.5 non-attainment area
- Increasing evidence of serious health effects even at levels below the standards.
- US EPA re-setting the standards to lower levels due to health effects.



## Recent PM2.5 Studies and Their Conclusions (late 2005 – 2006)

(Note: PRGS max. annual increment = 29 µg./cu.m. for primary PM2.5)

<p>“...A Case Study of Power Plants near Washington, DC,” Levy, Spengler and Greco, Briefing before US Senate Environment and Public Works Committee, 2002.</p>	<p>CALPUFF used to estimate impacts from five coal-fired power plants in DC; study finds they contribute a maximum of 1.3 µg./cu.m. <u>Result:</u> 250 premature deaths per year.</p>
<p>“National Ambient Air Quality Standards for Particulate Matter,” US EPA, Proposed Rule, Dec. 2005.</p>	<p>Proposes eliminating PM10 standard except for specific activities (construction) and reducing PM<sub>2.5</sub> 24-hour standard to 35 from 65 µg./cu.m.</p>
<p>Clean Air Scientific Advisory Council, Feb. 2006.</p>	<p>Objects formally to US EPA’s proposal to maintain current PM<sub>2.5</sub> annual standard at 15 µg./cu.m.</p>
<p>“Analysis of Particulate Matter Impacts for Six Power Plants in Maryland,” J. Levy, Harvard School of Public Health, February, 2006.</p>	<p>Cites evidence indicating health effects above 13 µg./cu.m. Result: 179 premature deaths in region; 35 in Maryland.</p>
<p>Editorial, <u>Am. Journal of Respiratory and Critical Care Medicine</u> February, 2006.</p>	<p>Cites results of time series analyses from 90 US cities to recommend tightening PM2.5 NAAQS.</p>
<p><u>Am. Journal of Respiratory and Critical Care Medicine</u>, March, 2006.</p>	<p>Largest decline in mortality rates occurred among six US cities with greatest reduction in ambient PM2.5.</p>



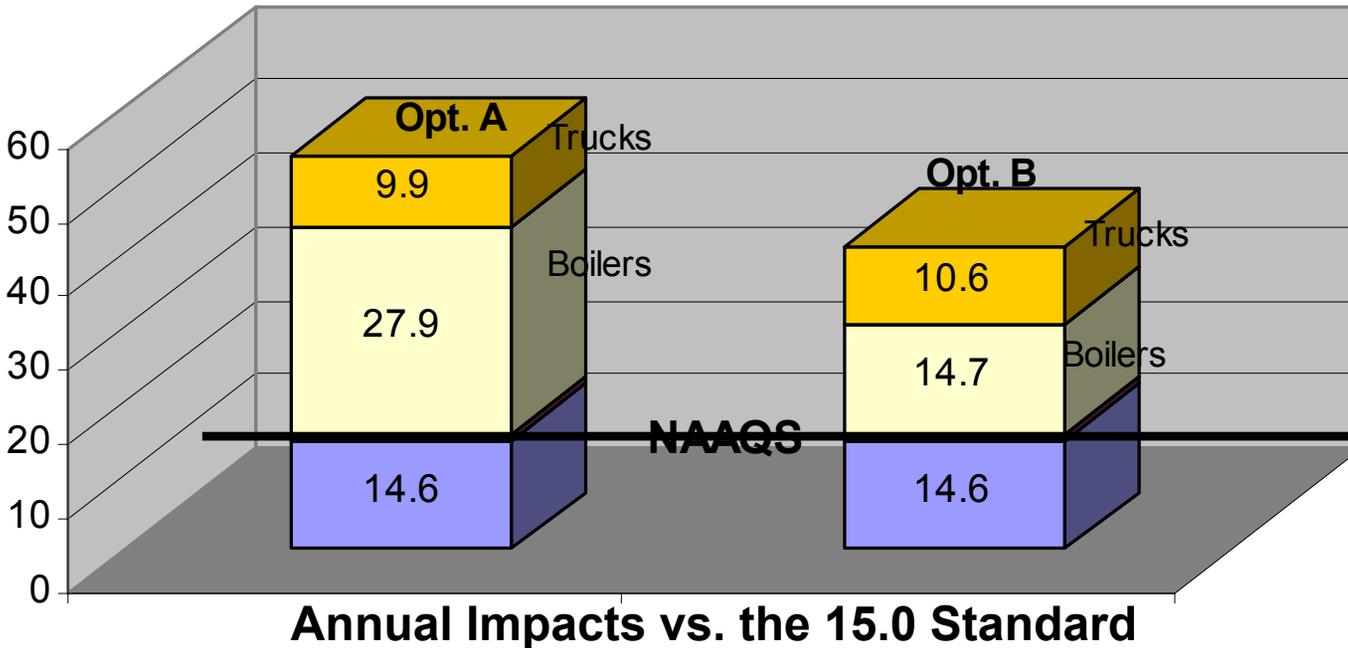
# PM2.5 is Regulated by VDEQ as a Criteria Pollutant

