BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	**)**	
	)	
PROPOSED AMENDMENTS TO	**)**	**R15-21**
SULFUR LIMITATIONS, NITROGEN	**)**	**(Rulemaking- Air)**
OXIDES EMISSIONS, AND CONTROL	**)**	**(35 ILL. ADM CODE PART 214,217, 225)**
OF EMISSIONS FROM LARGE	**)**	
COMBUSTION SOURCES	**)**	

NOTICE OF FILING

TO: Mr. John T. Therriault
Assistant Clerk of the Board
Illinois Pollution Control Board
100 West Randolph Street
Suite 11-500
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(VIA ELECTRONIC MAIL)

Daniel L. Robertson
Hearing Officer
Illinois Pollution Control Board
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(VIA U.S. MAIL)

Please take notice that on the 24th day of July 2015, I have filed with the Office of the Clerk of the Pollution Control Board the Pre-filed Testimony of Ranajit Sahu on Behalf of Sierra Club and Environmental Law & Policy Center. Copies of the documents are attached hereto and served upon the persons listed on the attached service list.

Respectfully submitted,

By: /s/ Faith Bugel

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PRE-FILED TESTIMONY OF RANAJIT (RON) SAHU
ON BEHALF OF SIERRA CLUB AND ELPC

NOW COMES Sierra Club and Environmental Law & Policy Center ("ELPC"), by and through their attorneys, Faith E. Bugel, Greg E. Wannier, and Jennifer Cassel, and, pursuant to the July 16, 2015, Hearing Officer Order, submits the following Pre-filed Testimony of Ranajit Sahu for presentation at the August 4, 2015, hearing in the above-referenced matter.

PRE-FILED TESTIMONY OF RANAJIT ("RON") SAHU ON BEHALF OF SIERRA CLUB AND ELPC

My name is Ranajit ("Ron") Sahu and I am an engineer and air pollution consultant. I have over twenty three years of experience in the fields of environmental, mechanical, and chemical engineering including: program and project management services; design and specification of air pollution control equipment for a wide range of emissions sources; combustion engineering evaluations; energy studies; multimedia environmental regulatory compliance (involving statutes and regulations such as the federal Clean Air Act and its Amendments, Clean Water Act, Toxic Substance Control Act, Resource Conservation and Recovery Act ("RCRA"), Comprehensive Environmental Response, Compensation, and Liability Act, Superfund Amendments and Reauthorization Act, Occupational Safety & Health Administration, National Environmental Policy Act, and other related state statutes);

transportation air quality impact analysis; multimedia permitting (including air quality New Source Review/Prevention of Significant Deterioration permitting, Title V permitting, NPDES permitting for industrial and storm water discharges, RCRA permitting, etc.), multimedia/multi-pathway human health risk assessments for toxics; air dispersion modeling; and regulatory strategy development, and support including negotiation of consent agreements and orders.

I have provided consulting services to numerous private sector, public sector, and public interest group clients. My major clients over the past twenty three years include various steel mills, petroleum refineries, cement companies, aerospace companies, power generation facilities, lawn and garden equipment manufacturers, spa manufacturers, chemical distribution facilities, and various entities in the public sector including U.S. Environmental Protection Agency ("U.S. EPA"), the U.S. Department of Justice, California Department of Toxic Substances Control, and various municipalities. I have successfully executed assignments in over 44 states, numerous local jurisdictions, and internationally.

In addition, I have taught numerous courses related to air pollution planning and control in several southern California universities including University of California, Los Angeles ("UCLA"), University of Southern California ("USC"), University of California, Riverside, and Loyola Marymount University. Finally, I have and continue to provide expert witness services in a number of environmental areas including air pollution emissions assessment, control, and permitting in both state and federal courts as well as before administrative bodies. A copy of my curriculum vitae is attached.

On April 28, 2015 (and later amended on April 30, 2015), the Illinois Environmental Protection Agency ("Agency" or "IEPA") filed a rulemaking generally proposing to control emissions of sulfur dioxide ("SO_2") in and around areas designated as nonattainment with

respect to the 2010 SO_2 National Ambient Air Quality Standard ("NAAQS"). The purpose of this rulemaking is to satisfy Illinois' obligation to submit a State Implementation Plan ("SIP") to the U.S. EPA to address requirements under Clean Air Act Sections 172, 191, and 192 for sources of SO_2 emissions in areas designated as nonattainment with respect to the 2010 SO_2 NAAQS. The Agency states that the proposed rule will 1) establish sulfur content limitations for liquid fuels used by fuel combustion emission units throughout the state; 2) establish SO_2 emission limitations for specific sources impacting an SO_2 nonattainment area; 3) address the conversion of certain coal-fired electric generating units ("EGUs") located in or near an SO_2 nonattainment area to fuel other than coal; and 4) correct or update various existing provisions. This testimony focuses on the SO_2 emissions and reductions aspects of this rulemaking.

The IEPA used air dispersion modeling to demonstrate that the various sources of SO_2 affecting the two non-attainment areas ("Lemont" and "Pekin") will be able to meet the 2010 SO_2 NAAQS. In order for us to better understand the basis for the emissions limits in this rulemaking, IEPA provided us with certain spreadsheet files containing the emissions rates used by IEPA in its modeling culpability analysis to demonstrate that, under the assumed emission rates, the two non-attainment areas will be able to demonstrate attainment. IEPA has indicated that it will hold a separate attainment demonstration hearing (along with opportunity for public review and comment) associated with IEPA's modeling. As a result, the documents provided through the current rule-making do not contain all of the details about to IEPA's modeling, including numerous assumptions that were made throughout the modeling process. Given the intimate relationship between this rulemaking and the modeling used to establish the emission limits in the rule, the bifurcation of these two actions unreasonably hinders the public's ability to fully comment on reasonableness of the emission limits in the proposed rule. I will not provide

testimony on the underlying modeling for the rule during this process. My testimony pertains to the emissions aspects of the current rulemaking as provided in the documents filed by the Agency in this rulemaking (the Statement of Reasons (SR), the Technical Support Document (TSD), and the proposed rule), the culpability spreadsheets, and in the transcript of the Board Hearing held on July 8, 2015. I would recommend that the Illinois Pollution Control Board ("the Board") delay making a decision on this rule-making docket until IEPA completes its attainment demonstration hearing as it is impossible for the Board, the public, and other interested parties to judge the reasonableness of this proposed rule without understanding the modeling that led to this proposed rule.

1. The modeling culpability analysis spreadsheet for the Lemont non-attainment area lists 1,789 separate sources and their impacts on various receptors in this non-attainment area. IEPA modeled each of these separate sources with a specific hourly emission rate in grams per second. It then summed the model-predicted concentrations (in micrograms per cubic meter, ug/m3) of SO_2 associated with each of these emissions, and then added to a "background" concentration value in order to show that the NAAQS value of approximately 196 ug/m3 could be met at each receptor in the non-attainment area. IEPA followed the same process for the Pekin analysis, for each of the 375 separate sources that were modeled for that non-attainment area.

(a) The rule contains emissions limits for certain sources in Section 214.603 and then requirements for use of low-sulfur fuels in Sections 214.121 *et seq.* and Section 214.161 et seq. Nonetheless, all modeled sources should have emissions limits in addition to low-sulfur fuel requirements in order (1) make the rule enforceable and (2) assure that the sources will actually achieve the modeled limits, and therefore attainment with the 1-hour SO_2 NAAQS. While IEPA modeled 1,789 sources for Lemont (including 32 with zero emission rates) and 375 sources for

Pekin (including 5 with zero emission rates), the rulemaking, at Section 214.603 only contains the emission rates "in terms of pounds of SO2 emitted per clock hour" for 30 sources in total: 13 sources at the Aventine renewable energy facility, 3 sources at the Illinois Power Holdings ED Edwards coal-fired power plant, 8 sources at Ingredion Bedford Park, 3 sources at Midwest Generation's Joliet coal-fired power plant, 1 source at Midwest Generation's Powerton coal-fired power plant (consisting of all 4 units at this plant), 2 sources at Midwest Generation's Will County coal-fired power plant, 5 sources at the Owens Corning plant, and "all calcining units combined" at the Oxbow Midwest Calcining plant – this includes the K-1 and K-2 calciners by our count. Section 214.603 contains pounds per hour limits for each of the sources above (with the exception of the Powerton power plant, which contains a 30-day limit – which we discuss further below). However, Section 214.603 omits the emission rates that were modeled for many additional sources. In order for the modeled hourly maximum emission rates to be enforceable under this rulemaking, the Board must include in the rule hourly emission rates for the sources not listed in Section 214.603 because practically speaking low sulfur fuel standards are unenforceable and lead to fluctuations in emissions. Sulfur content of fuel varies. So facilities that have a low sulfur fuel requirement are required to periodically sample a small percentage of the fuel that it burns. The problem is that a facility does not actually test the vast majority of the fuel that will burn and, given the fluctuations in the sulfur content of fuel, SO_2 emissions can easily exceed assumed limits. So without having an emission limit that reflects the low sulfur fuel assumptions, the standard is essentially unenforceable.

The concern regarding the failure to include emissions limits for all modeled sources in Section 214.603 is further emphasized when one looks at the largest sources of hourly SO_2 emissions. Section 214.603 does not appear to contain the emission limits even for all of the largest sources modeled. Table A below shows that top 40 (by emission rate) sources modeled

for the Lemont non-attainment area but most of these sources (roughly 80%) are not included among the sources for which emissions limits are provided in Section 214.603.

Table A – Highest Emitting Sources Modeled for Lemont Non-Attainment Area

Facility	**Source Description**	**Source ID**	**SO_2 Rate g/s**
NRG (Midwest Gen) -Will Cnty	Unit #4	139822	821.6027
Cokenergy, LLC	Waste Gas Main Stack (Scrubbed)	CE201	123.0999
Rhodia, Inc	Sulfuric Acid Regeneration Unit, Unit 4	00242_3	98.532
BP Products NA [BP Amoco]	Fluidized Catalytic Cracking Unit #500	BP230_01	94.50
ArcelorMittal IN Harbor, LLC	No. 8 Boiler	AMIH_S8G	81.5799
ArcelorMittal IN Harbor, LLC	84 in Hot Strip Mill - No.1 Reheat Furnace	AMIH_S4A	67.4226
ArcelorMittal IN Harbor, LLC	84 in Hot Strip Mill - No.2 Reheat Furnace	AMIH_S4B	67.4226
ArcelorMittal IN Harbor, LLC	84 in Hot Strip Mill - No.3 Reheat Furnace	AMIH_S4C	67.4226
Ingredion (formerly, CPC)	Boiler #10	225587	63.12461
BP Products NA [BP Amoco]	FCC Unit #600 Catalyst Regenerator	BP240_01	55.125
Argonne National Laboratory	Boiler #5	123577	48.08054
Carmeuse Lime	Kiln #5	118864	45.12591
NRG (Midwest Gen) - Joliet	Joliet 29: Unit 8	157016	43.11121
NRG (Midwest Gen) - Joliet	Joliet 29: Unit 7	157015	40.7349
ArcelorMittal IN Harbor, LLC	No. 6 Boiler	AMIH_S8E	33.9791
ArcelorMittal IN Harbor, LLC	No. 7 Boiler	AMIH_S8F	33.9791
ArcelorMittal IN Harbor, LLC	Sinter Plant West Windbox	AMIH_S2A	30.24
ArcelorMittal USA, Inc	No. 5 Boilerhouse - Boilers 501-503	AUSA_134	24.57
NRG (Midwest Gen) - Joliet	Joliet 9: Unit 6	139664	23.91805
ArcelorMittal USA, Inc	Sinter Plant East Windbox	AMUSA_7P	22.68
Aux Sable Liquid Products	IN507	206028	22.46601
ExxonMobil - Joliet Refinery	FCCU/CO Boiler	139240	21.02894
ArcelorMittal USA, Inc	No. 7 Blast Furnace Stoves - 4 Units	AUSA_170	20.412
ExxonMobil - Joliet Refinery	South Sulfur Recovery Unit	139239	18.57199
NRG (Midwest Gen) -Will Cnty	Unit #3	139820	18.2885
ArcelorMittal IN Harbor, LLC	No. 4 Blast Furnace Stoves (41, 42, 43)	AMIH_S1C	17.7584
ArcelorMittal IN Harbor, LLC	No. 5 Boiler	AMIH_S8C	16.9895
ArcelorMittal IN Harbor, LLC	No. 5 Boiler	AMIH_S8D	16.9895
Ironside Energy, LLC	Boiler No. 9	IRONSIDE	16.5564
Koppers Inc.	A-Train Reactor	154791	16.37964
Koppers Inc.	B-Train Reactor	237640	16.37964
Carmeuse Lime	Kiln #4	118860	16.2045
ArcelorMittal IN Harbor, LLC	No. 3 Blast Furnace Stoves (31, 32, 33)	AMIH_S1A	16.1141
Conopco, Inc (d/b/a Unilever)	Babcock-Wilcox Boiler No. 3	89_229_2	15.7812
Conopco, Inc (d/b/a Unilever)	Babcock-Wilcox Boiler No. 4	89_229_3	15.7812
Oxbow Midwest Calcining	K-1 Calciner	139505	14.13689
Ingredion (formerly, CPC)	Wet Mill Tanks to Vent Fan	158191	13.51572
CITGO Petroleum Corp.	112B-2: FCCU CO Boiler	219147	13.31917
ArcelorMittal USA, Inc	No.1 Electric Arc Furnace - Melting	AUSA_141	9.68545
Koppers Inc.	#1 Tube Heater (F101), Flare?	180052	9.58902

Looking at the sources that have the highest impacts and the most-impacted receptor also underscores the problem with failing to include emissions limits for all modeled sources in Section 214.603. Table B below shows the sources with the highest impacts at the most-impacted receptor, based on the modeling conducted by the IEPA. As context, the total modeled impact was 191.5 ug/m3 for the attainment scenario, very close to the SO_2 1-hour NAAQS of 196.5 ug/m3., Even though these sources have the highest impacts at the most-impacted receptor, only some of these are included in Section 214.603. Again, this creates a concern over limits not being set for the sources with the highest impacts, which throws into question the enforceability of the modeled emissions that demonstrate attainment.

Finally, the enforceability of the modeled emissions is problematic because most of the sources without hourly emissions limits do not appear to have SO_2 monitoring via continuous emission monitors ("CEMS"). A facility is only required to monitor its emissions with CEMS if it is above a certain emission threshold. The vast majority of the supposed SO_2 reductions are coming from hundreds of small sources that have no CEMS installed, so the public will not actually know how much SO_2 these facilities emit. This problem is amplified because it appears IEPA assumed the lower emissions were possible through use of low sulfur fuel, which practically speaking in impossible to enforce and inevitably leads to fluctuations in emissions.

Table B – Sources for Lemont with Highest Modeled Impacts at the Lockport 11 Receptor

Facility	Source Description	Source ID	SO_2 Rate g/s	Lockport 11 Concentration (ug/m^3)
NRG (Midwest Gen) -Will Cnty	Unit #4	139822	821.6027	150.3778
Ingredion (formerly, CPC)	Boiler #10	225587	63.12461	4.52655
NRG (Midwest Gen) -Will Cnty	Unit #3	139820	18.2885	4.4628
Argonne National Laboratory	Boiler #5	123577	48.08054	3.81577
CITGO Petroleum Corp.	112B-2: FCCU CO Boiler	219147	13.31917	2.99209
Oxbow Midwest Calcining	K-1 Calciner	139505	14.13689	1.77435
Ingredion (formerly, CPC)	Wet Mill Tanks to Vent Fan	158191	13.51572	1.35672
Oxbow Midwest Calcining	K-2 Calciner	139509	9.42459	1.11611
Koppers Inc.	A-Train Reactor	154791	16.37964	1.06268
Koppers Inc.	B-Train Reactor	237640	16.37964	1.06189
Koppers Inc.	#1 Tube Heater (F101), Flare?	180052	9.58902	0.64914
Koppers Inc.	#2 Tube Heater (F201)	243100	8.9836	0.60382
CITGO Petroleum Corp.	121D-Train: Sulfur Recovery	146967	1.95044	0.42554
CITGO Petroleum Corp.	121C-Train: Sulfur Recovery	139184	1.95044	0.42338
Owens Corning Rfng & Asphlt	Afterburner #1 (Loading Racks 1,2,4,5,9)	114393	5.63079	0.4013

(b) While Section 214.603 contains the general statement that "[T]he owner or operator of a source must comply with the following emission limitations, as applicable, expressed in terms of pounds of SO_2 emitted per clock hour" for each of the named emission sources in this section, the Powerton power plant's emission rate at (e)(1) as 3,452 lb/hr is supposed to be met as a "30 operating day rolling average" per (e)(2). The modeled emission rate for this source was 6,000 lb/hour on an hourly basis. IEPA's support in the TSD for the relationship between the 6,000 lb/hr modeled rate and the 3,452 lb/hour 30 operating day average permit limit for this source consisted of stating

> Illinois EPA, prior to the filing of this rulemaking with the Board, has consulted with USEPA regarding this 30-day averaging methodology. USEPA was given the same methodology and data set used to determine the 30-day average limit as has been submitted to the Board. USEPA confirmed that Illinois EPA's analysis

> and methodology were consistent with their published guidance on the subject, and that the 30-day average limit in the proposed amendments is an appropriate limit for the source.[1]

But IEPA did not indicate in the TSD any technical reason that prevented Powerton from meeting an hourly limit. In response to pre-filed Question 18 of the Board in which the Board asked IEPA for justification of the 30-day averaging provision in 214.603(e)(2), IEPA staff stated

> [V]ariation in emissions at the Powerton unit, based on the unit type and the control equipment used, can make compliance with an hourly limit difficult. This variability in fired units with dry scrubbers is discussed in the USEPA's guidance for the averaging periods, and this is a type of unit that was expected to need a longer averaging time with a more stringent numerical limit…The Powerton units will have to maintain an emissions average that is well below the hourly emissions that were modeled to determine this rulemaking would result in the attaining the SO_2 standard.[2]

IEPA's response is not a sufficient justification to allow Powerton to use a 30-day averaging time, as opposed to a one-hour averaging time. First, all 4 Powerton units emit via a single stack, allowing for inter-unit averaging already.

