

Modeled Assessment of Atmospheric Deposition Inputs to the Maryland Coastal Bays

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Abstract

This report describes a source apportionment analysis of nitrogen deposition in the Maryland Coastal Bays, based on the CALPUFF modeling system. Nutrient nitrogen concentrations on the Delmarva Peninsula are among the highest in the nation and estimates of nutrient N from atmospheric sources may comprise about 320,000 Kg-N/yr and may represent as much as 55% of the total anthropogenic input.

Many of the current estimates of atmospherically derived nitrogen are obtained from observations of wet and dry deposition. National programs, especially the National Atmospheric Deposition Program [NADP] for wet deposition, the Clean Air Status and Trends Network [CASTNet] for dry deposition and the Atmospheric Integrated Research Monitoring Network [AIRMoN] for both wet and dry deposition have provided the bulk of the data for these types of analyses. While these programs provide estimates of inputs they do not allow individual source contributions to be understood in more than a very broad way. For nutrient management purposes, a modeling framework that covers the full spatial scale of emissions and deposition and which derives estimates in a way that includes these atmospheric emission sources explicitly is desirable if credits for actions by individuals, either voluntary or through some nutrient trading program, are to be assessed.

The principal objective of this study is to develop a source apportionment framework for atmospheric deposition resulting from air emission. The Lagrangian formulation used in CALPUFF allows sources to be modeled individually and their combined impacts assessed. Estimates of ammonium deposition are included by using sulfate as a surrogate. Organic N is not included. Sources are divided in four main categories: electricity generating units [EGU], mobile sources, industrial sources and area sources. The results of this analysis show EGUs to be the largest contributing sources category, while mobile and area sources in Sussex County, Delaware are the largest individual sources. This type of information is useful for the development of mitigation strategies, especially voluntary efforts, by estimating “credits” for emission reduction activities at specific sources.

The modeling system appears to underestimate total deposition and hence deposition fluxes. This is especially true for ammonium. Enhancements to the modeling approach, currently underway, will include specific modeling of ammonia emissions. Further investigations are also underway that are examining the underprediction tendencies of the model.

1.0 Introduction

The effects of nutrient pollution on coastal waters are an issue of national concern as evidenced by a recent study sponsored by the National Research Council [National Research Council, 2000]. The contribution from the atmospheric deposition of biologically available nitrogen to the nutrient load of estuarine and coastal waters has been recognized for some time [Fisher et al, 1988], especially in the northeastern United States. A schematic from the National Research Council study shows the nitrogen mass balance for the Northeastern United States in Figure 1.1 and highlights the importance of atmospheric deposition in this region. A recent review [Valigura et al, 2001] provides a comprehensive overview of current methodologies, load estimates and ecological assessments covering the major coastal and estuarine systems in the United States.

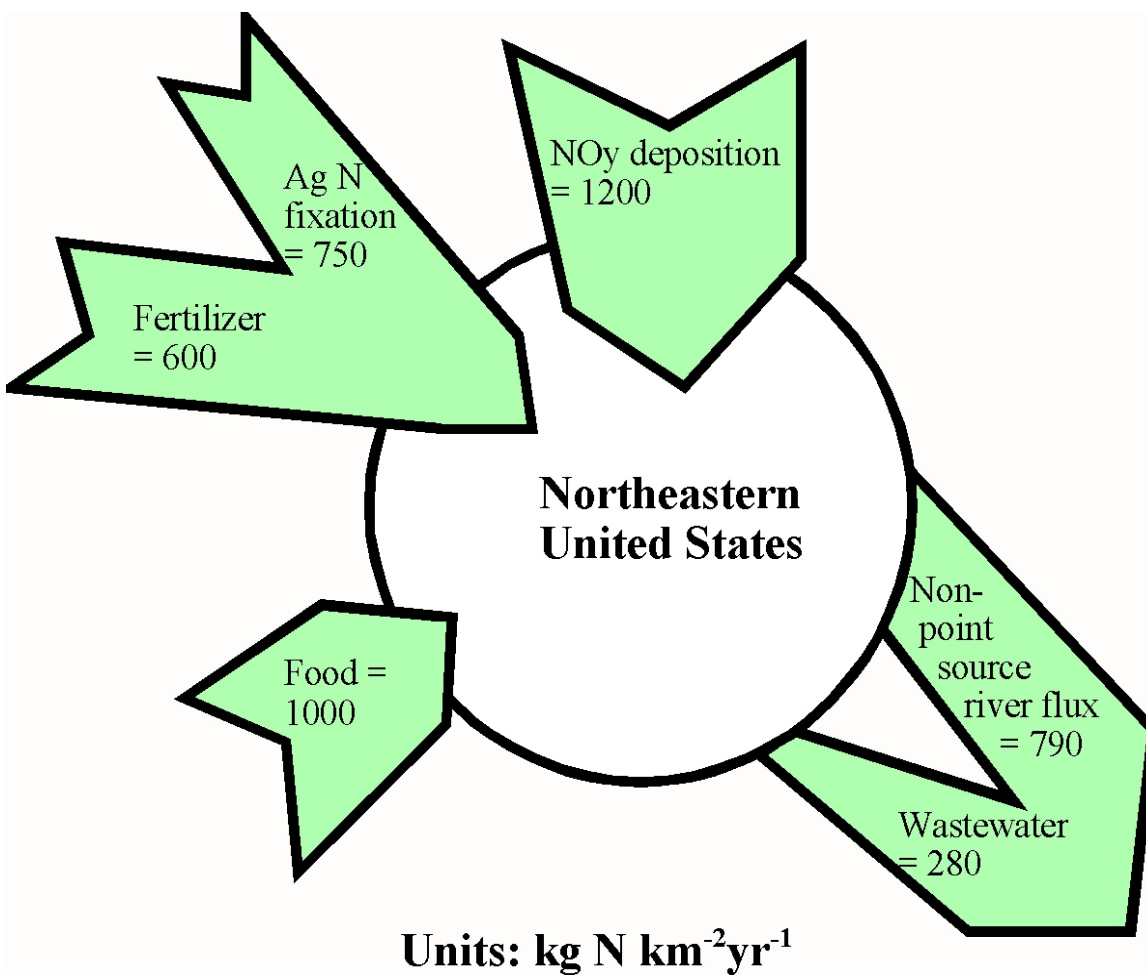


Figure 1.1. Human-controlled inputs and losses of nitrogen in the northeastern United States [National Research Council, 2000].

A recent report from the US Geological Survey indicates that nutrient concentrations in surface and shallow ground water on the Delmarva Peninsular are among the highest in

the nation [Denver, et al, 2004]. In this report, the contribution from atmospheric deposition to the total load in the Delmarva is about 4 percent, with manure and fertilizer dominating the inputs. There is probably significant regional variation in this value as recent analyses of nutrient N inputs to the Maryland Coastal Bays [Boynton et al, 1996 and Meyers et al, 2000] estimated deposition from atmospheric sources to be about 320,000 Kg-N/yr and to comprise about 55% of the total N inputs.

Many of the current estimates of atmospherically derived nitrogen are obtained from observations of wet and dry deposition. National programs, especially the National Atmospheric Deposition Program [NADP] for wet deposition, the Clean Air Status and Trends Network [CASTNet] for dry deposition and the Atmospheric Integrated Research Monitoring Network [AIRMoN] for both wet and dry deposition have provided the bulk of the data for these types of analyses. While these programs provide estimates of inputs they do not allow source contributions to be understood in more than a very broad way. The majority of sulfur in deposition is coming from coal-fired electricity generation, as this sector is the largest source of sulfur emissions to the atmosphere. However the contributions from a particular generating station cannot be determined from the deposition data alone. For nitrogen deposition the situation is more complex as there is no one dominating source sector, and both oxidized [nitrate] and reduced [ammonium] forms are observed.

For nutrient management purposes, a modeling framework that covers the full spatial scale of emissions and deposition and which derives estimates in a way that includes these atmospheric emission sources explicitly is desirable. Such modeling is performed on a nation-wide basis and has, for example, been used to estimate inputs for the Chesapeake Bay [Dennis, 1997]. These estimates are performed using large, Eulerian [gridded] photochemical models. However, it is the nature of these gridded models that information about the emissions from individual sources is lost as they are mixed with emissions from all the other sources through all the model's grid cells. These models are used to predict deposition benefits from reductions in emissions, however categorical credit cannot be allocated back to an individual source for a reduction that was made at the facility.

The current modeling approach is ideal for assessing benefits from national programs required by the Clean Air Act [CAA]. However actions by individuals, either voluntary or through some nutrient trading program cannot be readily assessed. As nutrient deposition is not regulated in the CAA, benefits are derived incidentally from emissions reductions mandated under other programs, such as those related to acid rain, ozone and particulate matter. To date these programs have made small contributions to reductions in nitrate-nitrogen and no reduction in ammonium-nitrogen deposition due to the implementation schedule of the CAA mandated programs and the fact that ammonia emissions are not regulated except at toxic levels. By 2010 benefits from the electricity sector regulations should be observed and only in 2020 would benefits from mobile and other combustion related sources come into effect. There are currently no planned regulations for ammonia in ambient air. For these reasons there has been interest in developing voluntary and/or nutrient trading programs to encourage further emission

reductions to help achieve water quality goals. A tracking tool that quantifies benefits from individual emission reduction actions is necessary for “air” to be included into these programs.

The Power Plant Research Program in the Maryland Department of Natural Resources has, in conjunction with the Chesapeake Bay Program, been developing an atmospheric deposition modeling capability for the Chesapeake Bay and watershed. The objective of this study was to provide an estimate of source-by-source contributions to the atmospherically derived load. This information is useful for the development of mitigation strategies, especially voluntary efforts, by estimating “credits” for emission reduction activities at specific sources.

This same modeling platform was used to estimate source-by-source deposition inputs to the Maryland Coastal Bays.

2 Modeling Platform

The modeling platform has three components:

- i. Emissions that are attributed to each source that is modeled,
- ii. Meteorology that describes the three-dimensional wind fields, temperature, rainfall, etc over the period of the simulation, and
- iii. A dispersion model that predicts the transport, transformation and deposition of the emissions as they carried through the region that is modeled.

Each of these aspects is discussed in this section.

2.1 Emissions

The 1996 National Emissions Trends [NET] Inventory, developed by the US EPA, was used in this study. The source domain modeled is shown in Figure 2.1. For analysis purposes, the emissions were divided in four categories:

- i. Electricity Generating Units [EGU]: these are all the large fossil-fueled electricity generating stations,
- ii. Mobile Sources: these are all the on-road vehicle [car and truck] emissions,
- iii. Industrial Sources: these are all the tall stack industrial sources, and
- iv. Area Sources: these are small industrial sources, off-road engines [lawn mowers to bulldozers] and all other sources not captured in the first three categories.

The NET Inventory identifies some 250,000 sources in the emissions domain. This is too many for a useful source-by-source analysis. An aggregation methodology has been developed to reduce the total number of sources while maintaining the total mass and approximate geographic location of the emissions. The emissions domain was divided into a grid. A source could be modeled explicitly, or sources of a similar type could be combined as a countywide area source (for emissions close to the receptor region), or they could be combined into a grid source (for the more distant sources). In this way a source is identified as being a Point [P] County [C] or Grid [G] source. The dispersion model handles C - and G – sources as ground level area sources. Using this process a little over 1,000 sources or source representations are modeled. All EGU sources are modeled explicitly. Mobile and Area sources are allocated to County and Grid sources depending on their proximity to the Coastal Bays and Industrial sources are largely treated as point sources though some distant, small sources are allocated to grids. The list of these sources is shown in Appendix A.

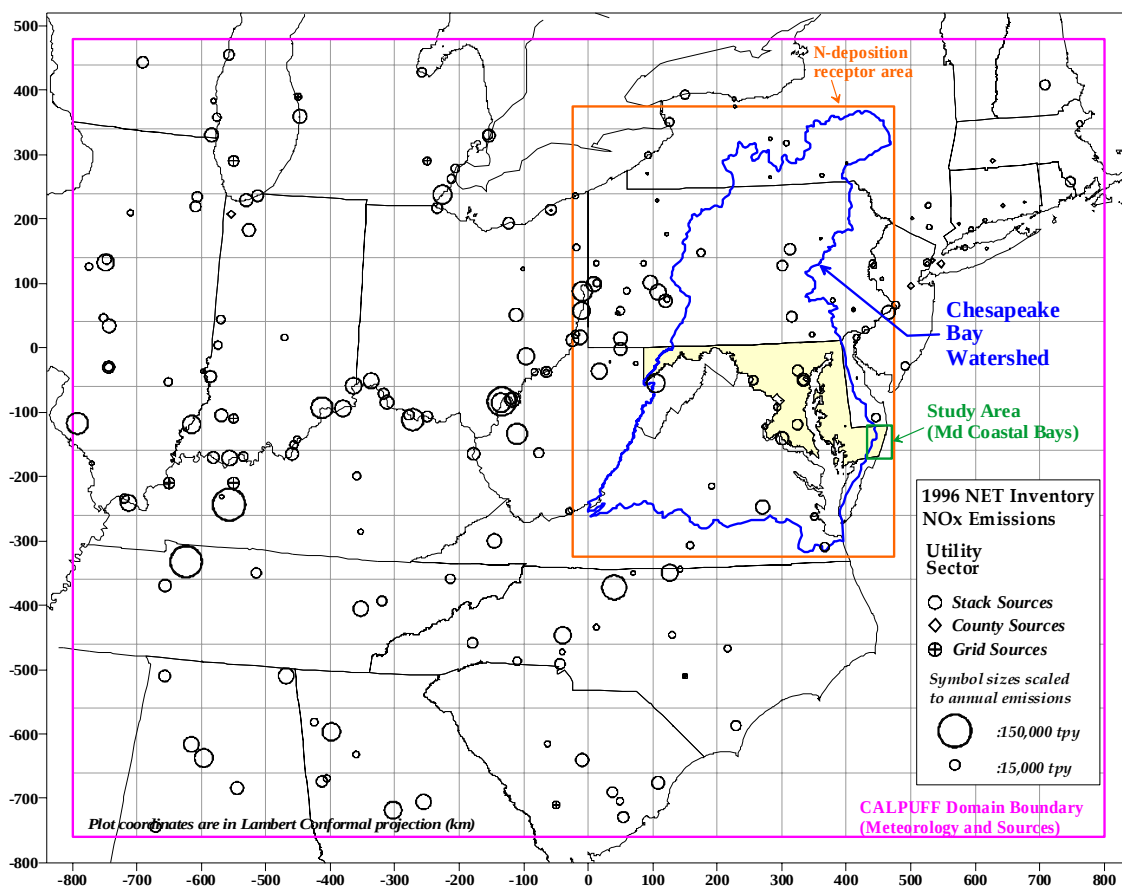


Figure 2.1. Emissions domain showing EGU sources and grid locations

2.2 Meteorology

The meteorological inputs to the model are the 1990 wind fields developed with the Penn State Meteorological Model Version 4 [MM4]. 1990 is used as it represents a year very close to the meteorological average for the mid-Atlantic, and the MM4 fields provide geographical coverage for areas that may not have observational data.

2.3 Dispersion, Transformation and Deposition

Dispersion, transformation and deposition modeling is performed using CALPUFF, a model that is widely used for atmospheric transport modeling and that is freely available [Earthtech]. CALPUFF is a Lagrangian puff model and as such tracks the evolution of the plume as a stream of puffs from each individual source, calculating chemical transformation and deposition at each time step as the plume traverses the modeling domain. The model then adds up the accumulated impact from all the sources over the receptor area. In this way, a source-by-source deposition impact can be developed. A yearlong simulation period is used with a model time step of one hour.

The model contains an explicit transformational mechanism for the formation of nitric acid [HNO_3] vapor and nitrate [NO_3^-] aerosol concentrations from the NOx emitted

from combustion sources. However, this does not represent all the anthropogenic nitrogen in deposition. Ammonia vapor [NH_3] and ammonium [NH_4^+] aerosols are important, especially near industrialized regions and in areas of high animal agriculture. In this study no estimates of NH_3 deposition are made, as the model does not currently have an explicit treatment of NH_3 transformation and deposition and the emissions inventory needs improvement. For NH_4^+ there is an observed stoichiometric relationship with SO_4^{2-} in both wet deposition and aerosols. Hence, as the model predicts both wet and dry deposition for these sulfur species, the associated ammonium can be estimated. A third component in nitrogen deposition, so called organic nitrogen, is thought to be largely biogenic in origin, has been experimentally difficult to quantify and is not included in this analysis.

The receptor region used in this analysis is the Maryland Coastal Bays “Shed” locations, as is shown in Figure 2.2. A significant complication in the Chesapeake Bay modeling

Figure 2.2. Receptor region for Coastal Bays deposition modeling



effort is the very large watershed that makes a very large contribution to the delivered load in comparison to the deposition directly to the Bay waters. In the absence of a

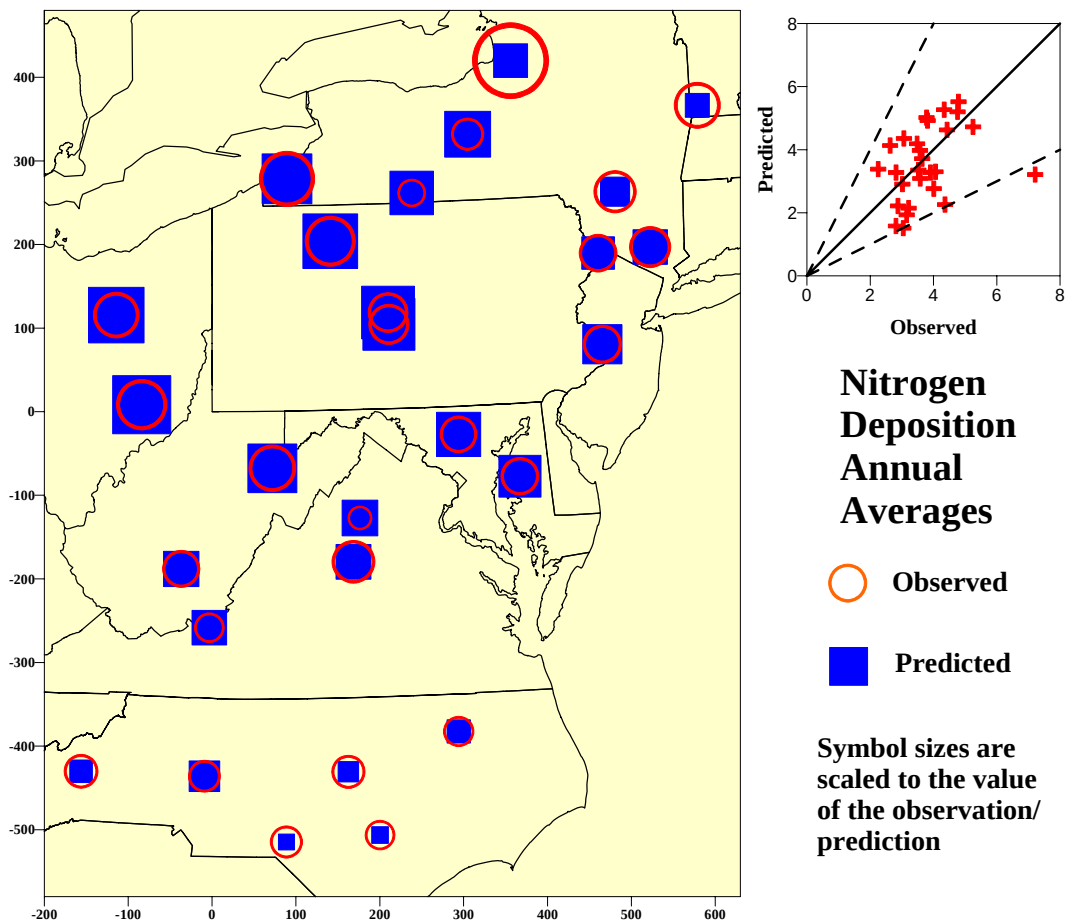
model to predict delivered loads due to nonpoint source nitrogen on the landscape, it is not possible to separate load delivered from the terrestrial fraction of a “shed” segment and direct deposition to the water surface in that segment. Generally, this may not be a significant error for the Coastal Bays as the contributions from the relatively small watershed are probably small compared to direct deposition to the water surface.

2.4 Model Performance

The model predicts both wet and dry deposition and the model performance is assessed by comparing modeled values to actual observations.

