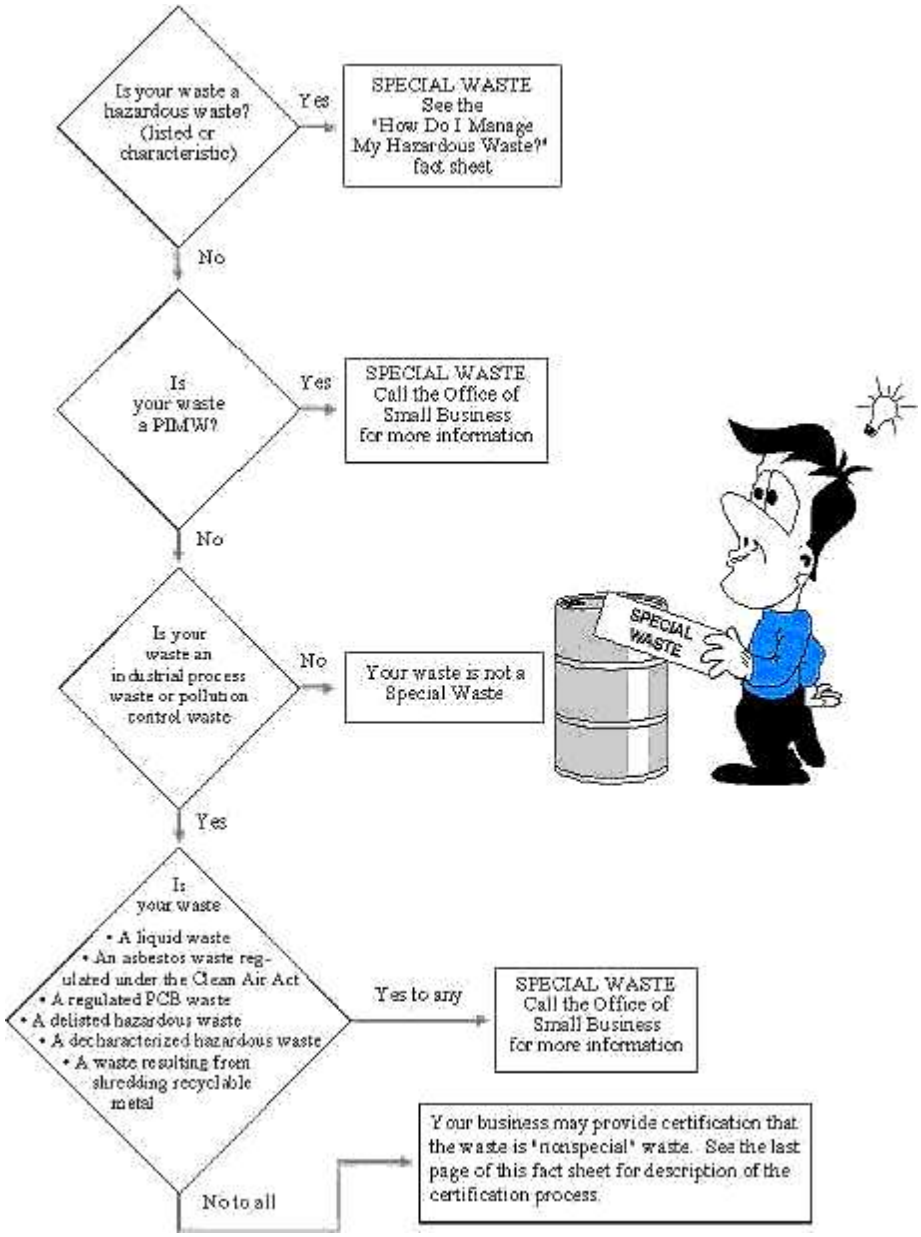

Nonspecial Waste Certification

Any industrial process wastes and pollution control wastes that are not hazardous and not liquid may be certified as nonspecial waste in Illinois and may be disposed of with your general refuse. In addition to these wastes, the containers that once held them may also be excluded from the definition of special waste if:

- The container no longer contains a liquid
- All wastes have been removed
- Any residue is less than 1 inch thick
- Any inner liner has been removed and disposed of as special waste

If you determine that the industrial process or pollution control waste that you generate is a "**nonspecial waste**", you may prepare a nonspecial waste certification. This certification must be made in writing and must be provided when requested by Illinois EPA, the waste transporter, the

disposal site, and any one else involved in managing the waste. If you do not make this written certification, the waste is still considered a special waste and must be managed as a special waste.

The information contained in this certification must include (as applicable):

- A description of the process that generated the waste
- **How** you determined the waste is not hazardous
- **How** you determined the waste is not a liquid, does not contain PCBs, asbestos, is not formerly hazardous waste rendered nonhazardous, and is not redded recyclable metals
- Any analytical results, or relevant MSDS
- An explanation as to why any analysis was not performed or required

If the process that generates the waste changes or the raw materials change, you must complete a new certification. Certifications must be signed, dated, and kept for at least 3 years after you stop operating the process that generates the certified nonspecial waste. The law provides stiff penalties for false certification.

Examples of Nonspecial Waste Certifications

No specific form is required for nonspecial waste certifications. Some example certifications are provided below.

John's Auto Body

123 Main Street

Roscoe, IL 61073

I certify that masking materials used when spray painting vehicles in my shop, including paper, plastic, and masking tape with paint overspray are not hazardous, not liquid, do not contain PCBs or asbestos, are not formerly hazardous , are not shredded recyclable metals, and are not special wastes. I determined that my wastes are not special wastes by looking at my MSDS. I also certify that discarded paint cans are empty and no longer contain any liquids. MSDS for paints are attached. 9-29-97

John R. Karr

[signature]

Owner

Mike's Machine Shop

2616 N.E. Adams St.

R 005739

Peoria, IL 61611

I certify that grit from grinding and metal grindings, shavings, turnings, and scrap resulting from machining various components are nonhazardous and nonliquid; do not contain asbestos or PCBs; are not formerly hazardous waste rendered nonhazardous; are not generated by shredding recyclable metals. Therefore, these are not special waste. 6 Nov. 1997

Michael W. Thomas

[signature]

Owner/Manager

(Analytical results attached)

What Do I Do Next?

Now that you have determined whether you generate a special waste, if you need additional assistance, please call the Office of Small Business at 1-888-EPA-1996 for more information about requirements that may apply to you.

SPECIAL WASTE (/EPA/TOPICS/WASTE-MANAGEMENT/WASTE-DISPOSAL/SPECIAL-WASTE/PAGES/DEFAULT.ASPX)

Do I Have a Special Waste? (/epa/topics/waste-management/waste-disposal/special-waste/Pages/do-i-have.aspx)

Non-Special Waste Certification (/epa/topics/waste-management/waste-disposal/special-waste/Pages/certification.aspx)

Hardous Waste Management (/epa/topics/waste-management/waste-disposal/special-waste/Pages/hazardous-waste-management.aspx)

ID number (/epa/topics/waste-management/waste-disposal/special-waste/Pages/id-number.aspx)

Transportation Permits (/epa/topics/waste-management/waste-disposal/special-waste/transportation-permits/Pages/default.aspx)

PIMW (/epa/topics/waste-management/waste-disposal/special-waste/Pages/pimw.aspx)

Policies

Policies and Disclaimers (/epa/Pages/policies-and-disclaimers.aspx)
Notice of Nondiscrimination (/epa/topics/environmental-justice/Pages/notice-of-nondiscrimination.aspx)
Notificación Sobre Actos Discriminatorios (/epa/topics/environmental-justice/es/Pages/notice-of-non-discrimination.aspx)

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Get Covered Illinois (https://getcoveredillinois.gov/)

(/)
Web Accessibility (http://www.dhs.state.il.us/page.aspx?item=32765)
State Phone Directory (https://cmsapps.illinois.gov/TeleDirectory)
State Agencies (/_layouts/15/FIXUPREDIRECT.ASPX?WebId=e0993042-42f2-4a0b-804e-6d1788289ff8&TermSetId=24819a58-6d26-4b89-ac19-a52b67bba01e&TermId=a8242ede-ac69-430d-a889-83152be52c50)
Illinois Privacy Info (/Pages/About/Privacy.aspx)

Governor JB Pritzker (/sites/gov)

Exhibit 26

Case Study

Development and Application of a Framework to Examine the Occurrence of Hazardous Components in Discarded Construction and Demolition Debris: Case Study of Asbestos-Containing Material and Lead-Based Paint

Jon Powell[1]; Pradeep Jain[2]; Ali Bigger[3]; and Timothy G. Townsend[4]

Abstract: Regulations that dictate the management of asbestos-containing materials (ACM) and lead-based paint (LBP) debris in the United States require these materials to be managed in a specific manner at the job site to reduce potentially hazardous exposure to site workers, and the disposal of the materials is regulated through notification and special handling requirements. However, management of ACM and LBP from residential projects are afforded some exemptions in U.S. regulations; thus, some quantity of these materials may be delivered to a disposal facility, thus representing a potential exposure concern for landfill workers because ACM and LBP cannot be detected through visual inspection. A novel characterization framework was developed to quantify the occurrence of ACM and LBP in discarded construction and demolition (C&D) debris. A total of 266 loads of debris and 307 samples of potential ACM were collected from 10 landfills in Georgia with a total of four detections of asbestos (frequency of 1.3%). A total of 487 painted surfaces of incoming waste were analyzed for lead using a handheld X-ray fluorescence device, with a total of 70 positive detections (defined as a concentration greater than 1 mg/cm^2). The mass of debris corresponding to the positive lead detections comprised a mass fraction of 1.4% of all waste that was sampled. The results represent the most extensive sampling and analysis of ACM and LBP in discarded C&D debris, demonstrating that the U.S. federal regulatory scheme for management of ACM and LBP are generally effective at limiting indiscriminate disposal of ACM and LBP. The results were also likely impacted by the timeframe of ACM and LBP use in the United States and the typical service life of construction materials that used ACM and LBP. The framework developed in this study can be applied at other disposal and recycling facilities to characterize other waste streams of interest that are difficult to assess through visual approximation such as specific metal alloys. **DOI:** 10.1061/(ASCE)HZ.2153-5515.0000266.

Author keywords: Waste characterization; Asbestos; Lead paint; Landfill; Construction debris; C&D debris; Worker exposure.

Introduction

Asbestos-Containing Material Historical Use and Current Disposal Considerations

Asbestos-containing materials (ACM) were once widely used in construction products because of favorable thermal insulating properties, resistance to corrosion, and tensile strength (Virta 2002). Reportedly more than 3,000 construction materials included ACM as a component (U.S. EPA 2013b). When inhaled, asbestos represents a significant human health hazard—exposure may occur in the workplace or in the home if asbestos becomes disturbed.

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In 1989, the United States Environmental Protection Agency issued a rule banning development of products that use ACM, but the rule was vacated in 1991—only bans addressing corrugated paper, rollboard, commercial paper, specialty paper, flooring felt, and any new uses remain in effect (U.S. EPA 2013c). Data from the U.S. Geological Survey show a significant decline in asbestos use and manufacture in the United States since the 1980s, but asbestos is still widely used in other countries such as China, India, and others as shown in Fig. S1 (Virta 2006; Virta et al. 2013).

Although the use of asbestos in the United States has declined substantially, the U.S. EPA (2013b) estimates approximately 840,000 public schools and public/commercial buildings have ACM present. Similarly, Fig. S2 presents the current U.S. housing inventory organized by construction year, which shows approximately 98 million houses were constructed during a period of ubiquitous asbestos use (1950 until 1980) in the United States (U.S. Census Bureau 2012). Thus, the information in Fig. S2 suggests that large quantities of ACM are still present in homes and therefore may be expected to be removed as older homes are renovated or demolished.

U.S. Federal regulations [National Emission Standards for Hazardous Air Pollutants (NESHAP)] dictate ACM management as part of demolition or renovation activities, generally requiring inspection to identify ACM, verification testing, and procedures to properly remove, containerize, transport, and dispose of ACM. This regulated ACM normally requires containing asbestos by double-bagging the material in polyethylene bags. NESHAP applies to commercial and industrial buildings but does not apply to single

family homes or residential buildings with four or fewer dwelling units (Code of Federal Regulations 2011). Once at a disposal facility, bagged asbestos is normally handled separately from other waste materials, with care taken to avoid directly compacting the material so asbestos fibers are not released.

Given that residential projects do not require the same containerizing and disposal requirements as commercial projects, the potential exists for ACM to be disposed of at landfills with no visual indicator (e.g., labeled bags) that the load contains ACM, thus representing a potential inhalation or ingestion hazard to landfill workers because no indication that the material requires special handling would be present. To date, no attempt has been made to estimate the amount of noncontainerized ACM that arrives at disposal facilities, thus the magnitude of this potential worker hazard is unknown.

Lead-Based Paint Debris and Disposal Considerations

Similar to asbestos, lead was a material once widely used as an ingredient in construction products because of its desirable properties (e.g., quick drying, durability, and moisture resistance). Risks associated with lead poisoning in children that might consume chipped paint, dust, or soil led the U.S. Consumer Product Safety Commission to ban the manufacture of paint containing more than 0.06% lead in 1978 [U.S. Department of Housing and Urban Development (HUD) 2013]. The U.S. Department of Housing and Urban Development (2001) estimates approximately 38 million homes contain lead-based paint (LBP), which is consistent with data (Fig. S2) showing the number of homes built during the time of heavy LBP usage.

In a disposal context, lead from LBP has been shown to have limited leachability under a variety of leaching settings (Wadanambi et al. 2008); thus, large-scale disposal of LBP in landfills (whether lined or unlined) may not be expected to produce excessive concentrations of lead within leachate. However, the management of large amounts of LBP debris with heavy equipment typical of disposal operations may result in large amounts of airborne particles with concentrations of lead greater than safe worker thresholds such as those defined by the U.S. Occupational Safety and Health Administration (OSHA). As a result, landfill workers may be exposed to lead via inhalation or ingestion, which has been observed in similar industrial work settings such as demolition sites (Reynolds et al. 1997; Johnson et al. 2000; Sen et al. 2002).

Like ACM, LBP debris generated from a residential setting is excluded from regulation as a hazardous waste and thus does not carry with it prescribed management requirements related to removal, containerizing, and disposal. Therefore, LBP generated from residential construction, demolition, or renovation projects can be disposed of in lined or unlined landfills. Although published examinations of airborne lead exposure at landfills has not been conducted, high exposure concentrations for construction and demolition site workers, including those not directly involved in lead abatement, have been reported (Sen et al. 2002; Tong et al. 2000). Examining the quantity of LBP debris delivered to landfills may serve as an indicator of potential exposure through inhalation or ingestion and can determine whether the need for additional precautions or evaluations are warranted.

Waste Characterization Study and Research Objectives

Measuring individual components of the discarded waste stream has been conducted at different scales for many years. The goals of a waste characterization study may include assessing performance of implemented waste management strategies and identifying recycling opportunities, among others (CalRecycle 2013a, b). Waste characterization studies may be conducted at varying frequencies depending on regulatory or program drivers and costs, e.g., every 5 years (Illinois Department of Commerce and Economic Opportunity 2009) and are normally performed over the course of two seasons to reflect climatic, commerce, and demographic changes (CalRecycle 2013c). These studies rely on visual observation to estimate composition of materials arriving at one or more waste handling facilities and by evaluating the composition on a volume or mass basis. This procedure is effective for characterizing bulk waste components, but the method is limited if materials such as ACM and LBP need to be characterized because these cannot be identified based on visual observation alone.

The objective of this study was to examine the quantity of ACM and LBP discarded at landfills as part of a larger C&D debris characterization study in Georgia. To meet the objective, a research plan consisting of two components was developed. First, to estimate the quantity of ACM and LBP, a sampling and analytical framework was developed so these materials could be properly characterized and the analytical data could be tied into a larger waste composition study. Second, the sampling plan was carried out as part of the statewide C&D debris characterization study. The resulting field and laboratory data were analyzed to estimate the quantity of ACM and LBP disposed at landfills in Georgia. A secondary objective of this research effort was to examine whether the discarded amounts of ACM and LBP were consistent with regulations that are more stringent for commercial-sized construction, demolition, and renovation projects and relatively relaxed for residential projects.

Materials and Methods

C&D Waste Characterization

A statewide C&D waste characterization study was conducted in Georgia (Beck 2010). During project planning, 10 landfills were identified that were distributed across different regions in Georgia to provide statewide representation. Two separate sampling events (one in the spring and one in the fall) at all sites were conducted to evaluate seasonal differences in waste composition.

A visual, volume-based C&D waste characterization study was conducted in general accordance with the California Integrated Waste Management Board (CIWMB) methodology (CIWMB 2006a). First, a waste load was selected for characterization based on a developed sampling plan and the waste origin and waste type as presented in Table 1. The load was then delivered to a designated area, and the field team visually characterized the material. The hauler of each waste load was asked about the origin (e.g., residential or nonresidential) and the activity type (e.g., demolition or renovation) of the load, and the results were recorded. Data reduction occurred following the completion of the study to convert the volumetric estimates of each material to a mass basis by using the appropriate unit weight conversion factors for each material

Table 1. C&D Waste Characterization Study Waste Origins and Activity Types

	Activity type		
Waste origin[a]	New construction	Demolition	Renovation
Residential	—	X	X
Nonresidential	—	X	X

Note: Activity types targeted for ACM and LBP sampling are marked with an X.
[a]Roofing and other C&D sources were included but were not identified by activity type.

(U.S. EPA 1997; Townsend 2000; CIWMB 2006b). The characterization of ACM and LBP was conducted in parallel with the overall C&D waste characterization.

ACM and LBP Sampling Plan Development

A bottom-up framework was developed as part of this research to characterize and quantify the amount of ACM and LBP discards in the C&D stream. ACM and LBP characterization was conducted at five landfills in the first sampling event (March 2009) and five landfills in the second sampling event (September 2009). Table 1 identifies the different waste origin activity types that were part of the overall C&D study that were specifically targeted for ACM and LBP sampling—new construction loads were not sampled for ACM or LBP because the use of asbestos and lead paint in new construction materials is very limited as described previously. Fig. 1 provides a flowchart depicting the ACM and LBP sampling procedure that was developed and used during the project. First, trained personnel visually evaluated each targeted load for the presence of suspect ACM or painted debris. Next, any suspected ACM was sampled and containerized for future laboratory analysis. Last, any painted debris was analyzed in the field. A visual estimate of each sampled component was made for future integration in the overall characterization study. More details on the specific methodologies for ACM and LBP characterization are provided subsequently.

ACM Sampling Methods and Data Evaluation

Because ACM cannot be identified based on visual inspection alone, a variety of resources (U.S. EPA 1985, 1990, 2013d; OSHA 1995; EMSL 2009; Fibertec 2009; Prolab 2009) were used to develop a sampling plan and list of suspected ACM including material categories and specific materials that fit into each category. The resultant materials list and sampling procedures were incorporated into a field form (Figs. S3 and S4) to facilitate consistent identification of materials that should be sampled and tested for asbestos and to document the amount of the sampled materials. Care was taken to develop the form in a manner to allow future incorporation into the broader C&D characterization so field-estimated volumes could be later converted to a mass basis.

Once an incoming targeted load was identified, all materials listed as *suspect ACM* in the field form were identified in a given load and classified as follows: (1) bagged ACM; (2) unbagged Category I nonfriable, defined as asbestos-containing packing, gasket, resilient floor covering, or asphalt roofing product; (3) unbagged Category II nonfriable, which are materials that are generally more susceptible to becoming friable; and (4) unbagged regulated ACM. Suspect ACM were then sampled by an Asbestos Hazard Emergency Response Act-licensed asbestos inspector; bagged ACM was not sampled because it was assumed to contain asbestos.

Fig. 2 presents detailed procedures used to sample asbestos during the characterization effort. Collected samples were sent to a National Voluntary Laboratory Accreditation Program (NVLAP) accredited laboratory for asbestos analysis using polarized light microscopy (PLM). Laboratory testing was required to confirm the presence of asbestos because asbestos cannot be detected based on visual inspection alone. Fig. S5 includes a photograph of suspected ACM collected in the field and a magnified view provided

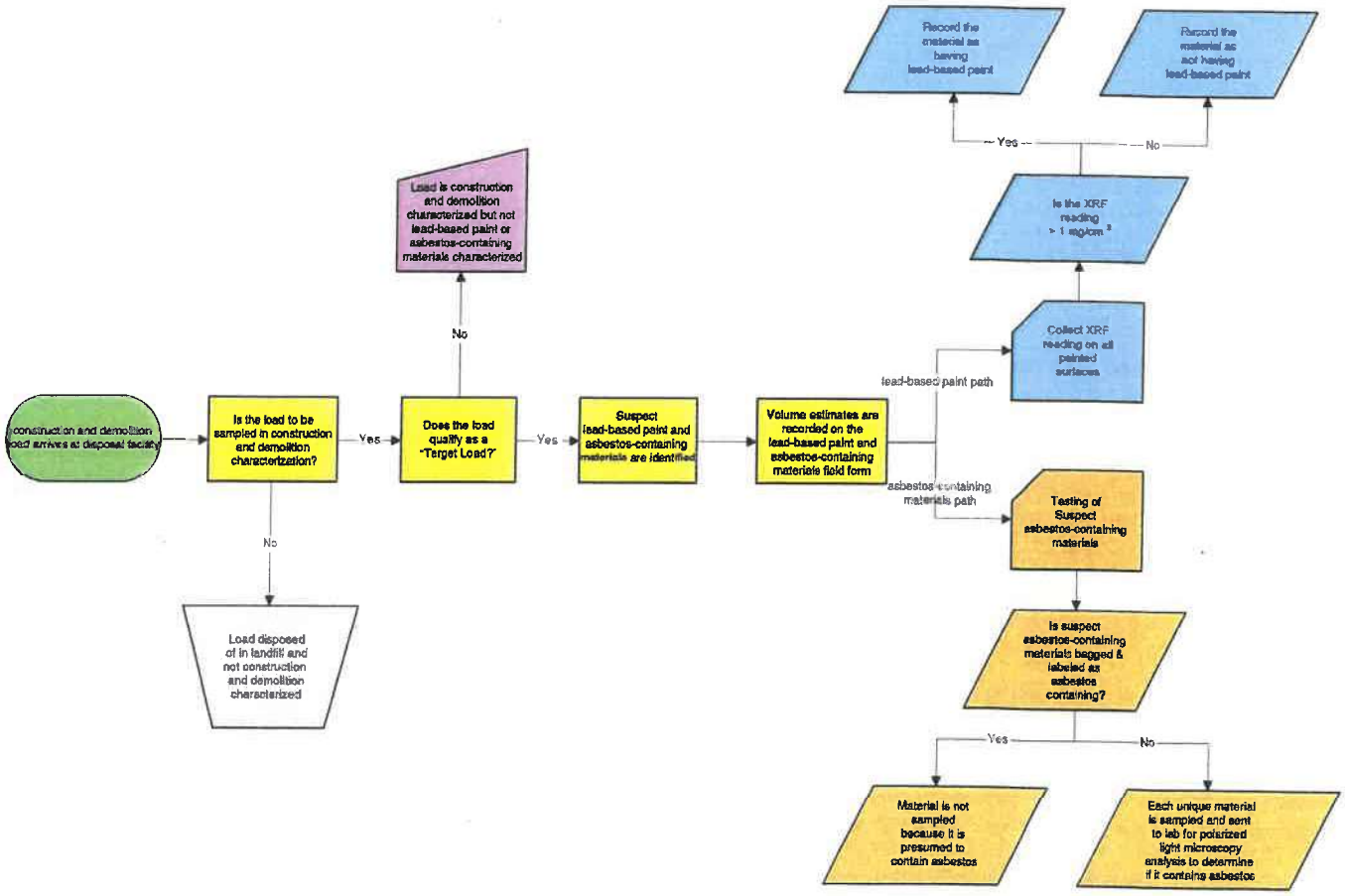

Fig. 1. ACM and LBP characterization flow chart demonstrating the decision making and sampling process

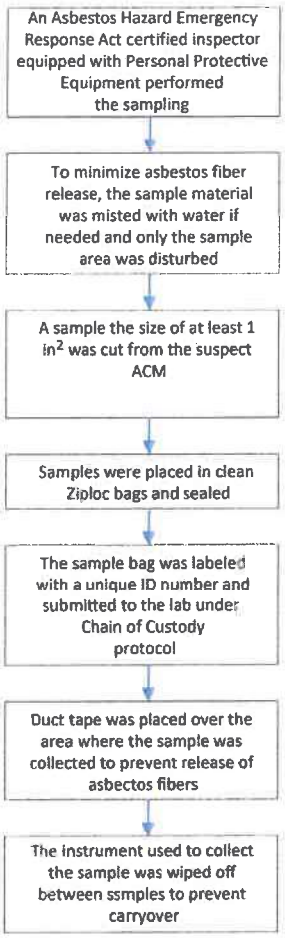

Fig. 2. ACM sampling procedure flowchart

by the laboratory—the sample in Fig. S5 tested positive for asbestos. The method to estimate volume of potential ACM was consistent with the CIWMB (2006a) methodology used in the broader C&D characterization study.

LBP Testing Method and Data Evaluation

Similar to ACM, LBP cannot be identified by visual inspection alone; thus, a sampling and testing plan was developed to allow confirmation of suspected LBP. To maintain consistency with the documentation methods of the broader C&D characterization study, an LBP sampling field form (Figs. S3 and S4) was created to record information about all sampled loads.

All painted surfaces were tested in accordance with ASTM E1729 (ASTM 2005) and U.S. HUD (1997) by a certified lead abatement worker. Sampling was conducted using a portable X-ray fluorescence (XRF) device (Thermo Scientific NITON 300/700 Series, Atlanta, Georgia) that provided a lead concentration per unit area (mg/cm^2).

The XRF instrument was factory calibrated, and field calibration checks were conducted before and after each startup and turn-off event, respectively, to ensure accurate instrument response. A representative sample location was selected for each painted material tested, defined as areas where the paint appeared to be average to above average in thickness relative to the rest of the painted surface. Fig. 3 provides a photograph demonstrating the use of the XRF device on painted debris. At least one XRF

Fig. 3. Certified lead abatement worker XRF testing a painted surface during waste characterization study

measurement was taken on each type of painted debris identified in the load. In cases in which multiple layers of paint appeared to be present, the top surface was scraped off so that the underlying surface(s) could also be tested with the XRF.

Measurement results with a lead concentration ≥1 mg/cm^2 were identified as a positive result for lead based on U.S. HUD (1997). The fraction of each painted material type that is lead-based and the fraction of painted material that is not lead-based was visually quantified (volume basis) based on CIWMB (2006a) methodology. Procedures to estimate the volume of LBP discovered within the targeted loads were based on the same method used to visually characterize the C&D stream (CIWMB 2006a).

Results

Of 364 incoming C&D loads (1,731 t of material) evaluated over the duration of the ACM and LBP testing portion of study, 266 loads (1,292 t of material) were identified as targeted loads (i.e., originating from demolition, renovation, roofing, and other C&D sources).

ACM Testing

Of the 266 targeted loads, 182 loads contained suspected ACM, and a total of 307 samples were collected for laboratory analysis. The most commonly sampled materials were composition roofing, painted/demolition gypsum, and remainder or composite C&D (generally, this corresponds to C&D that does not fit into the other material types). Composition roofing and painted/demolition gypsum were frequently sampled because of the potential presence of asbestos in the various roofing materials or in joint compound affixed to gypsum. The remainder/composite material type was frequently sampled primarily because of the large number of material subcategories (25) relative to the other material types.

Of the 307 samples collected for asbestos analysis, a total of 15 detections of asbestos were reported by the laboratory. Of the 15 detections, four samples had a reported asbestos content greater than 1%—Table 2 summarizes the sampling and analysis statistics. As shown in Fig. 4, the frequency of collected samples that met the definition of ACM was 1.3% overall—when converted to a weight basis, approximately 0.2% of all incoming material in the targeted loads met the definition of ACM.

Table 2. Summary of ACM Sample Count, Detection Frequency, and Corresponding Mass

Data category	Number	Mass (short ton)
Loads arriving during sampling	364	1,731
Samples collected	307	—
Samples with asbestos detection	15	2.6
Samples with detection >1% asbestos	4	0.4

Among the samples that exhibited a detection of asbestos (Fig. 5), 94% (weight basis) of materials originated from residential projects, with 63% corresponding to demolition activities and 31% derived from renovation activities. The material type and subcategory that exhibited the most frequent asbestos detection was painted/demolition gypsum, and wallboard and joint compound, consistent with the reported wide use of asbestos in these materials (U.S. EPA 1985, 1990, 2013a). The weight of asbestos (0.2%) reported corresponds to the entire material; for example, if a piece of drywall was sampled and exhibited a positive detection of asbestos, the entire mass of the drywall was counted in the weight estimate. Thus, the actual mass of asbestos is expected to be far less than 0.2%.

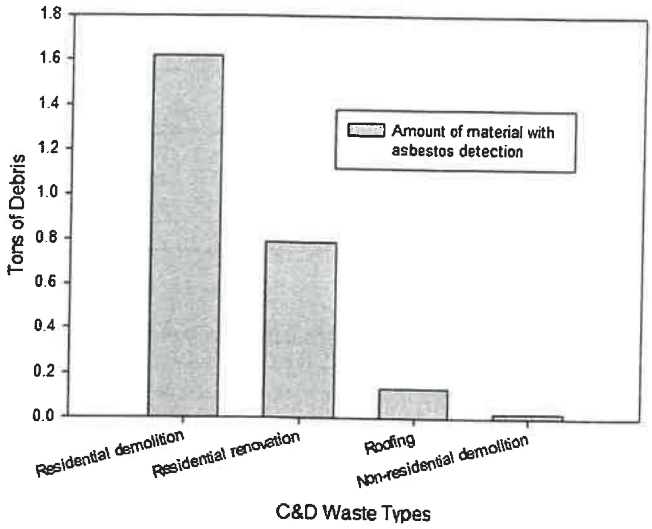

Fig. 5. Breakdown of activity types and corresponding mass of material testing positive for the detection of asbestos

LBP Results

Of the 266 targeted loads for LBP sampling, a total of 37 loads contained at least one piece of painted debris. A total of 487 unique painted surfaces were tested with the XRF device—the most commonly painted material types (in descending order) included painted/stained wood, painted/stained gypsum, and remainder/composite C&D debris. A summary of the sample count, detection frequency, and corresponding mass for the LBP evaluation is presented in Table 3. Of the 487 painted surfaces that were tested, a total of 70 samples (14.4%) exhibited a lead concentration greater than or equal to 1 mg/cm^2 as shown in Fig. 6. On a mass basis, 18 t of debris (of the total sampled weight from targeted loads of 1,292 t) tested positive for LBP, or 1.4%. When accounting for the total mass of all loads that were characterized during the overall characterization study (i.e., new construction, demolition, and renovation loads), the fraction of material considered to be lead-based was approximately 1.0%.

On a mass basis, painted/stained wood was the greatest contributor to the LBP detections (59%), with detections ranging from 1.0 to 14.6 mg/cm^2, with approximately 82% of positive detections less than 5.0 mg/cm^2. Additional material types that exhibited detections of LBP included painted concrete, painted remainder/composite C&D debris, and painted/demolition gypsum as shown in Fig. 6.

Residential projects contributed the greatest proportion (15.6 t, 85% by weight) of materials that tested positive for LBP (Fig. 7), with the demolition activity type contributing the most (11.7 t). Overall, the incidence of LBP detections was very low, and the greatest frequency of detections was observed in loads mass of the entire piece of debris, not the mass of actual lead paint.

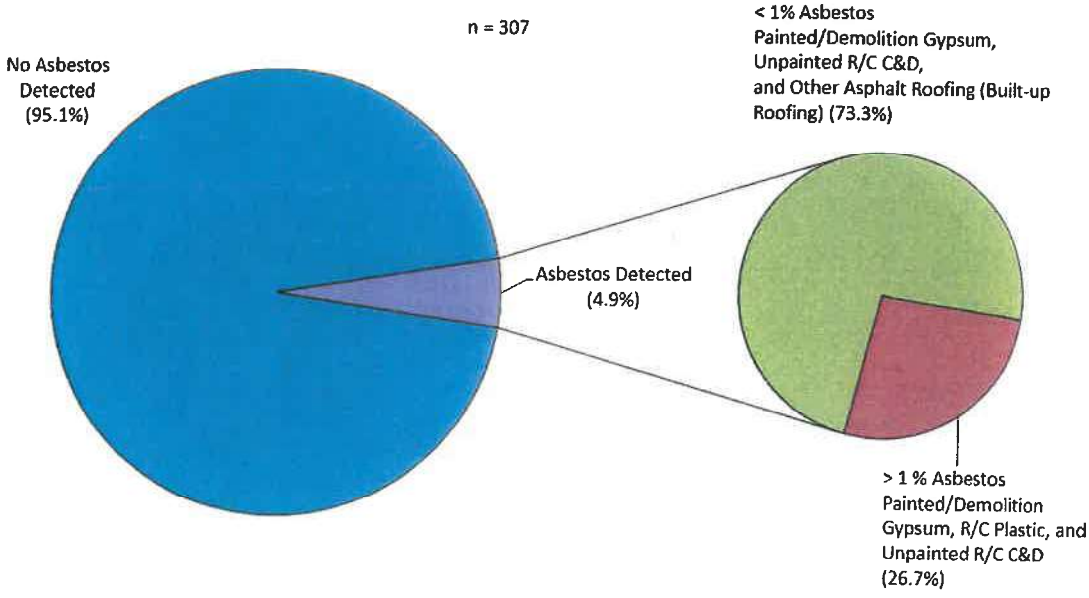

Fig. 4. Materials from demolition, renovation, roofing, and other C&D sources where asbestos was detected ($n = 307$)

Table 3. Summary of Lead-Based Paint Sample Count, Detection Frequency, and Corresponding Mass

Material subcategory	Number	Mass (short ton)
Loads arriving while XRF is on site	364	1,731
Loads from targeted activity types	266	1,292
Surfaces tested	487	165
Surfaces with lead measurement ≥ 1 mg/cm^2	70	18

For example, in the case in which a piece of painted wood showed a detection of lead greater than 1 mg/cm^2, the entire piece of debris was counted as a detection. Thus, the actual mass of lead paint in the debris is expected to comprise much less than 1.4% of the total mass of material sampled.

Conclusions

A framework was developed to evaluate the incidence of ACM and LBP in discarded C&D debris at landfills in Georgia. The framework used an aggressive approach to evaluating the potential incidence of these materials by creating a form and a series of field procedures to specify a wide range of potential materials that may have asbestos or lead paint. Furthermore, the framework was developed to allow integration with a waste characterization method that has been commonly used at large-scale characterization projects throughout the United States. Thus, the approach used in this study can be adapted to other waste characterization projects to examine asbestos, lead, and potentially other waste constituents that cannot be identified visually (e.g., targeted scrap metal alloys).

The framework deployed as part of the statewide characterization study showed limited detections of asbestos and lead. On a mass basis, approximately 0.2% and 1.4% of characterized loads consisted of ACM and LBP, respectively; and the actual mass of asbestos and lead is expected to be much less than these figures. In the case of asbestos and lead, residential projects contributed overwhelmingly to positive detections, at 94% and 85%, respectively. Based on data reported by the U.S. Census Bureau (2012) regarding age of the current home inventory and the statistics

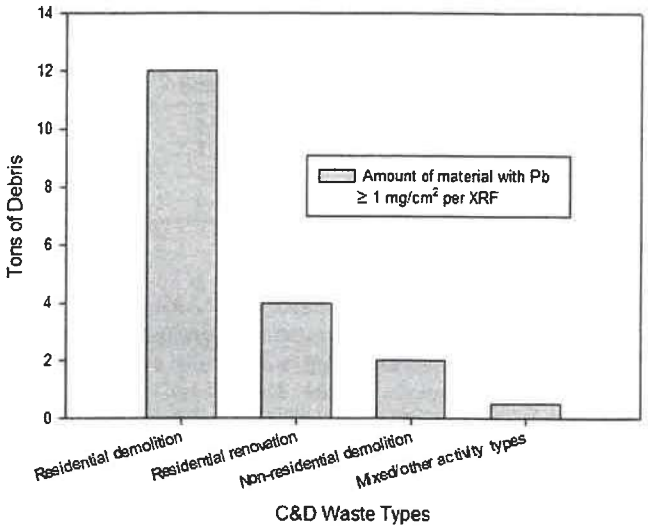

Fig. 7. Breakdown of activity types and corresponding mass of material testing positive for LBP (≥1 mg/cm^2)

regarding asbestos and lead usage in products, one cannot conclude that the low incidence of these materials was simply a function of the fact that asbestos and lead are no longer used in construction materials. Rather, a significant amount of material is expected to be in service; thus, it is expected that ACM and LBP debris will continue to be generated as part of residential and larger commercial demolition and renovation projects in the future.

The results suggest that rules in place in Georgia (Environmental Protection Division 2001, 2006), which are similar to asbestos and lead-related rules in other states in the United States in terms of disposal requirements, are effective in appropriately routing ACM and LBP containing waste at the point of generation from nonresidential renovation and demolition projects. Although waste material loads originating from new construction projects were not sampled, the likelihood of these loads containing ACM or LBP is limited because of data showing the use of these materials in new construction materials is extremely limited.

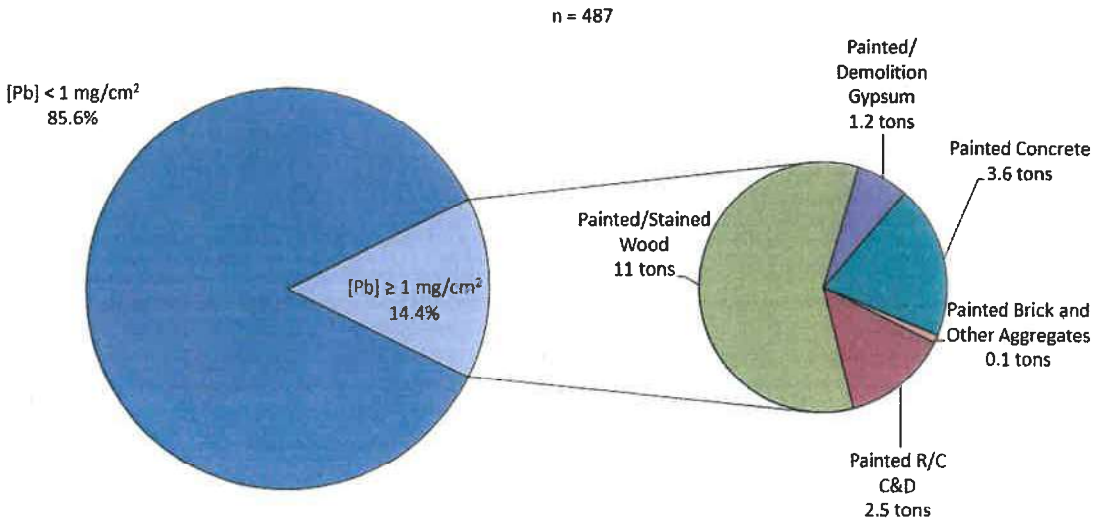

Fig. 6. Demolition, renovation, roofing, and other C&D sources: fraction of samples testing positive for LBP and corresponding material types ($n = 487$)

Because the characterization study was conducted at disposal facilities, the results cannot necessarily be applied to facilities that recycle C&D debris. Although there is no evidence to suggest that incoming waste at a C&D recycling facility would be more likely to contain ACM or LBP, future work may consider examining the incidence of these materials to provide field data to support this conclusion. An argument could be made that if similar incidence of ACM and LBP were found in C&D debris arriving at C&D recycling facilities, then workers may be at greater exposure risk because recycling facility personnel are normally in closer contact with the waste materials when compared to a landfill, where workers are typically located inside of heavy equipment.

From a human health perspective, despite the limited detections of ACM and LBP, it cannot be determined whether an unacceptable exposure risk to landfill workers (e.g., inhalation or ingestion) exists based on the results in this study. The results indicate that the overall contribution in terms of incrementally increased risk would be limited, because the quantity of ACM and LBP observed in this study was so low. Although the landfill industry is not specifically regulated by OSHA with respect to airborne asbestos or lead levels, future work may focus on a sampling program to evaluate these levels to examine whether undue risks are present so that recommended personal protective equipment practices can be specified based on actual measured risks.

More broadly, the results suggest that the confluence of rules and policy in the United States regarding ACM and LBP management may serve as a model for other developing countries that still actively use these materials. Even after restrictions are placed on the use of particular hazardous materials (ACM and LBP, for example), the historical use of the materials creates a long-term risk problem because building materials may be in place for a few years or several decades. From a disposal facility worker perspective, this research demonstrated that with effective restrictions on disposal of ACM and LBP at the point of generation (i.e., the construction site), the risk to landfill workers—as reflected by low incidence of detected ACM and LBP—can be mitigated. In the absence of effective upstream rules that regulate ACM or LBP removal and disposal activities, landfill workers may be subject to unacceptable exposure risk to these materials, particularly when considering typical landfilling activities that can pulverize and create airborne particles containing harmful components.

Acknowledgments

This work was funded by the Georgia Department of Natural Resources (DNR), Sustainability Division. Contributions of Roy Edwards (Georgia DNR), Abby Goldsmith (SAIC), Veronica Roof (SAIC), Cascadia Consulting Group, and Brett Tooley in reviewing a portion of the data collected are acknowledged.

Supplemental Data

Figs. S1–S5 are available online in the ASCE Library (www.ascelibrary.org).

References

ASTM. (2005). "Standard practice for field collection of dried paint samples for subsequent lead determination." *E1729*, West Conshohocken, PA.

Beck, R. W. (2010). *Statewide construction and demolition debris characterization study*, Georgia Dept. of Natural Resources, Sustainability Div., Atlanta.

CalRecycle (California Department of Resources Recycling and Recovery). (2013a). "2014 waste characterization study." Sacramento, CA. ⟨http://www.calrecycle.ca.gov/wastechar/2014Study.htm⟩ (Oct. 18, 2013).

CalRecycle (California Department of Resources Recycling and Recovery). (2013b). "Collecting your own solid waste characterization data: CalRecycle uniform waste disposal characterization method." Sacramento, CA. ⟨http://www.calrecycle.ca.gov/wastechar/YourData.htm⟩ (Oct. 18, 2013).

CalRecycle (California Department of Resources Recycling and Recovery). (2013c). "Waste characterization studies." Sacramento, CA. ⟨http://www.calrecycle.ca.gov/wastechar/WasteStudies.htm⟩ (Oct. 18, 2013).

CIWMB (California Integrated Waste Management Board). (2006a). *Method of visual characterization of disposed waste from construction and demolition activities*, Sacramento, CA.

CIWMB (California Integrated Waste Management Board). (2006b). *Targeted statewide waste characterization study: Detailed characterization of construction and demolition waste*, Sacramento, CA.

Code of Federal Regulations. (2011). "National emission standard for asbestos." *40 CFR Part 61*.

EMSL. (2009). "Field sampling guide (asbestos in bulk materials by PLM)." ⟨http://www.emsl.com/PDFDocuments/SamplingGuide/PLM.pdf⟩ (Feb. 17, 2009).

Environmental Protection Division. (2001). *Georgia's lead-based paint waste disposal requirements, georgia department of natural resources*, Environmental Protection Div., Lead-Based Paint and Asbestos Program, Atlanta.

Environmental Protection Division. (2006). *Chapter 391-3-14: Asbestos removal and encapsulation*, Georgia Dept. of Natural Resources, Atlanta.

Fibertec. (2009). "Asbestos sampling guide." ⟨http://www.fibertec-usa.com/asbestos_sampling_guide.pdf⟩ (Jan. 5, 2015).

Illinois Dept. of Commerce and Economic Opportunity. (2009). *Illinois commodity/waste generation and characterization study*, CDM, Springfield, IL.

Johnson, J. C., Reynolds, S. J., Fuortes, L. J., and Clarke, W. R. (2000). "Lead exposure among workers renovating a previously deleaded bridge: Comparisons of trades, work tasks." *AIHA J.*, 61(6), 815–819.

OSHA (Occupational Safety and Health Administration). (1995). "Polarized light microscopy of asbestos." *T-ID191-FV-01-9502-PM*, U.S. Dept. of Labor, Occupational Safety and Health Administration, Branch of Physical Measurements and Analysis, Salt Lake City.

Prolab. (2009). "Professional asbestos test kit." Weston, FL, ⟨http://www.prolabinc.com/instructions/asbestos.html⟩ (Feb. 27, 2009).

Reynolds, S. J., Fuortes, L. J., Garrels, P., Whitton, N. L., and Sprince, N. L. (1997). "Lead poisoning among construction workers renovating a previously deleaded bridge." *Am. J. Ind. Med.*, 31(3), 319–323.

Sen, D., Wolfson, H., and Dilworth, M. (2002). "Lead exposure in scaffolders during refurbishment construction activity—An observational study." *Occup. Med.*, 52(1), 49–54.

Tong, S., von Shirnding, Y. E., and Prapaontol, T. (2000). "Environmental lead exposure: A public health problem of global dimensions." *Bull. World Health Organ.*, 78(9), 1068–1077.

Townsend, T. (2000). *Converting C&D debris from volume to weight: A fact sheet for C&D debris facility operators*, Univ. of Florida, Gainesville, FL.

U.S. Census Bureau. (2012). "Statistical abstract of the United States: 2012, Table 988." *Housing units—Characteristics by tenure and region: 2009*, Washington, DC.

U.S. HUD (U.S. Department of Housing and Urban Development). (1997). "Chapter 7: Lead-based paint inspection." *Guidelines for the evaluation and control of lead-based paint hazards in housing*, Washington, DC.

U.S. HUD (U.S. Department of Housing and Urban Development). (2001). "National survey of lead and allergens in housing." *Analysis of lead hazards*, Vol. I, Office of Lead Hazard Control, Washington, DC.

U.S. HUD (U.S. Department of Housing and Urban Development). (2013). "About lead-based paint." ⟨http://1.usa.gov/MmuB7x⟩ (Oct. 17, 2013).

U.S. EPA. (1985). "Guidance for controlling asbestos-containing materials in buildings." *EPA 560/585-024*, Office of Pesticides and Toxic Substances, Washington, DC.

U.S. EPA. (1990). *Managing asbestos in place: A building owner's guide to operations and maintenance programs for asbestos-containing materials*, Office of Pesticides and Toxic Substances, Washington, DC.
U.S. EPA. (1997). "Measuring recycling: A guide for state and local governments." *EPA530-R-97-011*, Washington, DC.
U.S. EPA. (2013a). "Asbestos containing materials." Washington, DC. ⟨http://www.epa.gov/region6/6pd/asbestos/asbmatl.htm⟩ (Oct. 25, 2013).
U.S. EPA. (2013b). "Asbestos—General." Washington, DC. ⟨http://1.usa.gov/176xRyi⟩ (Oct. 18, 2013).
U.S. EPA. (2013c). "Asbestos: Top 20 frequently asked questions." Washington, DC. ⟨http://bit.ly/17RfiaL⟩ (Oct. 18, 2013).
U.S. EPA. (2013d). "SW-846 on-line." Chapter 9, Washington, DC. ⟨http://www.epa.gov/osw/hazard/testmethods/sw846/online/⟩ (Nov. 6, 2013).
Virta, R. L. (2002). "Asbestos: Geology, mineralogy, mining and uses." *Open-File Rep. 02149*, U.S. Geological Survey, Reston, VA.
Virta, R. L. (2006). *Worldwide asbestos supply and consumption trends from 1900 through 2003*, U.S. Geological Survey, Reston, VA.
Virta, R. L., Kraft, R. H., and Wallace, G. J. (2013). *2012 minerals yearbook asbestos [advance release]*, U.S. Geological Survey, Reston, VA.
Wadanambi, L., Dubey, B., and Townsend, T. (2008). "The leaching of lead from lead-based paint in landfill environments." *J. Hazard. Mater.*, 157(1), 194–200.

Pieces of burnt and bent metal lay on the ground as fire crews were called to General Iron Industries in the 1900 north block of Clifton Avenue Monday after a "major explosion," Ald. Brian Hopkins (2nd) said on May 18, 2020.

COLIN BOYLE/BLOCK CLUB CHICAGO

SOUTH CHICAGO, EAST SIDE

Explosion, City Shutdown Won't Stop State EPA From Letting General Iron Move To East Side

The Illinois Environmental Protection Agency cannot deny a permit "based upon allegations that a source is violating" the permit's requirements, a spokesperson said.

MAY 26, 2020 8:30AM CDT

Maxwell Evans

EAST SIDE — Last week's explosions that led to General Iron's indefinite closure will not impact the state's permit review for the company's planned move to East Side.

Last week, the metal scrapper at 1909 N. Clifton Ave. was shut down and fined $6,000 for violati state pollution standards during the explosions.

The initial blast occurred in a $2 million piece of pollution-limiting equipment installed after a 2018 citation for excessive air emissions.

General Iron plans to relocate to 11600 S. Burley Ave. by the end of the year after promising to leave the North Side last fall. Before the move, the Illinois Environmental Protection Agency must first issue an "air pollution control construction permit."

"Past or ongoing compliance issues must be addressed through the [IEPA's] compliance and enforcement programs," not the permit review process, according to IEPA spokesperson Kim Biggs.

"This stems from past court rulings holding that permitting is no substitute for enforcement," Biggs said. "The Agency must not deny or condition a permit decision based upon allegations that a source is violating, or has violated, applicable requirements."

The explosion and shutdown came just four days after an IEPA hearing on General Iron's permit application, where more than 20 residents spoke against the planned move.

Public input can't stop the IEPA from issuing a permit either, though officials have said they "may make changes to the permit based upon the comments."

General Iron "has shown time and time and again that they are irresponsible," East Side environmental activist Gina Ramirez said. "We don't need that carelessness on the Southeast Side putting our lives at risk."

After the explosions, members of the Southeast Environmental Task Force and the Southeast Side Coalition to Ban Petcoke — the latter of which Ramirez co-chairs — issued a short statement: "Don't bring that mess down here."

In an interview with Block Club, East Side Ald. Susan Sadlowski Garza (10th) criticized former Mayor Rahm Emanuel for negotiating a "backroom deal" to allow General Iron's continued operation despite

its checkered past.

"In light of the explosions, I'm more angry that things get shipped down here without letting us have a say in it whatsoever," she said. "We're the ones who have to live in it, who have to breathe the air."

Reserve Management Group owns General Iron and South Shore Recycling, which is adjacent to the Burley Avenue site where General Iron plans to relocate.

RMG "has been in my ward 28 years without incident," Sadlowski Garza said, but she isn't certain General Iron will operate safely in her ward.

The scrapper's agreement with city officials to leave the North Side followed a 2015 fire, a 2016 city-ordered shutdown, a 2017 harassment lawsuit and the 2018 citation for excessive emissions.

"I'm not against recycling, but there has to be a way that we can recycle cleanly and safely, she said. "With the track record of General Iron, I'm not so sure that that can be done."

Credibility Indicators

These are selected by the writer and confirmed by the editor

Original Reporting +

Sources Cited +

Learn more about Civil's Credibility Indicators

DOWNTOWN

Expect Masks, Temperature Checks: Chicago Schools Chief Offers New Details About Fall

Chicago remains "committed" to its start date of Sept. 8, the day after Labor Day, Chicago schools chief Janice Jackson wrote.

Cb **Cassie Walker Burke, Chalkbeat Chicago**

JUN 13, 2020 10:55AM CDT

JEFFERSON PARK, PORTAGE PARK

Hundreds March To Support Black Lives Matter On Northwest Side, But Ald. Gardiner Dodges Protesters: 'He's Been Completely Silent'

Protesters wanted to convince Ald. Jim Gardiner to support a Civilian Police Accountability Council — but he avoided protesters and dodged their questions after the march.

Bob Chiarito

JUN 12, 2020 10:46PM CDT

WICKER PARK, BUCKTOWN, WEST TOWN

Ipsento Coffee Shuts Down Bucktown Shops After Staffers Call For Boycott, Demand Support Of Black Lives Matter

The employees protested after the shop's owner demanded they remove signs supporting Black Lives Matter earlier this week.