Second, the TSD does not provide all the technical information EPA guidance requires to support the longer, 30-day averaging period. States are required to provide information on emissions variability to "enable the EPA to judge whether the frequency and magnitude of occurrence of elevated emissions can be expected to be sufficiently constrained that the plan provides adequate confidence that the area will attain the NAAQS."[3] States are also required to set supplemental limits in addition to the longer-term average limits. EPA finds it "advisable that longer term average limits for sources that meet these [longer-term] limits through the use of emission control equipment be subject to supplemental limits that serve to constrain the

[1] Technical Support Document at p. 10.
[2] Illinois EPA's Responses to Board's Pre-filed Questions, R15-21, p. 10-11.
[3] EPA, "Guidance for 1-Hour SO2 Nonattainment Area SIP Submissions," at page 28 (April 2014). Available at http://www.epa.gov/oaqps001/sulfurdioxide/pdfs/20140423guidance.pdf

frequency and/or magnitude of occasions of elevated emissions."[4] Possible additional constraints identified by EPA include requirements that the control equipment be operated a minimum percentage of the time, setting limits on "the number of times in a 30-day period that emissions exceed the critical [modeled] emission value," and setting "a cap on the magnitude of the peak hourly emissions rate" (i.e., setting a 1-hr limit along with the 30-day limit).[5] IEPA has also failed to include in the rule the additional technical information that assure that frequency and magnitude of emissions spikes will not lead to NAAQS violations and the supplemental limits as required in the EPA guidance.

Third, and most critically for the Board's determination here, the use of dry sorbent injection ("DSI") at Powerton does not provide any justification for requiring a longer averaging time, such as 30-days or 30-operating days, for the Powerton units. DSI has already been used at one of the two Powerton units since mid-November 2014 so the company has experience with this technology. In addition, due to the nature of the DSI process, it can be quickly adjusted to respond to fluctuations in conditions that would otherwise lead to spikes.

With DSI, a sorbent such as trona, is injected as a fine powder directly into the flue gases leaving the boiler at a location where the temperature is typically 275F or higher. After injection, the trona particles are calcined (i.e., expel carbon dioxide) and swell up to become large, porous, sodium carbonate particles, with high surface area. These porous particles then react with the SO_2 present in the flue gases forming sodium sulfate as the product, also in solid, particle form. The sodium sulfate particles are then captured in the downstream particulate control device such as the electrostatic

[4] *Ibid. at page 35.*
[5] *Ibid. at pages 34,35.*

precipitator. The amount of trona required depends on the size to which the trona is ground as well as the desired SO_2 reduction, among other variables.[6]

While there are various design considerations that can be used to optimize the functioning of a DSI system, the so-called residence time in which the trona particles react with SO_2 before becoming captured in the ESP is typically no more than a few seconds, with 1 second or so being the minimum time required in order for the reactions to occur as the gases and injected trona particles flow towards the ESP. Thus, the injection location is determined, in part, to allow for at least 1 second of residence/contact time before the gases reach the ESP. Also, trona injection systems, with appropriate feedback loops, can react to changes in boiler load and modify the quantities of injected trona into the flue gases within seconds to under a minute at the most.

Thus, the entire DSI and SO_2 removal action is very quick – lasting typically less than a minute. The short duration of necessary residence time makes the system very responsive. The short residence time and responsiveness mean that a utility can quickly adjust DSI to respond to any fluctuations in conditions that might lead to spikes. In light of this, DSI control systems do not support the need for a 30-day averaging time for an hourly SO_2 limit. In fact, utilization of DSI allows for a much shorter averaging time, such as a 1 hour averaging time, which is consistent with the SO_2 NAAQS.

2. One of the more significant issues with the proposed rulemaking is the lack of any discussion as to how the modeled emission rates (which demonstrate attainment) relate to the allowable emission rates for the various emission sources. It is clear from the culpability analyses and modeling conducted to support this rulemaking that the assumed modeled emission rates that

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[6] Kong, Y., and Wood, M., Dry Injection of Sodium Sorbents for Air Pollution Control, available at http://www.georgiaair.org/airpermit/downloads/permits/16300035/psd20584/facilitydocs/solvayarticle.pdf; Sahu, R. Dry Sorbent Injection (DSI) and Its Applicability to TVA's Shawnee Fossil Plant, available at http://www.cleanenergy.org/wp-content/uploads/Final_Sahu_DSI_Report.pdf

demonstrate attainment are, in many instances, lower than the corresponding "allowable" (presumably permitted) emission rates. While that is not surprising in itself, IEPA provides no explanation for the relationship between the allowable and modeled emission rates – i.e., when the modeled rate is lower than the allowable rate, how this reduction is to be achieved in practice.[7]

(a) Consider for example, recent actual emissions from Powerton (based on data the plant submits to the EPA using its SO_2 CEMS, available at www.epa.gov/ampd) for the period 2012-2014. This includes the time period with dry sorbent injection installed at one of the 2 units at the plant. The modeled maximum hourly emission rate of 6,000 lb/hr (which converts to 756 gram/second) has been exceeded on numerous occasions during 2012-2014. The highest hourly emission rate was 17,518 lb/hour. The 95th percentile hourly emission rate was 7,208 lb/hour and even the 90th percentile hourly emission rate was over 6,400 lb/hour. This means that 10 percent of the time, or roughly 876 hours in a year, the actual emission rate was over 6,400 lb/hour. I also reviewed the rolling 30-day average emissions for Powerton and there were many exceedances of the 3,452 lb/hr proposed limit as well. Thus, clearly, Powerton will need to reduce its emissions to meet the 6,000 lb/hour modeled rate under most conditions, even though this is not the enforceable limit, and the 3,452 lb/hr 30-day average limit. The TSD supporting the rulemaking does not indicate how Powerton will reduce these emissions. While the source may have plans to install additional controls to meet this proposed limit, none of that has been finalized with any detail to provide the necessary assurances that this plant can consistently meet this limit, along with all of the other pollutant limits. While the obligation to meet limits rests on the sources, the Agency must support at the front-end of its rule-making process its assumptions regarding expected emissions reductions, otherwise it appears that the public will need to takeunspecified future enforcement actions at the back-end.

[7] I have had some discussions with IEPA staff on this issue, IEPA indicates that it is the source's responsibility to meet the modeled emission rate – at the risk of enforcement action if these rates are not met.

(b) More generally, Table C (in Attachment A) shows the various sources affecting the Lemont non-attainment area for which the modeled emission rates are lower than the corresponding, current, allowable emission rates. Roughly 674 sources have been modeled with such reductions. The calculated percent reductions (i.e., allowable-modeled, normalized by allowable) are shown in the 6th column. As Table C shows, for many sources, the modeling assumes 100% or close to 100% reductions in their allowable emission rates. An over-99% reduction is assumed for 500 sources. An additional 145 sources are assumed to reduce allowable emissions greater than 90% (i.e., between 90 and 99%). Once again, the rulemaking does not indicate how these emissions sources are going to reduce all of their allowable emissions by over 90% to over 99%. Further, and as discussed above, the IEPA provides no support for how these large reductions will be enforceable as a practical manner. If another provision of the rule, such as the requirement to use low-sulfur fuel will automatically result in the low modeled limits, staff should indicate which modeled limits will be achieved through the low-sulfur fuel provisions. It is unlikely, however, that 100% reductions in allowable emissions can be met solely by using lower sulfur fuels in hundreds of sources. Use of low sulfur fuel as the main vehicle for attainment is problematic for two reasons. First, facilities that have a low sulfur fuel requirement are only required to periodically do representative sampling, so there is no actual assurance regarding the sulfur content of the fuel actually burned. Second, most of the reductions used to reach attainment are at small facilities that do not have CEMS installed, so the public won't know how much SO_2 is actually emitted.

(c) IEPA's analysis raises one final concern. The very last row in Table C is Will County Unit 4. As the Table shows, a roughly 28% reduction is expected from this source. The last column of Table C shows the modeled concentrations from each source at the Lockport 11 receptor, the highest-impacted receptor in the Lemont non-attainment area. Will County Unit 4, by itself, with the 28% lower allowable emissions shows a concentration of over 150 ug/m3 at this highest-impacted receptor. By far, per IEPA's modeling, this single source is the largest contributor to SO_2

concentrations at Lockport 11. Yet, it is also the source for which the least reduction is assumed. In fact, it appears that Will County Unit 4 will not have to do anything to actually control its emissions as its reduction is a "paper reduction," meaning that IEPA has set a new emission limit that is above Will County 4's actual emissions but lower than its previous very high allowable emission rate. So in reality Will County 4, which emits exponentially more SO_2 than other sources, does not have to actually reduce its emissions at all. Attainment is supposedly achieved on the backs of hundreds of smaller sources. The IEPA does not address the critical equity argument which is inherent here – namely why the source with the highest impact at the Lemont non-attainment area should be required to reduce its emissions the least or not at all – while hundreds of smaller sources are assumed, to almost eliminate their allowable emissions. This inequity is especially problematic when viewed through the enforcement lens, as the majority of the reductions are coming from facilities that don't have CEMS installed and supposedly would achieve these reductions through unenforceable low sulfur fuel requirement.

Thank you for the opportunity to present testimony in this proceeding.

Respectfully submitted,

By: /s/

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ATTACHMENT A

Table C – Modeled Versus Allowable Emission Rates

Facility	Source Description	Source ID	Modeled SO_2 (g/s)	Allowable SO_2 (g/s)	(Allowable-Modeled)/Allowable (%)	Conc. At Lockport 11 (ug/m3)
Calumet Energy Team Project	Engine #1	227740	0	0.08253	100.00%	0
Dynegy Kendall Energy LLC	Diesel Engine #1	227799	0	0.00063	100.00%	0
Dynegy Kendall Energy LLC	Diesel Engine #2	239219	0	0.00063	100.00%	0
IIT Cogeneration Plant	Boiler #5	244159	0.00005	0.95254	99.99%	0
IIT Cogeneration Plant	Boiler #6	249703	0.00005	0.95254	99.99%	0
Motorola Solutions Inc	Emergency Diesel Generator (500 kW)	195672	0.00001	0.17262	99.99%	0
JH Stroger Jr Hsptl of Cook Cnty	5 Engines	219785	0.00003	0.24229	99.99%	0
John H Stroger Hosp Cook Cnty	Engine ICE-2	250501	0.00003	0.24229	99.99%	0
John H Stroger Hosp Cook Cnty	Engine ICE-3	250502	0.00003	0.24229	99.99%	0
John H Stroger Hosp Cook Cnty	Engine ICE-4	250503	0.00003	0.24229	99.99%	0
John H Stroger Hosp Cook Cnty	Engine ICE-5	250504	0.00003	0.24229	99.99%	0
Central DuPage Hospital	Boiler #3	242700	0.00442	23.76978	99.98%	0.00001
Central DuPage Hospital	Power Plant	123472	0.00441	23.69861	99.98%	0.00001
Central DuPage Hospital	Boiler #2	242699	0.00441	23.69861	99.98%	0.00001
Sprint - Chicago Switch	Generator #6	225840	0.00005	0.26711	99.98%	0
Mayfair Pumping Station	Boilers	119380	0.00578	30.07176	99.98%	0.00002
St Mary of Nazareth Hosp Cntr	2 Emergency Generators	154867	0.00004	0.14232	99.97%	0
St. Mary of Nazareth Hosp Cntr	Emergency Generator #2	248819	0.00004	0.14232	99.97%	0
Art Institute of Chicago	14 Boilers	142214	0.00318	8.06382	99.96%	0.0002
South Suburban Hospital	Emergency Generator (1250 kW)	154630	0.00278	6.10709	99.95%	0
K-Five Construction Corp	Hot Oil Heater	233320	0.00013	0.189	99.93%	0
Nalco Co	Boiler #3	123177	0.00757	10.671	99.93%	0.00001
Nalco Co	Boiler #1	123175	0.00755	10.63906	99.93%	0.00001
Nalco Co	Boiler #2	123176	0.00755	10.63906	99.93%	0.00001
Oak Park Hospital	3 Boilers	117424	0.00529	6.12346	99.91%	0.00005
Univ of Illinois @ Chicago	3 Boilers (Building 654 and 354A)	120117	0.00006	0.06174	99.90%	0
ExxonMobil - Joliet Refinery	Diesel Generator	225284	0.00007	0.07157	99.90%	0
City of Chicago	5 Diesel Generators	228719	0.00098	0.91726	99.89%	0.00004
K-Five Construction Company	Asphalt Heaters and Boilers	121171	0.00265	2.22889	99.88%	0
Little Co of Mary Hospital	Boilers	115956	0.00601	5.03989	99.88%	0.00003
Ameritech	Diesel Exhaust	169257	0.00069	0.57455	99.88%	0
DuPage Water Commission	Auxiliary Trailer-Mounted Engine	227488	0.00098	0.8089	99.88%	0
CoreSite	3 Diesel Generator Sets	226830	0.00073	0.54179	99.87%	0.00004
CoreSite	Generator #2	249199	0.00073	0.54179	99.87%	0.00004
CoreSite	Generator #3	249200	0.00073	0.54179	99.87%	0.00004
CoreSite	Generator #4	249201	0.00073	0.54179	99.87%	0.00004
City of Chicago-Central Park P	Boilers	120148	0.02892	21.28093	99.86%	0.0012
Northeastern Illinois Univ	3 Boilers	201272	0.00215	1.56552	99.86%	0
Norwegian American Hospital	Boilers	121451	0.00472	3.14993	99.85%	0.00018
Owens Corning Rfng & Asphlt	Coating Operations	178998	0.02016	13.12135	99.85%	0.00144
NW Community Hospital	Model 350 Boilers	114508	0.01429	9.07256	99.84%	0.00002
Lafarge Midwest Inc	Slag Dryer	215253	0.00945	5.3385	99.82%	0.00001
CNH Burr Ridge Operations	Other Test Cells	215021	0.00006	0.03251	99.82%	0
CNH Burr Ridge Operations	Overhead Exhaust in LTL and 1M	247099	0.00006	0.03251	99.82%	0

CNH Burr Ridge Operations	Overhead Exhaust in LTL	247100	0.00006	0.03251	99.82%	0
CNH Burr Ridge Operations	HiTemp Test Cell	247101	0.00006	0.03251	99.82%	0
CNH Burr Ridge Operations	FPT Test Cells 5 & 6 Env Chmbr (horz exh)	247102	0.00006	0.03251	99.82%	0
Ingalls Memorial Hospital	3 Boilers	116373	0.0027	1.45653	99.81%	0
St James Hospital	Boiler 93720	148329	0.00312	1.67954	99.81%	0
Prov Hosps d/b/a St. Joseph	Generator GEN-1	250469	0.00086	0.45359	99.81%	0
Original Ferrara Inc	Boiler	175532	0.00019	0.10019	99.81%	0.00001
Prov Hosps d/b/a St. Joseph	Generator GEN-2	250470	0.00101	0.50399	99.80%	0
Swedish Covenant Hospital	2 Boilers	145821	0.00539	2.68374	99.80%	0.00004
MWRD Kirie Wtr Reclam Plant	3 Diesel Engines/Generators	173034	0.00021	0.1019	99.79%	0
Elmhurst Memorial Hospital	Generator #1	172255	0.00028	0.12708	99.78%	0
Elmhurst Memorial Hospital	Generator #2	243959	0.00028	0.12708	99.78%	0
Cook County Central Plant	Boiler 7	149019	0.00766	3.29542	99.77%	0.00056
Cook County Central Plant	Boilers 5-6	120353	0.01533	6.59084	99.77%	0.0011
Cook County Central Plant	Boilers 1-4	120352	0.03061	13.15863	99.77%	0.00208
Mount Sinai Hospital	700 kW Emergency Engine	218636	0.0004	0.16959	99.76%	0.00002
Equinix	Generator #1	215422	0.00302	1.21965	99.75%	0.00022
Kraft Foods Global Inc	Boiler #5	184454	0.01196	4.643	99.74%	0.00029
Kraft Foods Global Inc	Boiler #1	184456	0.01121	4.34527	99.74%	0.00028
AT & T	2 Diesel-Fired Emergency Generators	214969	0.00243	0.90718	99.73%	0
Beaver Oil Co Inc	Boiler #5	221730	0.00253	0.88702	99.71%	0.00021
Chicago Board of Education	2 Diesel Generators	219770	0.00465	1.55103	99.70%	0.00025
US Cellular Corp	Diesel-Fired Standby Generator	194094	0.0164	5.46828	99.70%	0.00007
Ashland Specialty Chemical Co	2 Boilers	115254	0.01172	3.90591	99.70%	0.00002
LaGrange Memorial Hospital	3 Boilers	198772	0.01829	6.03779	99.70%	0.00045
Metro Water Reclamation Dst	3 Electric Generators	209677	0.00009	0.02929	99.69%	0
Metro Water Reclamation Dst	Generator #2	249669	0.00009	0.02929	99.69%	0
Mount Sinai Hospital	1500 kW Emergency Engine	218635	0.00081	0.25113	99.68%	0.00004
Holy Cross Hospital	3 Emergency Diesel Generator Sets	152225	0.00009	0.02696	99.67%	0
Central DuPage Hospital	Generator #3	242704	0.00058	0.17199	99.66%	0
Loretto Hospital	2 Boilers	120749	0.00718	2.10037	99.66%	0.00023
St Alexius Medical Center	Emergency Generator	223558	0.00297	0.82019	99.64%	0
University of Illinois - Chicago	Boilers #5 and #6	161104	0.0412	11.15453	99.63%	0.00222
Copley Memorial Hospital	Boiler #1	155108	0.00198	0.50348	99.61%	0
Copley Memorial Hospital	Boiler #2	243723	0.00198	0.50348	99.61%	0
Copley Memorial Hospital	Boiler #3	243724	0.00199	0.505	99.61%	0
Midwest REM Enterprises Inc	2 Diesel Engines	228461	0.00001	0.00252	99.60%	0
Edwards Hospital	Boiler #1	123171	0.00059	0.14553	99.59%	0
Edwards Hospital	Boiler #2	244719	0.00059	0.14553	99.59%	0
Edwards Hospital	Boiler #3	244720	0.00059	0.14553	99.59%	0
Edwards Hospital	Boiler #4	244721	0.00059	0.14553	99.59%	0
DuPage County Power Plant	3 Boilers (Common Stack)	145173	0.01701	4.08231	99.58%	0.00003
Dart Container Corp of Illinois	Boiler #1	125845	0.00376	0.88482	99.58%	0.00001
Dart Container Corp of Illinois	Boiler #2	242442	0.00376	0.88482	99.58%	0.00001
Dart Container Corp of Illinois	Boiler #3	242443	0.00376	0.88482	99.58%	0.00001
Dart Container Corp of Illinois	Boiler #4	242444	0.00376	0.88482	99.58%	0.00001
Little Co of Mary Hospital	7 Generators	172761	0.00169	0.38555	99.56%	0
Lincoln Generating Facility	Fire Pump	227713	0.00014	0.03125	99.55%	0
Elmhurst Memorial Hospital	Generators #3 and #4	243960	0.0022	0.48592	99.55%	0
Central DuPage Hospital	Generator #4	242705	0.00203	0.44219	99.54%	0
Kaluzny Bros Inc	2 Boilers	159642	0.00002	0.00428	99.53%	0
Prvena Hsptls d/b/a St Jos Hspl	3 Boilers (Common Stack)	125915	0.01017	2.14447	99.53%	0.00001

