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Appendix A

facilities in Ohio with BART-eligible sources

Criteria for inclusion:
1) belong to one of 25 source categories ("B" through "Z") listed in Appendix C; and
2) built in period of 1962 through 1977; and
3) potential emissions of 250 tons per year of SO_2, NOx, particulate, or volatile organic compounds

	OEPA fac.no.	County	Appndx B Industrial category
BP Products North America Inc.	0448020007	Lucas	K,V
CEMEX, Inc	0829700165	Greene	D
Chemtrade Logistics	0302000001	Allen	U
Cinergy Solutions of St. Bernard	1431394148	Hamilton	V
Cognis Corporation	1431070035	Hamilton	V
Degussa	0684010049	Washington	U
Glatfelter	0671010028	Ross	V
ISG Cleveland Inc.	1318001613	Cuyahoga	V
LTV Steel Company, Inc.	0243030257	Lake	L
Marathon Ashland Petroleum LLC	1576000301	Stark	K,V
Marsulex	0448020014	Lucas	U
Martin Marietta Magnesia Specialties, Inc.	0372000127	Sandusky	L
Ormet Corporation	0656000001	Monroe	G
Millenium Inorganic Chemicals, Inc.	0204010193	Ashtabula	U,V
Owens Corning	0145020185	Licking	Y
Premcor Refining Group	0302020012	Allen	K
Republic Technologies International	0247080229	Lorain	V
Sun Company Inc.	0448010246	Lucas	K,V
Sunoco Inc (R&M)	0773000080	Scioto	V
WCI Steel, Inc.	0278000463	Trumbull	V
Wheeling Pittsburgh Steel Corporation	0641090010	Jefferson	V

Appendix B

Sample Questionnaire

Date

Name
Company Name
Address
Address

Re: Best Available Retrofit Technology (BART)

Dear :

I am writing to update you on air pollution requirements that may affect emission units at your facility. The rules involve the reduction of regional haze and the protection of sensitive national parks, forests and wilderness areas such as the Shenandoah National Park. These areas are identified as "Class I" areas under the Clean Air Act prevention of significant deterioration (PSD) rules. The regional haze rules were originally developed as part of the Clean Air Act Amendments (CAAA) of 1977. As part of the CAAA implementation, sources which were installed or modified between 1962 and 1977 were identified as potential sources of emissions that could cause or significantly contribute to impacts on Class I areas well into the future.

Many of the sources installed between 1962 and 1977 may have been installed without significant pollution controls. Sources installed subsequent to the 1977 CAAA are assumed to have been reviewed by states and installed with best available emission controls. Good visibility is considered a significant component of the enjoyment of these areas. The ultimate goal of the regional haze rules is to return conditions in these protected parks and forests back to natural conditions.

Regional haze can be affected by the presence of small particles that can interrupt the transmission of light, partially diminishing the ability to view objects over distance. Some of these particles are emitted as gasses such as sulfur dioxide or oxides of nitrogen which can transform into small sulfate and nitrate particles. The emissions from individual sources can combine with other sources over a region and can contribute significantly to the degradation of visibility to more distant Class I areas downwind.

The specific purpose of this letter is to identify and verify information about sources at your facility which are potentially subject to BART. Ohio EPA has reviewed our 1999 emissions inventory system and attempted to identify units in specific source categories

(list attached) that were installed or modified in the window of time between 1962 and 1977 (attached). I would ask that you review this list and verify that the information provided is correct. Also, add any additional relevant information concerning the history, upgrades and remaining useful life of the potentially affected source(s).

Once a source has been identified as eligible for BART, the agency will review factors such as impact on Class I areas, the cost of compliance, existing controls, the remaining useful life of the unit and the degree of air quality improvement controls would result in to determine if the unit(s) would be subject to the installation of BART controls.

Please review and provide any corrections to the information by August 15, 2004. If you have any questions, please contact either Bill Spires (614-644-3618) or Tom Velalis (614-644-4837).