Hannah Alani

JUN 12, 2020 6:30PM CDT

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From: "Frost, Brad" <Brad.Frost@Illinois.gov>
Date: Friday, June 5, 2020 at 7:53 AM
To: Nancy Loeb <n-loeb@northwestern.edu>, "Geertsma, Meleah" <mgeertsma@nrdc.org>, "EXT Harley, Keith" <kharley@kentlaw.iit.edu>
Cc: "Guy, Jeff" <Jeff.Guy@Illinois.gov>
Subject: RE: [External] Make a comment at the General Iron VIRTUAL HEARING

Nancy,

Under the Illinois EPA's enabling authority, we are required to issue a permit to an applicant upon proof that the proposed facility or equipment will not cause a violation of the Environmental Protection Act or the Pollution Control Board's Subtitle B air pollution regulations. See Section 39 (a). Under this standard, Agency review does not look to past practices or conduct at the source (or the same source at another location) but, rather, considers if the applicant's emission units or equipment that are being constructed or operated will comply with such requirements prospectively based on information contained within the application for permit.

An applicant's past or on-going compliance issues must instead be addressed through the Agency's compliance and enforcement programs. The distinction stems from past court rulings holding that permitting is no substitute for enforcement, and that the Agency must not deny or condition a permit decision based upon allegations that a source is violating, or has violated, applicable requirements.

Narrow exceptions will exist in the case of an applicant that has been previously adjudicated of violations that relate to either an environmental release or to prior experience in waste management operations, clean construction or demolition debris fill operations, or tire storage site management. These exceptions are found in Sections 39(a) and (i) of the Environmental Protection Act.

There are a number of cases relating to the statutory provisions, see IEPA v. PCB, 252 Ill. App3d 828 (3rd Dist. 1993), cited by ESG Watts v. PCB, 286 Ill. App3d 325 (3rd Dist. 1997); Grigoleit v. EPA, PCB No. 89-184 (November 29, 1990). See generally, Martell v. Mauzy, 511 F. Supp. 729 (N.D. Ill. 1981).

Brad

Brad Frost
Manager, Office of Community Relations
217/782-7027

From: Nancy Loeb <n-loeb@northwestern.edu>
Sent: Wednesday, June 3, 2020 9:13 AM
To: Frost, Brad <Brad.Frost@Illinois.gov>; Geertsma, Meleah <mgeertsma@nrdc.org>; EXT Harley, Keith <kharley@kentlaw.iit.edu>**Cc:** Guy, Jeff <Jeff.Guy@Illinois.gov>
Subject: Re: [External] Make a comment at the General Iron VIRTUAL HEARING

Dear Brad,

We would very much appreciate your response to this request.

Thank you and best regards,

Nancy

Nancy C. Loeb
Clinical Associate Professor of Law
Director, Environmental Advocacy Clinic
Bluhm Legal Clinic
Northwestern Pritzker School of Law
375 East Chicago Avenue, Chicago, IL 60611-3069
Tel: 312-503-0052
E-Mail: n-loeb@northwestern.edu

From: Nancy Loeb <n-loeb@northwestern.edu>
Date: Thursday, May 14, 2020 at 2:15 PM
To: "Frost, Brad" <Brad.Frost@Illinois.gov>, "Geertsma, Meleah" <mgeertsma@nrdc.org>, Olga Bautista <obautista58@gmail.com>
Cc: "Guy, Jeff" <Jeff.Guy@Illinois.gov>, Gina Ramirez <gramirez@nrdc.org>
Subject: Re: [External] Make a comment at the General Iron VIRTUAL HEARING

Brad,

Can you please provide citations for the caselaw referred to in IEPA Attorney Rob Lame's response concerning consideration of General Iron's compliance history.

Thank you very much.

Nancy

Nancy C. Loeb
Clinical Associate Professor of Law
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Northwestern Pritzker School of Law
375 East Chicago Avenue, Chicago, IL 60611-3069
Tel: 312-503-0052
E-Mail: n-loeb@northwestern.edu

South Chicago Property Management, Ltd
11600 S. Burley Avenue
Chicago, IL 60617

Via Certified Mail: No. 70151730000034419337
Return Receipt Requested

November 1, 2019

Illinois Environmental Protection Agency
Bureau of Air
Compliance & Enforcement Section (MC 40)
1021 North Grand Avenue East
P.O. Box 19276
Springfield, Illinois 62794-9276

RE: ***South Chicago Property Management, Ltd.***
11600 South Burley, Chicago, IL
Self-Disclosure per Section 415 ILCS 5/42(i) of the Illinois Environmental Protection Act

To Whom It May Concern:

South Chicago Property Management, Ltd. ("SCPM"), an affiliate of Reserve Management Group ("RMG"), is the owner of an industrial campus located at 11600 South Burley, Chicago, Illinois (the "Burley Campus"). Four companies are currently located on the Burley Campus: Reserve Marine Terminals ("RMT"), Napuck Salvage of Waupaca ("NSW"), South Shore Recycling ("SSR") and Regency Technologies ("RSR") (collectively, the "SCPM Entities").

SCPM intends to lease 25 acres of the Burley Campus to General III, LLC ("GIII"), another RMG-affiliated entity, for the development and operation of a scrap metal recycling facility. GIII submitted a construction permit application to the Illinois EPA on September 24, 2019. During the course of preparing the permit application, GIII investigated the operations and ownership of the SCPM Entities and determined that GIII is a single source with the SCPM Entities. The following is a description of these Entities, as provided in GIII's construction permit application:

Source Name	Source Description
Reserve Marine Terminals (RMT)	RMT operates a foundry sand, slag and scrap recovery operation that includes conveyors, magnetic separation, screening, crushing, and conveying that processes approximately 60,000 tpy of material. Outdoor activities are equipped with water misters as necessary to minimize particulate emissions. RMT generates fugitive particulate emissions from use of paved and unpaved roads, torch cutting and breakage, operation of one 7 HP gasoline-fired generator and one 56 HP diesel-fired generator. Generators operate only when processes are operating. RMT has no air permits and is not registered under the ROSS program.
Regency Technologies (RSR)	RSR is a small electronics recycling operation that operates indoors and has no process emissions. RSR also generates fugitive particulate emissions from use of paved roads. RSR has no process air emissions and therefore, is not required to obtain an air permit or register under the ROSS program.
Napuck Salvage of Waupaca (NSW)	NSW recycles approximately 262,800 tons/year of aluminum (with some cast steel). Operations include crushing, screening and conveying with processing equipment located indoors. NSW also acquires, processes, and markets all grades of ferrous and nonferrous scrap, specializing in engine blocks, foundry steel and aluminum. This includes processing of approximately 5,400 tpm of material by crushing, screening and other separation processes. All processing equipment is located indoors. NSW also generates fugitive particulate emissions from use of paved roads. NSW is registered under the Registration of Smaller Sources (ROSS) program (Application 12020006) – since February 6, 2012 continues to meet program eligibility requirements.
South Shore Recycling (SSR)	SSR purchases retail non-ferrous scrap metal and sells it to NSW or other offsite entities. SSR generates fugitive particulate emissions from use of unpaved roads and torch cutting (propane). SSR has no air emission permits and is not registered under the ROSS program.

Representatives from GIII and Illinois EPA met on October 23, 2019 to discuss the GIII construction permit application and permitting for the SCPM Entities. During the meeting, Bob Bernoteit stated that, because all of the entities on the Burley Campus are a single source, the Illinois EPA is requiring the SCPM Entities to apply for a Lifetime Operating Permit. Further, once the GIII facility is constructed, both GIII and the SCPM Entities will be required to obtain FESOPs. Accordingly, SCPM will be submitting a Lifetime Operating Permit application to the Illinois EPA for the SCPM Entities. That permit application is expected to be submitted within the next 30 days.

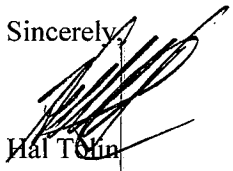
During the meeting, Eric Jones recommended that a voluntary self-disclosure be submitted to the compliance unit to address the discovery of the requirement to obtain a Lifetime Operating Permit for the

SCPM Entities. This letter constitutes the SCPM Entities self-disclosure under Section 42(i) of the Illinois Environmental Protection Act (Act), 415 ILCS 5/42(i). SCPM satisfies the nine criteria set forth in Section 42(i) of the Act for this voluntary self-disclosure, as follows:

1. The disclosed non-compliance was discovered through GIII's due diligence in preparing a construction permit application and subsequent meeting with Illinois EPA.
2. This self-disclosure is being submitted within 30 days of the Illinois EPA instructing SCPM to submit a Lifetime Permit Application for the SCPM Entities.
3. The disclosed non-compliance was not discovered as a result of a pending enforcement action, third-party complaint or citizen suit, or imminent inspection by Illinois EPA or another government agency.
4. The disclosed non-compliance is being corrected in a timely fashion. SCPM intends to submit a Lifetime Permit Application within 30 days of the date of this letter.
5. SCPM is committed to preventing a recurrence of this non-compliance.
6. No related non-compliance events have occurred in the past 3 years at the Burley Campus or in the past 5 years as part of a pattern at multiple facilities owned or operated by SCPM.
7. The disclosed non-compliance did not result in serious actual harm or present an imminent and substantial endangerment to human health or the environment and does not violate the specific terms of any judicial or administrative order or consent agreement.
8. SCPM will cooperate as reasonably requested by the Illinois EPA on this matter.
9. The disclosed non-compliance was discovered voluntarily and not through a legally-required monitoring, sampling or auditing procedure.

Please contact me at (773) 382-0123 if you need additional information concerning this matter. Thank you for your consideration.

Sincerely,



Hal Tolin
Member
South Chicago Property Management, Ltd.

cc: Eric Jones, via email
5074308v2/33494-0001

Community concerns with facilities at 11600 S. Burley

Geertsma, Meleah <mgeertsma@nrdc.org>

Wed 12/18/2019 4:37 PM

To: bob.bernoteit@illinois.gov <bob.bernoteit@illinois.gov>
Cc: Pressnall, Chris <Chris.Pressnall@Illinois.gov>; Graham, Dave (Dave.Graham@cityofchicago.org) <Dave.Graham@cityofchicago.org>; Hesse, Jennifer (Jennifer.Hesse@cityofchicago.org) <Jennifer.Hesse@cityofchicago.org>; Ames, Mort (Mort.Ames@cityofchicago.org) <Mort.Ames@cityofchicago.org>; Cantello, Nicole (cantello.nicole@epa.gov) <cantello.nicole@epa.gov>; Frank, Nathan (frank.nathan@epa.gov) <frank.nathan@epa.gov>; Peggy Salazar (peggy_setf@sbcglobal.net) (peggy_setf@sbcglobal.net) <peggy_setf@sbcglobal.net>; Olga Bautista (obautista58@gmail.com) <obautista58@gmail.com>; Ramirez, Gina <gramirez@nrdc.org>; Martita A <loquita8@gmail.com>; Harley, Keith (kharley@kentlaw.iit.edu) <kharley@kentlaw.iit.edu>; Daryl Grable <dgrable@kentlaw.iit.edu>; Nancy Loeb <n-loeb@northwestern.edu>; Cary John Shepherd <cary.shepherd@law.northwestern.edu>

4 attachments (2 MB)

FINAL letter to IEPA 11600 S Burley 12.18.2019.pdf; BRN3C2AF4665224_000253.pdf; Reserve FLT LLC 19DE000186 9.5.19.pdf; South Shore Recycling;

Mr. Bernoteit –

Please see the attached letter and accompanying documents sent on behalf of the Natural Resources Defense Council, Southeast Environmental Task Force and Southeast Side Coalition to Ban Petcoke, regarding community concerns with facilities at 11600 S. Burley in Chicago.

We look forward to hearing IEPA's response to this letter and working with you to protect the health of the Southeast Side, an environmental justice community. If you have any questions, I can be reached on my cell at 202-290-7164 or by email.

Best,
Meleah

MELEAH GEERTSMA
Senior Attorney, Environmental Justice

NATURAL RESOURCES
DEFENSE COUNCIL
20 N. WACKER DRIVE, SUITE 1600
CHICAGO, IL 60606
T 312.651.7904
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mgeertsma@NRDC.ORG
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December 18, 2019

Sent via email to Bob.Bernoteit@illinois.gov

Re: ***Community Concerns with Existing and Proposed Facilities at 11600 S. Burley, Chicago***

Mr. Bernoteit,

We write on behalf of the Southeast Environmental Task Force, Southeast Side Coalition to Ban Petcoke and Natural Resources Defense Council ("NRDC"), including NRDC members living on Chicago's Southeast Side, with regards to the proposed General III facility and existing Reserve Management Group ("RMG") facilities at 11600 S. Burley. First, we understand that the Illinois Environmental Protection Agency ("IEPA") has asked General III and the RMG facilities to provide additional information beyond the September air permit application for the proposed General III facility and want to thank you for this due diligence. In addition, as set forth below, our groups strongly oppose the IEPA granting the facilities protection from enforcement penalties under the state's voluntary self-disclosure program. We instead ask IEPA to fully investigate and hold these companies accountable for their violations and impacts on the Southeast Side, an environmental justice community.

It is our understanding, based on the attached November 1, 2019 submission by South Chicago Property Management to the IEPA obtained through the Illinois Freedom of Information Act, that the companies and agency are in discussions over the permitting status of the existing facilities at this address and how those facilities should be taken into account in reviewing the proposed General III. The companies' failures to obtain air approvals from the state as described in this document – despite years of operating in this community – are deeply troubling. So, too, their failure to proactively disclose the co-location, and similar/inter-twined operations, of the four RMG facilities *prior* to submitting an air permit application for solely the proposed General III.

Rather than let the companies off the hook for years of skirting our environmental laws, IEPA should protect the community by denying enforcement protections and pursuing actions against these companies. Enforcement protection is not only inappropriate given the environmental justice nature of the surrounding community, but also because the Section 42 (i) factors are not met here. With this email, we are providing several items that go to the Section 42 factors:

(a) a **Notice of Violation** issued by the Chicago Department of Public Health ("CDPH") to Reserve Marine Terminals for fugitive dust issues, which also evidences violations of Part 212 standards for visible emissions and PM, as well as potentially other state environmental regulations, and

(b) our **email of May 14, 2019 to staff at CDPH, IEPA and U.S. EPA**, in which we requested a full investigation of fugitive dust issues at South Shore Recycling based on a complaint by neighboring American Zinc Recycling and flagged our concern that South Shore lacked appropriate air approvals.

We have additional materials going to the Section 24(i) factors that we would be willing to discuss with IEPA as well, including our FOIA request for records related to any and all facilities at 11600 S. Burley, submitted in September of this year.

For decades, the Southeast Side has been heavily burdened with industrial pollution from a range of sources located in close proximity to homes, parks, and schools. Our community-based organizations have worked tirelessly to daylight and clean up this pollution, and NRDC is privileged to work in partnership with these groups to address ongoing environmental injustices. Of primary concern to our organizations and community members are the lack of environmental oversight and the piecemealing of any consideration of impacts from the many facilities in this community. We therefore look to IEPA to stand with us in saying that unpermitted activities and environmental violations in environmental justice communities are unacceptable, and to make good on its duty of care for Southeast Side individuals, families and organizations by alleviating the heavy cumulative burdens borne by this community.

Sincerely yours,

/s/ Meleah Geertsma
Meleah Geertsma, Natural Resources Defense Council

/s/ Peggy Salazar
Southeast Environmental Task Force

/s/ Olga Bautista
Southeast Side Coalition to Ban Petcoke

Cc:

Chris Pressnall, IEPA
Dave Graham, CDPH
Jennifer Hesse, CDPH
Mort Ames, CDPH
Nicole Cantello, USEPA
Nathan Frank, USEPA

South Chicago Property Management, Ltd
11600 S. Burley Avenue
Chicago, IL 60617

Via Certified Mail: No. 70151730000034419337
Return Receipt Requested

November 1, 2019

Illinois Environmental Protection Agency
Bureau of Air
Compliance & Enforcement Section (MC 40)
1021 North Grand Avenue East
P.O. Box 19276
Springfield, Illinois 62794-9276

RE: ***South Chicago Property Management, Ltd.***
11600 South Burley, Chicago, IL
Self-Disclosure per Section 415 ILCS 5/42(i) of the Illinois Environmental Protection Act

To Whom It May Concern:

South Chicago Property Management, Ltd. ("SCPM"), an affiliate of Reserve Management Group ("RMG"), is the owner of an industrial campus located at 11600 South Burley, Chicago, Illinois (the "Burley Campus"). Four companies are currently located on the Burley Campus: Reserve Marine Terminals ("RMT"), Napuck Salvage of Waupaca ("NSW"), South Shore Recycling ("SSR") and Regency Technologies ("RSR") (collectively, the "SCPM Entities").

SCPM intends to lease 25 acres of the Burley Campus to General III, LLC ("GIII"), another RMG-affiliated entity, for the development and operation of a scrap metal recycling facility. GIII submitted a construction permit application to the Illinois EPA on September 24, 2019. During the course of preparing the permit application, GIII investigated the operations and ownership of the SCPM Entities and determined that GIII is a single source with the SCPM Entities. The following is a description of these Entities, as provided in GIII's construction permit application:

Source Name	Source Description
Reserve Marine Terminals (RMT)	RMT operates a foundry sand, slag and scrap recovery operation that includes conveyors, magnetic separation, screening, crushing, and conveying that processes approximately 60,000 tpy of material. Outdoor activities are equipped with water misters as necessary to minimize particulate emissions. RMT generates fugitive particulate emissions from use of paved and unpaved roads, torch cutting and breakage, operation of one 7 HP gasoline-fired generator and one 56 HP diesel-fired generator. Generators operate only when processes are operating. RMT has no air permits and is not registered under the ROSS program.
Regency Technologies (RSR)	RSR is a small electronics recycling operation that operates indoors and has no process emissions. RSR also generates fugitive particulate emissions from use of paved roads. RSR has no process air emissions and therefore, is not required to obtain an air permit or register under the ROSS program.
Napuck Salvage of Waupaca (NSW)	NSW recycles approximately 262,800 tons/year of aluminum (with some cast steel). Operations include crushing, screening and conveying with processing equipment located indoors. NSW also acquires, processes, and markets all grades of ferrous and nonferrous scrap, specializing in engine blocks, foundry steel and aluminum. This includes processing of approximately 5,400 tpm of material by crushing, screening and other separation processes. All processing equipment is located indoors. NSW also generates fugitive particulate emissions from use of paved roads. NSW is registered under the Registration of Smaller Sources (ROSS) program (Application 12020006) – since February 6, 2012 continues to meet program eligibility requirements.
South Shore Recycling (SSR)	SSR purchases retail non-ferrous scrap metal and sells it to NSW or other offsite entities. SSR generates fugitive particulate emissions from use of unpaved roads and torch cutting (propane). SSR has no air emission permits and is not registered under the ROSS program.

Representatives from GIII and Illinois EPA met on October 23, 2019 to discuss the GIII construction permit application and permitting for the SCPM Entities. During the meeting, Bob Bernoteit stated that, because all of the entities on the Burley Campus are a single source, the Illinois EPA is requiring the SCPM Entities to apply for a Lifetime Operating Permit. Further, once the GIII facility is constructed, both GIII and the SCPM Entities will be required to obtain FESOPs. Accordingly, SCPM will be submitting a Lifetime Operating Permit application to the Illinois EPA for the SCPM Entities. That permit application is expected to be submitted within the next 30 days.

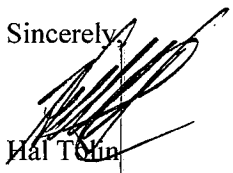
During the meeting, Eric Jones recommended that a voluntary self-disclosure be submitted to the compliance unit to address the discovery of the requirement to obtain a Lifetime Operating Permit for the

SCPM Entities. This letter constitutes the SCPM Entities self-disclosure under Section 42(i) of the Illinois Environmental Protection Act (Act), 415 ILCS 5/42(i). SCPM satisfies the nine criteria set forth in Section 42(i) of the Act for this voluntary self-disclosure, as follows:

1. The disclosed non-compliance was discovered through GIII's due diligence in preparing a construction permit application and subsequent meeting with Illinois EPA.
2. This self-disclosure is being submitted within 30 days of the Illinois EPA instructing SCPM to submit a Lifetime Permit Application for the SCPM Entities.
3. The disclosed non-compliance was not discovered as a result of a pending enforcement action, third-party complaint or citizen suit, or imminent inspection by Illinois EPA or another government agency.
4. The disclosed non-compliance is being corrected in a timely fashion. SCPM intends to submit a Lifetime Permit Application within 30 days of the date of this letter.
5. SCPM is committed to preventing a recurrence of this non-compliance.
6. No related non-compliance events have occurred in the past 3 years at the Burley Campus or in the past 5 years as part of a pattern at multiple facilities owned or operated by SCPM.
7. The disclosed non-compliance did not result in serious actual harm or present an imminent and substantial endangerment to human health or the environment and does not violate the specific terms of any judicial or administrative order or consent agreement.
8. SCPM will cooperate as reasonably requested by the Illinois EPA on this matter.
9. The disclosed non-compliance was discovered voluntarily and not through a legally-required monitoring, sampling or auditing procedure.

Please contact me at (773) 382-0123 if you need additional information concerning this matter. Thank you for your consideration.

Sincerely,



Hal Tolin
Member
South Chicago Property Management, Ltd.

cc: Eric Jones, via email
5074308v2/33494-0001

IN THE CITY OF CHICAGO, ILLINOIS
DEPARTMENT OF ADMINISTRATIVE HEARINGS

CITY OF CHICAGO, a Municipal Corporation, Petitioner,)	Address of Violation: 11600 S Burley
v.)	
Reserve Flt Llc)	Docket #: 19DE000186
11600 S BURLEY AVE)	
CHICAGO, IL 60617)	Issuing City
, Respondent.)	Department: Environment

FINDINGS, DECISIONS & ORDER

This matter coming for Hearing, notice given and the Administrative Body advised in the premises, having considered the motions, evidence and arguments presented, IT IS ORDERED: As to the count(s), this tribunal finds by a preponderance of the evidence and rules as follows:

Finding	*NOV#*	*Count(s)*	*Municipal Code Violated*	*Penalties*
City non-suit	E000035474	1	11-4-760(a) Failed to take reasonable precautions to minimize air pollution while handling a substance or material that may become airborne or be scattered by the wind.	$0.00
Liable - By plea	E000035474	2	11-4-2520 Permit--Required.	$1,000.00

Sanction(s):

Admin Costs: $40.00

JUDGMENT TOTAL: $1,040.00

Balance Due: $1,040.00

Respondent is ordered to come into immediate compliance with any/all outstanding Code violations.

ENTERED: Gregory C. Pleska 35 Sep 5, 2019

Administrative Law Judge ALO# Date

This Order may be appealed to the Circuit Court of Cook Co. (Daley Center 6th Fl.) within 35 days by filing a civil law suit and by paying the appropriate State mandated filing fees.

Pursuant to Municipal Code Chapter 1-19, the city's collection costs and attorney's fees shall be added to the balance due if the debt is not paid prior to being referred for collection.

ADMINISTRATIVE NOTICE OF ORDINANCE VIOLATION

In the City of Chicago Department of Administrative Hearings
City of Chicago, a Municipal Corporation, Petitioner, vs.

R-005772

Respondent if Chicago Business, use name on license	Last Name, First Name	MI
RESERVE FTL LLC		

Resp. Address No.	Dir.	Street Name	ST Suffix	Apt./Ste.
11600	S	BURLEY	AVE	

City	State	ZIP
CHICAGO	(•) IL ( ) Other:	60617

Person Served if other than the respondent	Last Name, First Name	MI
TOLIN	HAL	

Phone	Acct. No. or DREV No. on business license
7737218740	

Identification	DLN State	D.O.B. (M/D/Y)
( ) DLN/ID ( ) Other	( ) IL ( ) Other:	/ /

Height	Weight	Sex	Race	Eyes	Hair	Service Request Number
/						

Officer, Investigator, Inspector, and/or Complainant on oath states that the Respondent did then and there violate the following section(s) of the Municipal Code of Chicago:

E 00035474 16

COUNT		
	DUMPING ON REAL ESTATE WITHOUT A PERMIT 7-28-440	
	OPERATING A FACILITY WITHOUT A PERMIT ( ) 11-4-030	
1	HANDLING OF MATERIAL SUSCEPTIBLE TO BECOMING WINDBORNE ( ) 11-4-760	
	TREATMENT AND DISPOSAL OF SOLID OR LIQUID WASTE 11-4-1500	
	SANDBLASTING, GRINDING, CHEMICAL WASHING VIOLATION ( ) 11-4-2190	
	RECYCLING FACILITY PERMIT 11-4-2520	
	CONSTRUCTION SITE CLEANLINESS ( ) 13-32-125(2)	

COUNT	OTHER: TITLE CHA.SEC.	RULE	Offense (if other):
2	11-4-2520		PERMIT VIOLATION OF SPECIAL CONDITION #32
	– –		

You Must Describe Actions for Each Count below:

Count 1. In That: RESPONDENT FAILED TO TAKE REASONABLE PRECAUTIONS TO MINIMIZE WINDBORNE PARTICULATE MATTER

Count 2. In That: RESPONDENT FAILED TO CONTROL DUST FROM MIGRATING OFF-SITE FROM BARGE LOADING/UNLOADING OPERATIONS

Violation Location Nos.	Dir.	Street Name in the City of Chicago, County of Cook	ST Suffix
11600	S	BURLEY	

Vio. Date: Mo/Day	Year	Time of Violation	Notice Date: Mo/Day if different than Vio. Date	Year of Notice
06 27	2019	2:00 ( ) AM (•) PM	07 03	2019

Complainant's Name if not issuing officer, investigator, or inspector

Public Health (Environment) Version 10-24-15

Unit	Star / Badge	Signature of issuing officer, investigator, or inspector
PRI	82	X

Administrative Hearing Appearance

IMPORTANT: You must appear for a mandatory hearing on:

Date: Mo/Day	Year	Time	at:	Room No.
09 05	2019	1 : 00 ( ) AM (•) PM	(X) 400 W. Superior	112

FAILURE TO APPEAR may result in the imposition of a fine not to exceed the maximum penalties for each violation as specified in the Municipal Code of Chicago plus costs, restitution, and fees. Failure to comply with the administrative law judge's order may result in the issuance of additional sanctions.

I acknowledge receipt of this notice.
Signature of Respondent or Person Served: X

E

Comments
11-4-760(a)

DEPARTMENT OF ADMINISTRATIVE

CITY OF CHICAGO

DEPARTMENT OF PUBLIC HEALTH
PERMITTING AND ENFORCEMENT

R 005773

NARRATIVE EVALUATION

INSPECTION DATE: 06/27/2019
SITE NAME: Reserve Marine Terminals
SITE ADDRESS: 11600 S BURLEY AVE, CHICAGO, IL 60617
SITE CODE: Reserve Marine Terminals
PERMIT #: ENVAIR181098

TIME: 2:45 pm
EMPLOYEE:EMMANUEL ADESANYA

COUNTY:COOK / CHICAGO
INSPECTION #: 678670

SUMMARY

While I was carrying out a follow up inspection of American Zinc Recycling (AZR); with Michael Enos (CDPH environmental engineer); we observed plume of windborne particulate matter from barge loading, across the Calumet River. After completing the inspection of AZR, we proceeded to the location of the windborne particulate matter plume for inspection. Today was partly cloudy, temperature: high 88 degree F, low 67 degree F, wind: South at 16 mph; gust 0 mph, according to Weather Underground. Upon arrival we met Messrs. Hal Tolin (The Facility Co-Chief Operating Officer); and Ron Trivisonno (The Facility Plant Manager); for Reserve Marine Terminal, a permitted class II-B Recycling Facility. The two men took us around the facility for today's inspection, after a brief meeting. Summary of the facility PROCESS DESCRIPTION, according to Hal Tolin: The facility receives from customers, metal/Iron from junk vehicles, demolition materials etc. which could be processed through screening, manual sorting, touch cutting, shear and bale/compacting. The facility has capacity for rail, barge and truck loading/unloading of metal/iron scrap.

Today's inspection revealed the following:

1) I observed plume of windborne particulate matter from barge loading operations of metal scrap, with heavy duty loading machine. There was no dust control and suppression measure observed; for dust and air-borne materials, during this loading operation (Please see photo #s 1, 2, 3, 4, 5, 6, 7, 8, 9, & 10);
2) I observed the plume of windborne particulate matter from the barge loading operations of metal scrap migrating off-site (Please see photo #s 1, 6 & 10),
3) I observed plume of windborne particulate matter from pile of metal scrap processing (see photo #s 11 & 12).

Reserve Marine Terminals was served with notice of violation # E000035474 for the municipal codes violations 11-4-760 (a) (Handling of material susceptible to becoming windborne), 11-4-2520 (Permit violation of special condition #32). Hearing date pending for 9/5/2019. Follow up inspection the week of July 01, 2019. See the attachments

REPORT COMPLETED?	☑ YES	☐ NO	NOV ISSUED?	☑ YES	☐ NO
INVESTIGATION COMPLETED?	☑ YES	☐ NO	ATTACHMENTS?	☑ YES	☐ NO

I, EMMANUEL ADESANYA, an employee of the City of Chicago, Department of Public Health, declare that I have conducted an inspection of the above mentioned property on the date indicated. I further declare that the observations set forth on the report are true and accurate.

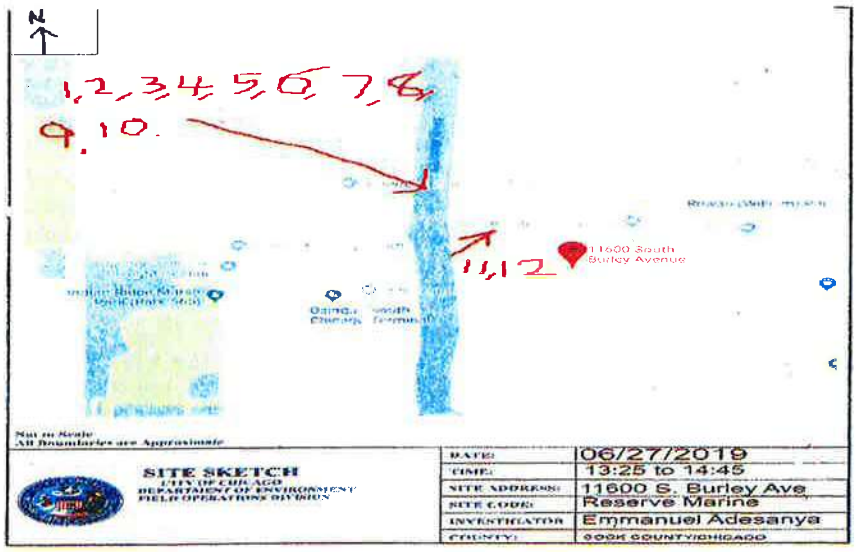
82
STAR #

SIGNATURE

DATE: 06/27/2019
SITE: 11600 S BURLEY AVE
SITE CODE: Reserve Marine Terminals
PERMIT #: ENVAIR181098

TIME: 6/27/2019 2:45:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 678670

R-005774



COMMENTS:

DATE: 06/27/2019
SITE: 11600 S BURLEY AVE
SITE CODE: Reserve Marine Terminals
PERMIT #: ENVAIR181098

TIME: 6/27/2019 2:45:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 678670

COMMENTS: Photo # 09 Direction: SE Comments: Plume of Windborne Particulate Matter from barge loading operations.

DATE: 06/27/2019
SITE: 11600 S BURLEY AVE
SITE CODE: Reserve Marine Terminals
PERMIT #: ENVAIR181098

TIME: 6/27/2019 2:45:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 678670

COMMENTS: Photo # 1 Direction: SE Comments: Plume of Windborne Particulate Matter from barge loading operations.

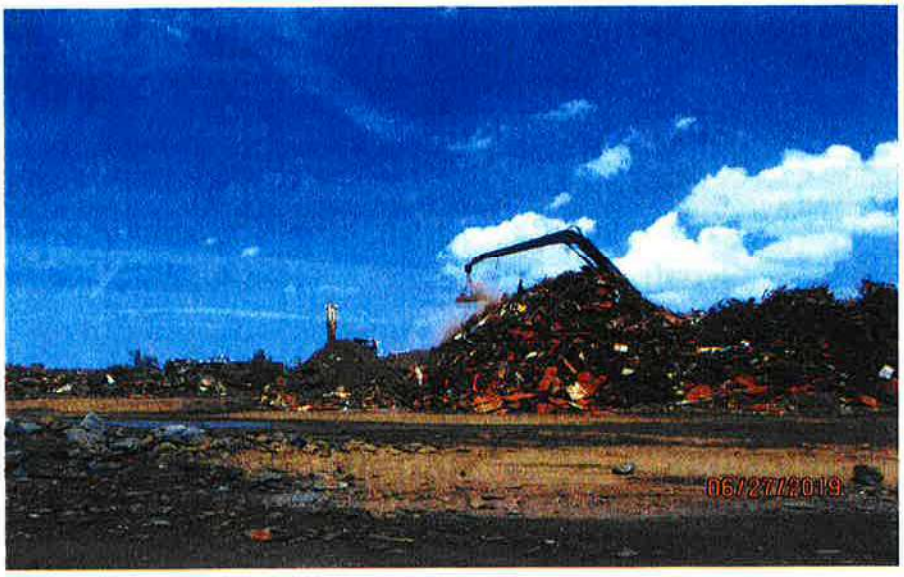
DATE: 06/27/2019
SITE: 11600 S BURLEY AVE
SITE CODE: Reserve Marine Terminals
PERMIT #: ENVAIR181098

TIME: 6/27/2019 2:45:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 678670

COMMENTS: Photo # 10 Direction: SE Comments: Plume of Windborne Particulate Matter from barge loading operations.

DATE: 06/27/2019
SITE: 11600 S BURLEY AVE
SITE CODE: Reserve Marine Terminals
PERMIT #: ENVAIR181098

TIME: 6/27/2019 2:45:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 678670



COMMENTS: Photo # 11 Direction: NE Comments: Plume of Windborne Particulate Matter from scrap metal pile and processing operations.

DATE: 06/27/2019
SITE: 11600 S BURLEY AVE
SITE CODE: Reserve Marine Terminals
PERMIT #: ENVAIR181098

TIME: 6/27/2019 2:45:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 678670

COMMENTS: Photo # 12 Direction: NE Comments: Plume of Windborne Particulate Matter from scrap metal pile and processing operations.

DATE: 06/27/2019
SITE: 11600 S BURLEY AVE
SITE CODE: Reserve Marine Terminals
PERMIT #: ENVAIR181098

TIME: 6/27/2019 2:45:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 678670

COMMENTS: Photo # 2 Direction: SE Comments: Plume of Windborne Particulate Matter from barge loading operations.

DATE: 06/27/2019
SITE: 11600 S BURLEY AVE
SITE CODE: Reserve Marine Terminals
PERMIT #: ENVAIR181098

TIME: 6/27/2019 2:45:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 678670

COMMENTS: Photo # 3 Direction: SE Comments: Plume of Windborne Particulate Matter from barge loading operations.

DATE: 06/27/2019
SITE: 11600 S BURLEY AVE
SITE CODE: Reserve Marine Terminals
PERMIT #: ENVAIR181098

TIME: 6/27/2019 2:45:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 678670

COMMENTS: Photo # 4 Direction: SE Comments: Plume of Windborne Particulate Matter from barge loading operations.

DATE: 06/27/2019
SITE: 11600 S BURLEY AVE
SITE CODE: Reserve Marine Terminals
PERMIT #: ENVAIR181098

TIME: 6/27/2019 2:45:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 678670

COMMENTS: Photo # 5 Direction: SE Comments: Plume of Windborne Particulate Matter from barge loading operations.

DATE: 06/27/2019
SITE: 11600 S BURLEY AVE
SITE CODE: Reserve Marine Terminals
PERMIT #: ENVAIR181098

TIME: 6/27/2019 2:45:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 678670

COMMENTS: Photo # 6 Direction: SE Comments: Plume of Windborne Particulate Matter from barge loading operations.

DATE: 06/27/2019
SITE: 11600 S BURLEY AVE
SITE CODE: Reserve Marine Terminals
PERMIT #: ENVAIR181098

TIME: 6/27/2019 2:45:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 678670

COMMENTS: Photo # 7 Direction: SE Comments: Plume of Windborne Particulate Matter from barge loading operations.

DATE: 06/27/2019
SITE: 11600 S BURLEY AVE
SITE CODE: Reserve Marine Terminals
PERMIT #: ENVAIR181098

TIME: 6/27/2019 2:45:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 678670

COMMENTS: Photo # 8 Direction: SE Comments: Plume of Windborne Particulate Matter from barge loading operations.

CITY OF CHICAGO

OTHER CDPH PERMITS

Permit Number	Permit Type	Expiration Date
ENVAIR181111	ENV_AIR	
ENVAIR181128	ENV_AIR	
ENVAIR181144	ENV_AIR	
ENVAIR997329	ENV_AIR	
ENVAIR997335	ENV_AIR	
ENVREC102877	ENV_RCYCLE	05/15/2021
ENVREC102879	ENV_RCYCLE	05/15/2022
ENVREC122597	ENV_RCYCLE	08/28/2021

DEPARTMENT OF PUBLIC HEALTH

CITY OF CHICAGO

June 7, 2016

Mr. Hal Tolin
Reserve FTL LLC
11600 S. Burley
Chicago, IL 60617

Subject: **City of Chicago Class II-B Recycling Facility Permit (ENVREC102879)**
Reserve Marine Terminals – 11600 S Burley Ave
Effective date: May 16, 2016 to May 15, 2019

Dear Mr. Tolin,

A permit is hereby granted by the City of Chicago Department of Public Health ("CDPH") to Reserve FTL LLC dba Reserve Marine Terminal ("the Permittee") to operate a Class II-B Recycling Facility located within the corporate limits of the City of Chicago at 11600 S Burley Ave ("the Facility").

Please carefully review all conditions outlined in this permit. Incorporated into this permit by reference are the following: 1) the application dated May 13, 2016 ("the Application"); and 2) all other supplemental information submitted as part of this application including drawings, sheets, and specifications. In the event of a conflict with said references, the terms and conditions of this permit shall prevail.

The Permittee shall fully comply with Article XX, Chapter 11-4 of the Municipal Code of Chicago ("the Ordinance") and the Recycling Facility Rules and Regulations ("the Regulations"). The Permittee shall also fully comply with the Standard Conditions outlined in Attachment A and the Special Conditions outlined in Attachment B of this permit.

This permit allows for the operation of the Facility from May 16, 2016 through May 15, 2019 upon which time the permit shall terminate by its own terms. On or before May 15, 2019, the Permittee may apply to the CDPH for a new operating permit for the following year. If a subsequent operating permit is applied for on or before May 15, 2019, this permit shall remain in effect until the CDPH acts on the pending permit application. If you have any questions concerning this permit, please contact me at (312) 745-3136.

Sincerely,

Renante Marante
Environmental Engineer III

ATTACHMENT A
STANDARD CONDITONS

1. The Permittee shall comply with all applicable local, State, and Federal laws, regulations and standards regarding the construction, operation, maintenance, and closure of the subject Facility, including but not limited to those regulations and standards concerning noise, vibrations, and particulate emissions.

2. Construction, operation, maintenance, and closure of the Facility shall be in accordance with the plans, drawings, and specifications referenced by this permit and included in these Standard Conditions and the Special Conditions.

3. Any changes, modifications, and additions to the Facility's permit or the approved plans and documentation shall be submitted to the CDPH for review and approval. Such a request shall be made in writing to the CDPH.

4. Issuance of this permit shall not transfer, assign or otherwise affect any liability to the City of Chicago, the CDPH, their employees, or agents as a result of the construction, operation, maintenance, and closure of this Facility.

5. Issuance of this permit does not relieve the Permittee of any liability with regards to the subject Facility.

6. The CDPH or its authorized representatives may inspect the Facility and the Facility records at any reasonable time to ensure compliance with this permit and all applicable rules, regulations, and standards, as well as all conditions necessary to protect the public health and safety.

7. The CDPH may revoke this permit on the basis of any of the grounds set forth in the City of Chicago, CDPH, Article XX Recycling Facility Permits Rules and Regulations.

8. The Permittee shall notify the CDPH of any notices of violations or administrative, civil or criminal citations received by the Facility or any of its operators relating to any alleged violation of any federal, state, or local laws, regulations, standards, or ordinances in the operation of any junk facility, recycling facility, or any other type of waste or recyclable materials handling facility or site. Such notifications shall be provided by email to EnvWastePermits@cityofchicago.org.

9. The Permittee shall provide the CDPH, if so requested, with copies of all correspondence to or from the IEPA and USEPA pertaining to the Facility, including, but not limited to notices of violation, letters, permit applications, reports, groundwater monitoring reports, and annual reports.

10. The Permittee shall comply with all requirements and conditions set forth in this permit. Should any portion of this permit be declared illegal or non-binding, the conditions of the remainder of the permit shall remain in effect.

ATTACHMENT B
SPECIAL CONDITIONS

The following Special Conditions are attached to the operating permit for the Reserve FTL LLC dba Reserve Marine Terminal Class II-B Recycling Facility located at 11600 S Burley Ave:

OPERATING HOURS

1. The Permittee may operate 7:00 a.m to 9:00 p.m. Monday through Saturday. CDPH reserves the right to amend the Permittee's operating hours and days of operation if the facility operation causes a nuisance to neighborhood uses.

MATERIAL HANDLING

2. The Facility is permitted to accept and handle Type A recyclable materials consisting of aluminum scraps; ferrous metal scrap; and non-ferrous metal scrap. The Permittee may also receive packaging materials (e.g. cardboard, wood, plastic, etc.) that are shipped with the above-authorized recyclables.

   The Facility is not allowed to receive other recyclable materials not explicitly listed above. The Facility shall not accept hazardous special waste, reactive metals, sealed containers, municipal solid waste, or stolen goods. The Permittee shall not accept charred wire unless it is accompanied by proper documentation stating that the material was obtained from a properly licensed company that uses adequate emission control devices for removing the wire coating.

   The Permittee shall inspect all loads entering the Facility for unauthorized wastes. Loads containing waste other than recyclable materials as authorized above shall not be accepted at this Facility.

3. The Permittee shall handle all unauthorized wastes inadvertently admitted into the Facility as follows:

   a. The Permittee shall separately containerize special waste, including hazardous waste, non-hazardous special waste, and PCB waste, and arrange for the immediate removal of such waste by a waste hauler authorized to accept such wastes for transport to a disposal facility that has obtained all necessary Federal, State, and local authorization.

   b. The Permittee shall isolate reactive metals upon discovery and place such material in a sealed, waterproof container. The Permittee shall arrange for proper disposal of the reactive metals and shall immediately notify the CDPH.

   c. The Permittee shall isolate all municipal solid waste and properly store such waste in an enclosed waste receptacle for disposal at a properly permitted facility.

   d. The Permittee shall isolate all suspected stolen property upon discovery and immediately notify the City of Chicago Police Department ("CPD").

   e. After unauthorized waste has been removed from the Facility, the Permittee shall thoroughly clean the affected area in a manner consistent with the type of unauthorized waste managed.

ATTACHMENT B
SPECIAL CONDITIONS

4. The Permittee shall not accept, receive, purchase or acquire any material that is delivered to the Facility in any city- owned or government-owned garbage container or cart; or city-owned or government-owned recycling container or cart; or retail store shopping cart of the type commonly provided by big-box stores and supermarkets for use by customers to transport merchandise to the checkout counter during shopping.
5. The Permittee may accept regulated or prohibited recyclable materials as defined in the Ordinance and the Regulations under the following conditions:
    a. The regulated or prohibited material is consistent with the types of recyclable materials authorized under Special Condition No. 2;
    b. The Facility is in compliance with all surveillance requirements specified in 11-4-2640(g) of the Ordinance; and
    c. The Permittee complies with the documentation requirements set forth in Section 9 of the Regulations.
6. The Facility may receive and process no more than 750 tons per day of recyclable materials as specified in Special Condition No. 2. If the Permittee desires additional capacity, the Permittee must submit a revised application to the CDPH for approval. A revised application must demonstrate that the Facility is adequately handling the currently permitted volumes and is sufficiently sized and staffed to accept, store, and process the desired quantity of material.
7. When transporting material to and from the site, the material shall fit entirely within the truck or trailer. Additionally, the truck or trailer shall have its tailgates in place, and the load covered with a tarp as necessary to control dust or loss of material.
8. When transporting material to and from the site, the Permittee shall prevent any fluids or material from spilling into the streets.
9. Material handling at the Facility shall be limited to breaking; cutting with torches and cutters; shearing; sorting, and screening using a McCloskey or similar screener. The Permittee is authorized to move materials at the Facility with the aid of vehicles; front-end loaders; fork lifts; cranes; and magnets.
10. The Permittee shall operate the McCloskey screener or similar screener, with attached generator and associated conveyors, in accordance with Mr. Dennis V. Stropko's letter dated June 21, 2013 and subject to the following requirements:
    a. The Permittee shall secure and maintain all necessary air permits and approvals from the Illinois Environmental Protection;
    b. The Permittee shall suppress dust and other air-borne materials generated by screening activities. At a minimum, the screener and related equipment (i.e. hoppers, conveyors, etc.) shall be outfitted with a spray/watering system to suppress dust;
    c. The Permittee shall ensure that sufficient water is available for dust suppression pursuant to Special Condition No. 31;
    d. The screener and associated equipment may be moved around the Facility to support various processing operations so long as a minimum setback of 20 feet from the river is maintained.; and

e. The Permittee shall ensure that no process or storm water from the screening operation drains into the river or storm-only sewer system.

REFRIGERANTS

11. If the Facility accepts any small appliance, room air conditioning appliance, motor vehicle air conditioner (MVAC), or MVAC-like appliance, as those terms are defined in 40 CFR Part 82 Subpart F, where applicable, the Permittee shall comply with all requirements of 40 CFR Section 82.156(f) in connection with any such appliance or item. Specifically, the Permittee shall either:

    a. Verify that the refrigerant was evacuated from the appliance or item in accordance with 40 CFR Section 82.156(f) by:

        i. Obtaining a written and signed statement from each customer stating that all refrigerant was removed in accordance with EPA standards. This statement must include the name and address of the person who removed the refrigerant and the date the refrigerant was removed; or

        ii. Maintaining a contract between the Permittee and the customer that specifies that refrigerant will be properly removed before delivery.

    Or

    b. Recover any remaining refrigerant from the appliance in accordance with 40 CFR Section 82.156(f) using EPA-certified refrigerant recovery equipment;

12. The Permittee shall not accept any appliance or item that has been previously vented of CFCs without the proper documentation in Special Condition 11(a) above.

MATERIAL STORAGE

13. The Permittee shall store all materials within the permitted property at all times. At no time shall material be stored on neighboring properties or the public way.

14. The Permittee shall maintain a minimum aisle width of 36 inches, or wider to accommodate workers, equipment, cleaning, and emergency response.

15. The Permittee shall handle and store all recyclable materials that may leak fluids or leave an oily residue on a dedicated, impervious concrete pad. The concrete pad shall be sloped, bermed, or otherwise constructed to minimize storm water run-on and run-off, and facilitate the capture and collection of fluids. The Permittee must properly dispose of all liquid waste collected at the Facility.

16. The Permittee shall segregate and store recyclable materials in durable receptacles or enclosures such as drums, boxes, bins, or storage bunkers. The Permittee may store recyclables in cardboard boxes provided they are placed indoors, on pallets or otherwise kept off the ground.

ATTACHMENT B
SPECIAL CONDITIONS

17. The Permittee may store recyclable materials on sturdy racks or shelving provided the stored materials are kept at least 18 inches off the ground and are not leaking.
18. The Permittee shall store newsprint, paper, corrugated paper and cardboard in closed containers.
19. The Permittee shall clearly mark all storage receptacles with the type of recyclable material stored. Letters shall not be less than three inches high, outward facing and not hidden. The Permittee shall not deposit other materials than that specified on the receptacle.
20. The Permittee shall maintain the area surrounding all storage containers in a clean and neat manner. No recyclable materials or waste materials of any kind shall be allowed to accumulate around any receptacle or to overflow from any receptacle.
21. The Permittee may stockpile bulk recyclable materials that require large machinery (such as a backhoe, front-end loader, crane, or grapple) to move or process. The Permittee shall maintain such inventories no taller than 30 feet in height as shown by a pile height marker. Further, such stockpiles shall be set back at least 8 feet away from the public way, as measured from the edge of the stockpile closest to the public way.
22. The Permittee shall maintain a twenty (20) foot setback between any waterway and any stockpile, as measured from the edge of the stockpile closest to the waterway and the top bank of the waterway.
23. The Permittee shall not allow the discharge of storm water or waste water into the waterway without a valid National Pollutant Discharge and Elimination System (NPDES) permit issued by IEPA.
24. The Permittee may not store recyclable materials at the Facility for a period longer than 90 days except materials ready for shipment offsite as finished product or raw material in the manufacturing of new, reused or reconstituted products.
25. The Permittee shall store all waste materials in such a way as to ensure adequate site safety. Flammable materials shall be stored away from sources of heat, sparks and open flames, and in accordance with applicable fire codes. Incompatible materials shall be segregated or stored away from each other.
26. The Permittee shall ensure that all tanks, drums or other vessels containing liquid materials such as, but not limited to, solvents and petroleum products, are:
    a. Kept in good condition. The Permittee shall immediately replace, repair, or overpack damaged containers;
    b. Compatible with their contents to avoid reactions or impairment of the container's integrity;
    c. Kept closed at all times except when adding or removing materials;
    d. Appropriately labeled in accordance with all local, state, and federal requirements; and
    e. Are provided with secondary containment complying with all local, state, and federal requirements.

ATTACHMENT B
SPECIAL CONDITIONS

SITE REQUIREMENTS

27. The Facility shall be entirely surrounded by a solid fence eight feet in height that obscure all material stored or kept outdoors at the Facility. Such fencing must be located at least eight feet from all public ways surrounding the property

28. The Permittee shall adequately pave and maintain all material handling areas, driveways, and access/haul roads to prevent migration of contaminants off-site. The acceptable paving material shall include, but not be limited to, asphalt, concrete or gravel. The CDPH reserves the right to require any additional or alternate paving as deemed necessary by CDPH.

29. The Facility shall have a sign, clearly visible to the public, which states the name, address and telephone number of the Permittee, the type of recyclable materials accepted, the types of materials prohibited, and the Facility's operating hours.

HOUSEKEEPING, DUST CONTROL, AND MAINTENANCE

30. The Permittee shall sweep Facility pavements and affected adjacent streets each working day, and on an as-needed basis. Such sweeping shall be performed using a mechanical street sweeper equipped with a water spray and vacuum system to effectively remove dust and litter.

31. The Permittee shall make a water source available at all times for purposes of Facility cleaning, and dust control. If the water source is a public waterbody or a City of Chicago fire hydrant, the Permittee shall secure all necessary permits and approvals prior to drawing water from such sources.

32. The Permittee shall control and suppress dust and other air-borne materials created by Facility activities so that the off-site migration of these materials does not occur. This control and suppression may include, but are not limited to:

    a. Employing watering methods as often as necessary;

    b. Adequately sheltering dust-emitting activities from the wind or temporarily suspending such activities during high wind conditions; and

    c. Enclosing and containerizing materials that are susceptible to becoming wind-borne.

33. The Permittee shall promptly repair damaged or broken pavements to sustain their integrity, prevent standing water, and minimize the generation of dust and mud. The Permittee shall promptly backfill all potholes and depressions at the Facility with aggregate or suitable fill material. In addition, The Permittee shall resurface worn gravel pavements with fresh aggregate as needed.

34. The Permittee shall place garbage inside a covered container. The Permittee shall not allow such containers to overflow and shall immediately empty, or remove and replace them when full.

35. The Permittee shall install and maintain filter inserts in all Facility catch basins and storm water inlets to keep sediments, oily liquids, and floatables from discharging into the City of Chicago sewer system.