VVF Illinois Services LLC	Boiler #3	126023	0.02362	4.96429	99.52%	0.00004
ElectroMotive Diesel Inc	Diesel Engine Test Cell #7	241299	0.00003	0.0063	99.52%	0
ElectroMotive Diesel Inc	Durability Test Cell MU-6	245679	0.00003	0.0063	99.52%	0
University of Chicago	Generator #11 (Hospital Pavilion)	249325	0.00006	0.0126	99.52%	0
University of Chicago	Generator #12 (Hospital Pavilion)	249326	0.00006	0.0126	99.52%	0
University of Chicago	Generator #13 (Hospital Pavilion)	249327	0.00006	0.0126	99.52%	0
University of Chicago	Generator #14 (Hospital Pavilion)	249328	0.00006	0.0126	99.52%	0
ElectroMotive Diesel Inc	Diesel Engine Test Cell #8	250541	0.00003	0.0063	99.52%	0
ElectroMotive Diesel Inc	Durability Test Cell MU-7	250542	0.00003	0.0063	99.52%	0
VVF Illinois Services LLC	Boiler #1, #2 (Combined Stack)	216727	0.03969	8.31582	99.52%	0.00007
Holy Cross Hospital	3 Boilers	120751	0.01814	3.77992	99.52%	0.00057
Reichhold Inc	Emergency Pump	227353	0.0004	0.08316	99.52%	0
Stepan Co	Boiler #4 (EUIB -4 R)	227495	0.01726	3.57832	99.52%	0.00003
DuPage Water Commission	4 Fixed Stationary Engines	227487	0.00098	0.20223	99.52%	0
DuPage Water Commission	Engine #2	250059	0.00098	0.20223	99.52%	0
DuPage Water Commission	Engine #3	250060	0.00098	0.20223	99.52%	0
DuPage Water Commission	Engine #4	250061	0.00098	0.20223	99.52%	0
Holy Family Medical Center	3 Boilers	115739	0.00397	0.81394	99.51%	0
Illinois Bell Telephone Co	Emergency Generator	216351	0.00235	0.47879	99.51%	0
Momentive Specialty Chems	Boiler #3	245120	0.00088	0.17927	99.51%	0.00009
Momentive Specialty Chems	Boiler #1	179588	0.00088	0.17874	99.51%	0.0001
Momentive Specialty Chems	Boiler #2	245119	0.00088	0.17874	99.51%	0.0001
St. Bernard Hospital	Boilers #1 , #2	119792	0.00633	1.28517	99.51%	0.0001
Advocate IL Masonic Med Cntr	Boilers	120560	0.01928	3.90717	99.51%	0.00059
Radco Industries	Heater Heat-1	149536	0.00015	0.03024	99.50%	0
Resurrection Hospital	Boiler	141516	0.00476	0.95758	99.50%	0.00001
Prov Hosps d/b/a St. Joseph	Boiler B-3	250468	0.00504	1.01302	99.50%	0.00001
Saint Anthony Hospital	Boilers 1, 2	121480	0.00378	0.75923	99.50%	0.00021
Ameropan Oil Corp	American Heating Company Boiler	142204	0.00198	0.39689	99.50%	0.00016
IL State Toll Highway Authority	Emergency Backup Power Generator	123607	0.0021	0.42083	99.50%	0
Elgin Mental Health Center	Lasker Boilers (#5 and #6) - West Stack	125864	0.00744	1.49055	99.50%	0.00001
Elgin Mental Health Center	Wickes Boilers (#3 and #4) - East Stack	125865	0.00744	1.49055	99.50%	0.00001
Aux Sable Liquid Products	Engine EG501	206034	0.00217	0.43469	99.50%	0
Aux Sable Liquid Products	Engine EG501	245291	0.00217	0.43469	99.50%	0
Argonne National Laboratory	Boilers #1 and #2	123576	0.04007	8.01342	99.50%	0.00319
Argonne National Laboratory	Boilers #3 and #4	144658	0.04007	8.01342	99.50%	0.00318
Ameropan Oil Corp	Gencor Industries Boiler	142205	0.00142	0.28349	99.50%	0.00013
Palos Community Hospital	1500 kW Generator #1	229640	0.00059	0.11748	99.50%	0
Palos Community Hospital	1500 kW Generator #2	229641	0.00059	0.11747	99.50%	0
Perkins Products Inc	Boiler #1	175219	0.00019	0.0378	99.50%	0.00002
Perkins Products Inc	Boiler #2	244339	0.00019	0.0378	99.50%	0.00003
Childrens Memorial Hospital	8 Boilers	172783	0.01559	3.09953	99.50%	0.00057
Illinois Bell d/b/a AT&T IL	Emergency Diesel Generator	224151	0.00351	0.69676	99.50%	0.00019
Navistar Inc	5 Boilers	123091	0.00397	0.78748	99.50%	0.00001
Korall Marine Facility	Heater #1	232859	0.00092	0.18207	99.49%	0.00008
Korall Marine Facility	Heater #2	243419	0.00092	0.18207	99.49%	0.00008
Korall Marine Facility	Heater #3	243420	0.00092	0.18207	99.49%	0.00008
Korall Marine Facility	Heater #4	243421	0.00092	0.18207	99.49%	0.00007
SBC Q11410	Emergency Generator	214586	0.00243	0.47879	99.49%	0.00008

Illinois Bell Telephone Co	Emergency Generator	214669	0.00243	0.47879	99.49%	0
Illinois Bell Telephone Co	Generator	216421	0.00243	0.47879	99.49%	0.00008
Illinois Bell d/b/a AT&T IL	Emergency Diesel Engine-Generator	221474	0.00243	0.47879	99.49%	0
Ameropan Oil Corp	Gencor & Hy-Way Heat Company Boiler	142203	0.00064	0.12574	99.49%	0.00006
University of Chicago	East Stack - Steam Plant: Boilers 1-4	220533	0.07182	14.08321	99.49%	0.00076
University of Chicago	West Stack - Steam Plant: Boilers 1-4	220534	0.07182	14.08321	99.49%	0.00076
Chicago - Dept of Aviation	2 Hot Water Boilers (BLR-62001, 62002)	184379	0.00026	0.0504	99.48%	0
Kohler Rental Power	Generator Sets	225735	0.00013	0.0252	99.48%	0
Illinois Bell d/b/a/ AT&T IL	Emergency Diesel Generator	223737	0.00297	0.57455	99.48%	0
IL Bell Telephone Co d/b/a SBC	Generator	216447	0.00279	0.53927	99.48%	0.00014
Chicago South Wtr Filtratn Plt	Boiler #3	120284	0.00104	0.20039	99.48%	0
D Construction Inc	Asphalt Heater	223394	0.00028	0.05393	99.48%	0
St. Francis Hospital	Boilers	115938	0.0155	2.98074	99.48%	0.00003
University of Chicago	Generator #1	240620	0.00021	0.04032	99.48%	0
University of Chicago	Generator #1 - Stack 2 of 2	249342	0.00021	0.04032	99.48%	0
IL Bell Telphn Co d/b/a AT&T IL	Emergency Generator	215048	0.00351	0.67031	99.48%	0
Illinois Bell Telephone Co	Emergency Generator	211275	0.00351	0.66968	99.48%	0
Vapor Power	Boiler/Burner Testing Area - Stack 3	249220	0.00126	0.24029	99.48%	0
Ortek Inc	Tower Heater #1	203813	0.00088	0.16774	99.48%	0.00005
Ortek Inc	Tower Heater #2	245361	0.00088	0.16774	99.48%	0.00005
Ortek Inc	Tower Heater #4	245363	0.00088	0.16774	99.48%	0.00005
Ortek Inc	Tower Heater #5	245364	0.00088	0.16774	99.48%	0.00005
Ortek Inc	Tower Heater #6	245365	0.00088	0.16774	99.48%	0.00005
Westlake Hospital	2 Diesel Generators	141939	0.00045	0.08568	99.47%	0
University of Chicago	Generator #8 (West Plant)	249322	0.00265	0.50399	99.47%	0.00002
Vapor Power	Boiler/Burner Testing Area - Vrtcl at Roof	208553	0.00126	0.23957	99.47%	0
Vapor Power	Boiler/Burner Testing Area - Stack 2	249219	0.00126	0.23957	99.47%	0
Ortek Inc	Cleaver Brooks Boiler	177283	0.00417	0.79209	99.47%	0.00026
Ortek Inc	Bigelow Boiler	177285	0.00368	0.69891	99.47%	0.00023
Rush North Shore Med Cntr	4 Boilers	117898	0.01013	1.9202	99.47%	0.00001
Childrens Memorial Hospital	Boiler 1 and 4	238346	0.01234	2.33725	99.47%	0.0006
Childrens Memorial Hospital	Boiler 2 and 3 (combined)	238373	0.01234	2.33725	99.47%	0.0006
Caterpillar Inc	Boiler #4	126658	0.03326	6.29713	99.47%	0.00006
Caterpillar Inc	Boiler #5	126659	0.03326	6.29713	99.47%	0.00006
CNH Burr Ridge Operations	Boiler 1	122893	0.0031	0.58688	99.47%	0.00011
CNH Burr Ridge Operations	Boiler 2	145623	0.0031	0.58688	99.47%	0.00011
VA Edward Hines Jr Hospital	Boilers	152397	0.0378	7.15412	99.47%	0.00041
Univ of Illinois @ Chicago	Engine #1	217805	0.00012	0.02268	99.47%	0.00001
Univ of Illinois @ Chicago	Engine #2	217810	0.00012	0.02268	99.47%	0.00001
Lutheran General Hospital	5 Large Standby Engines	225035	0.0004	0.0756	99.47%	0
Digital Realty Trust LP	2 Diesel Generator Sets (2250 kW)	226441	0.0002	0.0378	99.47%	0.00002
Ricardo North America Inc	Test Cell #2	238160	0.00037	0.06993	99.47%	0.00003
Ricardo North America Inc	Test Cell #4	238162	0.00037	0.06993	99.47%	0.00003
CNH Burr Ridge Operations	Test Cell #3	243799	0.0004	0.0756	99.47%	0.00001
CNH Burr Ridge Operations	Test Cell #4	243800	0.0004	0.0756	99.47%	0.00001
CNH Burr Ridge Operations	Test Cell #5	243801	0.0004	0.0756	99.47%	0.00001
CNH Burr Ridge Operations	Test Cell #6	243802	0.0004	0.0756	99.47%	0.00001
Digital Realty Trust LP	Diesel Generator #6 - Suites 410-460	249283	0.0002	0.0378	99.47%	0.00002
Lutheran General Hospital	Large Standby Engine #2	249413	0.0004	0.0756	99.47%	0

Lutheran General Hospital	Large Standby Engine #3	249414	0.0004	0.0756	99.47%	0
Lutheran General Hospital	Large Standby Engine #4	249415	0.0004	0.0756	99.47%	0
Lutheran General Hospital	Large Standby Engine #5	249416	0.0004	0.0756	99.47%	0
University of Illinois - Chicago	Boiler #7 (West Campus)	249799	0.0441	8.31582	99.47%	0.00234
Childrens Memorial Hospital	Generator EG1	238374	0.00073	0.13734	99.47%	0.00004
Childrens Memorial Hospital	Generator EG2	238375	0.00073	0.13734	99.47%	0.00004
Childrens Memorial Hospital	Generator EG3	238376	0.00073	0.13734	99.47%	0.00004
Childrens Memorial Hospital	Generator EG4	238377	0.00073	0.13734	99.47%	0.00004
Childrens Memorial Hospital	Generator EG5	238378	0.00073	0.13734	99.47%	0.00004
Childrens Memorial Hospital	Generator EG6	238379	0.00073	0.13734	99.47%	0.00004
Level 3 Communications	3 -2000 kw Emergency Generators	208658	0.00067	0.126	99.47%	0.00002
Exelon Generation Co LLC	Backup Generator EDG B	222737	0.00067	0.126	99.47%	0
Exelon Generation Co LLC	Backup Generator EDG C	222738	0.00067	0.126	99.47%	0
Walgreen Co - Mount Prospect	2206 HP Diesel Generator #04	232461	0.00063	0.11844	99.47%	0
Walgreen Co - Mount Prospect	2206 HP Diesel Generator #05	232462	0.00063	0.11844	99.47%	0
US DOE - Fermilab	Emergency Diesel Generator	221661	0.00059	0.11088	99.47%	0
Glen Oaks Medical Center	Emergency Generator	228463	0.00059	0.11088	99.47%	0
Verizon Wireless	1500 kW (2220 HP) Backup Generator	239359	0.00059	0.11088	99.47%	0.00011
Metro WRD of Greater Chicago	250 kW Electric Generator	225901	0.00051	0.09576	99.47%	0
Ricardo North America Inc	Test Cell #1	238159	0.00047	0.0882	99.47%	0.00003
Alexian Brothers Med Center	3 Erie City Boilers	118410	0.00454	0.85174	99.47%	0.00001
Adler Planetarium	2153 HP Diesel-Fired Emergency Gnrtr	212998	0.00043	0.08064	99.47%	0.00003
SBC Illinois	Emergency Diesel Engine-Generator	221541	0.00043	0.08064	99.47%	0
Dynegy Kendall Energy LLC	Diesel Firepump (240 HP)	227803	0.00043	0.08064	99.47%	0
University of Chicago	Generator #5 (Comer)	249319	0.00043	0.08064	99.47%	0
University of Chicago	Generator #6 (Comer)	249320	0.00043	0.08064	99.47%	0
University of Chicago	Generator #7 (Comer)	249321	0.00043	0.08064	99.47%	0
University of Chicago	Generator #9 (KCBD)	249323	0.00043	0.08064	99.47%	0
University of Chicago	Generator #10 (KCBD)	249324	0.00043	0.08064	99.47%	0
Ricardo North America Inc	Test Cell #3	238161	0.00042	0.07875	99.47%	0.00003
Hinsdale Hospital	Generators #1 and #4	242539	0.00042	0.07875	99.47%	0
Hinsdale Hospital	Diesel Generator #3	247401	0.00042	0.07875	99.47%	0
Fellowes Inc	Emergency Backup Generator	214645	0.00041	0.07686	99.47%	0
Chicago - Dept of Aviation	Generator EG-891L01 (Stack 1)	160682	0.00123	0.23057	99.47%	0
Chicago - Dept of Aviation	Generator EG-891L01 (Stack 2)	242402	0.00123	0.23057	99.47%	0
AT & T Corp	2 Diesel Generators - Roof Stack	214420	0.00121	0.2268	99.47%	0.00008
Navistar Inc	79 Engine Testing	160609	0.00102	0.19114	99.47%	0
Bank One Real Estate	6 Engines	221760	0.00067	0.12549	99.47%	0
Bank One Real Estate	Engine #4	247365	0.00067	0.12549	99.47%	0
Fidelity Information Services	Generator G1	217586	0.00111	0.2079	99.47%	0.00013
Fidelity Information Services	Generator G2	221529	0.00111	0.2079	99.47%	0.00013
Fidelity Information Services	Generator G3	221530	0.00111	0.2079	99.47%	0.00013
Fidelity Information Services	Generator G4	221531	0.00111	0.2079	99.47%	0.00013
Momentive Specialty Chems	Generator #2	227814	0.00037	0.0693	99.47%	0.00004
Momentive Specialty Chems	Generator #3	245121	0.00037	0.0693	99.47%	0.00004
UOP LLC	Joy Compressor	205924	0.0007	0.13104	99.47%	0.00004
Tribune Properties Inc	Generator (1750 kW)	171125	0.00175	0.32759	99.47%	0.00008
Citadel Investment Group LLC	3 Generators	218075	0.00063	0.11793	99.47%	0.00004
Alcatel Lucent USA Inc	2 2836 HP Diesel Generators	219823	0.00477	0.89269	99.47%	0.00001
Alcatel Lucent USA Inc	Diesel Generator #2 (2836 HP)	247420	0.00477	0.89269	99.47%	0.00001