A comparison between observed wet deposition from the NADP and model predicted NO_3^- deposition at regional monitoring sites is shown in Figure 2.3. As can be seen, the model is able to predict wet deposition fairly well on an annual average basis.

Figure 2.3. Comparison of observed and modeled nitrate wet deposition ($\text{Kg-NHa}^{-1}\text{yr}^{-1}$)



Data for dry deposition are not widely available, and indeed all values routinely reported are calculated using micrometeorological modeling. Thus the best comparison available is to judge against model predicted HNO_3 vapor and NO_3^- and SO_4^{2-} aerosol concentrations to those observed in ambient air sampling. The Clean Air Standards and Trends Network [CASTNet] and the Interagency Monitoring of Protected Environments

[IMPROVE] report HNO_3 vapor (CASTNET only) and NO_3^- and SO_4^{2-} aerosol concentration (IMPROVE and CASTNET) observations. These are technically challenging measurements and there is variability between networks. The comparison to combined observational data and the model predictions for sulfate are shown in Figure 2.4. The SO_4^{2-} data suggest that the model predicts this fairly stable aerosol quite well.

Figure 2.4 . Comparison of observed and modeled sulfate aerosol concentrations (ug/m3, annual average)

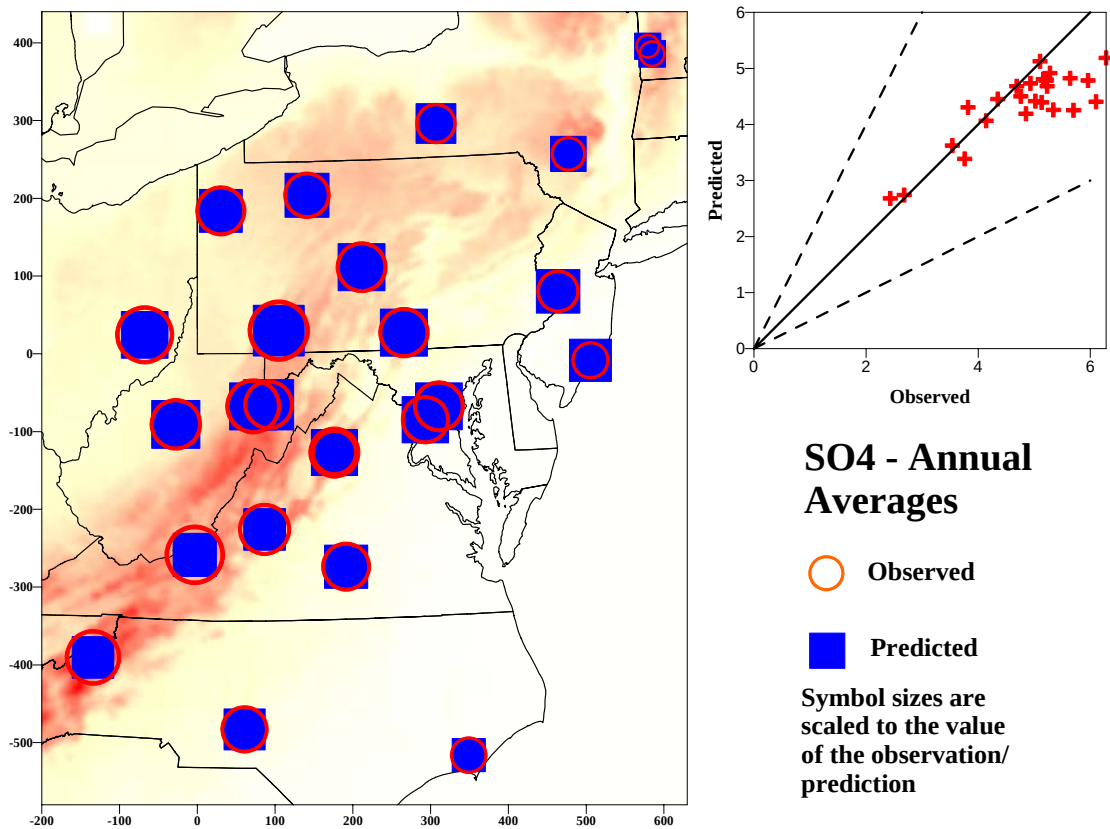
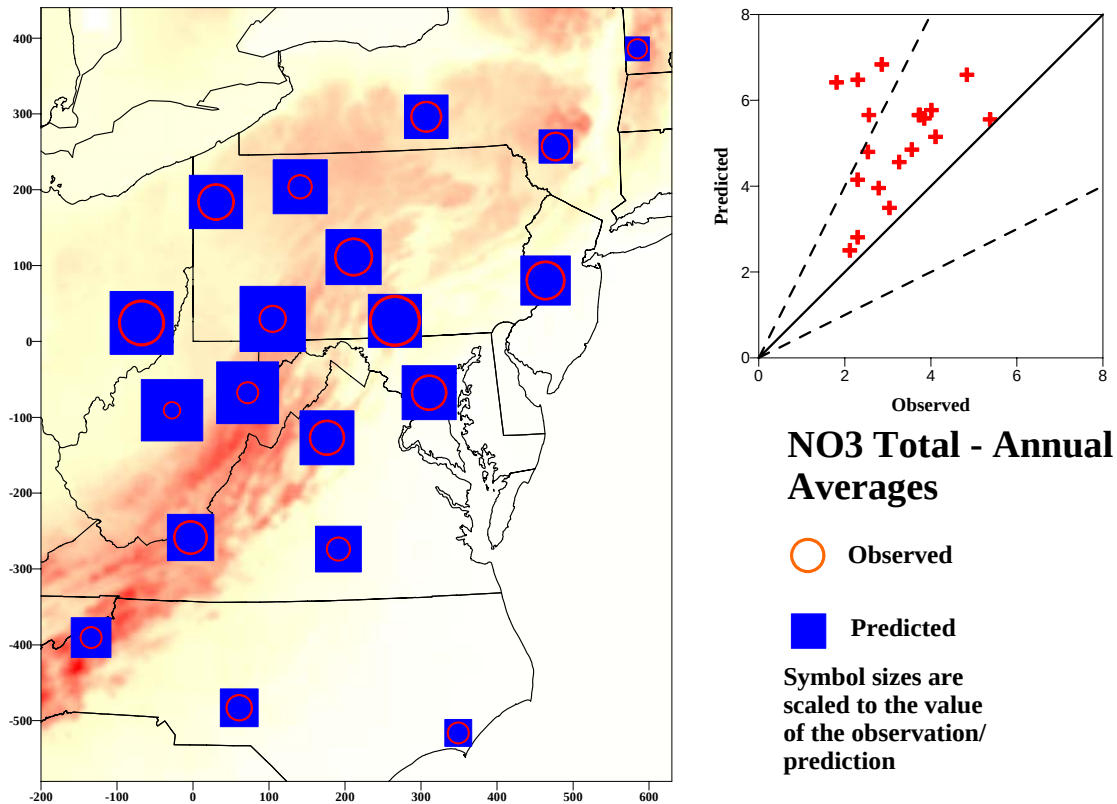


Figure 2.5 shows the comparison for total nitrate – the sum of HNO_3 vapor and NO_3^- aerosol – and indicates that the model may be over predicting these values. Both nitric acid and nitrate aerosols are reactive and difficult to measure, so observations may be biased also. This is an area of ongoing analysis from both the modeling and observational sides.

Figure 2.5. Comparison of observed and modeled nitrate aerosol concentrations (ug/m³, annual average)



The model does a reasonable job of describing the regional deposition in the mid-Atlantic region. Nitrate-N is the most problematic for the model due to the compromise between chemical accuracy and computational time. Work on improving this aspect of the model is underway. Ammonia deposition is not handled explicitly in the current formulation, though a future version will include emissions sources in the inventory. Using the relationship between sulfate and ammonium that is observed in both dry and wet deposition, ammonium deposition can be estimated. Consequently, this value represents a low estimate for reduced-N deposition.

3 Results and Discussion

3.1. Deposition Estimates

Isopleth maps for N-deposition [in $\text{Kg-NHa}^{-1}\text{yr}^{-1}$] from NO_3^- and NH_4^+ are shown in Figures 3.1 A and B respectively. The model indicates a gradient of decreasing deposition amount moving from west to east across the receptor region for both total nitrate and total ammonium, though the effect is more dramatic for nitrate. The deposition results are summarized in Tables 3.1 through 3.3. Tables 3.1a and b summarize the predicted total nitrate and ammonium respectively and indicate a total deposition of about 222,000 kg-Nyr^{-1} . Deposition is broken out by source type, by season and depositing species. Table 3.2 shows the total deposition flux, in $\text{kg-NHa}^{-1}\text{yr}^{-1}$ for the Maryland Coastal bays. In table 3.3, total deposition and fluxes are listed for the individual “sheds” that comprise the Coastal Bays region.

This modeling analysis predicts a total annual load of anthropogenic nutrient nitrogen to the Maryland Coastal Bays to be about 222,000 Kg-Nyr^{-1} with 82% being derived from nitrate and 18% being derived from ammonium deposition. The ammonium estimate is low, as it does not include direct deposition of gaseous ammonia. As animal agriculture

Table 3.1a. Summary of predicted total nitrate deposition to the Maryland Coastal Bays

(kg-Nyr^{-1})

		By Sector: Mass			By Sector: Percent			
Total	Elec	Ind	Mobile	Area	Elec	Ind	Mobile	Area
182,265	74,009	14,726	48,806	44,724	40.6%	8.1%	26.8%	24.5%
		By Season: Mass			By Season: Percent			
Total	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall
182,265	27,276	57,004	63,008	34,978	15.0%	31.3%	34.6%	19.2%

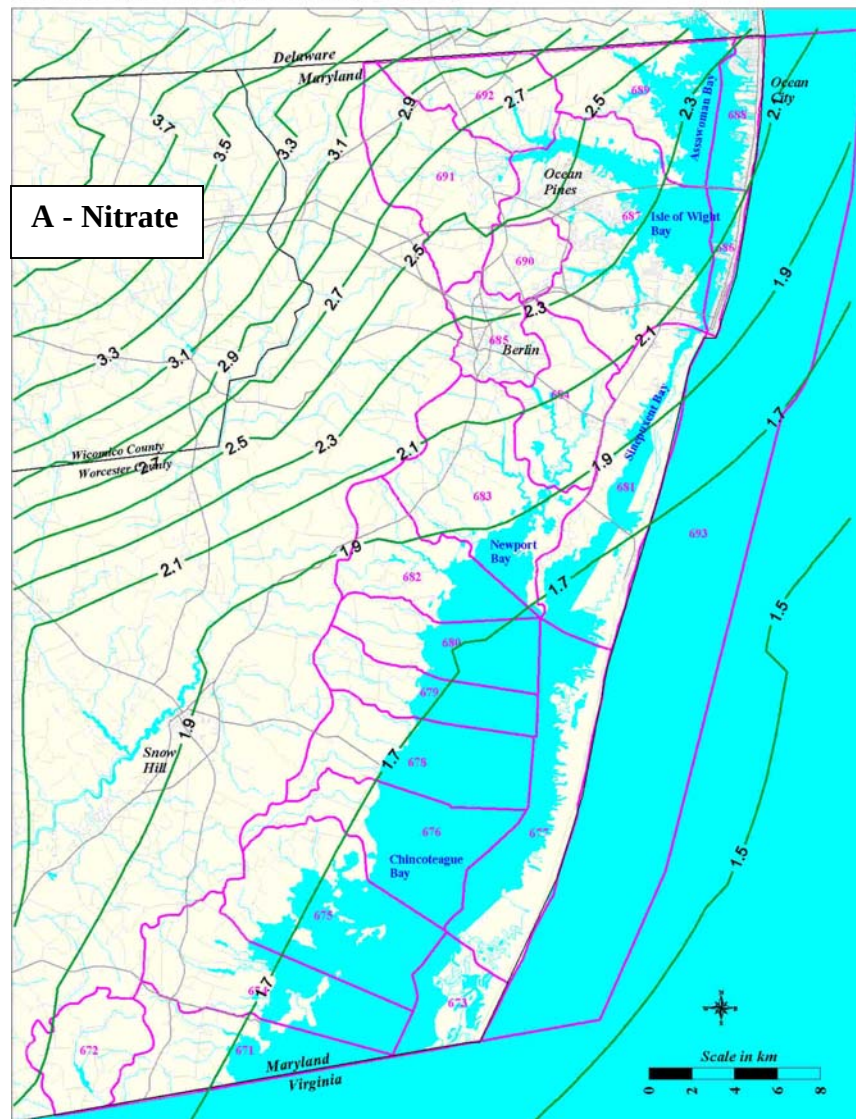
By Sector/Species (percent of total)

	Total	Wet	Dry
Total	182,265	45.7%	54.3%
Elect_Gen	74,009	57.1%	42.9%
Industry	14,726	48.2%	51.8%
Mobile	48,806	39.0%	61.0%
Area	44,724	33.6%	66.4%

By Season/Species (percent of total)

	Total	Wet	Dry
Total	182,265	45.7%	54.3%
Winter	27,276	61.2%	38.8%
Spring	57,004	62.5%	37.5%
Summer	63,008	30.1%	69.9%
Fall	34,978	34.6%	65.4%

Coastal Bays: N Dep from NO₃ (kg/Ha/yr)



Coastal Bays: N Dep from NH₄ (kg/Ha/yr)

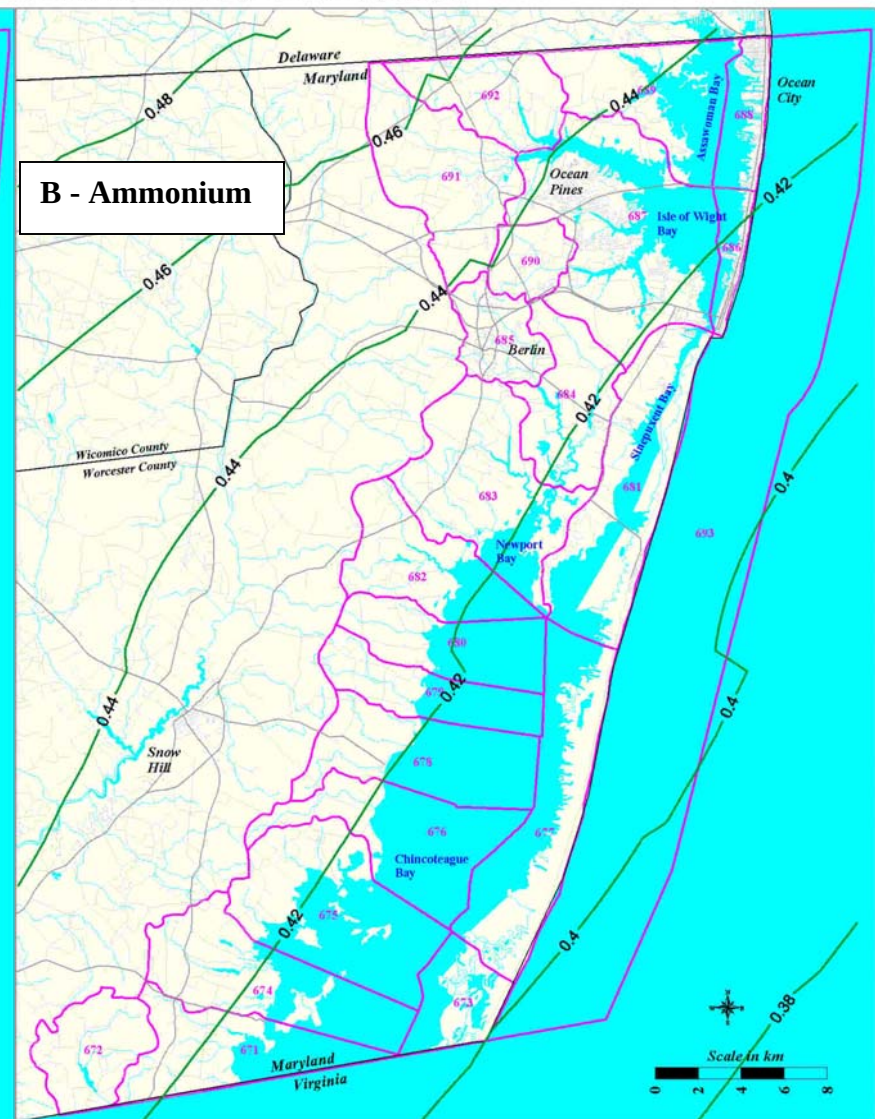


Figure 3.1 Deposition Isopleths

Table 3.1b. Summary of predicted total ammonium deposition to the Maryland Coastal Bays
(kg-Nyr⁻¹)

		By Sector: Mass			By Sector: Percent			
Total	Elec	Ind	Mobile	Area	Elec	Ind	Mobile	Area
40,102	32,847	4,491	319	2,445	81.9%	11.2%	0.8%	6.1%
		By Season: Mass			By Season: Percent			
Total	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall
40,102	5,161	14,273	16,226	4,442	12.9%	35.6%	40.5%	11.1%

By Sector/Species (percent of total)

	Total	Wet	Dry
Total	40,102	93.5%	6.5%
Elect_Gen	32,847	93.9%	6.1%
Industry	4,491	92.1%	7.9%
Mobile	319	91.8%	8.2%
Area	2,445	91.5%	8.5%

NH₄ values derived by using molar ratios of 1.7 (dry) and 0.6 (wet) from SO₄ (NH₄)₂ based on CASTNET, NADP and UMD

By Season/Species (percent of total)

	Total	Wet	Dry
Total	40,102	93.5%	6.5%
Winter	5,161	89.9%	10.1%
Spring	14,273	94.6%	5.4%
Summer	16,226	95.5%	4.5%
Fall	4,442	87.1%	12.9%

is a known source of ammonia emissions and as it is widely practiced on the Delmarva peninsular, this remains an importantly unquantified component of the anthropogenic load [Scudlark, 2004]. The next iteration of the model will include explicit modeling of ammonia emissions and so will not rely on using sulfate as a surrogate.