36. The Permittee shall promptly contain, and clean-up spilled or leaked fluids. The Permittee shall provide spill response kits in all areas of the Facility where chemical, oil, and fuel spills or leaks of one gallon or more may occur. Such kits shall be fully stocked with appropriate materials such as socks, brooms, adsorbent material, and proper personal protective equipment.
37. The Permittee shall routinely remove oil and grease stains off of site pavements, walls, and equipment by steam cleaning, pressure washing, or scrubbing these surfaces clean. Such cleaning shall be conducted at least bi-weekly and as needed.
38. The Permittee shall inspect the Facility for vectors twice per month or retain the services of a vector control specialist to conduct said inspections. The Permittee shall employ vector control measures that may include, but are not limited to, bait stations and traps, as often as necessary.
39. The Facility shall have personnel for patrolling adjacent properties for litter. The Permittee shall promptly remove and dispose of any litter that is observed at any affected off-site areas.
40. The Permittee shall maintain the streets, sidewalks and sewers adjacent to the Facility, free and clear at all times of all material and debris transported to or from, handled or stockpiled at the Facility.
41. The Permittee shall follow applicable requirements in Part 722 of the Illinois Administrative Code, Title 35 in the management and disposal of potentially hazardous waste such as, but not limited to, spilled battery acids, mercury-containing waste, and spent oils or chemicals.

RECORD KEEPING

42. All logs, receipts, and other documentation required under this permit shall be kept at the Facility a minimum of three years and shall be made available to the CDPH and the CPD upon request.
43. The Permittee shall maintain a written record of all vector inspections and vector control installations including date, time and a detailed description of each inspection and any installations or applications to control vectors.
44. The Permittee shall keep a log of liquid waste pickups that documents the dates and the volumes of liquid waste removed and disposed of offsite. Further, the Permittee shall keep all disposal receipts as proof of proper waste disposal.
45. The Permittee shall maintain a log of all vehicles entering and leaving the Facility. This log shall indicate the date, vehicle type, hauling company name if any, and the material type and quantity being transported. The Permittee shall maintain copies of all load ticket receipts.
46. The Permittee shall maintain a written log documenting all cleaning and maintenance activities performed at the Facility under the Housekeeping, Dust Control, and Maintenance section of this permit. Such log shall include a description of the cleaning operation or maintenance activity performed, the signature of the employee that performed it, and the date and time the employee started and completed the task.
47. The Permittee shall maintain a written record of all emergencies occurring at the Facility,

including the date and time of each incident, along with a detailed description of the emergency. The Permittee shall notify the CDPH each day that the Facility is affected by the emergency. Such notification shall be sent by email to EnvWastePermits@cityofchicago.org.

48. The Permittee shall timely comply with the requirements contained in Chapter 11-5, Reduction and Recycling Program of the Chicago Municipal Code. The Permittee shall submit semi-annual reports to the Department of Streets and Sanitation ("DSS") Recycling Coordinator, on forms provided by the DSS.

SITE SAFETY

49. The Permittee shall undertake all necessary steps to ensure that the Facility is secure from unauthorized entry, is sufficiently screened from the surrounding area and is adequately lighted after dark.

50. The Permittee shall provide training to all Facility employees on fire prevention, emergency procedures and hazardous material identification and handling procedures.

51. The Permittee shall install and maintain fire suppressant equipment in accordance with the Municipal Code of the City of Chicago.

52. The Permittee shall correct any and all violations identified by the City of Chicago Fire Department inspections. Failure to comply with these actions may result in revocation of this permit.

53. The Permittee shall conduct all torch cutting activities in a designated area located away from flammable material storage areas. Gas cylinders used for cutting or welding purposes shall be stored in an upright position and properly secured to avoid accidental jarring or impact.

PERMITS

54. The Permittee shall maintain an active Certificate of Operation from the CDPH, pursuant to Section 11-4-660 of the Code, for all existing regulated equipment or areas requiring an Air Pollution Control (APC) permit. The Permittee shall obtain an APC Permit from CDPH, pursuant to Section 11-4-620 of the Code, for any new regulated equipment or area installed at the Facility.

55. The Permittee shall acquire all necessary permits and approvals for the Facility including but not limited to those required by the CDPH, Department of Business Affairs and Consumer Protection, Zoning Board of Appeals, Metropolitan Water Reclamation District of Greater Chicago and the IEPA. The Permittee shall provide copies of all such permits and approvals to the CDPH upon request.

56. The Permittee shall maintain copies of all Facility permits on site at all times and shall make these available for inspection upon request by the CDPH.

CLOSURE

57. If the Permittee permanently closes or ceases operations at the site ("closure"), the Permittee must submit a written closure notification to the CDPH within 30 days of closure.

If the permit is not renewed for any reason, or the Permittee ceases operations at the site, the Permittee must clean up, remove and properly dispose of or recycle all material and waste on the site within 30 days of permit expiration or closure. The Permittee must submit disposal and recycling receipts as proof of proper disposal.

VEHICLES

58. Every vehicle used by the Facility for the collection, transportation or disposal of any recyclable material shall display on each side of the vehicle in letters not less than two inches in height, in contrasting color, the name, address, telephone number and permit number of the recycling facility.

MISCELLANEOUS

59. Within 45 days from the date of this permit, the Permittee shall submit a plan and timeline to effectively reduce dust generation and track-out from vehicles. Such plan may include the following:

    a. A thorough cleaning of underlying concrete pavement to remove dust buildup;

    b. Application of a gravel layer over worn surfaces in accordance with Section Three of the Federal Highway Administration's Gravel Roads Maintenance and Design Manual (available at the Illinois Department of Transportation's website at http://1.usa.gov/1Woytmg) , and/or as directed by a qualified pavement engineer or professional;

    c. Posting and enforcement of speed limits at the Facility to 15 miles per hour or less;

    d. Daily sweeping of concrete pavements with a street sweeper to pick up dust accumulation;

    e. Use of alternate environmentally-responsible dust suppressant to reduce water usage and prevention of mud;

    f. Construction of a stabilized surface at Facility ingress and egress points to remove dirt and mud from vehicles before entering the public way; and

    g. Incorporation of temperature, humidity, and roadway condition information to the *Facility's Monthly Water Log - Road Dust Suppression Control Record* form, and consideration of these factors to prevent the excessive application of water that contributes to mud generation.

VARIANCES

60. The Permittee is authorized to stockpile recyclables materials outdoors, with or without markings or labels as required in Special Condition No.19.

Delete ···

South Shore Recycling

You forwarded this message on Wed 5/29/2019 11:31 AM

Label: NRDC 50-Year Permanently Delete Sent Items (50 years) Expires: Wed 5/1/2069 3:22 PM

GM

Geertsma, Meleah
Tue 5/14/2019 4:22 PM

To: Graham, Dave (Dave.Graham@cityofchicago.org); Hesse, Jennifer (Jennifer.Hesse@cityofchicago.org); Ames, Mort (Mort.Ames@cityofchicago.org) **+4 others**
Cc: Harley, Keith (kharley@kentlaw.iit.edu)

All -

On behalf of the Natural Resources Defense Council, I am writing to request that local, state and federal agencies conduct a full investigation into air emissions, including but not limited to fugitive/visible emissions, from South Shore Recycling, located at 11600 S. Burley.

According to a recent variance request submitted by American Zinc Recycling (AZR) to the Chicago Department of Public Health (CDPH), AZR workers have observed visible emissions from the direction of South Shore Recycling; AZR further attributes PM10 spikes at its air monitors to South Shore. (See pages 13-14 here: https://www.chicago.gov/content/dam/city/depts/cdph/InspectionsandPermitting/AZR_VarianceRequest_4252019.pdf). [We note that USEPA's Xact Metals also described elevated metals in the vicinity of South Shore, though concentrated further south at Reserve Marine Terminals.]

In addition, we request that CDPH determine whether South Shore Recycling handles any materials qualifying as "bulk solid material" under the agency's dust rules that would require submission of a dust plan and installation of PM10 monitors, and inform us of its conclusion and the basis for it. We are also requesting Illinois EPA's and U.S. EPA's help in identifying any state/federal environmental permits issued to this facility, as a search in Illinois' online database turned up no hits (we did locate the facility in EPA's ECHO database, regarding RCRA).

Thanks,
Meleah

MELEAH GEERTSMA
Midwest Director, Health Equity and Water
Senior Attorney

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AZR AMERICAN ZINC RECYCLING
Delivering a Sustainable Future

April 25, 2019

Julia Morita, M.D.
Department of Public Health
Pollution Prevention Unit
333 South State Street, Room 200
Chicago, Illinois, 60604

Re: AZR Variance Request
Rules and Regulations for Control of Emissions from the Handling and Storage of Bulk Solid Materials - Part D.

Dear Commissioner Morita,

In accordance with Section 10.0 of the Rules and Regulations for Control of Emissions from the Handling and Storage of Bulk Solid Materials (the "BSM Rules"), effective January 25, 2019, American Zinc Recycling Corp. ("AZR") submits the following variance requests related to operations at its facility in the Calumet area of Chicago (the "Chicago Facility" or the "Facility").

Variance Requests (Section 10.0(2)(a))

A variance is requested from Part D Enclosure Requirements for the storage, handling, and transfer points for the Facility's manganese-bearing material known as Iron Rich Material ("IRM"). Although the Facility processes a second, manganese-bearing, bulk solid—electric arc furnace dust ("EAF dust")—AZR does not require regulatory relief for that material because the material already is handled in compliance with the BSM Rules.

A second variance is requested from the Interim Fugitive Dust Plan in Section 5.0(1)(b). Because this requirement does not have a direct effect on public health, and the appropriateness of this variance depends on CDPH's treatment of the first variance request, this variance request is discussed at the end of this filing.

Pertinent Data on Location, Size, Population, and Geographic Area in Vicinity of the Chicago Facility (Section 10.0(2)(b))

AZR's Facility is located at 2701 E. 114th St., in the Calumet area of Chicago, on the Calumet River. It was built in 1940. Horsehead Resource Development Company, Inc. ("Horsehead R&D") purchased the plant in 1986. In 2003, Horsehead Corporation purchased the assets of Horsehead R&D in a then-pending bankruptcy proceeding. Horsehead Corporation

subsequently changed its name to "American Zinc Recycling Corp." in May 2017. In all material respects, AZR has continued the plant manufacturing operations unchanged since the 2003 acquisition. The Facility currently employs 65 employees.

An aerial photograph of the Chicago Facility is attached as Exhibit A. The Facility property encompasses approximately 33.5 acres and is located in the South Deering neighborhood of Chicago. South Deering covers an area of approximately 11 square miles, bounded on the east by the Calumet River and on the west by Lake Calumet. The area has a long industrial history because of its ready access to transportation, including river, railcar, and nearby interstate highway connections. For an urban area, the neighborhood is sparsely populated: Despite easily being the largest of Chicago's 77 official community areas, South Deering only has ~14,600 residents.[1] By contrast, Chicago's second largest community area, Austin, is only 7.15 square miles, but has ~98,000 residents.[2] There are no residential properties in the immediate vicinity of the Facility—it is located within a district that is zoned for manufacturing use under the City of Chicago Zoning Ordinance. The closest residential property is ¼-mile southwest, across Torrence Avenue. AZR

The AZR Facility is bordered on the north by an equipment yard for Walsh Construction, and on the south by a grain facility (COFCO International). To the west, there are railroad tracks between the Facility and Torrence Avenue. The Calumet River is immediately east of the property, with industrial facilities located along it in the vicinity of the AZR Facility that are used for scrap metal processing, storing bulk materials, and transferring bulk materials (including coke) to and from barges and trucks. Within a mile of the plant are a number of other facilities, that handle various bulk solid materials, as well as a port vessel loading operation.

The area is heavily industrialized, and AZR personnel have observed visible dust emissions coming from the properties of its neighbors. On various occasions AZR personnel have smelled rotting grain coming from the adjacent facility immediately to the south and have observed particulate emissions originating from the scrap recycling facility across the river.

A map with nearby industrial facilities is attached as Exhibit B.

To be clear: AZR does not believe that its manufacturing operations affect the surrounding population beyond the normal effect of any ongoing manufacturing operation within a community, such as the presence of truck traffic entering and exiting the facility. (And even that effect is limited to a fraction of the South Deering area.) Accordingly, a formal response to the BSM Section 10.0(2)(b)'s request for information on "the population and geographic area affected by, or potentially affected by, the process or activity" would describe only the AZR Facility. Nonetheless, this variance request describes a broader geographical area so that the Department appreciates the industrial character of the region, and the potential for AZR's neighbors to cause dust emissions to be carried to the AZR Facility.

[1] https://www.cmap.illinois.gov/documents/10180/126764/South+Deering.pdf.

[2] https://www.cmap.illinois.gov/documents/10180/126764/Austin.pdf.

AZR strives to be a good member of the local community. Despite significant community and governmental interest in problems caused by airborne bulk solids (including airborne manganese), AZR has not received complaints from its neighbors, other local citizens, local police or elected officials regarding particulate materials leaving the AZR property.[3] Other than the use of the local roads leading to and from its facility by employees and contractors, AZR believes that the area affected by its manufacturing activity is generally limited to the Facility premises.

Description of Process & The Quantity and Types of Materials Used (Sections 10.0(2)(b) & 10.0(2)(c))

AZR's Facility is a recycling operation for electric arc furnace dust ("EAF dust") material generated by the steel mini-mill industry. AZR's recycling operation prevents EAF dust from winding up in landfills and instead turns it into valuable commercial products, namely "Waelz Oxide" ("WOX") and "Iron Rich Material" ("IRM").[4] The Facility is not a bulk-solids terminal, and does not handle, store, or transfer bulk material on behalf of others.

The manganese concentration (by weighted average) of EAF dust is approximately 2%-3%. But the Facility's receipt and use of EAF dust as a feed material to its manufacturing process is conducted in a fully enclosed process. The EAF dust and other zinc-bearing feedstock materials (collectively, the "feedstock material") arrive at the Facility via enclosed railcar or truck. The railcar or truck enters a Facility building, known as the "C&B Building" which provides full enclosure for the receipt and handling of the feedstock material. EAF dust is placed directly into the process from trucks and railcars which are offloaded indoors. All handling of this material is done indoors or within enclosed structures, which are equipped with particulate matter (PM) pollution control equipment. This air pollution control equipment is identified and regulated in the Facility's Clean Air Act Permit Program (CAAPP) permit issued by the Illinois EPA.[5] (Attached as Exhibit C) Through the use of the air pollution control equipment (Bag Collectors 11A, 11B, and 12), the C&B building is maintained under negative pressure to prevent the escape of fugitive emissions. Furthermore, the CAAPP Permit requires periodic testing of this air pollution control equipment.[6] This testing, most recently completed on November 15-16, 2017, confirmed that the air pollution control equipment was effectively

[3] On August 13, 2018, a CDPH inspector noted one of the kilns at the Facility producing emissions with "~10-15%" opacity. (A copy of the CDPH inspector's report is attached as Exhibit C.) AZR addressed this observation by adjusting the operations of the kiln to abate the emissions. The CDPH inspector's report documents AZR's compliance with the requirements of the BSM Rules.

[4] AZR manages its WOX materials in compliance with all applicable sections of the BSM Rules, and these materials are not the subject of this variance request.

[5] In CAAPP Permit No. 96030189, Condition 4.1.1, the C&B Building is identified as "Curing and Blending Building" and is controlled by Bag Collectors 11A, 11B, and 12.

[6] CAAPP Permit No. 96030189, Condition 4.1.2.b.ii.D.I.

operating, and compliance with PM_{10} emission limits identified in the CAAPP permit was demonstrated.[7]

The curing and blending process pelletizes the EAF dust. Pelletized EAF is no longer a "dust" and its potential to become airborne while being transported to the kilns is minimal. In any event, the pelletized EAF is not exposed to the outdoor environment—it travels through enclosed conveyor belts to the Feed Building, and proceeds either to Kiln 1 or Kiln 2, again through completely enclosed conveyor belts.

Thus, the AZR Facility's use of EAF dust does not present a threat of unacceptable off-site emissions either during transport to or after arrival at the Facility. Because EAF dust is not stored or otherwise handled outdoors, the use and handling of EAF dust does not trigger any additional enclosure or monitoring requirements under the Amendments.

The IRM produced by the processing of EAF dust has approximately 1%-2% manganese concentration. Manganese in the IRM is present in two compound forms: a very small amount of a silicate compound which includes manganese, and a smaller, trace presence of manganese in the metallic iron (as a ferromanganese compound).[8]

But although it has a lower manganese concentration than the EAF dust, the IRM cannot feasibly be handled in a totally enclosed manner like EAF dust. AZR produces approximately 76,000 cubic-yards of IRM annually, and at any given time, there are several piles of IRM stored outside at the Facility in compliance with the 30-ft. height restriction in Section 7.0(2) of the BSM Rules. Among other uses, IRM is used as an iron source in cement production, as an aggregate in asphalt production, and as a passive water treatment medium for the removal of metal (under the trade name "Ecotite").

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[7] *Report on a Particulate Emissions Test Program*, prepared by Clean Air Engineering for American Zinc Recycling Corporation, January 4, 2018. This Report is included in Exhibit E. The appendices to this report have been omitted due to size, but are available on request. See also CAAPP Permit No. 96030189, Conditions 4.1.2.b.i.B, and 4.1.2.b.i.D.

[8] *See* Pittsburgh Mineral & Environmental Technology, Inc. (PMET) results of semi-quantitative mineral phase analysis of AZR's IRM, dated October 24, 2018 (Exhibit F). PMET is a certified lab that performed an X-ray powder diffraction (XRD) analysis to determine the mineralogical composition of IRM, and an analysis of the metal flake in the IRM (largely iron based) using a scanning electron microscope with energy-dispersive x-ray detector (SEM-EDX) technology. Per the SEM-EDX analysis, a very small fraction of the metal in IRM as a ferromanganese compound (at a total manganese concentration of approximately 0.1% of the IRM), and, per the XRD analysis, another small percentage of manganese in the IRM (possibly in the form of manganese oxide, at approximately 1.5%) as braunite, a silicate material. AZR acknowledges that materials containing ferrous manganese compounds and manganese silicates fall within the BSM Rule's definition of "Manganese-Bearing Bulk Material," but manganese is not extracted from the IRM and AZR questions whether IRM generates manganese-containing emissions as handled at the AZR Facility, both of which are also requirements of the definition.

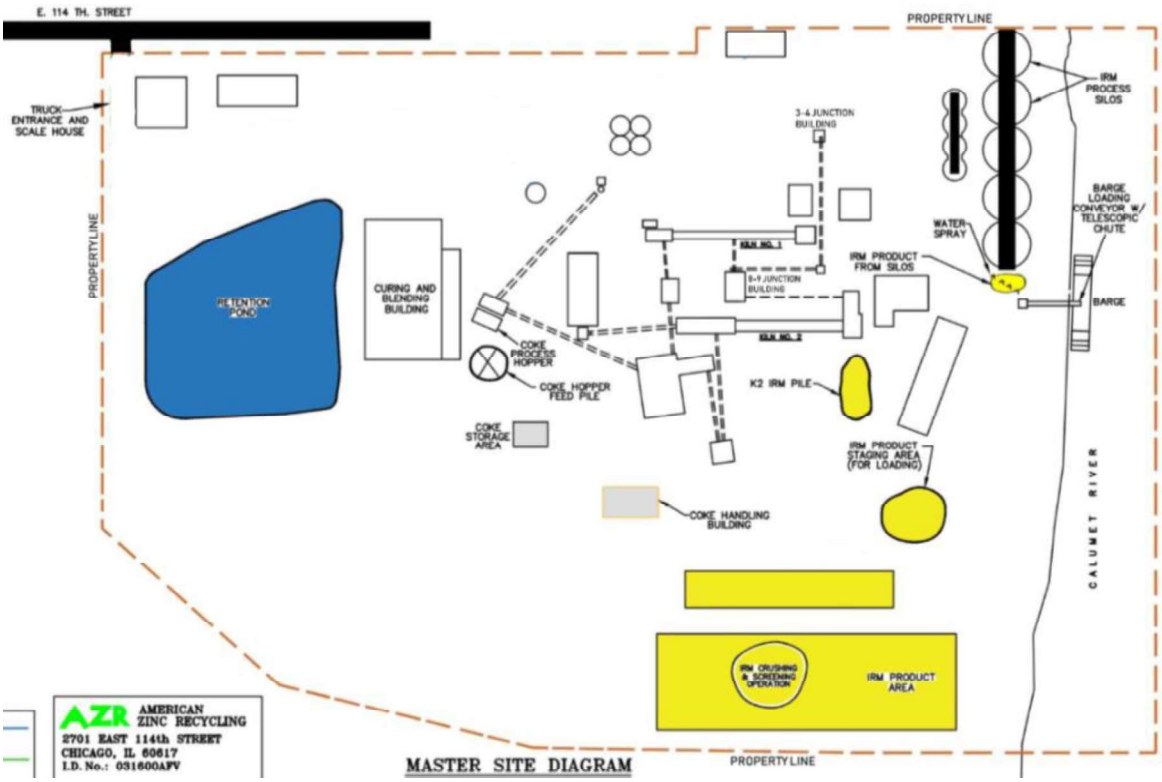

Figure 1 - Site Diagram (Large version attached as Exhibit G)

IRM is formed in the Chicago Plant's two Waelz kilns.[9] Each kiln produces IRM that can be in two forms: "fine" IRM and oversized IRM. The "oversized" IRM is about the size of a basketball and has no potential to become airborne. It exits each kiln into an "Oversize Pit" and is periodically collected by front-end loaders and taken to a dedicated bunker at the IRM Product Area. There it undergoes quality-control testing, and if it is of appropriate quality, it is run through crushing and screening equipment so that it is of a similar size to the other IRM material. This crushing and screening equipment is regulated by the Facility's CAAPP permit, and a water truck spray is used for dust suppression during crushing/screening operations (even during freezing conditions). The permit requires additional precautions required by 35 Ill. Admin. Code 212.301, 212.306, 212.308, and 212.316.

Fine IRM exits each kiln from a different port than the oversize IRM.[10] Each kiln is attached to a "cooler" which collects the Fine IRM and rapidly cools it with sprayed water so

[9] Pursuant to the Facility's CAAPP permit, the kilns use two product collectors for limiting emissions.

[10] In April 2019, the Kiln 2 Cooler was shut down for repairs, and Kiln 2 has temporarily been directing both "fine" IRM and oversize IRM into a "water quench pit." From the quench pit, a backhoe scoops up the material, and places it on the neighboring "K2 IRM Pile." After quality-control testing, material is wetted again, and transported by front-end loader to the IRM Product Area. Because the material is completely immersed in water while in the quenching pit, and remains soaking wet while it is placed in the "K2 IRM Pile," this temporary process has no

that it can be safely handled.[11] Fine IRM exiting Kiln 1 passes through the Kiln 1 Cooler, then travels along a series of three conveyor belts, each of which is enclosed. (In the map in Exhibit G, this can be seen as three dashed lines forming a "J" shape, beginning at the mid-point of Kiln 1.)

The conveyor belts from Kiln 1 terminate at the "3-4" Junction, which is a small building that encloses the deposited material on all but one side. The building does not have a northern wall, and this is how front-end loaders access the deposited material before transporting it to the IRM Process Silos. Three permanent water sprays soak all Fine IRM entering the 3-4 Junction. The 3-4 Junction is not a storage area—fine IRM is typically removed from the Junction by a front-end loader within two-to-four hours. Because the material is kept wet, is enclosed on all but one side, and is at this location only for a short period of time, this transfer point has no meaningful potential to generate fugitive IRM dust.

Figure 2 - "3-4 Junction" Building (showing water from overhead sprays)

Under normal operations, the Fine IRM exiting Kiln 2 passes through the Kiln 2 cooler, then travels on an enclosed conveyor belt to the "8-9 Junction" Building, a small building located in between Kiln 1 and Kiln 2. This building encloses the Fine IRM deposited there on five sides and an attached baghouse prevents fugitive dust from leaving the building.[12]

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potential to generate fugitive dust. The K2 IRM Pile will be eliminated once the Kiln 2 Cooler is repaired.

[11] Construction Permit No 18050025 from the Illinois EPA, identifies these water spray systems and associated water spray operating log.

[12] In order to minimize the number of conveyor belts and transfer points, AZR has committed project capital to redesigning the Kiln 1 Fine IRM system so that it terminates in the same place as the Kiln 2 Fine IRM, namely, the 8-9 Junction Building. This upgrade—projected to cost $250,000—will result in all Fine IRM being deposited in the 8-9 Junction Building. A water

Front-end loaders are used to transport Fine IRM from the 3-4 Junction Building and the 8-9 Junction Building to the IRM Process Silos. The Silos are not used for long-term storage of the IRM.[13] Rather, this is a "QA" area, where batches of IRM can undergo quality-control testing before being comingled with other batches of IRM at the IRM Product Area. The Silos do not provide complete enclosure of the IRM—each has an opening at the base large enough for the front-end loaders to enter the structure. Nonetheless, the IRM at this point has no meaningful potential to become airborne. The IRM is shielded from the wind on almost all sides and remains wet from the Kiln 1 and Kiln 2 coolers. Accordingly, there is no meaningful potential for this material to become airborne while being transferred or stored in the IRM Process Silos.

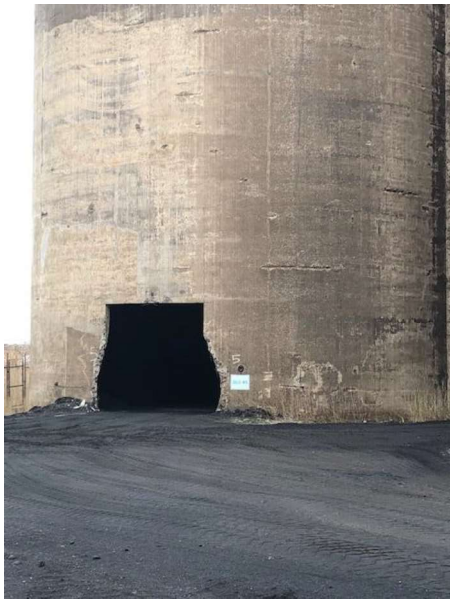

Figure 3 - IRM Process Silo

Figure 4 - "8-9 Junction" Building with Baghouse

After analytical testing, the IRM is moved by a front-end loader from the Silos to one of three areas. If barge shipments are scheduled in the near future, the IRM is moved to a temporary staging area located approximately 150 feet south of the barge-loading conveyor system (the "IRM Product Staging Area (for Loading)" on the site diagram.) IRM inventory for later customer shipments is stored in the IRM storage pile area located on the southern portion of the Facility (the "IRM Storage Bunkers" and "IRM Product Area" on the site diagram). The barge-loading conveyor system is enclosed, and a chute extends down from the end of the conveyor into the hull of the barge, so that descending material is protected and shielded from the wind.

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spray system (similar to the one at the 3-4 Junction Building) will be added to the 8-9 Junction Building. The 8-9 Junction Building's baghouse will be removed as part of this project. Once the project is complete (projected June 30, 2019), the 3-4 Junction Building will no longer be a transfer point for Fine IRM.

[13] The Process Silos are not large enough to be used for the long-term storage of IRM. The Silos were constructed before the Facility was repurposed as an EAF-recycling operation.

Figure 5 - Photo of Enclosed Conveyor with Chute Depositing Material in Barge

The AZR Facility has been permitted by both the City of Chicago and the Illinois EPA, including regular inspections by both authorities. As noted previously, the Facility currently operates under a Title V Clean Air Act Permit Program (CAAPP) permit (I.D. No. 031600AAF), issued by the Illinois EPA.[14] With one exception, the Facility has consistently complied with the requirements of this permit regarding the control of fugitive dust emissions.[15]

The Facility also operates as a solid waste management site (ILD040891368; Permit No. 1986-08-OP, Supplemental Permit No. 2004-07-SP), which contains provisions for the on-site accumulation and storage of product material on the property, namely IRM. In accordance with the requirements of the City of Chicago Rules and Section 11-4-660 of the Municipal Code of Chicago, the Facility maintains a Certificate of Operation from the City of Chicago.

Demonstration of Impact (Section 10.2.d.)

1. **IRM is unlikely to produce fugitive dust, even when stored outdoors.**

In the case of the IRM, the nature of that material is itself a limiting factor on emissions. It is very dense (weight upwards of 100 lbs/ft^3), when compared to bulk solids like coal or coke. When the IRM is exposed to the atmosphere, compounds which comprise IRM, similar in nature to lime, form a four-to-five-inch thick crust which is as hard as concrete (lime is a key component of most types of cement.) The crust is so hard that the IRM surface cannot be broken through with a shovel. This crust (which becomes one-inch thick within a few weeks regardless

[14] Per the Facility's CAAPP permit, fugitive emissions from IRM handling and storage piles are identified and permitted at Condition 4.4. Fugitive emissions from IRM screener, crusher, and storage piles and associated roadways are identified and permitted at Condition 4.6.

[15] On July 5, 2018, a lightning strike caused an operational failure at the Facility that caused the induction fans that draw emissions from the Facility's Kilns into AZR's pollution control equipment to lose power. After 23 minutes, AZR personnel identified and corrected the problem. However, during this period of time, the Permit's 30% opacity limit was exceeded. Within hours of the event, AZR submitted notices to the Illinois Environmental Protection Agency, the Illinois Emergency Management Agency, and the National Response Center.

of the season) prevents IRM from generating meaningful fugitive dust emissions when it is stored outside.

Figure 6 - Photo of IRM Showing Crust

2. AZR takes affirmative efforts to suppress fugitive dust.

Whenever the IRM is transferred at the Facility (*e.g.*, when exiting the kiln, or from storage silos to the IRM Product Area, or from the IRM Product Staging Area onto trucks), AZR uses its water-based dust-suppression system to apply water to the IRM.[16] The Facility has permanent water sprays installed at the 3-4 Junction Building, the Kiln 1 Cooler, and the Kiln 2 Cooler. The Facility has, for several years, used a water truck, equipped with a spray hose, for dust suppression at other IRM loading or transfer locations. And in February 2019, the Facility began renting a second water truck to ensure that dust suppression can be performed consistently or at those times when the other water truck is unavailable.[17] Facility personnel have no discretion to forego dust suppression efforts if a water truck is unavailable. The task must be delayed until a water truck becomes available. Even during freezing conditions, when water application is impractical or unsafe, a Liquidow™ technical-grade calcium chloride solution is used as a chemical stabilizer during any outdoor loading, unloading, transfer, or pile disturbance.

[16] When freezing conditions are present, quality-control and safety issues prevent AZR from applying water during transfer operations. In these circumstances, AZR (1) monitors weather forecasts and ensures that its on-call contractor applies chemical stabilizers to any outdoor loading, unloading, transfer, or pile disturbance during freezing conditions; (2) monitors for visible dust and shuts down if the dust emissions cannot be effectively suppressed without the use of water spray; and (3) as of February 2019, maintains and operates PM_{10} monitors and evaluates the results to ensure that there is no marked increase in fugitive dust during freezing conditions. CDPH has concluded that these measures are sufficient to prevent the creation of a public nuisance and protect the surrounding community. CDPH Response to Variance Request, at p. 3 (Sept. 14, 2018).

[17] The water truck costs about $2,000 dollars per week.

Figure 7 - Water Truck Applying Water to Bulk Solids

The application of water accelerates the formation of the crust on the surface of the IRM and also ensures that fugitive dust emissions are controlled during IRM loading or transfer activities. Indeed, the watering is so routine that Google Earth Pro's satellite photo of the IRM Product Area (taken at an essentially random point in time in October 2018) shows a water truck applying water to the IRM Storage Pile.

Figure 8 - Google Satellite Photography Dated 10/15/18 (Water Truck Shown on Right Side of Image)

Water is also applied to the IRM immediately prior to being screened at the IRM Product Area.

AZR's additional dust suppression efforts have been comprehensively documented in its Fugitive Dust Plan, which has been repeatedly updated since it was first submitted to the Department in 2014, most recently in January 2019. The Plan includes provisions to prevent truck activity from generating significant amounts of fugitive dust. AZR uses a uses a street sweeper equipped with a vacuum system to clean paved roads used to transport material inside

the facility and within one-quarter mile of the perimeter of the Facility. The sweeper also employs a water spray during non-freezing conditions.

Additionally, before IRM trucks exit the Facility, AZR personnel inspect their wheels for loose material. If loose material is found, it is hosed off with water (weather permitting) before the IRM truck is allowed to leave the Facility. This precaution was initially adopted when some portions of the Facility were unpaved, increasing the potential for material to adhere to truck tires. Now, all internal roads at the Facility are paved, and so significantly less material ends up on the tires of IRM trucks.[18] Nonetheless, AZR has left this inspection in place, out of an abundance of caution.

AZR has also devoted increasing resources towards preventative maintenance at the Facility. In November 2018, AZR implemented a computerized preventative maintenance system that tracks the maintenance needs of every piece of equipment at the Facility. The system, requires a significant commitment of man-hours to implement but greatly reduces the chance of any equipment breakdowns, including pollution-control equipment, because required maintenance and repairs are flagged and addressed on a consistent, regular basis.

The increased reliability of the pollution-control systems and other Facility equipment provided by the new preventative maintenance system is beneficial to the surrounding area. In May 2015, EAF dust escaped the C&B Building after a seal on a dust collector broke. With the new preventative maintenance system, this seal, and hundreds of other equipment components, are serviced or replaced on a set schedule incorporated into the maintenance system, significantly reducing how often unexpected failure events like this occur.[19]

3. Objective evidence from other AZR facilities confirms that IRM does not produce significant amounts of fugitive dust.

The effectiveness of the AZR Facility's suppression efforts has been corroborated by direct testing. AZR's quarterly opacity testing—using EPA Methods 9 and 22—in the areas of the Facility where IRM is handled or stored show no opacity or minimal levels well below 10% even when IRM is being removed from or added to the piles. This tracks with long-term PM_{10} monitoring that AZR has conducted at its facility in Rockwood, Tennessee (the "Rockwood Facility"). The Rockwood Facility is comparable to the AZR Chicago Facility both in terms of processing rate of IRM and overall operations. Both facilities operate two kilns, with similar reserves of IRM stockpiles on site. The Rockwood Facility's PM_{10} monitoring results are consistently well below the PM_{10} 150 $\mu g/m^3$ National Ambient Air Quality Standard. AZR previously submitted a detailed review of the Rockwood Facility's PM_{10} monitoring results

[18] The 2019 version of the Fugitive Dust Plan describes existing unpaved roads at the Facility. The next update will be corrected to note that there are no longer any unpaved roads at the Facility.

[19] Also in 2015, a breakdown in the Facility's bucket elevator (which was part of the system that transferred petcoke from storage areas to the kilns) caused material to spill on the ground. The Facility no longer uses petcoke, and it replaced the bucket elevator with an enclosed conveyor several years ago. Nonetheless, occurrences of this nature will be much less frequent now that the computerized preventative maintenance system is in use.

to the Department in support of its prior variance request related to the BSM Rules' requirements for continuous PM_{10} monitoring and that submission is incorporated by reference here.[20] Thus, the empirical data provided by the Rockwood Facility's PM_{10} monitors shows that IRM production, storage and handling at the Facility should not present a risk of off-site fugitive dust emissions that warrant the additional regulation in the Amendments.

4. Preliminary PM_{10} Monitoring corroborate the findings from the Rockwood Facility.

CDPH has previously recognized that the data from the Rockwood Facility is "promising," though it was not convinced that the similarities between the Chicago and Rockwood Facilities were sufficient to reliably predict the level of fugitive dust that would be found at the Chicago Facility. CDPH Response to Variance Request, at p. 13 (Sept. 14, 2018). But AZR has now installed four, permanent, continuous, Federal Equivalent Method real-time PM_{10} monitors at the Chicago Facility.[21]

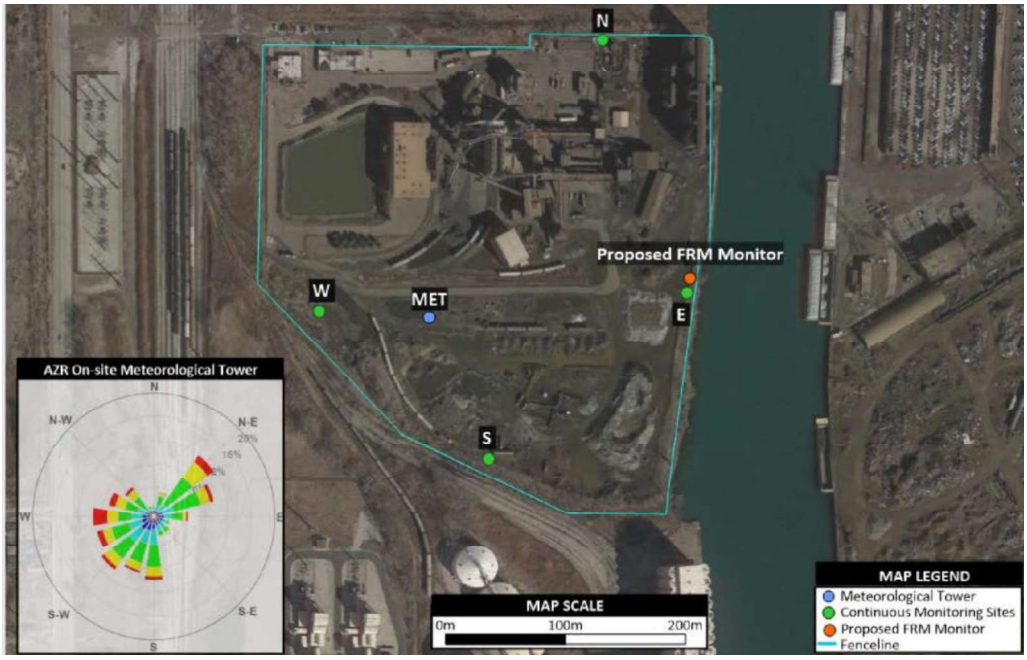

Figure 9 – Site Map Depicting Monitoring Locations

Per a review of the limited validated PM_{10} monitor data collected to date (February 22 through March 31, 2019, over 38 days), monitoring data for the North and the East monitors was evaluated to determine if elevated PM_{10} concentrations occur when the wind is blowing from a direction that would include either IRM handling or IRM storage operations. In the case of the East PM_{10} Monitor, during hours when the average hourly wind blew from a wind direction of south southwest to west (compass directions 190 to 270 degrees), which would include IRM storage and IRM crushing and screening activities immediately upwind of the East Monitor, the

[20] The prior submission, dated June 12, 2018, is available at: https://www.chicago.gov/content/dam/city/depts/cdph/InspectionsandPermitting/SuppSubSupport_AZR_VarReq_6132018.pdf

[21] Photographs of the PM_{10} monitors are attached as Exhibit H.

average PM_{10} concentration of these hours was 25.2 $\mu g/m^3$, as compared to a PM_{10} concentration at the East Monitor from all hours across the monitoring period of record 38 days, of 24.9 $\mu g/m^3$. Thus, there does not appear to be any impact of PM_{10} concentrations when wind blows from a direction with upstream IRM storage and handling operations. In the case of the North PM_{10} Monitor, during hours when the average wind blew from a wind direction of south to southwest (compass directions 180 to 220 degrees), which would include IRM discharge from the kilns and related handling activities immediately upwind of the North Monitor, the average PM_{10} concentration of these hours was 93.3 $\mu g/m^3$, as compared to a PM_{10} concentration at the North monitor from all hours across the monitoring period of record 38 days of 40.9 $\mu g/m^3$. Although these levels are still well below the PM_{10} ambient standard, as a precautionary measure, AZR has initiated additional actions which should help reduce PM_{10} concentrations at the North Monitor.[22] By comparison, across all hours of all 38 PM_{10} monitoring days, the average PM_{10} concentration at the South PM_{10} monitor was 22.4 $\mu g/m^3$, and the average PM_{10} concentration at the West PM_{10} monitor was 20.0 $\mu g/m^3$.

Given the limited data record, and AZR's actions since the PM_{10} monitoring was initiated, there is little evidence of elevated PM_{10} concentrations (fugitive dust) at monitors located immediately downwind of IRM storage and handling operations. So while further monitoring is needed to be more definitive, the fact that the Chicago Facility's air monitoring results resemble the Rockford Facility's results over an initial set of testing creates a strong presumption that extended testing will *also* resemble the PM_{10} monitoring results from Rockford.

If CDPH grants the requested variance, AZR is confident that long-term PM_{10} monitoring data (and metals monitoring to be conducted once CDPH approves the Facility's Metals Management Plan) will show that to be the correct decision. However, AZR is concerned that off-site sources may affect its manganese air monitoring results once that monitor is installed after the CDPH approves AZR's pending metals-monitoring location. As discussed on page 14, *infra*, the new PM_{10} monitoring is already providing strong evidence that PM_{10} levels in this area are the product of other facilities, particularly the South Shore Recycling site to the east where AZR personnel have observed fugitive dust emissions migrating across the river to its facility. AZR submits that more needs to be done to investigate potential sources of fugitive dust emissions, which may contain metals like manganese, so that the risk of off-site sources of manganese being recorded by the future AZR monitor are appropriately addressed.

[22] These measures include additional water spray application where IRM is handled, particularly during nonroutine operations (as discussed on page 15, below), and redesign/reconfiguration of IRM conveyor transfers to reduce the handling of IRM (as described in Footnote 12, *supra*). These activities will be reflected in a subsequent submittal of the Fugitive Dust Plan to the CDPH.

Figure 10 - Photo from AZR Facility of Visible Emissions Originating from South Shore Recycling Facility to the East

During an August 2018 inspection by CDPH inspector Kenneth Scott, AZR pointed out the visible emissions from the recycling facility across the river and suggested that CDPH conduct an investigation into their nature and origin. AZR is unaware whether CDPH has conducted that investigation. In any event, AZR has not noticed any reduction in the frequency or intensity of these emissions since August 2018. Indeed, recently collected monitoring data from the East Monitor suggests that most of the highest PM_{10} readings at this monitor location occur when the wind is blowing from the East.

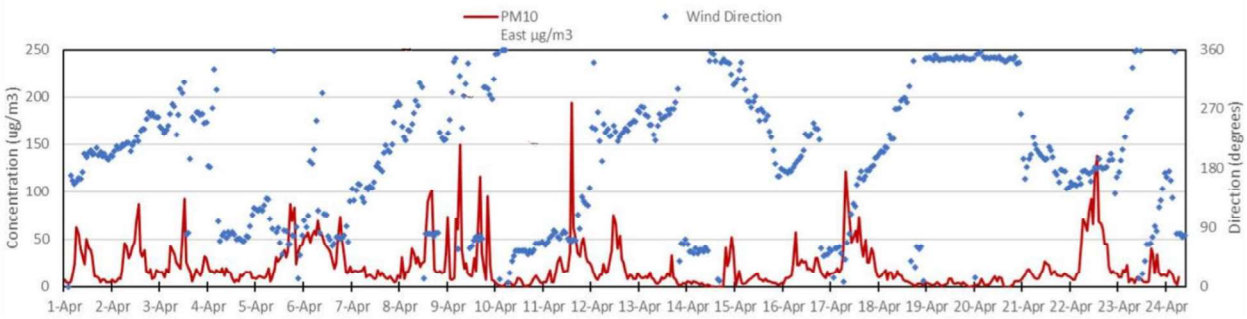

Figure 11 - PM_{10} and Wind Direction Data (East Monitor, April 2019)

On this graph, wind from the East is indicated on the right y-axis as centering around the 90° line. (Winds from the South are at 180°; West winds are at 270°; North winds are at 0°/360°) The elevated readings obtained on April 8th, 9th, 17th, and especially April 11th correlate with Eastern winds, and could not have been generated by the AZR Facility, as any fugitive dust would be blown away from the East Monitor.

5. PM_{10} monitoring shows the effectiveness of new dust suppression procedures relating to "kiln cleanout" events.

On March 19th, 2019, one monitor did find airborne PM_{10} material at levels that met or exceeded the Reportable Action Level. AZR initially notified CDPH of this event on March 22nd, and followed-up with additional information on April 9th, 2019. Based on an investigation by AZR's environmental consultant, Trinity Consultants, the available information shows that this event was not caused by the pile at the IRM Product Area. Rather, the elevated PM_{10} readings occurred while AZR was conducting a "kiln cleanout" of one of the two kilns it uses to process IRM. These cleanouts are part of periodic maintenance—the Waelz oxide process causes IRM residue build up along the interior walls of each kiln. Approximately every 3 months, the kilns are deactivated in turn, and a remote-controlled robot is used to dislodge the IRM residue (called "kiln rubble"). The kiln is rotated to move the kiln rubble towards an opening—the same opening where oversize IRM exits—so that it can be removed from the kiln.[23]

Although AZR personnel do not recall past kiln cleanouts producing significant amounts of dust, the elevated monitoring results on March 19 correspond with the cleanout of Kiln 2 in close proximity to the North Monitor. Once AZR noted the possible connection, it implemented new dust suppression procedures to be carried out as part of the kiln cleanout maintenance process. Specifically, a water truck is brought to the kiln during cleanout and uses its hose to spray water on kiln rubble as it is removed.

AZR first conducted these dust-suppression procedures during the cleanout of Kiln 1 on April 7, 2019. The PM_{10} monitors seem to have confirmed the success of these additional safeguards—none of the PM_{10} monitors recorded elevated levels during this cleanout. Accordingly, AZR has committed to a further capital project to design and install more permanent spray equipment at the site exit point. These upgrades, estimated to cost $150,000 dollars, will include water control valves that will enable adjustments to be made to the amount of water applied for dust suppression at the kiln exit point.

6. IRM storage piles have been studied and showed little to no risk to human health or the environment.

Most important, given the Department's concerns about human health risks posed by manganese-containing bulk solid materials, is the fact that the United States Environmental Protection Agency (U.S. EPA) has already studied the potential health risks posed by outdoor storage and transport of materials like IRM, and even based on what U.S. EPA described as a "very conservative risk assessment," the EPA found that they do not pose any significant health risks.

As AZR advised the Department in its prior variance submission under the BSM Rules, the IRM produced by AZR falls into a category of materials which the U.S. EPA refers to generally as "high temperature metals recovery" slag residue or "HTMR." In the 1990s, the

[23] Kiln rubble is unsuitable for reuse. Once removed, it is placed in an enclosed hopper and is eventually disposed of off-site.

U.S. EPA conducted a risk assessment on HTMR materials to determine the potential human and ecological health impacts from placing HTMR materials on land.[24] The risk assessment specifically included an evaluation of AZR's IRM, because AZR (then "Horsehead Corporation") was and is one of the major producers of this material. The U.S. EPA's risk assessment evaluated a number of potential release and exposure scenarios associated with the generation and management of storage piles of HTMR, including the potential for particulate matter emissions, releases to groundwater, releases that are deposited onto a neighboring residential area, and releases deposited into neighboring surface waters from: (1) outdoor pile storage directly on the ground; (2) the process of adding HTMR slag residuals to the outdoor storage pile; and (3) loading/unloading operations associated with transport of the HTMR slag.

The U.S. EPA reported on the results of this assessment as follows:

> The results from EPA's very conservative risk assessment for the relevant management practices and uses of HTMR slags indicate that constituents of concern in HTMR slags pose little or no risk to human health or the environment. Based on this assessment, no significant risks were found for storage, transport, disposal, and encapsulated uses of HTMR slags (use as subbase, as an ingredient in cement or concrete/asphalt) that meet the [proposed "generic exclusion levels" in the U.S. EPA rules].

59 Fed. Reg. 67256, 67261 (Dec. 29, 1994).

AZR's predecessor, Horsehead Resource Development Co., also commissioned a complete evaluation of the U.S. EPA's HTMR risk assessment by an independent company, Gradient Corporation ("Gradient"), with results similar to those of the U.S. EPA study.[25] Gradient evaluated the U.S. EPA's methodology, assumptions and conclusions, in addition to assessing HTMR product applications not assessed by the U.S. EPA. It concluded that the U.S. EPA was correct in its determination that the HTMR slag products poses "little or no risk to human health or the environment," even though U.S. EPA had employed generally conservative assumptions to predict media concentrations and for deriving health-based reference

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[24] See Proposed Rules, *Standards for the Management and Use of Slag Residues Derived from HTMR Treatment of K061, K062, and F006 Wastes*, 59 Fed. Reg. 67256 (December 29, 1994) ("1994 Proposed HTMR Rules"), https://archive.epa.gov/epawaste/hazard/web/pdf/59fr6725612291994.pdf; see also U.S. EPA, *Draft Report: Assessment of Potential Risks to Human Health and the Environment from Management and Uses of HTMR Slag*, (Nov. 30, 1994) ("1994 HTMR USEPA Report").

[25] Gradient Corporation, *Critical Evaluation of EPA's Risk Assessment in the Proposed HTMR Slag Product Rulemaking*, (Revised April 26, 1995) ("Gradient Corp. HTMR Assessment Report"). Because the Gradient Corp. HTMR Assessment Report is over 200 pages in length, only a copy of the Executive Summary is attached here as Exhibit I.

concentrations.[26] The results of Gradient's analysis similarly concluded that the storage and loading of IRM piles "pose an insignificant threat to human health and the environment."[27]

Statement of Hardship (10.0(2)(e)(i).

The question of whether Section 10.0(1)'s requirements impose an unreasonable hardship on AZR looks to more than the mere cost to comply. The review of the hardship issue is a balancing process which must balance the hardship of compliance against any adverse impact on the environment. *Marathon Oil Co. v. E.P.A.*, 242 Ill.App.3d 200, 206 (1993) (interpreting "arbitrary or unreasonable hardship" language as used in Section 35 of the Illinois Environmental Protection Act, 415 ILCS 5/35(a)). So, because the evidence shows that AZR's outdoor storage of IRM has no meaningful potential to produce airborne manganese, even if the enclosure requirement imposed only modest costs on AZR, those costs would be unreasonable. PM_{10} monitoring for the last month, which included high-wind days, lends support to the conclusion that the outdoor IRM piles do not appear to generate PM_{10} in significant amounts. The outdoor IRM piles and transfers have not produced any Reportable Action Level incidents.

The sole Reportable Action Level PM_{10} incident relates to a periodic maintenance process that only occurs eight times per year (quarterly cleanouts of the two kilns) and that AZR has already modified its procedures to correct. The effectiveness of these new procedures has been confirmed by subsequent testing. AZR has spent significant capital on installing and operating the PM_{10} monitors, and the information they generate has already been put to use identifying the Facility procedures most likely to generate fugitive dust and implementing appropriate corrective action. If this variance is granted, CDPH will have the ability to confirm the ongoing appropriateness of the variance as new monitoring data comes in.

The costs to comply with new BSM Enclosure Rules would be exorbitant. At any given time, there are several piles of IRM stored outdoors at the Facility, some reaching 30 feet high. The cost to enclose these piles would be prohibitively expensive. The IRM Product Area covers approximately five-and-a-half acres. It has cost AZR over $2.5 million just to build an enclosure for the relatively small amount of metcoke it stores for use in its production process. AZR typically stores fifteen times as much IRM as metcoke (by weight). AZR conservatively estimates that the cost to enclose the IRM Product Area in compliance with the Amendments will exceed $10 million. What's more, without a variance, AZR would also be required to install enclosures at *all* transfer points, including the Kiln 1 Oversize Bunker, the Kiln 2 Oversize Bunker/Water Quench Pit, the K2 IRM Pile, the IRM Product Staging Area, and the Barge Loading Area. Additionally, all five IRM Process Silos would need to be retrofitted to add doors. These upgrades would cost at least $3.5 million dollars.

Requiring these costs, when IRM has a minimal manganese content, is already mostly enclosed (except at the IRM Product Staging area and Barge Loading Area), and is subject to aggressive and effective dust-suppression measures, would be unreasonable and arbitrary. AZR has demonstrated in this variance request that it has in place equivalent measures that are

[26] Gradient Corp. HTMR Assessment Report at p. ES-1 to ES-2.

[27] Gradient Corp. HTMR Assessment Report at p. 178.

reasonably expected to adequately control manganese emissions. Therefore, prior to requiring enclosure at a cost that threatens the continued viability of the Chicago Facility, AZR should be given the opportunity that a variance provides to show through actual operations that its outdoor handling and storage of IRM does not cause any nuisance or adverse effect upon the public health or environment.