Sincerely

Robert F. Hodanbosi, Chief
Division of Air Pollution Control

Attachments:

List of units potentially subject to BART
List of 26 source categories subject to BART

BART Categories

(1) Fossil-fuel fired steam electric plants of more than 250 million British thermal units (BTU) per hour heat input,
(2) Coal cleaning plants (thermal dryers),
(3) Kraft pulp mills,
(4) Portland cement plants,
(5) Primary zinc smelters,
(6) Iron and steel mill plants,
(7) Primary aluminum ore reduction plants,
(8) Primary copper smelters,
(9) Municipal incinerators capable of charging more than 250 tons of refuse per day,
(10) Hydrofluoric, sulfuric, and nitric acid plants,
(11) Petroleum refineries,
(12) Lime plants,
(13) Phosphate rock processing plants,
(14) Coke oven batteries,
(15) Sulfur recovery plants,
(16) Carbon black plants (furnace process),
(17) Primary lead smelters,
(18) Fuel conversion plants,
(19) Sintering plants,
(20) Secondary metal production facilities,
(21) Chemical process plants,
(22) Fossil-fuel boilers of more than 250 million BTUs per hour heat input,
(23) Petroleum storage and transfer facilities with a capacity exceeding 300,000 barrels,
(24) Taconite ore processing facilities,
(25) Glass fiber processing plants, and
(26) Charcoal production facilities.

Appendix C

26 Best Available Retrofit Technology (BART) categories under the "existing stationary facility" definition in 40 CFR 51.301

A	Fossil-fuel fired steam electric plants of more than 250 million British thermal units per hour heat input
B	Coal Cleaning plants (thermal dryers)
C	Kraft pulp mills
D	Portland cement plants
E	Primary zinc smelters
F	Iron and steel mill plants
G	Primary aluminum ore reduction plants
H	Primary copper smelters
I	Municipal incinerators capable of charging more than 250 tons of refuse per day
J	Hydrofluoric, sulfuric, and nitric acid plants
K	Petroleum refineries
L	Lime plants
M	Phosphate rock processing plants
N	Coke oven batteries
O	Sulfur recovery plants
P	Carbon black plants (furnace process)
Q	Primary lead smelters
R	Fuel conversion plants
S	Sintering plants
T	Secondary metal production facilities
U	Chemical process plants
V	Fossil-fuel boilers of more than 250 million British thermal units per hour heat input
W	Petroleum storage and transfer facilities with a capacity exceeding 300,000 barrels
X	Taconite ore processing facilities
Y	Glass fiber processing plants, and
Z	Charcoal production facilities

Appendix D

Results of LADCO's Q/D screening analysis for BART-eligible sources in Ohio

	latitude	longitude	actual SO_2 TPY	actual NOx TPY	closest Class 1 area	km	Q/D $(SO_2 + NOx)/D$ TPY/km
BP Products North America Inc.	41.654	-83.450	13	732	doso	456	1.6
CEMEX, Inc	39.750	-83.953	464	3689	maca	344	12.1
Chemtrade Logistics	40.849	-84.077	1597(1)	0.1(1)	doso	424	3.8
Cinergy Solutions of St. Bernard	39.175	-84.503	1991	1145	maca	250	12.5
Cognis Corporation	39.178	-84.504	1708	434	maca	250	8.6
Degussa	39.301	-81.568	1272(2)	261(2)	doso	165	9.3
ISG Cleveland Inc.	41.462	-81.671	419	180	doso	338	1.8
LTV Steel Company, Inc.	41.724	-81.277	589	468	doso	345	3.1
Marathon Ashland Petroleum LLC	40.751	-81.415	45	259	doso	263	1.2
Marsulex	41.656	-83.455	591	1	doso	456	1.3
Martin Marietta Magnesia Specialties, Inc.	41.439	-83.370	1513	2032	doso	436	8.1
Ormet Corporation	39.704	-80.843	4211(2)	0.1(2)	doso	124	34.0
Glatfelter	39.325	-82.975	20507	2665	doso	284	81.6
Millenium Inorganic Chemicals, Inc.	41.869	-80.771	0	21	doso	342	0.1
Owens Corning	40.071	-82.403	58	316	doso	259	1.4
Premcor Refining Group	40.689	-84.124	984	1380	maca	427	5.5
Republic Technologies International	41.449	-82.146	2	28	doso	338	0.1
Sun Company Inc.	41.632	-83.498	3225	1750	doso	432	11.5
Sunoco Inc (R&M)	38.566	-82.814	14	544	doso	302	1.8
WCI Steel, Inc.	41.211	-80.817	1729	617	doso	258	9.1
Wheeling Pittsburgh Steel Corporation	40.292	-80.600	160	609	doso	180	4.3