Verizon Business	Diesel Generator #3	247120	0.00141	0.26386	99.47%	0
The Hartford	Emergency Generator - Vertical Exhaust	216350	0.00163	0.30491	99.47%	0
Advocate IL Masonic Med Cntr	Generators 3, 4	198560	0.00225	0.42083	99.47%	0.00005
Advocate IL Masonic Med Cntr	Generator #4	248623	0.00225	0.42083	99.47%	0.00005
Exelon Energy Delivery-ComEd	Diesel Generators (Stack 1 of 3)	157977	0.0018	0.33666	99.47%	0
AT & T Corp	3 Diesel Generators (1 Cat, 2 Solar)	214421	0.00128	0.23939	99.47%	0
St James Hsptl & Health Cntrs	Emergency Diesel Generator Set	225542	0.00128	0.23939	99.47%	0
St James Hsptl & Health Cntrs	Emergency Diesel Generator Set	244421	0.00128	0.23939	99.47%	0
D Construction Inc	Diesel Generator	219558	0.00044	0.08228	99.47%	0
SunGard Availability Services	1500 kW Diesel Generator	223961	0.00345	0.64511	99.47%	0
Navistar Inc	4 Diesel Generators	224726	0.00436	0.8152	99.47%	0.00001
SBC Q11720	Emergency Diesel Generator	223736	0.0031	0.57959	99.47%	0.0001
Illinois Bell	Emergency Diesel Generator	223738	0.0031	0.57959	99.47%	0
Wood Dale Road Investors LLC	1252 kW Emergency Generator Set (G-S)	226153	0.00275	0.51407	99.47%	0
Rush Univ Medical Center	Boiler #1	246420	0.00422	0.78874	99.46%	0.00021
Central DuPage Hospital	Generator #5	242706	0.00145	0.27101	99.46%	0
Palos Community Hospital	Diesel Generator #5	243307	0.0006	0.11214	99.46%	0
Momentive Specialty Chems	Generator #1	227813	0.0018	0.33641	99.46%	0.00018
WMAQ TV	Emergency Generator (1500 kW)	185884	0.00329	0.61487	99.46%	0.00015
IL Bell Telphn Co d/b/a AT&T IL	2000 kW Emergency Generator (Gen #01)	190566	0.0041	0.76606	99.46%	0.00025
Verizon Business GNI	2000 kW Emergency Generator	222740	0.0041	0.76606	99.46%	0.00013
Illinois Bell d/b/a AT&T IL	2000 kW Emergency Generator (Gen #02)	228941	0.0041	0.76606	99.46%	0.00025
Good Samaritan Hospital	Generator #2	244381	0.0021	0.39236	99.46%	0
Wood Dale Road Investors LLC	1535 kW Emergency Generator Set (G-N)	226154	0.00348	0.65015	99.46%	0
AT&T Corp	Engine #11	247091	0.00607	1.13398	99.46%	0.00001
Illinois Bell d/b/a AT&T IL	1250 kW Emergency Generator (Gen #04)	228943	0.00259	0.48383	99.46%	0.00016
Chicago South Wtr Filtratn Plt	Generator #1	172072	0.00373	0.69676	99.46%	0
Chicago South Wtr Filtratn Plt	Generator #2	229719	0.00373	0.69676	99.46%	0
Chicago South Wtr Filtratn Plt	Generator #3	229720	0.00373	0.69676	99.46%	0
Chicago South Wtr Filtratn Plt	Generator #4	229721	0.00373	0.69676	99.46%	0
Chicago South Wtr Filtratn Plt	Generator #5	229722	0.00373	0.69676	99.46%	0
Chicago South Wtr Filtratn Plt	Generator #6	229723	0.00373	0.69676	99.46%	0
AT & T	Emergency Generator A (1250 kW)	123224	0.00228	0.42587	99.46%	0
AT & T	Emergency Generator B (1250 KW)	174245	0.00228	0.42587	99.46%	0
Verizon Business	Stack #1	190529	0.0028	0.52289	99.46%	0.00018
Verizon Business	Stack #2	190530	0.0028	0.52289	99.46%	0.00019
Sysco Food Services	3 Emergency Generators	228560	0.00977	1.82444	99.46%	0.00001
AT & T Corp	Emergency Generator - Vertical Stack	192541	0.00614	1.14657	99.46%	0.00001
AT&T Corp	Engine #2	247082	0.00614	1.14657	99.46%	0.00001
AT&T Corp	Engine #3	247083	0.00614	1.14657	99.46%	0.00001
AT&T Corp	Engine #4	247084	0.00614	1.14657	99.46%	0.00001
AT&T Corp	Engine #5	247085	0.00614	1.14657	99.46%	0.00001
AT&T Corp	Engine #6	247086	0.00614	1.14657	99.46%	0.00001
AT&T Corp	Engine #7	247087	0.00614	1.14657	99.46%	0.00001
AT&T Corp	Engine #8	247088	0.00614	1.14657	99.46%	0.00001
AT&T Corp	Engine #9	247089	0.00614	1.14657	99.46%	0.00001

AT&T Corp	Engine #10	247090	0.00614	1.14657	99.46%	0.00001
Verizon Wireless	2000 kW Emergency Generator	215668	0.00251	0.46871	99.46%	0.00041
AT&T Communications	Diesel Generator	226691	0.00251	0.46871	99.46%	0.00001
Swedish Covenant Hospital	Emergency Generator	226677	0.00305	0.56951	99.46%	0.00002
CNH Burr Ridge Operations	Test Cell #2	215023	0.00776	1.44897	99.46%	0.00023
Stateville Correctional Center	Emergency Generator	211012	0.00359	0.67031	99.46%	0.00003
Verizon Wireless	1500 kW Emergency Generator	215667	0.00359	0.67031	99.46%	0.00068
WMAQ TV	Emergency Generator (500 kW)	185885	0.0011	0.20538	99.46%	0.00005
Caterpillar Inc	Emergency Generator	222557	0.011	2.05375	99.46%	0.00002
Elmhurst Memorial Hospital	Generator #5	172256	0.00192	0.35846	99.46%	0
175 W Jackson LLC	2168 HP Diesel-Fired Emergency Genertr	222758	0.00355	0.66275	99.46%	0.00021
University of Illinois - Chicago	Boiler #4	243641	0.01966	3.6703	99.46%	0.00104
Calumet Energy Team Project	Turbine CT-01	219682	0.06682	12.47372	99.46%	0.00006
Calumet Energy Team Project	Turbine CT-02	222391	0.06682	12.47372	99.46%	0.00006
IIT Cogeneration Plant	Turbine #1	148070	0.03829	7.14782	99.46%	0.00314
IIT Cogeneration Plant	Turbine #2	148071	0.03829	7.14782	99.46%	0.00314
Illinois Bell	Emergency Engine	221470	0.00054	0.1008	99.46%	0
Digital Realty Trust LP	Emergency Generator (1500 kW)	225945	0.00027	0.0504	99.46%	0.00002
Prvna Hsptls d/b/a St Jsph Med	2 Emergency Generators	225957	0.00108	0.2016	99.46%	0
Sysco Food Services	2000 kW Diesel Generator Set	228561	0.00081	0.1512	99.46%	0
SunGard Availability Services	2937 HP Emergency Generator	234262	0.00081	0.1512	99.46%	0
Rush North Shore Med Cntr	Diesel Generator #01 (1500 kW)	235580	0.00054	0.1008	99.46%	0
Rush North Shore Med Cntr	Diesel Generator #02 (1500 kW)	235581	0.00054	0.1008	99.46%	0
Walgreen Co - Mount Prospect	2168 HP Diesel Generator #02	232460	0.00351	0.65519	99.46%	0
West Suburban Hospital	Emergency Generator	224246	0.00324	0.60479	99.46%	0.00005
Sprint - Chicago Switch	Generator #3	237782	0.00324	0.60479	99.46%	0.00027
Sprint - Chicago Switch	Generator #4	237783	0.00324	0.60479	99.46%	0.00027
Sprint - Chicago Switch	Generator #5	237784	0.00324	0.60479	99.46%	0.00027
Northwestern Mem Hospital	5 Diesel Generators	160017	0.01998	3.72952	99.46%	0.00099
Copley Memorial Hospital	Emergency Generator	172819	0.00486	0.90718	99.46%	0.00001
AT & T	2 Diesel-Fired Emergency Generators	214965	0.00486	0.90718	99.46%	0.00001
SunGard Availability Services	2 Emergency Generators	224949	0.00486	0.90718	99.46%	0.00001
SunGard Availability Services	Emergency Generator #2	247323	0.00486	0.90718	99.46%	0.00001
United Airlines	Emergency Generator	155642	0.00702	1.31037	99.46%	0.00001
Savvis Communications Corp	1677 HP Emrgncy Gnrtr - Vertical on Roof	208573	0.00459	0.85678	99.46%	0.00026
Tellabs	Emergency Diesel Generator Set	226831	0.00459	0.85678	99.46%	0.00001
Sprint - Chicago Switch	Generator #1	215177	0.00216	0.40319	99.46%	0.00018
Childrens Memorial Hospital	4 Diesel-Fired Generators	222799	0.00216	0.40319	99.46%	0.00009
Digital Realty Trust LP	Emergency Generator (2000 kW)	225946	0.00432	0.80638	99.46%	0.00035
HSBC-North Amer Weigel Fac	Emergency Diesel Generator Set	226160	0.00432	0.80638	99.46%	0.00001
Sprint - Chicago Switch	Generator #2	237781	0.00216	0.40319	99.46%	0.00018
Fellowes Inc	Emergency Pump	216789	0.00135	0.25199	99.46%	0
Caterpillar Inc	Turbine #1	222556	0.01788	3.33704	99.46%	0.00003
Caterpillar Inc	Turbine #2	222568	0.01788	3.33704	99.46%	0.00003
Caterpillar Inc	Duct Burner #1	237479	0.01788	3.33704	99.46%	0.00003
Caterpillar Inc	Duct Burner #2	237480	0.01788	3.33704	99.46%	0.00003
Oak Forest Hospital	8 Emergency Generators	167369	0.00956	1.78412	99.46%	0.00002

Alcatel Lucent USA Inc	764 HP Diesel Generator	219825	0.00106	0.19782	99.46%	0
Good Samaritan Hospital	Generator #1	223602	0.00257	0.47955	99.46%	0
Village of Schaumburg	Emergency Generator	224061	0.00497	0.92734	99.46%	0.00001
City of Chicago - Dept Water	Generator 1	215565	0.00104	0.19404	99.46%	0
City of Chicago - Dept Water	Generator 2	215684	0.00104	0.19404	99.46%	0
City of Chicago - Dept Water	Generator 3	215685	0.00104	0.19404	99.46%	0
City of Chicago - Dept Water	Generator 4	215686	0.00104	0.19404	99.46%	0
Verizon Business	3 Diesel Generators	149303	0.00141	0.26307	99.46%	0
Verizon Business	Diesel Generator #2	247119	0.00141	0.26307	99.46%	0
McMaster Carr Supply	2 Emergency Diesel Generators	230526	0.00416	0.77614	99.46%	0.00001
McMaster Carr Supply	Emergency Diesel Generator #2	247339	0.00416	0.77614	99.46%	0.00001
Allstate Insurance Co	Diesel Generator	227848	0.00362	0.67535	99.46%	0.00002
LaGrange Memorial Hospital	2 Emergency Generators	221069	0.00308	0.57455	99.46%	0.00007
Palmer House Hilton	2000 kW Emergency Generator	230003	0.00435	0.81142	99.46%	0.00026
Level 3 Comms - Broadview	2000 kW Emergency Generator	235379	0.00435	0.81142	99.46%	0.00001
Level 3 Communications	Emergency Generator (1750 kW)	201052	0.00381	0.71062	99.46%	0.00017
Lutheran General Hospital	3 Diesel Generators (1500 kW each)	239221	0.00054	0.1007	99.46%	0
Exelon Energy Delivery-ComEd	Diesel Generators (Stack 2 of 3)	157978	0.0018	0.33566	99.46%	0
Exelon Energy Delivery-ComEd	Diesel Generators (Stack 3 of 3)	157979	0.0018	0.33566	99.46%	0
INEOS Styrenics LLC	Emergency Generator	205765	0.00375	0.69928	99.46%	0.00001
US Cellular-Bensenville Data C	1250 kW Emergency Generator	232419	0.00273	0.50903	99.46%	0
Clear Blue Tchnlgies/OakBrook	1680 HP Emergency Generator	233992	0.00273	0.50903	99.46%	0
Computer Sciences Corp	3 Diesel Generator Sets	226417	0.00246	0.45863	99.46%	0.00019
Illinois Bell	Emergency Engine	221463	0.00073	0.13608	99.46%	0.00003
Comcast of Illinois Inc	2000 kW Backup Generator	222286	0.00073	0.13608	99.46%	0.00004
Walgreen Co - Mount Prospect	1804 HP Diesel Generator #01	232459	0.00292	0.54431	99.46%	0
Verizon Business	Generator G-1	189824	0.00146	0.27215	99.46%	0
Verizon Business	Generator G-2	189825	0.00146	0.27215	99.46%	0
Verizon Business	Generator G-1 (Stack 2 of 2)	247200	0.00146	0.27215	99.46%	0
Verizon Business	Generator G-2 (Stack 2 of 2)	247201	0.00146	0.27215	99.46%	0
Central DuPage Hospital	Diesel Generators	213780	0.00145	0.2702	99.46%	0
69 W Washington Mgmt Co	Emergency Diesel Generator	225287	0.00142	0.26459	99.46%	0.00006
69 W Washington Mgmt Co	Emergency Diesel Generator	249039	0.00142	0.26459	99.46%	0.00006
CNH Burr Ridge Operations	Test Cell #152	215024	0.00195	0.36325	99.46%	0.00006
Roseland Pumping Station	Generator 1	209872	0.00104	0.19372	99.46%	0
Roseland Pumping Station	Generator 2	213516	0.00104	0.19372	99.46%	0
Roseland Pumping Station	Generator 3	221527	0.00104	0.19372	99.46%	0
Roseland Pumping Station	Generator 4	221528	0.00104	0.19372	99.46%	0
SBC Q11320	Emergency Diesel-Fired Engine-Genratr	221456	0.00046	0.08568	99.46%	0.00001
SBC Q26510	Emergency Diesel Engine-Generator	221461	0.00046	0.08568	99.46%	0
Illinois Bell	Emergency Diesel Engine-Generator	221476	0.00046	0.08568	99.46%	0
Comcast of Illinois	1200 kW Backup Generator	222284	0.00046	0.08568	99.46%	0
Comcast of Illinois	1250 kW Backup Generator	222285	0.00046	0.08568	99.46%	0
Oak Park Hospital	2 Standby Engine Generators	168148	0.00207	0.38555	99.46%	0.00002
Reichhold Inc	Emergency Generator	227352	0.00138	0.25703	99.46%	0
Advocate IL Masonic Med Cntr	Generators 1 and 2	172134	0.00088	0.1638	99.46%	0.00003
Advocate IL Masonic Med Cntr	Generator #2	248622	0.00088	0.1638	99.46%	0.00003

SunGard Availability Services	1750 kW Diesel Generator	227348	0.00065	0.12096	99.46%	0
Illinois Bell d/b/a AT&T IL	1250 kW Emergency Generator (Gen #03)	228942	0.00065	0.12096	99.46%	0.00004
Mercy Hospital & Med Center	5 Standby Engine Generators	249020	0.00076	0.1414	99.46%	0.00009
Metro Biosolids Management	3 Thermal Oil Heaters	226555	0.00252	0.46871	99.46%	0.00016
Metro Pier & Exposition Auth	2 Emergency Generators	228759	0.00082	0.15246	99.46%	0.00006
Lincoln Generating Facility	Diesel Engine Generator ICE1	226490	0.00061	0.1134	99.46%	0
Lincoln Generating Facility	Diesel Engine Generator ICE2	243200	0.00061	0.1134	99.46%	0
Prvena Hsptls d/b/a Mercy Ctr	3 Generators	198893	0.0002	0.03717	99.46%	0
Bank One Real Estate	Engine #2	247363	0.00068	0.12625	99.46%	0
Bank One Real Estate	Engine #3	247364	0.00068	0.12625	99.46%	0
Bank One Real Estate	Engine #5	247366	0.00068	0.12625	99.46%	0
Bank One Real Estate	Engine #6	247367	0.00068	0.12625	99.46%	0
Mercy Hospital & Med Center	5 Standby Engine Generators	172780	0.00076	0.14098	99.46%	0.00009
Mercy Hospital & Med Center	5 Standby Engine Generators	249019	0.00076	0.14098	99.46%	0.00009
Digital Realty Trust LP	5 Diesel Generator Sets (2,000 kW)	225944	0.00051	0.0945	99.46%	0.00006
Digital Realty Trust LP	Diesel Generator #2 - Suites 240 and 285	249279	0.00051	0.0945	99.46%	0.00004
University of Chicago	Generator #3	240622	0.00068	0.126	99.46%	0.00001
University of Chicago	Generator #4	240623	0.00068	0.126	99.46%	0.00001
Bank of America	7 Emergency Diesel Gneratrs (G-1 to G-7)	232579	0.00064	0.11856	99.46%	0.00003
Lutheran General Hospital	Emergency Generator #2	249408	0.00025	0.04629	99.46%	0
Lutheran General Hospital	Emergency Generator #3	249409	0.00025	0.04629	99.46%	0
Lutheran General Hospital	Emergency Generator #5	249411	0.00025	0.04629	99.46%	0
Lutheran General Hospital	Emergency Generator #6	249412	0.00025	0.04629	99.46%	0
Crown Cork & Seal Co (USA)	Mobile Electric Generator	228557	0.0003	0.05544	99.46%	0
Qwest Comm d/b/a Cent Link	Generators	219450	0.00026	0.048	99.46%	0.00003
Qwest Comm d/b/a Cent Link	Generator #2	248722	0.00026	0.048	99.46%	0.00003
Qwest Comm d/b/a Cent Link	Generator #3	248723	0.00026	0.048	99.46%	0.00003
Qwest Comm d/b/a Cent Link	Generator #4	248724	0.00026	0.048	99.46%	0.00003
Qwest Comm d/b/a Cent Link	Generator #5	248725	0.00026	0.048	99.46%	0.00003
Qwest Comm d/b/a Cent Link	Generator #6	248726	0.00026	0.048	99.46%	0.00003
Qwest Comm d/b/a Cent Link	Generator #7	248727	0.00026	0.048	99.46%	0.00003
Qwest Comm d/b/a Cent Link	Generator #8	248728	0.00026	0.048	99.46%	0.00003
Qwest Comm d/b/a Cent Link	Generator #9	248729	0.00026	0.048	99.46%	0.00003
Qwest Comm d/b/a Cent Link	Generator #10	248730	0.00026	0.048	99.46%	0.00003
University of Chicago	Generator #2	240621	0.00026	0.04788	99.46%	0
University of Chicago	Generator #2 - Stack 2 of 2	249343	0.00026	0.04788	99.46%	0
Lutheran General Hospital	Emergency Generators	151934	0.00025	0.04601	99.46%	0
Lutheran General Hospital	Emergency Generator #4	249410	0.00025	0.04601	99.46%	0
Hinsdale Hospital	Generator #5	242542	0.00037	0.06804	99.46%	0
Motorola Solutions Inc	Generator (160 HP)	193087	0.00012	0.02205	99.46%	0
Motorola Solutions Inc	Generator (150 HP)	249599	0.00012	0.02205	99.46%	0
Illinois Bell d/b/a AT&T Illinois	Emergency Generator	161331	0.00417	0.76543	99.46%	0.00001
University Park Energy LLC	Emergency Generator	227638	0.00011	0.02016	99.45%	0
Hinsdale Hospital	Generators #2 and #3	242541	0.0003	0.05481	99.45%	0
Hinsdale Hospital	Diesel Generator #4	247402	0.0003	0.05481	99.45%	0
Motorola Solutions Inc	9 Diesel Emergency Generators	195674	0.00003	0.00548	99.45%	0
Motorola Solutions Inc	Large Diesel Emergency Generator #2	249610	0.00003	0.00548	99.45%	0
Motorola Solutions Inc	Large Diesel Emergency Generator #3	249611	0.00003	0.00548	99.45%	0
Motorola Solutions Inc	Large Diesel Emergency Generator #4	249612	0.00003	0.00548	99.45%	0
St James Hsptl & Health Cntrs	Boiler #3	244420	0.00489	0.87196	99.44%	0.00001