Table 3.2. Predicted total nitrogen deposition flux to the Maryland Coastal Bays.
(Kg-NHa⁻¹yr⁻¹)

By Sector				
Total	Elec	Ind	Mobile	Area
2.33	1.12	0.20	0.52	0.49
By Season				
Total	Winter	Spring	Summer	Fall
2.33	0.34	0.75	0.83	0.41

By Sector/Species (percent of total)				By Season/Species (percent of total)			
	Total	Wet	Dry		Total	Wet	Dry
Total	2.33	1.27	1.06	Total	2.33	1.27	1.06
Elect_Gen	1.12	0.77	0.35	Winter	0.63	0.50	0.13
Industry	0.20	0.12	0.08	Spring	0.64	0.42	0.23
Mobile	0.52	0.20	0.31	Summer	0.66	0.20	0.46
Area	0.49	0.18	0.31	Fall	0.39	0.15	0.24

Table 3.3 Predicted “shed”-by-“shed” deposition loads and fluxes

Shed Number	Location	Atmospheric Deposition Loading by Source Sector (N-equivalent kg)					Atmospheric Deposition Flux by Source Sector (kg/(ha-yr))				
		Total	EGU	Ind.	Mobile	Area	Total	EGU	Ind.	Mobile	Area
688	Assawoman_Bay	3,413	1,473	275	835	830	2.49	1.07	0.20	0.61	0.60
689	Assawoman_Bay	10,362	4,224	787	2,670	2,681	2.95	1.20	0.22	0.76	0.76
693	Atlantic_Ocean	48,981	24,414	4,413	10,282	9,872	2.15	1.07	0.19	0.45	0.43
680	Chincoteague_Bay	5,341	2,823	498	1,045	974	1.97	1.04	0.18	0.39	0.36
679	Chincoteague_Bay	5,137	2,726	481	1,001	929	2.24	1.19	0.21	0.44	0.40
677	Chincoteague_Bay	9,482	5,066	893	1,827	1,696	1.93	1.03	0.18	0.37	0.34
678	Chincoteague_Bay	9,081	4,836	851	1,764	1,629	2.40	1.28	0.22	0.47	0.43
676	Chincoteague_Bay	7,481	4,002	702	1,447	1,330	1.95	1.04	0.18	0.38	0.35
675	Chincoteague_Bay	11,166	5,980	1,046	2,167	1,972	2.16	1.15	0.20	0.42	0.38
674	Chincoteague_Bay	8,742	4,683	819	1,703	1,538	2.07	1.11	0.19	0.40	0.36
673	Chincoteague_Bay	3,358	1,808	317	646	588	1.93	1.04	0.18	0.37	0.34
671	Chincoteague_Bay	7,444	3,991	698	1,450	1,305	2.26	1.21	0.21	0.44	0.40
672	Chincoteague_Bay	4,992	2,641	464	1,001	885	2.24	1.19	0.21	0.45	0.40
692	Isle_of_Wight_Bay	7,394	2,811	520	2,026	2,037	2.93	1.12	0.21	0.80	0.81
691	Isle_of_Wight_Bay	12,838	4,978	915	3,509	3,435	3.15	1.22	0.22	0.86	0.84
687	Isle_of_Wight_Bay	19,798	8,240	1,529	5,006	5,022	2.74	1.14	0.21	0.69	0.70
686	Isle_of_Wight_Bay	1,999	880	164	480	476	2.45	1.08	0.20	0.59	0.58
690	Isle_of_Wight_Bay	3,405	1,406	259	865	874	2.96	1.22	0.23	0.75	0.76
685	Newport_Bay	4,035	1,740	318	989	988	2.53	1.09	0.20	0.62	0.62
684	Newport_Bay	7,761	3,492	637	1,824	1,807	2.71	1.22	0.22	0.64	0.63
683	Newport_Bay	11,701	5,553	999	2,619	2,530	2.37	1.12	0.20	0.53	0.51
682	Newport_Bay	6,850	3,431	610	1,467	1,342	2.26	1.13	0.20	0.48	0.44
681	Sinepuxent_Bay	11,608	5,658	1,021	2,502	2,427	2.21	1.07	0.19	0.48	0.46
TOTAL		222,367	106,856	19,217	49,125	47,169	2.33	1.12	0.20	0.52	0.49

Deposition flux estimates for individual “sheds” within the receptor region show values ranging from a high of 3.2 to a low of 1.9 kg-Nha⁻¹yr⁻¹. In the analysis by Boynton et al [1988] and Meyers et al [2000] flux values are quoted that are higher than those derived in this analysis. For example, Boynton et al allocate the Maryland portion of Chincoteague Bay an atmospheric deposition load of 318,403 kg-N per year. We estimate the area for Chincoteague as 34,288 ha. [and is reported as 33,000 in Boynton et al], which would correspond to a value of 9.3 kg/ha-yr. In contrast, our estimate for this area is about 72,223 kg N, about half of which is from wet deposition - or about 1 kg/ha-yr. Wet deposition estimates may be low side as the measured value from the MD18 NADP site is around 2 kg/ha-yr. Table 3.4 compares results from the CALPUFF modeling to the results obtained by Meyers et al. Issues relating to these differences are being investigated and could involve differences in model formulation, meteorology and emissions inventory. Table 3.5 shows a comparison of the modeled deposition to the observations at the two NADP sites in the region.

Table 3.4. Comparison of modeled deposition fluxes
[kg-Nha⁻¹yr⁻¹]

	Wet		Dry		total - anthropogenic	total#
	NH4	NO3	NH4	NO3		
Meyer et al*	2.22	3.24	0.56	3.62	9.64	11.56
This report	0.39	0.87	0.03	1.04	2.33	

*includes 15% NH3 loss, #25% DON in wet

Table 3.5 Comparison of modeled and observed deposition
(Kg-NHa⁻¹yr⁻¹)

	MD13		MD18		CALPUFF (wet+dry)	
	NO3-	NH4+	NO3-	NH4+	NO3-	NH4+
2001	3.06	2.12	2.08	1.81	1.80	0.41
2002	0.69	1.65	0.47	1.41	(1990 meteorology 1996 emissions)	

MD13 - Wye Research Center
MD18 - Assateague Island NS
CALPUFF - Sinepuxent Bay

MD13, the site at the Wye Research Center, has a long period of record and has been used in all deposition estimates for the Coastal Bays. However, the site is well west of the receptor region and may be influenced by the apparent gradient in deposition that decreases towards the ocean. A more representative site is MD18, located at the Assateague Island National Seashore. This site is a recent addition to the NADP network and Table 3.5 contains the currently available data. Again the underestimate of

ammonium deposition is clear, as is the possible year-to-year variation in the observed wet deposition.

3.2. Source Apportionment

The principal objective of this study is to provide a source apportionment of deposition loads back to individual sources. Appendix A contains a complete ranking, from largest to smallest contributor, for all sources considered in this analysis. A state-by-state summary is presented in Table 3.6. While Maryland emissions have the largest combined contribution to load and electricity generation is the largest source category, the largest individual sources are area and mobile sources in Sussex Co., Delaware. As is shown in the tables 3.1, electricity generation contributes about 41% of the nitrate load with mobile and area source contributing 27% and 25% respectively and tall-stack industrial source making up the balance. Electricity generation apparently dominates ammonium deposition also, however this is an artifact of the analysis. Ammonia in the free atmosphere reacts with sulfuric acid that is derived primarily from the sulfur in the coal that is burned at generating stations utilizing this fuel to form ammonium sulfate aerosols. The ammonium in deposition in fact comes from a wide variety of human activities, such as agriculture, many industrial processes and the tail pipes of automobiles using modern catalytic converters.

Table 3.6. Predicted state-by-state contributions to deposition (kg-Nyr⁻¹)

State	Nitrogen From NO3					Nitrogen From NH4				
	Total	Elect_Gen	Industry	Mobile	Area	Total	Elect_Gen	Industry	Mobile	Area
MD	31780.3	13653.6	1569.24	7760.36	8797.02	3589.97	3223.39	171.031	37.5835	157.96
VA	27858.2	7644.73	3802.96	9288.93	7121.57	2652.83	1752.53	679.769	46.4529	174.082
DE	26591.4	2359.02	840.704	11259.3	12132.5	1028.14	629.305	301.44	7.60917	89.7825
PA	20214.8	7738.42	3948.66	5056.69	3471.04	5097.57	4233.27	499.958	32.7297	331.615
OH	15707	11446.1	507.076	2131.08	1622.78	6320.6	5322.22	820.469	22.1906	155.718
NC	11354.4	6657.21	791.145	2287.24	1618.79	3205.55	2673.65	325.133	31.4528	175.314
WV	9915.82	7968.69	657.623	617.425	672.085	3526.73	3249.68	173.985	5.04587	98.0215
NJ	7619.8	2139.88	706.604	2057.22	2716.09	962.809	360.217	236.67	19.839	346.083
NY	4981.51	498.628	366.345	2246.28	1870.26	1130.89	652.077	186.112	21.1704	271.535
IN	4226.74	2884.92	135.7	679.365	526.759	2026.23	1864.2	124.017	8.97029	29.0431
KY	3808.61	2742.2	96.1553	478.584	491.668	1806.55	1646.35	48.7803	7.5926	103.832
MI	3148.31	1251.51	272.503	873.275	751.019	733.424	583.356	86.3153	10.6039	53.1489
TN	2874.36	1918.57	320.427	436.355	199.002	2306.11	1879.71	334.111	9.82102	82.4708
IL	2825.47	960.054	254.258	720.731	890.428	1021.74	806.217	151.669	9.54219	54.3101
SC	2783.06	1415.52	238.311	761.981	367.246	1184.1	899.79	204.455	14.4523	65.4001
GA	2385.6	1379.34	64.6421	632.155	309.47	1703.02	1576.21	72.0896	16.548	38.1807
AL	1067.29	798.063	37.8538	136.725	94.6483	1208.56	1126.4	42.8613	4.45257	34.8375
DC	898.748	15.1359	35.3684	412.284	435.96	68.8521	10.9928	12.9143	2.33342	42.6116
CT	722.631	72.7257	38.995	426.256	184.654	67.4822	50.0857	7.33654	3.48062	6.5794
WS	719.594	318.198	0	209.221	192.175	210.963	181.149	0	2.67687	27.1374
MA	594.897	100.364	39.4604	242.908	212.164	141.397	77.6946	9.74674	3.35763	50.5978
NH	118.069	46.1489	2.33668	45.8864	23.6975	102.2	48.9243	1.67833	0.780833	50.8162
RI	68.3376	0	0	45.3381	22.9996	6.33779	0	0	0.521026	5.81676
TOTAL	182264.9	74009.03	14726.37	48805.59	44724.03	40102.06	32847.42	4490.541	319.2072	2444.893

As the CALPUFF modeling system appears to be underestimating the total deposition of anthropogenic nitrate and ammonium it may be that the modeling results should best be viewed in a relative sense. In this way the source apportionment data can provide a useful tool for identifying opportunities for emission reductions and provide guidance on developing policy relating to anthropogenic emissions sources. Emissions reductions at individual sources that may be contributing similar loads may not produce similar benefits. The load reduction benefits from reductions at a source will depend on that sources' geographical location. Table 3.7 contains a ranking of the top ten sources by their contribution to deposition and Table 3.8 lists the ten most sensitive sources to emissions control.

Table 3.7. Top ten contributing sources to deposition loads
(kg-Nyr⁻¹)

State	Sector	NOx emissions tpy	Total N	Source/County Name or Grid Location
DE	A	7,359.4	11,288.8	SUSSEX Co
DE	M	6,805.8	10,414.2	SUSSEX Co
MD	A	2,809.9	4,560.4	Grid_Xc+450_Yc-110
MD	U	23,614.8	4,470.7	MORGANTOWN
OH	U	113,356.9	3,851.3	GEN_J_M_GAVIN
MD	U	22,986.5	3,422.0	BRANDON_SHORES
VA	U	26,473.8	3,356.9	DUTCH_GAP
MD	U	15,024.2	3,311.6	CHALK_POINT
NC	U	82,287.9	2,961.8	BELEWS_CREEK
WV	U	46,601.2	2,793.3	MT_STORM

The Sensitivity in Table 3.8 is the deposition load per unit of emission from a source. The larger this sensitivity value is, the larger the deposition reduction will be for a given emission reduction.

Table 3.8. Ten most sensitive sources for reducing deposition load
[(kg-Nyr⁻¹)/NOx ton emitted]

State	Sector	Sensitivity Load/emission	Source/County Name or Grid Location
MD	A	1.616	Grid_Xc+450_Yc-110
DE	M	1.530	SUSSEX
DE	A	1.528	SUSSEX
VA	I	0.441	Grid_Xc+450_Yc-210
NJ	I	0.402	STONY_BROOK_REGIONAL_SEWERAGE
NY	I	0.402	CHAMPION_PRODUCTS_INC
MD	M	0.361	WICOMICO
DE	I	0.336	DUPONT_SEAFORD

MD	U	0.316	VIENNA
MD	A	0.278	DORCHESTER

The names of the grid sources identified in this table refer to the location of the (100-km square) source with respect to the modeling domain. Xc and Yc refer to the coordinates of the center of the grid in the Lambert Conformal projection used in the modeling. Figure 2-1 provides the reference coordinates that can be used to determine the locations of the grid sources.

A modeling system for estimating the atmospheric deposition load due to emission sources has been demonstrated. Contributions to the deposition load from individual sources can be estimated as well as the benefits that can be derived from a reduction in emissions from those sources. This capability allows policy makers to review emission reduction options, especially if voluntary programs are encouraged and a “credit” for a deposition load reduction is to be allocated.

The model underestimates total deposition, especially for reduced forms of nitrogen. The model is currently being upgraded to include a better depiction of ammonia dynamics as well as improving the chemistry that converts the oxides of nitrogen emitted from fossil fuel combustion to the active nitrate forms in deposition. A revised report can be submitted once these modifications have been made.

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Appendix A

List of emission sources ranked in descending order of deposition impact.

CALPUFF Estimated Nitrogen

Deposition

Eastern U.S. NOx Sources; Emissions Based on 1996 NET Inventory

1990 MM4

Meteorology

DRAFT

08 June 2004

All deposition values are N-equivalent kilograms

Values are sorted by N deposition to the Coastal Bays

State	Sector	Type P=Point, C=County, G=Grid	NOx emissions tpy	SO2 emissions tpy	Total N to Coastal Bays (FROM NO3)	Total N to Coastal Bays (FROM NH4)	Total N	Source/County Name or Grid Location
DE	A	C	7,359.4	2,434.7	11,245.9	42.9	11,288.8	SUSSEX
DE	M	C	6,805.8	232.0	10,410.1	4.1	10,414.2	SUSSEX
MD	A	G	2,809.9	767.8	4,541.3	19.1	4,560.4	Grid_Xc+450_Yc-110
MD	U	P	23,614.8	72,777.6	3,450.7	1,020.0	4,470.7	MORGANTOWN
OH	U	P	113,356.9	69,041.7	3,450.8	400.5	3,851.3	GEN_J_M_GAVIN
MD	U	P	22,986.5	52,252.6	2,800.2	621.9	3,422.0	BALTO._GAS_&_ELEC.___BRANDON_SH ORES
VA	U	P	26,473.8	70,030.1	2,695.5	661.4	3,356.9	VIRGINIA_POWER_DUTCH_GAP
MD	U	P	15,024.2	41,326.6	2,701.7	610.0	3,311.6	POTOMAC_ELECTRIC___CHALK_POINT
NC	U	P	82,287.9	78,241.2	2,486.0	475.8	2,961.8	BELEWS_CREEK
WV	U	P	46,601.2	112,306.6	1,984.4	808.9	2,793.3	MT_STORM
DE	U	P	9,805.1	27,857.4	2,088.4	566.0	2,654.5	DELMARVA_POWER___INDIAN_RIVER
OH	U	P	51,304.1	123,599.4	1,382.8	733.4	2,116.2	KYGER_CREEK
MD	U	P	13,721.9	19,645.0	1,838.6	258.9	2,097.5	HERBERT_A_WAGNER
MD	U	P	15,954.1	28,743.6	1,779.8	304.0	2,083.8	C_P_CRANE
NC	U	P	38,085.4	64,890.7	1,527.2	438.6	1,965.8	CP&L_ROXBORO_UNITS_1_2_3_4
VA	U	P	11,261.1	30,892.1	1,473.5	355.2	1,828.8	VIRGINIA_POWER_CHESAPEAKE
WV	U	P	58,680.4	99,940.5	1,275.2	483.3	1,758.5	JOHN_E_AMOS
PA	U	P	15,674.7	92,602.8	947.9	664.0	1,611.9	PP&L_BRUNNER_ISLAND
PA	U	P	34,074.0	134,200.7	1,025.3	557.9	1,583.3	HOMER_CITY
OH	U	P	52,816.5	107,393.8	1,140.7	389.4	1,530.1	W_H_SAMMIS
VA	U	P	7,342.0	21,008.2	1,206.3	272.6	1,478.8	VIRGINIA_POWER_YORKTOWN
OH	U	P	65,561.8	99,146.7	1,158.2	300.5	1,458.7	J_M_STUART
KY	U	P	146,447.0	190,294.3	1,000.1	448.8	1,448.8	TVA___PARADISE
PA	U	P	28,172.9	168,610.3	762.1	675.9	1,438.0	KEYSTONE
NC	U	P	39,334.2	100,849.7	810.7	616.6	1,427.3	MARSHALL
OH	U	P	38,054.1	180,591.7	741.5	637.6	1,379.1	MUSKINGUM_RIVER
OH	U	P	40,719.0	125,812.4	850.6	436.1	1,286.6	CARDINAL
IN	U	P	63,276.8	104,328.8	934.5	311.4	1,245.9	CLIFTY_CREEK
MD	U	P	12,157.0	32,526.7	908.9	332.5	1,241.4	POTOMAC_ELECTRIC___DICKERSON
WV	U	P	31,837.6	64,742.2	875.3	360.2	1,235.5	PHILIP_SPORN
WV	U	P	34,459.6	16,469.0	1,091.3	83.4	1,174.7	HARRISON
TN	U	P	138,998.7	22,775.2	1,088.1	71.5	1,159.6	TVA_CUMBERLAND_STEAM_PLANT
PA	U	P	25,132.6	153,412.6	596.8	560.1	1,156.9	HATFIELD'S_FERRY
VA	M	C	10,059.7	432.9	1,151.5	4.7	1,156.2	VIRGINIA_BEACH
VA	A	C	8,016.7	1,954.3	1,118.6	22.8	1,141.4	NORFOLK
NJ	U	P	9,673.9	20,826.7	825.6	256.6	1,082.2	B_L_ENGLAND
WV	U	P	28,419.1	119,368.7	608.0	474.1	1,082.1	OHIO_POWER___KAMMER_PLANT
MD	M	C	2,929.5	112.1	1,056.2	1.9	1,058.2	WICOMICO
VA	M	G	11,890.8	439.1	1,004.0	3.3	1,007.3	Grid_Xc+350_Yc-210
MD	M	C	14,457.1	742.4	996.4	5.9	1,002.3	BALTIMORE_City

VA	M	C	22,016.5	1,032.2	991.4	6.2	997.7	FAIRFAX
VA	U	P	7,059.5	10,589.3	852.6	135.7	988.3	POTOMAC_RIVER
MD	M	C	16,533.3	773.7	976.0	5.5	981.5	PRINCE_GEORGE@S
MD	M	C	9,476.1	472.7	966.8	4.7	971.5	ANNE_ARUNDEL
MD	A	C	3,291.9	2,090.7	916.0	33.6	949.6	DORCHESTER
MD	M	G	6,335.0	243.5	924.6	2.7	927.3	Grid_Xc+350_Yc-110
GA	U	P	44,964.5	157,160.1	365.1	560.9	926.0	BOWEN
VA	M	C	6,590.0	284.7	909.9	3.3	913.2	NORFOLK
PA	U	P	17,613.7	108,204.4	495.4	392.7	888.0	MONTOUR
PA	U	P	30,466.2	24,881.8	724.5	105.0	829.5	BRUCE_MANSFIELD
VA	A	G	9,707.9	1,306.0	819.4	10.0	829.3	Grid_Xc+350_Yc-210
VA	I	P	11,681.8	2,298.1	796.5	13.2	809.7	ALLIEDSIGNAL_INC
OH	U	P	24,159.2	125,184.3	399.9	407.9	807.8	CONESVILLE
MD	M	C	15,346.6	765.9	798.8	5.3	804.0	BALTIMORE_County
MI	U	P	48,508.9	118,001.6	551.7	248.9	800.6	MONROE
TN	U	P	31,178.8	105,188.2	338.6	447.2	785.8	TVA_KINGSTON_STEAM_PLANT_KINGSTON
WV	U	P	21,936.7	71,151.6	504.1	262.8	766.8	MONONGAHELA_POWER_CO._FORT_MARTIN_POWER
PA	U	P	24,144.8	7,108.3	735.3	28.5	763.8	CONEMAUGH
NJ	U	P	24,926.6	0.2	758.3	0.0	758.3	PUBLIC_SERVICE_ELECTRIC_AND_GA
MD	M	C	17,036.5	822.0	716.8	4.4	721.1	MONTGOMERY
VA	A	C	15,646.5	3,348.4	690.7	20.2	710.9	FAIRFAX
PA	M	C	30,576.8	1,205.7	705.2	3.9	709.2	PHILADELPHIA
GA	U	P	41,404.7	94,969.4	383.2	310.7	693.9	SCHERER
KY	U	P	36,417.7	56,114.9	526.6	167.0	693.6	KENTUCKY_UTILITIES_CO
PA	U	P	15,125.8	45,303.7	482.3	188.0	670.4	PP&L__SUNBURY_SES
SC	U	P	22,493.7	39,532.5	388.1	277.6	665.7	WATEREE
WV	U	P	16,728.1	37,572.6	430.1	215.7	645.8	APPALACHIAN_POWER__MOUNTAINEER_PLANT
WV	U	P	15,910.3	47,495.4	424.9	220.2	645.1	PLEASANTS
VA	A	C	7,644.5	1,854.2	624.2	13.1	637.3	NEWPORT_NEWS
GA	U	P	31,452.6	66,024.6	370.7	259.8	630.5	HARLLEE_BRANCH
VA	A	C	5,604.1	941.1	619.8	10.2	630.0	VIRGINIA_BEACH
DE	I	P	8,315.0	28,473.3	488.0	141.2	629.2	STAR_ENTERPRISE_DELAWARE_CITY
KY	U	P	21,410.8	56,777.1	327.4	294.1	621.5	KENTUCKY_POWER_CO
WV	U	P	21,395.6	53,151.7	415.1	199.4	614.5	MITCHELL
IN	U	P	44,692.2	155,728.4	268.6	342.5	611.2	GIBSON
MD	A	C	5,835.2	2,270.2	584.0	22.6	606.6	ANNE_ARUNDEL
VA	I	P	3,938.1	9,419.7	519.0	84.9	604.0	ST_LAURENT_PAPER_PRODUCTS_CORP
IN	U	P	36,537.4	71,046.9	428.2	167.6	595.8	TANNERS_CREEK
VA	U	P	3,921.7	11,986.1	420.7	156.6	577.3	VIRGINIA_POWER_POSSUM_POINT
TN	U	P	20,696.9	154,066.7	117.4	451.4	568.7	TVA_JOHNSONVILLE_STEAM_PLANT
OH	U	P	16,256.1	120,730.6	211.1	355.0	566.1	EASTLAKE
NJ	A	C	5,351.6	5,898.1	504.1	58.4	562.5	CAPE_MAY
IL	U	P	63,211.5	273,838.0	224.0	327.5	551.5	ILLINOIS_POWER_CO__BALDWIN_POWER_PLANT
NC	U	P	13,824.7	20,180.3	375.1	169.2	544.3	L_V_SUTTON
OH	U	P	33,251.6	69,322.2	374.4	160.9	535.3	MIAMI_FORT
DE	A	C	13,548.4	8,575.8	488.2	34.2	522.3	NEW_CASTLE
VA	M	C	3,373.5	145.7	509.7	1.7	511.3	HAMPTON
TN	U	P	13,932.6	116,665.7	91.8	404.3	496.2	TVA_GALLATIN_STEAM_PLANT
VA	I	P	3,937.9	18,438.2	348.4	147.1	495.5	UNION_CAMP_CORP_FINE_PAPER_DIV
DE	M	C	13,504.5	559.2	486.2	2.2	488.5	NEW_CASTLE
IL	A	C	126,501.9	19,628.6	467.0	20.7	487.7	COOK
OH	U	P	6,648.9	88,692.7	124.1	360.9	485.0	RICHARD_H._GORSUCH
SC	U	P	22,387.0	32,877.3	315.8	166.4	482.1	WINYAH