Section 10.0(2)(f), Regarding the Proposing of a Compliance Timetable, Is Not Applicable Here

Because AZR is not citing Section 10.0(2)(e)(ii) of the BSM Rules as a basis for the variance, Section 10.0(2)(f)—which is explicitly not a universal requirement for variances from the BSM Rules—is not applicable. CDPH has already recognized that a variance can be appropriate if (1) a facility's manganese-bearing materials contain "a level of manganese that is so low as to be negligible" and (2) the facility "persuasively demonstrates why . . . the exemption will not create a public nuisance or adversely impact the surrounding area, environment, or property uses." See CDPH, *Official Response to Public Comments on Proposed Amendments to Rules for the Handling and Storage of Bulk Material Piles*, at p. 4 (Jan. 25, 2019).[28] Thus, if the CDPH finds that the minimal amounts of manganese found in the Facility's IRM, stored in accordance with existing procedures and dust-control procedures, do not create a public nuisance then there is no need for an arbitrary timetable. AZR will continue to execute existing fugitive-dust control measures indefinitely.

Alternative Methods of Compliance (Section 10.0(2)(g))

AZR takes the issue of manganese emissions seriously. Even though the previous opacity testing and the nature of IRM establish a *prima facie* case that the IRM does not pose a public nuisance, the CDPH can engage in ongoing vetting of that case using additional PM_{10} data generated by the Facility. AZR has installed four, permanent, continuous, Federal Equivalent Method (FEM) real-time PM_{10} monitors to measure potential fugitive dust emissions from the storage, on-site handling, loading, unloading, stockpiling, and processing of bulk solids at the Facility. One of these monitors is located directly adjacent to the IRM Product Area. As the data collection record of these monitors increases, they will measure, among other things, the quantity of PM_{10} in the air at the boundaries of the Facility property and show that the Facility is not a significant contributor to fugitive dust, including fugitive dust that may contain manganese.

Providing CDPH with objective evidence that IRM poses no threat to the South Deering community regardless whether it is transferred or stored indoors or outdoors is an "alternative method of compliance" within the purpose of Part D of the BSM Rules. To date, these monitors are confirming that the Facility's outdoor handling and storage of PM_{10} is not presenting a threat of unacceptable fugitive dust emissions. The isolated March 19 incident associated with a periodic kiln cleanout activity has been addressed by improving the cleanout procedure with the addition of a water spray step, and subsequent data has confirmed the effectiveness of that response.

[28] Available at https://www.chicago.gov/content/dam/city/depts/cdph/InspectionsandPermitting/CDPH_Resp_Com_BulkMaterialAmendments_January2019.pdf

Further, AZR has timely submitted to CDPH its metals monitoring plan (MMP) with a monitoring plan for a proposed Federal Reference Method Sampler (FRM) for PM_{10} filter-based monitoring efforts, as required per Section 6.0(a) of the Amendments. AZR intends to install and commence air monitoring for manganese after its MMP is approved by the Department.[29] The proposed location of the FRM monitor is in close proximity to the larger IRM storage piles on the southern portion of the facility. The manganese air monitoring results will provide an additional alternative method of compliance within the purpose of Part D of the BSM Rules. AZR should be allowed the opportunity to demonstrate through this on-site monitoring that the enclosure of its IRM piles and transfer points is not required to protect public health and the environment.

AZR has considered alternative methods of "enclosing" the IRM piles, but none are feasible. It is impractical to tarp or similarly cover the IRM piles. The need to work the piles somewhat frequently to transfer material makes the use of large tarps impractical. Applying tarps would also create a potential safety hazard for Facility employees working at the IRM piles, particularly during times when gusty wind conditions could cause the tarps to become airborne like a "sail" and threaten the ability of workers to control the tarp when trying to remove it or to secure it back onto the pile. Put simply, the IRM piles already become "enclosed" in a four-to-five inch-thick layer of concrete-like crust material when stored outside.

Nor are existing structures at the Facility sufficient to serve as enclosures. The IRM Process Silos do not have adequate volume and already serve an important role in the quality-control process. Even if the Silos were used for long-term IRM storage, AZR would still have to construct a new enclosure to serve as the new "QA" area.[30]

And some portions of the outdoors IRM transfer process are also already, in effect, enclosed. Section 3.0(7) of the BSM Rules recognizes that conveyors used to transfer bulk solids will, inevitably, be located outdoors sometimes, and so it allows for such systems to be "covered *or* enclosed" so long as this reduces fugitive-dust emissions "to the maximum extent practicable. *Id.* (emphasis added). In particular the conveyor system AZR operates to load barges shields the IRM on all sides from the wind. And at the end of the conveyor, where material is transferred to the hold of a barge, there is an enclosed chute that extends down from the covered conveyor into the hold. (See Figure 5, *supra*.)

AZR's most recent Fugitive Dust Plan describes the Facility's compliance with the provisions of the BSM Rules relating to material transport on site. Trains bringing EAF Dust to

[29] To demonstrate its commitment to installing and operating the FRM monitor, AZR has made reasonable efforts to follow up with the CDPH concerning its review of the MMP. In 2019, AZR or its consultant, Trinity Consultants, left voicemails with David Graham of CDPH on March 11th, March 15th, and March 28th. John Iwanski of Trinity Consulting also emailed Mr. Graham on March 15th. AZR is awaiting the CDPH's response. Once CDPH approves the MMP, AZR will be able to quickly proceed with installation and begin operating the new monitoring equipment.

[30] The Facility Map (Exhibit G) shows four, smaller, silos immediately west of the IRM Process Silos. These smaller silos are not structurally capable of storing IRM.

the facility are unloaded in the C&B Building, which is totally enclosed. Trucks at the Facility must obey a 5 mph speed-limit, which is significantly below the 8 mph limit imposed by Section 3.0(9) of the BSM Rules. Truck traffic is monitored by on-site personnel to ensure that these limits are obeyed.

After loading or unloading at the Facility, trucks are cleaned, sampled, and for loaded trucks, covered at a weigh station before exiting the Facility. Although the elimination of unpaved roads at the Facility significantly limits the potential for dirt to adhere to the tires of exiting trucks, AZR continues to operate rumble strips and wheel washes for outbound traffic. These practices were confirmed by CDPH during an inspection on August 13, 2018.

Current Status (10.2.h)

AZR believes that it has provided the requested statement concerning its current status of compliance related to the subject matter of this variance request. The above information provides the City with AZR's current status regarding the requirements of the City's Rules from which it is seeking a variance.

Fugitive Dust Monitoring Reports (Section 10.0(2)(i))

AZR commenced monitoring for PM_{10} on February 22, 2019. Therefore it only has one complete month of PM_{10} fugitive dust monitoring.[31] So AZR is including, as Exhibit J, the Method 9 and 22 opacity results for 4Q 2018—all of which show no visible dust at the property boundaries of the Chicago Facility. AZR's preparation of the 1Q2019 opacity results for submission to the CDPH is nearly complete and will be submitted shortly to the CDPH. Upon their submission, AZR incorporates by reference the 1Q2019 results into this variance request.

If the requested variance is granted by the CDPH, AZR will provide monthly fugitive dust monitoring reports as required by Section 10.0(2)(i) the BSM Rules. Based on preliminary information regarding the typical timing for receipt of the monitoring results, the requirement to submit the monthly manganese and other metals monitoring results by the 14th day of the month following the monitoring period is shorter than the typical turnaround provided by outside laboratories for such work. AZR requests that the CDPH allow an extension to the end of each month following the monitoring period for submitting the monitoring results so that it can avoid the significant cost premiums that may be imposed by outside laboratories for earlier receipt of the monthly monitoring results. Even the higher costs associated with the earlier receipt of laboratory results does not allow adequate time to perform quality assurance review and evaluation of the data as well as the preparation of the monitoring report for submission to the CDPH by the 14th day of the month.

Once the proposed FRM monitor and location is approved by CDPH, AZR will complete installation and setup as soon as practicable. Once installed, AZR will begin submitting monthly data to CDPH as required by Section 6.0(i) of the BSM Rules.

[31] As noted previously, February PM_{10} data was emailed to the CDPH on March 14, 2019; March PM_{10} data was emailed to the CDPH on April 12, 2019.

Variance Request — Enclosure Construction Schedule (Section 5.0(1)(b))

AZR is also requesting a variance from Section 5.0(1)(b) of the BSM Rules. Section 5.0(1)(b) calls for the submission of an interim Fugitive Dust Plan. This requirement is redundant. AZR already submitted—pursuant to Section 3.0(3) of the BSM Rules—a Fugitive Dust Plan in 2014, and has updated that Plan six times, most recently in January 2019. If AZR's variance request is approved, AZR is willing to either update its Fugitive Dust Plan to reflect the variance terms and conditions or to include all relevant methods for manganese dust control measures, devices, and technologies in a separate interim dust plan to be submitted to the CDPH.

Enforcing Section 5.0(1)(b) as written in these circumstances would impose an arbitrary and unreasonable burden on AZR. Indeed, the "interim" nature of this plan reflects the fact that, if the enclosure variance is granted, the interim plan would quickly be rendered obsolete. Accordingly, waiving the requirement to submit this plan by April 25, 2019, has no potential to create a public nuisance or adversely impact the surrounding environment. Allowing AZR to direct its resources towards active compliance monitoring efforts and the development of a non-interim Fugitive Dust Plan reflecting variance terms and conditions is preferable as a matter of public policy.

AZR respectfully submits that it has satisfied the requirements for a variance in Section 10.0 of the BSM Rules and requests that the Commissioner grant the requested variances from Part D of the BSM Rules and Section 5.0(1)(b) of the BSM Rules for the reasons described above.

Respectfully submitted,

Brad Sutek
Plant Manager

Responsiveness Summary

September 20, 2019

Issuance of a Construction Permit
Sterigenics U.S. LLC - Willowbrook I

Facility Identification No.: 043110AAC
Application No.: 19060030

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INTRODUCTION

This document is a Responsiveness Summary prepared by the Illinois EPA in conjunction with the issuance of a construction permit to an ethylene oxide sterilization source, Sterigenics US, LLC, for a suite of enhancements to its Willowbrook I facility located in Willowbrook, Illinois. The construction permit issued by the Illinois EPA on this same date authorizes the installation of control improvements that are necessary for Sterigenics to comply with the newly-enacted requirements of the Matt Haller Act. *See,* Public Act 101-0022, codified at 415 ILCS 5/9.16. As part of the commitments made by the Illinois EPA when scheduling the August 1, 2019, public meeting, this document provides a written response to significant, permit-related comments raised at the meeting and during the related public comment period.

PUBLIC OUTREACH

Recognizing the significant public interest in the permitting action and based on communications with local elected officials, the Illinois EPA held a public meeting at Ashton Place in Willowbrook on the evening of August 1, 2019, to allow the public to submit comments about the draft construction permit.

Though not required by statute or regulation, the Illinois EPA borrowed from a historical practice of offering the public the opportunity to meet with Illinois EPA officials in advance of the permitting of controversial projects. To ensure that the public benefited from an orderly process that guaranteed the right of public comment, the Illinois EPA made use of the hallmarks of a traditional informational hearing for the occasion. This approach included the following: public notice of the meeting that was distributed on the Agency's website, and forwarded to numerous elected officials, notice of a 30-day public comment period and notice of a draft construction permit; convening of a panel of Illinois EPA staff to address questions at the meeting, including the manager of the Bureau of Air/Permit Section's construction unit group, an emissions testing specialist from the Bureau of Air, and both a Hearing Officer and a Community Relations Coordinator from the Office of Community Relations; transcribing of the hearing by a court reporter; and, the preparation of this Responsiveness Summary to address all significant permit-related comments raised at the public meeting and during the comment period.

Over 500 people participated in Illinois EPA's public outreach in this matter. The Illinois EPA considered all comments in its final permit decision. Public comments generally expressed disapproval of the project, urging the Illinois EPA to deny the permit application. Comments also addressed why Sterigenics would be afforded a second chance of operating its facility given their history of alleged violations.

This Responsiveness Summary responds to the questions and concerns raised relative to this construction permit. Notably, the document addresses the Illinois EPA's role under the Environmental Protection Act and the relevant legal authorities that underlie the Illinois EPA's responses to many of the questions and comments on the permit decision.

Comments are shown in conventional text and responses are shown in boldface. Comments and responses are arranged by subject matter, paraphrasing and grouping similar comments and questions. Numerous comments in this document are depicted in a condensed or paraphrased form, rather than recited in full. In other instances, comments are retained in original form because of their complexity or level of specificity.

All significant comments relating to the draft construction permit or that otherwise fall within the Illinois EPA's scope of permit authority are being addressed in this Responsiveness Summary. This framework necessarily does not answer some of the comments raised at the public meeting or during the comment period but is appropriate because of the inability to address matters outside of the Illinois EPA's regulatory expertise.

QUESTIONS AND AGENCY RESPONSES

Permitting

1. The application was not complete.

The application contained the necessary information for the Illinois EPA to issue the construction permit. As a general rule, permit forms seek information to assist an agency's evaluation of an application, however, the Illinois EPA is not without jurisdiction to base its permit decision on matters outside of the permit forms (e.g. its own institutional knowledge or judgement). In this instance, the application contained sufficient information to demonstrate that the source would not cause a violation of the Act.

2. The permit should be denied. It is within the Illinois EPA's discretion.

Under the Environmental Protection Act, the Illinois EPA is required to issue a permit to an applicant upon proof that the proposed facility or equipment will not cause a violation of the Act or promulgated regulations. *See, 415 ILCS 5/39(a).* This standard is a mandatory one, expressed in the language of the provision as a "duty" that is imposed upon the Illinois EPA. While agency deliberation of certain aspects of the permit may be grounded in the exercise of discretion, the broader legal standard governing permit issuance or denial limits the discretion of the Illinois EPA. In its application, Sterigenics addresses changes that would be made to the facility to comply with the new law. As such, in this instance, the Illinois EPA finds that the legal standard noted above has been met. Nothing in the record, including the public comments on the draft construction permit, adduces otherwise.

3. Is it an option for IEPA to modify the permit for approval without further public comment or meeting?

The Agency may issue a construction permit that includes changes from the draft permit provided to the public for comment. As a general matter, this routinely occurs as public comments on a draft permit help identify changes that should be made.

4. The Illinois EPA cannot ignore public comment and approve the construction permit.

The Illinois EPA reviewed all comments raised at the public meeting and submitted during the public comment period. The Illinois EPA is generally responding to all comments that are significant and, as frequently happens, is making various changes to the permit in response to the comments. These changes include various enhancements to the terms of the permit, as discussed later in this document.

5. Why isn't the Illinois Department of Public Health study a consideration in the construction permit action?

Based upon the recommendation in the ATSDR report, the Illinois Department of Public Health conducted a cancer study of the Willowbrook area. The study is separate and distinct from the actions of the Illinois EPA and speaks for itself. This study is not a relevant consideration in the construction permit action, as it does not reflect requirements of the Environmental Protection Act or its implementing regulations.

6. Why isn't the completed or impending ATSDR report a consideration in the construction permit action?

At the request of USEPA, ATSDR performed an assessment of human health risk posed by emissions of the hazardous air pollutant ethylene oxide from Sterigenics' facility in Willowbrook. ATSDR is currently preparing a second report that would be similar in nature but based on additional information gathered after the completion of the first report. The initial report and the impending report are separate and distinct from the actions of the Illinois EPA and are not relevant to the permitting action.

7. What permit now governs Sterigenics' operation?

The current CAAPP permit for Sterigenics' source, which addresses both Willowbrook facilities, generally sets forth the applicable emission standards, testing, record-keeping, reporting and monitoring requirements that govern Sterigenics' operations.

Sterigenics' operation of the control improvements for the Willowbrook I facility will be governed, in the short term, by the issued construction permit. This will assure that, upon a potential future resumption of operations at the Willowbrook I facility, the more stringent control requirements of the construction permit will govern.

8. The application reveals that Sterigenics is asking the Illinois EPA to operate its facility under the issued construction permit until the CAAPP permit can be revised. Can this construction

permit be used by Sterigenics to resume its operations before the proper operating permit can be issued?

The Illinois EPA is including the authorization to operate the control improvements addressed by the comment. *See,* Condition 12. The condition will allow Sterigenics to operate the control improvements until the requisite operating permit is revised to incorporate the terms of the construction permit.[1] The CAAPP's available procedures result in the same effect.[2] As a practical matter, Sterigenics' obligation to comply with the requirements of the construction permit will assure that the substantive emission standards of the new law will apply prospectively.

9. While Sterigenics may not immediately resume operations at the Willowbrook II facility, there is potential for it to reopen in the future. There are serious concerns that the combined emissions impact from both of Willowbrook facilities could generate harmful levels of ethylene oxide to the atmosphere, which Illinois EPA should assess now before the construction permit issues.

Neither the permit or the dispersion modeling addressed in the permit application for the control improvements at Willowbrook I facility account for the resumption in operation of the Willowbrook II facility. Because Willowbrook II is currently idled by the Consent Order, the Illinois EPA will not address the impact of the idled plant's emissions in this permit action. A resumption in operation of the Willowbrook II facility would require Sterigenics to address applicable requirements through an application for construction permit. As the two facilities are viewed as a single CAAPP source, the Illinois EPA would expect the construction permit application for the Willowbrook II facility to include modeling for both facilities.

10. No company should be permitted to operate if that company poses a risk of serious health issues to the public.

Permits for the construction or operation of emissions units or control equipment may be acquired under the Environmental Protection Act upon a showing that there is no violation of the Act or applicable regulations. 415 ILCS 5/39(a). Except for some requirements that are developed on a health-based standard (e.g., National Ambient Air Quality Standards), this legal standard for permit issuance may not appear to directly account for risks posed to human health from a particular activity or exposure to a particular pollutant. This does not mean that the permitting process ignores these risks, only that they are accounted for, indirectly, through an evaluation of the rules and regulations that a stationary source must meet when constructing and operating new emissions units or control devices. The Act

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[1] **Sterigenics submitted an application for CAAPP renewal to the Illinois EPA on September 6, 2019.**

[2] **In the absence of operating authority for terms from a recently-acquired construction permit, a CAAPP source typically seeks a minor modification to incorporate those terms into the CAAPP permit in accordance the 415 ILCS 5/39.5(14)(a). The net result is that upon submission of the application, a source may operate under the terms of the proposed application until the CAAPP permit is revised by the Illinois EPA. 415 ILCS 5/39.5(a)(vi).**

contains several enforcement provisions that are available to restrain violations, such as injunctions that can be sought by prosecutorial authorities under Sections 42(e) and 43, and by any persons adversely affected in fact under Section 45. Other statutory or common law remedies exist that complement the enforcement remedies under the Act.

11. What is the scope of review by both the USEPA and the Illinois EPA in approving a construction permit?

The Illinois EPA is the sole authority for reviewing and acting on an application for a permit for a minor construction project in Illinois, i.e., a proposed project that would not be considered a major project under the USEPA's rules for Prevention of Significant Deterioration (PSD), 40 CFR 52.21. This is the type of project addressed by Sterigenics' application for control improvements. USEPA does not have a formal role in the Illinois EPA's administration of minor source permits.

The scope of the Illinois EPA's review of Sterigenics' application for a construction permit is generally framed by the new emission control requirements under the new law.

12. If data logs or data collection mechanisms at the Sterigenics facility are altered, deleted or proven incorrect, the Illinois EPA should revoke the construction permit.

Permit revocation is governed by the regulations established by the Pollution Control Board. More specifically, revocation of a construction permit on grounds that the permittee violates permit conditions, or fails to comply with any other requirement of the Board's regulations, is only authorized by way of an enforcement action. *See,* 35 IAC 201. In other words, the Illinois EPA cannot unilaterally revoke a construction permit, or impose conditional permit requirements that would effectuate the same, in response to alleged violations of the permit or other substantive requirements. The only recourse available to the Illinois EPA would be to seek enforcement through the Attorney General's Office.

13. What is the Illinois EPA's time-frame for permit decision? Is the permit decision being fast-tracked?

The permit is not being fast-tracked, as the time-frame for permit decision is governed by the Environmental Protection Act. The relevant provisions of Section 39(a) of the Act provide that if there is no action by the Illinois EPA within 90 days of receipt of the permit application, the applicant may deem the permit issued by operation of law. *See,* 415 ILCS 5/39(a). A permit that is issued by operation of law is simply a type of enforcement shield, protecting a permittee from the allegation that the source is constructing or operating without a permit. A permit issued by operation of law does not provide for substantive requirements that would ordinarily appear in a permit, such as the limits on ethylene oxide in Condition 3, the usage limits for ethylene oxide in Condition 5, the operational requirements for the PTE in Condition 6 and the numerous other testing, monitoring, recordkeeping and reporting

requirements detailed in the permit. Consequently, the Illinois EPA strives to avoid permit issuance by default.

14. The preconditioning and aeration rooms are heated. Should the heating for these rooms be included in emissions, given that this is part of their operation? If upgrades or changes are being made to heating systems, do they need to be re-evaluated under the New Source Performance Standards (NSPS), 40 CFR 60 Subpart Dc?

Further evaluation of heating is not necessary. The application did not address and the construction permit (Condition 1(d)) does not provide for changes to process equipment at the facility that would increase sterilization capacity or emissions.

15. Condition 5 limits the usages of ethylene oxide and propylene oxide on a monthly and annual basis. Condition 9(c) requires recordkeeping for the usages of these materials with "supporting data and calculations." However, Condition 9(c) does not detail the specific supporting data that must also be recorded. This condition also does not address reporting of material usages. Annual reports are not frequent enough to track monthly limits, which should be reported promptly and not allowed to continue until an annual check is performed.

The supporting data for which records must be kept is the underlying data from which the monthly and annual usages of materials are calculated. Since the drum for each sterilization chamber sits on a separate weigh scale, it is expected that this support data would consist of data for the beginning and ending weight of each drum of a material as used during each month, which values are combined to calculate the total usage of the material during the month.

It is not necessary for the construction permit to require frequent, routine reporting of the facility's usages of either ethylene oxide or propylene oxide. Compliance with these limits is appropriately addressed as Condition 9(b) of the construction permit generally requires Sterigenics to promptly report deviations from the requirements of the permit. In this regard, as is standard practice for pollution control permits, the construction permit requires Sterigenics to specifically notify the Illinois EPA of any noncompliance. This is appropriate as sources have the legal obligation for compliance.

16. Condition 5 would provide for compliance with annual limits to be determined on a rolling basis from 12 consecutive months of data with the first compliance period beginning in March 2019. Why would the compliance period start at that time? Is this time set so Sterigenics can make up for lost production with increased usage later in the year?

March 2019 was selected as the start of the first compliance period for the <u>annual</u> limit for emissions of ethylene oxide simply because it would provide for a compliance determination to be made for this limit, if and whenever the operation of the facility might resume. It was not selected to let Sterigenics "make up" for lost production. In this regard, Condition 5 also

limits the facility's emissions of ethylene oxide to 8.5 pounds per month. By way of further explanation, the compliance period for the annual emission limit should not start with the month in which operation would resume. In that case, compliance with the annual limit would not be able to be determined for the first eleven months after resuming operation of the facility. On the other hand, a compliance period that would begin before March 2019 could address months before the improvements to the emission controls addressed by the permit would have occurred.

Permit Conditions

17. The construction permit must prevent the facility from operating when the pollution control equipment is not operating. The draft permit does not include such a condition.

The permit mandates that the control system must be utilized during sterilization operations. More specifically, the permit requires: all components of a control system (i.e., Deoxx™ scrubber, AAT scrubber, initial DBA device and final DBA device) must be operating whenever any sterilizing chamber is being evacuated (Condition 3(c)(i)(A)); the segment of a control system for the backvents (i.e., AAT scrubber, initial DBA device and the final DBA device) shall be operated whenever any sterilizing chamber is being ventilated (Condition 3(c)(i)(B)); and the DBA device shall be operated whenever sterilized material is being moved from a sterilizing chamber to an aeration room or stored at the facility (Condition 3(c)(i)(C)). These requirements assure that the proper control systems (or system components) are operating any time the various emissions units are capable of emitting ethylene oxide or propylene oxide through normal uses.

18. Why does draft Condition 2.3(a) refer to the seal order, knowing that the seal order is not going to remain effective? It is a misrepresentation for the draft permit to address the seal order.

The draft construction permit referred to the seal order because it was in effect when the draft construction permit was distributed to the public. The Illinois EPA referenced the seal order in the draft construction permit to emphasize that the permit did not authorize Sterigenics to operate its facility in violation of the requirements of the seal order. Because the seal order operated independently of the Illinois EPA's permitting of the facility, the draft construction permit simply observed that it did not affect the operation of the seal order, which, at the time, compelled the source to remain closed. Because the seal order was removed following the recent entry of the Consent Order, Condition 2.3(a) now refers to the Consent Order rather than the seal order.

Matt Haller Act

19. What does the Act require, and will it be applied?

The Matt Haller Act (also referred to as the "new law"), codified at 415 ILCS 5/9.16 of the Environmental Protection Act, was enacted by the 101st General Assembly in the most recent legislative session and became effective upon Governor JB Pritzker's signature on June 21, 2019. The new law provides some incomparable provisions for the protection of public health from the emissions of ethylene oxide caused by sterilization operations in Illinois. Notable among these requirements are 100% capture of ethylene oxide emissions from these operations and a reduction in ethylene oxide emissions to the atmosphere from each exhaust point at the ethylene oxide sterilization source of at least 99.9% or to 0.2 parts per million. [415 ILCS 5/9.16(b)].

The new law requires affected sources to conduct initial emission testing to confirm compliance, accompanied by test protocol submissions by the source, and review and approvals by the Illinois EPA. [415 ILCS 5/9.16(b)]. Significantly, the law requires an immediate shut-down of operations at an ethylene oxide sterilization source upon the source becoming aware of a failed emissions test, followed by additional analyses, reporting and emission testing prior to a resumption in operations. [415 ILCS 5/9.16(c)]. Additional requirements include: the development and implementation of a an ambient air monitoring plan for collecting and evaluating air samples of ethylene oxide offsite during a multi-day sampling period every calendar quarter, [415 ILCS 5/9.16(e)]; dispersion modeling conducted using, among other things, the initial stack testing data and accepted United States Environmental Protection Agency methodologies [415 ILCS 5/9.16(e)]; certifications from Sterigenics' suppliers attesting that the sterilization or fumigation of their product(s) (including packaged products) is the only method to completely sterilize or fumigate the product(s) [415 ILCS 5/9.16(g)(i]); and a certification from the Illinois EPA that Sterigenics' control system makes use of technology that achieves the "greatest reduction in ethylene oxide emissions that are currently available [415 ILCS 5/9.16(g)(ii)].

As it relates to this permitting action, the Matt Haller Act requires an ethylene oxide sterilization source to obtain a construction permit for modifications made to the source to comply with the law's requirements. *See,* 415 ILCS 5/9.16(j). Sterigenics submitted its construction permit application to the Illinois EPA on June 24, 2019. The submission prompted a permit review that must be completed in 90 days, which ends on September 22, 2019. The construction permit only concerns itself with provisions of the new law that directly relate to the control improvements addressed by the permit application. This explains why the construction permit incorporates the law's requirements for Sterigenics to comply with the substantive capture and control standards (Condition 2-1(a)); the mandate for shutdown of facility operations upon an emission testing failure (Condition 2-1(b)) and testing (Condition 8-1 for permanent total enclosure; Condition 8-2 for initial and annual emission testing requirements).

Those provisions of the new law that are not addressed in the construction permit still apply to Sterigenics' operations, as they derive their origin of authority independently of the Illinois EPA's authority used in issuing construction permits under the Environmental Protection Act. Sterigenics is thus expected to meet those remaining obligations, including its various submissions of plans to the Illinois EPA, in the future.

20. The new law states that the company operating with ethylene oxide must capture 100% of its emissions.

This statement is true. Specifically, the new law provides that an ethylene oxide sterilization source must demonstrate that it captures 100% of all its emissions. 415 ILCS 5/9.16(b)(1). This capture efficiency is to be achieved by Sterigenics through use of a permanent total enclosure (PTE) system that is addressed by the construction permit. In addition, the new law provides that once the source captures its ethylene oxide emissions, it must achieve a reduction in emissions from each emission point at the source by at least 99.9% or to 0.2 parts per million. 415 ILCS 5/9.16(b)(1). This control efficiency is to be achieved by the sterilizers, backvents, aeration room and the finished products room, and demonstrated by Sterigenics through emission testing addressed in Condition 8-2. The PTE and control improvements will drastically reduce emissions of ethylene oxide from the source.

Permanent Total Enclosure

21. The stated goal of this construction permit in Condition 1 is to address improvements to the emission control measures for ethylene oxide sterilization operations and propylene oxide emissions for treatment of foods. It is unclear what the changes made to the facility to achieve permanent total enclosure will involve.

The new requirements for control of the emissions of ethylene oxide from the facility, as per Section 9.16(b) of the new law, are stated in Condition 2(a). The further description or specificity sought by this comment as to certain improvements that will be made to achieve permanent total enclosure does not need to be included in the construction permit. In this regard, this air pollution control construction permit allows Sterigenics to make changes at the facility as are needed to achieve permanent total enclosure. The ultimate requirement for these changes, i.e., achievement of permanent total enclosure, is clearly stated.

22. As related to permanent total enclosure, it is not clear from the permit how the construction of the new partition and the transition room will be done or exactly where those will be located.

As explained above, the new requirements for control of emissions of ethylene oxide by Sterigenics, as per Section 9.16(b) of the new law, are stated in Condition 2(a). The further information sought by this comment as to certain improvements that will be made to achieve permanent total enclosure is not required to be provided in the permit nor is it the practice of the Illinois EPA.

23. Are the sterilization chambers in an enclosed room or open to the hallway? Are the aeration rooms fully enclosed? How are the hallways near those locations monitored for ethylene oxide and for ventilation?

The sterilization chambers and aeration rooms are not in their own separate rooms. The sterilization chambers are accessible from the "work aisle." This is a broad interior "hallway" running through the center of the facility in which pallets of unsterilized material are loaded by forklift into the sterilization chambers and the sterilized material is unloaded by forklift. The sterilized material is then transported through interior passage ways at the facility to the aeration rooms.

The permit would not require monitoring of the work aisle or other passages inside the facility for ethylene oxide itself. This is because the ethylene oxide released in these areas is required to be captured and controlled. These releases will be an inherent aspect of the sterilization process as pallets of sterilized material are being transported inside the facility, particularly pallets of newly sterilized material from the sterilization chambers.

The "ventilation" for the work aisle and other internal passages at the facility will be addressed through the operational monitoring that must be conducted at the facility relative

to achievement of permanent total enclosure. The issued permit specifies that there must be at least two devices for monitoring pressure differential in the work aisle so that the capture of the ethylene oxide released in this area is confirmed. Another monitoring device is required in the storage area for sterilized product, which is adjacent to the entrances to the two of the three aeration rooms at the facility.

24. Condition 3(b) would require permanent total enclosure (PTE) for all areas of the facility where ethylene oxide may be used or released. This includes the sterilization chambers, work aisles, aeration rooms, and storage areas for fully processed materials. However, it would not include an area where full or empty drums or containers of ethylene oxide would be stored. This would not comply with 100 percent capture as any leaks from the drums in this area would vent directly to the atmosphere. The drum storage area needs to be enclosed in the permanent total enclosure to comply with 100 percent capture.

The drum storage does not need to be within the permanent total enclosure because this area is not an exhaust point for ethylene oxide. Both new drums and "empty" drums of ethylene oxide that are held in this area must be sealed. In this regard, ethylene oxide is transported in specially designed, stainless steel, pressurized, double-wall containers, which are commonly referred to as drums. Each drum has a fitting at the top through which ethylene oxide may be removed. At the facility, these fittings are only opened after the drum has been moved inside the facility and is being connected to the feed system for one of the sterilization chambers. When the contents of a drum are used up, the drum is again closed before being returned to the storage area preventing the loss of the residual ethylene oxide still contained in the empty drum.

To confirm that drums for ethylene oxide are properly sealed when they are held in the drum storage area, the issued construction permit requires recordkeeping related to these drums. It provides that the paperwork that Sterigenics maintains for these drums, including the verification of drum integrity, shall also be required records pursuant to the permit.

25. The proposed single stack location is furthest from the product loading doors. Maintaining adequate negative pressure in a distant corridor requires further attention and validation.

The location of the stack is not a critical factor for capture of emissions. The achievement of permanent total enclosure, including capture of emissions at the loadout doors, will not rely on the natural draft from a new or modified stack. Achievement of permanent total enclosure for the facility will entail changes to the existing mechanical ventilation system. These changes will include changes to the fans associated with the control devices, as well as installation of an appropriately sized fan at the new or modified stack itself.

26. If doors or windows closer to the stack than the product loading doors are allowed to be open, doing so would create air flow that would take away from the negative pressure for the product shipping area and loading doors. The building has several doors between the proposed stack location and the loadout bays. A few are declared natural draft openings.

Additionally, many undeclared doors and several undeclared windows line the exterior walls and may be opened unless either permanently sealed or connected to remote alarms, such as at the fire department. Additional safeguards are needed to ensure compliance with 100 percent capture.

As discussed, the mechanical ventilation system for the facility must be designed and operated to maintain permanent total enclosure. There are only a few doors and windows along the exterior walls of the facility. The windows are sealed. For this permit, it would be unreasonable to presume that the doors would now begin to be kept open. Moreover, because doors may be necessary for emergency exit or entry to the facility, it would not be appropriate to require that they be sealed. The opening of these doors and windows, if they were ever unsealed, would be addressed on an ongoing basis, by the continuous operational monitoring required under the permit. If a door or window that is normally kept closed is opened, it will reduce the pressure differential between the inside of the facility and the outside. This would be measured and recorded by the monitoring system. Appropriate action could be instituted if sufficient pressure differential is not maintained. Additional monitoring for the status of individual doors and windows that are capable of being opened, as requested by this comment, need not be required by the permit.

27. In the application, page 13, Sterigenics states that Criterion 4 of Method 204 will be met as follows, “Sterigenics will maintain all doors and windows not covered in Criterion No. 3 closed during normal operations and therefore Criterion 4 is satisfied.” This is not an enforceable statement. A tamper proof indicator of door status linked to an external entity, such as the fire department, would ensure accountability and would create records for enforcement. Such a provision should be included in the permit.

The statement in the application addressed by this comment would not serve to ensure that doors and windows that are normally kept closed would never be opened. However, the status of doors and windows at the facility will be addressed by the permit by the operational monitoring that is required for the permanent total enclosure.

28. Ethylene oxide may be pulled outside by the trucks leaving the loading dock as they pull air behind them. This situation would be a violation of the 100 percent capture provision and should be tested.

This phenomenon posed in this comment is not a concern for the facility. Sterigenics has explained that its practice for load out of material is to only open a loadout door at the facility once the truck is in place and to close the loadout door once the truck is loaded. This practice is followed because of the danger to the operator of the fork lift truck from potentially driving off the loadout dock if a door is open and a truck is not in place.

29. The area outside the loading dock should have sensitive ethylene oxide monitors in the parts per billion to parts per trillion range located near the ground. These monitors would

help verify the proper functioning of the capture system. They would also act as an alarm in the event of failure.

Ambient air monitoring, as essentially suggested by this comment, would not be a useful method to verify effective capture. For example, it would not be able to distinguish between loss of ethylene oxide from the loading dock and background concentrations of ethylene oxide in the ambient air. Moreover, the approach to ongoing compliance inherent in Method 204 is assuring that once a capture system has been demonstrated to provide permanent total enclosure, the capture system is operated and maintained in the manner and condition for which compliance has been demonstrated.

30. For initial development and periodic checks of the permanent total enclosure, a smoke test might prove useful.

Use of smoke tubes is one of the techniques that is identified in Section 8.4 of Method 204 for verification of the direction of air flow through natural draft openings.

31. Condition 1(b)(i) describes the construction of a transition room to bring material to be sterilized into the permanent total enclosure. There is no further description of the details of this room including such basics as its location, the size of doors on each side of this room, or the mechanism by which the "transition" feature would work such as airlock style doors and emergency-only overrides. Will there be an engineered control to ensure only one door is open at a time? It seems that if there was an emergency where both doors are opened (override of control), there should be a direct alarm to fire department like a fire alarm. Architectural plans should also be submitted.

The transition room at the facility would be constructed between the west end of the work aisle and the area where pallets of unsterilized material are kept. It was neither necessary nor appropriate for the application to include detailed construction drawings for this room. This room must be designed and operated, with other changes that are being made to the facility for permanent total enclosure, to maintain total enclosure. Sterigenics has explained that the room will be designed so that only one set of doors will normally ever be open. However, it is not appropriate for the permit to dictate actions that must occur in the event of emergencies that affect the operation of the transition room or to presume that a separate alarm to the local fire department is necessary.

32. Would the construction of the transition room for material entering the permanent total enclosure create another natural draft opening? In the application, the transition room door is not identified as a natural draft opening.

The construction of the transition room will eliminate a natural draft opening that would otherwise be present at the facility. This room will be designed and constructed so that only one set of doors, either the doors next to the unsterilized material storage area or the doors going into the work aisle, can be open at any given time.

33. A transition room should also be required for sterilized product leaving the permanent total enclosure.

A transition room for load out would not avoid the need to address the loadout doors for compliance with the relevant criteria for permanent total enclosure. This is because load out of material from the facility involves sterilized material. This is different than the situation for the planned transition room through which unsterilized material will pass. For this material entering the permanent total enclosure, the transition room will serve to eliminate a natural draft opening that is currently present at the facility.

34. The exemption in Condition 3(b)(ii) from the first criterion for a permanent total enclosure is very concerning (Criterion 5-1 in USEPA's Method 204, "Criteria for And Verification of a Permanent or Temporary Total Enclosure," which is codified at 40 CFR Part 51 Appendix M.) This criterion is that any VOC emitting point should be four equivalent diameters away from any natural draft opening in the enclosure. It seems from the statements in the application and in the draft permit that the exception from Criterion 5-1 would be provided because it would not be appropriate to apply this requirement if product is considered a VOC emitting point while being loaded onto a truck for shipping. Since the product is considered a VOC emitting point, this necessitates the exception provided for by Method 204.

This is correct, it would not be appropriate to apply this requirement if product is considered a VOC emitting point while being loaded onto a truck for shipping. This necessitates the exception provided for by Method 204.

35. If one criterion for permanent total enclosure is modified, other criteria may need to be modified, such as the facial velocity criterion, in order to adequately maintain the permanent total enclosure.

The circumstances of the loading dock are such that an increase in the required facial velocity of air flow for the doors at the loading dock is not warranted. The loading dock is not on the exterior of the building. Access to the loading dock is through two doors on the west side of the building through which trucks are backed up to the actual loading dock. Only the front portions of the trucks extend outside of the building and are in the open during loading. The loading doors themselves will be equipped with sealing systems that reduce the amount of open area that is present between the wall of the loading dock and a truck during loading.

36. It appears that the exemption from the first criterion for total enclosure would be provided to Sterigenics for its convenience rather than for physical merit.

This exception is warranted on a technical basis, not simply for convenience. This exception enables Sterigenics to ship its sterilized product from the facility. If this exception, which is allowed for by Method 204, were not provided, sterilized product could not be shipped from the facility. This is because a material that is considered to be emitting organic material

would be passing through a natural draft opening and, as such, could never be at least the specified distance from any natural draft opening. In such circumstances, compliance with the other criteria in Method 204 is considered sufficient to show the achievement of permanent total enclosure.

37. By way of comparison, the Illinois EPA granted a construction permit for a printing plant in October 2018 (ID No. 179473AAI). Presumably, this plant has product that is printed inside the permanent total enclosure that must be removed from the enclosure to ship to customers. That construction permit also referred to Method 204 but the plant was not granted an exception to Criterion 5-1 that would accommodate product being removed from the permanent total enclosure though a natural draft opening.

The circumstances of the printing plant that is addressed by this comment are different than those would be present at Sterigenics. At this printing plant, packaging material is printed using solvent-based inks. The printed packaging material is dried in a natural gas-fired oven that is part of the printing press, evaporating the organic solvent before the printed material leaves the enclosure. As such, it was not appropriate for that plant to consider the printed material from the press to be a source of emissions. In contrast, the construction permit for this facility is premised on the sterilized product still continuing to contribute to the emissions of the facility even after it has undergone aeration.

38. The justifications for the exception for Sterigenics require further explanation to provide confidence that 100 percent capture would be reliably maintained in the loadout area.

The exception to Criterion 5-1 allowed by Method 204 is being provided because, as addressed in statements in the application and in the draft permit, it would not be appropriate to keep this requirement since sterilized product is considered a VOC emitting point while being loaded onto trucks for shipping. If the exception were not provided, sterilized product would never be able to be shipped out from the facility.

39. The third criterion for a permanent total enclosure (Criterion 5-4 of Method 204), as addressed in Condition 6-1(a)(ii)), requires that the direction of air flow through all openings to be into the enclosure at all times. There is no stated mechanism by which compliance with this requirement can be demonstrated.

The direction of air flow through openings is addressed in Method 204 as it also provides the procedure for testing to confirm permanent total enclosure. With respect to the direction of air flow through individual natural draft openings during testing for permanent total enclosure, Section 8.4 of Method 204 provides as follows:

Verify that the direction of air flow through all NDO's is inward. If FV [face velocity] is less than 9,000 m/hr (500 fpm), the continuous inward flow of air shall be verified using streamers, smoke tubes, or tracer gases. Monitor the direction of air flow for at least 1 hour, with checks made no more than 10 minutes apart. If FV is greater than 9,000 m/hr (500 fpm),

the direction of air flow through the NDOs shall be presumed to be inward at all times without verification.

40. For the permanent total enclosure, operational monitoring for pressure differential would be used to show compliance. However, there are concerns with such monitoring. In Condition 7-2, which describes operational monitoring for the permanent total enclosure by means of pressure differential, Condition 7-2(a)(i)(A) would provide that a pressure monitor along the east side of the building does not need to be operational if no sterilizers on that side of the building are operating. This provision appears to be based on the mistaken assumption that use of ethylene oxide in this area is linked to use of ethylene oxide in this area. This is irrelevant to the determination of permanent total enclosure. This monitor should always be used to address compliance. The monitoring along the east side of the building is very relevant for this requirement. An open door on this wall could compromise the total enclosure. This monitor needs to be required all the time.

The issued permit does not include the provision from the draft permit addressed by this comment. Monitoring of pressure differential at the east side of the facility is required for this area even if the sterilization chambers in this area are not being used. Incidentally, it should be understood that the enhanced capture system for the facility will pull air from a number of points in the facility. This system must be designed to appropriately maintain negative air pressure throughout the facility.

41. The draft permit should require a pressure differential monitor in the area of the loading docks.

The issued construction permit requires that one of the monitors for pressure differential now be located in the area of the loading dock. Upon consideration, a monitor in this location is appropriate. On the other hand, a monitor is not needed in the center of the work aisle, as monitoring is now always required for the east section of the work aisle.

42. Another concern with using pressure difference monitoring for permanent total enclosure is it is unclear whether the facial velocity of 200 fpm (which can alternatively be measured by the difference in pressure between the interior and exterior of the permanent total enclosure) is sufficient to maintain an inward flow of air at all times. Method 204 specifies that these are separate concepts. The minimum average facial velocity shall be 3600 meter/hour (200 feet per minute (fpm)). Separately, flow of air must be inward. These concepts must therefore be separately verified, and both are required. For comparison, 200 fpm translates to 2.3 mph, which is slower than the typical adult walking pace, about 3 mph. So, what happens then, when a person walks out the door and takes a trail of swirling air behind them or a truck leaves the loading dock and swirling air follows the truck as it pulls out of the bay? Method 204 calls for a facial velocity of at least 200 fpm. A study needs to be done at this facility to determine if that facial velocity is sufficient or if it should be increased and if increased, what facial velocity would be required to maintain 100 percent capture, particularly in areas like the loading dock?

Additional study is not needed for the doors at the loading dock. As already discussed, Sterigenics has explained that its practice for loadout is to only open a loadout door once a truck is in place and to close the loadout door once the truck is loaded. In addition, loadout does not take place at the exterior of the building. Trailer trucks back into the loading dock so that only the front end of the truck extends out into the driveway. Wind currents do not directly impinge on the back end of the trucks during loading. Seal systems will also be in place surrounding the loadout doors. The area through which air is drawn into the facility during loadout will be a fraction of the area of the door that is open during loadout. The facial velocity at the loading dock will typically be substantially greater than shown in the conservative calculations provided in the application.

43. On the point of showing inward air flow, one suggestion would be requiring a ribbon at each natural draft opening for easy verification. Video cameras showing ribbon position would allow a third-party audit and provide confidence that this provision is being met at all times.

The approach suggested by this comment is not technically sound. In particular, it would rely on video cameras and review of the images collected by the cameras by individuals for evidence of compliance or noncompliance. Issues that are posed would include positioning of the cameras, lighting, focus, contrast and image quality, as well as the subjective nature of the review of the images. This approach would not provide immediate feedback to the source on the operation of the permanent total enclosure. Monitoring of pressure differential will directly provide immediate, objective information for the permanent total enclosure.

44. The specific monitor model(s), parameters, specifications and maintenance schedule for proper upkeep of pressure difference monitors to address permanent total enclosure needs to be specified here for practical enforceability.

Practical enforceability in permits involves the clarity in applicable limits and the method(s) by which compliance with those limits is to be determined. The use of particular monitoring instruments does not need to be specified. Sources are responsible for selecting monitoring instruments that can make the necessary measurements and then properly installing, operating and maintaining those instruments.

45. Sensitivity limits should be listed for the monitoring systems for pressure differential so that it is clear what is required from the devices.

In the issued construction permit, the sensitivity of the monitoring devices for pressure differential is addressed. Condition 7-2(a)(ii) provides that these devices must be designed so as to be able to measure pressure differential to the nearest 0.001 inches of water. This is about 15 percent of the minimum pressure differential that is required, 0.007 inches of water.

46. Where is (are) the comparison probe(s) located for measuring difference in pressure? With such small differences in pressure, the comparison probe is important to consider. If the comparison probe is located indoors, there could be seasonal differences in relative pressure due to heating and cooling? If the probe is outdoors, how does that work given normal wind patterns and constantly shifting pressures, often much higher than the target difference in pressure required for the permanent total enclosure?

It is expected that the probes for pressure outside the permanent total enclosure will be located on the roof of the facility. This will reduce the impact of building downwash and localized air turbulence due to the building and other nearby structures on these measurements.

47. Condition 7-2(d) provides for extended time to work out problems in establishing the monitoring system for the permanent total enclosure and its associated logs. Condition 7-2(d) appears to allow extra time for difficulties in implementing the pressure difference monitors. These difficulties need to be resolved before operations with ethylene oxide can resume. Resolution of these difficulties requires air handling and building specifications. Resolution does not require the use of ethylene oxide. All difficulties must be resolved before ethylene oxide use can be resumed.

The permit requires verification of the permanent total enclosure before the facility may resume operation using ethylene oxide. It is expected that any difficulties with the monitoring for pressure differential will generally be resolved before such operation would occur. However, there still may be difficulties that only arise or become apparent during the course of operation.

48. An additional mechanism by which permanent total enclosure could be demonstrated might be to include ethylene oxide monitors of sufficient sensitivity in suspected problem areas such as just outside of the natural draft openings. Sterigenics maintains that it monitors ethylene oxide concentrations throughout the building. Are monitors located in the loading dock area and in the hallway outside the aeration rooms? What is the sensitivity level of these monitors?

Additional monitoring, as suggested by this comment, would not be a practical means to assure that total enclosure is maintained for the facility. The operational monitoring systems that Sterigenics has inside the facility are not suitable for such monitoring as they are designed to address matters such as worker safety and prevention of an explosion. The monitoring that is suggested by this comment would necessarily involve ambient monitoring. It would not provide real-time information about the permanent total enclosure at the facility. It would also not serve to directly address the presence of total enclosure at the facility. As recognized by Method 204, pressure differential is an appropriate and effective way to monitor for total enclosure.

49. Are all the scrubbers located together? It is unclear whether there is a pressure monitor in every area containing a control device.

Pressure monitoring is not required in area in which the initial scrubber for the sterilization chambers is located. This area is on the interior of the facility. Pressure monitoring is required for the room where the other control devices are located, which is next to an exterior wall.

50. The wording in Condition 7-2(a)(ii) should be changed to "independent" measurements for statistical purposes.

It is appropriate that this condition require separate measurements as a common meaning of the term "separate" is intended, e.g., individual or distinct. Any benefit from changing the wording of this condition as suggested by this comment would be outweighed by the fact that it would use a term that is not typically used when addressing monitoring systems.

51. Condition 7-2(a)(ii) addresses recordkeeping in the event of failure of the continuous monitoring equipment for permanent total enclosure. There should be a requirement that the auto-recorder must be repaired promptly. The process by which will be enforced needs to be spelled out.

The requirement for prompt repair of monitoring equipment is embodied in the general requirement that the facility be operated and maintained in accordance with good air pollution control practice. It is unnecessary and impractical to specify the actions that must be taken to repair monitoring equipment. This would appropriately be addressed on a "case-by-case" basis, considering factors such as the nature of the needed repair, whether the repair is made as a preventative measure or a response to failure of equipment, and the effort expended in reducing the time that the monitoring equipment was not in service. In this regard, Sterigenics will need to timely undertake measures necessary to satisfy its obligation to have an operational continuous emissions monitoring system.

52. Condition 7-2(a)(ii) requires that pressure difference recordings are to be made every 5 minutes. In the construction permit issued by the Illinois EPA in 2018 for permanent total enclosure at a printing plant (ID No. 179473AAI), the requirement was to record pressure differences at least every minute. Why would this condition be less stringent?

In the issued construction permit, Condition 7-2 (a) (ii) requires measurements for pressure differential at least every minute, rather than at least every five minutes. Accordingly, the required frequency for these measurements will be the same as that for the plant cited in this comment.

53. Why would recording for pressure difference only be required on a rolling 3-hour average? This could mask large spikes and troughs. It would be very informative to have the maximum and minimum for these time periods as well as the standard deviation. The

additional data would help demonstrate that the correct pressure is being consistently maintained.

A three-hour average, rolled hourly, is appropriate for this operational monitoring. It would provide data that is representative of the actual operation of the permanent total enclosure and would not be distorted by short-term fluctuations in pressure differential. In this regard, data from continuous operational monitoring of control devices is routinely applied on a three-hour average. As this monitoring for the facility will involve monitoring of pressure differential, with probes both inside and outside the enclosure, the averaging time needs to be long enough that routine fluctuations in measurements by the monitoring devices do not bias the compliance determination. Three-hour averages will provide definitive data for the permanent total enclosure. In this regard, the statistical information for the data for pressure differential that this comment suggests be required would not be relevant to determining whether the required level of pressure differential has been maintained at the facility for total enclosure.

54. In its application, page 12, Sterigenics states the following, "Loading Through Two Dock Doors 8'x10' with 50% effective seals (Normal practice is to only load one truck at a time through one door)." Members of the public have seen multiple dock doors/loading bays in use at the same time. There are three dock doors. Two of those are claimed as natural draft openings, only one is assumed to be used at a time. How will the permit address the assumption that only one will be in use at a time?

In its application, Sterigenics did not assume that only one door would be open at a time, although loading of one truck at a time with only one open loading door has been its normal practice. Rather, notwithstanding its normal practice for loadout, Sterigenics conservatively assumed in the application that two trucks would be loaded at a time, with two loading doors open. (Two doors @ 80 square feet each, with 50 percent seal with the truck being loaded, times two equals a total area of 80 square feet.)

55. What would be done with the third loadout door? It is not claimed as a natural draft opening. It would most appropriately be permanently sealed under the provisions of Method 204, as would other doors not clamed as natural draft openings. Otherwise, there should be alarms that connect outside the building for the third loadout door being opened.

Method 204 does not require that doors into an enclosure that are closed during the operation of a source, and thus are not addressed as natural draft openings, be physically sealed. As specifically related to the "third loadout door" at this facility, Sterigenics plans to develop the permanent total enclosure to be able to have two open loadout doors at a time. As this is the case, any two out of the three doors may be open at a time. It is not necessary to specifically identify a particular loadout door that must be kept closed and no longer used. It is also not appropriate to require an alarm to address the possibility that three loadout doors would be open at once. The normal practice for the facility, as stated by Sterigenics, would be to have only one loadout door open at a time. In addition, whether the three

loadout doors at the facility, which are all at the front of the building toward the south, are open at the same time would be clearly visible.