St James Hsptl & Health Cntrs	Boiler #1	193487	0.00488	0.86935	99.44%	0.00001
St James Hsptl & Health Cntrs	Boiler #2	244419	0.00488	0.86935	99.44%	0.00001
Illinois Bell Telephone Co	Emergency Generator - Roof Exhaust	213792	0.00378	0.67031	99.44%	0.00001
IMTT Illinois Joliet Facility	Steam Boiler: Backup Diesel-Fired	184061	0.00395	0.69298	99.43%	0.00001
Illinois Bell d/b/a AT&T IL	Emergency Generator - Vertical Exhaust	224296	0.00297	0.51659	99.43%	0
St Mary of Nazareth Hosp Cntr	3 Murray-Trane NG-Fired Blrs w/ #2 Fuel	120904	0.01323	2.24993	99.41%	0.0005
Northwestern Univ - Chgo Cmp	Boiler #4	143506	0.01363	2.30953	99.41%	0.00069
BT Americas Inc	Emergency Diesel Generator	226306	0.00003	0.00504	99.40%	0
United Airlines Inc	Emergency Generator	233763	0.00003	0.00504	99.40%	0
DuPage County Power Plant	Generator #1	244841	0.00003	0.00504	99.40%	0
DuPage County Power Plant	Generator #2	244842	0.00003	0.00504	99.40%	0
DuPage County Power Plant	Generator #3	244843	0.00003	0.00504	99.40%	0
Argonne National Laboratory	APS Emergency Generator #1	241651	0.00194	0.32381	99.40%	0.00016
Argonne National Laboratory	APS Emergency Generator #2	149384	0.00438	0.72952	99.40%	0.00032
Argonne National Laboratory	APS Emergency Generator #3	237500	0.00438	0.72952	99.40%	0.00035
Chicago South Wtr Filtratn Plt	2 Boilers	229682	0.01417	2.30323	99.38%	0.00002
Rush Univ Medical Center	Boiler #4	249204	0.00631	1.01725	99.38%	0.0003
Rush Univ Medical Center	Boiler #2	249202	0.00631	1.01657	99.38%	0.00031
Rush Univ Medical Center	Boiler #3	249203	0.00631	1.01657	99.38%	0.00031
Caterpillar Inc	HVOF System	224290	0.00002	0.00315	99.37%	0
Caterpillar Inc. (#197809AAC)	HVOF System - Stack 2 of 8	247012	0.00002	0.00315	99.37%	0
Caterpillar Inc. (#197809AAC)	HVOF System - Stack 3 of 8	247013	0.00002	0.00315	99.37%	0
Caterpillar Inc. (#197809AAC)	HVOF System - Stack 4 of 8	247014	0.00002	0.00315	99.37%	0
Caterpillar Inc. (#197809AAC)	HVOF System - Stack 5 of 8	247015	0.00002	0.00315	99.37%	0
Caterpillar Inc. (#197809AAC)	HVOF System - Stack 6 of 8	247016	0.00002	0.00315	99.37%	0
Caterpillar Inc. (#197809AAC)	HVOF System - Stack 7 of 8	247017	0.00002	0.00315	99.37%	0
Caterpillar Inc. (#197809AAC)	HVOF System - Stack 8 of 8	247018	0.00002	0.00315	99.37%	0
Cook County Central Plant	21 Emergency Generators	216482	0.00055	0.0853	99.36%	0.00004
Richard J Daley Center	Emergency Generator	238563	0.00002	0.00307	99.35%	0
Palos Community Hospital	4 Boilers	229642	0.00474	0.71944	99.34%	0.00001
Palos Community Hospital	Boiler #2	249420	0.00474	0.71944	99.34%	0.00001
Palos Community Hospital	Boiler #3	249421	0.00474	0.71944	99.34%	0.00001
Palos Community Hospital	Boiler #4	249422	0.00474	0.71944	99.34%	0.00001
Caterpillar Inc	Boiler #2	139608	0.02128	3.22553	99.34%	0.00005
Oak Forest Hospital	4 Boilers	117404	0.03742	5.54388	99.33%	0.00006
MetroSouth Medical Center	Boiler	115114	0.00359	0.53171	99.32%	0.00001
St. Josephs Hospital	3 Boilers	121027	0.01323	1.9517	99.32%	0.00045
Dana Auto Systems Group LLC	Diesel-Fired Emergency Generator	169925	0.00002	0.00289	99.31%	0
Mars Chocolate North America	Cogen/Boiler System	120126	0.00773	1.11558	99.31%	0.00004
Westlake Hospital	6 Boilers	117008	0.0034	0.48761	99.30%	0.00001
Caterpillar Inc	Boiler #3	139609	0.02266	3.22553	99.30%	0.00005
IL Bell Telephone Co d/b/a SBC	Diesel Generator	216360	0.0034	0.47879	99.29%	0
Chicago - Dept of Aviation	Turbine EG-H4007	149119	0.01093	1.52961	99.29%	0.00001
Dana Auto Systems Group LLC	Boiler	169918	0.00019	0.02655	99.28%	0
Shriners Hospitals for Children	Boilers LP 1, 2	119815	0.00393	0.53675	99.27%	0.00001
United Airlines World Hdqrtrs	Generator #3 (WHQ South Building)	248960	0.00125	0.16732	99.25%	0
United Airlines World Hdqrtrs	Generator #6 (WHQ South Building)	248963	0.00125	0.16732	99.25%	0
United Airlines World Hdqrtrs	Generators (WHQ South Building)	157341	0.00126	0.16833	99.25%	0
United Airlines World Hdqrtrs	Generator #2 (WHQ South Building)	248959	0.00126	0.16833	99.25%	0

United Airlines World Hdqrtrs	Generator #4 (WHQ South Building)	248961	0.00126	0.16833	99.25%	0
United Airlines World Hdqrtrs	Generator #5 (WHQ South Building)	248962	0.00126	0.16833	99.25%	0
Verizon Business	Stack	190544	0.00387	0.51659	99.25%	0.00018
Verizon Business	Generator	187268	0.0034	0.45359	99.25%	0
Verizon Business	Standby Generator #2	249505	0.0034	0.45359	99.25%	0
Verizon Business	Standby Generator #3	249506	0.0034	0.45359	99.25%	0
Verizon Business	Standby Generator #4	249507	0.0034	0.45359	99.25%	0
Verizon Business	Standby Generator - South of Building	185417	0.00324	0.43217	99.25%	0.00021
Momentive Specialty Chems	Generator #4	227815	0.00001	0.00126	99.21%	0
Palos Community Hospital	2 Diesel Generator Sets	225413	0.00008	0.00991	99.19%	0
Palos Community Hospital	Diesel Generator Set #4	249423	0.00008	0.00991	99.19%	0
S & C Electric Company	Boiler 6A (Building 6)	120192	0.00446	0.52037	99.14%	0.00002
S & C Electric Company	Boiler 6B (Building 6)	120191	0.00452	0.52037	99.13%	0.00002
Equinix Inc	17 Diesel Generators	233019	0.03024	3.42712	99.12%	0.00004
Central DuPage Hospital	Boiler #5	242701	0.01234	1.34439	99.08%	0.00002
Elmhurst Memorial Hospital	4 Boilers	199295	0.01043	1.02058	98.98%	0.00002
Glenbrook Hospital	3 Boilers	161373	0.00939	0.89962	98.96%	0.00001
Exelon-Dresden Station	Auxiliary Heating Boilers A and B	151337	0.0189	1.79798	98.95%	0.00003
AT & T	Generators	160688	0.01047	0.90718	98.85%	0.00044
Tarantula Ventures LLC	32 Diesel Generator Sets	226349	0.0017	0.14364	98.82%	0
Argonne National Laboratory	Transportation Resrch Fac: Test Engines	155059	0.00023	0.0189	98.78%	0.00003
Argonne National Laboratory	Transportation Resrch Fac: Test Engines	237502	0.00023	0.0189	98.78%	0.00003
Mount Sinai Hospital	3 Boilers	120087	0.0207	1.67576	98.76%	0.00112
Adventist Bolingbrook Hosptl	2 Boilers	227951	0.00633	0.50096	98.74%	0.00002
St. Alexius Medical Center	Boilers	116506	0.00663	0.51367	98.71%	0.00001
Prvena Hsptls d/b/a Mercy Ctr	Boiler	125539	0.01129	0.82402	98.63%	0.00002
Prvena Hsptls d/b/a Mercy Ctr	2 Boilers	125540	0.01129	0.82402	98.63%	0.00002
Silver Cross Hospital	Boiler (Point 0002)	139029	0.02682	1.86476	98.56%	0.00009
Northwestern Univ - Chgo Cmp	Boilers #1, #2	151020	0.04234	2.30953	98.17%	0.00172
City of Chgo - Wstrn Ave Pmp	Boiler #5	222735	0.00962	0.47703	97.98%	0.00085
City of Chicago-Western Ave P	Boilers 1-4	119347	0.03849	1.9081	97.98%	0.00275
Oak Park Hospital	Boiler	117408	0.01826	0.88874	97.95%	0.00012
Christ Hospital & Med Center	Boiler	117407	0.00609	0.29625	97.94%	0.00002
Sandeno Inc	Drum Mix Asphalt Plant	161219	0.06552	2.64972	97.53%	0.00018
Exelon-Dresden Station	Unit 2 Emergency Pwr Diesel Generator	124541	0.00082	0.032	97.44%	0
Exelon-Dresden Station	Unit 2/3 Emergency Pwr Diesel Generator	124542	0.00082	0.032	97.44%	0
Exelon-Dresden Station	Unit 3 Emergency Pwr Diesel Generator	124543	0.00082	0.032	97.44%	0
Exelon-Dresden Station	Emer Stn Black-Out (SBO) Diesel Gen - 1/4	147800	0.00041	0.016	97.44%	0
Exelon-Dresden Station	Emer Stn Black-Out (SBO) Diesel Gen - 2/4	147801	0.00041	0.016	97.44%	0
Exelon-Dresden Station	Emer Stn Black-Out (SBO) Dsl Gen- Stk 3/4	242884	0.00041	0.016	97.44%	0
Exelon-Dresden Station	Emer Stn Black-Out (SBO) Dsl Gen- Stk 4/4	242885	0.00041	0.016	97.44%	0
University of Chicago	New Boiler #1	238399	0.0567	2.15455	97.37%	0.001
University of Chicago	New Boiler #2	242500	0.0567	2.15455	97.37%	0.001
Hinsdale Hospital	3 Boilers and Comfort Heating Units	152558	0.01663	0.62999	97.36%	0.00011
KA Steel Chemicals Inc	Fuel Oil-Fired Boiler	151831	0.00127	0.04759	97.33%	0.00024
Akzo Nobel Surface Chem LLC	Dowtherm Process Heater	235819	0.00652	0.23309	97.20%	0.00001

South Suburban Hospital	Boilers #1, #2	154628	0.00472	0.16128	97.07%	0.00001
MacNeal Memorial Hospital	2 Boilers	115077	0.00949	0.32255	97.06%	0.00055
Lutheran General Hospital	4 Boilers (#1-#4)	146200	0.00541	0.1827	97.04%	0.00001
Lutheran General Hospital	Boiler #2	249405	0.00541	0.1827	97.04%	0.00001
Lutheran General Hospital	Boiler #3	249406	0.00541	0.1827	97.04%	0.00001
Lutheran General Hospital	Boiler #4	249407	0.00541	0.1827	97.04%	0.00001
NRG (Midwest Gen) - Joliet	Joliet 9: Unit 6	139664	23.91805	803.53468	97.02%	0.03322
NRG (Midwest Gen) - Joliet	Joliet 29: Unit 8	157016	43.11121	1448.31287	97.02%	0.04888
NRG (Midwest Gen) - Joliet	Joliet 29: Unit 7	157015	40.7349	1368.48103	97.02%	0.04488
NRG (Midwest Gen) -Will Cnty	Unit #3	139820	18.2885	614.38766	97.02%	4.4628
Richard J Daley Center	Boiler #1	238559	0.02923	0.97774	97.01%	0.00152
Equinix Inc	Generator #2	238571	0.00302	0.1008	97.00%	0.00022
Equinix Inc	Generator #3	238572	0.00302	0.1008	97.00%	0.00022
Equinix Inc	Generator #4	238573	0.00302	0.1008	97.00%	0.00022
Equinix Inc	Generator #5	238574	0.00302	0.1008	97.00%	0.00022
Equinix Inc	Generator #6	238575	0.00302	0.1008	97.00%	0.00022
GenOn Wholesale Generation	Emergency Diesel Engine Gnratr (EDG-1)	224035	0.01092	0.36413	97.00%	0.00002
Ameritech	4 Emergency Generators	177155	0.00718	0.23939	97.00%	0.00034
Comcast of Illinois	Diesel Engine	222282	0.00257	0.08568	97.00%	0
600 W Chicago LLC	6 Emergency Generators	222661	0.02275	0.7584	97.00%	0.00097
600 W Chicago LLC	Generator #2 (2000 kW)	249180	0.02275	0.7584	97.00%	0.00097
600 W Chicago LLC	Generator #3 (2000 kW)	249181	0.02275	0.7584	97.00%	0.00097
600 W Chicago LLC	Generator #4 (2000 kW)	249182	0.02275	0.7584	97.00%	0.00097
CIBA Vision Corp	Emergency Generator	154601	0.00161	0.05367	97.00%	0
Exelon Generation Co LLC	Backup Generator EDG A	222736	0.00378	0.126	97.00%	0
Modern Drop Forge Co	Standby Generator	209296	0.00076	0.02533	97.00%	0
KCBX Terminals Co	Generator #1	184804	0.00947	0.31562	97.00%	0.00001
KCBX Terminals Co	Generator #2	221441	0.00947	0.31562	97.00%	0.00001
UBS Ag	2 - 1500 kW Generators	222454	0.01724	0.57455	97.00%	0.00081
600 W Chicago LLC	Generator #1 (1500 kW)	249183	0.0177	0.58987	97.00%	0.00048
600 W Chicago LLC	Generator #2 (1500 kW)	249184	0.0177	0.58987	97.00%	0.00048
Ameritech Corp	1250 kW Diesel Generator	208973	0.00225	0.07497	97.00%	0.00004
Digital Realty Trust LP	Diesel Generator #2 - Suite 810	249284	0.00244	0.08122	97.00%	0.0002
Digital Realty Trust LP	Diesel Generator #3 - Suite 810	249285	0.00244	0.08122	97.00%	0.0002
Digital Realty Trust LP	Diesel Generator #5 - Suite 810	249287	0.00244	0.08122	97.00%	0.0002
Digital Realty Trust LP	Diesel Generator #6 - Suite 810	249288	0.00244	0.08122	97.00%	0.0002
Digital Realty Trust LP	Diesel Generator #1 - Suite 810	247039	0.00243	0.08073	96.99%	0.0002
Digital Realty Trust LP	Diesel Generator #4 - Suite 810	249286	0.00243	0.08073	96.99%	0.0002
Tarantula Ventures LLC	Fire Pump Engine	226351	0.00023	0.00756	96.96%	0
Digital Realty Trust LP	Diesel Generator #3 - Suite 410	249290	0.00252	0.08248	96.94%	0.00021
Digital Realty Trust LP	Diesel Generator #1 - Suite 410	247040	0.00252	0.08224	96.94%	0.00021
Digital Realty Trust LP	Diesel Generator #2 - Suite 410	249289	0.00252	0.08224	96.94%	0.00021
JH Stroger Jr Hsptl of Cook Cnty	6 Boilers (B-1 to B-6)	219784	0.01246	0.38097	96.73%	0.00062
John H Stroger Hosp Cook Cnty	Boilers B-2 and B-5	250499	0.01246	0.38097	96.73%	0.00062
John H Stroger Hosp Cook Cnty	Boilers B-3 and B-6	250500	0.0125	0.38211	96.73%	0.00062
ElectroMotive Diesel Inc	Production Engine Cell #1	182772	0.00324	0.08653	96.26%	0.0002
ElectroMotive Diesel Inc	Production Engine Cell #2	242445	0.00324	0.08653	96.26%	0.0002
ElectroMotive Diesel Inc	Production Engine Cell #3	242446	0.00324	0.08653	96.26%	0.00021
ElectroMotive Diesel Inc	Production Engine Cell #4	242447	0.00324	0.08653	96.26%	0.00021
ElectroMotive Diesel Inc	R&D Turbo Test Cell #1	182771	0.01298	0.34624	96.25%	0.00081
ElectroMotive Diesel Inc	R & D Turbo Test Cell #3	242448	0.01298	0.34624	96.25%	0.00081
ElectroMotive Diesel Inc	R & D Turbo Test Cell #4	242449	0.01298	0.34624	96.25%	0.00081
ElectroMotive Diesel Inc	R & D Turbo Test Cell #5	242450	0.01298	0.34624	96.25%	0.0008
ElectroMotive Diesel Inc	R & D Turbo Test Cell #6	242451	0.01298	0.34624	96.25%	0.0008