DC	A	C	8,754.6	6,988.9	436.0	42.6	478.6	DISTRICT_OF_COLUMBIA
VA	U	P	27,695.3	24,517.3	402.7	69.2	471.9	CLINCH_RIVER
TN	U	P	12,247.1	75,022.3	150.3	321.2	471.6	JOHN_SEVIER
NC	U	P	15,323.8	35,290.7	272.4	196.5	468.9	G_G_ALLEN
AL	U	P	32,050.3	147,141.8	134.5	333.0	467.4	GORGAS
MD	A	C	8,944.9	1,634.0	453.3	11.2	464.5	BALTIMORE_County
VA	I	P	2,276.6	8,144.9	367.1	91.4	458.5	AMOCO_PETROLEUM_PRODUCTS__REFI NING_BG
IN	U	P	33,019.4	66,623.2	281.1	177.2	458.3	ROCKPORT
NJ	A	C	27,910.5	28,576.7	375.9	78.3	454.2	MONMOUTH
OH	U	P	24,795.0	29,348.3	368.7	81.9	450.6	W_H_ZIMMER
PA	A	C	18,829.2	9,330.6	414.8	30.4	445.2	PHILADELPHIA
PA	M	C	11,065.4	419.4	441.5	2.2	443.7	YORK
VA	A	C	4,043.5	1,145.6	422.7	11.9	434.6	CHESAPEAKE
VA	M	C	4,061.2	172.8	424.8	1.8	426.6	CHESAPEAKE
NY	A	C	31,670.2	27,720.6	369.5	56.2	425.7	NEW_YORK
IL	M	C	114,033.5	5,057.6	415.6	5.3	420.9	COOK
DC	M	C	8,304.8	382.3	412.3	2.3	414.6	DISTRICT_OF_COLUMBIA
NY	M	C	30,572.7	1,393.0	409.9	3.1	413.0	KINGS
DE	A	C	5,741.2	1,819.5	398.4	12.7	411.2	KENT
PA	I	P	11,050.1	6,912.2	377.1	30.0	407.1	SUN_COMPANY__INC.
PA	M	C	30,404.9	1,320.2	402.9	3.5	406.5	ALLEGHENY
AL	U	P	46,524.5	79,413.0	212.0	188.2	400.1	JAMES_H_MILLER_JR
OH	A	C	33,127.6	7,275.5	379.7	20.1	399.7	SUMMIT
DE	I	P	807.7	5,454.5	271.8	124.4	396.2	DUPONT_SEAFORD
OH	U	P	15,874.4	78,008.9	199.8	193.3	393.1	WALTER_C_BECKJORD
AL	U	P	33,666.0	38,487.4	242.5	148.4	390.9	WIDOWS_CREEK
OH	U	P	8,492.9	62,557.1	156.5	228.1	384.5	R_E_BURGER
PA	U	P	8,456.6	53,945.4	203.5	180.8	384.3	SHAWVILLE
OH	U	P	15,900.5	30,514.7	284.4	98.7	383.1	KILLEN_STATION
MD	A	C	5,728.7	918.7	372.0	7.3	379.3	BALTIMORE_City
VA	A	C	2,848.2	1,008.5	367.2	12.0	379.3	PORTSMOUTH
OH	M	C	35,309.6	1,510.2	372.2	3.9	376.1	CUYAHOGA
VA	A	G	6,819.6	1,050.9	364.3	8.0	372.2	Grid_Xc+350_Yc-310
DE	M	C	5,241.0	185.4	362.9	1.3	364.2	KENT
SC	U	P	16,570.6	24,349.5	217.4	138.5	355.9	WILLIAMS
PA	U	P	3,547.8	12,821.1	259.2	94.6	353.8	PA_P_&_L_CO
GA	U	P	17,143.7	70,670.7	124.2	227.0	351.1	WANSLEY
SC	U	P	15,082.6	12,291.6	260.1	84.1	344.3	CROSS
VA	M	C	4,287.8	185.2	340.8	1.3	342.1	NEWPORT_NEWS
MD	A	C	2,309.2	1,356.5	325.7	16.0	341.7	CALVERT
KY	U	P	13,879.4	37,919.4	224.6	116.4	340.9	EAST_KY_POWER_COOP
VA	M	G	6,265.0	250.8	334.6	1.9	336.6	Grid_Xc+350_Yc-310
OH	U	P	17,999.0	32,762.7	242.3	93.9	336.2	AVON_LAKE
NC	U	P	15,434.8	24,425.7	208.1	126.5	334.7	ASHEVILLE
MD	A	C	5,742.6	1,017.3	324.8	7.2	332.0	PRINCE_GEORGE@S
PA	U	P	6,151.1	39,980.0	155.1	175.7	330.8	CHESWICK
NC	U	P	9,366.3	28,877.7	157.4	166.1	323.5	CLIFFSIDE
PA	I	P	4,537.2	3,066.5	297.3	25.1	322.4	J_E_BAKER_COMPANY
MD	A	C	7,725.2	1,303.2	315.1	6.9	322.0	MONTGOMERY
PA	M	C	12,600.5	476.6	315.2	1.8	317.0	LANCASTER
TN	U	P	13,017.8	45,415.1	132.3	184.1	316.5	TVA_BULL_RUN_STEAM_PLANT__CLIN TON_37716
TN	I	P	10,823.0	46,428.3	133.2	181.3	314.5	EASTMAN__TENN._CO
VA	M	C	7,725.7	336.5	311.9	2.1	314.1	PRINCE_WILLIAM
NY	A	C	21,885.7	12,738.9	282.8	28.2	311.0	KINGS
NC	U	P	6,403.1	11,087.6	220.6	88.7	309.3	LEE

AL	U	P	18,143.9	90,156.8	68.6	235.9	304.5	COLBERT
IN	U	P	18,772.5	92,918.7	106.5	196.9	303.4	SIGECO_WARRICK_PWR_PLANT_ALCOA _GENERATNG
MD	I	P	4,800.6	1,303.4	294.4	8.5	302.9	LEHIGH_PORTLAND_CEMENT
VA	U	P	5,152.7	8,542.6	253.1	48.7	301.8	VIRGINIA_POWER_BREMO_BLUFF
VA	A	G	7,687.9	1,489.4	290.5	8.6	299.1	Grid_Xc+250_Yc-110
KY	U	P	22,364.9	51,580.3	178.7	117.8	296.4	MILL_CREEK
IN	U	P	22,262.9	67,109.9	145.7	147.4	293.1	PETERSBURG
DE	U	P	5,355.6	13,397.5	232.7	54.5	287.2	DELMARVA_POWER__EDGE_MOOR
PA	U	P	6,574.9	8,330.4	248.2	35.3	283.5	PECO_ENERGY_CO
MD	M	C	3,224.0	123.3	281.1	1.1	282.2	ST._MARY@S
VA	M	G	7,406.9	283.4	279.9	1.6	281.6	Grid_Xc+250_Yc-110
NY	M	C	25,925.6	1,181.3	277.6	2.4	280.1	QUEENS
PA	M	C	15,101.5	578.6	276.5	1.7	278.2	MONTGOMERY
WV	U	P	13,116.1	13,453.0	220.6	57.3	277.9	KANAWHA_RIVER
AL	U	P	22,399.6	75,658.4	106.5	167.7	274.2	E_C_GASTON
NC	M	G	18,690.8	834.2	271.2	2.6	273.8	Grid_Xc+150_Yc-410
NC	U	P	6,299.8	14,569.8	171.0	96.8	267.8	CAPE_FEAR
NJ	U	P	8,805.5	8,028.8	230.7	34.7	265.4	MERCER
MI	U	P	25,970.0	44,912.1	191.5	73.2	264.7	J_H_CAMPBELL
NY	A	C	22,662.8	12,424.8	239.0	25.7	264.6	QUEENS
NC	M	G	10,955.8	480.5	258.6	2.3	260.9	Grid_Xc+250_Yc-410
VA	U	P	7,255.9	1,436.6	252.2	7.2	259.4	CLOVER
PA	M	C	11,265.2	405.9	255.5	1.4	256.8	CHESTER
NC	M	C	16,786.5	805.4	252.0	2.7	254.8	WAKE
OH	U	P	4,776.9	67,319.2	55.1	198.3	253.4	ASHTABULA
MD	I	P	1,858.4	3,358.2	211.0	37.4	248.4	BETHLEHEM_STEEL_CORP
VA	M	C	6,835.8	283.7	239.6	1.2	240.8	HENRICO
OH	A	C	42,302.4	8,275.9	228.3	11.8	240.1	FRANKLIN
MD	A	C	2,634.2	1,249.8	229.2	10.7	240.0	ST._MARY@S
NC	U	P	4,687.1	9,671.5	169.6	67.5	237.1	MAYO
PA	A	C	17,462.7	5,053.1	222.5	13.6	236.0	ALLEGHENY
VA	M	C	4,657.8	210.6	231.1	1.3	232.5	ARLINGTON
VA	A	G	6,754.1	1,333.8	226.2	6.2	232.4	Grid_Xc+250_Yc-210
PA	A	C	8,502.0	5,644.6	210.7	21.0	231.7	LANCASTER
KY	U	P	35,951.5	45,886.2	145.4	85.7	231.1	TVA_ENVIRONMENTAL_AFFAIRS
OH	A	C	20,883.3	7,266.5	211.6	18.7	230.3	CUYAHOGA
MD	A	G	4,889.7	1,835.0	218.3	11.0	229.3	Grid_Xc+350_Yc-010
NJ	I	P	338.6	4,733.5	136.1	92.0	228.2	STONY_BROOK_REGIONAL_SEWERAGE
OH	U	P	15,389.0	25,025.0	170.4	53.2	223.6	BAY_SHORE
PA	U	P	6,828.1	30,058.4	132.6	90.4	223.0	PP_&_L__MARTINS_CREEK
PA	U	P	9,915.9	4,675.0	206.0	16.0	222.0	ELRAMA
IN	U	P	18,559.0	37,452.1	145.9	76.0	221.9	HOOSIER_ENERGY_RURAL_ELEC_MERO M_STATION
NC	A	G	8,696.5	3,523.5	205.1	16.5	221.6	Grid_Xc+250_Yc-410
NY	M	C	19,767.0	900.7	219.6	1.8	221.4	NEW_YORK
MD	M	C	4,571.9	214.8	220.0	1.4	221.4	HARFORD
KY	U	P	8,701.1	38,511.5	86.4	134.5	220.9	E_W_BROWN
PA	A	C	5,093.1	3,552.9	202.3	18.4	220.7	YORK
MI	M	C	50,600.4	2,278.7	216.1	2.7	218.8	WAYNE
VA	A	C	6,089.5	1,178.5	212.3	4.8	217.1	HENRICO
NY	U	P	5,926.7	53,667.5	63.2	153.6	216.8	DUNKIRK
PA	I	P	5,307.3	5,320.4	194.1	22.6	216.7	BP_OIL_INC
MI	A	C	48,498.5	7,974.5	206.1	9.6	215.7	WAYNE
PA	I	P	2,364.9	6,394.8	161.0	54.3	215.3	P._H._GLATFELTER_CO.
PA	I	P	10,244.1	4,354.7	202.7	12.1	214.8	BETHLEHEM_STRUCTURAL_PRODUCTS_ CORP.

PA	M	C	10,832.2	424.4	213.5	1.2	214.7	DELAWARE
MD	U	P	468.3	2,581.7	148.1	65.6	213.7	VIENNA
VA	I	P	1,939.7	132.8	210.7	1.8	212.5	OGDEN_MARTIN_FAIRFAX
VA	M	C	8,619.3	352.2	211.4	0.9	212.3	CHESTERFIELD
NC	A	G	13,530.0	4,950.7	196.4	15.8	212.2	Grid_Xc+150_Yc-410
PA	I	C	5,121.0	1,537.2	203.4	8.0	211.4	YORK
MI	U	P	21,671.2	48,000.9	136.4	73.4	209.8	ST_CLAIR
PA	A	C	10,216.0	9,275.9	182.7	26.7	209.4	MONTGOMERY
VA	M	C	5,781.8	246.3	207.9	1.0	208.8	RICHMOND
NC	M	G	17,131.3	764.9	205.0	3.1	208.2	Grid_Xc+150_Yc-510
VA	I	P	2,111.8	2,621.6	186.2	21.9	208.1	STONE_CONTAINER_CORP
VA	M	G	6,179.6	220.4	206.9	1.0	208.0	Grid_Xc+250_Yc-210
VA	A	C	4,097.3	865.8	202.1	5.5	207.6	ARLINGTON
MD	M	C	4,569.9	224.0	204.6	1.3	205.9	HOWARD
VA	I	P	3,504.4	0.6	205.3	0.0	205.3	TRANSCONTINENTAL_GAS_PIPE_LINE
NJ	M	C	6,278.6	278.1	203.2	1.9	205.1	ATLANTIC
OH	I	P	418.6	11,458.6	44.4	159.8	204.2	CLEVELAND_THERMAL_ENERGY_CORP.
PA	I	P	9,079.5	1,977.0	196.7	7.1	203.9	USS__CLAIRTON_WORKS
PA	U	P	4,584.2	18,530.7	128.6	74.6	203.2	SEWARD
NC	A	G	6,453.2	2,226.5	187.1	15.4	202.5	Grid_Xc+350_Yc-410
NC	I	G	4,472.4	10,536.0	129.7	72.8	202.5	Grid_Xc+350_Yc-410
MD	I	P	3,458.2	553.8	198.5	3.5	202.0	ESSROC_MATERIALS
NJ	A	C	16,649.8	10,359.1	176.2	21.8	198.0	HUDSON
MD	I	G	1,209.1	1,765.6	176.4	19.9	196.3	Grid_Xc+350_Yc-110
PA	U	P	4,231.4	32,149.1	83.3	111.1	194.3	ARMSTRONG
KY	U	P	12,385.2	57,156.9	68.8	125.1	193.9	WESTERN_KENTUCKY_ENERGY_CORP
NY	A	C	18,536.0	13,540.0	164.4	24.1	188.5	SUFFOLK
OH	U	P	6,186.4	22,484.6	104.9	83.6	188.4	NILES
PA	M	C	6,616.3	255.0	186.7	0.9	187.6	CUMBERLAND
PA	M	C	12,684.4	473.8	185.4	1.2	186.6	BUCKS
NJ	M	C	10,254.4	453.2	184.1	1.8	185.9	OCEAN
SC	U	P	7,327.3	15,858.9	95.5	89.8	185.3	JEFFERIES
VA	I	P	6,034.8	10,421.1	130.7	54.0	184.8	WESTVACO_CORPORATION_BLEACHED_BOARD_DIV
NC	A	C	11,660.2	3,063.4	172.6	10.3	183.0	WAKE
SC	U	P	5,087.4	15,137.7	79.3	102.7	182.0	MCMEEKIN
NJ	A	C	20,810.4	10,571.3	162.2	19.4	181.6	BERGEN
WS	U	P	25,928.6	39,313.3	127.2	50.6	177.9	PLEASANT_PRAIRIE
NJ	A	C	20,066.4	10,027.9	157.1	17.9	175.0	ESSEX
PA	U	P	7,689.3	2,416.0	164.7	9.8	174.5	AES_BEAVER_VALLEY_PARTNERS_INC
NY	U	P	10,355.5	55,626.6	76.6	95.5	172.1	C_R_HUNTLEY
NJ	A	C	9,666.8	5,442.2	155.3	15.0	170.3	CAMDEN
IL	U	P	38,872.7	23,803.1	145.4	24.9	170.3	POWERTON
PA	M	C	8,757.5	346.4	168.5	1.1	169.6	DAUPHIN
IN	U	P	6,999.9	50,435.4	54.9	113.8	168.7	R_GALLAGHER
NC	U	P	4,795.1	12,053.6	93.5	73.8	167.3	DUKE_POWER_BUCK_PLT
MD	I	C	2,489.2	1,513.9	154.7	12.1	166.8	BALTIMORE_City
PA	M	C	9,879.5	379.2	165.5	1.1	166.6	BERKS
KY	A	C	30,995.6	15,750.4	137.4	28.7	166.1	JEFFERSON
PA	U	P	3,950.9	21,835.7	78.0	87.0	165.0	NEW_CASTLE
PA	A	C	6,550.0	5,486.4	146.6	18.3	164.9	CHESTER
VA	M	C	3,015.2	136.9	163.7	0.9	164.7	ALEXANDRIA
NC	M	G	20,546.9	885.6	161.2	2.8	164.0	Grid_Xc-050_Yc-410
NJ	M	C	10,054.3	477.3	162.1	1.3	163.4	CAMDEN
GA	A	G	42,342.3	7,950.8	143.8	19.4	163.2	Grid_Xc-350_Yc-610
NY	M	C	15,991.1	728.6	161.3	1.4	162.7	BRONX
NJ	A	C	14,588.1	7,180.1	145.1	17.5	162.6	MIDDLESEX