56. The idea that there can be 50 percent effective seals is very misleading. The seal either seals with calculable minor gaps or it does not seal according to how accurately the driver matches his trailer to the seal. There are more effective systems in use elsewhere.

As implied by this comment, Sterigenics has been very conservative in only assuming that the dock seals installed on the loadout doors at the facility would provide only a 50 percent seal. In actual practice, the dock seals would be more effective.

57. Section 9.16(b) of the new law requires 100 percent capture. A "50 percent efficiency seal" does not comply with this requirement, particularly since no assurances are in place to demonstrate that a successful enclosure has been created and that these follow the criteria in Method 204.

This comment confuses the statutory requirement for capture of emissions with the measures that would be taken to comply with this statutory requirement. In particular, the calculations included in the application by Sterigenics to show that a face velocity of at least 200 feet per minute would be achieved through the loadout doors are based on the door seals reducing the area of the actual natural draft opening by at least 50 percent. This is a conservative assumption for the actual open area between the wall of the loading dock and a truck during loadout.

58. Testing for the permanent total enclosure in Condition 8-1 (a) indicates the tester must be independent and qualified. What are these qualifications? Is there an approved vendor list? If not, why not?

The terms "independent" and "qualified" do not need to be defined in the permit because these terms are used with their standard, dictionary meanings. The requirement that the testing firm be "independent" means that it must be a separate entity from Sterigenics, be objective and be free from influence. The requirement that the testing firm be "qualified" means that it has the necessary qualities and is fit and competent to perform the testing that is to be conducted.

The Illinois EPA does not maintain a list of "approved testing" firms. Among other things, this is because it is more effective to address testing firms on a case-by-case basis as part of the review of the protocol submitted for a particular planned test.

59. Are there established methods for testing a permanent total enclosure? They should be listed in the permit as the required method?

The methods for testing for permanent total enclosures are part of Method 204. The issued permit specifies that the testing for Permanent Total Enclosure must be in accordance with the procedures set forth in Method 204.

60. Condition 8-1(c)(iii) provides that the conditions under which testing is conducted must be representative. This is not practically enforceable. A minimum list of what constitutes "normal conditions" needs to be known, such as ventilation systems need to be up and running as if the sterilization facility were operating and need to include a list of specifications such as temperature and humidity ranges that can be easily verified by an inspector.

As a general matter, the operating conditions under which testing will be performed are appropriately addressed as part of the review of the protocol submitted for the required test. More significantly, if after a test is performed, it is subsequently determined that testing was conducted under operating conditions that are not representative, the Illinois EPA may require testing to be repeated. This would be the case if testing was conducted under operating conditions that would potentially overstate the effectiveness of capture of the emission at the facility compared to how the facility is typically operated. This repeat testing would be required to be conducted under operating conditions that are representative of how the facility has actually been operated.

61. In Condition 8-1(c)(iv), the minimum measurement locations for testing need to be specified, with a provision for additional measurement locations. The minimum number of independent test runs and analysis guidelines should also be specified, either by listing them or referencing an established method.

In the issued construction permit, Condition 8-1(a) specifies that the testing for permanent total enclosure shall be conducted in accordance with the applicable procedures contained in Method 204. Other changes to this condition requested by this comment are not appropriate. As a general matter, they address matters that are relevant for emissions testing but not for testing of permanent total enclosure. Testing or verification of permanent total enclosure is far simpler. Measurements of the gas flow are only required for gas flow out of the enclosure through ducts and hoods. The velocity of air flow into the enclosure through the natural draft openings is calculated by dividing the measured air flow out of the enclosure by the total area of the natural draft openings. The direction of air flow through each natural draft opening must be verified if the calculated velocity is less than 9,000 meters/hour (500 feet/ minute).

62. Condition 8-1(b) provides for initial testing of the permanent total enclosure but not regular follow up testing to ensure it is still working properly. This regular checkup testing needs to be included.

Periodic follow-up testing of the permanent total enclosure is not needed. Once the initial testing has been completed demonstrating that the criteria for permanent total enclosure have been met, the operational monitoring for pressure differential will directly address

ongoing compliance. However, the permit does provide for further testing for total enclosure upon specific request by the Illinois EPA.

63. Rather than requiring permanent total enclosure, a better solution would be to identify the leaky processes first and then correct the leaks or utilize a leak detection and repair program. It should not be presumed that permanent total enclosure will capture the emissions.

Permanent total enclosure is a sound approach to capture the emissions of ethylene oxide of the facility, including the "other releases." Further, it is mandated by the new law. The incidental releases are not the result of leaks from specific pieces of equipment. Rather they are the result of activities at the facility that are inherent in sterilization of material with ethylene oxide, notably the transfer of pallets of sterilized material through the work aisle and interior passage ways at the facility. Thus, there are no leaks to be fixed, identified or measured.

64. The permit should require Sterigenics to implement a leak detection and repair program to promptly identify and fix any unintended release of ethylene oxide. A leak detection and repair program would not facilitate provide 100 percent capture.

Sterigenics will implement a leak detection and repair program for valves and piping components at the facility for purposes of reducing risks to staff and equipment at the facility. This program uses monitoring devices that are located inside the facility to detect leaks. However, as this is the case and any leaks would occur within the enclosure, the permit does not need to address this program.

65. The permit would not require a minimum off-gassing time, which could result in sterilized equipment being removed from the permanent total enclosure while still capable of emitting ethylene oxide.

The required duration of aeration of pallets of different sterilized material is a matter that is addressed as a part of the protocols for processing different materials. This time varies from product to product because the protocols for sterilization are product-specific. As such, it is not appropriate for the permit to simply set a minimum duration for aeration. Moreover, as the required duration of aeration of different products is addressed in the sterilization protocols, this subject need not be addressed by the permit.

66. Condition 6-1(a)(i) requires that the permanent total enclosure be maintained when the "affected facility" is in "operation" but in this context "operation" is not adequately defined. Condition 3(b)(i) specifies where the permanent total enclosure must be maintained but it does not specify when it must be maintained. For example, may Sterigenics cease to maintain the permanent total enclosure if there are sterilized materials in the aeration rooms and it asserts that all ethylene oxide has been evaporated from them?

In fact, Condition 3(b)(i) addresses when total enclosure must be maintained. It requires operation of the facility with permanent total enclosure for all areas of the facility in which ethylene oxide is used or may be released, including the storage and handling of sterilized material prior to load out.

67. Are there any Illinois rules regarding the installation and operation of Permanent Total Enclosure system?

Illinois has certain rules that address permanent total enclosure by reference to USEPA Method 204. These rules are applicable to processes such as printing presses and coating lines. As the rules applicable to ethylene oxide sterilization sources are federal, these are not Illinois rules wherein Method 204 is applied to commercial sterilization sources.

68. The opening of a window or a door at the facility that is supposed to be kept closed might be sufficient to defeat permanent total enclosure.

It is uncertain that the opening of one door that is supposed to be kept closed would be sufficient to defeat the permanent total enclosure. However, this possibility is addressed by the ongoing monitoring for pressure differential between the inside and the outside of the enclosure. A drop in the monitored pressure differential from the normal range would be an indication that something may have occurred that is worthy of investigation by facility personnel. A drop in pressure differential below the required level would indicate a lapse in total enclosure, necessitating corrective action and triggering a requirement for reporting of a deviation to the Illinois EPA, which would be reviewed.

69. The new law specifically requires a subject source to "immediately cease ethylene oxide sterilization and notify the Agency within 24 hours of becoming aware of the failed emissions test." However, the permit does not provide for cessation of operations in the event of a breach of permanent total enclosure during normal operations.

The differences in the contexts in which required emission testing would conducted at the facility and permanent total enclosure must be maintained are such that an interruption in total enclosure does not warrant a cessation of operation. Emission testing is only expected to be conducted on an initial and thereafter periodic, annual basis for the specific purpose of demonstrating compliance with the emission standards in Section 9.16(b) of the new law. Failure of an emission test will have implications for compliance until a new test is conducted. Moreover, before such further testing is conducted, Section 9.16(c) of the new law provides that the reasons or causes for the failed test are to be investigated, identified and remedied. In contrast, the presence of permanent total enclosure will be addressed on an ongoing basis by continuous monitoring for pressure differential. A lapse in permanent total enclosure may have no implications for subsequent operation. The cause of the lapse may be able to be readily remedied. Whether the situation has been corrected and total enclosure has been restored will be demonstrated by monitoring data.

70. Condition 4(c) should provide that existing stacks and roof vents may no longer be used after construction of the new stack, to avoid the reading that they can continue to be used in the 30 days prior to their being sealed.

Condition 4(c) addresses the timing for the sealing of existing stack and roof vents. Other provisions in the permit address when the existing stacks and roof vents can no longer be used. In particular, Condition 4(a)(ii) provides that the replacement of the existing stacks must be completed before the facility resumes operation. Condition 8-1(b)(i) provides that testing of the permanent total enclosure, which necessarily involves discontinuing the use of the existing stacks and roof vents, must be completed before the initial emissions testing of the facility with improvements is conducted.

Emissions Control

71. Very little is specified about the emissions control systems, even the existing systems. The permit reads more like a permission to explore market options document and not an enforceable construction document. These pieces of equipment are not widely available like a toaster, for example. There are likely only a few manufacturers that produce these kinds of items and only a few models that meet the required specifications for sensitivity. Sterigenics should have specified the models, specifications, applicable parameters and maintenance requirements for those devices in its application. Simply saying that manuals must be provided and equipment must be properly maintained is insufficient for practical enforceability. Specific schedules and values must be included. Specific values will assist inspectors in verifying that permit criteria are being met. The absence of this information makes the permit unenforceable.

Further specificity is not needed to make the permit enforceable. The new limits and control requirements that would apply to the facility's emissions of ethylene oxide are clear. The construction permit requires Sterigenics to conduct emission testing, emission monitoring, operational monitoring and recordkeeping to show compliance with these new limits and control requirements. The permit requires that control devices be operated in a manner that is consistent with how they were operated during the testing that shows compliance, specifying the operating parameters of control devices that must be addressed. The permit also requires Sterigenics to prepare plans that document how it operates and maintains the dry bed absorption devices, as they are an essential aspect of improved control of emissions. The permit generally requires operation and maintenance of all control devices in accordance with good air pollution control practice. However, it is not necessary or practical for the construction permit to dictate specific maintenance actions, with schedules, for the control devices. This would only be necessary if implementation of these work practices was the means by which compliance with the requirement to control emissions would be shown, which is not the case.

72. Condition 7-3(c) appears to provide choices for how flow of gas to individual beds in the dry beds absorber devices is determined. These need to be resolved before the permit is issued for practical enforceability.

Condition 7-3(c) is clear that the Permittee must operate instrumentation for the dry bed absorber devices for the flow of gas to individual beds. There are various ways that this could physically be done, as is appropriately recognized by this condition which lays out three options by which Sterigenics may collect this information.

73. Condition 7-3(d) is insufficiently specific in what the required parameters are. For operation, is pH required to be included in the log? Temperatures? Pressures? In the maintenance log, does the bed number need to be recorded? How about the concentrations of chemicals in the spent bed? Perhaps a "Notes" section about appearance for other observations that

may be helpful? What minimum parameters need to be included and what value ranges should the inspector be looking for to easily identify any immediate problems.

Condition 7-3(d) addresses the operation, calibration and maintenance of the monitoring systems and instrumentation required by the permit. This condition addressed information related to the operation and maintenance of the monitoring systems and not the data that is to be measured and recorded, which is addressed elsewhere in the permit.

74. Condition 9(a)(i) provides that device-specific information must be kept on file. This information should have been provided in the permit application to facilitate the creation of an enforceable permit document.

Condition 9(a)(i) appropriately requires Sterigenics to keep a file at the facility that contains certain detailed information about the design, operation and maintenance of the dry bed absorption devices. This will require that this information be kept up-to-date and be available for both the operating personnel of Sterigenics and the inspectors of the Illinois EPA.

75. Condition 9(a)(i)(A) - "Spent" should be defined here according to manufacturer's specifications.

The term "spent" does not need to be defined as the common meaning is intended. In particular, this condition simply requires Sterigenics to have written procedures for the practices it follows for disposal of the used sorbent that is removed from the dry bed absorber devices.

76. The permit should require that the spent sorbent be immediately replaced to return the device to full capacity. These kinds of parts should be required to be kept on hand for replacement and not ordered once the spent sorbent is removed to prevent situations when sorbent might be backordered.

Condition 6-3 generally requires Sterigenics to operate and maintain the emission control devices at the facility "…in a manner consistent with safety and good air pollution control practice for minimizing emissions." It is not necessary, for the permit to specify further requirements with regard to the replacement of sorbent in the individual beds in the dry bed absorbers. This is particularly true as typical practice for replacement of sorbent in a bed in a multi-bed device is to fill the bed with new sorbent immediately after the spent sorbent is emptied from the bed and to then return the bed to service

As this comment expresses concern that the timely replacement of sorbent in a bed might be delayed because of not having sufficient new sorbent on hand, the issued construction permit requires Sterigenics to maintain records for the amount of sorbent that it has on hand. It reasonably addresses the supply of sorbent for the dry bed absorption devices. If timely replacement of sorbent in a bed does not occur, this will also provide information to assess whether lack of new sorbent was a factor.

77. Condition 9(a)(ii)(A) - The minimum frequency for the evaluation of performance of individual beds in the dry bed absorber devices should be set. Reporting requirements should also be set. Perhaps inclusion in the quarterly report would be appropriate as supporting evidence for the reasonability of continuous emissions monitoring system reports.

The required evaluations for the dry bed absorber devices must be conducted on a schedule that is consistent with assuring effective operation and control of emissions by these devices. However, the actual operating level of the facility, the usage of ethylene oxide and the effectiveness of the scrubber(s) that precede these devices will determine the loading of ethylene oxide to the dry bed absorber devices and the rate at which the sorbent is consumed. A set schedule for the required evaluations in the construction permit would not provide for appropriate consideration of these factors.

78. Condition 9(a)(ii)(C) - When does information that must be recorded for not following operating or maintenance procedures for DBA devices need to be reported?

This information need not be routinely reported. The information specified in this condition is required to be kept because it would be relevant if there is a violation of an emission limit. In such case, a relevant consideration is whether control device(s) were properly operated and maintained, or whether improper operation or poor maintenance may have been a contributing factor in the violation. More generally, as control devices are to be properly operated and maintained, a deviation from established practices is worthy of being recorded with accompanying explanation. This information about operation and maintenance is then readily available to Illinois EPA staff during an on-site inspection.

79. In Condition 9(b), the reference to Conditions 6-2(a)(ii-iv) is incorrect. Such conditions do not exist. Perhaps it should be Condition 6-2(c)(ii-iv).

This error in the draft permit was corrected. In the issued construction permit, this condition requires that Sterigenics keep a log or other records to address compliance with Condition 3(c), which addresses the control systems that must be in operation when the different sterilization processes or operations at the facility are taking place.

80. Condition 7-3(a), which governs operational monitoring for scrubbers, continuous monitoring is required for the scrubbant flow rate, pH, and inlet temperature. There is no specification here for the frequency or type of recording or the definition of “continuous” in this context.

This shortcoming in the draft permit has been addressed in the issued construction permit. It provides that the continuous operational monitoring shall generally be conducted in accordance with 40 CFR 63.8(c). This provides that continuous monitoring entails automatically recording measured data at least every 15 minutes except during system

breakdowns, repair, maintenance and certain other periods in which it would be unreasonable to require collection of the measured data.

81. Condition 9(a)(ii)(B) has a recordkeeping requirement related to the performance of the dry bed absorber devices. How is this performance to be determined? If this is intended to be determined solely by data from the continuous emissions monitoring system, this data would not discriminate to the level of bed-level performance, as required by this condition.

In response to this comment, this condition in the issued construction permit requires recordkeeping related to the effect of sorbent replacement in a bed on overall performance of the control system for ethylene oxide, if any. In conjunction with sorbent replacement, it is appropriate that Sterigenics review the data from the continuous emissions monitoring system to see whether there is a discernable reduction in measured concentrations of ethylene oxide.

82. Condition 6-2(c) would not provide a precise list of data that must be collected, recorded, and reported for the scrubbers, regardless of the determination of whether the 99.9 percent or 0.2 ppmv standard is met. It would also lack practically enforceable specificity as to what those ranges should be for a properly maintained piece of equipment such as what the liquor level must be or pH or flow rates and temperatures. These requirements and their values should be explicitly specified and should not be difficult for the source to provide given that these scrubbers are existing devices that have been in operation.

For the scrubbers at the facility, this condition specifies the operating parameters for which continuous monitoring must be conducted. The initial emission testing of the facility required by Section 9.16(b) of the new law, which will be the basis for the values of these operating parameters, has not yet been conducted. The past operation of the scrubbers, before the new law was adopted, should not be the basis of the values for these parameters.

83. The recordkeeping requirement for instances when there is a malfunction in the automatic data recorder does not address pH, which is a vital component of the function of the scrubber as acidic conditions are required for the control of ethylene oxide by the scrubber.

The issued construction permit requires data for pH to be recorded at least every eight hours if there is a malfunction in the recorder. This frequency is appropriate because the volumes of material in the scrubbers are such that changes in pH occur gradually. In addition, samples of scrubbant material will have to be physically taken from a scrubber to obtain this data.

84. Condition 6-2(c)(i)(A) includes a requirement for flow rate and pH but not inlet temperature as does Condition 7-3(a). These requirements should be consistent.

Inlet temperature is addressed by Condition 7-3(a) because it is an operating parameter that is relevant for the operation of a scrubber controlling a gaseous pollutant and is readily monitored. However, the effect of temperature on the operation of the scrubbers is not

expected to be significant enough to address this parameter in Condition 6-2(c)(i)(A), which sets requirements for the operating parameters of the scrubbers if the facility is being operated to comply with the 99.9 percent reduction requirement for emissions.

85. Operational monitoring data on a rolling 3-hour basis can easily mask spikes and troughs. For example, a rolling 3-hour average might look fine, but if the emissions spike every time a chamber evacuates, that might be problematic and might need to be examined. A maximum, minimum, and standard deviation should be added to the recordkeeping requirements to support those values and to give a more complete picture of the data.

Under air pollution control regulations, monitoring for the operating parameters of control devices is commonly required to be conducted to obtain data on a three-hour average. This ensures that the data is representative and can be relied upon if needed for purposes of enforcement. For this facility, this is an appropriate time frame, particularly as dry bed absorption devices will be used to control emissions. Additional statistical information for the recorded data, as requested by this comment, would not have direct value for the implementation of the substantive requirements of the permit.

86. In regard to data collection, please define the intervals meant by “continuous” monitoring. Manual collection defines that data must be collected every hour. Automated data collection intervals are not defined but should be.

The issued construction permit provides that automated measurements must be taken at least every minute and this data must be recorded on an hourly average and a rolling three-hour average.

87. Conditions 6-2(c)(ii) and 6-3 are inconsistent with one another. Condition 6-3 requires maintenance and operation to be consistent with good air pollution control practice at all times. Condition 6-2(c)(ii) only requires good practices in the period before emissions testing is conducted.

There is not an inconsistency between these conditions. Condition 6-2(c)(ii) addresses operation before initial emission testing has been completed. During this period, control devices cannot be held to values of the specified operating parameters that are consistent with those during testing. For this period, Condition 6-2(c)(ii) makes clear that the control devices must still be operated in accordance with good air pollution control practice. On the other hand, Condition 6-3 addresses operation of control devices after initial emission testing is completed, when control devices must be operated in a manner that is consistent with the manner in which they were operated during testing.

88. As Section 9.16(b) of the new law provides for two alternative limits for emissions of ethylene oxide from a sterilization facility, i.e., either 99 percent reduction or 0.2 ppm, it would seem that with a single stack, the 0.2 ppm limit would not be consistent with the “greatest reduction” considering the limits in the permit for usage of ethylene oxide.

As a legal matter, the requirements that apply to emissions and usage of ethylene oxide by the facility are separate and independent. The emissions of the facility will be constrained by the statutory requirements in Section 9.16(b) of the new law (as restated in Condition 2-1(a)) and by the emission limits set by the permit (Condition 3(a)). Section 9.16(b) of the new law sets numerical emission standards that address the effectiveness with which emissions must be controlled. These standards address emissions in relative terms, i.e., the percentage of ethylene oxide that is emitted compared to entering the control devices (efficiency or the amount of ethylene oxide in the exhaust stream compared to the volume of the exhaust stream (concentration). The "permit limits" address the amount of ethylene oxide emitted by the facility. These limits relate to the impacts of the facility on ambient air quality, as has been evaluated with dispersion modeling. Finally, the usage of ethylene oxide by the facility is separately limited by the permit (Condition 5(a)).

However, as appears to be observed by this commenter, to comply with the permit limits for emissions of the facility based on the permitted usage of ethylene oxide, the facility's average emission control efficiency on a monthly and annual basis would have to be substantially greater than 99.9 percent and the average concentration of ethylene oxide in the exhaust would have to be substantially below 0.2 ppm. However, this is not sufficient reason for the permit to set emission standards for ethylene oxide that are more stringent than those in the new law. It is reasonable and to be expected that a facility will design and operate its emission control system to comply with applicable emission standards with a margin of compliance.

89. As related to Section 9.16(g) of the new law, would Sterigenics be required to comply with the 99.9 percent reduction requirement for the facility, rather than the 0.2 ppm limit, given the facility's permitted usage of ethylene oxide to be considered compliant with the "greatest reduction" requirement in Section 9.16(g) of the Act?

As already discussed, if the facility were to operate at its permitted annual usage of ethylene oxide, emissions of ethylene oxide would have to be controlled by more than 99.9 percent. However, this would be the consequence of the level of operation of the facility and the annual limit for emissions of ethylene oxide set by permit. For purposes of Section 9.16(b) of the new law, Sterigenics could still elect to show compliance with either of the emission standards set in Section 9.16(b) of the new law. Likewise, the requirement of Section 9.16(g) of the new law related to control technology is separate from the limit on annual emissions of ethylene oxide set by the permit.

90. How would emissions of ethylene oxide be measured to determine compliance with the applicable limit on annual emissions set by the permit?

The permit is based on continuous emissions monitoring being the principle way that emissions of ethylene oxide would be measured to determine compliance with the limits for monthly and annual emissions set by the permit. While continuous emissions monitoring

specifically for ethylene oxide may be new, this monitoring will utilize equipment and methodology that is now in routine use for monitoring of emissions of organic pollutants other than ethylene oxide. In this regard, continuous emissions monitoring for ethylene oxide is a matter of applying an existing type of monitoring system to a new pollutant and potentially refining the methodology for that equipment to provide the necessary level of sensitivity. Moreover, as addressed in certain other comments, it is appropriate for the permit to be based on the routine use of continuous emissions monitoring at the facility as this should provide the most accurate information for the emissions of the facility for the periods of time between the required annual emission tests. The operational monitoring required by the permit will be a secondary way that emissions of ethylene oxide will be determined.

Facility Oversight

91. Are you only planning to check in on Sterigenics annually?

No. Given the concerns for sources of ethylene oxide emissions, the new law expressly mandates at least one unannounced inspection by the Illinois EPA each year. However, the Illinois EPA has broader authority under Section 4 of the Environmental Protection Act to conduct announced and unannounced inspections of sources including Sterigenics. Illinois EPA also has broad authority to request information from air emissions source. Illinois EPA is committed to utilizing its statutory authority to ensure that the Sterigenics meets its obligations under the construction permit, the new law and the Consent Order.

Additional oversight will occur as Sterigenics submits various plans required by the Matt Haller Act and the Consent Order, including:

- **review and approval of permanent total enclosure demonstration;**
- **review and approval of an emission testing protocol, addressing the manner of testing, test methods, operating conditions and the independent third-party company performing the test;**
- **witnessing of emissions testing by Illinois EPA;**
- **review and approval of emission testing results;**
- **review and approval of a monitoring plan for identifying the manner, equipment and locations for continuously collecting emissions;**
- **review and approval of ambient monitoring plan, addressing ambient monitoring conducted during a 30-day period of operation, as detailed by the Consent Order;**
- **review and approval of an ambient monitoring plan identifying the means of collecting and analyzing samples of ethylene oxide emissions, on a quarterly basis, at the property boundaries and select community locations, and the independent third-party company performing the monitoring; and**
- **review and approval of a plan for conducting dispersion modeling, incorporating the initial emissions testing data and meeting USEPA methodologies.**

92. The permit is full of monitoring requirements, but it doesn't address what happens if Sterigenics or the Illinois EPA identify an issue.

As a general matter, permits address applicable requirements and the means to assure compliance with such requirements, rather than the actions or consequences that would ensue from issues encountered in attempts to implement or comply with an issued permit. This is, in part, because one cannot anticipate all issues that might later develop, much less how those might be appropriately addressed in the permitting context. Further, some issues that may develop may not be permitting considerations but compliance or enforcement considerations. However, as noted above, the Illinois EPA will be overseeing Sterigenics operations in a myriad of ways and will appropriately address any identified issues.

93. Was the Illinois EPA conducting routine inspections of Sterigenics?

Sterigenics currently operates pursuant to an existing CAAPP permit. As such, under federal air program guidance, the Illinois EPA inspects this source on a routine frequency. In addition, Sterigenics was the subject of periodic report reviews. Post issuance of its seal order, the Bureau of Air inspected the facility on a near weekly basis, conducting 27 inspections between February when the seal order was effectuated, and September when the Consent Order was entered, and the seal order was lifted, a period of time when the source was not operating and thus was not impacting human health or the environment.

94. Was Illinois EPA aware of the fact the back vents were not controlled?

The federal rule for commercial sterilizers such as Sterigenics was first adopted in November 1994. That rule addressed control of sterilization operations including the back vents. In July 1997, USEPA became aware of explosions at several facilities nationwide due to oxidizers being overfed with ethylene oxide. This was later determined to be caused by anomalies at the backvents. The USEPA concluded that there were no available mechanisms to regulate ethylene oxide flow from back vents to control devices and, in November 2001, revised the federal rule to remove the requirement for control of back vents. In April 2006, the USEPA reviewed its rule retaining the 1994 version, as amended in 2001.

The Illinois EPA historically has been aware of the regulatory status of the back vents. Specifically, the Illinois was aware of whether the back vents were required to be controlled, whether they were controlled, whether the requisite emissions testing had occurred, and whether it demonstrated compliance with applicable requirements. In December 2016, when the federal government completed its reevaluation of the IRIS for ethylene oxide, the back vents were not required to be controlled. Subsequently, control of the back vents resulted from the efforts of the Illinois EPA and its federal partner following that reevaluation.

Storage and Transport of Ethylene Oxide

95. Why is the Illinois EPA allowing transport and storage of ethylene oxide in a residential area?

The Illinois EPA is not empowered to make decisions relating to zoning. Whether and where transport and storage of ethylene oxide may occur is generally a matter for local units of government.

96. Why is outdoor storage of ethylene oxide being allowed?

The legislature did not address outdoor drum storage or transport in the recently enacted legislation. Additionally, there are no otherwise applicable requirements under the Illinois Environmental Protection Act and regulations thereunder. Rather, the drums are subject to requirements outside the Agency's purview. For example, drum storage is addressed by international standards recommending storage of the drums in a "well-ventilated, fire-proof area, preferably away from other chemicals and outdoors." Thus, storage of drums outside of a building is consistent with applicable recommendations and not an issue for the Illinois EPA's consideration.

Ethylene oxide is stored in drums each with 400 pounds of ethylene oxide. New and empty drums of ethylene oxide stored outside at the Willowbrook facility must be sealed. The drums at issue are specially designed, stainless steel, pressurized and double-walled. Each drum has fittings, including pressure valves. These fittings are opened when connecting a drum to the feed system for one of the chambers at the station that serves that chamber.

97. What happened to the drums that were onsite when the seal order was effectuated?

When the Agency effectuated its seal order, there were full, partially full and empty drums present at the Willowbrook site. Subsequently, these drums were removed from the site. Based on available information, all drums were removed in accordance with applicable requirements.

98. Does drum storage pose a risk of explosion? What would the Agency's response be to an explosion? The source should be fined $1 million and shut down.

Ethylene oxide is a flammable gas. However, as with other flammable materials, risks associated with storage, transport and use can be appropriately managed. This is the case with ethylene oxide. There is no available information that indicates that the Willowbrook facility has caused any explosions. A root cause analysis would ensue subsequent to any such event, and the Agency would take any necessary or appropriate compliance and enforcement measures. However, with regard to the suggestion of the imposition of a one-million-dollar civil penalty for any such event, the Agency notes that civil penalties are dictated by the

Illinois Environmental Protection Act with a current penalty scheme of $50,000 per violation and $10,000 for each continuing day of violation.

99. How will the drums be protected from accidental damage, which could cause release of ethylene oxide?

As an initial point, the drums or canisters in which ethylene oxide is transported are designed to prevent releases of ethylene oxide from accidental damage. The drums in the storage area are only readily accessible to facility staff. In the event of any damage to a drum that might threaten the integrity of a drum, the drum can be moved inside the facility and the contents transferred to a drum that has not sustained any damage.

100. Condition 3(b)(iii) states "In the drum storage area next to the affected facility, all drums for ethylene oxide shall be kept sealed and the Permittee shall not dispense or otherwise allow the release of ethylene oxide from any of these drums while they are in this area. How will Sterigenics show that it complies with this requirement?

The issued construction permit provides that the records that Sterigenics would keep as matter of its normal practice to document that drums for ethylene oxide in the outside storage area are sealed and are not leaking are considered records required by the permit. Because the normal operating practice for the facility will involve inspection of any drums before they are placed in the outside storage, the permit does not include any further requirements for the documentations that would be completed for these inspections.

Emissions Testing or Stack Testing

101. What is emissions testing or stack testing and why is it not performed before the permit is issued and before the controls are used at the source to confirm that the controls will work and should be permitted?

Stack testing is a tool used to determine a source's compliance status with applicable control efficiencies. Sterigenics is subject to a control efficiency. In accordance with the new law, compliance with this efficiency will be determined by an initial stack test, and thereafter annual stack testing. Stack testing appropriately and necessarily is to be conducted after construction or installation of the enhancements authorized by the construction permit are in place.

This construction permit is required for the enhancements at issue under the new law and stack testing before its issuance is not an option. Further, the purpose of the testing is to assess the efficiency of the control systems when in use at the source. As such, the testing necessarily must occur after issuance of the construction permit and when in use at the source.

102. Why are the details of the emissions testing to be performed not set forth in the permit?

As provided in the new law, and reiterated in the construction permit, the details of the testing will be set forth in an emissions test protocol. This protocol shall be submitted by Sterigenics and, after review and approval by the Illinois EPA, will serve as the guide for testing. To keep the public informed, the Illinois EPA has committed to making this protocol available on its web page.

103. What is the purpose of the emissions or stack testing?

Site-specific emissions testing will be required to ensure that the technology as specifically applied at Sterigenics satisfies the requirements of the new law and the terms of the construction permit.

104. Will you be using the same approach to emissions testing as was used in the past?

No. Previous testing was performed to ensure compliance with the federal NESHAP applicable to commercial sterilization sources. As such, the methods and the approach were consistent with the testing aspects of the federal regulation. Testing under the construction permit will rely upon different methods and approach, some of which is addressed in the permit, and all of which will be addressed in the protocol to be submitted for Illinois EPA review and approval.

105. Will Sterigenics be conducting the testing or who will be conducting the emissions testing?

As set forth in the new law, the initial and annual emissions testing must be conducted by an independent third-party company. Indeed, most emissions testing conducted for purposes under the Illinois Environmental Protection Act is conducted by third parties with relevant experience and with no financial connection to the facility undergoing the testing.

106. In Condition 8-2(c), a minimum of three test runs should be required. Please specify that there must be a minimum of three valid runs and specify what valid means.

This condition appropriately addresses a general aspect of emission testing consistent with the relevant requirements of state rules at 35 IAC 283.240. Most emission tests are composed of three separate test runs. These rules address the possibility that "…one of the test runs must be discontinued because of forced shutdown, failure of an irreplaceable portion of the sample train, extreme meteorological conditions, malfunction or other dissimilar or non-representative circumstances," in which case the results of two test runs may be used when determining compliance.

107. For the provisions of Condition 2-1(b), what constitutes a failed emissions test? Is this only for emission testing?

Condition 2-1(b) reflects specific provisions in Section 9.16(c) of the new law that would be applicable in the event of a failed emission test. For this purpose, a failed emission test would be a test that showed that the facility was not complying with the statutory requirements for control of emissions of ethylene oxide in Section 9.16(b) of the new law. For example, if Sterigenics conducted emission testing with the objective of showing emissions of no more than 0.2 ppm, a failed test would show that this limit was exceeded.

The new law does not specify circumstances other than a failed test for which the operation of the facility must cease. The new law specifies the steps that a source must take to resume operation, including taking action to address the cause(s) for the failed test and having a new test conducted that shows that those actions were effective in restoring compliance with the statutory requirements for control of emissions.

108. The draft permit would provide two options for emission testing. One option needs to be chosen and spelled out. Those procedures and parameters should be fully described so the public knows how to hold Sterigenics accountable for achieving compliance and Sterigenics knows the standards that it needs to meet.

The permit appropriately addresses two approaches to emission testing, as Section 9.16(b) of the new law provides two, alternative emission standards for the emissions of ethylene oxide of this facility, i.e., either at least 99.9 percent reduction in emissions of ethylene oxide or emissions of no more than 0.2 ppm. The standard with which Sterigenics intends to comply and for which it will have emission testing conducted will be addressed in the protocol that Sterigenics must submit to the Illinois EPA prior to emission testing. It will also be apparent

based on the scope of testing. Testing to address the concentration standard will only need to address emissions. Testing to address the emission reduction standard will need to include measurement of ethylene oxide entering the control devices, as well as controlled emissions of the facility.

109. Condition 2-1(b) addresses actions that Sterigenics must take if an emissions test fails to show that the facility's emissions are reduced by at least 99.9 percent or to no more than 0.2 parts per million. This is an either/or statement. It would be best to say both emission standards should be met or that the stricter standard should be met. Allowing the facility to comply with either standards is not in the public interest.

As stated in Condition 2-1(a) and repeated in Condition 2-1(b), Section 9.16(b) of the new law sets two alternative emission standards for an ethylene oxide sterilization facility. It does not require a facility to meet both standards.

In addition, it is not uncommon for alternative emission standards to be adopted for emission units with standards that are addressed in different terms. For example, one standard may address the minimum efficiency of the emission control system, relating the allowed emissions to the amount of material entering the control system. Another standard may limit the concentration of emissions or the amount of emissions relative to the volume of the exhaust. This practice serves to set standards that more appropriately address a number of units that differ in key aspects, or individual units that have different modes of operation or whose mode of operation evolves over time.

110. If Sterigenics fails an emission test, who reviews the required root cause analysis to see if Sterigenics truly arrived at the root cause? An independent expert in the field of sterilization would be better able to make that type of judgement than the Illinois EPA.

The Illinois EPA would be responsible for reviewing the report for the root cause analysis given its experience and expertise with the operation of emission control devices and with root cause analyses. If necessary, the Illinois EPA could solicit the assistance of USEPA or other experts when reviewing the report.

111. Condition 6-2(c)(iii). If the control devices are not run with the same parameters during testing as they are for normal operations, then the test would not address normal operation and therefore could not verify compliance.

Emissions testing is to be performed under conditions that are representative of how the source normally operates. How a source operates during successful testing establishes parameters on future operations until the next test event.

Backvent Controls

112. Who required the control of the backvents and did the controls work?

In December 2016, USEPA completed a reevaluation of its Integrated Risk Information System (IRIS) for ethylene oxide. Specifically, USEPA classified ethylene oxide as a human carcinogen, posing a greater risk of cancer than previously known if people are exposed for many years. USEPA then began to assess potential risks from certain sources, one of whom was Sterigenics. Among other things, USEPA asked the Agency for Toxic Substances and Disease Registry (ATSDR) to evaluate any public health implications for persons living in and working in the Village of Willowbrook based on a very limited amount of ambient data collected by the USEPA in May 2018. ATSDR responded by letter in July 2018 recommending the control of the commercial sterilization backvents to reduce emissions.

Following receipt of limited ambient air sampling data in June 2018 (and prior to the ATSDR's recommendation), Illinois EPA engaged in communications with the USEPA and Sterigenics regarding emissions from the source and potential measures to reduce the same. On June 11, 2018, Sterigenics applied for and on June 26, 2018 received a construction permit from the Illinois EPA to control emissions from the sterilization back vents. That construction permit required emissions testing of backvent emissions pursuant to an emissions testing protocol. Both the Illinois EPA and the USEPA reviewed the protocol, witnessed the emissions testing event in September 2018, and reviewed the emissions test results. The test was performed in a manner that was consistent with the June 2018 construction permit, as well as the NESHAP Subpart O test methods. The purpose of the test was to demonstrate the effectiveness of the pollution controls to remove ethylene oxide from the chamber exhaust vent cycle (back vents) at conditions that should have represented the highest amount of ethylene oxide through the back vents. The testing demonstrated a control efficiency of at least 99%, or a 99% reduction in emissions. Further, the emissions were well within the emissions limits set forth in the CAAPP permit issued in June 2015.

113. Doesn't the ambient air monitoring conducted by the Village of Willowbrook suggest that the controls did not work?

No, the ambient air testing data does not speak to the success of the emissions testing. These two types of testing are separate and distinct and bear little relationship to each other.

Section 9.16(g) technology evaluation

114. There's no way that the Agency has made the independent findings that the technology that exists for each particular product Sterigenics proposed to sterilize is in fact the best that's possible available.

The draft construction permit contained a provision recognizing that the control improvements being made as part of this construction permit will satisfy the requirements of Section 9.16(g). In response to comments, the Illinois EPA is modifying its approach and issuing a separate certification. The Illinois EPA believes that the certification should be a stand-alone document and not enveloped as part of the permitting decision, as it is more in keeping with the new law's intent to create a certification process for the two, discrete standards that operate as conditions on the continued use of ethylene oxide by Sterigenics.

The Illinois EPA is issuing the certification required by Section 9.16(g) in parallel with this permit decision, in part, because it makes sense to certify the control systems contemporaneous with the permit review of the control improvements. Moreover, because nothing in the new law addresses the timing or the manner in which the Illinois EPA must act on its certification obligation under the provision. The remaining components of the new law as they relate to the Illinois EPA's oversight, including the review and approval of the emissions testing, CEMS monitoring, ambient air monitoring and other requirements, will be addressed as they arise.

It is noteworthy that the control system evaluation performed by the Illinois EPA did not include an examination of each product, or grouping of products, that will be treated by Sterigenics' control system upon resumption of operation. The Illinois EPA's responsibility set forth in Section 9.16(g) largely pertains to certifying available control technologies in terms of their emission reduction capabilities, which necessarily focuses on control systems that act to treat ethylene oxide emitted by one or more of sterilization chambers. As a fundamental matter, the control system for a facility using ethylene oxide for sterilization or fumigation will achieve, both by design and in practice, a range of control performance irrespective of the individual or product groupings that are treated in the sterilizing chambers. While the supplier certifications are part of a separate requirement of the same provision, their consideration by the Illinois EPA within the context of the technology review would be of little to no value. It should be mentioned that a plain reading of the dual certification requirements of Section 9.16(g) does not indicate, in either express or implied language by the General Assembly, that the control system evaluation is linked with the supplier certifications.

115. There are no objective criteria concerning the certification of control technology evident in the Illinois EPA's draft construction permit. What research has been done to ensure that they comply with this certification requirement?

The Illinois EPA acknowledges that the certification of control technology referenced in the draft construction permit does not elaborate upon the considerations made by the Illinois EPA in fulfilling its obligation under the Matt Haller Act. However, the statute does not detail any accompanying requirements for a formal finding of fact(s) or technical support on the face of the certification. In fact, most certifications, including those that carry a legal significance, are of a short form variety, with supporting justifications commonly being found in a companion document or in the administrative record of the agency's deliberation.

It is also noteworthy that the standard for the Illinois EPA's certification under 9.16(g) is rather abbreviated itself. The yardstick for measuring the Illinois EPA's evaluation is that the affected source's control system employs technology that achieves the "greatest reduction in ethylene oxide currently available." Neither the phrase nor the individual terms are defined by the statute, effectively leaving their meaning and implementation of the phrase to the Illinois EPA's discretion.

In this instance, the Illinois EPA's certification for the control technology is fully documented in a companion document. The memorandum dated September 20, 2019, provides a detailed account of the evaluation. Among other things, the document explains why the control improvements authorized in the construction permit will assure that the control system employed by the Willowbrook I facility produces "the greatest reduction in ethylene oxide emissions currently available."

More specifically, the memorandum discusses the improvements that Sterigenics will make to its existing control system for the different "processes" at Willowbrook I that release ethylene oxide, i.e., the evacuation of the sterilization chambers, the use of the backvents on the chambers, the aeration of sterilized material, and "fugitive emissions," including releases from transfer and storage of sterilized material. Fugitive emissions would be directly addressed with the required permanent total enclosure and a new absorption device. Absorption with an appropriate sorbent is highly effective for control of low concentrations of a gaseous pollutant. For the other processes, additional control would be provided by making more use of two existing control devices at the Willowbrook I facility to also control evacuation of the sterilization chambers, and by installation of another absorption device. Notably, four control devices, in series, will now be used for the evacuation of the chambers, i.e., two acid scrubbers and two absorption devices. The initial control of emissions by the scrubbers will facilitate effective control by the existing absorption device. The second absorption device will act as a polisher device for further control of emissions.

The memorandum also discusses the control systems at other sources that use ethylene oxide for sterilization, based on information obtained by the Illinois EPA from permits and related documents outside the application. This review shows that other sources are commonly controlled with devices of the same type as at this facility. Although some sources use afterburners or oxidation for control, it should not be considered more effective than the combination of controls that Sterigenics would use. Lastly, a review of the emission

standards currently in place for other sources confirms that the emission standards set forth in the new law are more stringent.

116. The Illinois EPA must certify and not merely determine that the control technology employed by Sterigenics meets the legal standard set forth in Section 9.16(g). In section 1.b.iii.c. of the permit, the Illinois EPA makes the statement that is has determined "the facility's emissions control systems would use the technology that produces the greatest reduction in ethylene oxide available."

This statement is true. As a matter of law, a certification is regarded as an act of attesting to, or an affirmation of, something as being true or as to meeting a certain standard. A certification signifies a type of authoritative confirmation, or proof of conclusiveness, that would not extend to an ordinary act of approval. By requiring a certification of control technology under Section 9.16(g), the General Assembly intended for it to have a meaning commensurate with its legal connotation. Given the Illinois EPA's long-standing expertise in the field of air pollution control, the certification can be viewed as a means of providing credible assurance that the affected source (i.e., Sterigenics) will be able to meet one of the two condition precedents for using ethylene oxide under Section 9.16(g).

117. The Agency may not rest on the assumption the facility is using the best technology as a proxy for making an independent determination that each product sterilization method is the best and most stringent technology available.

The legal standard governing the Illinois EPA's certification obligation in Section 9.16(g) is centered on a review of technology. The Illinois EPA's review under Section 9.16(g) need not incorporate a review of the separate supplier certifications because the latter does not provide relevant information that would affect the emission reduction capabilities with respect to available control systems.

118. It's particularly troubling that the Illinois EPA seems to be equating the facility standards of Subsection B to the product-based standards that are in Subsection G.

The Illinois EPA does not equate the concentration and mass-based emission standards of Section 9.16(b) with the dual certification requirements of Section 9.16(g). The former sets alternate standards of performance. The latter establishes a set of additional requirements for Sterigenics to resume operation. The technology certification by the Illinois EPA in Section 9.16(g) is not a product-based standard, as the comment claims, but a technology-forcing standard.

119. Condition 1(c) states that with the various improvements described in Condition 1(b) the facility's emission control system would use technology that produces the greatest reduction in ethylene oxide emissions, as is now required by Section 9.16(g) of the new law, without reference to an independent description of what that technology should look like in an ideal facility, such as an air pollution control board regulatory document.

To provide further clarity as to the technology upon which this determination is based, and in response to certain comments on the draft permit related to this technology, the issued construction permit provides that this technology consists of permanent total enclosure and the specific improvements to the emission control system as would be allowed by the permit as described in Condition 1(b)(ii) of the permit.

120. Under Section 9.16(g) of the new law, a requirement for a facility subject to this section is that "the Agency has certified that the facility's emission control system uses technology that produces the greatest reduction in ethylene oxide emissions currently available." What are the requirements that a facility must meet to qualify as having technology that "produces the greatest reduction in ethylene oxide emissions currently available?"

As provided in Section 9.16(g) of the new law and restated in this comment, Section 9.16(g) of the new law simply provides that the Illinois EPA must have certified that "…the facility's emission control system uses technology that produces the greatest reduction in ethylene oxide emissions currently available." The Illinois EPA simply considers this to mean that, in addition to permanent total enclosure, as would be addressed by the construction permit, a facility makes use of appropriate control devices to meet the legal standard. As discussed in the supporting memorandum accompanying the certification, a review of Sterigenics control measures and other known control systems confirms this showing.

121. If relevant USEPA standards for Maximum Achievable Control Technology (MACT) are included in the determination of "greatest reduction" and these standards change, what is the process for updating the Illinois standards for "greatest reduction," as governed by the Act?

If the USEPA revises its emission standards for commercial ethylene oxide sterilization facilities in the future, and further improvements would be needed at this facility to comply with the revised standards, Sterigenics would have to make such improvements. However, in the context of the current permit action, it is not appropriate to speculate on what a future regulatory development might mean for the certification of technology required by Section 9.16(g) of the Act.

122. Without the raised stack, can Sterigenics still be considered to have technology that provides the greatest reduction in ethylene oxide emissions?

The determination that the facility's emission control system uses technology that produces the greatest reduction in ethylene oxide emissions relates to the facility's systems for control of emissions. It does not address the height of the stack at the facility as a stack does not function to control emissions.

Section 9.16(g) supplier certifications

123. Sterigenics is required by law to have certification from its customers that ethylene oxide is the only way to sterilize each individual product they intend to sterilize with ethylene oxide. They have not produced these certifications. The permit application is incomplete because of the absence of the supplier certifications. Where are the suppler certifications? The permit should be denied in the absence of the certifications.

These comments refer to certification(s) required under Section 9.16(g) of the Act. An entity providing products to the affected facility for sterilization or fumigation can be viewed as a "supplier," which is the terminology in the statute, because the entity supplies the affected facility with the individual or grouped products to be sterilized or fumigated. The entity could also be viewed as a customer, in the sense that the affected facility is performing a service pertaining to such products.

Section 9.16(g) does not require the supplier certifications be provided to the Illinois EPA as part of the permit review for Sterigenics' control improvements. In fact, nothing in the new law suggests that the supplier certifications must be addressed by the Illinois EPA as part of any permit review process, or before the issuance of a construction permit for control improvements made pursuant to the new law. The only temporal element of the provision is that such certification(s) be forthcoming prior to Sterigenics "using ethylene oxide for sterilization or fumigation."

124. Illinois EPA must verify that for each product that Sterigenics proposes to sterilize, ethylene oxide is the only thing that can be used to sterilize that product. Illinois EPA must make independent findings to this effect.

The language of Section 9.16(g) does not require "findings" by the Illinois EPA with respect to the supplier certifications. The certification has a distinctly legal meaning, to attest or provide an assurance of the accuracy of a particular statement. A legal certification does not operate in a way that requires prior review and approval by others; by its nature, a certification is self-authenticating, obviating the need for someone else to review or approve it. As such, a review by the Illinois EPA of the supplier certifications is incongruous with the legal principles applying to formal certifications.

In contrast to the certification process of Section 9.16(g), the new law establishes a technical review and a formal approval process by the Illinois EPA of submissions made by ethylene oxide sterilization sources in no less than nine (9) instances. In each instance, the General Assembly created detailed provisions to govern the back-and-forth exchanges of information between the sources and the regulatory agency, often doing so in multiple paragraphs. The Illinois EPA does not and may not presume a right of review and approval is mandated by the legislature where, as here, the relevant statutory provisions do not even hint at it.

As discussed in the response above, the various product certifications that must be obtained by Sterigenics from its suppliers are not tied to the Illinois EPA's permit review of control improvements made pursuant to the new law.

125. The supplier certifications need to be made public for examination with a public comment period and public forum with the suppliers and Sterigenics present.

Nothing in Section 9.16 or the other provisions of the Environmental Protection Act suggests that the supplier certifications be subject to a public comment period or a hearing compelling the attendance of Sterigenics' suppliers. Public comment and hearings are staples of a public participation process that often accompanies governmental decision-making, most frequently either during or before the issuance of a final decision. As the supplier certifications are not a form of governmental action, it is not clear what purpose would be served by the proceedings suggested by the comment. Moreover, a legal certification does not depend upon some independent action by a third party for its execution. Based on the plain language of the provision, there is no indication that the supplier certifications under Section 9.16(g) must be examined or reviewed by the public prior to becoming effective.

There is also no authority under the new law or the other provisions of the Environmental Protection Act for the Illinois EPA to compel Sterigenics, much less "suppliers", to attend a hearing to address issues germane to the certifications.

Any certifications provided by Sterigenics to the Illinois EPA would be available under the Freedom of Information Act (FOIA), unless such information is exempted by relevant provisions of the Environmental Protection Act (as in the case of trade secrets under 415 ILCS 5/7 and 7.1 of the Act) or by other relevant statute (as in the case of FOIA).

126. How often would the company be required to certify that a product may only be sterilized completely by ethylene oxide?

The new law does not specify a limit on the term of a supplier certification or a frequency at which a certification must be renewed. The certification is a condition precedent to lifting a prohibition on Sterigenics' future use of ethylene oxide for sterilization or fumigation.

127. The supplier certifications should be rigorously enforced.

The new law provides that Sterigenics may not operate unless it "can provide a certification to the Agency by the supplier of a product to be sterilized or fumigated that ethylene oxide sterilization or fumigation is the only available method to completely sterilize or fumigate the product. It is fair to construe a violation of the requirement as a proper subject of an enforcement action brought under Title XII of the Act. Remedies available under the Act would include a civil action to recover penalties, 415 ILCS 5/42(a), a criminal action, 415 ILCS 5/44, a governmental action to restrain violations or for an immediate injunction, 415 ILCS 5/42(e) or 5/43, or a citizen action for injunction, 415 ILCS 5/45.

Some considerations are noted with respect to the potential enforcement under the Environmental Protection Act of the supplier certifications addressed by Section 9.16(g). This provision does not directly implicate a signatory to the certificate. While it may stand to reason that a supplier who signs a certification under the provision should be bound to the accuracy of the certification, enforcement of the accuracy of the certifications against such individuals may be challenging. The individuals who certify to the new law's method availability standard will likely be the only individuals who possess the relevant information for the certifications. In this regard, there is not a public database identifying the suppliers and products for which ethylene oxide treatment is the only method for complete sterilization or fumigation. Lastly, suppliers may be averse to providing supporting information to the Illinois EPA. That could aid in any such enforcement.

128. What is the process for appealing the supplier certifications?

Nothing in the new law contemplates a right of appeal of a supplier's certification under Section 9.16(g). As to the other provisions of the Environmental Protection Act, there does not appear to be any provision that would authorize an appeal of the supplier certification.

129. Will there be rules creating criteria for the supplier certifications, and will the criteria be revised when newer sterilization methods are approved in the future?

The new law does not authorize agency rulemaking for the provisions relating to supplier certifications.

130. How is the public assured that Sterigenics is obtaining the required certifications and that the certifications are complying with the requisite legal standard?

The new law does not specify the mechanics of how compliance with the supplier certifications is to be demonstrated. The new law also does not explicitly require the review and approval of the certifications by the Illinois EPA. It is unclear if enforcement under the Environmental Protection Act is an appropriate vehicle against the suppliers themselves to assure that the certifications are lawful.

131. The draft permit does not address the certifications required by Section 9.16(g) of the new law from entities that send product(s) to the facility for sterilization, which state that ethylene oxide sterilization is the only available method to sterilize to completely sterilize the product(s). How would this be dealt with?