ElectroMotive Diesel Inc	MU-1 Durability Test Cell	182779	0.02499	0.66653	96.25%	0.00152
ElectroMotive Diesel Inc	MU-5 Durability Test Cell	116612	0.02476	0.66023	96.25%	0.00153
Chicago Department of Water	Boiler	120703	0.03374	0.89962	96.25%	0.00175
DSM Desotech Inc	Diesel Generator	213764	0.00246	0.06552	96.25%	0
Gottlieb Memorial Hospital	4 Boilers	117023	0.01181	0.30718	96.16%	0.00002
Digital Realty Trust LP	Diesel Generator - Suite 260	247041	0.00003	0.00076	96.05%	0
Romeoville Asphalt Plant	Asphalt Plant	139869	0.11844	2.82108	95.80%	0.08327
Chicago - Dept of Aviation	High Temp Water Generatr (HTWG-4001)	149118	0.01792	0.37201	95.18%	0.00002
Chicago - Dept of Aviation	High temp water generator (HTWG-4002)	242403	0.01792	0.37201	95.18%	0.00002
Chicago - Dept of Aviation	High temp water generator (HTWG-4003)	242404	0.01792	0.37201	95.18%	0.00002
Chicago - Dept of Aviation	High temp water generator (HTWG-4004)	242405	0.01792	0.37201	95.18%	0.00002
Chicago - Dept of Aviation	High temp water generator (HTWG-4005)	242406	0.01792	0.37201	95.18%	0.00002
Chicago - Dept of Aviation	High temp water generator (HTWG-4006)	242407	0.01792	0.37201	95.18%	0.00002
Chicago - Dept of Aviation	High temp water generator (HTWG-4007)	242408	0.01792	0.37201	95.18%	0.00002
Chicago - Dept of Aviation	High temp water generator (HTWG-4008)	242409	0.01792	0.37201	95.18%	0.00002
Ingredion (formerly, CPC)	Germ Proc: Wet Prep - Scrubber 86A15	151627	1.68345	33.66898	95.00%	0.17242
Ingredion (formerly, CPC)	Channel 2 Wet Scrubber Fan 86A12	158218	0.89206	17.82609	95.00%	0.0907
Ingredion (formerly, CPC)	Scrubber 86A17 for Cyclone, 85A07	158219	0.89206	17.82609	95.00%	0.09075
Ingredion (formerly, CPC)	Channel 4 Wet Scrubber Fan 86A14	158220	0.89206	17.82609	95.00%	0.0908
NRG (Midwest Gen) - Joliet	New Dual Fired Heater (TH6)	225031	0.00227	0.04536	95.00%	0.00001
Gallagher Asphalt	Drum Mix Asphalt Plant	222598	0.11214	1.7501	93.59%	0.00029
Interstate Asphalt LLC	Drum Mix Asphalt Plant	223146	0.11718	1.7375	93.26%	0.00012
Orange Crush LLC	Drum Mix Asphalt Plant	151730	0.22428	3.31877	93.24%	0.00029
K-Five Construction Company	Drum Mix Asphalt Plant	116860	0.11214	1.65938	93.24%	0.00016
Geneva Construction Co	Drum Mix Asphalt Plant	190966	0.18522	2.74044	93.24%	0.00031
Ogden Ave Materials Inc	Drum Mix Asphalt Plant	154952	0.10206	1.50945	93.24%	0.00359
Central Blacktop Co Inc	Drum Mix Asphalt Plant	177721	0.25451	3.76354	93.24%	0.01902
K-Five Construction Corp	Drum Mix Asphalt Plant	233319	0.19782	2.92314	93.23%	0.00027
K-Five Construction Company	Baghouse Control 0001	121169	0.21168	3.12725	93.23%	0.00028
K-Five Construction Company	Drum Mix Asphalt Plant	123688	0.21168	3.12725	93.23%	0.00032
K-Five Construction Company	Drum Mix Asphalt Plant	123168	0.21168	3.12691	93.23%	0.00041
D Construction Inc	Drum Mix Asphalt Plant	216364	0.1008	1.48803	93.23%	0.00014
Allied Asphalt Paving Co	Drum Mix Asphalt Plant	223167	0.1323	1.95296	93.23%	0.00018
Allied Asphalt Paving Co	Drum Mix Asphalt Plant	227563	0.04536	0.66905	93.22%	0.00006
Builders Asphalt LLC	Drum Mix Asphalt Plant	226702	0.31499	4.64552	93.22%	0.00041
Reliable Laflin LLC	Drum Mix Asphalt Plant	121011	0.22428	3.30491	93.21%	0.02051
Arrow Road Construction Co	Drum Mix Asphalt Plant	121694	0.17514	2.58042	93.21%	0.00023
Allied Asphalt Paving Co	Drum Mix Asphalt Plant	123409	0.18396	2.7102	93.21%	0.00028
Gallagher Asphalt Corp	Drum Mix Asphalt Plant	186161	0.27593	4.06467	93.21%	0.00037
PT Ferro Construction Co	Asphalt Plant	139776	0.21042	3.09701	93.21%	0.00055
Oxbow Midwest Calcining	K-2 Calciner	139509	9.42459	136.077	93.07%	1.11611
James D Fiala Asphalt Corp	Drum Mix Asphalt Plant	139528	0.12411	1.7375	92.86%	0.00153
Microsoft Corp-Chcgo Data Ctr	27 Emergency Generators (2740 kW each)	234180	0.01408	0.18774	92.50%	0.00002
Akzo Nobel Surface Chem LLC	Volcano Steam Boiler	235799	0.01264	0.15876	92.04%	0.00002
MWRD Kirie Water Reclam Plt	Boilers, Water Heaters, and Space Htrs	115776	0.00624	0.07182	91.31%	0.00001
Oxbow Midwest Calcining	K-1 Calciner	139505	14.13689	151.00767	90.64%	1.77435

Good Samaritan Hospital	Boiler #1	208732	0.00966	0.10196	90.53%	0.00002
Good Samaritan Hospital	Boiler #2	244399	0.00966	0.10196	90.53%	0.00002
Good Samaritan Hospital	Boiler #4	244380	0.00163	0.0172	90.52%	0
Good Samaritan Hospital	Boiler #3	244379	0.00233	0.02457	90.52%	0
Glen Oaks Medical Center	2 Boilers	123038	0.00198	0.02016	90.18%	0
Glen Oaks Medical Center	Boiler #2	247139	0.00198	0.02016	90.18%	0
S & C Electric Company	Boiler 3 (Building 3)	120189	0.03641	0.36413	90.00%	0.00009
Ingredion (formerly, CPC)	Molten Sulfur System-Tanks Vent Scrubr	244939	0.33956	3.39563	90.00%	0.03471
Stepan Co.	Boiler #2	247839	0.23244	2.32442	90.00%	0.00047
Stepan Co.	Boiler #3	247840	0.23244	2.32442	90.00%	0.00047
Ingredion (formerly, CPC)	Molten Sulfur System	151637	0.88349	8.83493	90.00%	0.0901
Mercy Hospital & Med Center	4 Boilers	119928	0.44099	4.4099	90.00%	0.03292
Stepan Co.	Boiler #5	247842	0.23314	2.3314	90.00%	0.00047
Sts Mary & Eliz Medical Center	Boilers	172700	0.05544	0.55439	90.00%	0.00195
General Mills Operations Inc	Boiler	123281	0.04627	0.46095	89.96%	0.00007
General Mills Operations Inc	Boiler	123279	0.04491	0.44739	89.96%	0.00007
General Mills Operations Inc	Boiler	123280	0.04491	0.44739	89.96%	0.00007
Ingredion (formerly, CPC)	Bghse 23A19 for 0116 Bghse, 23A23 Cycln	114753	3.07244	30.59276	89.96%	0.31282
RML Specialty Hospital	Boiler 3	148032	0.0257	0.25558	89.94%	0.00024
RML Specialty Hospital	Boiler 1	148030	0.02495	0.24806	89.94%	0.00023
RML Specialty Hospital	Boiler 2	148031	0.02495	0.24806	89.94%	0.00023
Argonne National Laboratory	Building 200 Peak Shave Generator	214042	0.00742	0.06426	88.45%	0.00018
Argonne National Laboratory	Building 202 Peak Shave Generator	237501	0.00742	0.06426	88.45%	0.00044
Owens Corning Rfng & Asphlt	Afterburner #2 (Loading Racks 1,2,4,5,9)	114410	3.43569	27.73737	87.61%	0.24094
Provident Hsptl of Cook Cnty	3 Boilers (Common Stack - Powerhouse)	152353	0.01283	0.10019	87.19%	0.00035
Blue Island Phenol LLC	Boiler #1	148210	0.01436	0.10971	86.91%	0.00002
Blue Island Phenol LLC	Boiler #2	226922	0.01436	0.10971	86.91%	0.00002
Central Steel & Wire Co	Boiler Stack (1) Plant A	188604	0.00451	0.03427	86.84%	0.00044
Central Steel & Wire Co	Boiler Stack (2) Plant B	188606	0.00902	0.06854	86.84%	0.00088
Central Steel & Wire Co	Boiler Stack (2) Plant C	188607	0.00902	0.06854	86.84%	0.00101
Northwestern Mem Hospital	5 Boilers	160016	0.02381	0.16884	85.90%	0.00114
Tootsie Roll Industries LLC	5 Diesel Generators	230353	0.22264	1.48425	85.00%	0.00884
Brookfield Zoo	Standby Generator #1	154586	0.09072	0.60479	85.00%	0.00221
Kraft Foods Global Inc	Boiler #4	120004	0.00722	0.04158	82.64%	0.00018
Reliable Asphalt Corporation	Drum Mix Asphalt Plant	244499	0.02646	0.12852	79.41%	0.00208
Owens Corning Rfng & Asphlt	Afterburner #1 (Loading Racks 1,2,4,5,9)	114393	5.63079	27.02266	79.16%	0.4013
Owens Corning Rfng & Asphlt	Afterburner #3	214179	0.54739	1.44112	62.02%	0.03345
Akzo Nobel Surface Chem LLC	Nebraska Steam Boiler	124501	0.11512	0.26333	56.28%	0.00018
Woodridge-Greene Vly WWTP	Fairbanks-Morse Dual Fuel Engine	197352	0.12287	0.24456	49.76%	0.0003
Prvena Hsptls d/b/a St Jos Med	Boilers	139031	0.01622	0.03062	47.03%	0.00006
Ingredion (formerly, CPC)	Wet Mill Tanks to Vent Fan	158191	13.51572	24.5745	45.00%	1.35672
Blue Island Phenol LLC	Cumene Unit Process Heater	122077	0.00794	0.01419	44.05%	0.00001
Springfield Pumping Station	Boilers	119379	0.03478	0.05796	39.99%	0.00079
Owens Corning Rfng & Asphlt	Afterburner #4 (Loading Racks 1,2,4,5,9)	114409	0.80484	1.12128	28.22%	0.04918
NRG (Midwest Gen) -Will Cnty	Unit #4	139822	821.60269	1137.60372	27.78%	150.37782

RANAJIT (RON) SAHU, Ph.D, QEP, CEM (Nevada)

CONSULTANT, ENVIRONMENTAL AND ENERGY ISSUES

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EXPERIENCE SUMMARY

Dr. Sahu has over twenty three years of experience in the fields of environmental, mechanical, and chemical engineering including: program and project management services; design and specification of pollution control equipment for a wide range of emissions sources; soils and groundwater remediation including landfills as remedy; combustion engineering evaluations; energy studies; multimedia environmental regulatory compliance (involving statutes and regulations such as the Federal CAA and its Amendments, Clean Water Act, TSCA, RCRA, CERCLA, SARA, OSHA, NEPA as well as various related state statutes); transportation air quality impact analysis; multimedia compliance audits; multimedia permitting (including air quality NSR/PSD permitting, Title V permitting, NPDES permitting for industrial and storm water discharges, RCRA permitting, etc.), multimedia/multi-pathway human health risk assessments for toxics; air dispersion modeling; and regulatory strategy development and support including negotiation of consent agreements and orders.

He has over twenty one years of project management experience and has successfully managed and executed numerous projects in this time period. This includes basic and applied research projects, design projects, regulatory compliance projects, permitting projects, energy studies, risk assessment projects, and projects involving the communication of environmental data and information to the public.

He has provided consulting services to numerous private sector, public sector and public interest group clients. His major clients over the past twenty three years include various steel mills, petroleum refineries, cement companies, aerospace companies, power generation facilities, lawn and garden equipment manufacturers, spa manufacturers, chemical distribution facilities, and various entities in the public sector including EPA, the US Dept. of Justice, California DTSC, various municipalities, etc.). Dr. Sahu has performed projects in over 44 states, numerous local jurisdictions and internationally.

In addition to consulting, Dr. Sahu has taught numerous courses in several Southern California universities including UCLA (air pollution), UC Riverside (air pollution, process hazard analysis), and Loyola Marymount University (air pollution, risk assessment, hazardous waste management) for the past seventeen years. In this time period he has also taught at Caltech, his alma mater (various engineering courses), at the University of Southern California (air pollution controls) and at California State University, Fullerton (transportation and air quality).

Dr. Sahu has and continues to provide expert witness services in a number of environmental areas discussed above in both state and Federal courts as well as before administrative bodies (please see Annex A).

EXPERIENCE RECORD

2000-present **Independent Consultant.** Providing a variety of private sector (industrial companies, land development companies, law firms, etc.) public sector (such as

the US Department of Justice) and public interest group clients with project management, air quality consulting, waste remediation and management consulting, as well as regulatory and engineering support consulting services.

1995-2000 Parsons ES, **Associate, Senior Project Manager and Department Manager for** Air Quality/Geosciences/Hazardous Waste Groups, Pasadena. Responsible for the management of a group of approximately 24 air quality and environmental professionals, 15 geoscience, and 10 hazardous waste professionals providing full-service consulting, project management, regulatory compliance and A/E design assistance in all areas.

Parsons ES, **Manager for Air Source Testing Services**. Responsible for the management of 8 individuals in the area of air source testing and air regulatory permitting projects located in Bakersfield, California.

1992-1995 Engineering-Science, Inc. **Principal Engineer and Senior Project Manager** in the air quality department. Responsibilities included multimedia regulatory compliance and permitting (including hazardous and nuclear materials), air pollution engineering (emissions from stationary and mobile sources, control of criteria and air toxics, dispersion modeling, risk assessment, visibility analysis, odor analysis), supervisory functions and project management.

1990-1992 Engineering-Science, Inc. **Principal Engineer and Project Manager** in the air quality department. Responsibilities included permitting, tracking regulatory issues, technical analysis, and supervisory functions on numerous air, water, and hazardous waste projects. Responsibilities also include client and agency interfacing, project cost and schedule control, and reporting to internal and external upper management regarding project status.

1989-1990 Kinetics Technology International, Corp. **Development Engineer.** Involved in thermal engineering R&D and project work related to low-NOx ceramic radiant burners, fired heater NOx reduction, SCR design, and fired heater retrofitting.

1988-1989 Heat Transfer Research, Inc. **Research Engineer**. Involved in the design of fired heaters, heat exchangers, air coolers, and other non-fired equipment. Also did research in the area of heat exchanger tube vibrations.

EDUCATION

1984-1988 Ph.D., Mechanical Engineering, California Institute of Technology (Caltech), Pasadena, CA.

1984 M. S., Mechanical Engineering, Caltech, Pasadena, CA.

1978-1983 B. Tech (Honors), Mechanical Engineering, Indian Institute of Technology (IIT) Kharagpur, India

TEACHING EXPERIENCE

Caltech

"Thermodynamics," Teaching Assistant, California Institute of Technology, 1983, 1987.

"Air Pollution Control," Teaching Assistant, California Institute of Technology, 1985.

"Caltech Secondary and High School Saturday Program," - taught various mathematics (algebra through calculus) and science (physics and chemistry) courses to high school students, 1983-1989.

"Heat Transfer," - taught this course in the Fall and Winter terms of 1994-1995 in the Division of Engineering and Applied Science.

“Thermodynamics and Heat Transfer,” Fall and Winter Terms of 1996-1997.

U.C. Riverside, Extension

"Toxic and Hazardous Air Contaminants," University of California Extension Program, Riverside, California. Various years since 1992.

"Prevention and Management of Accidental Air Emissions," University of California Extension Program, Riverside, California. Various years since 1992.

"Air Pollution Control Systems and Strategies," University of California Extension Program, Riverside, California, Summer 1992-93, Summer 1993-1994.

"Air Pollution Calculations," University of California Extension Program, Riverside, California, Fall 1993-94, Winter 1993-94, Fall 1994-95.

"Process Safety Management," University of California Extension Program, Riverside, California. Various years since 1992-2010.

"Process Safety Management," University of California Extension Program, Riverside, California, at SCAQMD, Spring 1993-94.

"Advanced Hazard Analysis - A Special Course for LEPCs," University of California Extension Program, Riverside, California, taught at San Diego, California, Spring 1993-1994.

“Advanced Hazardous Waste Management” University of California Extension Program, Riverside, California. 2005.

Loyola Marymount University

"Fundamentals of Air Pollution - Regulations, Controls and Engineering," Loyola Marymount University, Dept. of Civil Engineering. Various years since 1993.

"Air Pollution Control," Loyola Marymount University, Dept. of Civil Engineering, Fall 1994.

“Environmental Risk Assessment,” Loyola Marymount University, Dept. of Civil Engineering. Various years since 1998.

“Hazardous Waste Remediation” Loyola Marymount University, Dept. of Civil Engineering. Various years since 2006.

University of Southern California

"Air Pollution Controls," University of Southern California, Dept. of Civil Engineering, Fall 1993, Fall 1994.

"Air Pollution Fundamentals," University of Southern California, Dept. of Civil Engineering, Winter 1994.

University of California, Los Angeles

"Air Pollution Fundamentals," University of California, Los Angeles, Dept. of Civil and Environmental Engineering, Spring 1994, Spring 1999, Spring 2000, Spring 2003, Spring 2006, Spring 2007, Spring 2008, Spring 2009.

International Programs

“Environmental Planning and Management,” 5 week program for visiting Chinese delegation, 1994.

"Environmental Planning and Management," 1 day program for visiting Russian delegation, 1995.

"Air Pollution Planning and Management," IEP, UCR, Spring 1996.

"Environmental Issues and Air Pollution," IEP, UCR, October 1996.