NY	M	C	18,029.2	810.9	159.5	1.4	161.0	SUFFOLK
NJ	A	C	4,538.0	2,270.3	145.0	15.2	160.2	ATLANTIC
MD	M	C	4,260.0	187.9	158.7	0.9	159.6	CARROLL
IN	U	P	22,777.2	30,989.7	117.7	40.9	158.6	R_M_SCHAHFER
CT	M	C	22,765.0	877.1	157.3	1.2	158.5	FAIRFIELD
MD	I	P	2,148.9	1.8	158.4	0.0	158.4	TRANSCONTINENTAL_GAS_PIPE_LINE
NC	U	P	4,360.5	16,475.2	67.8	90.2	158.0	RIVERBEND
OH	M	C	29,932.8	1,150.6	155.8	1.6	157.4	FRANKLIN
VA	A	G	5,373.2	1,282.5	151.6	4.3	155.9	Grid_Xc+250_Yc-310
MD	A	C	3,153.1	700.8	150.9	4.7	155.5	HARFORD
NC	M	G	5,316.0	222.8	153.9	1.5	155.5	Grid_Xc+350_Yc-410
NC	M	G	11,601.0	512.3	153.2	2.2	155.5	Grid_Xc+250_Yc-510
MD	M	C	5,144.8	209.5	154.5	0.8	155.4	FREDERICK
PA	M	G	9,168.5	313.6	154.5	0.9	155.4	Grid_Xc+250_Yc+090
VA	A	C	4,453.3	872.2	149.2	4.8	153.9	LOUDOUN
OH	M	C	14,119.8	596.8	152.3	1.6	153.9	SUMMIT
PA	U	P	3,557.8	25,783.0	69.4	81.7	151.1	PORTLAND
VA	A	C	3,653.0	883.4	144.3	5.5	149.8	PRINCE_WILLIAM
PA	A	C	13,365.0	3,079.6	142.9	6.1	149.0	SCHUYLKILL
OH	M	C	23,542.1	995.9	146.4	1.7	148.0	HAMILTON
OH	M	G	25,369.1	966.6	145.6	1.6	147.2	Grid_Xc-050_Yc+190
WV	I	P	3,504.8	495.2	143.8	2.8	146.6	CAPITOL_CEMENT_CORPORATION
IL	I	C	32,320.5	38,669.6	105.5	40.8	146.3	COOK
NC	M	C	16,714.7	814.5	143.1	2.8	146.0	MECKLENBURG
NJ	M	C	11,576.0	529.0	144.3	1.4	145.8	MONMOUTH
SC	M	G	23,385.4	883.2	142.5	2.9	145.4	Grid_Xc-050_Yc-610
OH	M	G	19,766.6	712.4	144.0	1.4	145.4	Grid_Xc-050_Yc+090
NJ	A	C	7,443.7	3,293.2	131.7	12.9	144.6	OCEAN
NC	I	G	5,041.5	11,097.4	81.6	62.1	143.7	Grid_Xc+250_Yc-610
IN	U	P	18,530.5	14,841.3	119.0	23.9	143.0	MICHIGAN_CITY
MA	U	P	13,886.5	44,319.0	81.7	61.3	142.9	NEW_ENGLAND_POWER_BR
NC	A	C	14,890.7	4,384.8	126.7	15.3	142.0	MECKLENBURG
PA	I	P	3,146.8	5,034.5	120.0	21.9	141.9	SUN_CO_INC
MI	U	P	13,397.7	28,143.2	92.9	48.8	141.7	BELLE_RIVER
NJ	M	G	8,689.4	412.1	139.3	1.2	140.4	Grid_Xc+550_Yc+090
MI	U	P	10,376.6	26,817.0	90.7	48.8	139.5	DETROIT_EDISON_CO
MD	M	C	3,670.2	144.3	138.5	0.6	139.1	CECIL
IN	U	P	9,288.3	51,109.2	58.6	80.4	139.0	WABASH_RIVER
PA	M	C	10,472.6	416.6	137.8	1.1	138.9	WESTMORELAND
WV	M	G	12,985.2	470.0	136.6	1.3	137.9	Grid_Xc-050_Yc-110
MI	I	C	25,840.9	28,023.9	103.4	33.6	137.0	WAYNE
MD	I	P	1,149.0	931.0	126.4	10.6	137.0	BALTIMORE_RESCO
VA	M	C	3,109.8	119.3	134.9	0.8	135.7	STAFFORD
NC	A	G	10,334.8	3,006.6	123.2	12.2	135.4	Grid_Xc+150_Yc-510
NC	I	C	4,101.2	4,857.2	115.9	19.5	135.3	HALIFAX
PA	A	C	7,981.7	7,647.3	114.7	20.0	134.8	BUCKS
VA	A	C	3,743.9	789.6	131.4	3.1	134.5	RICHMOND
OH	A	G	16,794.2	6,381.4	122.1	12.2	134.3	Grid_Xc-050_Yc+090
VA	U	P	5,693.1	13,632.2	88.2	45.9	134.1	AMERICAN_ELECTRIC_POWER_GLEN_L YN
VA	M	C	3,571.6	138.2	133.3	0.7	134.0	SPOTSYLVANIA
IN	U	P	9,838.5	70,809.3	50.8	82.9	133.7	CAYUGA
MD	A	C	2,940.9	539.8	130.2	3.1	133.2	HOWARD
OH	M	G	28,816.3	1,057.6	131.8	1.4	133.2	Grid_Xc-250_Yc+190
GA	M	G	38,053.9	1,488.6	129.3	3.6	132.9	Grid_Xc-350_Yc-610
PA	A	C	6,134.1	5,974.9	115.8	16.9	132.6	DELAWARE
NC	M	G	12,564.1	554.9	130.4	1.9	132.4	Grid_Xc+050_Yc-410

NJ	M	G	4,309.3	181.8	129.6	1.0	130.6	Grid_Xc+450_Yc-010
VA	A	G	8,487.6	1,321.0	125.2	3.9	129.1	Grid_Xc+150_Yc-210
WV	A	C	12,029.1	10,026.0	105.2	23.2	128.4	KANAWHA
PA	U	P	2,594.8	15,964.8	71.9	56.4	128.3	METROPOLITAN_EDISON_CO
NJ	M	C	9,047.4	407.5	126.2	1.3	127.5	MERCER
PA	A	C	6,066.0	3,636.0	115.5	11.8	127.3	DAUPHIN
NJ	M	C	12,759.6	594.9	125.5	1.5	127.0	MIDDLESEX
PA	A	C	6,638.3	5,277.4	110.5	15.9	126.4	BERKS
PA	I	P	7,881.3	8,560.5	101.0	25.3	126.4	GE_CO
IN	M	C	30,978.1	1,210.4	124.6	1.8	126.4	MARION
IL	U	P	24,874.1	20,050.7	105.7	20.5	126.2	KINCAID
NJ	A	C	3,590.7	2,641.6	111.1	15.0	126.1	CUMBERLAND
NY	M	C	17,235.5	784.3	124.9	1.2	126.1	NASSAU
NY	U	C	8,774.9	5,245.7	46.1	80.0	126.1	QUEENS
NC	M	G	15,599.6	701.3	123.4	2.5	126.0	Grid_Xc-050_Yc-510
MI	M	G	34,709.8	1,313.5	124.6	1.4	125.9	Grid_Xc-350_Yc+290
NC	M	C	13,193.7	626.0	124.0	1.8	125.7	GUILFORD
NY	M	C	21,258.3	934.9	123.2	1.6	124.8	ERIE
TN	M	G	32,255.7	1,191.6	122.1	2.6	124.8	Grid_Xc-350_Yc-410
NY	I	G	5,117.5	15,431.3	81.5	43.0	124.5	Grid_Xc+550_Yc+090
NJ	U	C	6,831.5	10,639.2	122.7	1.5	124.2	MIDDLESEX
PA	A	G	6,769.5	3,519.8	114.0	10.0	124.0	Grid_Xc+250_Yc+090
VA	M	G	4,324.8	154.3	122.0	0.5	122.5	Grid_Xc+250_Yc-310
NJ	U	P	6,874.2	12,321.2	90.6	31.7	122.3	HUDSON
WV	I	P	5,081.0	12,950.6	78.7	43.2	121.9	PPG_INDUSTRIES__INC.
NJ	A	C	5,892.5	4,407.6	108.3	13.3	121.5	GLOUCESTER
GA	U	P	8,155.5	21,609.8	48.6	72.9	121.5	HAMMOND
KY	M	C	27,047.2	1,099.3	119.0	2.0	121.1	JEFFERSON
VA	I	G	1,979.2	1,952.0	105.7	14.8	120.6	Grid_Xc+350_Yc-310
IL	U	P	20,043.0	28,720.0	83.8	36.7	120.5	COFFEEN
OH	M	G	32,009.0	1,262.1	118.0	1.3	119.3	Grid_Xc-350_Yc-010
PA	M	C	8,086.9	313.6	117.7	0.8	118.6	LEHIGH
GA	U	P	7,189.0	24,108.7	44.2	74.0	118.2	YATES
OH	A	G	18,358.6	7,607.8	105.1	12.7	117.8	Grid_Xc-050_Yc+190
OH	M	C	11,416.9	426.4	116.6	1.1	117.8	STARK
VA	M	C	3,146.6	126.4	117.2	0.5	117.7	PRINCE_GEORGE
NC	A	G	9,846.0	4,318.6	102.1	14.9	117.1	Grid_Xc+050_Yc-410
MD	A	C	3,784.7	588.5	113.4	2.4	115.8	FREDERICK
SC	I	P	3,668.6	6,827.5	37.7	77.8	115.5	CELANESE_ACETATE:ROCKHILL
VA	A	G	5,689.4	802.4	112.1	3.2	115.2	Grid_Xc+150_Yc-110
NY	A	C	13,822.5	11,316.3	97.8	17.1	114.8	NASSAU
MI	A	C	27,961.3	8,344.4	105.1	9.1	114.2	OAKLAND
GA	U	P	5,692.5	18,676.6	43.4	70.8	114.2	JACK_MCDONOUGH
OH	M	G	21,940.5	768.0	113.0	1.0	114.1	Grid_Xc-150_Yc+090
VA	M	G	5,722.4	204.2	112.7	0.8	113.5	Grid_Xc+150_Yc-110
NC	A	G	7,894.1	2,100.5	104.4	9.1	113.5	Grid_Xc+250_Yc-510
TN	I	G	13,548.9	28,004.0	51.1	61.5	112.6	Grid_Xc-350_Yc-410
MA	M	G	47,722.4	2,173.9	110.4	1.4	111.9	Grid_Xc+750_Yc+290
OH	A	G	20,465.5	14,028.2	92.9	18.8	111.7	Grid_Xc-250_Yc+190
IN	U	P	22,331.0	3,835.2	106.7	4.8	111.5	NIPSCO__BAILLY
NJ	A	C	7,308.3	3,409.0	100.2	10.7	111.0	MERCER
NY	A	C	10,446.0	5,262.2	100.5	10.3	110.8	BRONX
NJ	M	C	9,040.0	406.8	109.7	1.1	110.8	BURLINGTON
WV	A	G	8,809.4	1,501.4	107.2	3.6	110.7	Grid_Xc+050_Yc-010
WV	U	P	4,420.8	8,610.9	79.2	31.5	110.7	WILLOW_ISLAND
NJ	I	C	3,389.3	394.1	107.8	2.6	110.5	ATLANTIC
NJ	M	C	14,559.9	690.0	109.0	1.3	110.3	BERGEN

VA	I	G	2,709.0	1,366.5	102.4	7.8	110.2	Grid_Xc+250_Yc-110
WV	I	C	10,743.1	6,976.8	93.7	16.1	109.8	KANAWHA
KY	A	G	19,882.1	6,474.9	98.6	10.6	109.3	Grid_Xc-350_Yc-110
MD	M	C	4,591.4	187.3	108.5	0.6	109.1	WASHINGTON
OH	I	P	0.0	34,466.8	0.0	107.4	107.4	USS_KOBE_STEEL_CO.____LORAIN_WOR KS
OH	A	C	15,264.8	8,584.9	92.3	14.6	106.9	HAMILTON
SC	M	G	13,330.5	481.2	105.0	1.7	106.7	Grid_Xc-050_Yc-510
PA	A	C	3,451.0	2,813.8	96.7	10.0	106.7	CUMBERLAND
VA	M	C	3,676.7	149.0	106.2	0.5	106.7	DINWIDDIE
WS	M	C	25,878.3	1,143.2	105.1	1.2	106.3	MILWAUKEE
IL	U	P	12,747.4	67,792.9	39.3	67.0	106.3	E_D_EDWARDS
VA	I	P	1,066.9	2,804.3	84.8	21.0	105.8	PHILIP_MORRIS_USA_PARK_500
NC	A	G	11,235.9	5,465.2	88.0	17.3	105.4	Grid_Xc-050_Yc-410
PA	I	P	4,826.8	3,993.2	89.7	15.7	105.4	ESSROC_BESSEMER
MI	M	C	27,688.6	1,217.8	103.8	1.3	105.1	OAKLAND
NJ	M	C	13,690.7	649.3	103.1	1.2	104.2	ESSEX
MI	U	P	10,008.7	14,896.2	78.7	24.7	103.3	RIVER_ROUGE
NJ	A	C	11,134.7	5,538.0	92.6	10.3	102.9	UNION
NJ	M	C	5,565.8	251.9	102.0	0.8	102.7	GLOUCESTER
GA	M	C	25,816.6	1,108.1	100.1	2.5	102.6	DE_KALB
WS	A	C	22,205.8	11,230.9	90.1	12.0	102.0	MILWAUKEE
WV	M	G	3,684.7	125.9	101.4	0.5	101.9	Grid_Xc+250_Yc-010
WS	U	P	17,487.1	38,625.8	61.7	39.7	101.4	COLUMBIA
NY	M	G	24,862.2	1,036.0	100.4	0.8	101.2	Grid_Xc+550_Yc+290
WV	U	P	2,451.1	12,657.4	52.4	48.6	100.9	ALBRIGHT
PA	I	P	2,479.2	0.0	100.9	0.0	100.9	TX_EASTERN_GAS_PIPELINE_CO
KY	U	P	9,028.7	13,097.0	69.8	31.0	100.8	CANE_RUN
KY	M	G	20,114.4	754.8	99.6	1.2	100.8	Grid_Xc-350_Yc-110
PA	M	C	4,339.7	149.0	99.8	0.5	100.2	FRANKLIN
NJ	M	C	3,218.5	140.9	99.4	0.8	100.2	CUMBERLAND
SC	U	G	7,818.9	23,124.6	59.2	40.8	100.0	Grid_Xc-050_Yc-710
VA	M	C	2,952.3	105.3	99.4	0.6	100.0	FAUQUIER
VA	A	G	10,545.5	1,401.0	96.3	3.0	99.3	Grid_Xc+050_Yc-310
VA	I	G	985.0	2,048.8	83.1	15.6	98.8	Grid_Xc+350_Yc-210
MI	A	C	17,370.1	4,545.3	91.9	6.7	98.6	MACOMB
MI	A	G	25,676.2	6,755.8	91.6	7.0	98.5	Grid_Xc-350_Yc+290
NJ	M	C	9,732.8	461.6	97.5	1.0	98.5	HUDSON
SC	M	G	14,258.8	521.0	96.1	1.8	97.8	Grid_Xc+050_Yc-610
WS	U	P	9,748.6	34,260.4	49.9	47.5	97.4	SOUTH_OAK_CREEK
SC	I	G	10,786.7	17,164.7	52.3	44.9	97.2	Grid_Xc+050_Yc-710
MI	U	P	11,854.5	22,668.2	60.9	36.2	97.1	DAN_E_KARN
IN	U	P	6,004.7	38,276.5	34.6	62.2	96.9	IPALCO____STOUT
CT	A	G	13,843.2	2,350.3	93.4	3.3	96.7	Grid_Xc+650_Yc+190
IL	U	P	15,986.9	20,799.9	70.7	26.0	96.7	JOLIET_9
WV	M	G	7,900.4	272.1	96.0	0.6	96.6	Grid_Xc+050_Yc-010
NY	M	C	17,412.9	762.2	94.5	1.2	95.7	MONROE
OH	M	G	18,367.9	656.8	94.2	0.9	95.2	Grid_Xc-250_Yc-010
NH	U	P	13,440.7	34,642.7	46.1	48.9	95.1	MERRIMACK
PA	A	C	13,060.6	4,097.3	88.4	6.6	95.0	LUZERNE
NY	U	C	3,730.8	2,552.4	4.1	90.8	94.9	NEW_YORK
VA	I	G	168.9	837.5	74.5	20.1	94.7	Grid_Xc+450_Yc-210
NJ	A	C	7,312.0	2,329.4	88.1	6.5	94.7	BURLINGTON
NY	A	C	13,802.7	9,608.0	78.1	16.3	94.4	ERIE
IL	U	P	9,545.6	26,552.5	48.7	45.4	94.1	NEWTON
MI	M	C	17,531.0	782.7	92.9	1.1	94.0	MACOMB
MD	I	P	1,984.1	223.9	92.6	1.1	93.7	INDEPENDENT_CEMENT_ST._LAWEREN

SC	M	G	18,776.0	722.4	91.4	1.9	93.4	CE
VA	I	P	444.4	1,870.6	68.2	25.2	93.3	Grid_Xc+050_Yc-710
PA	A	C	5,751.4	3,937.8	82.6	10.6	93.2	USN_NORFOLK_NAVAL_BASE
NY	A	C	13,456.3	13,500.5	71.8	21.2	93.1	LEHIGH
NJ	A	C	2,481.9	2,473.9	82.1	10.8	92.9	MONROE
NY	U	P	11,007.6	13,969.6	68.5	24.3	92.8	SALEM
VA	A	C	3,756.3	691.2	90.4	1.9	92.3	KINTIGH
NJ	I	P	2,784.2	0.3	62.8	28.8	91.5	CHESTERFIELD
NC	M	G	15,389.0	675.7	89.8	1.6	91.4	HOFFMAN_LAROCHE_INC.
CT	M	G	13,417.8	499.5	90.6	0.7	91.3	Grid_Xc-150_Yc-410
PA	I	P	6,333.5	0.0	90.7	0.0	90.7	Grid_Xc+650_Yc+190
PA	M	C	3,154.0	107.8	90.3	0.4	90.7	TENNESSEE_GAS_PIPELINE_CO
NY	I	P	198.0	1,886.9	79.6	10.6	90.2	ADAMS
OH	I	P	0.0	11,815.2	0.0	89.6	89.6	CHAMPION_PRODUCTS_INC
								WHEELING_PITTS_STL_STEUBENVILLE_NORTH
OH	M	G	15,474.9	604.2	87.9	1.2	89.0	Grid_Xc-150_Yc+190
PA	A	C	6,165.4	3,021.1	80.6	8.1	88.7	WESTMORELAND
NC	A	C	8,637.9	2,887.0	79.9	8.1	88.1	GUILFORD
VA	I	P	4,652.5	6,887.8	65.4	22.5	87.9	HOECHST_CELANESE_CORP
OH	I	G	14,326.4	10,256.9	73.5	14.3	87.8	Grid_Xc-250_Yc-010
WS	U	P	15,428.2	18,930.9	64.6	23.1	87.8	EDGEWATER
AL	U	P	15,103.0	45,455.2	34.0	53.3	87.4	GREENE_COUNTY
NC	M	C	9,743.0	456.9	85.9	1.3	87.2	FORSYTH
IN	M	G	32,314.6	1,168.0	85.8	1.1	86.9	Grid_Xc-450_Yc+090
VA	M	G	9,436.9	337.4	86.1	0.7	86.9	Grid_Xc+050_Yc-310
VA	M	C	2,958.8	110.4	86.2	0.4	86.7	HANOVER
NC	U	P	2,687.1	7,877.1	51.9	34.6	86.5	DAN_RIVER
WV	A	C	10,294.0	13,724.3	59.4	26.7	86.1	WAYNE
VA	M	C	3,963.5	152.2	85.1	0.6	85.7	ALBEMARLE
VA	M	G	11,002.0	392.7	84.6	1.0	85.5	Grid_Xc-050_Yc-310
NJ	I	G	4,389.9	5,309.9	70.3	15.2	85.5	Grid_Xc+550_Yc+090
GA	M	C	30,758.7	1,316.0	83.1	2.3	85.4	FULTON
NC	A	G	8,830.3	4,045.3	69.5	14.6	84.2	Grid_Xc-050_Yc-510
MD	I	P	659.6	1,428.8	66.5	17.2	83.7	NAVAL_SURFACE_WARFARE_CNTR_IND
								IAN_HD
PA	I	P	3,059.8	0.0	82.9	0.0	82.9	TRANSCONTINENTAL_GAS_PIPE_LINE_C
								ORP
IN	A	C	20,311.0	3,042.1	78.3	4.4	82.7	MARION
CT	M	C	19,800.8	762.5	81.7	0.7	82.4	NEW_HAVEN
NC	A	G	4,504.4	1,668.7	73.0	9.4	82.4	Grid_Xc+250_Yc-610
IL	I	P	3,213.1	24,837.3	57.4	24.8	82.1	MOBIL_JOLIET_REFINING_CORP
WV	A	G	9,454.8	1,124.4	78.8	2.3	81.1	Grid_Xc-050_Yc-010
NY	M	G	5,039.5	229.6	80.2	0.6	80.9	Grid_Xc+550_Yc+090
NY	A	C	12,330.3	9,245.7	67.5	13.4	80.9	WESTCHESTER
OH	A	G	13,970.3	6,681.4	71.9	8.9	80.7	Grid_Xc-150_Yc+090
VA	M	C	3,640.4	130.1	80.0	0.6	80.6	ROCKINGHAM
SC	M	G	9,087.5	334.9	79.1	1.2	80.3	Grid_Xc+150_Yc-610
TN	I	C	8,467.0	8,871.3	56.5	23.6	80.1	SULLIVAN
SC	M	C	10,238.6	381.3	77.9	1.4	79.3	SPARTANBURG
NC	U	G	3,840.7	8,023.7	45.9	32.8	78.7	Grid_Xc+150_Yc-510
VA	M	G	5,291.3	191.0	78.1	0.6	78.7	Grid_Xc+150_Yc-210
IN	A	G	27,875.2	4,554.6	74.1	4.2	78.3	Grid_Xc-450_Yc+090
IL	U	P	9,382.2	41,522.8	34.5	43.5	78.1	DALLMAN
WS	A	G	33,935.1	13,904.4	67.5	10.5	78.0	Grid_Xc-650_Yc+390
MD	A	C	3,256.8	403.2	76.7	1.3	78.0	WASHINGTON
SC	A	G	10,914.7	3,731.0	65.8	12.2	78.0	Grid_Xc-050_Yc-610