(1) projected future emission
(2) allowable

Appendix E

Four-character abbreviations of affected national parks and other Class I areas

bowa	Boundary Waters Canoe Area	Minnesota
brig	Brigantine National Wildlife Refuge	New Jersey
doso	Dolly Sods/Otter Creek Wilderness	W. Virginia
grgu	Great Gulf Wilderness	New Hampshire
grsm	Great Smoky Mountains National Park	Tennessee
hegl	Hercules-Glades	Missouri
isle	Isle Royale National Park	Michigan
jari	James River Face	Virginia
ligo	Linville Gorge	N. Carolina
lybr	Lye Brook Wilderness	Vermont
maca	Mammoth Cave National Park	Kentucky
ming	Mingo	Missouri
sene	Seney	Michigan
shen	Shenandoah National Park	Virginia
sips	Sipsy Wilderness	Alabama
voya	Voyageurs National Park	Minnesota

Appendix F

Technical parameters of the Calpuff modeling

Ohio followed the recommendations contained in "Single Source Modeling to Support Regional Haze BART / Modeling Protocol" (March 21, 2006) by the Lake Michigan Air Directors Consortium, Des Plaines, Il (attached as Appendix E-m) and that document should be consulted for a detailed technical discussion. The technical approach will be briefly summarized under the following headings:

- pollutants
- sources
- grid
- meteorology
- receptors
- background visibility
- calculation of extinction coefficients
- criteria for acceptable impact
- plot of receptors
- QA plots of downwind impact
- sample listings showing selected CALPUFF and CALPOST parameters
  - *i)* CALPUFF
    - *A)* emissions.glat_553.txt
    - *B)* calpuff.recp.2003.glat_553.inp
  - *ii)* CALPOST
    - *A)* ../calpost/run/run.job
    - *B)* calpost.2003.recp.inp
- modeler's notes providing details of emission rates and stack parameters
- LADCO guidance document

POLLUTANTS

Point-source emissions of sulfur dioxide, sulfate, nitric acid, nitrogen oxides (NOx), and primary fine particulate matter (PM 2.5) were modeled. Where PM 2.5 micron emissions were unavailable, PM 10 was used instead.

SOURCES

Twenty-five of the twenty-six BART categories listed in Appendix B were considered as candidates for BART analysis. Ohio chose to exclude Category A, "Fossil-fuel fired steam electric plants of more than 250 MMBtu" on the grounds that the Clean Air Interstate Rule (CAIR) will mandate a level of control equal to or higher than BART. Further requirements to be a BART candidate are that the source in question must have been put in place between August 7, 1962 and August 7, 1977 and have have the potential to emit 250 tons per year of a visibility-impairing pollutant.

c) GRID

The grid consists of 90 rows and 97 columns of 36-km cells, covering all of the United States east of the Rocky Mountains. A Lambert conformal map projection was used, centered at 97 degrees longitude, 40 degrees latitude, with true latitudes of 33 and 45 degrees. This is the same projection being used by the LADCO participating states for ozone and PM 2.5 modeling with CAMx.

d) METEOROLOGY

Data files of wind velocity and other parameters over the entire grid were created by the MM5 v3.6 prognostic meteorological model for years 2002, 2003, and 2004, with the use of actual observational data as needed to initialize the model calculations. LADCO performed the modeling and supplied the files to Ohio.

e) RECEPTORS

Each of the sixteen Class I areas is provided with a fine grid of discrete receptors, with actual ground-level elevations, at an approximate spacing of one kilometer, with a total of 4434 receptors for all areas. A plot is provided as Appendix E.i.

f) BACKGROUND VISIBILITY

Consistent with the LADCO protocol.

g) CALCULATION OF EXTINCTION COEFFICIENTS

Calculation of visibility extinction is based on the modeled concentrations of three species: sulfate, nitrate, and fine particles. The visibility calculations are performed by the CALPOST post-processor, which operates on the outputs from CALPUFF, in accordance with either the calpost.YYYY.grid.inp or calpost.YYYY.recp.inp control file, depending on whether cell-average or discrete-receptor calculations are to be performed.