- **9VAC Chapter 30**: “to ensure that ambient concentrations ...are consistent with established criteria...”
- **9VAC 5-20-180**: “reduce level of operation ...to prevent a violation of any primary AAQS.”
- **DOE order requires that operation must comply with all AAQS.**
- **US EPA applied AERMOD** using primary portion of PM2.5 to evaluate “local-scale” impacts in three major urban areas.
- **City applied AERMOD** using primary PM2.5 for current operational scenarios and impacts show exceedances.
- VDEQ, USEPA and Mirant **have not modeled** PM2.5 impacts.



# Current Operations Egregiously Violate PM<sub>2.5</sub> NAAQS

How do Options A and B Compare with PM<sub>2.5</sub> AAQS?



# Amended Consent Decree

## Mirant Gets:

- Plant continues to operate under minimal review.
- No BACT/LAER demonstration, instead an SO2 control w. additional impacts.
- SCR at Maryland, just one - two years ahead of regulatory requirements.
- No need to demonstrate continued compliance of PM10 and PM2.5 limits.

## City Gets:

- Instead of 1,019 tons of NO2, 1600 to 1,475 tons per season!
- An experimental process with additional potential pollutants.
- NO2 control on only 3 of 5 boilers.
- Continued egregious violations of PM10, PM2.5, HCl and other pollutants.
- Potential load-shifting to PRGS.
- Fugitive dust controls that assist in compliance with basic requirements.



# Fiscal Impacts on City

- In addition to environmental impacts on City, City bears financial cost of analysis regarding Mirant's impacts on community
- City has had to fund these analyses and respond to community's concerns with increased inspection :
  - HAPs analysis, Options A and B modeling, two-boiler scenario modeling, BACT review of trona, PM2.5 source testing survey, trona emissions review, baseline parallel modeling, review of Consent Decrees, protocol comments, monitoring
- Yet Mirant pays huge annual Title V revenues to VDEQ for air permitting and enforcement (about 350,000 dollars per year)



## City Requests VDEQ Assert Jurisdiction

- VDEQ should independently evaluate and render determination of whether current scenarios comply with AAQS and SAAC guidelines.
- For January and April, 2006 violations, VDEQ should issue NOVs.
- No documented approval by VDEQ (or US EPA) of any scenario.
- Result: Mirant currently violating NAAQS and SAACs and running scenarios of its own choosing.



# City Requests a Rigorous Regulatory Review

- HAPs analysis still lacking (promised 18 months ago) while current impacts continue to exceed SAACs.
- Modeled and monitored compliance for all criteria pollutants including PM2.5.
- In PM2.5 nonattainment, all impacts should be evaluated against NSR requirements.
- PM Continuous Emission Monitors as part of Compliance Assurance Monitoring plan.



## City Requests that VDEQ Undertake Rigorous Trona Process Review

- Evaluation of process fugitive and stack emissions.
- ESP Inlet and outlet testing of PM2.5 and PM10 (after 50 plus years of operation there are no ESP efficiency tests!).
- Operational parameters of ESPs must be documented.
- City requests installation of PM10 CEMs.
- Ash content of coal used in testing must be equivalent to ash content of coal used in historical operations.



## City Requests Improved Communications and Participation by VDEQ on Mirant Issues

- City thanks VDEQ for its attendance and participation in Mirant Community Monitoring Group and requests that it continue.
- City requests documented and written responses to issues and concerns in City's correspondence.
- Need for written record of decisions (operating scenarios, test protocols).
- As primary stakeholder and as a local air pollution control agency, City requests opportunity to participate, review and comment on testing protocols, modeling protocols and draft permits before public issuance.



# Discussion and Questions

*Thank you very much.*