IL	U	P	14,478.6	13,747.0	61.8	16.1	77.9	WILL_COUNTY
KY	A	G	16,906.3	7,331.6	64.2	13.7	77.8	Grid_Xc-350_Yc-210
WV	M	G	11,147.7	380.5	76.7	0.8	77.5	Grid_Xc-050_Yc-210
WS	M	G	37,626.1	1,464.7	76.2	1.1	77.3	Grid_Xc-650_Yc+390
NC	I	G	6,546.7	2,703.5	67.9	9.4	77.3	Grid_Xc+050_Yc-410
VA	M	C	3,096.6	110.6	76.0	0.5	76.5	FREDERICK
TN	A	G	17,401.3	5,078.7	65.3	11.1	76.3	Grid_Xc-350_Yc-410
NC	I	G	4,587.2	2,911.6	66.5	9.3	75.8	Grid_Xc+150_Yc-410
KY	U	G	17,517.3	14,332.4	49.7	25.8	75.6	Grid_Xc-650_Yc-210
DE	I	C	1,667.3	4,612.5	56.8	18.4	75.1	NEW_CASTLE
KY	M	G	19,426.2	726.0	73.7	1.4	75.1	Grid_Xc-350_Yc-210
CT	M	C	24,016.1	929.2	74.4	0.7	75.1	HARTFORD
NY	A	G	4,420.1	1,533.3	70.4	4.3	74.6	Grid_Xc+550_Yc+090
IL	U	P	11,387.5	25,286.3	35.7	38.7	74.4	JOPPA_STEAM
IN	M	G	25,253.8	922.4	73.3	0.9	74.3	Grid_Xc-450_Yc+190
OH	M	G	12,841.1	441.7	73.4	0.6	74.0	Grid_Xc-150_Yc-010
PA	I	P	3,134.1	1,150.4	69.0	4.6	73.7	US_STEEL_CORP
MI	M	G	33,762.0	1,277.2	72.6	0.8	73.4	Grid_Xc-250_Yc+390
PA	A	C	5,533.0	1,796.4	68.6	4.3	72.9	FAYETTE
VA	I	P	3,313.3	0.6	72.8	0.0	72.8	TRANSCO_STATION_170
OH	I	P	3,523.6	55,233.7	0.0	72.6	72.6	LTV_STEEL_COMPANY__INC.
KY	U	P	3,704.3	16,652.4	24.8	47.7	72.5	EAST_KY_POWER_COOP
OH	U	P	2,014.3	12,586.0	30.1	42.4	72.5	ORRVILLE
PA	A	C	5,511.2	1,567.0	68.9	3.4	72.3	NORTHUMBERLAND
IL	M	G	34,415.5	1,402.3	71.1	1.1	72.2	Grid_Xc-650_Yc+290
NY	M	C	12,968.6	579.6	71.3	0.8	72.1	WESTCHESTER
NY	M	G	14,213.5	603.3	71.3	0.8	72.0	Grid_Xc+550_Yc+190
GA	M	G	20,242.2	739.5	70.4	1.6	72.0	Grid_Xc-250_Yc-610
WV	M	G	4,797.8	163.7	71.3	0.5	71.8	Grid_Xc+050_Yc-110
OH	M	G	8,529.3	297.3	71.1	0.6	71.8	Grid_Xc-050_Yc-010
IN	M	G	27,869.4	1,061.1	69.6	0.8	70.4	Grid_Xc-550_Yc+190
PA	I	P	3,225.8	4,638.3	57.8	12.6	70.4	ESSROC_MATERIALS__INC.
VA	M	G	5,983.0	213.4	69.9	0.5	70.3	Grid_Xc+150_Yc-310
PA	M	C	7,249.3	274.2	69.8	0.6	70.3	NORTHAMPTON
GA	I	C	6,051.2	10,433.4	32.9	37.3	70.1	RICHMOND
OH	A	G	10,341.0	5,640.9	59.0	10.9	69.9	Grid_Xc-150_Yc+190
PA	I	P	2,857.3	2,774.3	58.4	11.3	69.8	ZINC_CORP_AMER
NC	I	G	7,140.3	881.5	67.6	2.2	69.8	Grid_Xc+050_Yc-310
PA	M	C	6,185.3	244.5	69.0	0.6	69.6	WASHINGTON
MI	M	G	17,520.6	634.4	68.4	0.7	69.1	Grid_Xc-450_Yc+290
OH	I	G	10,672.1	15,324.6	48.3	20.7	69.0	Grid_Xc-250_Yc+190
PA	I	C	2,328.3	1,068.8	65.2	3.8	69.0	CUMBERLAND
IN	M	G	18,349.9	673.1	68.0	0.8	68.8	Grid_Xc-350_Yc+190
NY	U	P	4,331.3	10,345.0	45.7	22.9	68.6	DANSKAMMER
OH	A	G	16,796.4	6,822.4	61.7	6.9	68.6	Grid_Xc-350_Yc-010
VA	I	P	360.2	1,757.4	48.1	20.3	68.4	NEWPORT_NEWS_SHIPBUILDING_CO
SC	M	C	11,681.0	457.1	66.7	1.4	68.1	GREENVILLE
VA	A	G	5,634.2	930.1	65.7	2.0	67.8	Grid_Xc+150_Yc-310
MI	M	G	20,247.1	812.2	66.9	0.8	67.7	Grid_Xc-250_Yc+290
NC	M	G	7,180.6	301.5	66.5	1.0	67.5	Grid_Xc+050_Yc-510
OH	I	C	8,177.3	1,548.5	64.4	3.0	67.4	ATHENS
IL	U	P	5,130.0	46,256.7	17.5	49.6	67.1	HENNEPIN
PA	I	C	4,793.1	3,084.5	58.6	8.3	66.9	ALLEGHENY
IN	M	G	22,674.3	795.0	66.1	0.8	66.9	Grid_Xc-450_Yc-010
CT	A	C	9,992.1	1,714.8	64.5	2.3	66.8	FAIRFIELD
PA	A	C	4,649.3	1,362.4	63.2	3.3	66.6	SOMERSET
OH	U	C	978.6	4,499.9	0.0	66.6	66.6	LAKE

SC	A	G	11,642.7	3,642.2	56.7	9.6	66.2	Grid_Xc+050_Yc-710
WV	A	G	8,062.3	3,467.1	58.8	7.0	65.7	Grid_Xc-150_Yc-110
PA	I	P	3,364.4	103.4	65.4	0.3	65.7	IN_UNIV_PA
MA	A	C	24,481.7	10,144.3	59.7	6.0	65.6	SUFFOLK
NY	M	G	9,622.2	388.0	64.6	0.6	65.2	Grid_Xc+250_Yc+290
PA	U	P	2,200.3	4,436.1	50.9	14.3	65.1	CROMBY
MA	A	G	23,056.9	19,144.9	52.4	12.7	65.1	Grid_Xc+750_Yc+290
PA	M	C	5,213.2	179.6	64.6	0.4	65.1	FAYETTE
PA	I	C	2,639.1	1,868.4	58.8	6.2	65.0	CHESTER
SC	M	G	14,915.3	535.0	63.7	1.3	65.0	Grid_Xc-150_Yc-610
WV	A	C	6,124.8	6,183.9	51.0	13.8	64.8	WOOD
GA	A	C	22,079.9	3,916.8	57.8	6.7	64.6	FULTON
SC	I	G	5,466.3	9,519.8	33.2	31.2	64.4	Grid_Xc-050_Yc-610
VA	M	G	12,090.3	438.6	63.5	0.8	64.4	Grid_Xc-150_Yc-310
WV	A	C	5,293.9	5,681.2	51.1	13.2	64.3	PUTNAM
IL	A	C	18,983.3	3,317.9	60.9	3.4	64.3	DU_PAGE
NY	U	P	3,719.0	15,586.8	38.1	25.9	64.1	LILCO_NORTHPORT_POWER_STAT
NC	A	G	5,996.6	2,550.1	55.2	8.7	63.9	Grid_Xc+050_Yc-510
NJ	A	C	9,213.5	3,896.2	57.2	6.4	63.6	MORRIS
IN	A	G	20,718.1	3,158.9	60.2	3.2	63.4	Grid_Xc-450_Yc+190
NJ	I	C	5,404.7	5,156.5	50.3	12.6	62.9	MIDDLESEX
IN	A	G	24,033.3	3,653.8	60.0	2.8	62.8	Grid_Xc-550_Yc+190
WV	A	G	8,312.4	1,205.2	60.4	2.3	62.7	Grid_Xc-050_Yc+090
PA	M	G	9,667.3	330.7	61.9	0.5	62.3	Grid_Xc+350_Yc+190
NJ	U	P	1,102.1	3,228.9	47.5	14.8	62.3	DEEPWATER
PA	I	P	3,117.3	7.8	61.9	0.0	62.0	DAMASCUS_STEEL_CSTNG
NJ	A	C	9,411.6	4,831.6	54.6	7.3	61.9	PASSAIC
OH	A	G	11,050.7	3,397.6	56.8	4.8	61.6	Grid_Xc-250_Yc-010
PA	A	C	5,170.7	1,957.7	57.5	4.0	61.6	CAMBRIA
MI	M	G	27,064.3	1,085.2	60.4	0.9	61.3	Grid_Xc-350_Yc+390
IL	U	P	10,492.2	15,034.6	41.9	19.2	61.1	COFFEEN
VA	M	G	7,077.3	253.7	60.5	0.6	61.1	Grid_Xc+050_Yc-210
PA	A	C	2,452.7	1,555.1	56.3	4.7	61.0	FRANKLIN
NJ	M	C	9,623.0	432.5	59.8	0.7	60.5	MORRIS
PA	I	P	2,012.2	0.0	60.5	0.0	60.5	TX_EASTERN_GAS_PIPELINE_CO
PA	I	C	2,895.7	1,416.0	55.1	4.6	59.7	PHILADELPHIA
IL	A	G	27,201.8	4,594.6	55.9	3.6	59.5	Grid_Xc-650_Yc+290
TN	M	C	22,247.4	918.2	57.8	1.6	59.4	DAVIDSON
MD	M	G	4,053.2	163.0	58.9	0.4	59.3	Grid_Xc+150_Yc-010
PA	M	C	4,953.4	203.1	58.4	0.6	58.9	BEAVER
MI	A	G	23,621.4	7,377.2	52.7	6.2	58.9	Grid_Xc-350_Yc+390
TN	A	C	15,219.5	11,818.8	38.2	20.6	58.8	DAVIDSON
GA	M	G	14,287.1	548.9	56.9	1.4	58.3	Grid_Xc-150_Yc-710
WV	I	G	5,229.5	7,241.8	43.6	14.7	58.3	Grid_Xc-050_Yc-010
MI	A	G	16,144.4	4,133.1	53.1	4.3	57.4	Grid_Xc-250_Yc+290
NY	A	G	12,432.0	9,133.3	49.9	7.2	57.1	Grid_Xc+550_Yc+290
OH	M	G	14,993.8	526.3	56.5	0.6	57.1	Grid_Xc-250_Yc+090
IN	A	G	14,534.9	2,195.9	53.8	2.6	56.4	Grid_Xc-350_Yc+190
PA	A	G	6,244.8	2,361.6	52.1	4.3	56.4	Grid_Xc+050_Yc+190
GA	M	C	21,388.7	912.3	54.5	1.6	56.0	COBB
PA	A	C	4,630.8	1,319.3	53.1	2.9	56.0	CLEARFIELD
NY	U	P	3,850.7	9,185.3	37.2	18.8	56.0	LOVETT
SC	A	G	6,171.6	2,152.1	48.3	7.6	55.9	Grid_Xc-050_Yc-510
PA	I	C	2,105.3	1,067.8	51.9	4.0	55.9	LANCASTER
NJ	A	C	5,774.4	3,103.9	48.6	6.8	55.4	SOMERSET
IN	I	P	2,899.8	25,028.4	23.7	31.6	55.3	AMOCO_OIL_COMPANY__WHITING__R EFINERY

PA	M	C	4,909.3	184.1	54.6	0.4	55.0	CAMBRIA
IN	I	C	12,022.6	30,624.3	29.4	25.3	54.7	LAKE
PA	I	P	3,335.6	0.0	54.7	0.0	54.7	TENNESSEE_GAS_PIPELINE
PA	M	C	8,142.4	315.5	54.1	0.5	54.6	LUZERNE
PA	I	P	1,737.3	5,405.6	35.5	19.1	54.6	INTL_PAPER_CO
WV	M	G	6,474.8	233.1	53.9	0.5	54.4	Grid_Xc-050_Yc-010
KY	I	P	4,375.2	6,650.4	36.4	18.0	54.3	MARATHON_ASHLAND_PETROLEUM
NC	I	G	1,852.3	2,219.9	43.7	10.4	54.1	Grid_Xc+250_Yc-410
WV	A	G	4,966.4	615.7	52.2	1.7	53.9	Grid_Xc-050_Yc-110
CT	U	P	3,768.0	12,600.7	33.2	20.2	53.4	BRIDGEPORT_HARBOR
PA	M	C	3,400.6	123.6	53.0	0.4	53.4	LEBANON
SC	A	G	6,800.0	2,203.3	45.8	7.4	53.2	Grid_Xc+050_Yc-610
NC	I	G	2,155.9	5,648.5	28.5	24.6	53.2	Grid_Xc+250_Yc-510
WV	I	C	2,754.9	6,867.5	33.4	19.7	53.1	HANCOCK
PA	I	P	2,542.8	1,380.6	48.8	4.2	53.0	ALLENTOWN_CEMENT_CO_INC
VA	M	C	2,952.1	105.8	52.6	0.4	53.0	AUGUSTA
IN	M	G	15,283.2	549.6	52.0	0.8	52.8	Grid_Xc-450_Yc-110
WV	I	C	3,168.9	0.4	52.7	0.0	52.7	LEWIS
MI	A	G	23,087.1	5,307.6	49.2	3.4	52.6	Grid_Xc-250_Yc+390
WV	A	G	3,240.7	1,417.4	48.1	4.3	52.5	Grid_Xc+050_Yc-110
NY	U	P	2,419.3	18,110.9	17.8	34.3	52.1	ROCHESTER_7
PA	A	C	2,960.1	1,939.3	46.0	5.9	51.9	LEBANON
GA	M	G	27,593.8	1,032.5	50.5	1.4	51.8	Grid_Xc-350_Yc-710
MA	M	C	29,190.3	1,343.1	51.0	0.7	51.7	MIDDLESEX
MI	I	C	8,095.9	15,460.8	32.7	19.0	51.7	MONROE
IN	A	G	16,603.4	2,778.6	48.7	2.9	51.5	Grid_Xc-450_Yc-010
NY	I	C	2,433.5	11,631.1	25.7	25.8	51.4	KINGS
IL	A	G	13,651.0	2,483.3	48.9	2.5	51.4	Grid_Xc-550_Yc+290
TN	A	G	13,448.8	12,253.2	30.8	20.4	51.2	Grid_Xc-550_Yc-410
SC	A	C	7,416.4	3,089.5	41.6	9.5	51.1	GREENVILLE
MI	A	G	12,212.6	3,077.1	47.6	3.4	51.1	Grid_Xc-450_Yc+290
PA	I	G	3,462.7	2,077.1	45.5	5.0	50.5	Grid_Xc+350_Yc+090
NY	A	G	8,768.8	5,158.6	43.9	6.5	50.5	Grid_Xc+550_Yc+190
OH	I	C	1,974.7	10,898.0	20.3	30.1	50.4	SUMMIT
NC	I	G	1,142.2	3,544.7	24.9	25.4	50.3	Grid_Xc+350_Yc-510
NJ	M	C	5,017.7	202.0	49.6	0.5	50.1	HUNTERDON
PA	M	C	3,554.1	136.7	49.8	0.3	50.1	BLAIR
SC	I	G	4,635.7	5,514.9	31.3	18.7	50.0	Grid_Xc+050_Yc-610
NJ	M	C	5,868.6	260.6	49.3	0.6	49.9	SOMERSET
PA	M	C	4,983.9	170.6	49.4	0.4	49.8	BUTLER
WV	I	P	938.9	9,144.0	15.1	34.5	49.6	CABOT_CORPORATION_OHIO_RIVER_PLANT
OH	I	G	4,781.1	7,727.7	34.8	14.8	49.6	Grid_Xc-050_Yc+090
VA	A	G	6,075.6	1,168.4	46.6	2.8	49.5	Grid_Xc-050_Yc-310
NC	I	G	5,380.2	2,341.3	42.0	7.4	49.4	Grid_Xc-050_Yc-410
OH	A	G	11,851.9	4,281.0	44.5	4.5	49.1	Grid_Xc-250_Yc+090
KY	U	P	2,561.7	18,415.6	10.6	38.5	49.0	KENTUCKY_UTILITIES_CO
VA	I	P	982.2	1,694.4	36.4	12.6	49.0	DUPONT__EI_DENEMOURS_&_CO
PA	A	C	4,047.4	1,527.1	45.0	4.0	49.0	WASHINGTON
OH	I	P	0.0	29,132.1	6.6	42.4	48.9	AK_STEEL_CORPORATION
OH	M	G	6,531.8	227.6	48.0	0.5	48.5	Grid_Xc-150_Yc-110
PA	I	C	2,494.9	1,699.1	43.6	4.9	48.4	MONTGOMERY
KY	I	C	8,546.9	7,594.7	34.3	14.1	48.3	JEFFERSON
DC	I	C	780.0	2,119.0	35.4	12.9	48.3	DISTRICT_OF_COLUMBIA
IL	U	P	2,406.9	19,300.6	12.7	35.4	48.2	HUTSONVILLE
OH	I	G	3,670.2	8,256.0	30.6	17.2	47.8	Grid_Xc-050_Yc-010
PA	I	P	1,819.7	2,107.8	39.2	8.5	47.7	LTV_STEEL_COMPANY___PGH_COKE_PLANT