PROFESSIONAL AFFILIATIONS AND HONORS

President of India Gold Medal, IIT Kharagpur, India, 1983.

Member of the Alternatives Assessment Committee of the Grand Canyon Visibility Transport Commission, established by the Clean Air Act Amendments of 1990, 1992-present.

American Society of Mechanical Engineers: Los Angeles Section Executive Committee, Heat Transfer Division, and Fuels and Combustion Technology Division, 1987-present.

Air and Waste Management Association, West Coast Section, 1989-present.

PROFESSIONAL CERTIFICATIONS

EIT, California (# XE088305), 1993.

REA I, California (#07438), 2000.

Certified Permitting Professional, South Coast AQMD (#C8320), since 1993.

QEP, Institute of Professional Environmental Practice, since 2000.

CEM, State of Nevada (#EM-1699). Expiration 10/07/2011.

PUBLICATIONS (PARTIAL LIST)

"Physical Properties and Oxidation Rates of Chars from Bituminous Coals," with Y.A. Levendis, R.C. Flagan and G.R. Gavalas, *Fuel*, **67**, 275-283 (1988).

"Char Combustion: Measurement and Analysis of Particle Temperature Histories," with R.C. Flagan, G.R. Gavalas and P.S. Northrop, *Comb. Sci. Tech.* **60**, 215-230 (1988).

"On the Combustion of Bituminous Coal Chars," PhD Thesis, California Institute of Technology (1988).

"Optical Pyrometry: A Powerful Tool for Coal Combustion Diagnostics," *J. Coal Quality*, **8**, 17-22 (1989).

"Post-Ignition Transients in the Combustion of Single Char Particles," with Y.A. Levendis, R.C.Flagan and G.R. Gavalas, *Fuel*, **68**, 849-855 (1989).

"A Model for Single Particle Combustion of Bituminous Coal Char." Proc. ASME National Heat Transfer Conference, Philadelphia, **HTD-Vol. 106**, 505-513 (1989).

"Discrete Simulation of Cenospheric Coal-Char Combustion," with R.C. Flagan and G.R.Gavalas, *Combust. Flame*, **77**, 337-346 (1989).

"Particle Measurements in Coal Combustion," with R.C. Flagan, in "**Combustion Measurements**" (ed. N. Chigier), Hemisphere Publishing Corp. (1991).

"Cross Linking in Pore Structures and Its Effect on Reactivity," with G.R. Gavalas in preparation.

"Natural Frequencies and Mode Shapes of Straight Tubes," Proprietary Report for Heat Transfer Research Institute, Alhambra, CA (1990).

"Optimal Tube Layouts for Kamui SL-Series Exchangers," with K. Ishihara, Proprietary Report for Kamui Company Limited, Tokyo, Japan (1990).

"HTRI Process Heater Conceptual Design," Proprietary Report for Heat Transfer Research Institute, Alhambra, CA (1990).

"Asymptotic Theory of Transonic Wind Tunnel Wall Interference," with N.D. Malmuth and others, Arnold Engineering Development Center, Air Force Systems Command, USAF (1990).

"Gas Radiation in a Fired Heater Convection Section," Proprietary Report for Heat Transfer Research Institute, College Station, TX (1990).

"Heat Transfer and Pressure Drop in NTIW Heat Exchangers," Proprietary Report for Heat Transfer Research Institute, College Station, TX (1991).

"NOx Control and Thermal Design," Thermal Engineering Tech Briefs, (1994).

“From Puchase of Landmark Environmental Insurance to Remediation: Case Study in Henderson, Nevada,” with Robin E. Bain and Jill Quillin, presented at the AQMA Annual Meeting, Florida, 2001.

“The Jones Act Contribution to Global Warming, Acid Rain and Toxic Air Contaminants,” with Charles W. Botsford, presented at the AQMA Annual Meeting, Florida, 2001.

PRESENTATIONS (PARTIAL LIST)

"Pore Structure and Combustion Kinetics - Interpretation of Single Particle Temperature-Time Histories," with P.S. Northrop, R.C. Flagan and G.R. Gavalas, presented at the AIChE Annual Meeting, New York (1987).

"Measurement of Temperature-Time Histories of Burning Single Coal Char Particles," with R.C. Flagan, presented at the American Flame Research Committee Fall International Symposium, Pittsburgh, (1988).

"Physical Characterization of a Cenospheric Coal Char Burned at High Temperatures," with R.C. Flagan and G.R. Gavalas, presented at the Fall Meeting of the Western States Section of the Combustion Institute, Laguna Beach, California (1988).

"Control of Nitrogen Oxide Emissions in Gas Fired Heaters - The Retrofit Experience," with G. P. Croce and R. Patel, presented at the International Conference on Environmental Control of Combustion Processes (Jointly sponsored by the American Flame Research Committee and the Japan Flame Research Committee), Honolulu, Hawaii (1991).

"Air Toxics - Past, Present and the Future," presented at the Joint AIChE/AAEE Breakfast Meeting at the AIChE 1991 Annual Meeting, Los Angeles, California, November 17-22 (1991).

"Air Toxics Emissions and Risk Impacts from Automobiles Using Reformulated Gasolines," presented at the Third Annual Current Issues in Air Toxics Conference, Sacramento, California, November 9-10 (1992).

"Air Toxics from Mobile Sources," presented at the Environmental Health Sciences (ESE) Seminar Series, UCLA, Los Angeles, California, November 12, (1992).

"Kilns, Ovens, and Dryers - Present and Future," presented at the Gas Company Air Quality Permit Assistance Seminar, Industry Hills Sheraton, California, November 20, (1992).

"The Design and Implementation of Vehicle Scrapping Programs," presented at the 86th Annual Meeting of the Air and Waste Management Association, Denver, Colorado, June 12, 1993.

"Air Quality Planning and Control in Beijing, China," presented at the 87th Annual Meeting of the Air and Waste Management Association, Cincinnati, Ohio, June 19-24, 1994.

Annex A

Expert Litigation Support

1. Occasions where Dr. Sahu has provided Written or Oral testimony before Congress:

(a) In July 2012, provided expert written and oral testimony to the House Subcommittee on Energy and the Environment, Committee on Science, Space, and Technology at a Hearing entitled "Hitting the Ethanol Blend Wall – Examining the Science on E15."

2. Matters for which Dr. Sahu has have provided affidavits and expert reports include:

(b) Affidavit for Rocky Mountain Steel Mills, Inc. located in Pueblo Colorado – dealing with the technical uncertainties associated with night-time opacity measurements in general and at this steel mini-mill.

(c) Expert reports and depositions (2/28/2002 and 3/1/2002; 12/2/2003 and 12/3/2003; 5/24/2004) on behalf of the United States in connection with the Ohio Edison NSR Cases. *United States, et al. v. Ohio Edison Co., et al.*, C2-99-1181 (Southern District of Ohio).

(d) Expert reports and depositions (5/23/2002 and 5/24/2002) on behalf of the United States in connection with the Illinois Power NSR Case. *United States v. Illinois Power Co., et al.*, 99-833-MJR (Southern District of Illinois).

(e) Expert reports and depositions (11/25/2002 and 11/26/2002) on behalf of the United States in connection with the Duke Power NSR Case. *United States, et al. v. Duke Energy Corp.*, 1:00-CV-1262 (Middle District of North Carolina).

(f) Expert reports and depositions (10/6/2004 and 10/7/2004; 7/10/2006) on behalf of the United States in connection with the American Electric Power NSR Cases. *United States, et al. v. American Electric Power Service Corp., et al.*, C2-99-1182, C2-99-1250 (Southern District of Ohio).

(g) Affidavit (March 2005) on behalf of the Minnesota Center for Environmental Advocacy and others in the matter of the Application of Heron Lake BioEnergy LLC to construct and operate an ethanol production facility – submitted to the Minnesota Pollution Control Agency.

(h) Expert Report and Deposition (10/31/2005 and 11/1/2005) on behalf of the United States in connection with the East Kentucky Power Cooperative NSR Case. *United States v. East Kentucky Power Cooperative, Inc*., 5:04-cv-00034-KSF (Eastern District of Kentucky).

(i) Affidavits and deposition on behalf of Basic Management Inc. (BMI) Companies in connection with the BMI vs. USA remediation cost recovery Case.

(j) Expert Report on behalf of Penn Future and others in the Cambria Coke plant permit challenge in Pennsylvania.

(k) Expert Report on behalf of the Appalachian Center for the Economy and the Environment and others in the Western Greenbrier permit challenge in West Virginia.

(l) Expert Report, deposition (via telephone on January 26, 2007) on behalf of various Montana petitioners (Citizens Awareness Network (CAN), Women's Voices for the Earth (WVE) and the Clark Fork Coalition (CFC)) in the Thompson River Cogeneration LLC Permit No. 3175-04 challenge.

(m) Expert Report and deposition (2/2/07) on behalf of the Texas Clean Air Cities Coalition at the Texas State Office of Administrative Hearings (SOAH) in the matter of the permit challenges to TXU Project Apollo's eight new proposed PRB-fired PC boilers located at seven TX sites.

(n) Expert Testimony (July 2007) on behalf of the Izaak Walton League of America and others in connection with the acquisition of power by Xcel Energy from the proposed Gascoyne Power Plant – at the State of Minnesota, Office of Administrative Hearings for the Minnesota PUC (MPUC No. E002/CN-06-1518; OAH No. 12-2500-17857-2).

(o) Affidavit (July 2007) Comments on the Big Cajun I Draft Permit on behalf of the Sierra Club – submitted to the Louisiana DEQ.

(p) Expert Report and Deposition (12/13/2007) on behalf of Commonwealth of Pennsylvania – Dept. of Environmental Protection, State of Connecticut, State of New York, and State of New Jersey (Plaintiffs) in connection with the Allegheny Energy NSR Case. *Plaintiffs v. Allegheny Energy Inc., et al.,* 2:05cv0885 (Western District of Pennsylvania).

(q) Expert Reports and Pre-filed Testimony before the Utah Air Quality Board on behalf of Sierra Club in the Sevier Power Plant permit challenge.

(r) Expert Report and Deposition (October 2007) on behalf of MTD Products Inc., in connection with General Power Products, LLC v MTD Products Inc., 1:06 CVA 0143 (Southern District of Ohio, Western Division)

(s) Experts Report and Deposition (June 2008) on behalf of Sierra Club and others in the matter of permit challenges (Title V: 28.0801-29 and PSD: 28.0803-PSD) for the Big Stone II unit, proposed to be located near Milbank, South Dakota.

(t) Expert Reports, Affidavit, and Deposition (August 15, 2008) on behalf of Earthjustice in the matter of air permit challenge (CT-4631) for the Basin Electric Dry Fork station, under construction near Gillette, Wyoming before the Environmental Quality Council of the State of Wyoming.

(u) Affidavits (May 2010/June 2010 in the Office of Administrative Hearings))/Declaration and Expert Report (November 2009 in the Office of Administrative Hearings) on behalf of NRDC and the Southern Environmental Law Center in the matter of the air permit challenge for Duke Cliffside Unit 6. Office of Administrative Hearing Matters 08 EHR 0771, 0835 and 0836 and 09 HER 3102, 3174, and 3176 (consolidated).

(v) Declaration (August 2008), Expert Report (January 2009), and Declaration (May 2009) on behalf of Southern Alliance for Clean Energy et al., v Duke Energy Carolinas, LLC. in the matter of the air permit challenge for Duke Cliffside Unit 6. *Southern Alliance for Clean Energy et al., v. Duke Energy Carolinas, LLC*, Case No. 1:08-cv-00318-LHT-DLH (Western District of North Carolina, Asheville Division).

(w) Declaration (August 2008) on behalf of the Sierra Club in the matter of Dominion Wise County plant MACT.

(x) Expert Report (June 2008) on behalf of Sierra Club for the Green Energy Resource Recovery Project, MACT Analysis.

(y) Expert Report (February 2009) on behalf of Sierra Club and the Environmental Integrity Project in the matter of the air permit challenge for NRG Limestone's proposed Unit 3 in Texas.

(z) Expert Report (June 2009) on behalf of MTD Products, Inc., in the matter of *Alice Holmes and Vernon Holmes v. Home Depot USA, Inc., et al.*

(aa) Expert Report (August 2009) on behalf of Sierra Club and the Southern Environmental Law Center in the matter of the air permit challenge for Santee Cooper's proposed Pee Dee plant in South Carolina).

(bb) Statements (May 2008 and September 2009) on behalf of the Minnesota Center for Environmental Advocacy to the Minnesota Pollution Control Agency in the matter of the Minnesota Haze State Implementation Plans.

(cc) Expert Report (August 2009) on behalf of Environmental Defense, in the matter of permit challenges to the proposed Las Brisas coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH).

(dd) Expert Report and Rebuttal Report (September 2009) on behalf of the Sierra Club, in the matter of challenges to the proposed Medicine Bow Fuel and Power IGL plant in Cheyenne, Wyoming.

(ee) Expert Report (December 2009) and Rebuttal reports (May 2010 and June 2010) on behalf of the United States in connection with the Alabama Power Company NSR Case. *United States v. Alabama Power Company*, CV-01-HS-152-S (Northern District of Alabama, Southern Division).

(ff) Pre-filed Testimony (October 2009) on behalf of Environmental Defense and others, in the matter of challenges to the proposed White Stallion Energy Center coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH).

(gg) Pre-filed Testimony (July 2010) and Written Rebuttal Testimony (August 2010) on behalf of the State of New Mexico Environment Department in the matter of Proposed Regulation 20.2.350 NMAC – *Greenhouse Gas Cap and Trade Provisions*, No. EIB 10-04 (R), to the State of New Mexico, Environmental Improvement Board.

(hh) Expert Report (August 2010) and Rebuttal Expert Report (October 2010) on behalf of the United States in connection with the Louisiana Generating NSR Case. *United States v. Louisiana Generating, LLC*, 09-CV100-RET-CN (Middle District of Louisiana) – Liability Phase.

(ii) Declaration (August 2010), Reply Declaration (November 2010), Expert Report (April 2011), Supplemental and Rebuttal Expert Report (July 2011) on behalf of the United States in the matter of DTE Energy Company and Detroit Edison Company (Monroe Unit 2). *United States of America v. DTE Energy Company and Detroit Edison Company*, Civil Action No. 2:10-cv-13101-BAF-RSW (US District Court for the Eastern District of Michigan).

(jj) Expert Report and Deposition (August 2010) as well as Affidavit (September 2010) on behalf of Kentucky Waterways Alliance, Sierra Club, and Valley Watch in the matter of challenges to the NPDES permit issued for the Trimble County power plant by the Kentucky Energy and Environment Cabinet to Louisville Gas and Electric, File No. DOW-41106-047.

(kk) Expert Report (August 2010), Rebuttal Expert Report (September 2010), Supplemental Expert Report (September 2011), and Declaration (November 2011) on behalf of Wild Earth Guardians in the matter of opacity exceedances and monitor downtime at the Public Service Company of Colorado (Xcel)'s Cherokee power plant. No. 09-cv-1862 (D. Colo.).

(ll) Written Direct Expert Testimony (August 2010) and Affidavit (February 2012) on behalf of Fall-Line Alliance for a Clean Environment and others in the matter of the PSD Air Permit for Plant Washington issued by Georgia DNR at the Office of State Administrative Hearing, State of Georgia (OSAH-BNR-AQ-1031707-98-WALKER).

(mm) Deposition (August 2010) on behalf of Environmental Defense, in the matter of the remanded permit challenge to the proposed Las Brisas coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH).

(nn) Expert Report, Supplemental/Rebuttal Expert Report, and Declarations (October 2010, November 2010, September 2012) on behalf of New Mexico Environment Department (Plaintiff-Intervenor), Grand Canyon Trust and Sierra Club (Plaintiffs) in the matter of Plaintiffs v. Public Service Company of New Mexico (PNM), Civil No. 1:02-CV-0552 BB/ATC (ACE). (US District Court for the District of New Mexico).

(oo) Expert Report (October 2010) and Rebuttal Expert Report (November 2010) (BART Determinations for PSCo Hayden and CSU Martin Drake units) to the Colorado Air Quality Commission on behalf of Coalition of Environmental Organizations.

(pp) Expert Report (November 2010) (BART Determinations for TriState Craig Units, CSU Nixon Unit, and PRPA Rawhide Unit) to the Colorado Air Quality Commission on behalf of Coalition of Environmental Organizations.

(qq) Declaration (November 2010) on behalf of the Sierra Club in connection with the Martin Lake Station Units 1, 2, and 3. *Sierra Club v. Energy Future Holdings Corporation and Luminant Generation Company LLC*, Case No. 5:10-cv-00156-DF-CMC (US District Court for the Eastern District of Texas, Texarkana Division).

(rr) Pre-Filed Testimony (January 2011) and Declaration (February 2011) to the Georgia Office of State Administrative Hearings (OSAH) in the matter of Minor Source HAPs status for the proposed Longleaf Energy Associates power plant (OSAH-BNR-AQ-1115157-60-HOWELLS) on behalf of the Friends of the Chattahoochee and the Sierra Club).

(ss) Declaration (February 2011) in the matter of the Draft Title V Permit for RRI Energy MidAtlantic Power Holdings LLC Shawville Generating Station (Pennsylvania), ID No. 17-00001 on behalf of the Sierra Club.

(tt) Expert Report (March 2011), Rebuttal Expert Report (Jue 2011) on behalf of the United States in *United States of America v. Cemex, Inc.*, Civil Action No. 09-cv-00019-MSK-MEH (US District Court for the District of Colorado).

(uu) Declaration (April 2011) and Expert Report (July 16, 2012) in the matter of the Lower Colorado River Authority (LCRA)'s Fayette (Sam Seymour) Power Plant on behalf of the

Texas Campaign for the Environment. *Texas Campaign for the Environment v. Lower Colorado River Authority,* Civil Action No. 4:11-cv-00791 (US District Court for the Southern District of Texas, Houston Division).

(vv) Declaration (June 2011) on behalf of the Plaintiffs MYTAPN in the matter of Microsoft-Yes, Toxic Air Pollution-No (MYTAPN) v. State of Washington, Department of Ecology and Microsoft Corporation Columbia Data Center to the Pollution Control Hearings Board, State of Washington, Matter No. PCHB No. 10-162.