h) CRITERIA FOR ACCEPTABLE IMPACT

A source has an unacceptable impact if either of the following is true:

- the highest 24-hour emission rate from 2002 to 2004 causes eight or more days of modeled visibility impact greater than 0.5 deciviews in any single Class I area, during any one of the years 2002, 2003, and 2004;

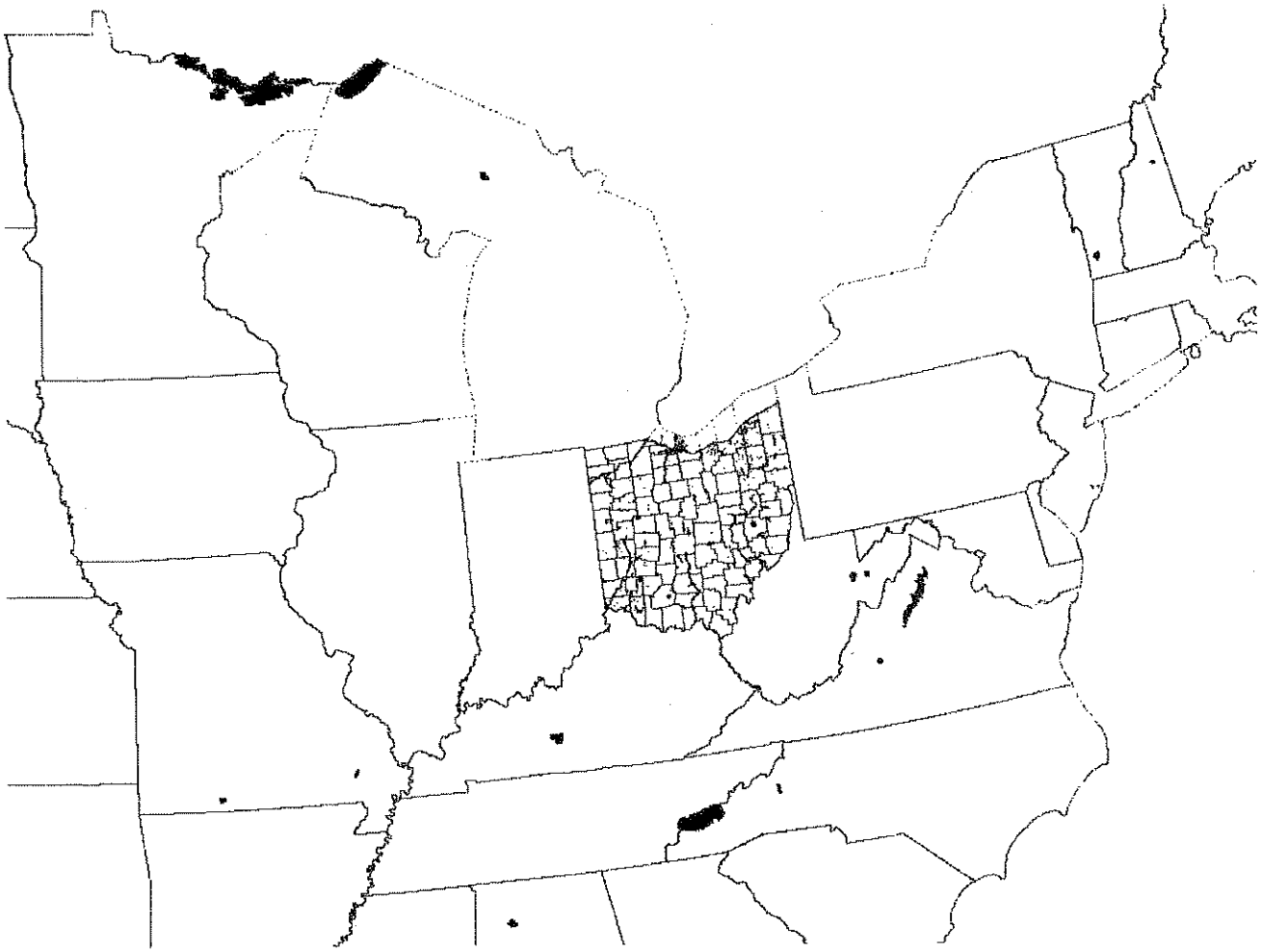
- the highest actual annual emissions divided by hours of operation causes one or more days of modeled visibility impact greater than 0.5 deciviews in any single Class I area, during any one of the years 2002, 2003, and 2004.