The certifications addressed by this comment do not need to be addressed in this construction permit because they do not involve or relate to the control of the emissions of ethylene oxide and are directly addressed by Section 9.16(g) of the new law.

Continuous Emissions Monitoring System

132. What is Continuous Emissions Monitoring and why is it being required?

Continuous Emissions Monitoring is a tool used for, among other things, measuring concentrations out of an emissions stack. The Continuous Emissions Monitoring System (CEMS) that is required of Sterigenics, as set forth in the construction permit, is in addition to emissions testing, ambient monitoring in the community, and other periodic monitoring measures, such as recordkeeping and reporting set forth in the construction permit. When Sterigenics is operating, the CEMS will provide a measured concentration of ethylene oxide, which is in contrast to the historical assessment of emissions via calculation based on emissions testing and other relevant factors. A CEMS is not new technology. Nor is it untested or unreliable. However, its application to commercial sterilization operations is developing. It is in this regard that Sterigenics, in its cover letter to the construction permit application, indicated that it "looked forward to field testing."

The Illinois EPA, in this construction permitting action, is requiring the installation and use of a CEMS – a significant additional compliance tool - in response to concerns for the toxicity of ethylene oxide and for the source's ability to comply with applicable requirements. Also, this is consistent with the new law which requires the submission of a plan "describing how the owner or operator will continuously collect emissions information" at the source. That plan will be forthcoming with more details regarding the CEMS, but the obligation for a CEMS is captured as part of this permitting action. Consistent with its goal to keep the public informed, along with other information, the CEMS plan will be made available to the public.

133. Can the Agency cause the source to cease operation if its CEMS is not operating?

The CEMS is merely one aspect of the periodic monitoring required of Sterigenics. Indeed, other records relative to their operations and emissions are required by the construction permit. Further, the CEMS serves the purpose of data collection, not control of emissions. Thus, while data collection is a key component of compliance assurance, it does not directly affect the emissions of a source. The response to any failure to operate the requisite CEMS is a compliance and enforcement consideration upon which the Agency cannot speculate.

134. The control technology, particularly the emission monitoring system, is not proven and is untested. Sterigenics states, "We look forward to working with you to gain experience." Isn't that their job, to have the experience to get this done and to have that verified? And at this point, it cannot accomplish the goals, nor will it get the job done. Right there is reason number one to deny this permit.

In fact, the proposed modifications, which are expressly borne of the new law, should be viewed as a combination of conventional technologies.[3] Further, the Illinois EPA is recognizing the overall system of controls as satisfying the Act's requirement for using technology that will produce the greatest reduction in ETO emissions currently available. Moreover, as required by the new law and reiterated in the construction permit, the facility must test its improvements, once constructed.

The concern noted appears to stem from the permit application submitted by Sterigenics. In the cover letter to the application acknowledges that the selection of measurement technology (i.e., Fourier Transform Infrared (FTIR) spectroscopy) will be new to a sterilization facility. But, in the wake of concerns regarding the toxicity of ETO, the new law requires sterilizing facilities to monitor exhaust concentrations of ETO directly, rather than merely using parametric monitoring to assure that emission controls are operating effectively.

FTIRs have been utilized for the last 30 years to measure hundreds of different organic compounds, including ethylene oxide. When a few organic compounds are targeted for monitoring, as would be the case here, FTIRs can be further enhanced to measure emissions with significantly lower detection limits. Such an enhancement, which the source proposed in the permit application, does not make the proposed CEMS untested or unreliable.

135. The proposed continuous emissions monitoring system is not specifically identified in the draft permit. The permit describes the system as "such as a Max Analytical Technologies MAX StarBoost" rather than specifying the exact product. This needs to be specified here along with all operational, calibration, testing, and maintenance parameters for practical enforceability.

The permit addresses the required continuous emissions monitoring system. It specifies the performance specifications that the selected system must meet. It is not appropriate, and it is not Illinois EPA practice, to specify that a particular brand and model be used. Aside from the propriety of doing so, it would shift the burden for effective emissions monitoring from the source to the Illinois EPA. The responsibility to select and purchase an appropriate emissions monitoring system, and to then properly operate and maintain that system, lies with the source.

136. I am concerned that continuous emissions monitoring may be unproven for ethylene oxide. In the application, Sterigenics states "As IEPA is aware, we have proposed use of a CEMS even though no CEMS has been demonstrated as applied to a sterilization facility like our Willowbrook plant. We look forward to working with IEPA to gain field experience with such systems in the sterilization industry." This statement is concerning. Since this

[3] The proposed improvements generally consist of the ducting of all exhaust streams to a single stack, the polisher dry bed control system being added to the facility's existing wet acid scrubber, the proposed ducting the Deoxx acid scrubber to the aforementioned wet acid scrubber and changes to the facility to achieve a permanent total enclosure.

would appear to be pilot project for such an emissions monitoring system, multiple validation methods should be employed that such a system a) works b) is appropriate for the range of values seen c) is consistent over time. Validation should require not only measurements and calculations at several different segments of the system to ensure the concentration drops make sense and are consistent but also multiple analysis techniques by established method to support the data output of the continuous emissions monitoring system. Regular validation and checks (for example quarterly or annually) would be appropriate for such a pilot case. Given those concerns, what is the plan for verifying that the method for continuous emissions monitoring is adequate? A method should be spelled out or cited here including previously established methods for comparison and verification. Also, if this continuous emissions monitoring system does not adequately quantify, what is the alternative plan?

Notwithstanding the concerns expressed in the application and in this comment, continuous emissions monitoring for ethylene oxide is not unproven and should be readily implemented for the facility. The specific concerns expressed in this comment are addressed by the requirement in the permit that the emissions monitoring system be designed and operated to meet the requirements of USEPA's Performance Specification 15, Performance Specification for Extractive FTIR Continuous Emissions Monitor Systems in Stationary Sources. They will also be addressed by means of the plan required by Section 9.16(d) of the new law, which will provide details on the methods and procedures to be used by Sterigenics to continuously collect emission data, and which will be reviewed and approved by the Illinois EPA.

137. USEPA Performance Specification 15 does not specify a sensitivity requirement for a monitoring system. This should be specified in this permit, just as was done in a construction permit for the Medline facility in Waukegan. The permit for Medline specifies that its emissions monitoring system shall be operated to maintain a limit for quantification that is no greater than 10 ppbv. A system with a 40 ppbv detection limit, as proposed in the application should be considered insufficient.

In the issued construction permit, Condition 7-1 specifies that the continuous emissions monitoring system must have a limit of quantification of no more than 20 ppm.

138. In Condition 7-1(a), certain specific requirements are listed for the continuous emissions monitoring system (USEPA Performance Specification 15). What is the protocol for operating the continuous emissions monitoring system, certification protocol, maintenance schedule, regular performance checks? An initial performance test, as addressed by Performance Specification 15 would not be sufficient above. The monitoring system should be checked periodically to ensure performance is maintained.

These subjects addressed in this comment will be addressed in the plan required by Section 9.16(d) of the new law that will describe how emission information will be collected. In this regard, this plan will need to address the subjects involved with continuous emissions monitoring that are addressed with Procedure 1 in 40 CFR 60 Appendix F, "Quality Assurance

Requirements for Gas Continuous Emission Monitoring Systems Used for Compliance Determination."

139. The continuous monitoring system for gas flow rate in the stack is required to be in the same area as the continuous emissions monitoring system. How far apart can they be? This should be specified and the devices should be located reasonably close together for determinations of emissions that require data measured by both monitoring systems.

The concern expressed in this comment is addressed as this monitoring system must meet USEPA's Performance Specification 6, "Specifications and Test Procedures for Continuous Emission Rate Monitoring Systems in Stationary Sources." This performance specification requires this monitoring system to be located so as to provide accurate determinations of the mass of emissions, e.g., pounds of pollutant emitted per hour.

140. Conditions 7-1(a) and (b) addressed data from the continuous emissions monitoring system that must recorded. How does that data need to be recorded and how should it be reported? How many readings are the minimum for any rolling averages?

This data must be collected on a one-hour and three-hour rolling average. Further requirements for the frequency of measurements and the recordkeeping of collected data will likely be established in the plan required by Section 9.16(d) of the new law.

141. Condition 7-1(e) lists an exception to the requirements for Conditions 7-1 (a), (b) and (c) if there are difficulties in initial calibration or certification such as obtaining calibration gases, relocation, and re-certification. What restrictions are placed on this?

The use of this provision would be subject to review by the Illinois EPA on a case-by-case basis. In this regard, the issued construction permit provides that reliance on this provision must be accompanied by notification to the Illinois EPA by Sterigenics. The nature of the specific difficulties that are encountered and the appropriateness and adequacy of Sterigenics' responses would then be considered.

142. For the limits for emissions of ethylene oxide in Condition 3(a), this condition provides that when data from the continuous emissions monitoring system is unavailable, emission data will be based on usage, operating data, and emissions factors from test results. How will this be done?

As a general matter, data for emissions of ethylene oxide during such periods would be determined from the measured usage of ethylene oxide during such period, operating data from the control systems to verify that they were being operated properly during such period, and a representative factor for control efficiency as measured or derived from measurements made during emission testing.

143. In Condition 10, the requirement for quarterly emissions reports starting the first full month after continuous emissions monitoring system certification. What is this certification process? Will resumption of operations be contingent on this certification? Isn't a continuous emission monitoring system a crucial requirement for showing compliance with the emission standards of Section 9.16(b) of the Act?

The certification process for an emissions monitor is the process by which fulfillment of the applicable performance specification is demonstrated. An emissions monitor must be certified before the data that it collects is considered reliable for purposes of directly determining compliance. Section 9.16(b) of the new law provides that initial and annual emission test must be conducted to confirm compliance with the emission standards that it established. The provisions for continuous emissions monitoring are established by the permit. Continued operation of the facility is permissible during an interruption in the operation of the continuous emissions monitoring system for several reasons. Among other things, such an interruption would not mean that the facility is not in compliance with substantive requirements for control of emissions. Other operational monitoring is required that would provide information upon which compliance could be determined.

Continuous emissions monitoring systems are sophisticated devices such that interruptions in operation should be anticipated. In this regard, the permit appropriately includes provisions to address difficulties that may be encountered with the emissions monitoring system. Such difficulties are inherent in the operation of emissions monitoring systems and are routinely addressed on a case-by-case basis considering the type of monitoring that is being conducted, the specific difficulty that was encountered and other relevant factors.

Incidentally, in the issued construction permit, the timing of the quarterly compliance reports is no longer related to the certification of the emissions monitoring systems. It is instead linked to the completion of the initial emission testing. This a more appropriate point at which to begin quarterly compliance reporting.

144. Condition 8-2(e) instructs the source to submit "accompanying documentation." What data are included in this set of documents? Does it include raw data and calibration data or weather data?

The accompanying documentation that must be included in reports submitted for emission testing is specified by Section 9.16(b)(d)(i) through (iv) of the new law. This documentation includes raw data and calibration data. It does not include weather data, which would not be relevant documentation for a test, as sterilization operations are conducted in a building.

145. Condition 10(a) would provide for changes to the emission monitoring systems to "improve the limit of quantification of these systems" to be reported in a quarterly report after the changes have been made. This is not acceptable. A comparison study must be made to show these changes are appropriate and correctly measure what they are designed to measure before implementation of the changes.

It is appropriate that changes to improve the limit of quantification of the emissions monitoring systems be able to proceed without the delays that would result from case-by-case review and approval of individual changes. In the issued permit, further information for such changes is required to be reported to show that such changes have improved the limit of quantification of the monitoring systems.

146. I have doubts as to the availability and accuracy of sub-ppm ethylene oxide calibration gases for the continuous emissions monitoring system. Ethylene oxide is a very reactive compound and can decompose over time. Despite the methods used by calibration gas manufacturers, I would bet the accuracy of these gases would degrade over time leading to inaccurate data recorded by the monitoring systems.

The deterioration of the calibration gases that are used as part of quality control for continuous emissions monitoring systems for gaseous pollutants is a matter that is well-recognized. Procedures and practices are implemented to address this phenomenon. For example, calibration gases have set expiration dates, after which date they should no longer be used.

147. Page 20 (Item 32) Explanation of how ongoing compliance will be demonstrated: “EO Concentration: CEMS unit to be installed in common stack.” If there is not a common stack, will the continuous emissions monitoring system (CEMS) be installed in the existing stacks until a common one can be created at the final height?

The construction permit requires the continuous emissions monitoring system to be installed in a new or modified stack for the facility, which stack would be the one exhaust point for the sterilization facility. The CEMS would not be installed in an existing stack.

Parametric Monitoring

148. In no case should Sterigenics be allowed to substitute a parametric monitoring system for the required continuous emissions monitoring system. A parameter monitoring system, which might address a parameter such as pH of the scrubbant, would only indirectly address emissions and should not take the place of an emissions monitor.

"Parametric monitoring" would not take the place of continuous emissions monitoring for the facility. Rather it would serve as a necessary alternative to address any interruptions that might occur in the operation of the continuous emissions monitoring system. In this regard, it would not be appropriate to presume that any continuous emissions monitor system will always be in service, much less a monitoring system that involves an application of a monitoring technology to a new pollutant for which the technology has not historically been used. Regardless, this approach is not at all uncommon even where continuous emissions monitoring is also required.

149. All inputs and outputs of all processes and devices, including the sterilization chambers should be monitored. This includes monitoring for flow rates, concentrations and efficiencies. The monitoring required by the draft permit appears inadequate in that it is too coarse grained and unclear how compliance can be verified, or problems diagnosed.

The construction permit is appropriate as it addresses operational monitoring for the control devices and not process equipment at the facility. The function of the construction permit is to address control of emissions. Moreover, as the permit is based upon and requires continuous emissions monitoring for ethylene oxide, the operational monitoring for the control devices required by the permit is set at an appropriate level. This operational monitoring will not be the primary means to determine the emissions of ethylene oxide. However, it will be sufficient to address operation of the control system during any periods in which the continuous emissions monitoring system is out of service. It should provide ample information to determine whether elevated levels are the result of the failure of a particular control device.

150. At least for the initial year or two of operation, quarterly reporting is not adequate, and reporting should be more frequent.

The timing of reports required by the permit is appropriate, as deviations from applicable requirements are to be promptly reported to the Illinois EPA as they occur. The quarterly reports have a different role, as they require general information related to the operation of the facility.

Modeling and Stack Height

151. What is dispersion modeling and when is it utilized?

Dispersion modeling is the mathematical simulation of how air pollutants disperse in the ambient atmosphere. It is performed with computer models that include algorithms to solve equations that govern pollutant dispersion. The model relies upon inputs, such as stack height, stack emissions, meteorological conditions and topography, to predict ambient concentrations of pollutants from a source.

Charged with restoring, maintaining and enhancing air quality, the Illinois EPA's Bureau of Air engages in compliance, inspection, permitting and air quality planning and monitoring activities, to which end it employs a small number of modelers that support these activities. Most commonly, these modelers perform dispersion modeling or audit dispersion modeling in support of regulatory planning and development, or permitting actions, respectively.

152. How was dispersion modeling utilized relative to Sterigenics?

Relative to Sterigenics, modeling was utilized in support of the enforcement action brought by the Illinois Attorney General's Office and the DuPage County State's Attorney's Office, captioned 2018 CH 001329, and later in this construction permit transaction. In this permitting action, the Illinois EPA audited (performed audit modeling) the dispersion modeling submitted with the permit application by Sterigenics

153. What was the specific purpose for the dispersion modeling in the permitting context?

The dispersion modeling assessed the effects that the suite of enhancements addressed by the construction permit would have on ambient air quality, with an eye toward reducing impacts on the local community. The modeling reflects that at the stack heights contemplated by the permit, ethylene oxide air concentrations at all locations are lowered, thus any risks associated with the commercial sterilization operations are in turn reduced.

154. Was the modeling submitted as part of the permit application required under existing or new requirements under the Environmental Protection Act?

With respect to the permitting action, no modeling was statutorily or regulatorily required. However, given concerns for the toxicity of ethylene oxide, the source was requested to conduct and provide dispersion modeling. This is in addition to the dispersion modeling required under the new law, which is to be performed in the future, using data from emissions testing of the control system after completion of construction, start-up, and testing of the enhancements addressed by the construction permit.

155. Who performed the modeling submitted as part of the permitting action?

The dispersion modeling in the permit application was performed by a consulting group, on behalf of Sterigenics. This modeling was subsequently audited by Agency modelers. This approach was undertaken in the ordinary course and bore no relation to Agency capabilities, but rather was reflective on the obligation of the permit applicant to provide requisite information. While Sterigenics utilized an independent third-party consultant to perform the modeling, whether an applicant utilizes a consultant, and who that might be, is generally not within the Agency's control or decisional process. Moreover, the Agency does not maintain a list of, nor make recommendations, on such. Notably, the dispersion modeling required under the new law must be performed by an independent third party.

156. Does the modeling consider cumulative exposure to ethylene oxide or the results of the IDPH study?

In this permitting action, the dispersion modeling does not account for cumulative exposure to ethylene oxide. It addresses the ethylene oxide emissions from Sterigenics commercial sterilization operations at Willowbrook I. Further, it is addressing the likely emissions impacts of those operations, in the future, after a suite of enhancements have been made. The point of the modeling in the permitting context, at this juncture, is to confirm that the sterilization operations, with the authorized enhancements, will be effective in reducing impacts on ambient air quality to below the levels that USEPA considers acceptable. Modeling of past operational scenarios is not relevant to the Illinois EPA's permitting consideration. Similarly, consideration of the IDPH study is misplaced in the context of the permitting transaction, as it does not bear on how the source will operate prospectively under the Environmental Protection Act.

157. Why does the modeling assume that the source operates 24/7?

The modeling assumes the source operates 24/7 because it is, in fact, the mode of operation.

158. Isn't Sterigenics design value for exit gas velocity of 96.1 high and perhaps not representative of likely actual velocity?

The velocity is an appropriate value.

159. What is the explanation for the 1-kilometer radius in the modeling?

The modeling concentrates on a 1-kilometer radius. This is appropriate based on Agency modeling experience. Also, it is consistent with the federal modeling exercises relative to Sterigenics. Additionally, it is consistent with the relevant factors, such as terrain and the single stack which indicate that the sterilization operations will have a localized impact. Further, the purpose of the modeling is to capture the maximum impact and the maximum impact at the nearest residence from the sterilization operations. Beyond these points of maximum impact, the impacts from the source drop off. As such, modeling a larger radius would serve no relevant purpose.

160. Why did the Illinois EPA rely upon the urban option rather than a rural option in performing its dispersion modeling?

The Illinois EPA relied upon the urban option based on its considered judgement, as well as that of USEPA who recommended the urban option for purposes of, among other reasons, consistency in approach with relevant federal dispersion modeling. More specifically, USEPA's Office of Air Quality Planning and Standards (OAQPS) utilized the Urban mode in its recently released risk analysis, "*Risk Assessment Report for the Sterigenics Facility in Willowbrook, Illinois*" (August 2019). OAQPS assessed various factors available to inform the determination such as near field land use, population exposure per square kilometer, and urban heat island effects. Although land use in the immediate vicinity is suburban and is moderately developed (suggesting rural dispersion), the population density exceeded 750 people per square kilometer in most (at > 750 per km^2 urban mode is recommended) areas near Sterigenics. OAQPS determined that the broader Chicago-Joliet-Naperville urbanized, heat island influence, critical for characterizing night-time conditions and the depth of the boundary layer carried the greatest importance in choosing the use of Urban mode in their risk analysis. Illinois EPA concurred with USEPA's assessment and recommended that the applicant execute the model in urban mode for assessing impacts from the proposed plant improvements.

161. Why is the Illinois EPA not forcing the source to utilize an 87-foot stack?

The Illinois EPA is not in a position to dictate decisions of a unit of local government – in this instance the Village of Willowbrook. As such, the Illinois EPA cannot require the Village of Willowbrook to approve an ordinance allowing the increase in stack height to 87 feet. In turn, in this instance, it cannot require the source to utilize an 87-foot stack. Notwithstanding, it is the considered opinion of the Illinois EPA that 87 feet is an optimal height for an emissions stack at Willowbrook I. To this end, the permit requires Sterigenics to petition the Village for construction or extension of a stack to this height.

162. Is there an alternative to an 87-foot stack?

Yes. In recognition of comments received to the effect that an 87-foot extension is unlikely to receive the requisite Village approval, the Agency's construction permit affords an option for an extension of an existing stack to 50 feet consistent with existing ordinance provisions. Like the 87-foot stack height extension, the 50-foot stack height extension is supported by dispersion modeling submitted by Sterigenics and audited by the Illinois EPA. While not as effective as the taller stack, the 50-foot stack likewise reduces concentrations of ethylene oxide at all locations and thus reduces risks.

163. What is the point of a taller stack?

A taller stack is intended to reduce the impacts of downwash and improve dispersion. The presence of buildings near a stack can affect plume rise and initial dispersion of pollutants

within the atmosphere. The purpose of the stack height increase is to address the possibility of this occurring at Willowbrook I. Specifically, an extended stack would reduce the impacts of building-induced downwash of the plume, which may occur when the stack interacts with the building creating a current or eddy and pulling the plume to the ground, resulting in excessive nearby ambient concentrations. A stack height increase has no effect on the quantity of emissions. Rather, it limits downwash and thereby substantially reduces all ethylene oxide ambient impacts regardless of location.

164. Doesn't a higher stack merely spread the emissions coming out of the stack a greater distance.

No. Contrary to the expressed concerns of some commenters, at the noted stack heights, the ethylene oxide emissions from the commercial sterilization operations do not affect additional areas. Simply put, the footprint remains the same, but the impact in the affected footprint is markedly reduced.

165. Has any modeling information been made available to the public or will it be made available?

The dispersion modeling at the 87-foot height, as well as the audit modeling and an initial Agency technical support document, were made available to the public under the Freedom of Information Act during the pendency of the permitting action. The dispersion modeling at the 50-foot height was an outgrowth of public comment. As such, the modeling, audit modeling and technical support document have only recently been finalized. Consistent with its goal to keep the public informed, along with other information, the modeling and audit modeling, as well as modeling technical support document will be made available to the public upon request.

166. You know full well that your modeling won't work.

The dispersion modeling that has been submitted by Sterigenics, and audited by the Illinois EPA, indicates Sterigenics will not cause a lifetime cancer risk in the surrounding community that is above the 1 chance in 10,000 "upper bound" threshold that is relied upon by the USEPA. After the required improvements, the lifetime cancer risk from Sterigenics ethylene oxide emissions will be much closer to 1 chance in 1,000,000, USEPA's most protective standard. See pages 5 and 6 of Illinois EPA's Dispersion Modeling Memorandum dated September 20, 2019.

167. Will the control requirements be met without an 87-foot stack height? If not, and if the local municipality is not going to authorize an extension of the stack's height, why then does the permit consider the higher stack height as a possibility?

The initial modeling submitted with the permit application and the draft construction permit addressed a stack height of 87 feet, as reflected in draft Condition 4(b)(1). This is because

modeling conducted as part of the design of the improvements identified this as a height for a stack at which dispersion of emissions would not be negatively impacted, to a significant degree, by downwash due to the presence of other structures. However, because stack height is commonly a local prerogative related to zoning and is not something that the Illinois EPA can dictate as part of the construction permit, the Illinois EPA has re-considered the permit condition. The condition will still allow for the optional use of the higher stack height should Sterigenics obtain approval for its construction. However, the condition will now take into account a height for the new stack that is presently allowable under local ordinances.

168. The section in the application addressing dispersion modeling shows the proposed stack at the north-east corner of the building. This stack location does not appear to be 30 feet to the nearest plant boundary as specified in the application on p. 55 (Exhaust Point Information Table).

The Agency can confirm that the information utilized in the dispersion modeling is correct.

169. There are inconsistencies in the dimensions of the stack in the application. On application p. 55 in the Exhaust Point Information Table, the diameter is given as 2 ft. In the modeling information on p. 68, the stack diameter is given as 2.8 ft. This does not appear to be a rounding error.

The Agency can confirm that the information utilized in the dispersion modeling is correct.

170. Because gaseous ethylene oxide has a density greater than the atmosphere (relative gas density of 1.49 compared to 1.0), it will normally sink in the atmosphere over time.

In the atmosphere, ethylene oxide is in solution and, as such, does not sink or settle out due to the effect of gravity.

171. Condition 4(a) addresses a situation where the facility could potentially resume operations without fully increasing the stack height. Is this a way to bypass local control of building code?

This condition merely recognizes that the Village may ultimately approve construction of a taller stack than currently allowed by local ordinances. Such action may not occur until after the initial construction of a new or modified stack is completed.

172. Wouldn't the fan for the new stack need to be sized for the total dimensions?

The additional height of a stack with an extension to its height would not be a significant factor in the sizing of the fan for the stack.

173. Is the maximum stack height allowed without a variance known? If the final stack height is not 87 feet, is the application complete?

Based on comments on the draft permit submitted by the Village of Willowbrook, the maximum height of the stack currently allowed without a variance is now 50 feet. Sterigenics has supplemented the application to address this scenario.

174. The draft construction permit does not specify stack diameter.

It is not necessary for the permit to specify the diameter of the new stack. The effectiveness of the new stack in improving dispersion will be addressed by the dispersion modeling required under the new law, after the initial emission testing is completed, as further required by the new law.

175. In Condition 4(c), there appears to be a 30-day time limit on the operation of existing stacks after the new single stack is put in place, except when adding a stack extension. Does this mean that the old stacks are to remain operable until a final stack height is achieved? What is the time limit? This sounds like an unlimited extension to delay the closure of the old stacks and vents at which no continuous monitoring is occurring. This sounds like an invitation for manipulation.

The construction of the new or modified stack must be completed before the resumption of operation of the facility. The existing stacks and vents must then be sealed within 30 days. After this 30-day period, the existing stacks and vents cannot be used and must be sealed except as reasonably necessary to accommodate an increase in the height of the new stack. In particular, operation of the existing stacks and vents could resume on a temporary basis while an extension is bolted onto the top of the new stack. This is justified because of the long-term benefits for ambient air quality from a taller stack, i.e., better dispersion and lower ambient concentrations of ethylene oxide.

176. How will the continuous emissions monitoring system (CEMS) work if the facility operates with the existing stacks and vents during the period when a stack extension is being installed.

During the period when a stack extension is being installed, the continuous emissions monitoring system would not be used to determine emission of ethylene oxide. Instead, emissions would be determined from operational data, including operational monitoring for control devices and usage of ethylene oxide, and demonstrated control efficiencies. In this situation, operational monitoring data would also be used to confirm that emissions were properly controlled.

177. Condition 10(c)(vi) indicates that a reduction in operation may be warranted during the extension of the stack. What level of reduction would be required? Would a 1 percent reduction be sufficient? Would a greater reduction be appropriate?

During the installation of a stack extension, the construction permit requires that operation of the facility be reduced to the extent that is reasonably practical. This is an appropriate approach to the reduction of operation during an extension of the stack. It is neither appropriate or desirable to specify further requirements, particularly as the period of time that installing a stack extension would take cannot be known until specific plans are developed for, and local approval is provided for, any such extension.

178. How will compliance with the 99.9 percent reduction or 0.2 ppm limit be determined during the period when a stack extension is being installed in this situation? It is my understanding that these limits apply to total emissions, so all emissions need to be added together and examined for compliance?

During the period when a stack extension is being installed, operational monitoring data would also be used to determine whether emissions are properly controlled. The permit does not require that there ever be separate continuous emissions monitoring systems in the existing stacks and vents, only continuous emissions monitoring systems for the new or modified stack.

Risk

179. What ambient air concentrations of ethylene oxide are acceptable?

Ethylene oxide is one of 187 pollutants that Congress has classified as hazardous air pollutants. The Clean Air Act requires the USEPA to regulate hazardous air pollutants by setting limits on the amount of a particular HAP that specified industrial sources can emit. This is in contrast to criteria pollutants for which ambient standards are set that limit the amount of a pollutant that can be in the air.

USEPA acknowledges that exposure to a carcinogen creates some risk. But typically, USEPA has not attempted to address risks on a facility-specific basis if the risks to the most exposed person are under 100 in a million.

The concentration of ethylene oxide associated with a 100 in a million risk, for a lifetime of continuous exposure (For people living near a facility, exposure 24 hours/day, 365 days/year, for 70 years. For people working near a facility, exposure 8.5 hours/day, 5 days/week, 50 weeks/year, 25 years.), is .02 ug/m3. The concentration of ethylene oxide associated with a 1 in a million risk, for a lifetime of continuous exposure, is .0002 ug/m3. Concentrations and associated risks within this range have been deemed acceptable. These risks related to ethylene oxide are in addition to other risks. These calculated risks related to ethylene oxide are general and not specific to any one individual. These risks related to ethylene oxide are likely conservative with what USEPA considers health-protective assumptions.

180. What is risk?

As presented in USEPA's 2014 National Air Toxics Assessment (NATA), risk is defined as the probability that adverse effects to human health or the environment will occur due to a given hazard such as exposure to a toxic chemical or a mixture of toxic chemicals. As a means to quantify risk, it can be measured or estimated in numerical terms like "one chance in a thousand". In NATA, lifetime cancer risk represents the probability of contracting cancer over the course of a 70-year lifetime. A risk level of "N"-in-1 million implies that up to "N" people out of one million equally exposed people may contract cancer if exposed continuously (24 hours per day) to the specific concentration over an assumed 70-year lifetime. This would be in addition to cancer cases that would normally occur in one million unexposed people.

USEPA uses risk calculations as a basis for regulatory determination. Risk calculations are not used as a measure of personal risk for numerous reasons, not the least of which is the inability of determining personal exposure, which is critical in determining risk.

181. What is the estimated risk for the 87 feet and 50 feet scenarios?

In the dispersion modeling submitted by Sterigenics and reviewed by the Illinois EPA to ensure appropriate modeling methods were employed, the maximum 5-year concentrations

were reported for all "receptor" points within 1 kilometer of the facility. Employing the same risk calculation methods utilized by the USEPA's Office of Air Quality Planning and Standards in their August 2019 Risk Assessment for Willowbrook, Illinois EPA calculated the highest lifetime risk predicted by the dispersion model for both stack height scenarios. For the 87-foot stack height, the maximum predicted lifetime risk is 2.8 in a million. For the 50-foot stack height, the maximum predicted lifetime risk is 4.4 in a million.

Ambient Monitoring

182. What is ambient monitoring?

Ambient air monitoring is the systematic assessment of the level of a particular pollutant by measuring the quantity of pollutant in the outdoor air. It can be used to quantify pollution, inform and assess air quality goals and strategies as well as trends, support modeling, and support research among other. Most ambient monitoring is performed by states as part of their required ambient air monitoring networks. Most of this monitoring relates to criteria pollutants – the six pollutants for which national ambient air quality standards exist. Limited monitoring information exists on hazardous air pollutants.

183. What ambient monitoring is required of Sterigenics?

Sterigenics is required to perform ambient monitoring under the new law and under the Consent Order entered by the Office of the Attorney General and the DuPage County State's Attorney's Office. The new law requires that within 180 days after the effective date, Sterigenics shall submit an ambient air monitoring plan for review and approval by the Illinois EPA. This plan shall include, at minimum, a proposal for collection and analysis of ambient air samples for ethylene oxide near plant boundaries and in the community on a quarterly basis over multiple days. The plan shall include a schedule for implementation and identify the name and credentials of the independent third-party company that will perform the sampling and analysis.

The Consent Order requires that Sterigenics conduct ambient air monitoring pursuant to an air monitoring plan submitted to and approved by the Illinois EPA. Such monitoring shall commence no later than 14 days of the date of the Illinois EPA's approval of the stack test results report likewise required under the Consent Order after the conclusion of emissions or stack testing also required under the Consent Order, the construction permit and the new law.

184. The ambient sampling needs to span 24 hours.

Again, the ambient monitoring that is required of Sterigenics under the new law and the Consent Order will be conducted pursuant to an ambient air monitoring plan reviewed and approved by the Illinois EPA. The sampling would likely be in accordance with USEPA method TO15 and the sampling period will be 24 hours.

185. What will the ambient monitoring tell us?

It will tell us the amount of ethylene oxide in the ambient air. It will not directly identify the contributing source or sources of the ethylene oxide. The results of the ambient monitoring conducted by the USEPA after Sterigenics ceased operation pursuant to the Illinois EPA's Seal Order, suggest that Sterigenics is not the sole source of ethylene oxide emissions in the

relevant area. Indeed, one of the federal undertakings currently under way at a national level is an effort to establish urban baselines for ethylene oxide emissions and to better understand the sources that contribute to these baselines.

186. Will the USEPA or the Illinois EPA be undertaking any ambient monitoring.

With the ambient monitoring obligations incumbent on Sterigenics, there appears to be no purpose or need for monitoring by the state or federal regulatory agencies. This is particularly true given that the ambient monitoring activities of Sterigenics will be overseen by the Illinois EPA, who will have the benefit of consultation with the USEPA. This said, it warrants mention that the new law also imposed an obligation upon the Illinois EPA to develop and submit to the Pollution Control Board rules for ambient air testing to be performed by the Illinois EPA to determine the ambient levels of ethylene oxide throughout the state.

187. Ambient levels of ethylene oxide detected by monitors after Sterigenics' facility was shut down showed each of the ten monitors at 50% lower and at 90% lower at monitors closest to the facility. Why is there nothing contained in the construction permit detailing what will happen if ambient levels of ethylene oxide return to levels preceding the shutdown? What will the Illinois EPA do about the problem?

A construction permit contains emissions standards, as well as monitoring, reporting and other requirements that provide an assurance of compliance by the source at the emissions stack(s). A permit document is not suitable for addressing off-site, ambient impacts.

If elevated ambient concentrations of ethylene oxide are monitored, the Illinois EPA will examine the emissions data collected by Sterigenics' CEMs and investigate the facility's operations. If the investigation revealed that Sterigenics' operations was substantially contributing to the elevated levels, the Illinois EPA would evaluate compliance and enforcement options, including referral of the matter to the Attorney General's Office for enforcement under the Environmental Protection Act.

188. Is there a plan to make the ambient monitoring information available to the public?

Yes. The information would necessarily be available to the public under the Freedom of Information Act. However, consistent with its commitments regarding other information addressed in this Responsiveness Summary, the Illinois EPA is committed to making this information available on its web page. Similarly, the Illinois EPA will share the information with its federal partners, particularly the USEPA who may find the information instructive in its efforts relative to ethylene oxide.

189. For the permanent total enclosure, a fenceline ambient air monitoring program should be required to show that facility is indeed containing fugitive emissions as required by Section 9.16(b) of the new law.

Fenceline ambient monitoring would not provide useful information for the maintenance of permanent total enclosure. Ambient monitoring is conducted with evacuated canisters that typically collect a sample of the ambient air for period of at least 24 hours. The canister is then sent to a laboratory for analysis of the ethylene oxide content of the collected sample of air. Ambient monitoring would not provide timely data on an appropriate time period to address the ongoing maintenance of permanent total enclosure for the facility. In addition, fenceline ambient monitors would also measure background concentrations of ethylene oxide in the ambient air.

Historical

190. Is any of the past information regarding the facility such as annual emissions or ethylene oxide purchases and deliveries being considered as part of this permitting transaction.

Historic ethylene oxide deliveries and emissions are not directly relevant. Notwithstanding, the source is required to file and has filed Annual Emissions Reports with the Illinois EPA. These reports indicate that the source has been in compliance with applicable terms of its CAAPP permit. Such reports are available via request under the Freedom of Information Act. Further, the Agency notes that the ethylene oxide usage limits in the draft permit, which have been reduced from those in the CAAPP permit, are relevant to emissions and may be of interest in lieu of the purchase and delivery information.

191. Sterigenics has emitted greater amounts of ethylene oxide that what is allowed.

This comment is an enforcement consideration and not a permitting consideration. Notwithstanding, a review of the facility's Annual Emission Reports does not indicate that the source has exceeded its permit allowable limits.

192. The source has not acknowledged or accepted responsibility for its emissions.

The permitting process under the Act is distinct from the enforcement program, which is where the concerns raised by the comments should be addressed. The permitting of stationary sources to construct or operate emission sources is not tied to the legal considerations of whether a source should admit to violations or be made to account for allegations of past wrong-doing. With limited exceptions, the permitting process focuses on whether an applicant can show that its emission-related activities will prospectively comply with applicable air pollution requirements under the Act. It can be noted that courts reviewing permitting decisions by the Illinois EPA have frequently observed that permitting is no substitute for enforcement.[4] This means that issues relating to past non-compliance are usually best left to the Illinois EPA's enforcement program or to other prosecutorial authorities.

193. Past violations by the company should result in a permit denial.

Similar to the response above, allegations of past violations are generally not an appropriate basis for a permit denial, as permitting is not an appropriate substitute for an enforcement

[4] ***See,*** **ESG Watts v. Pollution Control Board, 286 Ill. App.3d 325, 335 (court acknowledging general recognition that it is improper for Illinois EPA to consider unadjudicated violations under Section 39(i)); Illinois EPA v. Pollution Control Board, 252 Ill. App.3d 828, 830 (3rd Dist. App. Ct., 1993)(appellate court affirming that "procedures for permit denial and enforcement of the Act are separate and distinct" and that Board did not error in "inference that the Agency improperly used the permit denial process as a substitute for the enforcement process").**

action. This is especially true in the present context, where the applicant is seeking a construction permit that will authorize it to make improvements to its facility or equipment so as to comply with the new law.

However, there are at least three limited exceptions to this general rule for permitting actions by the Illinois EPA that are set forth in Section 39(a) and (i) of the Act.[5] Section 39(a) is the relevant authority for this permit action, and it allows the Illinois EPA to consider an applicant's noncompliance that involves a contaminant's release to the environment. This language does not constrain the Illinois EPA's consideration to a single mode of action, meaning that such grounds could support the imposition of conditions for an issued permit or, alternatively, the denial of the permit. However, the language makes clear that the noncompliance cannot be merely alleged but must involve "prior adjudications[6]."

Section 39(a) was later amended to allow the Illinois EPA discretion to include terms to a permit relating to an applicant's "past compliance history" as may be warranted to remediate or prevent noncompliance. As compared to the language that appears in the older text, the amendment authorizes the Illinois EPA's consideration of an applicant's past noncompliance in issuing permits but does not authorize a permit denial. Additionally, the language is not confined to cases involving a release of a contaminant, thus applying to a broader set of circumstances involving noncompliance under the Act. However, the language is necessarily limited to adjudications and not mere allegations.[7]

In light of the statutory requirements concerning the Illinois EPA's scope of permit review, it must also be noted that the Consent Order entered by Sterigenics, the Attorney General's Office and the DuPage County State's Attorney's Office, as approved by the DuPage County Circuit Court on September 6, 2019, specifically allows for the use of the Consent Order in any subsequent permit proceeding authorized by Section 39 of the Act. *See,* Section II(1) of Consent Order. In this instance, the Illinois EPA will decline to deny Sterigenics' application for construction permit on the basis of this authority.

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[5] In addition to Section 39(a), Section 39(i) vests the Illinois EPA with authority under its implementation of the Resource Conservation and Recovery Act, 42 U.S.C. §§6901 et seq., to consider the prospective owner's or operator's history of repeated violations of federal, state or local laws concerning the operation of waste management facilities, or clean construction and demolition debris fill operation facilities. 415 ILCS 5/39(i)(1).

[6] An adjudication is an enforcement case whose merits are resolved through a formal ruling by a circuit court or the Pollution Control Board.

[7] This is because the phrase "past compliance history" is generally synonymous with past noncompliance, and such a constraint was likely intended by the General Assembly in both passages of the Act's licensing scheme to prevent infringement upon constitutionally protected interests. See, Martell v. Mauzy, 511 F. Supp. 729 (N.D. Ill., 1981)(court recognizing that once the broad enforcement powers of the Environmental Protection Act are employed to "punish violative conduct," there is a "clearly established and adjudicated basis for the denial of future permits…").

This decision recognizes that all the parties to the Consent Order, having negotiated in good faith and agreed to its making, indisputably contemplated that Sterigenics would pursue future efforts to assure that its ethylene oxide sterilization source will comply with the provisions of the Matt Haller Act and such other applicable requirements of the Environmental Protection Act and the Pollution Control Board's regulations. A denial of the permit application by the State of Illinois, through the Illinois EPA acting in its permitting capacity, would effectively negate many of the Consent Order's compliance terms and, indeed, would render superfluous the Matt Haller Act's specifically-delineated provisions tailored to Sterigenics' operations.

194. The source has been a "bad actor" and should not be permitted to operate its facility.

The Illinois EPA appreciates that this comment reflects a commonly-held view, as expressed by attendees of the public meeting and in comments submitted during the public comment period. However, the legal standard governing the Illinois EPA's review of application materials under the Act generally does not look to the past. As previously mentioned, the permitting process under the Environmental Protection Act usually focuses on the prospective ability of an applicant to comply with applicable requirements.

Leaks and Spills

195. How many leaks or spills are expected?

Leaks and spills are under the purview of the Illinois EPA's Bureau of Land. Measures are in place to prevent leaks and spills. Any leaks or spills would be addressed by the Illinois EPA as necessary and appropriate.

196. In the event there are leaks or spills, what is the recourse?

To the extent a leak or spill falls within the purview of the Illinois EPA, and to the extent it is a violation of the Environmental Protection Act or provisions thereunder, there is a clear statutory path for addressing the leak of spill. Specifically, the Environmental Protection Act provides several tools to the Agency under Title VIII Enforcement and Title XII Penalties.

197. Sterigenics has a well-documented history of spills.

The Illinois EPA is aware of two ethylene glycol spills from the Willowbrook facility occurring in October 2013 and September 2018. The 2013 spill was investigated by the Illinois EPA, referred for enforcement to the Attorney General's Office and settled by way of a consent order that was approved by the DuPage County Circuit Court in September 2015. A copy of the consent order is available at https://www2.illinois.gov/epa/topics/community-relations/sites/sterigenics/Documents/Sterigenics%20Consent%20Order%202015.pdf. The 2018 spill was investigated by the Illinois EPA and referred for enforcement to the Attorney General's Office.

Third Party

198. The company should not be allowed to conduct self-modeling, self-monitoring, self-testing and self-reporting as it relates to its emission-related activities. Independent third parties should perform these tasks.

The Illinois EPA does not possess the requisite legal authority under the Environmental Protection Act to perform, or to fund through a third party, these types of activities. In addition, the self-monitoring is an inherent aspect of the air pollution control program because the obligation for compliance is on the sources of emissions. As discussed above, the Illinois EPA's consideration of someone's past compliance history in a permit review is narrowly constrained and does not include the discretion to compel an independent third party to perform activities that are normally reserved to a permittee. From a programmatic perspective, advances in the development of current continuous emission monitoring systems no longer pose the general concerns, as reflected by the comment, regarding the reliability of emissions information that is generated, recorded and reported by a regulated entity. Notwithstanding, the source did not conduct the modeling it submitted but rather retained a third-party to perform such. Further, consistent with the new law, the source will not be performing emissions testing or monitoring itself, but rather is obligated to retain an "independent third-party company".

199. Testing companies should not be selected by Sterigenics, rather Illinois EPA and the Village of Willowbrook should make the selections.

The Illinois EPA does not possess the requisite legal authority to compel this type of requirement. In this context, the Act also does not provide such authority to local representatives. A selection process by someone other than Sterigenics would also call into question the data and work that is collected and performed by such contractors and the ability to hold Sterigenics accountable for such data.

200. Condition 8-2(b) the terms "qualified" "independent" and "experienced" need to be defined.

These terms do not need to be defined because the common meanings of these terms are used. For example, "qualified" means having the necessary qualities and being fit and competent.

Communications

201. What communications did Illinois EPA have with Sterigenics?

In addition to this construction permitting action, the Bureau of Air was also involved in an enforcement action (referred to the Office of the Attorney General on October 2, 2018) filed against the source by the Office of the Attorney General and the DuPage County State's Attorney's Office on October 30, 2018, and a seal order effectuated by the Director of the Illinois EPA on February 15, 2019. Litigation ensued relative to the enforcement action and the seal order, in which the Illinois EPA was represented by the Office of the Attorney General. The Illinois EPA was not involved in a single conversation with Sterigenics that did not involve counsel for the State, as well as for Sterigenics. Further, the conversations were directly related to the subject matter of the litigation.

Regarding the construction permitting action, the Illinois EPA had its first conversation with Sterigenics regarding the application for construction permit on May 17, 2019. This meeting was with the knowledge and agreement of respective counsel for the parties. Additionally, at the request of the Office of the Attorney General, Sterigenics provided an agenda for the meeting to confirm the topics to be covered during the meeting. The meeting was pre-applicational for the construction permit and such meetings are commonplace for permit applicants. The application for construction permit was submitted to the Illinois EPA on June 24, 2019, with periodic exchanges between the applicant and permitting authority in the ordinary course. Notably, at the time of the pre-application meeting with Sterigenics, the Illinois EPA had already received an application for construction permit from Medline, and had been working with Medline on this permitting transaction for many months.

202. When did discussions between the Illinois EPA or the Attorney General and Sterigenics start relating to the settlement of lifting the seal order?

The possibility of resolving the seal order litigation through settlement was initially raised in a phone call between Sterigenics' attorneys and the Attorney General's Office on February 22, 2019, two days after a federal court judge denied Sterigenics' motion for a temporary restraining order. The first settlement meeting concerning the same was held on March 6, 2019. The Illinois EPA had no communications with Sterigenics regarding this matter outside the presence of the Attorney General's Office.

203. The Illinois EPA owes it to the people of Illinois to be transparent in its decision-making. Why did the Agency work with Sterigenics under a veil of secrecy to negotiate the terms?

The Illinois EPA agrees that its decision-making in this matter must be transparent, particularly with respect to being open and honest about who an agency is meeting or conversing with about a particular subject matter. Transparency in governmental actions is usually focused on decision-making, not the deliberative process when decisions are pending. Documents generated from a given decision-making process are subject to FOIA. And, in this

particular case, the Illinois EPA prepared a draft construction permit, and convened a public comment period and public meeting, to facilitate transparency and inform its final decision.

The fact that conference calls or meetings between Bureau of Air Permits Section staff and a permit applicant occur during the development of a permit is not improper and does not diminish transparency with respect to either process or decision-making. The Bureau of Air/Permits Section arranges phone calls and meetings with thousands of permit applicants each year. The permit program could not be administered without conferring one-on-one with permit applicants, as it would be impossible to convene open meetings or hearings every time the agency and applicant confer.

Process

204. The Illinois EPA should have held a public hearing rather than a public meeting.

Recognizing the significant public interest in the permitting action and based on communications with elected officials, the Illinois EPA scheduled a public meeting at the Ashton Place in Willowbrook, Illinois on the evening of August 1, 2019, to allow the public to comment about the draft construction permit.

In lieu of a hearing, the Illinois EPA borrowed from a historical practice of offering the public the opportunity to meet with Illinois EPA officials in advance of the permitting of controversial projects. To ensure that the public and elected officials benefited from an orderly process that guaranteed the right of public comment, and of agency responsiveness to those comments, the Illinois EPA made use of the hallmarks of a traditional informational hearing for the occasion. This approach included the following: public notice of the meeting that was distributed on the agency's website, and forwarded to numerous elected officials, notice of a 30-day public comment period and notice of a draft construction permit that was prepared by the BOA/Permits Section; convening of a panel of Illinois EPA staff to address questions at the meeting, including the manager of the BOA/Permits Section's construction unit group, a testing engineer from BOA/Compliance Section, and both a Hearing Officer and a Community Relations Coordinator from the Office of Community Relations; transcribing of the hearing by a court reporter; and the preparation by the Illinois EPA of a Responsiveness Summary to address all significant public comments and/or questions raised at the public meeting and during the comment period. When these added features are considered, the meeting that was held was tantamount to an informational hearing.

205. I believe that Sterigenics should have been required to attend the public meeting and should have been subject to cross-examination.

Permit procedures that are implemented by the Illinois EPA currently allow, but do not compel, a permit applicant to attend or participate in an information hearing. The same would be true for a meeting held in lieu of a hearing. This is because the focus of any hearing or meeting is the agency action approving or denying a permit. In this regard, the permitting process, administered by the Illinois EPA under the Illinois Environmental Protection Act for construction and operation of emission units or control equipment, is guided by applicable environmental laws and rules. If an applicant submits proof that the emission units or control equipment will achieve compliance, the permit must be granted.

Contested case hearings, 2 IAC 166.260 and 166.265, are not applicable to permitting actions by the Illinois EPA under the Illinois Environmental Protection Act, as they are subject to administrative review by the Illinois Pollution Control Board. Current procedures for informational hearings by the Illinois EPA do not allow for cross-examination of witnesses.

Alternatives to Sterilization

206. Why is the Illinois EPA allowing the use of sterilization at the Willowbrook facility when alternatives exist?

According to information available on the FDA web page, medical devices are sterilized in a variety of ways including using ethylene oxide sterilization. For many medical devices, this may be the sole method that effectively sterilizes and does not damage the devices. The FDA is working to advance innovative ways to sterilize with lower quantities of currently used sterilants as well as to sterilize through alternative means. The FDA has also worked with medical device manufacturers to mitigate sterilized medical equipment supply issues.

There is no ban on the use of ethylene oxide in Illinois. As such, in acting on the construction permit application from Sterigenics, the Illinois EPA had no basis to preclude usage of ethylene oxide provided the commercial sterilization operations will be constructed and operated so as not to cause a violation of the Illinois Environmental Protection Act.

207. Are products unnecessarily being sterilized with ethylene oxide at the Willowbrook facility?

Generally speaking, the Illinois EPA regulates the emissions units and emissions from the Willowbrook facility. However, as addressed elsewhere herein, Sterigenics will need to comply with the supplier product certifications requirements under Section 9.16 of the Act.

208. Why is Sterigenics still utilizing ethylene oxide to sterilize medical products when hospitals have ceased the practice?

Hospitals have not completely ceased their reliance on sterilization with ethylene oxide. Indeed, according to Illinois EPA records, there are approximately 20 hospitals that still operate ethylene oxide sterilizers. Further, for those hospitals that have ceased ethylene oxide sterilization operations, available information does not support the conclusion that they have ceased their reliance on medical goods and products that are sterilized with ethylene oxide. It is more likely that they have increased their reliance on products that have already been sterilized. Indeed, as noted elsewhere herein, the FDA acknowledges that sterilization has not yet evolved to the place where reliance on ethylene oxide is unnecessary or obsolete.

209. Why didn't Illinois EPA require Sterigenics to address alternatives to sterilization with ethylene oxide in its application?

As discussed elsewhere herein, the Illinois Environmental Protection Act and regulations thereunder address applications for construction permits, including the content of applications for construction permits and the attendant review process. The application and ultimately any construction permit would necessarily relate to emissions units or air pollution

control equipment, the emissions therefrom, applicable environmental laws and regulations and compliance therewith. Given this, apart from the obligation under the new Section 9.16 of the Act regarding supplier certifications, which requirement is separately addressed in this Responsiveness Summary, information regarding sterilization alternatives is not directly relevant to the permitting process and thus not addressed in the permit.

210. Does the permit allow the use of sterilants other than ethylene oxide or propylene oxide?

The application for construction permit and the construction permit itself, as well as previously issued operating permits, solely address the use of ethylene oxide and propylene oxide in the sterilization process. The source has not sought to use other sterilants nor has the Agency granted authorization to use other sterilants.

Ban

211. The Illinois EPA should ban the use of ethylene oxide, or either deny the application or close the facility

There exists no ban on the use or emission of ethylene oxide in Illinois. The Illinois EPA does not possess the requisite authority to ban the use of ethylene oxide by Sterigenics or other sources in Illinois. The Illinois EPA cannot deny the permit application or force a shut-down of the facility because of the use of ethylene oxide. The Illinois EPA's current authority for denial of the permit application or forcing the closure of the facility is governed by existing permitting and enforcement requirements of the Act, as described elsewhere in these responses.