(ww) Expert Report (June 2011) on behalf of the New Hampshire Sierra Club at the State of New Hampshire Public Utilities Commission, Docket No. 10-261 – the 2010 Least Cost Integrated Resource Plan (LCIRP) submitted by the Public Service Company of New Hampshire (re. Merrimack Station Units 1 and 2).

(xx) Declaration (August 2011) in the matter of the Sandy Creek Energy Associates L.P. Sandy Creek Power Plant on behalf of Sierra Club and Public Citizen. *Sierra Club, Inc. and Public Citizen, Inc. v. Sandy Creek Energy Associates, L.P.,* Civil Action No. A-08-CA-648-LY (US District Court for the Western District of Texas, Austin Division).

(yy) Expert Report (October 2011) on behalf of the Defendants in the matter of *John Quiles and Jeanette Quiles et al. v. Bradford-White Corporation, MTD Products, Inc., Kohler Co., et al.,* Case No. 3:10-cv-747 (TJM/DEP) (US District Court for the Northern District of New York).

(zz) Declaration (February 2012) and Second Declaration (February 2012) in the matter of *Washington Environmental Council and Sierra Club Washington State Chapter v. Washington State Department of Ecology and Western States Petroleum Association,* Case No. 11-417-MJP (US District Court for the Western District of Washington).

(aaa) Expert Report (March 2012) and Supplemental Expert Report (November 2013) in the matter of *Environment Texas Citizen Lobby, Inc and Sierra Club v. ExxonMobil Corporation et al.,* Civil Action No. 4:10-cv-4969 (US District Court for the Southern District of Texas, Houston Division).

(bbb) Declaration (March 2012) in the matter of *Center for Biological Diversity, et al. v. United States Environmental Protection Agency,* Case No. 11-1101 (consolidated with 11-1285, 11-1328 and 11-1336) (US Court of Appeals for the District of Columbia Circuit).

(ccc) Declaration (March 2012) in the matter of *Sierra Club v. The Kansas Department of Health and Environment,* Case No. 11-105,493-AS (Holcomb power plant) (Supreme Court of the State of Kansas).

(ddd) Declaration (March 2012) in the matter of the Las Brisas Energy Center *Environmental Defense Fund et al., v. Texas Commission on Environmental Quality,* Cause No. D-1-GN-11-001364 (District Court of Travis County, Texas, 261st Judicial District).

(eee) Expert Report (April 2012), Supplemental and Rebuttal Expert Report (July 2012), and Supplemental Rebuttal Expert Report (August 2012) on behalf of the states of New Jersey and Connecticut in the matter of the Portland Power plant *State of New Jersey and State of Connecticut (Intervenor-Plaintiff) v. RRI Energy Mid-Atlantic Power Holdings et al.,* Civil Action No. 07-CV-5298 (JKG) (US District Court for the Eastern District of Pennsylvania).

(fff) Declaration (April 2012) in the matter of the EPA's EGU MATS Rule, on behalf of the Environmental Integrity Project

(ggg) Expert Report (August 2012) on behalf of the United States in connection with the Louisiana Generating NSR Case. *United States v. Louisiana Generating, LLC*, 09-CV100-RET-CN (Middle District of Louisiana) – Harm Phase.

(hhh) Declaration (September 2012) in the Matter of the Application of *Energy Answers Incinerator, Inc.* for a Certificate of Public Convenience and Necessity to Construct a 120 MW Generating Facility in Baltimore City, Maryland, before the Public Service Commission of Maryland, Case No. 9199.

(iii) Expert Report (October 2012) on behalf of the Appellants (Robert Concilus and Leah Humes) in the matter of Robert Concilus and Leah Humes v. Commonwealth of Pennsylvania Department of Environmental Protection and Crawford Renewable Energy, before the Commonwealth of Pennsylvania Environmental Hearing Board, Docket No. 2011-167-R.

(jjj) Expert Report (October 2012), Supplemental Expert Report (January 2013), and Affidavit (June 2013) in the matter of various Environmental Petitioners v. North Carolina DENR/DAQ and Carolinas Cement Company, before the Office of Administrative Hearings, State of North Carolina.

(kkk) Pre-filed Testimony (October 2012) on behalf of No-Sag in the matter of the North Springfield Sustainable Energy Project before the State of Vermont, Public Service Board.

(lll) Pre-filed Testimony (November 2012) on behalf of Clean Wisconsin in the matter of Application of Wisconsin Public Service Corporation for Authority to Construct and Place in Operation a New Multi-Pollutant Control Technology System (ReACT) for Unit 3 of the Weston Generating Station, before the Public Service Commission of Wisconsin, Docket No. 6690-CE-197.

(mmm) Expert Report (February 2013) on behalf of Petitioners in the matter of Credence Crematory, Cause No. 12-A-J-4538 before the Indiana Office of Environmental Adjudication.

(nnn) Expert Report (April 2013), Rebuttal report (July 2013), and Declarations (October 2013, November 2013) on behalf of the Sierra Club in connection with the Luminant Big Brown Case. *Sierra Club v. Energy Future Holdings Corporation and Luminant Generation Company LLC*, Civil Action No. 6:12-cv-00108-WSS (Western District of Texas, Waco Division).

(ooo) Expert Report (May 2013) and Rebuttal Expert Report (July 2013) on behalf of the Sierra Club in connection with the Luminant Martin Lake Case. *Sierra Club v. Energy Future Holdings Corporation and Luminant Generation Company LLC*, Civil Action No. 5:10-cv-0156-MHS-CMC (Eastern District of Texas, Texarkana Division).

(ppp) Declaration (August 2013) on behalf of A. J. Acosta Company, Inc., in the matter of A. J. Acosta Company, Inc., v. County of San Bernardino, Case No. CIVSS803651.

(qqq) Comments (October 2013) on behalf of the Washington Environmental Council and the Sierra Club in the matter of the Washington State Oil Refinery RACT (for Greenhouse

Gases), submitted to the Washington State Department of Ecology, the Northwest Clean Air Agency, and the Puget Sound Clean Air Agency.

(rrr) Statement (November 2013) on behalf of various Environmental Organizations in the matter of the Boswell Energy Center (BEC) Unit 4 Environmental Retrofit Project, to the Minnesota Public Utilities Commission, Docket No. E-015/M-12-920.

(sss) Expert Report (December 2013) on behalf of the United States in *United States of America v. Ameren Missouri*, Civil Action No. 4:11-cv-00077-RWS (Eastern District of Missouri, Eastern Division).

(ttt) Expert Testimony (December 2013) on behalf of the Sierra Club in the matter of Public Service Company of New Hampshire Merrimack Station Scrubber Project and Cost Recovery, Docket No. DE 11-250, to the State of New Hampshire Public Utilities Commission.

(uuu) Expert Report (January 2014) on behalf of Baja, Inc., in Baja, Inc., v. Automotive Testing and Development Services, Inc. et. al, Civil Action No. 8:13-CV-02057-GRA (District of South Carolina, Anderson/Greenwood Division).

(vvv) Declaration (March 2014) on behalf of the Center for International Environmental Law, Chesapeake Climate Action Network, Friends of the Earth, Pacific Environment, and the Sierra Club (Plaintiffs) in the matter of Plaintiffs v. the Export-Import Bank (Ex-Im Bank) of the United States, Civil Action No. 13-1820 RC (United States District Court for the District of Columbia).

(www) Direct Prefiled Testimony (June 2014) on behalf of the Michigan Environmental Council and the Sierra Club in the matter of the Application of DTE Electric Company for Authority to Implement a Power Supply Cost Recovery (PSCR) Plan in its Rate Schedules for 2014 Metered Jurisdictional Sales of Electricity, Case No. U-17319 (Michigan Public Service Commission).

(xxx) Expert Report (June 2014) on behalf of ECM Biofilms in the matter of the US Federal Trade Commission (FTC) v. ECM Biofilms (FTC Docket #9358).

(yyy) Declaration (July 2014) on behalf of Public Health Intervenors in the matter of EME Homer City Generation v. US EPA (Case No. 11-1302 and consolidated cases) relating to the lifting of the stay entered by the Court on December 30, 2011 (US Court of Appeals for the District of Columbia).

3. Occasions where Dr. Sahu has provided oral testimony <u>in depositions, at trial or in similar proceedings</u> include the following:

(zzz) Deposition on behalf of Rocky Mountain Steel Mills, Inc. located in Pueblo, Colorado – dealing with the manufacture of steel in mini-mills including methods of air pollution control and BACT in steel mini-mills and opacity issues at this steel mini-mill.

(aaaa) Trial Testimony (February 2002) on behalf of Rocky Mountain Steel Mills, Inc. in Denver District Court.

(bbbb) Trial Testimony (February 2003) on behalf of the United States in the Ohio Edison NSR Cases, *United States, et al. v. Ohio Edison Co., et al.*, C2-99-1181 (Southern District of Ohio).

(cccc) Trial Testimony (June 2003) on behalf of the United States in the Illinois Power NSR Case, *United States v. Illinois Power Co., et al.*, 99-833-MJR (Southern District of Illinois).

(dddd) Deposition (10/20/2005) on behalf of the United States in connection with the Cinergy NSR Case. *United States, et* al. *v. Cinergy Corp., et al.*, IP 99-1693-C-M/S (Southern District of Indiana).

(eeee) Oral Testimony (August 2006) on behalf of the Appalachian Center for the Economy and the Environment re. the Western Greenbrier plant, WV before the West Virginia DEP.

(ffff) Oral Testimony (May 2007) on behalf of various Montana petitioners (Citizens Awareness Network (CAN), Women's Voices for the Earth (WVE) and the Clark Fork Coalition (CFC)) re. the Thompson River Cogeneration plant before the Montana Board of Environmental Review.

(gggg) Oral Testimony (October 2007) on behalf of the Sierra Club re. the Sevier Power Plant before the Utah Air Quality Board.

(hhhh) Oral Testimony (August 2008) on behalf of the Sierra Club and Clean Water re. Big Stone Unit II before the South Dakota Board of Minerals and the Environment.

(iiii) Oral Testimony (February 2009) on behalf of the Sierra Club and the Southern Environmental Law Center re. Santee Cooper Pee Dee units before the South Carolina Board of Health and Environmental Control.

(jjjj) Oral Testimony (February 2009) on behalf of the Sierra Club and the Environmental Integrity Project re. NRG Limestone Unit 3 before the Texas State Office of Administrative Hearings (SOAH) Administrative Law Judges.

(kkkk) Deposition (July 2009) on behalf of MTD Products, Inc., in the matter of *Alice Holmes and Vernon Holmes v. Home Depot USA, Inc., et al.*

(llll) Deposition (October 2009) on behalf of Environmental Defense and others, in the matter of challenges to the proposed Coleto Creek coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH).

(mmmm) Deposition (October 2009) on behalf of Environmental Defense, in the matter of permit challenges to the proposed Las Brisas coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH).

(nnnn) Deposition (October 2009) on behalf of the Sierra Club, in the matter of challenges to the proposed Medicine Bow Fuel and Power IGL plant in Cheyenne, Wyoming.

(oooo) Deposition (October 2009) on behalf of Environmental Defense and others, in the matter of challenges to the proposed Tenaska coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH). (April 2010).

(pppp) Oral Testimony (November 2009) on behalf of the Environmental Defense Fund re. the Las Brisas Energy Center before the Texas State Office of Administrative Hearings (SOAH) Administrative Law Judges.

(qqqq) Deposition (December 2009) on behalf of Environmental Defense and others, in the matter of challenges to the proposed White Stallion Energy Center coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH).

(rrrr) Oral Testimony (February 2010) on behalf of the Environmental Defense Fund re. the White Stallion Energy Center before the Texas State Office of Administrative Hearings (SOAH) Administrative Law Judges.

(ssss) Deposition (June 2010) on behalf of the United States in connection with the Alabama Power Company NSR Case. *United States v. Alabama Power Company*, CV-01-HS-152-S (Northern District of Alabama, Southern Division).

(tttt) Trial Testimony (September 2010) on behalf of Commonwealth of Pennsylvania – Dept. of Environmental Protection, State of Connecticut, State of New York, State of Maryland, and State of New Jersey (Plaintiffs) in connection with the Allegheny Energy NSR Case in US District Court in the Western District of Pennsylvania. *Plaintiffs v. Allegheny Energy Inc., et al.*, 2:05cv0885 (Western District of Pennsylvania).

(uuuu) Oral Direct and Rebuttal Testimony (September 2010) on behalf of Fall-Line Alliance for a Clean Environment and others in the matter of the PSD Air Permit for Plant Washington issued by Georgia DNR at the Office of State Administrative Hearing, State of Georgia (OSAH-BNR-AQ-1031707-98-WALKER).

(vvvv) Oral Testimony (September 2010) on behalf of the State of New Mexico Environment Department in the matter of Proposed Regulation 20.2.350 NMAC – *Greenhouse Gas Cap and Trade Provisions,* No. EIB 10-04 (R), to the State of New Mexico, Environmental Improvement Board.

(wwww) Oral Testimony (October 2010) on behalf of the Environmental Defense Fund re. the Las Brisas Energy Center before the Texas State Office of Administrative Hearings (SOAH) Administrative Law Judges.

(xxxx) Oral Testimony (November 2010) regarding BART for PSCo Hayden, CSU Martin Drake units before the Colorado Air Quality Commission on behalf of the Coalition of Environmental Organizations.

(yyyy) Oral Testimony (December 2010) regarding BART for TriState Craig Units, CSU Nixon Unit, and PRPA Rawhide Unit) before the Colorado Air Quality Commission on behalf of the Coalition of Environmental Organizations.

(zzzz) Deposition (December 2010) on behalf of the United States in connection with the Louisiana Generating NSR Case. *United States v. Louisiana Generating, LLC*, 09-CV100-RET-CN (Middle District of Louisiana).

(aaaaa) Deposition (February 2011 and January 2012) on behalf of Wild Earth Guardians in the matter of opacity exceedances and monitor downtime at the Public Service Company of Colorado (Xcel)'s Cherokee power plant. No. 09-cv-1862 (D. Colo.).

(bbbbb) Oral Testimony (February 2011) to the Georgia Office of State Administrative Hearings (OSAH) in the matter of Minor Source HAPs status for the proposed Longleaf Energy Associates power plant (OSAH-BNR-AQ-1115157-60-HOWELLS) on behalf of the Friends of the Chattahoochee and the Sierra Club).

(ccccc) Deposition (August 2011) on behalf of the United States in *United States of America v. Cemex, Inc.*, Civil Action No. 09-cv-00019-MSK-MEH (US District Court for the District of Colorado).

(ddddd) Deposition (July 2011) and Oral Testimony at Hearing (February 2012) on behalf of the Plaintiffs MYTAPN in the matter of Microsoft-Yes, Toxic Air Pollution-No (MYTAPN) v. State of Washington, Department of Ecology and Microsoft Corporation Columbia Data Center to the Pollution Control Hearings Board, State of Washington, Matter No. PCHB No. 10-162.

(eeeee) Oral Testimony at Hearing (March 2012) on behalf of the United States in connection with the Louisiana Generating NSR Case. *United States v. Louisiana Generating, LLC*, 09-CV100-RET-CN (Middle District of Louisiana).

(fffff) Oral Testimony at Hearing (April 2012) on behalf of the New Hampshire Sierra Club at the State of New Hampshire Public Utilities Commission, Docket No. 10-261 – the 2010 Least Cost Integrated Resource Plan (LCIRP) submitted by the Public Service Company of New Hampshire (re. Merrimack Station Units 1 and 2).

(ggggg) Oral Testimony at Hearing (November 2012) on behalf of Clean Wisconsin in the matter of Application of Wisconsin Public Service Corporation for Authority to Construct and Place in Operation a New Multi-Pollutant Control Technology System (ReACT) for Unit 3 of the Weston Generating Station, before the Public Service Commission of Wisconsin, Docket No. 6690-CE-197.

(hhhhh) Deposition (March 2013) in the matter of various Environmental Petitioners v. North Carolina DENR/DAQ and Carolinas Cement Company, before the Office of Administrative Hearings, State of North Carolina.

(iiiii) Deposition (August 2013) on behalf of the Sierra Club in connection with the Luminant Big Brown Case. Sierra Club v. Energy Future Holdings Corporation and Luminant Generation Company LLC, Civil Action No. 6:12-cv-00108-WSS (Western District of Texas, Waco Division).

(jjjjj) Deposition (August 2013) on behalf of the Sierra Club in connection with the Luminant Martin Lake Case. Sierra Club v. Energy Future Holdings Corporation and Luminant Generation Company LLC, Civil Action No. 5:10-cv-0156-MHS-CMC (Eastern District of Texas, Texarkana Division).

(kkkkk) Deposition (February 2014) on behalf of the United States in *United States of America v. Ameren Missouri*, Civil Action No. 4:11-cv-00077-RWS (Eastern District of Missouri, Eastern Division).

(lllll) Trial Testimony (February 2014) in the matter of *Environment Texas Citizen Lobby, Inc and Sierra Club v. ExxonMobil Corporation et al.*, Civil Action No. 4:10-cv-4969 (US District Court for the Southern District of Texas, Houston Division).

(mmmmm) Trial Testimony (February 2014) on behalf of the Sierra Club in connection with the Luminant Big Brown Case. *Sierra Club v. Energy Future Holdings Corporation and Luminant Generation Company LLC*, Civil Action No. 6:12-cv-00108-WSS (Western District of Texas, Waco Division).

(nnnnn) Deposition (June 2014) and Trial (August 2014) on behalf of ECM Biofilms in the matter of the US Federal Trade Commission (FTC) v. ECM Biofilms (FTC Docket #9358).

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	)	
	)	PCB No. R15-21
	)	(Rulemaking- Air)
AMENDMENTS TO 35 ILL. ADM CODE	)	
PART 214, SULFUR LIMITATIONS, PART	)	
217, NITROGEN OXIDES EMISSIONS	)	
AND PART 225, CONTROL OF EMISSIONS	)	
FROM LARGE COMBUSTION SOURCES	)	

CERTIFICATE OF SERVICE

I, Faith E. Bugel, the undersigned, hereby certify that I have served Sierra Club and Environmental Law & Policy Center's Pre-Filed Questions upon:

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