The "potential" or "allowable" emission rate of a source is permitted to be a surrogate for "highest 24-hour emission rate" where the historic records of emission rate are not readily available. The second criterion ("annual emissions divided by hours") is resorted to only if the information required by the first criterion cannot be obtained. The protocol document refers to "more than 21 days of visibility impairment over the 3 year modeling period or 7 days of visibility impairment in any one of the 3 years modeled," but since 21 over three years cannot be exceeded without exceeding 7 days in at least one year, the initial segment of the protocol text is obviously nonfunctional, and will be omitted from the current discussion.

The eight or more days of excessive impact must all be within the same Class I area, but are not necessarily located at the same receptor. Thus, an area with a large angular extent when viewed from a distant source (such as the Shenandoah National Park) may suffer an unacceptable impact, where a closer but smaller area in the same general direction may not.

Appendix F-i

plot of receptor locations



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Appendix F-j

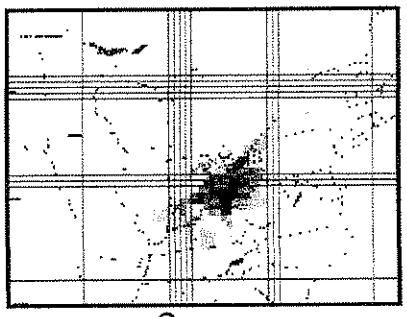
Quality assurance plots for Calpuff BART runs

(page 1 of 2)

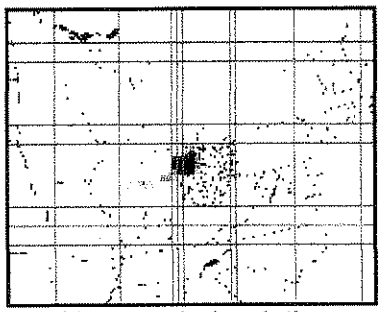
Effects of point source releases from potential BART sources upon downwind visibility, based upon gridded concentrations computed by the Calpuff air pollutant dispersion model

Cells are colored according to number of days of impact above 0.5 deciviews, with white denoting zero days and a progression of colors representing increasing number of days. The purpose of the plots is to qualitatively demonstrate the correct placement of sources and to allow rough comparisons of relative impact. The actual compliance demonstration is based on visibilities calculated at specific point locations, and may not be in exact agreement with gridded results.

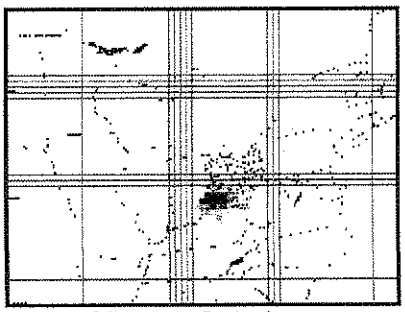
(click on the thumbnails for larger images)



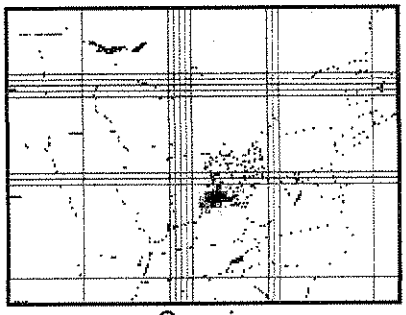
Cemex
(Greene Cnty)



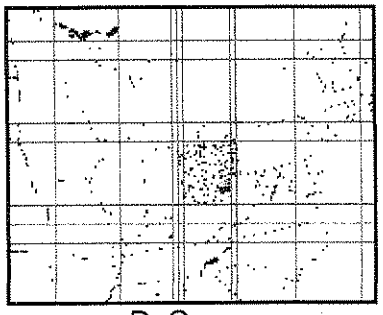
Chemtrade Logistics
(Allen Cnty)