212. Why are there no "rules" in place that prohibit or disallow the use of ethylene oxide near schools or parks?

A ban or other type of restriction on the use of a product is, in the first instance, the province of the General Assembly and not an administrative agency such as the Illinois EPA. Indeed, in the new law, the General Assembly has recently taken a step in this comment's direction, establishing location requirements for any new sterilizing or fumigant facility using ethylene oxide that was not in existence prior to January 1, 2020, and that requires a CAAPP permit. *See,* 415 ILCS 5/9.16(i).

Zoning

213. The Illinois EPA should establish the physical location of the source, such that the sterilizing processes using ethylene oxide are moved somewhere other than Willowbrook or to an unpopulated area.

The state's Environmental Protection Act does not vest the Illinois EPA with the requisite legal authority to act as a state-wide zoning authority.

214. Why can't the Illinois EPA mandate that Sterigenics' employees live within 5-10 miles of the source?

State laws and regulations concerning environmental protection generally address sources of pollution and not ancillary issues related to the residency of employees.

215. If ethylene oxide must be used to sterilize a specific medical device, companies who do not have a past history of violations should be used, provided that they are manufactured in non-residential areas. Sterigenics should not be allowed to resume operations in a highly-populated area.

The new law does not affect the location of existing sterilization sources in Illinois, though it does provide certain set-back requirements for new CAAPP sources. *See,* 415 ILCS 5/9.16(i). The Illinois EPA is lacking any other authority under the Environmental Protection Act to compel Sterigenics to re-locate.

As mentioned elsewhere, Sterigenics is obligated to comply with the certification requirements of Section 9.16(g) because they had been previously subject to a seal order.

Miscellaneous Comments or Questions

216. Rather than consider the issuance of construction permit allowing the source to reopen, why not fine them millions of dollars and require a healthcare fund for those in the community who have suffered from illness and respiratory disease.

A permit proceeding is not the appropriate venue for a civil penalty, and imposing penalties through the permit would be an unauthorized attempt to circumvent the Environmental Protection Act's enforcement process. A healthcare fund is likewise something for which the Illinois EPA does not possess the legal authority to establish in a construction or operating permit.

217. Article XI of the Illinois Constitution generally provides that every person has a right to a healthful environment that is enforceable through "appropriate legal proceedings subject to reasonable limitation and regulation as the General Assembly may provide by law." If Sterigenics is allowed to reopen, the Illinois EPA will be the subject of a lawsuit for violating the local communities' rights under this provision.

The right under the Illinois Constitution to a healthful environment is generally enforceable but subject to the General Assembly's right to prescribe reasonable limits or requirements. The constitutional right to a healthful environment was designed to remove a special injury requirement for standing, not to create an independent cause of action. *See,* People v. Pollution Control Board, 129 Ill.App.3d 958, 964 (Ill. 1985). Because the General Assembly has exercised its power to regulate environmental enforcement under the Environmental Protection Act, the right to a healthful environment under the Constitution is merely commensurate with the broad enforcement rights available under the Act. In addition, Illinois courts generally recognize that the Environmental Protection Act's enforcement provisions are intended for prosecuting polluters, not the Illinois EPA. *See,* Landfill, Inc., v. Pollution Control Board, 74 Ill.2d 541, 556 (Ill. 1978).

218. Why did you not consider the Precautionary Principle in your permit decision?

The Precautionary Principle is a strategy to address possible risks where scientific understanding may not yet be complete. As has been stated throughout this Responsiveness Summary, the Illinois Environmental Protect Act and regulations thereunder establish the review process for permitting actions. Consideration of this Principle is not part of this process. Notwithstanding, under the Illinois Environmental Protection Act, and as addressed more specifically herein, the Illinois EPA has assessed the emissions implications of Sterigenics' commercial sterilization operations and determined that construction and operation with the enhancements addressed under the construction permit, would not cause any violation of the Act.

219. Why did you not consider the Rio Declaration of 1992 in your permit decision?

The Rio Declaration of 1992 defines sustainable development and implementation and environmental preservation. It stresses citizen participation in policy development. As has been stated throughout this Responsiveness Summary, the Illinois Environmental Protect Act and regulations thereunder establish the review process for permitting actions. Consideration of this Declaration is not part of this process. Notwithstanding, the Illinois Environmental Protection Act, under which the relevant permitting action is issued, has as one of its several purposes "to restore, maintain and enhance the purity of the air of in Illinois in order to protect health, welfare, property, and the quality of life and to assure that no air contaminants are discharged into the atmosphere without being given the degree of treatment or control necessary to prevent pollution." The issued construction permit is consistent with this purpose. Also, the permitting action furthered the goals of public participation, as the permit was subject to notice and comment and a public meeting.

220. Were costs considered in the permit action?

Costs were not considered in this permitting determination. Nor do costs appear to have been a consideration under the new law. Specifically, among other things, the new law prohibits the source from using ethylene oxide for commercial sterilization purposes "unless the Illinois EPA has certified that the facility's emission control system uses technology that produces the greatest reduction in ethylene oxide emissions currently available."

221. Have private wells been tested at and near this facility?

In response to concerns of residents and local officials in Willowbrook and the surrounding area, in December 2018, the Illinois EPA and DuPage County Health Department coordinated efforts to identify private wells, obtain access from homeowners, and sample private wells near the Sterigenics facility for ethylene glycol and ethylene oxide. No contamination was found in any of the sampled wells.

This action was taken out of an abundance of caution as no groundwater contamination and thus no private well contamination was expected. More than 55 samples were taken from residences where Illinois EPA obtained access agreements.

222. Sterigenics has caused property values to decline and the permit should be denied.

Under the Environmental Protection Act, the Illinois EPA is required to issue a permit to an applicant upon proof that the proposed facility or equipment will not cause a violation of the Act or promulgated regulations. Property values are not reflected in the Act and to not therefore serve as a basis for denial.

223. There is an assumption that the controls that are used for emissions of ethylene oxide will be also appropriate for propylene oxide. This claim should have verification documents with testing performed on the control unit models by the manufacturer to show that

reduction levels for propylene oxide are substantially similar to reduction for ethylene oxide.

Sterigenics last used propylene oxide several years before the Seal Order was issued in February 2019 and it is uncertain whether propylene oxide will ever be used at the facility in the future. Section 9.16 of the new law does not contain requirements related to emissions of propylene oxide. Regardless, based on the similar chemical structures of propylene oxide and ethylene oxide, control devices for ethylene oxide will also control propylene oxide.

224. Since propylene oxide is listed as a hazardous air pollutant under the Clean Air Act, any permit that provides for usage of propylene oxide should include verifications for the appropriateness of any equipment specifically for propylene oxide. There should also be testing required to demonstrate that propylene oxide is being controlled at the expected efficiencies and levels. If these are not included in testing and control requirements, propylene oxide usage should not be permitted at the facility at all.

As discussed, Sterigenics will be enhancing the control measures at the facility for emissions of ethylene oxide. A secondary consequence of improved control measures would be reduction in emissions of propylene oxide if propylene oxide were used in the future at the facility.

225. Ethylene chlorohydrin sometimes gets formed during the ethylene oxide sterilization process. Would this compound be controlled?

Ethylene chlorohydrin is a liquid that may be formed during ethylene oxide sterilization. It has not been identified as a concern for the sterilization process. The presence of this compound on the surface of sterilized items, if any, is a matter that is addressed for the usage of the items.

226. Redundant communication links and power supplies should be required so there is no data loss.

The source has redundant power supplies from Commonwealth Edison designed to prevent loss of power at the plant.

227. Provide the names and positions of IEPA staff that will be making the decision regarding the draft Sterigenics construction permit (who is tasked with approving or denying it).

Any construction permit would be signed by Mr. Ray Pilapil, Manager of the Permit Section in the Bureau of Air, or his designee, Mr. Christopher Romaine, Manager of the Construction Permit Section in the Bureau of Air.

228. Who were the Illinois EPA staff at the public meeting on the draft construction permit and what are their credentials?

The Illinois EPA employees on the panel at the public meeting were, Chris Romaine, Manager of the Construction Permit Unit in the Bureau of Air; Kevin Mattison, stack test specialist in the Bureau of Air; Brad Frost, Manager of the Office of Community Relations; and Dean Studer, Agency Hearing Officer.

Attachment 1: Listing of Significant Changes Between the Draft Construction Permit and the Issued Construction Permit

Condition 1(c)

In the draft construction permit, this condition addressed the certification requested by Sterigenics with respect to Section 9.16(g) and stated that the Illinois EPA has determined that, with improvements to the control system addressed by the permit, the criteria for this certification would be met, i.e., "…the facility's emission control system would use technology that produces the greatest reduction in ethylene oxide emissions currently available." In the issued permit, Condition 1(c) is revised. The revised condition will recognize that the Illinois EPA, separate and apart from the permit, is certifying that with the permanent total enclosure and improvements to the emission control system addressed in Condition 1(b)(ii), the emission control system at the facility would use technology that meets the criterion in Section 9.16(g).

Condition 2-3(a)

This condition explicitly recognizes that this construction permit does not affect the provisions of the relevant legal order that also applies to this facility. For this purpose, this condition in the draft permit referred to the Seal Order as it was the order that was in effect at the time that the draft permit was distributed for public review. In the issued permit, this condition refers to the Consent Order. This is because the Seal Order is no longer in effect, having been replaced by the Consent Order.

Condition 4

This condition addresses the changes that would be made to the facility to have a single exhaust point. In the draft permit, this condition only addressed the construction of a new, taller stack. In the issued construction permit, this condition also addresses the possibility that these changes may involve modification of an existing stack. The changes to this condition are a response to comments that indicate the height of the new stack is now restricted by a new local ordinance. Accordingly, changes to an existing stack may be more effective in improving dispersion and reducing impacts on ambient air quality in Willowbrook and neighboring communities.

Condition 7-1(a)

In the issued construction permit, this condition, which addresses the required continuous emissions monitoring system for ethylene oxide, provides that this system shall be designed and operated to achieve a limit of limit of quantification of no more than 20 parts per billion by volume (ppbv). This corrects an omission in the draft permit that was identified in comments. The value that is specified is 10 percent of the limit that would apply for the concentration of ethylene oxide emissions, 0.2 ppmv.

Condition 7-2(a)(ii)

In the issued construction permit, this condition, which addresses the required operational monitoring for the permanent total enclosure, provides that this system shall be designed to provide measurements of pressure differential to at least the nearest 0.001 inches of water. This corrects an omission in the draft permit that was identified in comments. The specified value is about 15 percent of the required minimum pressure differential, 0.007 inches of water.

Condition 7-2(c)(a)(i)(A) and (F)

These conditions address the areas in which continuous operational monitoring devices for the permanent total enclosure are required to be located. In the issued construction permit, two devices are required for the work aisle, one at the west end and one at the east end. The draft permit would have required three devices (west, central and east). However, it would have also provided that a monitoring device was not required at the east end of the work aisle if the sterilization chambers served by that portion of the work aisle were not in use. The issued permit also provides that a monitoring device must be located in the area in which sterilized material is loaded out from the facility. The draft permit would not have required a monitoring device in this area. These changes respond to comments on the areas at the facility where pressure differential monitoring would be required. These comments requested that monitoring always be required at the east end of the work aisle and that monitoring also be required for the area in which sterilized material is loaded out from the facility.

Condition 9(b)

This condition addresses a log or other records that are required for the emission control devices. In the issued construction permit, this condition requires that Sterigenics keep records to identify periods, if any, when the requirements of Condition 3(c) for use control devices were not fulfilled. That is, periods when a particular operation or activity takes place at the facility and the control system for that operation or activity is not also being operated. In the draft permit, these records would only have been required for the scrubbers. In addition, the draft condition incorrectly referred to conditions that were not in the draft permit. These changes respond to comments requesting additional clarity in the permit as to the when the control devices at the facility must be operated, as well as a comment addressing the incorrect references in the draft condition.

Condition 9(c)(ii)

This new condition in the issued construction permit requires recordkeeping for the amount of sorbent for the dry bed absorption devices that is in inventory at the facility. This new condition responds to comments that expressed concern that an adequate supply of fresh sorbent should be kept at the facility. Otherwise, the replacement of sorbent in the dry bed absorption devices could be delayed because of a lack of fresh sorbent.

Condition 9(e)

This new condition in the issued construction permit addresses the documentation that Sterigenics keeps for ethylene oxide drums at the facility, both full and empty, prior to placing these drums in the drum storage area. This documentation addresses the inspections of these drums that are conducted to confirm that the drums are sealed. This new condition provides that, as inspection of drums for leakage is addressed, this documentation shall be considered to be records required by this permit. This new condition responds to comments that requested measures be required to ensure that ethylene oxide does not leak from drums in the drum storage area.

Condition 10(a)

This condition addresses the information that must be included in the quarterly reports that Sterigenics must submitted to the Illinois EPA for the facility. In the issued construction permit, more information is required to be included in these reports. In addition to information for monthly emissions and the results of emissions testing, these reports must now also include specific information for any changes that were made to the continuous emissions monitoring to improve the limit of quantification, a summary of the results of the ambient air monitoring for the previous quarter, and a summary for deviations during the quarter, if any. (Notification or reporting for deviations is separately required by the permit with such reports to be submitted within five days of an event.) In addition, the final quarterly for each year must include emission information for the year and information for usage of ethylene oxide for the year. These additions to the required contents of the quarterly reports respond to comments that requested that more information be required to be supplied in these reports.

Condition 12

This new condition in the issued construction permit addresses the operation of the facility with the improvements provided for by the construction permit. It provides that, until an operating permit is issued for affected facility that provides for operation of the improvements to control measures addressed by this constructtion permit, Sterigenics may operate the facility with these improvements pursuant to this construction permit provided that the facility is otherwise allowed to operate. This condition is included in the construction permit to address the roles of this construction permit and the existing operating permit for the facility for the operation of the facility. It responds to comments that sought reassurance that the facility is not allowed to resume operation based simply on the issuance of this construction permit or the existing operating permit. This is not the case because relevant requirements of the new law and the Consent Order must be fulfilled before any resumption of operation.

POLICY ANALYSIS

Protecting the Illinois EPA's Health, so that It Can Protect Ours

By Mark Templeton, Robert Weinstock, and Elizabeth Lindberg of the Abrams Environmental Law Clinic at the University of Chicago Law School

And former Illinois EPA Directors Mary Gade and Doug Scott

With former US EPA Region V Deputy Regional Administrator Bharat Mathur

November 2019

Protecting Illinois EPA's Health, so that It Can Protect Ours

By Mark Templeton, Robert Weinstock, and Elizabeth Lindberg of the Abrams Environmental Law Clinic at the University of Chicago Law School and former Illinois EPA Directors Mary Gade and Doug Scott

Executive Summary

During the past decade, environmental challenges across the country and in Illinois have increased and become more complex. During this same period, the resources at Illinois Environmental Protection Agency (IEPA) have decreased significantly. Recent federal roll-backs in both resources and authority to meet these challenges place added pressure on IEPA. Despite the laudable efforts of many IEPA employees, the agency lacks the assets it needs to protect the environment and public health sufficiently. These deficiencies hinder its capacity to execute its historical mission and are barriers to overcome if Illinois chooses to step up efforts to ensure that environmental protection is not compromised. We therefore call on Illinois policymakers to increase the resources available to the agency so that it can hire the quality and quantity of personnel necessary to do the job that the public trusts and needs the agency to do, and we call on IEPA to use existing and additional resources more efficiently and effectively.

Longer-term decline in IEPA's resources is compounded by recent reductions in federal involvement. In many areas, the federal government is rolling back environmental protections, is not enforcing environmental laws sufficiently, and is not working effectively with states to ensure compliance with baseline standards. The absence of federal leadership necessitates agency action at the state level on discrete areas such as coal ash regulation, safe drinking water, and standard-setting (e.g., perfluoroalkyl and polyfluoroalkyl substances (PFAS)), among others. With regard to climate change, Governor J.B. Pritzker signed Executive Order 2019-06, in which he pledged Illinois' commitment to the principles of the Paris Climate Agreement in order to "prevent further impacts of climate change" and to "protect the environment, economy, and residents' health." In the executive order, Governor Pritzker expressly called on IEPA to take a leading role to "protect Illinoisans from dangerous federal environmental policy" and to "monitor the Trump Administration's environmental proposals and identify opportunities to protect Illinoisans from environmental harm." With the added responsibility to monitor environmental issues at a national level and to address broader, systemic environmental challenges such as climate change, nutrient pollution, and environmental justice, among others, IEPA needs greater resources in the form of funds and personnel.

At the same time that the state's responsibilities have grown, technical requirements have increased in complexity and amount in many areas, and staffing levels at IEPA have declined precipitously. Between 2003 and 2018, staffing levels have decreased by almost 50 percent. Since 2003, IEPA has seen a 33 percent reduction in the number of professionals protecting our waters, an almost 50 percent reduction in those protecting our air, and a 43 percent reduction in those protection our lands. This strong downward trend prevails despite occasional increases in funding and staff for individual programs to address particular needs or legislative mandates.

IEPA's budget has not kept pace with other state environmental agencies in recent years. A survey by the Environmental Council of the States (ECOS), the national nonprofit, nonpartisan association of state and territorial environmental agency leaders, documented that state environmental agency budgets increased, on average, by roughly seven percent between 2013 and 2015, in figures unadjusted for inflation. During this period, Illinois' budget increased by only about 2.5 percent.

Impacts are widespread. Among other examples, IEPA has not been able to assess the health of nearly 85 percent of river and stream miles, and more than half of lake, reservoir and pond areas. As of 2016, there were more than 10,000 miles of rivers and streams and more than 140,000 acres of lakes, reservoirs, and ponds that have already been identified as threatened or impaired that are awaiting studies for how to address those threats and impairments. Since 2003, inspections of air pollutant emitting facilities have declined by 81 percent, air-monitoring technology throughout the state is outdated and needs to be replaced, and IEPA has missed several deadlines for filing plans with U.S. EPA to address air pollution. Enforcement cases referred to the Attorney General from the Bureaus of Air, Water, and Land were down significantly in 2015 to 2017 as compared to the years 2010 through 2014. Community engagement and environmental justice efforts have also suffered. Over the last few years, programs, such as Partners for Clean Air, have been disbanded due to lack of resources, and public outreach commitments to environmental justice areas have not been fulfilled.

IEPA needs additional resources to address these issues. A first step would be to increase funds through some mix of increased environmental fees and general appropriations. Modernized technology and equipment are clear areas where funds are needed. Necessary changes within the agency that update programming and facilitate knowledge transfer as key leaders move into retirement require funds as well. Environmental problems in our country and our state will only become more urgent and complicated during the coming years and decades. While there may be some areas in which IEPA needs to work more efficiently, our legislative and executive leaders must reverse this downward path in IEPA resources and capacity by providing the agency with the additional funds it needs to fulfill its mission.

I. Resource challenges

A. Headcount reductions

Figure 1 shows that staffing levels at IEPA have declined precipitously over the past 15 years.[1] These professionals are the core of Illinois' environmental protection capacity—engineers, chemists, biologists, attorneys, and support staff. Between 2003 and 2018, staffing levels have decreased by almost 50 percent. Staffing levels have decreased by 23 percent since 2014, as compared to 2018.[2]

IEPA Annual Actual Headcount, 2003-2018

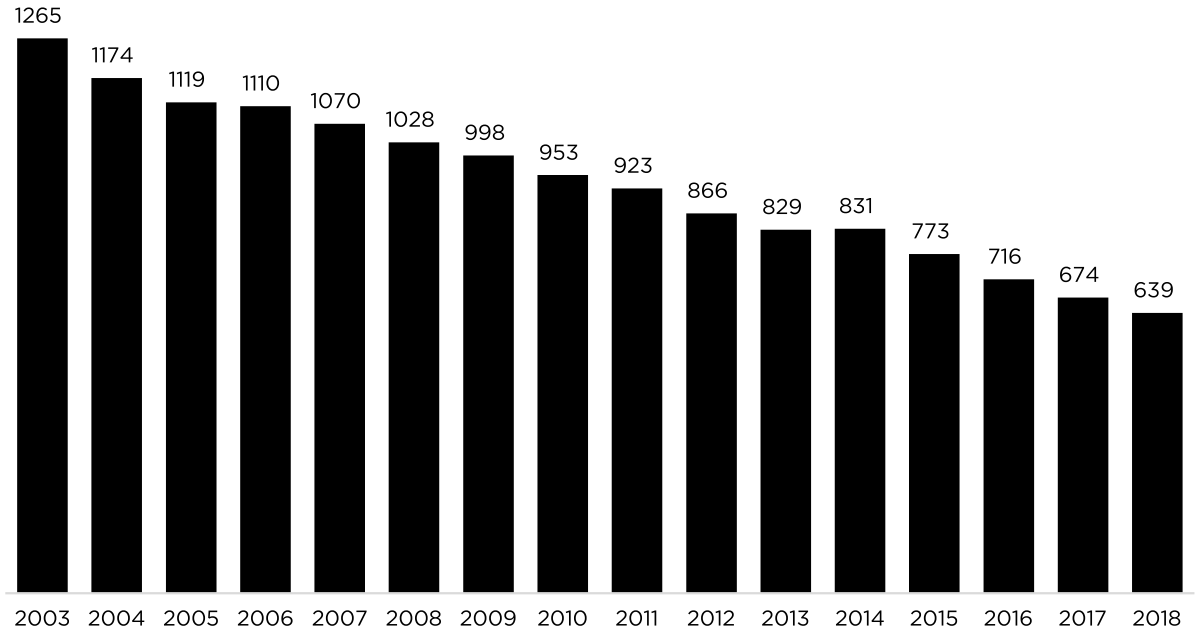

Figure 1

While these numbers are bleak, especially in light of the increasing challenges facing the agency, they do not show another significant personnel problem: succession planning. IEPA has

[1] Figure 1 shows the actual headcount within the agency. Actual headcount is reported after the fiscal year has ended, and reflects the actual number of employees working for the agency. For instance, the FY 2016-2017 Illinois Budget Book reports the actual headcount for FY 2015. *See* Ill. Office of Mgmt. & Budget, Exec. Office of the Governor, Ill. State Operating Budget, FY 2003-2020, https://www2.illinois.gov/sites/budget/Pages/BudgetBooks.aspx (Last Visited Jun. 17, 2019). The authors and contributors appreciate the assistance of former IEPA Director Lisa Bonnett in understanding IEPA's personnel and financial reports.

[2] *Id.*

already lost key personnel, and long-time leaders are approaching retirement. Decades of accumulated knowledge and relationships have left the agency, and this problem is anticipated to accelerate in the next few years. Without the resources to attract, train, and retain high-quality personnel to replace retiring staff, the agency will not have the people needed to fulfill its mission.

B. Budget Reductions

In general, financial resources have declined as well. While the IEPA's financial picture can be difficult to depict clearly due to the timing of fees receipts and federal grant payments and funding surges from one-time programs such as the American Recovery and Reinvestment Act

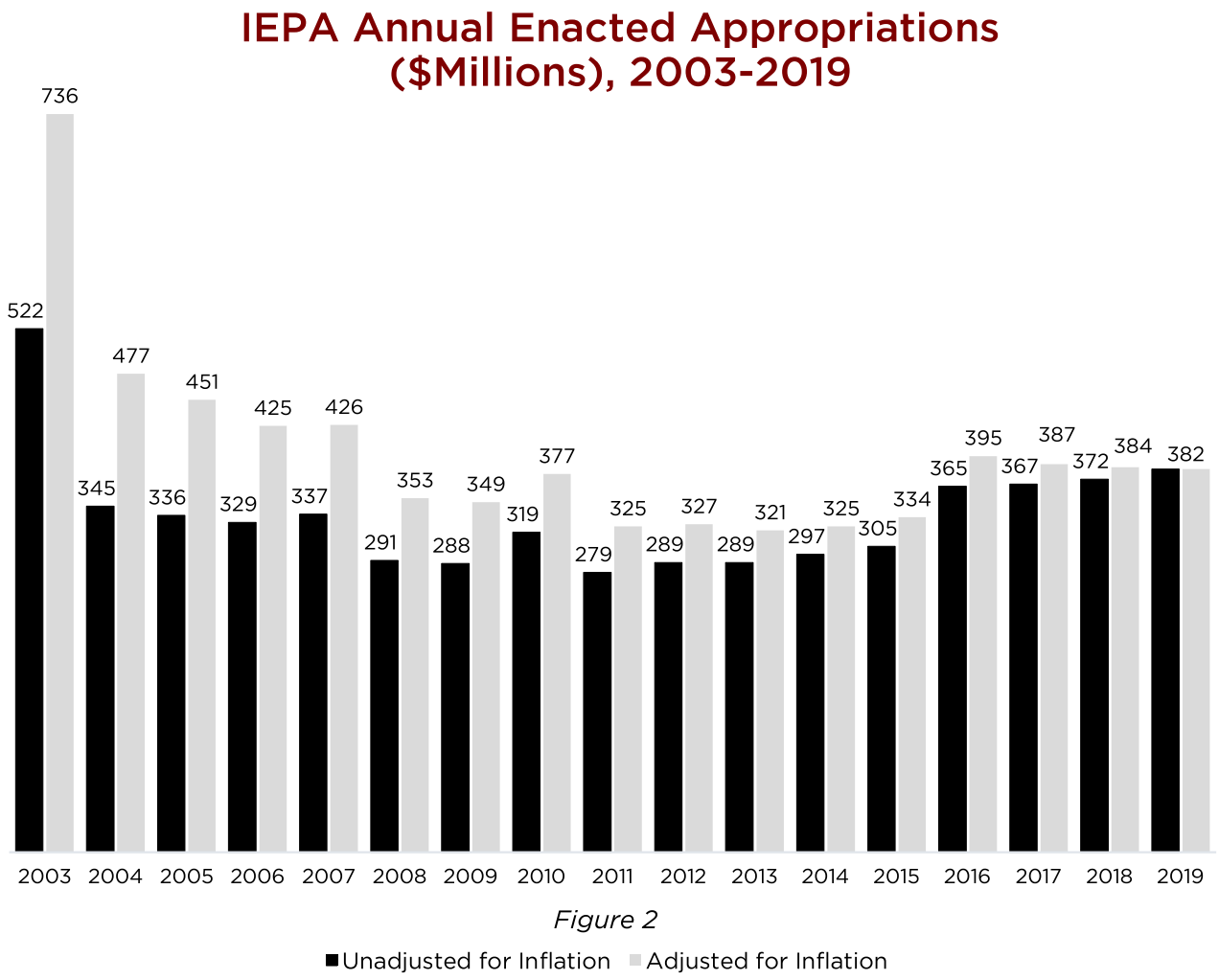

Figure 2

and the Volkswagen Settlement, Figure 2 shows that the agency's budget is on a downward trend in terms of the financial assets it has to do its job.[3]

IEPA's budget has not kept pace with other state environmental agencies in recent years. A survey by the Environmental Council of the States (ECOS), the national nonprofit, nonpartisan association of state and territorial environmental agency leaders, documented that state environmental agency budgets increased, on average, by roughly seven percent between 2013 and 2015, in figures unadjusted for inflation.[4] During this period, Illinois' budget increased by only about 2.5 percent.

Since 2003, the General Assembly has not provided any general fund appropriation for IEPA's regulatory programs, and Illinois is one of only three states where the environmental agency receives no yearly general fund appropriations.[5] Between 2013 and 2015, ECOS data shows that nationally, funds from general state appropriations increased by 35 percent on average; however, IEPA continued to receive no general appropriation funds. In 2015, the last year of the ECOS report, Illinois was the only state in EPA Region V that did not receive any general state appropriation funds.[6] As a result, IEPA has primarily had to rely on revenues from environmental fees and federal grants. While it may be appropriate to update and increase environmental fees, it is also appropriate and necessary to increase the general revenues for the agency, because IEPA's work benefits all who reside in Illinois.

* * *

In addition to lack of general funds over the long term, IEPA's increasing resource deficit is revealed in more recent, administration-specific, trends that can be tracked through programmatic metrics within each bureau, such as compliance monitoring, enforcement, accurate reporting, community involvement, and environmental justice.

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[3] Data showing enacted appropriations was gathered from the Illinois State Budget Books for each fiscal year from 2003 through 2020. The Illinois State Budget Books from these years provide figures for the IEPA's enacted appropriations, as well as the agency's actual expenditures. Our data draws only from the total enacted appropriations for each fiscal year. The figure for the total enacted appropriations reflects the summation of general funds, other state funds, and federal funds. To calculate the enacted appropriations in 2003, we subtracted the "appropriation authority actual" figure—distinguished from the "expenditures estimated" or the "appropriation authority recommended"—for the Water Revolving Fund from the total enacted appropriations. Following 2003, the Water Revolving Fund was not included in the total enacted appropriations for IEPA, so we did not subtract it from the total enacted appropriations from 2004 forward. *See* Ill. Office of Mgmt. & Budget, Exec. Office of the Governor, Ill. State Operating Budget, 2003 to 2020, https://www2.illinois.gov/sites/budget/Pages/BudgetBooks.aspx (Last Visited Jun. 17, 2019).

[4] Beth Graves et al., Env't Council of the States, Status of State Environmental Agency Budgets (EAB), 2013-2015 at 3, (March 15, 2017), https://www.ecos.org/wp-content/uploads/2017/03/Budget-Report-FINAL-3_15_17-Final-4.pdf.

[5] *Id.*

[6] States in EPA Region V include Wisconsin, Ohio, Minnesota, Michigan, Indiana, and Illinois. *Id.* at 14.

II. Program and function-specific challenges

A. Bureau of Water

During the past two decades, IEPA's responsibilities with respect to protecting the state's waters and assuring safe drinking water have only increased. This is true of both the agency's specific state and federal statutory mandates, as well as in the more general sense of responding to specific, known threats to the state's water resources.

With respect to statutory mandates, the agency's core responsibilities delegated under the federal Clean Water Act and Safe Drinking Water Act have placed constant or increasing demands on the agency. Regular permit renewals continue apace, and US EPA has periodically rolled out new requirements that all or some of those permits are to implement, such as federal regulations for cooling water intakes under section 316(b) of the Clean Water Act. These heightened requirements can necessitate significant time, effort, and technical expertise to implement. Additionally, the state legislature has imposed new programmatic requirements, such as the microbeads ban (2014),[7] lead service line inventory legislation (2017),[8] and audit functions under school lead testing legislation (2017).[9] IEPA is also managing a growing portfolio of infrastructure loan and grant programs.[10]

Simultaneously, additional environmental problems are coming more into focus. For example, the federal government has pushed to the states responsibility for developing strategies to address nutrient pollution and emerging environmental contaminants such as perfluoroalkyl and polyfluoroalkyl substances (PFAS). With contamination and overuse, groundwater protection has become a more pressing concern in Illinois than ever before. At the end of 2018, IEPA regulated 1,747 Community Water Supplies in 1,749 communities, which utilize both groundwater and surface water sources to serve a total of 12,001,944 people.[11] For the IEPA, maintaining the safety and protection of drinking water source water involves

[7] S.B. 2727, 98th Gen. Assemb. (Ill., 2014).

[8] S.B. 0550, 99th Gen. Assemb. (Ill., 2017).

[9] *Id.*

[10] Ill. Env't Protection Agency, State Revolving Fund Postings, https://www2.illinois.gov/epa/topics/grants-loans/state-revolving-fund/Pages/postings.aspx (last visited Jan. 23, 2019).

[11] Data recorded during phone conversation with Mary Reed, Manager over Compliance Assurance, Ill. Env't Protection Agency (Oct. 10, 2019). This data will be published in Ill. Env't Protection Agency, Annual Groundwater and Drinking Water Program Review, Calendar Year 2018 (forthcoming).

implementing a permitting program for the design, construction and operation of public water supply treatment facilities and maintaining a surveillance program for water systems' untreated and treated waters.[12] To keep up with these existing responsibilities and to meet new challenges, the Bureau of Water's resource needs have only grown over time.

Bureau of Water Actual Headcount, 2003-2018

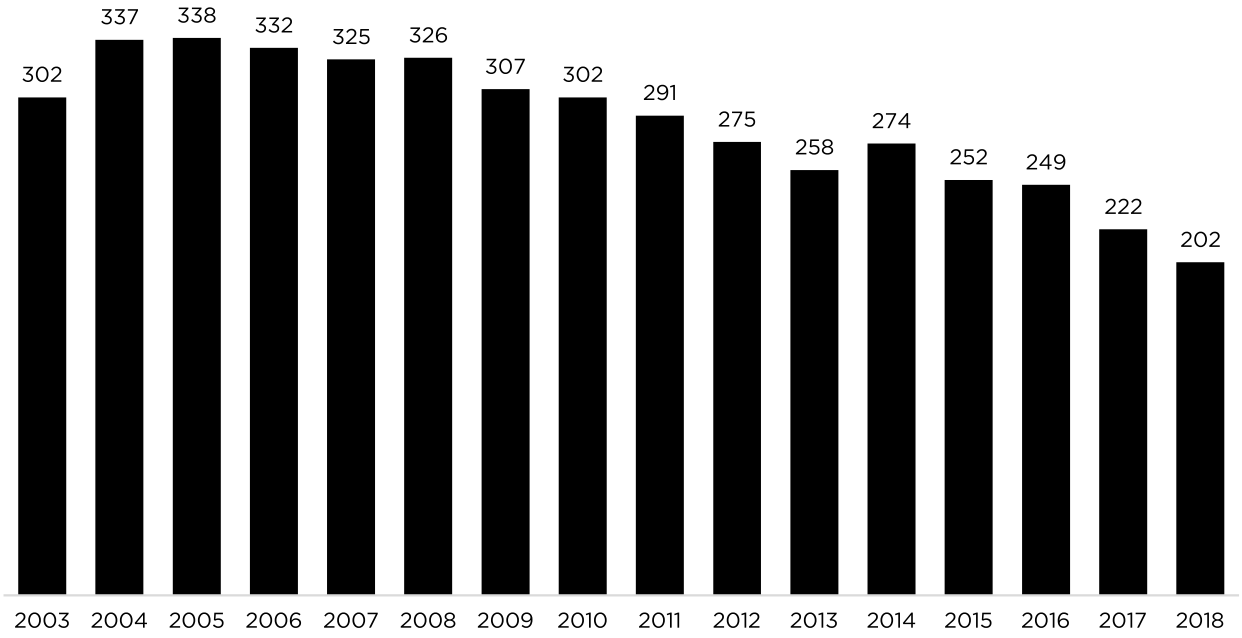


Figure 3

At its current capacity, the Bureau of Water is unable to keep up. Figure 3 shows that IEPA has seen a 33 percent reduction in the number of professionals protecting our waters since 2003.[13] Federal funds do not make up for this decline. For instance, in June 2016, IEPA reported that due to attrition, the administrative support unit of IEPA's Division of Public Water Supplies (DPWS) had decreased to two full-time staff, and as a result, DPWS would have to come up with a "continuity of operation plan" to address the large shortage of administrative support in 2016

[12] *Id.* at 3.

[13] Office of Mgmt. & Budget, Exec. Office of the Governor, Ill. State Operating Budget, FY 2003-2020, https://www2.illinois.gov/sites/budget/Pages/BudgetBooks.aspx (Last Visited Jun. 17, 2019).

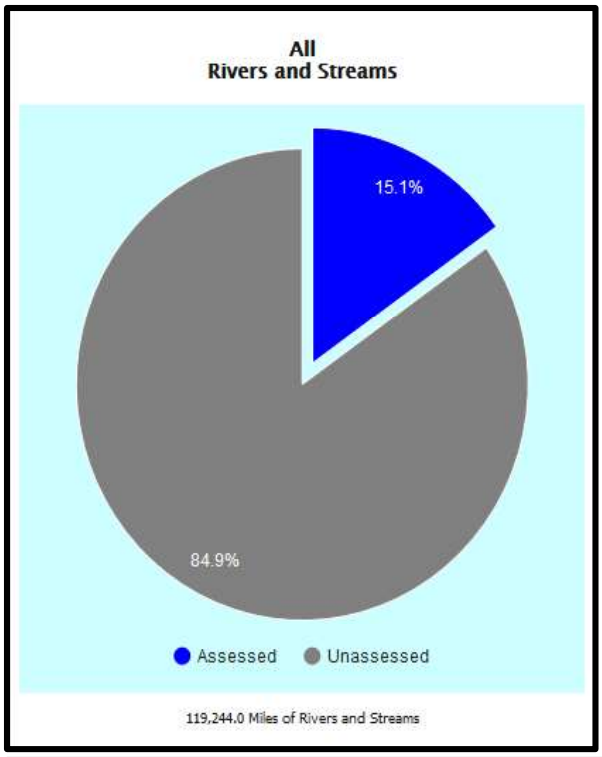
and beyond.[14] In subsequent program reviews, IEPA has reported the exact same problem: as of June 2018, there were still only two full-time administrative support-staff members in the Division, which oversees a broad range of work including field operations, compliance assurance, permitting, infrastructural and financial assistance, and groundwater protection, and IEPA has confirmed that this problem continues up to present.[15] In June 2018, IEPA reported that federal funds provided by the Public Water Supply Supervision (PWSS) Program grant currently supply less than half of the funds that are used to protect drinking water in Illinois. IEPA has acknowledged that for public water supplies (PWS) that are "in distress," technical assistance "remains the cornerstone in developing capacity."[16] However, US EPA's recent evaluations of the Illinois Capacity Development Program have highlighted low staff levels as an area of concern.[17]

[14] Ill. Env't Protection Agency, Annual Drinking Water Program Review, Calendar Year 2015 at 39 (June, 2016), https://www2.illinois.gov/epa/Documents/uploads/2015%20drinking%20water%20program%20review-consolidatedannualreport%20-%20final.pdf.

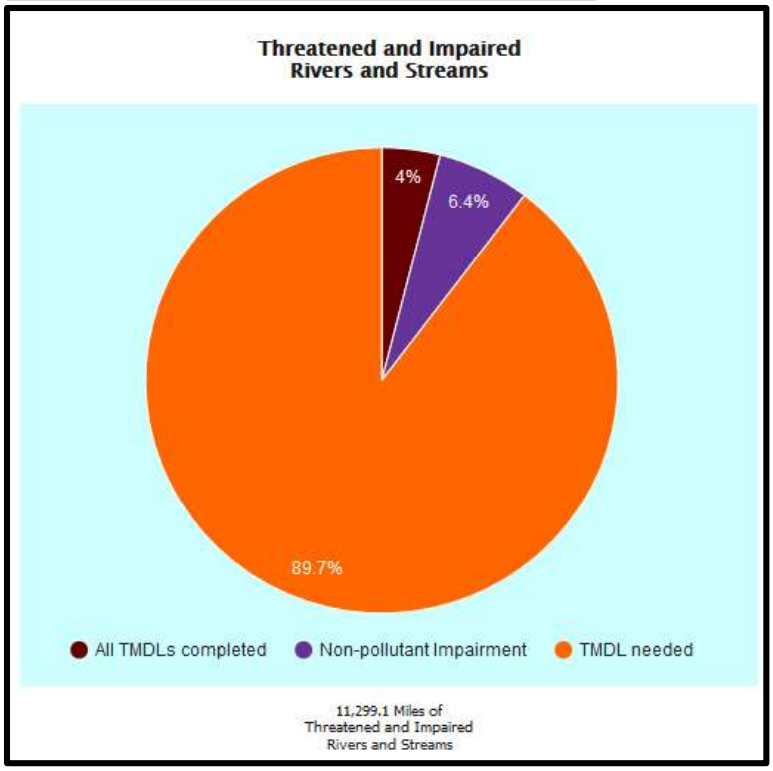
[15] Ill. Env't Protection Agency, Annual Groundwater and Drinking Water Program Review, Calendar Year 2017 (June 2018), at 47, https://www2.illinois.gov/epa/Documents/iepa/compliance-enforcement/drinking-water/2018_20groundwater-drinking_20water_20program_20review_20report_20-_20final.pdf. During a phone conversation, Mary Reed, Manager over Compliance Assurance, Ill. Env't Protection Agency, confirmed that low staff levels remain a problem (Oct. 10, 2019). This data will be published in Ill. Env't Protection Agency, Annual Groundwater and Drinking Water Program Review, Calendar Year 2018 (forthcoming).

[16] *Id.* at 7.

[17] The capacity development program was established in 2000 and aims to ensure that water suppliers have the capacity to achieve compliance. *Id.* at 25.

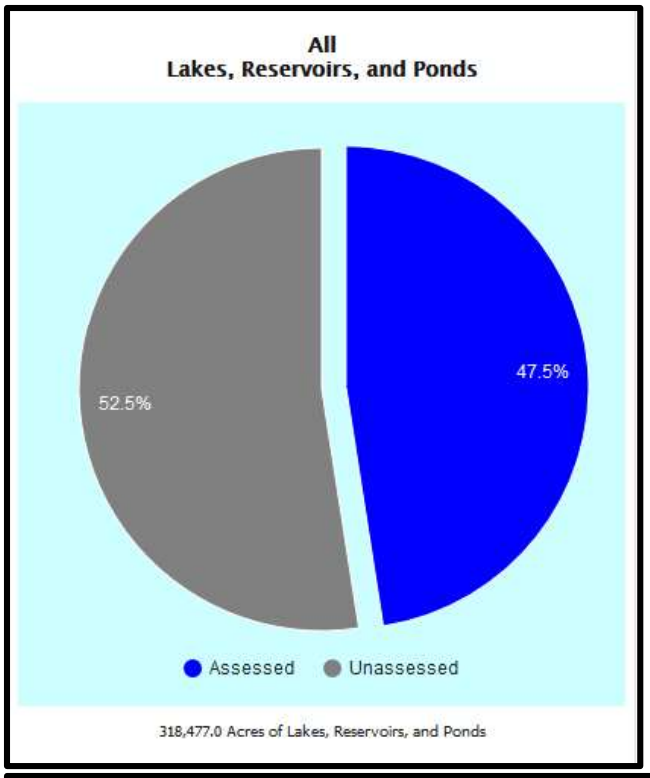


Assessed Status	Miles
Assessed	18,056.4
Unassessed	101,187.6
Total Miles	**119,244.0**

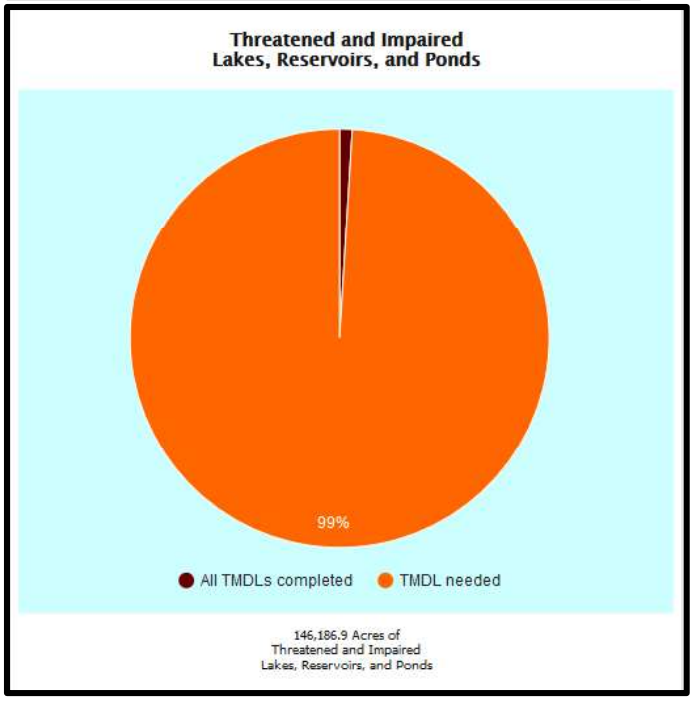


TMDL Development Status	Miles
All TMDLs completed	450.1
TMDL alternative	.0
Non-pollutant impairment	718.1
TMDL needed	10,130.9
Total Threatened and Impaired	**11,299.1**

Figure 4



Assessed Status	Acres
Assessed	151,434.9
Unassessed	167,042.1
Total Acres	**318,477.0**



TMDL Development Status	Acres
All TMDLs completed	1,407.4
TMDL alternative	.0
Non-pollutant impairment	.0
TMDL needed	144,779.5
Total Threatened and Impaired	**146,186.9**

Figure 5

The Bureau also needs more staff resources to support effective rulemakings that are essential to establish water quality standards, such as standards to address PFOA/PFAS and nutrient-related eutrophication in the state's rivers and streams. Other regulatory processes necessary to protect our waters also require additional resources. Figures 4 and 5 show that as of 2016, there were more than 10,000 miles of rivers and streams and more than 140,000 acres of lakes, reservoirs, and ponds that have already been identified as threatened or impaired and yet are waiting for Total Maximum Daily Load studies.[18] Figures 4 and 5 also show that as of 2016, IEPA had not been able to assess the health of nearly 85 percent of river and stream miles, and more than half of lake, reservoir and pond areas.[19] The Bureau's monitoring data is also backlogged, and as of 2017, data on surface monitoring and assessment activities funded by section 106 of the Clean Water Act was not consistently entered into EPA's Ambient Water Quality Monitoring System (AWQMS) database.[20]

B. Bureau of Air

Since 2010, IEPA has made significant headway in reducing its permit backlog, both for Title V and New Source Review (NSR) permitting.[21] However, as of 2017, lack of resources has impacted issues such as air toxics regulation, air monitoring, and climate change, as well as community outreach. Similar to the Bureau of Water, staffing levels in the Bureau of Air have dropped by almost 50 percent since 2003 (Figure 6).[22] In 2017, lack of available staff prevented the drafting of agreements and the development of regulations consistent with federal air quality rules on transportation conformity.[23]

In addition, over the past few years, the Bureau's Ambient Air Quality Monitoring Network has operated below its optimum level. For instance, IEPA has had only enough funding to switch 14 of its 35 Fine Particulate Matter ($PM_{2.5}$) monitors from older, manual filter-based monitors to updated, continuous monitors.[24] The IEPA reported in May 2018 that increasing the number of

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[18] US Env't Protection Agency, Ill. Assessment Data for 2016, https://ofmpub.epa.gov/waters10/attains_state.control?p_state=IL&p_cycle=2016 (last visited Jan. 22, 2019).

[19] *Id.*

[20] Ill. Env't Protection Agency, FY 16/17 Performance Partnership Grant Annual Performance Report (January 25, 2018) at 44.

[21] US Env't Protection Agency, Review of Illinois Environmental Protection Agency's New Source Review and Title V Permit Programs (Sept. 2017) at 3.

[22] Ill. Office of Mgmt. & Budget, Exec. Office of the Governor, Ill. State Operating Budget, FY 2003-2020, https://www2.illinois.gov/sites/budget/Pages/BudgetBooks.aspx (Last Visited Jun. 17, 2019).

[23] Ill. Env't Protection Agency, FY 16/17 Performance Partnership Grant Annual Performance Report (January 25, 2018) at 8-9.

[24] Ill. Env't Protection Agency, Bureau of Air, Ambient Air Monitoring 2019 Network Plan (May 2018) at 7, 26-30, https://www2.illinois.gov/epa/Documents/iepa/air/monitoring/2018/2019_20illinois_20network_20plan.pdf.

continuous monitors depends on "funding availability and monitoring site logistics."[25] IEPA generally lacks a robust monitoring network for all air pollutants.

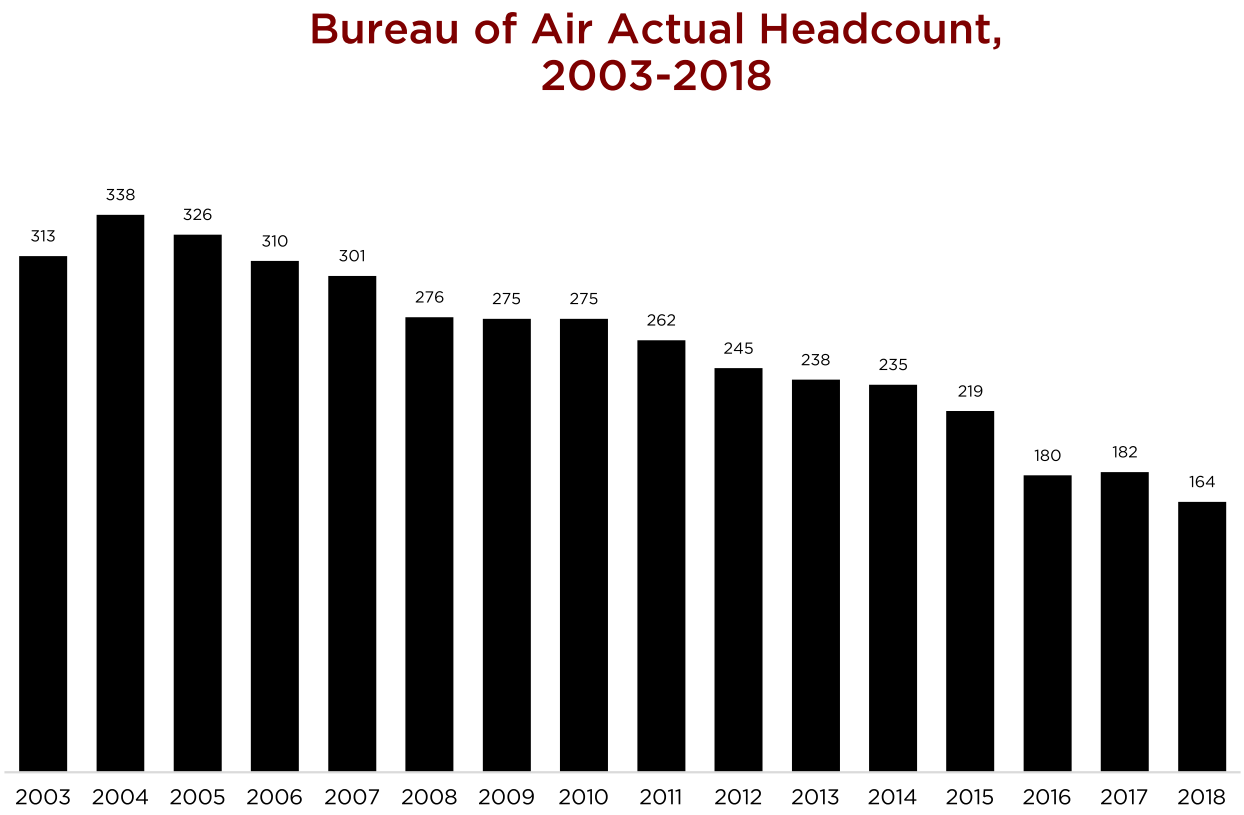

Figure 6

Low staff levels have affected the Bureau's ability to record and to report information. As of 2017, the Bureau only had one analyst entering data on Best Available Technology (BACT) determinations into the US EPA's RACT/BACT/LAER Clearinghouse (RBLC) permit database, which aids both permit applicants and reviewers in their decisions about pollution prevention and control technology for stationary air pollution sources.[26] In addition, data on particulate pollution throughout Illinois has been missing from 2014 to present.[27]

[25] *Id.*

[26] US Env't Protection Agency, Review of Illinois Environmental Protection Agency's New Source Review and Title V Permit Programs, (Sept. 2017) at 18.

[27] American Lung Association, State of the Air 2018 (2018) at 8 https://www.lung.org/assets/documents/healthy-air/state-of-the-air/sota-2018-full.pdf.