ANT								
NY	M	G	17,447.3	730.1	46.9	0.7	47.7	Grid_Xc+550_Yc+390
IL	A	G	20,701.5	3,560.3	44.8	2.7	47.6	Grid_Xc-650_Yc+190
OH	I	C	4,972.8	11,199.8	28.5	18.9	47.4	HAMILTON
SC	A	G	4,874.9	1,356.0	42.6	4.8	47.4	Grid_Xc+150_Yc-610
MD	A	C	3,104.9	408.2	46.1	1.0	47.0	ALLEGANY
MA	A	C	22,487.7	17,365.9	38.3	8.7	47.0	MIDDLESEX
SC	A	G	5,858.8	2,606.8	38.0	8.8	46.8	Grid_Xc-150_Yc-510
DE	U	P	407.7	881.8	37.9	8.8	46.6	DOVER_ELECTRIC__MCKEE_RUN
PA	A	C	7,707.6	2,267.9	42.8	3.4	46.2	LACKAWANNA
PA	M	C	3,526.1	133.4	45.9	0.3	46.2	CENTRE
VA	M	C	6,358.4	263.3	45.7	0.5	46.2	ROANOKE
IN	M	G	17,910.1	643.2	45.6	0.6	46.2	Grid_Xc-550_Yc-010
WV	M	G	6,250.4	228.9	45.6	0.5	46.1	Grid_Xc-150_Yc-110
PA	M	C	4,367.3	149.7	45.6	0.3	45.9	SCHUYLKILL
RI	M	G	19,972.8	785.4	45.3	0.5	45.9	Grid_Xc+750_Yc+290
NJ	U	C	3,395.0	1,818.0	30.3	15.4	45.7	HUDSON
PA	A	C	4,106.0	3,358.6	38.8	6.7	45.6	NORTHAMPTON
MI	M	G	13,887.0	521.8	44.9	0.5	45.4	Grid_Xc-450_Yc+390
SC	I	G	3,918.6	4,015.4	30.8	14.3	45.1	Grid_Xc-050_Yc-510
NY	M	G	14,655.9	599.0	44.0	0.5	44.5	Grid_Xc+350_Yc+390
WV	I	G	3,246.1	3,746.8	34.1	10.3	44.4	Grid_Xc-050_Yc-110
PA	I	C	2,387.5	338.0	43.1	1.0	44.0	DELAWARE
KY	M	G	8,589.0	298.1	43.4	0.5	44.0	Grid_Xc-150_Yc-210
NC	I	G	3,517.7	4,416.2	27.7	16.0	43.7	Grid_Xc-050_Yc-510
OH	I	C	1,006.2	13,300.0	9.4	34.3	43.7	CUYAHOGA
WV	I	C	2,537.6	9,542.0	23.1	20.6	43.7	MARSHALL
NJ	I	P	3,520.0	328.3	34.2	9.3	43.4	DUPONT_DE_NEMOURS__E.I.__&_CO.
KY	U	G	18,619.2	15,800.0	29.3	14.1	43.4	Grid_Xc-550_Yc-210
TN	M	G	7,333.6	274.7	42.4	0.7	43.1	Grid_Xc-150_Yc-410
NC	A	G	6,097.9	3,158.9	35.5	7.6	43.1	Grid_Xc-150_Yc-410
PA	M	C	3,143.5	108.1	42.7	0.3	43.0	SOMERSET
PA	M	G	5,085.5	174.0	42.4	0.3	42.7	Grid_Xc+050_Yc+190
PA	I	P	3,276.0	0.0	42.5	0.0	42.5	TENNESSEE_GAS_TRANSMISSION
MI	I	G	9,427.2	8,589.7	33.5	8.9	42.4	Grid_Xc-350_Yc+290
PA	A	G	3,894.2	1,316.3	39.4	2.9	42.3	Grid_Xc+050_Yc+090
TN	M	G	11,209.8	387.0	41.5	0.7	42.2	Grid_Xc-250_Yc-410
KY	A	G	11,973.7	3,618.9	36.0	6.1	42.0	Grid_Xc-450_Yc-210
NY	M	C	11,865.9	512.9	41.5	0.5	42.0	ONONDAGA
NY	U	P	2,233.7	11,190.3	21.0	20.9	41.9	GOUDEY
MI	U	G	8,118.9	14,603.2	26.7	15.2	41.9	Grid_Xc-250_Yc+290
PA	A	C	5,713.3	2,248.7	37.3	4.5	41.8	ERIE
NY	U	P	4,299.0	4,471.3	34.5	7.2	41.7	MILLIKEN
DE	I	P	275.2	1,962.0	24.2	17.5	41.7	KRAFT_GENERAL_FOODS
TN	M	G	7,330.4	279.9	40.9	0.6	41.5	Grid_Xc-150_Yc-310
AL	A	G	16,254.2	8,871.5	27.5	13.9	41.4	Grid_Xc-550_Yc-510
MD	I	G	1,249.6	1,861.3	34.4	7.0	41.4	Grid_Xc+250_Yc-010
PA	M	C	6,233.6	237.2	40.8	0.5	41.3	ERIE
NC	I	C	3,034.7	5,416.8	25.7	15.5	41.3	FORSYTH
IL	I	P	2,019.9	18,037.3	12.7	28.5	41.2	CITGO_PETROLEUM_CORPORATION_(UN O_VEN_CO)
PA	A	C	2,735.2	1,238.1	38.3	2.7	41.0	BLAIR
VA	I	P	1,382.2	3,388.7	26.0	14.9	41.0	ROANOKE_CEMENT_COMPANY
OH	A	G	6,330.3	2,936.3	36.5	4.3	40.8	Grid_Xc-150_Yc-010
SC	M	G	8,607.2	303.2	39.5	0.9	40.4	Grid_Xc-050_Yc-710
VA	M	C	4,374.6	162.2	40.0	0.3	40.3	PITTSYLVANIA
NJ	I	G	1,088.0	1,432.6	32.7	7.5	40.2	Grid_Xc+450_Yc-010

OH	M	G	7,232.7	248.0	39.7	0.4	40.1	Grid_Xc-250_Yc-110
NC	I	G	2,800.9	4,063.4	25.9	14.0	39.9	Grid_Xc+050_Yc-510
PA	I	P	1,952.8	2,291.1	33.4	6.4	39.8	KEYSTONE_PORTLAND_CEMENT_CO.
NJ	U	P	1,636.6	1,483.3	34.4	5.4	39.8	JERSEY_CENTRAL_POWER_&_LIGHT
MI	I	G	16,033.5	4,809.6	35.6	4.0	39.6	Grid_Xc-350_Yc+390
OH	I	P	0.0	22,714.2	0.0	39.6	39.6	WHEELING_PITTSBURGH_STEEL_STEUB ENVILLE_S
PA	A	C	2,988.7	1,604.4	34.9	4.5	39.4	BEAVER
OH	I	P	556.9	14,654.6	5.1	34.2	39.3	LTV_STEEL_COMPANY_INC.
MA	M	G	12,295.7	560.8	38.6	0.4	39.0	Grid_Xc+650_Yc+290
IL	M	G	10,767.9	464.0	38.5	0.5	39.0	Grid_Xc-550_Yc+290
NJ	I	P	654.4	2,582.0	39.0	0.0	39.0	DUPONT_DE_NEMOURS_E.I._&_CO.
NY	I	P	2,003.6	10,753.1	33.9	5.1	39.0	HOOKEF_EFW_PLANT_NIAGAR
MI	A	G	11,224.8	2,743.6	36.3	2.6	38.9	Grid_Xc-450_Yc+390
PA	U	P	1,919.6	742.1	36.2	2.5	38.7	MITCHELL
WV	I	G	2,577.0	66.0	38.3	0.2	38.5	Grid_Xc+050_Yc-110
PA	I	P	2,010.2	941.6	35.8	2.7	38.5	HERCULES_CEMENT_CO.
NJ	M	G	7,526.7	356.9	38.0	0.5	38.5	Grid_Xc+550_Yc+190
PA	A	C	2,684.8	1,458.5	35.0	3.5	38.4	CENTRE
PA	M	G	4,600.6	157.4	38.1	0.3	38.3	Grid_Xc+150_Yc+190
VA	I	G	1,182.7	1,461.2	33.4	4.9	38.3	Grid_Xc+250_Yc-310
AL	M	C	27,606.6	1,116.4	36.9	1.2	38.1	JEFFERSON
GA	A	G	8,677.1	1,293.8	34.6	3.4	37.9	Grid_Xc-150_Yc-710
VA	I	G	983.0	1,071.9	32.9	5.0	37.9	Grid_Xc+250_Yc-210
IL	U	P	7,482.3	13,668.6	23.9	14.0	37.9	DUCK_CREEK
IN	I	C	9,570.5	8,698.8	29.1	8.7	37.7	ST._JOSEPH
NC	M	G	3,938.4	165.1	37.3	0.4	37.7	Grid_Xc+050_Yc-310
PA	I	G	4,066.7	1,857.3	33.9	3.4	37.3	Grid_Xc+050_Yc+190
SC	I	G	5,213.0	1,042.8	33.7	3.5	37.2	Grid_Xc-150_Yc-510
VA	A	G	3,695.2	2,278.7	31.6	5.4	37.0	Grid_Xc+050_Yc-210
NJ	I	P	9,632.0	33,461.5	32.6	4.2	36.9	PSE_&_G_CO._ATTN_ENVIRONMETAL
GA	A	G	9,496.8	1,650.8	33.0	3.6	36.6	Grid_Xc-250_Yc-610
AL	A	G	23,906.4	7,054.7	29.5	7.0	36.5	Grid_Xc-550_Yc-610
PA	I	P	1,614.1	3,151.1	27.9	8.6	36.5	LONE_STAR_INDUSTRIES
NY	M	G	7,197.8	289.7	36.1	0.3	36.4	Grid_Xc+350_Yc+290
WV	M	G	7,252.0	248.5	36.0	0.4	36.4	Grid_Xc-150_Yc-210
IN	I	G	8,511.1	15,236.9	21.7	14.6	36.2	Grid_Xc-550_Yc-010
MI	U	G	6,817.6	15,162.2	22.0	14.2	36.2	Grid_Xc-450_Yc+390
MD	U	P	614.7	2,146.8	25.6	10.6	36.2	R_P_SMITH
PA	M	C	3,432.8	117.3	35.9	0.3	36.2	INDIANA
VA	M	C	4,054.4	160.3	35.6	0.3	35.8	CAMPBELL
MI	I	C	7,146.7	13,232.5	23.2	12.2	35.5	MUSKEGON
OH	M	G	10,514.5	362.6	35.1	0.4	35.4	Grid_Xc-350_Yc+090
NY	M	C	6,788.9	291.8	35.0	0.4	35.4	BROOME
VA	I	C	946.1	1,054.5	31.3	4.1	35.4	RICHMOND
VA	I	G	2,756.6	4,724.2	25.2	10.2	35.4	Grid_Xc+050_Yc-310
IL	A	G	17,278.9	4,712.8	32.3	3.1	35.4	Grid_Xc-650_Yc+090
PA	U	P	1,171.4	5,530.2	18.1	17.2	35.4	WARREN
IN	U	C	9,298.0	12,527.4	9.5	25.9	35.4	LAKE
PA	I	P	1,372.6	3,965.9	23.4	11.6	35.0	WILLAMETTE_IND
WS	U	P	3,613.1	16,550.7	14.8	20.1	34.9	VALLEY
PA	I	P	1,872.5	589.0	32.5	1.7	34.3	LAFARGE_CORP
PA	I	C	2,825.8	1,376.8	31.3	2.8	34.2	CAMBRIA
PA	M	C	3,696.4	134.6	33.9	0.3	34.2	MERCER
OH	I	P	0.0	34,600.5	0.0	34.1	34.1	MEAD_CORPORATION
SC	A	G	6,698.4	2,355.4	28.5	5.6	34.1	Grid_Xc-150_Yc-610
OH	A	G	3,686.9	1,590.9	30.8	3.3	34.1	Grid_Xc-050_Yc-010

GA	I	G	4,923.2	7,104.5	16.5	17.5	34.0	Grid_Xc-350_Yc-610
VA	I	C	3,381.7	1,653.3	30.9	3.1	34.0	PITTSYLVANIA
TN	M	G	14,544.3	517.9	33.1	0.8	33.9	Grid_Xc-550_Yc-410
IL	I	G	12,963.6	7,384.7	28.0	5.6	33.7	Grid_Xc-650_Yc+190
NJ	I	P	1,164.9	2,175.3	22.6	11.1	33.6	MOBIL_OIL_CORPORATION
NY	I	P	823.7	1,894.5	17.7	15.9	33.5	IONDECK_SILVER_SPRINGS_ENERGY
PA	M	C	2,909.8	99.5	33.3	0.2	33.5	CLEARFIELD
PA	M	C	4,001.7	151.9	33.1	0.2	33.3	LYCOMING
NC	I	G	1,569.4	3,568.0	18.7	14.6	33.3	Grid_Xc+150_Yc-510
NJ	I	C	1,910.4	2,682.8	24.8	8.5	33.3	MERCER
SC	I	G	4,215.1	4,520.0	19.3	13.9	33.2	Grid_Xc-050_Yc-710
KY	M	G	10,853.4	383.4	32.5	0.6	33.2	Grid_Xc-450_Yc-210
PA	A	C	2,123.2	901.4	31.1	2.0	33.1	BEDFORD
PA	A	C	3,058.8	1,237.9	30.3	2.8	33.1	BUTLER
TN	I	G	14,051.3	14,810.1	17.7	15.4	33.0	Grid_Xc-650_Yc-410
GA	M	G	13,509.7	510.3	32.2	0.7	32.9	Grid_Xc-250_Yc-710
IN	U	G	11,319.3	29,735.3	22.5	10.4	32.8	Grid_Xc-550_Yc-110
KY	M	G	8,277.8	287.6	32.4	0.4	32.8	Grid_Xc-250_Yc-210
OH	A	G	8,914.2	2,871.0	29.6	3.1	32.8	Grid_Xc-350_Yc+090
TN	I	G	3,498.4	10,941.3	12.9	19.8	32.7	Grid_Xc-250_Yc-410
OH	I	G	4,136.3	5,425.9	23.6	9.1	32.7	Grid_Xc-050_Yc+190
IN	A	G	9,144.1	1,141.3	31.0	1.6	32.5	Grid_Xc-450_Yc-110
KY	A	G	5,508.1	1,261.8	30.4	2.0	32.4	Grid_Xc-250_Yc-110
NC	M	G	4,875.3	204.6	31.7	0.7	32.4	Grid_Xc-150_Yc-510
WV	I	G	2,499.3	817.1	30.4	1.9	32.3	Grid_Xc+050_Yc-010
IL	A	G	17,666.6	4,896.4	29.4	2.9	32.3	Grid_Xc-750_Yc+190
KY	A	G	15,827.4	4,182.5	27.8	4.4	32.2	Grid_Xc-550_Yc-210
TN	M	G	15,803.0	611.0	31.2	0.9	32.2	Grid_Xc-450_Yc-510
PA	A	C	3,528.7	1,870.0	29.2	2.9	32.1	LYCOMING
IN	M	G	8,607.5	298.5	31.7	0.3	32.1	Grid_Xc-350_Yc-010
MD	I	P	150.0	4,312.1	7.2	24.9	32.1	FORT_DETTRICK
PA	I	P	2,418.4	1,976.2	27.3	4.7	32.0	THE_PROCTOR_&_GAMBLE_PAPER_PRO DUCTS_CO.
PA	I	P	1,800.6	3,706.6	21.2	10.8	32.0	INTL_PAPER_CO
IL	M	G	17,671.2	646.8	31.5	0.5	31.9	Grid_Xc-750_Yc-110
PA	M	C	3,009.1	102.8	31.5	0.2	31.8	ARMSTRONG
CT	U	P	1,943.2	9,247.5	16.8	14.7	31.5	NEW_HAVEN_HARBOR
PA	I	P	1,519.3	559.5	29.2	2.1	31.4	KOSMOS_CEMENT_COMPANY
KY	I	G	2,932.8	4,365.0	21.7	9.4	31.1	Grid_Xc-150_Yc-110
NC	I	G	4,361.3	8,388.9	16.1	14.9	31.0	Grid_Xc-250_Yc-410
NY	A	C	7,543.8	5,453.7	25.9	5.0	30.9	ONONDAGA
CT	I	G	3,712.1	4,150.6	25.0	5.8	30.8	Grid_Xc+650_Yc+190
PA	A	C	3,379.5	975.0	28.8	1.9	30.7	CARBON
PA	I	P	870.5	1,586.2	24.1	6.6	30.7	PA_STATE_UNIV
AL	M	G	17,560.6	687.5	29.6	1.1	30.7	Grid_Xc-550_Yc-510
KY	A	G	16,483.5	2,964.7	27.7	2.9	30.6	Grid_Xc-650_Yc-210
MD	I	G	626.0	441.1	28.0	2.6	30.6	Grid_Xc+350_Yc-010
PA	A	G	4,267.4	2,260.9	27.3	3.2	30.6	Grid_Xc+350_Yc+190
NJ	I	C	1,623.5	572.3	28.8	1.7	30.6	GLOUCESTER
GA	A	G	14,874.3	2,765.8	26.9	3.6	30.5	Grid_Xc-350_Yc-710
NY	A	G	4,045.9	2,138.4	27.1	3.3	30.4	Grid_Xc+250_Yc+290
PA	M	G	3,662.6	125.2	29.9	0.2	30.1	Grid_Xc+250_Yc+190
NJ	I	C	2,419.4	6,390.8	18.1	11.9	30.0	UNION
KY	M	G	9,174.0	319.1	29.5	0.5	30.0	Grid_Xc-250_Yc-310
OH	M	G	6,024.1	233.7	29.5	0.4	29.8	Grid_Xc-350_Yc-110
IL	A	G	14,715.7	3,915.9	27.0	2.6	29.6	Grid_Xc-750_Yc+090
OH	I	G	3,555.1	6,104.5	20.5	8.9	29.4	Grid_Xc-150_Yc-010

OH	I	C	4,494.4	10,846.2	17.7	11.6	29.3	BUTLER
VA	I	P	727.8	2,430.4	17.7	11.4	29.1	VA_FIBRE_CORPORATION
PA	M	C	3,161.7	108.1	28.8	0.3	29.0	CRAWFORD
TN	A	G	6,520.0	6,078.4	17.6	11.2	28.8	Grid_Xc-450_Yc-410
RI	A	G	10,154.5	8,770.7	23.0	5.8	28.8	Grid_Xc+750_Yc+290
PA	M	C	5,235.9	208.6	28.4	0.3	28.7	LACKAWANNA
PA	M	C	3,704.1	126.6	28.4	0.2	28.7	MONROE
NY	A	G	8,154.5	4,751.3	24.5	4.1	28.6	Grid_Xc+350_Yc+390
IN	A	G	10,627.1	1,658.9	27.0	1.6	28.6	Grid_Xc-550_Yc-010
PA	A	G	3,199.7	928.3	26.5	1.6	28.1	Grid_Xc+150_Yc+190
IL	U	P	2,635.2	19,552.5	6.8	21.2	28.0	CENTRAL_ILLINOIS_PUBLIC_SERVICE_C OMPANY
KY	A	G	10,286.5	14,853.1	13.7	14.3	28.0	Grid_Xc-650_Yc-310
NY	I	P	537.0	41,982.0	11.4	16.5	28.0	BETHENERGY_LACK_COKE_____LA
PA	I	C	2,592.6	77.0	27.8	0.2	27.9	CLINTON
IL	U	G	15,067.2	22,744.8	7.4	20.5	27.9	Grid_Xc-550_Yc+290
MD	I	P	70.4	3,967.4	3.5	24.3	27.8	EASTALCO_ALUMINUM_CO.
KY	A	G	8,764.9	8,148.5	17.6	10.2	27.8	Grid_Xc-550_Yc-310
CT	A	C	9,135.0	1,401.9	26.7	1.0	27.7	HARTFORD
TN	I	G	9,535.5	3,572.2	21.7	5.9	27.7	Grid_Xc-550_Yc-410
VA	I	G	1,098.5	1,508.5	21.6	6.0	27.6	Grid_Xc+150_Yc-110
NY	U	P	1,766.2	8,560.3	13.9	13.7	27.6	GREENIDGE
NY	I	C	6,021.8	2,421.5	25.0	2.6	27.6	ALBANY
IN	M	G	14,002.4	487.5	27.0	0.5	27.5	Grid_Xc-550_Yc-110
NY	A	G	8,334.7	5,346.9	22.3	5.2	27.5	Grid_Xc+550_Yc+390
GA	M	G	10,042.1	356.7	26.8	0.7	27.4	Grid_Xc-350_Yc-510
OH	I	G	3,097.0	5,031.4	17.6	9.7	27.3	Grid_Xc-150_Yc+190
NY	M	G	4,488.7	176.5	27.1	0.2	27.3	Grid_Xc+450_Yc+290
OH	I	G	2,872.7	7,202.1	15.8	11.2	27.0	Grid_Xc-250_Yc-110
IL	M	G	12,259.5	455.5	26.5	0.3	26.9	Grid_Xc-650_Yc+190
IL	M	G	14,151.2	512.5	26.5	0.3	26.9	Grid_Xc-650_Yc+090
WV	I	G	3,718.7	637.1	25.5	1.3	26.9	Grid_Xc-050_Yc-210
PA	I	C	1,415.1	3,217.1	19.8	7.0	26.8	BLAIR
IL	M	G	14,447.8	517.2	26.4	0.3	26.8	Grid_Xc-750_Yc+090
NY	U	C	1,487.4	6,926.1	0.6	26.1	26.7	ORANGE
IL	A	G	13,818.4	2,931.3	24.6	2.1	26.7	Grid_Xc-750_Yc-110
PA	U	P	1,614.9	0.0	26.5	0.0	26.5	NATL_FUEL_GAS_SUPPLY_CORP
NH	A	C	7,104.3	27,060.2	9.3	17.1	26.3	HILLSBOROUGH
DC	U	P	151.5	922.9	15.1	11.0	26.1	PEPCO___BENNING
NY	M	G	5,398.6	212.3	25.8	0.3	26.1	Grid_Xc+150_Yc+290
TN	M	G	11,258.4	418.4	25.4	0.7	26.1	Grid_Xc-550_Yc-310
MI	I	G	6,867.3	3,299.0	22.6	3.4	26.0	Grid_Xc-250_Yc+290
PA	A	C	2,294.6	908.6	24.0	2.0	26.0	INDIANA
OH	I	G	1,810.6	6,062.2	13.3	12.6	25.9	Grid_Xc-150_Yc-110
PA	I	P	1,113.8	3,459.6	15.5	10.3	25.8	UNITED_REFINING_CO.
NJ	M	C	4,455.6	182.2	25.5	0.3	25.7	SUSSEX
AL	I	C	5,475.0	10,686.3	9.0	16.6	25.6	MORGAN
TN	A	G	7,496.4	5,063.8	16.9	8.7	25.5	Grid_Xc-550_Yc-310
KY	A	G	7,814.4	3,656.7	21.1	4.5	25.5	Grid_Xc-350_Yc-310
WS	A	G	6,676.9	3,071.9	22.3	3.0	25.3	Grid_Xc-550_Yc+390
NY	I	G	2,726.7	9,209.5	13.6	11.6	25.2	Grid_Xc+550_Yc+190
PA	I	C	1,321.3	903.5	21.9	2.7	24.7	BERKS
NY	A	G	4,329.5	2,381.1	21.7	2.6	24.2	Grid_Xc+350_Yc+290
MA	M	C	15,614.9	687.5	23.4	0.3	23.8	WORCESTER
IL	A	G	14,299.6	2,430.9	22.2	1.5	23.7	Grid_Xc-750_Yc-010
VA	I	P	946.5	1,376.2	17.8	5.9	23.7	GEORGIA_PACIFIC_CORP
IL	A	G	12,225.6	3,227.5	21.3	2.2	23.4	Grid_Xc-750_Yc+290