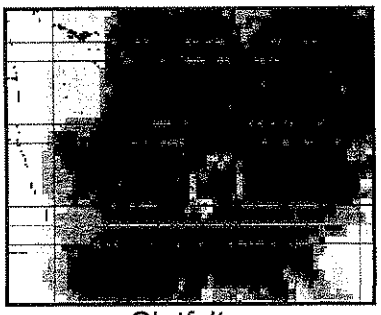
Cinergy Solutions
of St. Bernard, LLC
(Hamilton Cnty)



Cognis
(Hamilton Cnty)



DeGussa
Engineered Carbons LP
(Washington Cnty)
(next page)



Glatfelter
baseline
(Ross Cnty)

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Quality assurance plots for Calpuff BART runs

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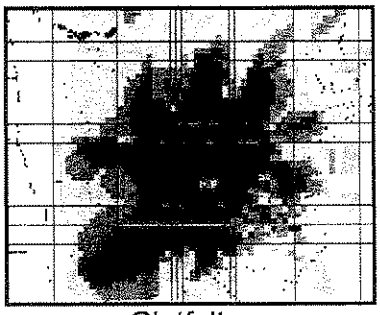
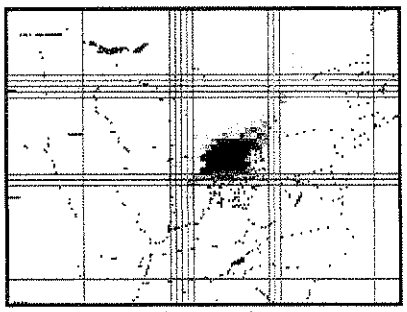
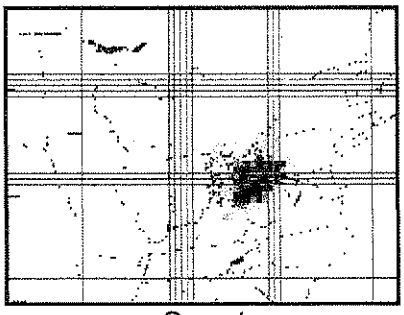


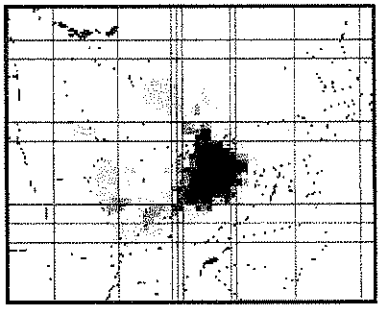
Glatfelter
60% control
(Ross Cnty)



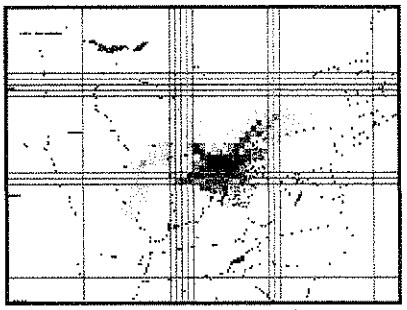
Martin Marietta
Magnesium
(Sandusky Cnty)



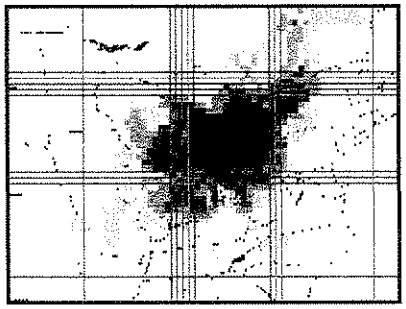
Ormet
(Monroe Cnty)



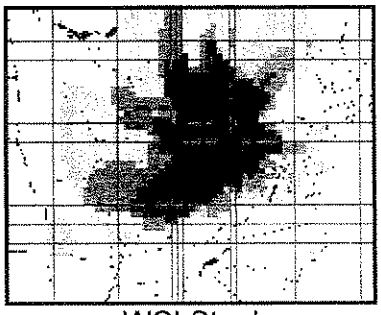
Owens Corning
(Licking Cnty)



Premcor Refining Group
(Allen Cnty)



Sun
(Lucas Cnty)



WCI Steel
(Trumbull Cnty)

(previous page)

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