IL	A	G	10,680.4	3,431.3	20.9	2.5	23.4	Grid_Xc-650_Yc-010
VA	I	G	1,772.4	7,544.2	9.3	14.1	23.4	Grid_Xc-150_Yc-310
NJ	I	P	516.3	1,631.7	5.0	18.3	23.3	COASTAL_EAGLE_POINT_OIL_CO.
NJ	A	C	2,115.7	1,109.1	20.7	2.5	23.2	HUNTERDON
TN	M	G	8,381.4	290.4	22.6	0.5	23.2	Grid_Xc-450_Yc-410
MI	M	G	6,900.8	274.0	22.7	0.3	23.0	Grid_Xc-150_Yc+390
PA	I	C	1,475.7	1,586.7	19.2	3.8	23.0	CENTRE
IL	M	G	14,524.3	539.1	22.7	0.3	23.0	Grid_Xc-750_Yc-010
WS	M	G	6,809.5	278.1	22.7	0.3	23.0	Grid_Xc-550_Yc+390
IL	M	G	13,695.5	480.2	22.7	0.3	22.9	Grid_Xc-750_Yc+190
IL	I	G	8,167.4	9,423.4	16.0	6.9	22.9	Grid_Xc-650_Yc-010
PA	A	C	2,513.2	963.7	21.3	1.6	22.9	COLUMBIA
PA	I	P	1,266.3	1,395.2	18.4	4.5	22.8	PENNZOIL_PRODUCTS_COMPANY
IN	A	G	10,051.0	1,604.2	21.5	1.3	22.8	Grid_Xc-550_Yc+090
IN	A	G	10,770.1	1,696.1	20.8	1.8	22.5	Grid_Xc-550_Yc-110
CT	M	G	7,119.6	253.5	22.3	0.2	22.5	Grid_Xc+650_Yc+290
KY	M	G	8,124.2	282.9	22.0	0.3	22.4	Grid_Xc-350_Yc-310
MA	U	P	4,864.8	23,790.6	11.3	11.0	22.3	SALEM_HARBOR
IN	A	G	5,794.8	847.8	21.4	0.9	22.3	Grid_Xc-350_Yc-010
PA	I	G	2,437.3	1,199.9	20.2	2.0	22.2	Grid_Xc+150_Yc+190
NY	U	P	759.7	3,586.3	10.3	11.8	22.1	S_A_CARLSON
VA	I	G	1,217.3	5,172.1	9.3	12.6	21.9	Grid_Xc-050_Yc-310
WV	I	G	4,297.6	379.4	21.3	0.6	21.9	Grid_Xc-150_Yc-210
NJ	I	G	1,573.9	835.9	19.5	2.0	21.6	Grid_Xc+450_Yc+090
NY	A	C	3,343.1	3,253.6	17.1	4.4	21.5	BROOME
NY	U	P	1,196.2	6,688.1	9.1	12.3	21.4	ROCHESTER_3
OH	I	G	2,265.8	7,148.4	11.7	9.5	21.2	Grid_Xc-150_Yc+090
PA	A	G	2,390.2	972.1	19.5	1.7	21.1	Grid_Xc+250_Yc+190
IN	M	G	9,819.5	352.8	20.9	0.3	21.1	Grid_Xc-550_Yc+090
IN	I	G	3,897.5	11,868.5	10.2	10.6	20.9	Grid_Xc-450_Yc+090
TN	I	G	7,027.4	2,840.0	15.8	4.9	20.7	Grid_Xc-550_Yc-310
NY	A	C	2,560.4	1,836.6	16.7	3.9	20.6	CHAUTAUQUA
PA	I	P	601.8	1,817.3	13.3	7.2	20.5	BELLEFONTE_LIME_CO
PA	U	P	824.5	2,413.1	13.4	7.0	20.4	HUNLOCK_PWR_STATION
IL	I	C	6,001.0	11,582.7	12.3	8.2	20.4	MACON
TN	I	G	3,342.4	8,902.2	6.6	13.8	20.4	Grid_Xc-450_Yc-510
IN	I	G	4,525.7	6,716.1	13.2	6.8	20.1	Grid_Xc-450_Yc-010
VA	A	C	2,732.0	455.5	19.2	0.9	20.1	ROANOKE
MA	M	G	15,270.5	697.6	19.5	0.5	19.9	Grid_Xc+750_Yc+390
PA	I	C	2,962.8	0.0	19.9	0.0	19.9	POTTER
NH	A	C	4,972.0	19,828.4	6.1	13.7	19.8	ROCKINGHAM
PA	I	G	1,429.9	1,032.6	17.3	2.4	19.8	Grid_Xc+050_Yc-010
NY	A	G	3,592.5	1,877.5	17.2	2.6	19.7	Grid_Xc+150_Yc+290
NY	M	G	7,898.7	325.4	19.3	0.3	19.6	Grid_Xc+150_Yc+390
PA	I	C	2,296.7	2,050.7	16.2	3.4	19.6	MCKEAN
AL	M	G	15,321.4	568.4	18.9	0.6	19.4	Grid_Xc-550_Yc-610
MA	I	G	5,052.8	4,582.6	15.9	3.5	19.4	Grid_Xc+650_Yc+290
MD	I	G	1,198.9	776.5	17.4	1.8	19.2	Grid_Xc+150_Yc-010
PA	I	G	968.1	1,023.4	16.3	2.9	19.2	Grid_Xc+250_Yc+090
IN	A	G	5,396.6	887.8	18.1	1.0	19.1	Grid_Xc-350_Yc+090
MA	A	C	6,517.2	4,973.0	15.6	3.5	19.1	HAMPDEN
NY	I	G	4,353.1	1,967.9	17.5	1.6	19.1	Grid_Xc+550_Yc+290
PA	I	P	321.5	4,173.8	5.2	13.5	18.7	ARMSTRONG_CEMENT_&_SUPPLY_COR P
AL	I	G	6,159.8	11,053.1	7.6	10.9	18.5	Grid_Xc-550_Yc-610
PA	I	C	1,535.5	1,431.7	15.2	3.3	18.5	BUTLER
MA	A	G	10,120.5	8,519.0	12.9	5.6	18.5	Grid_Xc+750_Yc+390

IN	I	G	1,766.4	13,744.4	3.6	14.7	18.3	Grid_Xc-650_Yc-110
MI	A	G	5,278.9	929.3	17.4	0.9	18.3	Grid_Xc-150_Yc+390
OH	I	G	3,509.3	5,320.6	12.8	5.4	18.2	Grid_Xc-350_Yc-010
NJ	I	P	677.7	2,165.8	12.0	6.2	18.2	SCOTT_PAPER_COMPANY
MA	I	G	6,746.5	4,352.6	15.3	2.9	18.2	Grid_Xc+750_Yc+290
PA	I	G	2,122.7	473.6	17.3	0.8	18.1	Grid_Xc+250_Yc+190
PA	I	G	591.8	478.1	16.3	1.8	18.1	Grid_Xc+250_Yc-010
GA	I	G	4,981.6	4,353.4	11.8	6.3	18.1	Grid_Xc-250_Yc-710
MA	A	C	3,168.3	9,215.1	9.2	8.8	18.0	BERKSHIRE
MA	A	C	9,437.3	7,722.4	14.0	3.9	18.0	WORCESTER
NH	M	C	13,136.7	476.2	17.7	0.3	18.0	HILLSBOROUGH
PA	I	C	812.3	2,691.7	10.6	7.3	17.9	WESTMORELAND
OH	I	P	0.0	10,328.1	8.1	9.7	17.8	TENNACO_PACKAGING
PA	I	G	1,506.6	1,157.6	15.3	2.6	17.8	Grid_Xc+050_Yc+090
VA	I	G	974.7	1,159.8	14.4	3.4	17.8	Grid_Xc+150_Yc-210
PA	I	P	442.8	2,192.7	8.9	8.9	17.8	SHENANGO_NEVILLE_ISLAND_COKE_W ORKS
NH	M	G	13,588.4	482.1	17.3	0.3	17.6	Grid_Xc+750_Yc+390
NY	I	P	219.2	3,131.8	7.7	9.8	17.5	AKZO_SALT_WATKINS_GLEN_REFIN.
PA	I	P	640.0	2,117.9	10.3	7.0	17.3	INDSPEC_CHEM_CORP
TN	A	G	6,407.6	2,959.9	12.7	4.6	17.2	Grid_Xc-450_Yc-510
WV	I	G	557.6	491.9	15.3	1.9	17.2	Grid_Xc+250_Yc-010
PA	M	G	3,014.4	102.9	17.1	0.1	17.2	Grid_Xc+450_Yc+190
CT	U	C	1,564.7	5,526.8	9.8	7.4	17.2	FAIRFIELD
NY	A	G	5,467.7	3,984.3	13.3	3.6	17.0	Grid_Xc+150_Yc+390
PA	A	C	1,901.1	1,250.8	14.6	2.3	16.9	MONROE
IL	I	C	3,623.0	16,626.0	6.0	10.8	16.8	TAZEWELL
NY	A	G	2,548.9	1,273.3	15.4	1.3	16.7	Grid_Xc+450_Yc+290
PA	I	G	992.8	881.6	14.4	2.1	16.5	Grid_Xc+150_Yc-010
IN	I	G	2,233.0	14,809.2	4.8	11.7	16.5	Grid_Xc-550_Yc+090
KY	M	G	8,988.1	323.8	15.9	0.3	16.2	Grid_Xc-550_Yc-210
PA	U	P	478.8	707.3	13.2	2.9	16.1	DELAWARE
KY	A	G	4,287.8	4,297.5	10.8	5.3	16.1	Grid_Xc-450_Yc-310
GA	M	G	9,717.9	360.6	15.5	0.4	15.9	Grid_Xc-450_Yc-610
NC	I	G	1,489.2	2,951.9	8.7	7.1	15.8	Grid_Xc-150_Yc-410
PA	I	G	1,077.9	1,287.5	12.8	2.8	15.6	Grid_Xc+450_Yc+090
CT	I	G	4,462.7	2,028.8	14.0	1.6	15.5	Grid_Xc+650_Yc+290
PA	I	C	2,184.2	708.8	14.4	1.1	15.5	LUZERNE
IL	M	G	7,817.3	260.6	15.3	0.2	15.5	Grid_Xc-650_Yc-010
VA	I	C	471.6	1,560.3	11.3	4.2	15.5	CHESTERFIELD
TN	A	G	8,554.8	4,359.8	10.8	4.6	15.3	Grid_Xc-650_Yc-410
IL	M	G	8,818.3	294.6	15.1	0.2	15.3	Grid_Xc-750_Yc+290
AL	I	C	4,067.9	12,195.7	4.5	10.7	15.3	TALLADEGA
IN	M	G	7,161.5	270.6	14.7	0.3	15.0	Grid_Xc-650_Yc-110
MI	I	G	3,682.5	2,801.1	12.1	2.8	14.9	Grid_Xc-150_Yc+390
IL	A	G	6,438.1	1,498.8	13.3	1.6	14.9	Grid_Xc-650_Yc-110
IL	I	C	4,662.8	11,449.1	7.6	7.3	14.9	PEORIA
NY	I	G	3,070.3	6,582.3	9.2	5.7	14.9	Grid_Xc+350_Yc+390
NY	A	C	2,397.2	1,534.4	12.9	2.0	14.9	STEUBEN
GA	A	G	5,619.2	988.3	13.4	1.4	14.8	Grid_Xc-250_Yc-710
WV	I	G	1,189.8	3,191.2	8.6	6.1	14.8	Grid_Xc-050_Yc+090
GA	I	G	2,133.5	9,017.1	3.4	11.1	14.5	Grid_Xc-450_Yc-610
IL	A	G	5,935.5	1,786.8	12.9	1.4	14.4	Grid_Xc-550_Yc+090
PA	I	P	392.1	1,961.6	7.5	6.8	14.3	PA_ELEC_CO
AL	A	G	7,368.5	3,423.4	9.7	4.2	13.9	Grid_Xc-650_Yc-510
IL	I	G	2,693.5	7,766.9	5.6	8.3	13.9	Grid_Xc-650_Yc-110
PA	U	P	441.8	1,152.0	10.0	3.8	13.8	CROMBY

IL	I	G	2,491.3	14,781.9	3.2	10.4	13.7	Grid_Xc-750_Yc-210
GA	M	G	6,511.2	241.3	13.0	0.4	13.4	Grid_Xc-450_Yc-510
AL	M	G	13,632.9	506.4	12.9	0.4	13.3	Grid_Xc-550_Yc-710
NY	A	G	3,503.4	1,566.9	11.5	1.6	13.1	Grid_Xc+250_Yc+390
AL	M	G	9,580.9	361.6	12.6	0.5	13.0	Grid_Xc-650_Yc-510
IN	A	G	5,839.6	811.6	12.0	0.9	12.9	Grid_Xc-650_Yc-110
TN	I	G	850.4	3,298.6	4.9	8.0	12.9	Grid_Xc-150_Yc-410
CT	U	C	2,334.3	3,941.0	8.9	3.9	12.9	MIDDLESEX
MA	U	C	3,131.6	7,767.8	7.4	5.4	12.8	HAMPDEN
NY	M	C	2,889.9	113.7	12.4	0.1	12.5	ONTARIO
WV	U	P	480.9	1,269.6	8.0	4.5	12.5	MONONGAHELA_POWER_CO._RIVESVIL LE_POWER
NY	I	C	1,596.2	2,147.7	8.8	3.6	12.5	ERIE
AL	I	G	10,110.9	122.3	11.8	0.1	11.9	Grid_Xc-450_Yc-710
AL	A	G	5,239.5	2,683.9	8.5	3.4	11.9	Grid_Xc-650_Yc-610
NH	A	C	2,477.2	10,313.4	2.9	8.9	11.8	MERRIMACK
MI	I	G	4,495.5	3,651.2	9.5	2.3	11.8	Grid_Xc-250_Yc+390
PA	I	G	1,001.3	291.3	11.1	0.6	11.7	Grid_Xc+150_Yc+090
MA	I	G	6,534.2	5,086.3	8.3	3.3	11.6	Grid_Xc+750_Yc+390
NY	I	C	830.8	8,681.1	2.2	9.3	11.6	SARATOGA
MA	A	G	3,173.7	1,914.0	9.9	1.5	11.4	Grid_Xc+650_Yc+290
AL	M	G	6,817.1	263.1	11.0	0.3	11.3	Grid_Xc-450_Yc-610
KY	I	G	2,169.2	6,935.0	3.8	7.3	11.1	Grid_Xc-550_Yc-210
NJ	I	G	1,571.9	2,484.9	7.9	3.2	11.1	Grid_Xc+550_Yc+190
NH	M	G	7,535.5	256.7	10.9	0.2	11.0	Grid_Xc+650_Yc+390
AL	A	G	9,078.6	2,973.0	8.6	2.2	10.8	Grid_Xc-550_Yc-710
KY	M	G	6,268.4	225.7	10.5	0.2	10.7	Grid_Xc-650_Yc-210
NY	A	G	3,076.7	2,000.4	9.2	1.5	10.7	Grid_Xc+450_Yc+390
NY	I	P	175.7	3,039.0	6.7	3.8	10.5	UNIVERSITY_OF_ROCHESTER_ROCHES
IL	A	G	6,914.1	2,244.5	8.9	1.6	10.5	Grid_Xc-750_Yc-210
NY	U	P	628.7	2,977.3	5.3	5.1	10.4	JENNISON
TN	M	G	10,553.7	378.0	10.0	0.3	10.3	Grid_Xc-750_Yc-410
PA	I	G	1,169.1	1,888.4	7.5	2.7	10.2	Grid_Xc+350_Yc+190
NY	I	C	1,477.9	1,604.6	7.6	2.5	10.1	MONROE
VA	I	C	856.1	1,313.6	7.5	2.3	9.8	CAMPBELL
TN	M	G	7,439.9	256.5	9.4	0.3	9.6	Grid_Xc-650_Yc-410
AL	I	G	5,297.4	5,992.6	5.0	4.5	9.5	Grid_Xc-550_Yc-710
NH	A	G	2,245.5	9,478.0	3.2	6.1	9.3	Grid_Xc+650_Yc+390
PA	I	P	21.3	2,131.9	0.6	8.7	9.3	CONGOLEUM_CORP
AL	A	G	9,463.9	3,973.1	6.9	2.1	9.0	Grid_Xc-650_Yc-710
IL	M	G	6,805.5	227.0	8.8	0.2	8.9	Grid_Xc-750_Yc-210
NY	U	P	583.8	1,775.3	5.4	3.5	8.9	HICKLING
WS	A	G	5,613.9	1,589.3	7.5	0.9	8.4	Grid_Xc-750_Yc+390
TN	A	G	7,221.4	1,788.8	6.8	1.4	8.2	Grid_Xc-750_Yc-410
NY	I	G	2,189.2	2,351.7	5.9	2.3	8.2	Grid_Xc+550_Yc+390
AL	M	G	10,540.1	401.3	7.7	0.2	7.9	Grid_Xc-650_Yc-710
CT	U	C	1,071.1	4,247.0	4.0	3.9	7.9	NEW_LONDON
KY	A	G	4,899.3	1,552.7	6.5	1.1	7.6	Grid_Xc-750_Yc-210
NY	I	G	610.1	2,267.7	4.1	3.5	7.6	Grid_Xc+250_Yc+290
AL	M	G	7,752.3	279.0	7.2	0.3	7.4	Grid_Xc-650_Yc-610
NH	A	G	1,710.4	7,734.0	2.2	5.0	7.2	Grid_Xc+750_Yc+390
NY	I	P	94.0	14,493.8	1.5	5.2	6.7	TONAWANDA_COKE_CORP__TONAWA
VA	I	G	432.5	628.2	5.0	1.4	6.4	Grid_Xc+150_Yc-310
NY	I	G	877.9	1,880.3	4.4	2.0	6.4	Grid_Xc+350_Yc+290
NY	U	C	2,122.0	8,926.9	1.1	5.3	6.4	SUFFOLK
AL	A	G	4,271.2	2,238.7	3.9	2.0	6.0	Grid_Xc-650_Yc-610
VA	I	G	470.0	760.9	4.0	1.8	5.8	Grid_Xc+050_Yc-210

WS	A	G	6,252.4	2,244.6	4.8	0.7	5.6	Grid_Xc-650_Yc+490
NY	I	P	5,686.2	41,132.3	1.6	3.9	5.5	KODAK_PARK_DIV_____ROCHES
WS	M	G	6,717.7	241.8	5.2	0.1	5.3	Grid_Xc-650_Yc+490
PA	I	G	397.9	1,018.2	2.5	1.6	4.1	Grid_Xc+050_Yc+290
NH	I	G	1,618.3	2,607.5	2.3	1.7	4.0	Grid_Xc+650_Yc+390
NJ	I	G	341.2	1,033.9	2.0	1.6	3.6	Grid_Xc+450_Yc+190
NY	I	G	1,018.2	6,182.3	0.8	1.7	2.6	Grid_Xc+350_Yc+490