Number of Pollutant Emitting Facilities Inspected, 2003-2017

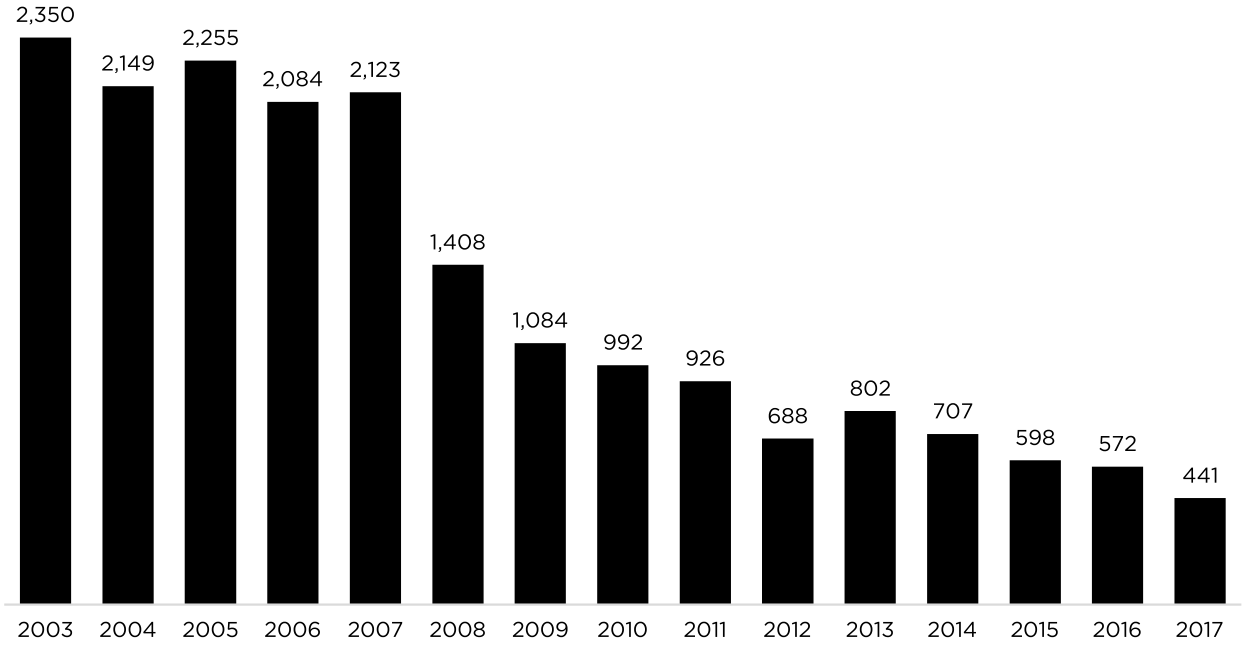

Figure 7

Figure 7 shows that since 2003, inspections of pollutant emitting facilities have declined by 81 percent.[28] This sharp decline may be due at least partly to changes in regulation. In 2011, IEPA established the Registration of Smaller Sources (ROSS) program, which reduced the number of air emissions sources requiring inspection.[29] However, since 2001, resource constraints have also impacted compliance and enforcement of the air laws. For example, from FY 2001 to FY 2005, IEPA did not submit a compliance monitoring plan (CMS) to U.S. EPA, as required by CMS policy.[30]

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[28] Ill. Office of the Comptroller, Illinois Public Accountability Reports (2003-2018), https://illinoiscomptroller.gov/financial-data/find-a-report/public-accountability-report/. We appreciate the input of Jonathan Hettinger, who pointed us to the Public Accountability Reports. See Jonathan Hettinger, *Illinois Environmental Agency Suffers Deep Staff Cuts*, Midwest Center for Investigative Reporting (April 11, 2018) https://investigatemidwest.org/2018/04/11/illinois-environmental-agency-suffers-deep-staff-cuts/.

[29] In 2011, IEPA estimated that 3,200 of Illinois' 6,500 air emissions sources would be eligible for a much less burdensome annual registration process as a result of the ROSS program. *See* Ill. Env't Protection Agency, Biennial Report 2011-2012 (September 2013) at 8. https://www2.illinois.gov/epa/Documents/epa.state.il.us/biennial-report/2011-2012-report.pdf.

[30] US Env't Protection Agency, Review of Illinois EPA Enforcement Program Federal Fiscal Year (FFY) 2005 (Aug 22, 2007) at 18.

While the emphasis has been to regulate large pollutant-emitting facilities, small businesses, such as dry-cleaners or auto-body shops, collectively contribute to pollution levels in the state and add to pollution from larger sources. In its 2019 State of the Air study, the American Lung Association (ALA) reported that compared to other American cities, Chicago had some of the worst ozone pollution levels from 2015 to 2017. The city's pollution levels have increased in the last couple of years. Chicago had a higher average of "unhealthy days" in the 2015-2017 period than it did in the ALA's report covering emissions data from 2014 to 2016.[31] During the last five years, the percentage of volatile organic compound (VOC) and nitrogen oxide (NOx) from area sources in the city of Chicago has increased by eight percent and two percent, respectively.[32] Without the same kind of permitting and inspection procedures that regulate large sources, educational and technical assistance that helps to ensure small businesses meet air pollution requirements is needed. Small source polluters that qualify under the ROSS program are managed by Illinois's small business and environmental assistance program (SBEAP), which helps small businesses meet national emissions standards and offers them educational materials, including fact sheets, guides, and trainings. IEPA oversees SBEAP jointly with the Illinois Department of Commerce (DCEO), primarily by providing technical assistance. IEPA and DCEO are both understaffed in these areas and in need of funds to support programs that maintain robust regulatory programs for small sources.[33]

Declining resources not only affect the Bureau's regulatory, monitoring, inspection and reporting capacities, but they also impact the Bureau's engagement with the community. In June 2017, the Illinois Partners for Clean Air program, an outreach program that encouraged Illinois residents, businesses and government entities to sign up for air quality forecasts and to develop and implement action plans, was disbanded due to lack of funding and staffing issues.[34] Increased resources are needed to revive community outreach programs like Partners for Clean Air, as well as to develop training programs for staff specifically devoted to community issues.

These resource issues are compounded by US EPA's new, complex federal emissions and hazardous air pollutant standards. National Ambient Air Quality Standards (NAAQS) for nitrogen

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[31] Am. Lung Ass'n, State of the Air 2019, (2019) at 6, https://www.lung.org/assets/documents/healthy-air/state-of-the-air/sota-2019-full.pdf.

[32] Ill. Env't Protection Agency, Bureau of Air, Draft Attainment Demonstration for the 2008 Ozone National Ambient Air Quality Standard for the Chicago Nonattainment Area at 28 (April 2017), https://www2.illinois.gov/epa/public-notices/Documents/General%20Notices/Attainment%20Demonstration%20-%202008%20Ozone%20NAAQS%20-%20Chicago%20NAA.pdf

[33] The number of professionals working on the DCEO's Business Development program has dropped from 31.5 professionals in 2010 to 18 professionals in 2017. *See* Ill. Office of the Comptroller, Illinois Public Accountability Reports (2000-2018), https://illinoiscomptroller.gov/financial-data/find-a-report/public-accountability-report/.

[34] Ill. Env't Protection Agency, FY 16/17 Performance Partnership Grant Annual Performance Report (January 25, 2018) at 15.

dioxide, sulfur dioxide and greenhouse gases come with expectations about practical enforceability of emissions limitations and the provision of permits. IEPA has expressed concern about its ability to implement the administrative steps required for compliance with these standards.[35] In February 2017, US EPA found that Illinois was among 15 states that did not submit State Implementation Plan (SIP) revisions on time and in a manner that satisfied requirements of the 2008 ozone NAAQS that apply to nonattainment areas and states in the Ozone Transport Region (OTR).[36] In December 2017, US EPA found that Illinois did not timely submit a revision to its SIP to satisfy moderate Nonattainment New Source Review (NNSR) requirements for the Chicago area. As a result, US EPA promulgated a Federal Implementation Plan (FIP) that required Illinois to submit a complete SIP within 18 months to avoid sanctions. IEPA avoided the FIP and sanctions when, in May 2018, US EPA approved IEPA's revised SIP, but only after Illinois had submitted two SIPs that US EPA had found deficient.[37]

C. Bureau of Land

Unlike in the Bureaus of Air and Water, where new federal regulations having been ever increasing over the last several years, the regulatory responsibilities in the Bureau of Land have remained relatively constant and with such, employees within the Bureau of Land may be an under-utilized asset within the agency. Figure 8 shows that as of 2018, the Bureau of Land had 223 staff members, compared to 164 staff members in the Bureau of Air (Figure 6) and 202 in the Bureau of Water (Figure 3).[38]

The Agency has the opportunity to utilize staff across programs with complimentary goals in order to move higher priority programs forward. For example, the Brownfields Program, which was established in 1995, could be revitalized and expanded by having staff in various cleanup programs (e.g., LUST and Voluntary State Remediation Program (SRP)) work to market and support the Brownfields financial assistance programs. The Leaking Underground Storage Tank (LUST) cleanup program could be updated as well. Figure 9 shows the number of corrective action measures taken to address underground storage tank cleanups from 2006 to 2018. In a study from 2011 on the National LUST Cleanup Backlog, US EPA reported that for 73 percent of

[35] US Env't Protection Agency, Review of Illinois Environmental Protection Agency's New Source Review and Title V Permit Programs (Sept. 2017).

[36] *Id.*

[37] Air Plan Approval; Illinois; Nonattainment New Source Review Requirements for the 2008 8-Hour Ozone Standard, A Proposed Rule by the Env't Protection Agency, 83 Fed. Reg. 50551 (proposed October 9, 2018) (to be codified at 70 C.F.R. pt. 52).

[38] Ill. Office of the Comptroller, Illinois Public Accountability Reports (2003-2018), https://illinoiscomptroller.gov/financial-data/find-a-report/public-accountability-report/.

releases in Illinois, there was no data on the type of financing for cleanup releases. Illinois also commented that the high costs for cleanups were driven by older longer-term cleanups.[39]

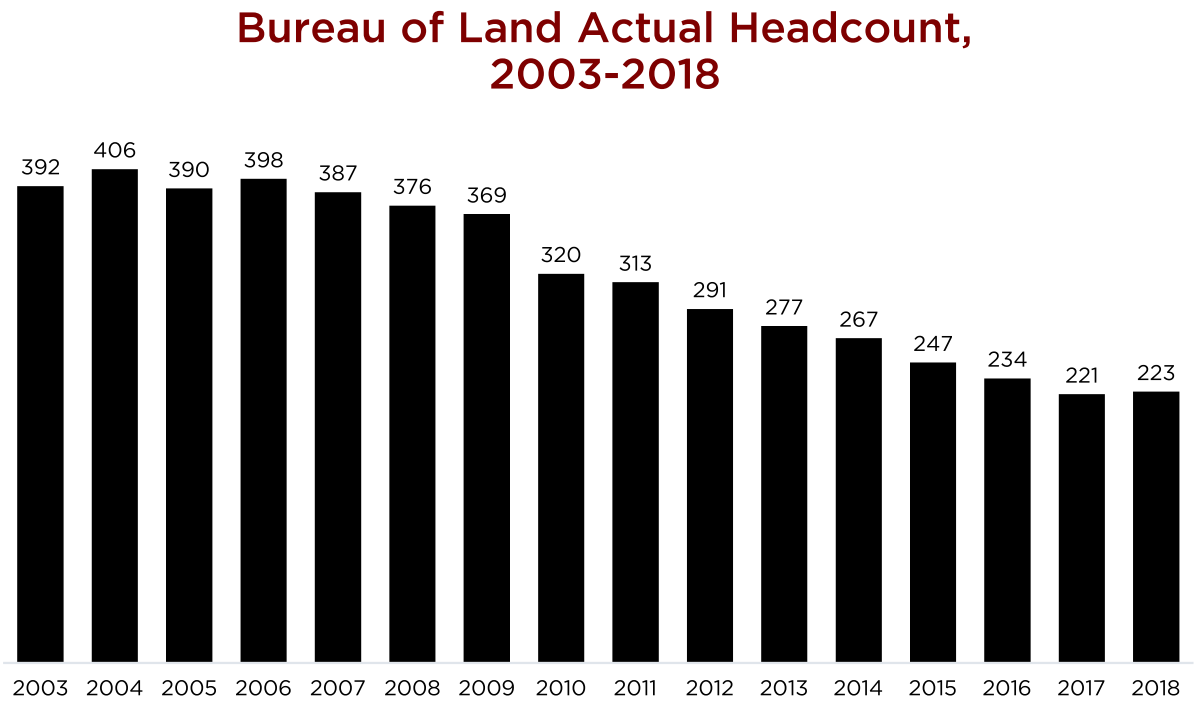

Figure 8

Additionally, the Bureau of Land would benefit from an evaluation to determine the value-added of the current remediation programs, policies and regulations—from whether the SRP should be modified to establish timelines for projects to receive a No Further Remediation Letter, to whether gas-station owners should obtain pollution liability insurance to lessen the burden on taxpayers paying for spills due to poor equipment maintenance. In particular, IEPA should reassess the payment-by-review structure which governs the Voluntary Cleanup Program and which may dis-incentivize employees from moving a cleanup to completion. This evaluation may result in identifying staff resources that could be moved to higher priority environmental programs.

[39] U.S. Env't Protection Agency, The National LUST Cleanup Backlog: A Study of Opportunities, at 23, 25 (Sept. 2011), https://www.epa.gov/sites/production/files/2014-03/documents/backlog_national_chapter.pdf.

Besides the Brownfields Program, other programs that address solid waste, landfills and composting could be renovated to become more focused on energy issues, such as utilizing landfill gas energy for electricity. Lack of modernization not only results in inefficiencies; it also means that IEPA has been unable to participate in national reporting programs that can aid in future permitting and enforcement actions. Databases should be updated and investment in technologies and training programs should be made for accurate electronic reporting.

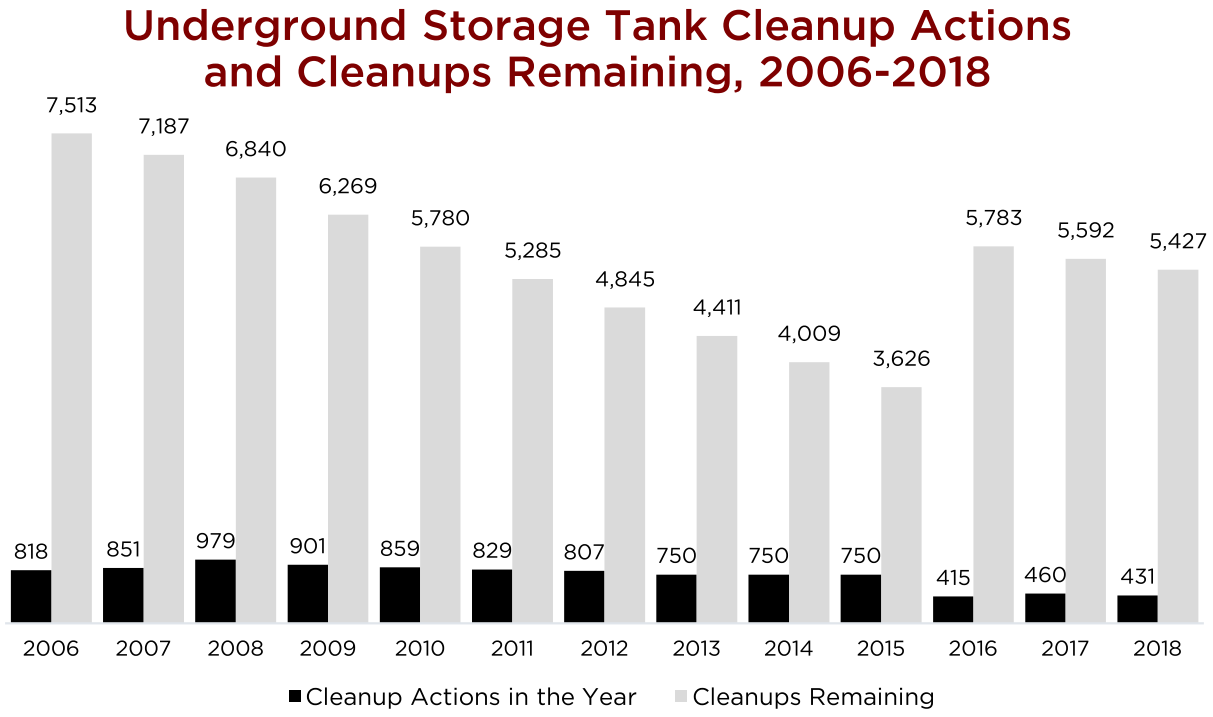

Figure 9

D. Enforcement

Robust enforcement of environmental laws and regulations is crucial for protecting the environment and public health and for ensuring that polluters do not benefit from a competitive advantage if they violate the law. This function serves to level the playing field and to protect responsible companies from having to compete with companies that shirk their legal obligations. Figure 10 shows a decline in the number of cases referred from the agency to the Illinois Attorney General's Office in recent years. While the number of cases may vary from year to year for a variety of reasons, and while the agency may be using Compliance Commitment Agreements (CCAs) more than enforcement referrals to achieve environmental objectives, the decline in referrals does raise questions about the agency's approach to enforcing environmental laws.

IEPA could improve in several areas of enforcement by developing more consistent policies, implementing training programs, and improving record-keeping. For instance, in 2013, US EPA reported that IEPA lacked a set process for determining whether violations of the Clean Air Act (CAA) should be addressed with a referral to the Illinois Attorney General's Office or through a CCA.[40] In addition to inconsistencies in terms of the application of policy, US EPA reported that IEPA's case files often failed to document determinations about enforcement actions and penalty calculations.[41] To address these issues, US EPA has recommended that IEPA establish universal policies; however, IEPA has expressed concern about this approach because enforcement determinations are made on a case-by-case basis.[42] Where policies cannot be universalized, IEPA needs additional resources to develop more comprehensive strategies and to train its professionals.

Number of Enforcement Cases Referred to the Attorney General from Bureau of Air, Water and Land, 2010-2017

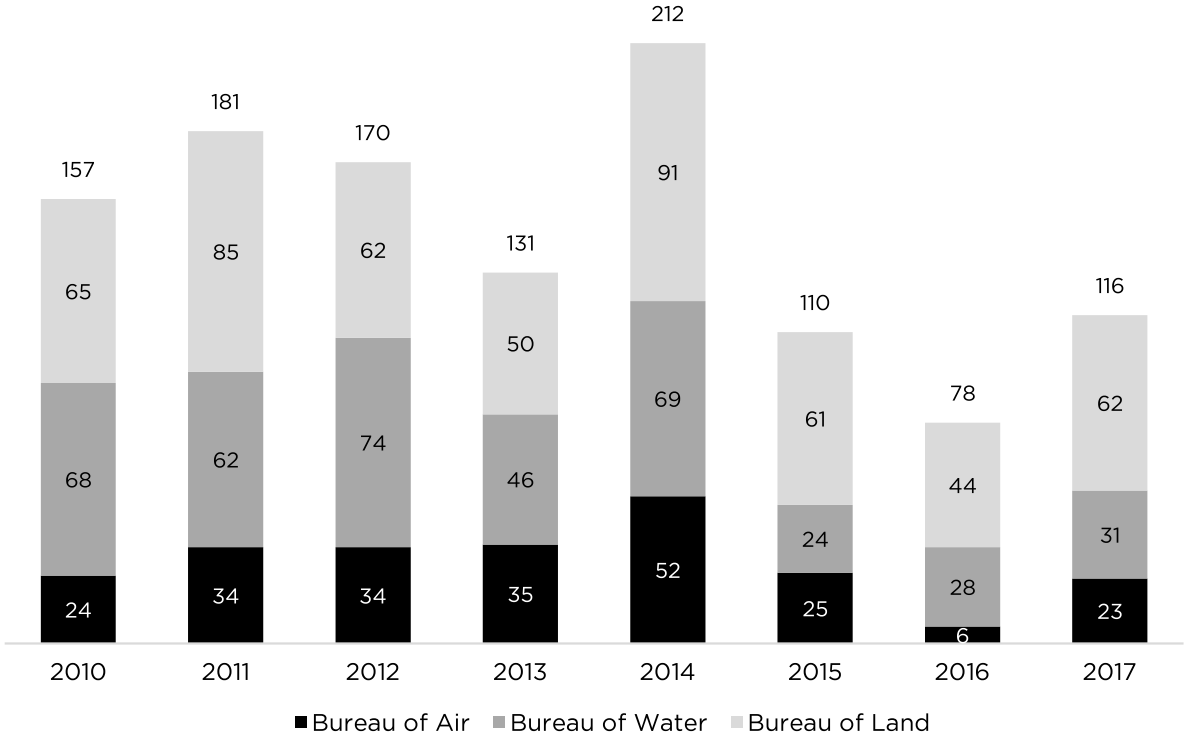

Figure 10

[40] US Env't Protection Agency, State Review Framework, Illinois, Clean Water Act, Clean Air Act, and Resource Conservation Recovery Act Implementation in Federal Fiscal Year 2013, (May 4, 2015) at 29.

[41] *Id.* at 28-29.

[42] *Id.*

IEPA also needs more people. Enforcement is labor-intensive. Referrals to the Attorney General involve responsibilities such as conducting an on-site inspection, reviewing documents, helping to prepare a case, preparing for a deposition, and potentially appearing in court, and CCAs take time to develop the facts, to set a strategy, and to negotiate with the violator.

Relatedly, IEPA's Office of Solid Waste and Emergency Response could also benefit from technological improvements to support enforcement of environmental laws. In 2017, for example, the office was neither able to participate in US EPA's digital inspector program by gathering inspection data electronically, nor could it update software and equipment due to technical issues. As a result, IEPA's participation in this program was reported "on hold" in both 2014 and 2015.[43]

III. Recommendations

We encourage the General Assembly to increase funding for IEPA. We also make several recommendations that not only identify new resources, but also highlight strategies for maximizing IEPA's present resources.

1. Environmental fees should be raised to ensure that, at a minimum, the complete costs of permitting, inspecting, regulating, remediating, and preventing pollution are covered by the fees paid. We understand that the current fee schedule was established in 2003, and the statute does not provide for an escalator to keep pace with inflation or the rising cost of pension payments and healthcare—payments that are taken directly from IEPA's funds. In updating, IEPA should examine fee structures of other states that may be more sustainable.
2. IEPA and the General Assembly should develop new sources of revenue, particularly sources designed to incentivize positive environmental decision-making, such as statewide plastic bottle or bag fees, water-quality utility fees, or storm water fees.
3. IEPA also needs additional resources to undertake any statewide climate initiatives and to participate in any regional or national greenhouse reduction efforts. With those resources, IEPA could work with other agencies and provide leadership in the state achieving 100 percent clean energy within the next 30 years.
4. IEPA must respond to the need for more community outreach and environmental justice work. In order to encourage engagement and to ensure that the current notification process is a worthwhile and efficient expenditure of IEPA's resources, IEPA needs to clarify its environmental justice notification process for both IEPA employees and the

[43] Ill. Env't Protection Agency, FY 14/15 Performance Partnership Agreement between Illinois and Region 5, USEPA, (Sept. 26, 2013) at 15.

public.[44] The agency also needs to hire additional professionals to work across agencies and within communities on these issues and to support and empower the Illinois Environmental Justice Commission.

5. IEPA must modernize the delivery of environmental protection through improved technology, and it must provide its employees a modern work environment with modern technology.
6. IEPA should initiate a staffing plan that would identify priorities, optimize timely hiring, establish training programs, and facilitate knowledge transfer of retiring workers. In order to attract and maintain a workforce of skilled professionals, IEPA must also develop a robust mentoring program to ensure knowledge transfer from retiring workers.
7. The governor should establish a blue-ribbon panel consisting of former IEPA leaders and key environmental protection stakeholders to analyze IEPA's capacity and programmatic needs, and to make recommendations about the future of the agency.

Beyond these recommendations to address IEPA authorities and operating resources, any major capital spending plan should include investments in IEPA capacity that would generate employment, allow for new economic development, and reduce pollution of our land, air, and water, including:

1. Air and water quality monitoring stations to restore lost capacity, to monitor public health threats, and to track environmental changes, including but not limited to the agency's water monitoring programs and Nutrient Loss Reduction Strategy superstation network;
2. Lab equipment at state labs to allow IEPA to assist local governments with testing requirements;
3. Site cleanup funds to remediate toxic waste sites not covered by the federal Superfund program;
4. Brownfield revolving loan program to incentivize cleanup and economic development;
5. Implementation for Nutrient Loss Reduction Strategy—funds for wastewater treatment and agricultural projects to implement INLRS;
6. An updated IT system to improve monitoring, permitting and enforcement; and

[44] In an article from November 2018, the *Chicago Tribune* found that for more than half of the permits affecting conditions in environmental justice areas considered by the IEPA, no public hearings have been held in nearly three years. The *Tribune* also found that between January 2015 and August 2018, almost 2,000 permit applications were catalogued in the state's environmental justice outreach database and marked as complete; however, in 56 percent of these cases, no notification was sent. Of the applications for which notifications letters were sent, communities were given a minimum of two weeks or less to respond. Chris Pressnall, environmental justice officer for the IEPA, stated that it has been almost two years since the IEPA's environmental justice office held any community meetings in an environmental justice community. Tony Briscoe, "Illinois EPA is supposed to inform poor, minority communities about potential polluters, but many have been left in the dark," *The Chicago Tribune*, (Nov. 15, 2018), https://www.chicagotribune.com/news/ct-met-illinois-environmental-justice-pollution-20181024-story.html.

7. Changes to state revolving fund rules to make financing of green infrastructure projects and other non-point pollution control projects a priority under water loan programs.

It will likely be appropriate to pair these capital investments with increased general appropriations and other revenue increases to cover annual program administration expenses.

IV. Conclusion

During the past two decades, IEPA's budget and staff have been on the decline generally. Lower levels of funding and fewer employees have hamstrung the agency's work. Reports and evaluations from US EPA, as well as IEPA itself, during the past 20 years show that, in addition to other problems, compliance monitoring and enforcement activities, such as inspections, have declined; data management is often incomplete or inaccurate; standard-setting is slow-moving; and community involvement has dwindled. These resource constraints have become an important problem in the wake of recent federal rollbacks. As IEPA's resources continue to decline, its responsibilities grow and become more complex. Governor Pritzker's recent executive order places responsibility for many of these issues squarely in the hands of IEPA. If the agency is to monitor the federal government's environmental proposals and ensure the protection of Illinoisans, it will need to use its existing resources more effectively and to have even more resources to address all of the environmental challenges facing the state.

A first step to address these issues would be additional funding through some mix of increased environmental fees and general appropriations. Modernized technology and equipment as well as new hires are clear areas where funds are needed. Necessary changes within the agency—such as more effective training policies as key leaders move into retirement or increased agency involvement in environmental justice issues through outreach programs—require funds as well. Environmental problems in our country and our state will only become more urgent and complicated during the coming years and decades. While there may be some areas in which IEPA needs to work more efficiently, our legislative and executive leaders must reverse this downward path in IEPA resources and capacity by providing the agency with the additional funds it needs to fulfill its mission.

In the spring of 1970, Illinois became the first state to establish an environmental protection agency, and operations officially began on July 1st of that year.[45] In July 2020, our state will

[45] Ill. Env't Protection Agency, History: The Beginnings, https://www2.illinois.gov/epa/about-us/Introduction/Pages/History.aspx (Last visited Jul. 11, 2019).

celebrate the agency's 50th anniversary. As we approach this date, we should examine the agency's evolution and performance over the last decades; reflect on recurring and emerging challenges; and identify areas where state environmental protection can be improved to ensure that the agency can accomplish its core duty: to safeguard environmental quality in order to protect health, welfare, property and the quality of life.

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History of Air Pollution Legislation in the United States

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History of Air Pollution Legislation in the United States

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History is more than a chronology of the flow of events. It also includes explanation as to why these events occurred; why they occurred at the time, and in the form that they did; and what were their consequences.

This history must, of necessity, be abridged, because it would take much more than the allotted space fully to cover the history of municipal legislation in each of our hundreds of cities, county legislation in each of our numerous counties, state legislation in all of our 50 states, and our federal legislation. In this paper only the history of federal legislation is presented in detail. The history of municipal, county, and state legislation is presented only in broad brush terms. No attempt is made in this paper to cover the development of air pollution regulations.

For the first hundred years of the existence of the United States, air pollution problems were settled by litigation among the parties involved rather than by legislation. During these hundred years, problem resolution was originally by private litigation to abate air pollution as a common law nuisance, either as a private nuisance, a public nuisance, or a trespass. This was before the time (about 1881) when the first legislation was enacted specifically declaring the emission of smoke to be a public nuisance.

The next development, which occurred around the turn of the century was "the general acceptance by the courts of laws prohibiting the emission of specified levels, or quantities, of air pollutants without an accompanying declaration that such emissions constituted a public nuisance"[1] and that such action was within the police power of the state. "As air pollution control began to move away from reliance on this theory of nuisance, it became apparent that the prevention of air pollution was at least as important, if not more important, than abatement after the fact; that, under appropriate legislation, preventative action was possible."[1] Thereafter abatement of air pollution under the nuisance doctrine gradually gave way to resolution of the problem by governmental agencies created by specific air pollution control legislation.

The first municipal legislation was in 1881 in Chicago, IL and Cincinnati, OH. State legislation between 1910 and 1912 provided for smoke abatement in Boston, MA and Providence, RI. The first county legislation was for Albany County, NY about 1913, and the first comprehensive state legislation was that of Oregon in 1952. The first federal air pollution law was in 1955. Our information on local and state air pollution legislation in the U.S. (Table I) comes mainly from publications of the Bureau of Mines of the U.S. Department of the Interior, the Manuals of Ordinances and Regulations published by the Smoke Prevention Association of America (the predecessor organization of APCA), APCA, the U.S. Environmental Protection Agency, and the chapter on legislation by Seamans in the *Air Pollution Handbook*.[2]

A number of jurisdictions, over the years, passed air pollution regulatory laws and ordinances which they failed to implement by not providing the organization, personnel, or fiscal means for enforcement. Because of differences of definition of whether a jurisdiction was or was not implementing its law or ordinance, Table I (and later in the paper, Table III and VII), may differ from similar tables published elsewhere. Thus, according to my definition, in 1920 there were about 175 municipalities which had ordinances, but only about 40 operating smoke abatement agencies; and in 1940 there were about 200 municipalities with ordinances but only about 52 operating smoke abatement agencies.

Table I. Development of American municipal, county, and state air pollution control legislation from 1880 to 1980.

	Municipal[a]	County[b]	State[c]
1880			
1890	2		
1900	5		
1910	23		
1920	40	1	
1930	51	2	
1940	52	3	
1950	80	2	
1960	84	17	8
1970	107	81	50
1980	81	142	50

[a] Includes city-county agencies (See Table III).
[b] Includes multi-county agencies, each such agency counted as one agency (See Table III).
[c] See Table VII.

In the hundred year span from 1881 to 1981 there have been leaders in each of the cities, counties, and states without whom little would have been accomplished. My personal hall of fame of deceased Americans who achieved national recognition for their pioneering efforts in smoke abatement and air pollution control is offered as Table II.

Dr. Stern is Emeritus Professor, Department of Environmental Sciences and Engineering, School of Public Health, The University of North Carolina at Chapel Hill, Chapel Hill, NC 27514. He was President of the Air Pollution Control Association in 1975–1976.

Table II. Hall of Fame of 30 deceased American smoke abatement and air pollution control pioneers.

Name	Claim to fame in smoke abatement or air pollution control	Decades of principal activity
Harry C. Ballman	Association Executive, Washington, DC	1940–60
John F. Barkley	Engineer-Consultant, Washington, DC	1920–50
James H. Carter	Control Officer, St. Louis, MO	1940–60
Frank A. Chambers	Control Officer, Chicago, IL	1900–50
William G. Christy	Control Officer, Jersey City, NJ	1920–50
Francis G. Cottrell	Engineer-Inventor, Riverside, CA	1910–30
Ward F. Davidson	Engineer-Consultant, New York, NY	1940–60
Sumner B. Ely	Control Officer, Pittsburgh, PA	1940–60
W. Lawrence Faith	Scientist-Consultant, San Marino, CA	1950–80
Samuel B. Flagg	Engineer-Consultant, Washington, DC	1910–20
S. Smith Griswold	Control Officer, Los Angeles, CA	1950–70
Arie J. Haagen-Smit	Scientist-Administrator, Pasadena, CA	1940–80
John K. Haywood	Plant Pathologist, Washington, DC	1900–10
George R. Hill	Scientist-Administrator, Salt Lake City, UT	1940–60
Ozni P. Hood	Engineer-Administrator, Washington, DC	1910–30
Charles Howison	Association Executive, Cincinnati, OH	1940–60
Henry Kreisinger	Engineer-Research, Pittsburgh, PA	1920–40
Herbert B. Lammers	Association Executive, Cincinnati, OH	1940–60
Louis C. McCabe	Engineer-Consultant, Washington, DC	1940–70
Paul L. Magill	Engineer-Editor, Menlo Park, CA	1940–60
Frederick Mallette	Association Executive, New York, NY	1940–60
Thomas Marsh	Association Executive, Cleveland, OH	1920–40
Herbert B. Meller	Control Officer, Pittsburgh, PA	1920–40
Osborne Monnett	Control Officer, Chicago, IL	1910–30
Helmuth H. Schrenk	Scientist-Research, Pittsburgh, PA	1940–60
Robert E. Swain	Scientist-Administrator, Palo Alto, CA	1900–50
Moyer D. Thomas	Scientist-Editor, Salt Lake City, UT	1930–70
Julian E. Tobey	Association Executive, Cincinnati, OH	1930–50
Raymond R. Tucker	Control Officer-Mayor, St. Louis, MO	1930–50
Thomas C. Wurts	Control Officer, Pittsburgh, PA	1940–50

Local (Municipal and County) Air Pollution Control Legislation (Table III)

Some of the smoke abatement ordinances of the late 1800s[3] required that furnaces consume the smoke produced or employ a device that would do so. These ran into trouble in the courts which ruled that there were no such furnaces or devices available. In the early 1900s, smoke defined variously as "dense," "black," or "grey," was prohibited, generally with an exception of a certain number of minutes per hour, for start-up, cleaning fires, etc. Problems with definition of "dense, black, or grey" led to the adoption, in the first quarter of the century, of definition of smoke density by Ringelmann Chart number or percent opacity. Originally almost all communities prohibited smoke darker than #3 on the Ringelmann scale (60% opacity). Since then there has been a progressive decrease in allowable smoke density (Table IV).[4] In most communities, private dwellings were exempted from regulation until the 1940s. Communities with railroads or marine traffic included special regulations for smoke and cinder emission from locomotives and steamships. Ordinance provisions requiring approval of plans and specifications of installations of fuel burning equipment and the issuance of construction and operating permits developed during the first quarter of the century; those for annual inspection of instal-

Table III. Development of principal American municipal smoke abatement legislation prior to 1930.

Decade	Cities
1880–1890	Chicago, IL; Cincinnati, OH
1890–1900	Cleveland, OH; Pittsburgh, PA; St. Paul, MN
1900–1910	Akron, OH; Baltimore, MD; Boston, MA; Buffalo, NY; Dayton, OH; Detroit, MI; Indianapolis, IN; Los Angeles, CA; Milwaukee, WI; Minneapolis, MN; New York, NY; Newark, NJ; Philadelphia, PA; Rochester, NY; St. Louis, MO; Springfield, MA; Syracuse, NY; Washington, DC
1910–1920	Albany County, NY; Atlanta, GA; Birmingham, AL; Columbus, OH; Denver, CO; Des Moines, IA; Duluth, MN; Flint, MI; Hartford, CT; Jersey City, NJ; Kansas City, MO; Louisville, KY; Lowell, MA; Nashville, TN; Portland, OR; Providence, RI; Richmond VA; Toledo, OH
1920–1930	Cedar Rapids, IA; East Cleveland, OH; Erie County, NY; Harrisburg, PA; Grand Rapids, MI; Lansing, MI; Omaha, NE; Salt Lake City, UT; San Francisco, CA; Seattle, WA, Sioux City, IA; Wheeling, WV

Table IV. Percent of American local regulations prohibiting visible emissions of various opacities from stationary sources.[3]

Emission greater than percent opacity prohibited	Percent of regulations prohibiting visible emissions				
	1940	1950	1960	1965	1975
60	81	69	41	32	3
40	19	31	59	66	33
20	0	0	0	2	56
0	0	0	0	0	8

Table V. Number of American communities adopting various emission standards for total solid particulate pollutants in effluent gases from the combustion of fuels.[4]

mg/m^3 STP (equivalent)[a]	Before 1949	1950–1959	1960–1965	Total
Over 1030	4	5	1	10
1030	12	24	4	40
840–1030	0	4	4	8
Under 840	0	3	6	9
Total	16	36	15	67

[a] Adjusted to either 12% CO_2, 50% excess air or 6% O_2.

Table VI. Model smoke abatement ordinances.

1930	U.S. Bureau of Mines
1938	Smoke Prevention Association of America
1939	Stoker Manufacturers Association
1939	American Society of Heating and Ventilating Engineers
1949	American Society of Mechanical Engineers
1949	Coal Producers Committee for Smoke Abatement
	a) Model Smoke Abatement Ordinance
	b) Model Railway Smoke Abatement Ordinance
1950	National Institute of Law Officers

lations, solid fuel specification and testing, and dealer licensing developed during the second quarter of the century. Installations were required to meet rigidly specified furnace design specifications during the first quarter of this century. These were relaxed and more attention paid to performance specifications during the second quarter.

To understand why these events occurred, their timing, form, and consequences, it is necessary to review briefly the technology of fuel utilization in the U.S. in the period from 1880 to date. At the start of this period, the principal fuel was bituminous coal and the principal means of firing it was by shoveling it onto an up-draft stationary flat grate, with the consequent production of dense smoke whenever a shovelful landed on the burning fuel bed. Alternatives immediately available were carefully-planned, rather than random, shoveling, down-draft, and the use of anthracite and low-volatile content bituminous coal or coke, all of which were more expensive than soft coal. Development over the ensuing decades, motivated in part by the desire to abate smoke, but also to increase combustion efficiency and capacity, and decrease labor, led sequentially to a variety of forms of automatic stokers, of pulverized coal firing, of oil and gas burning furnaces, and of the totally electric home. Each of these successive developments decreased the amount of smoke emitted per Btu utilized, but, all of them except oil and gas firing increased emissions of solid particulate matter so that as progress was made toward eliminating smoke emissions, a major

Table VII. State air pollution control legislation.

State	Date of original law	Number of original law	Dates of amendments
Alabama	1969	Title 22, Chapt. 28, Act. 1135, S 520	1971, 1980
Alaska	1969	Title 44, Chapt. 46; Chapt. 86 (1969)	1971, 1972, 1973, 1976, 1977, 1978
Arizona	1967	Title 36, Chapt. 6, Art. 8; Chapt. 2 (1967)	1969, 1970, 1971, 1972, 1973, 1974 1975, 1976, 1977, 1978
Arkansas	1965	Sec. 81-1901 et seq., Act 183 (1965)	None
California	1956	Div. 1, Part I, Chapt. 2, Art. 9, Div. 26	1960, 1967, 1968, 1979, 1980
Colorado	1966	Title 25, Art. 7, Senate Bill 69 (1970)	1969, 1973, 1974, 1977, 1978, 1979
Connecticut	1967	Title 22a, Chapt. 360; Chapt. 439 (1971)	1971, 1973, 1974, 1975, 1977, 1978, 1979
Delaware	1966	Title 7, Chapt. 60; Chapt. 442, Vol. 55, Title 29, Chapt. 80 (1966)	1969, 1974, 1975, 1977, 1979
Florida	1957	Chapt. 403 Part I; Chapt. 88-9 (1957)	1967, 1969, 1970 thru 1978
Georgia	1967	HB 1545 (1978); Chapt. 88-9 (1967)	1978
Hawaii	1957	Chapt. 342 (1972); Chapt. 47 part V (1957)	1972, 1973, 1974, 1977, 1979
Idaho	1959	Title 39, Chapt. 1	1967, 1972, 1973, 1975, 1976, 1978
Illinois	1963	PA76-2429 (1970); House bill 3788 (1963)	1970, 1977, 1978, 1979, 1980 1981
Indiana	1961	Title 13, Art. 1, Chapt. 1; Chapt. 171 (1961)	1969, 1978
Iowa	1967	Title 17, Chapt. 445B (1977); Chapt. 162 (1967)	1971, 1977
Kansas	1967	Chapt. 65, Art. 30; Chapt. 347 (1967)	1970, 1973, 1974, 1975, 1976, 1978
Kentucky	1966	Chapt. 224, Revised Statutes	1968, 1972, 1974, 1976, 1978
Louisiana	1964	Title 30, Chapt. II (1979); Chapt. 12 Title 40 (1964)	1979, 1980
Maine	1969	Title 38, Chapt. 4; Chapt. 474 (1969)	1971, 1972, 1973, 1975, 1976, 1977, 1979, 1980
Maryland	1967	Article 43, Sec. 690–706.	1970, 1979
Massachusetts	1954	Chapt 111, Sec 31C (insert Chapt. 672)	1959, 1963, 1967, 1969, 1971, 1974, 1975, 1979
Michigan	1965	Act. 348 (1965)	1967, 1972, 1976
Minnesota	1967	Vol. 9, Chapt. 116; Chapt. 882 (1967)	1969, 1971, 1973, 1974, 1976, 1979, 1980
Missouri	1965	Title 12, Chapt. 203; pp. 335 et seq. (1965)	1967, 1972, 1979
Mississippi	1966	Title 49, Chapt. 17; Chapt. 258 (1966)	1968, 1970, 1971, 1974, 1977, 1978, 1980
Montana	1967	Title 75, Chapt. 2; Chapt. 313 (1967)	1974, 1975, 1977, 1979
Nebraska	1969	Chapt. 81, Art 15	1971 thru 1977, 1979, 1980
Nevada	1967	Title 40, Chapt. 445	1971, 1973, 1975, 1979
New Hampshire	1967	Chapt. 125C, Art. 433	1979
New Jersey	1954	Chapt. 212, Title 26	1962, 1967, 1970
New Mexico	1967	Chapt. 277 (1967)	1970 thru 1974, 1979
New York	1961	Book 44, Sec. 1264 to 1299	1970, 1972 thru 1979
North Carolina	1967	Chapt. 892 (1967) (Rewriting Art. 21, Chapt. 143)	1969, 1971, 1973, 1975, 1977, 1979
North Dakota	1969	Title 23, Chapt. 23-5; Chapt. 260 (1969)	1971, 1975, 1979
Ohio	1967	Title 37, Chapt. 4; Vol. 132–H689 (1967)	1971, 1972, 1973, 1975, 1979
Oklahoma	1967	Title 63, Art 18; Chapt. 801 (1967)	1971, 1975, 1978, 1981
Oregon	1952	Chapts. 181, 184 and 353 (1979)	1961, 1969, 1977, 1979
Pennsylvania	1960	Title 35, Chapt. 23; PL 2119 (1960)	1968, 1970, 1972, 1976, 1978
Rhode Island	1966	Title 23, Chapt. 23; PL 256 (1966)	1970, 1971, 1974, 1977, 1978, 1979, 1980
South Carolina	1965	Title 70, Chapt. 3, Secs. 70–123	1970, 1971, 1973, 1974, 1975
South Dakota	1970	Chapt. 203, Senate Bill No. 8, Chapt. 34–16A	1973
Tennessee	1967	Title 53, Chapt. 34, Sect 3408-22; Chapt. 367 (1967)	1969, 1970 thru 1975, 1977 thru 1979
Texas	1965	Title 71, Chapt. 4A, Art. 4477-5, Sect. 1-19	1967, 1969, 1971, 1973
Utah	1967	Title 26, Chapt. 24; Chapt. 47 (1967)	1969, 1971, 1973, 1975, 1979
Vermont	1968	Title 10, Chapt 15, Nos. 351-37; Chapt. 47 (1967)	1971, 1972, 1974
Virginia	1966	Title 10, Chapt. 1.2	1970 thru 1973, 1975 thru 1979
Washington	1967	Title 70, Chapt. 70.94; Chapt. 238 (1967)	1969, 1970 thru 1975, 1977, 1979
West Virginia	1961	Chapt. 16, Art. 20; Chapt. 63 (1961)	1963, 1967, 1971, 1979
Wisconsin	1967	Chapt. 83	1977, 1979
Wyoming	1967	Cumulative Supplement, Chapt. 9	1973, 1974, 1975, 1977, 1978

cinder and fly ash problem was created. This was coped with, legislatively, by incorporation in municipal ordinances, starting in the 1930s, of gravimetric emission limits for solid fuel combustion, expressed as grams per cubic foot (STP) of effluent gas, or as pounds per thousand pounds of gas (Table V). In the 1940s, gravimetric limits for solid particulate matter from sources other than solid fuel combustion, and, in the 1950s, standards for the emission of gases, began to be incorporated into ordinances.

During the two decades before 1950, a number of organizations published model smoke abatement ordinances to help communities in the drafting of their legislation (Table VI).

The development of municipal ordinances reached their zenith in the period from 1945 to 1950, with the St. Louis, MO ordinance the exemplar. The exemplar for county ordinances which occurred in the next decade was Allegheny County, PA. Prior to 1958, 18 cities had limitations on the volatile content of coal to be burned. By 1966 there were about 6 communities with limits on the sulfur content of fuel.

In 1946 there were 2 cities; in 1956, 3 cities and 2 counties, and by 1966, 53 cities, and 12 counties with regulations on solid particulate matter emissions from solid fuel combustion sources, including 7 cities and 4 counties with regulations specific for incineration of refuse. By 1966 fifteen cities and 6 counties regulated solid particulate matter emissions from sources other than solid fuel combustion, including two each which regulated metallurgical operations emission. Also 3 cities and 5 counties regulated SO_2 emissions and 2 counties limited organic chemical emissions.

By 1974, there were 40 county ordinances with ambient air quality limits for 19 substances, and 21 municipal ordinances with ambient air quality standards for 13 substances.[5] There were emission standards in over 50 city and county regulations for 29 substances.

State Air Pollution Legislation

The earliest state legislation regulating air pollution that has come to my attention is the Ohio law passed before 1897 requiring that every steam boiler in any city of the first grade of the first class (which most likely meant Cleveland and Cincinnati) shall be constructed or altered "to prevent the production and emission of smoke so far as the same is possible" and that these furnaces be so operated "on pain of fine to the operator." In 1910 and 1912, respectively, the Massachusetts and Rhode Island legislatures passed smoke control laws for Boston and Providence. By the time state agencies proliferated in the 1950s and 1960s, the black smoke problems of the first half of the century had largely disappeared because of the changes in the methods of fuel utilization previously discussed. The first state law to tackle air pollution other than black smoke was the California law of 1947 authorizing counties to regulate air pollution. The first state law to provide state-wide authority to a state air pollution control agency was in Oregon in 1951 (California did not do so until 1957 and only with respect to motor vehicles). The sequence of adoption of state air pollution control legislation is given in Table VII. Although Table I lists only 8 states with air pollution control laws in 1960, there were 9 other states that carried on some state-wide air pollution activities under the authority of their general public health law, and 8 states had enacted legislation authorizing local air pollution control agencies to transcend municipal boundaries i.e. to form city-county or multiple county control agencies.

There has been great reluctance by the states to set air quality standards until forced to do so by the promulgation of National Ambient Air Quality Standards. Prior to 1960 there were no state air quality or deposited matter standards. By 1966, ten states, California, Colorado, Delaware, Missouri, Montana, New York, Oregon, Pennsylvania, South Carolina, and Texas had adopted Ambient Air Quality standards for a total of 14 substances, and for deposited matter. By 1976, nine additional states, Idaho, Kentucky, Louisiana, Minnesota, New Hampshire, New Mexico, North Dakota, Tennessee, and Washington, had adopted such standards but for only two additional substances, but all fifty states had to adhere to the ambient air quality or deposited matter standards for the substances for which EPA had adopted such standards (Table VIII).

Since federal fiscal support of state (and local) agencies, and federal regulatory authority in interstate air pollution, did not start until 1963, there was only the relatively brief period from 1951 to 1963 during which other states could follow the lead of Oregon without federal involvement. It was not until 1967 that there was federal preemption of control of pollution from new motor vehicles, except for California. Prior to 1967, although this area of legislation was open to all the states, only California took advantage of it by adopting state new vehicle regulations in 1960. Prior to the Clean Air Act Amendment of 1970, which set a completely new set of federal-state relations in air pollution control, there were several provisions of federal legislation in which states could have become involved but in which the states unanimously elected not to become involved. These included the opportunity to associate with one another in interstate compacts (1963), to form interstate air quality control agencies to operate in federally designated interstate air quality control regions (1967), and to set air quality standards for these regions.

The only federal legislative provisions from 1955 to 1970 that were favorably responded to by the states were federal research funds available to their academic institutions, federal training programs available to their staffs, and federal technical assistance available to them after 1955, and the various forms of fiscal aid offered them starting in 1963. The increase in municipal and county programs between 1960 and 1970 (Table I) was in part due to the fact that local programs were eligible for federal fiscal aid separate from that available to the states in which they were located. At least one state provided fiscal aid to its cities and counties for this purpose. During the 17-yr period from 1952 to 1970, all the states adopted state-wide air pollution control legislation (Table VII), some of which substituted state for local control; others of which supplemented existing local control with state control in areas without effective local control; and still others of which reorganized existing local control so as to provide local control for all areas of the state.

From Table VII, it is apparent that prior to the passage of PL88-206 "The Clean Air Act of 1963," which made grants-in-aid available to the states, only 11 states had adopted air pollution control legislation but in the six years after the

Table VIII. State air quality and deposited matter standards.[3,4]

Pollutant / Air quality	Number of states having such standards 1966	1976
Total suspended particulate matter	9	50
Oxidant (ozone)	4	50
Carbon monoxide	3	50
Oxides of nitrogen	2	50
Hydrocarbons	0	50
Hydrogen sulfide	6	8
Fluorides	3	6
Beryllium	4	5
Sulfuric acid	3	3
Sulfates	3	3
Lead	2	3
Lime (CaO)	1	1
Asbestos	0	1
Heavy metals	0	1
Ethylene	1	0
Deposited matter	5	10

availability of grant funds, all the remaining states adopted such legislation, presumably to take advantage of federal grant support for programs in their states. In this author's opinion, this eventual development of viable state air pollution control agencies in every state has been the most significant result of federal air pollution control legislation to date.

The Clean Air Act Amendment of 1970 made all the areas of all the states air quality control regions, so that each state had to review its legislation to insure that it provided coverage of all areas of the state. In so doing, many states elected to form single county, multi-county, and city-county air pollution control agencies. As a result, some pre-existing municipal air pollution control agencies were incorporated in these newer units and lost their earlier identity. This accounts for the decrease of municipal programs and increase in county programs between 1970 and 1980 (Table I).

In the 1970s, federal policy was to encourage states to assume as much as possible of the regulatory burden of the 1970, 1974, and 1977 federal air pollution acts. This has required of the states wishing to do so whatever alignment of state legislation that was necessary. In 1956 no state had regulations covering stationary source emissions. By 1966, 6 states had regulations on solid particulate matter emissions, all 6 for incinerators; 3 each for other combustion sources, hot-mix asphalt plants and metallurgical operations; and 2 for cement plants. By 1976, all states had regulations covering particulate matter emissions from all the above processes and some states regulated 52 other industrial operations. By 1966, 3 states had regulations on SO_2 emissions, 2 on H_2SO_4 emissions, and one each on fluoride, hydrocarbon, and NO_x emissions. By 1976, all states had regulations covering SO_2, H_2SO_4, and NO_x emissions, 6 covered HC and 5 covered F and all states regulated CO and H_2S emissions. Fifty-one other substances were covered in at least one state.

Since 1976 the issuance of additional federal new source performance standards by EPA has increased the number of processes regulated by essentially all states as state regulations have kept pace with federal regulations.

There were no state standards for the sulfur content of fuels prior to about 1968, at which time, three states adopted such standards. By 1976, 8 states had adopted sulfur content limits for liquid fuel and 6 for solid fuel.

Federal Air Pollution Legislation (Table IX)

Public Law 84-159, The Air Pollution Control Act (1955)[6-8]

Air pollution hit the national headlines in the 1940s with the Donora, PA episode and Los Angeles smog. The former caused a ripple of concern but was soon forgotten, but the latter continued, grew in intensity, and precipitated the expenditure of millions of dollars for research as to its cause and cure—first by the City and County of Los Angeles, and by local industry, and later by the State of California.

Table IX. Principal federal air pollution control legislation.[a]

Public Law	Name of law	Date of signature	Congressional bill	Statutory designation	Codification	Table no. of legislative history
84-159	Air Pollution Control Act	6/14/55	S928	69 Stat 3221		
86-365	Air Pollution Control Act, Extension	9/22/59	HR7476	73 Stat 646		
86-493	The Motor Vehicle Exhaust Study Act of 1960	6/8/60	HR3238	74 Stat 162		
87-761	Air Pollution Control	10/9/62	S455	76 Stat 760		
88-206	The Clean Air Act of 1963	12/17/63	HR6518	77 Stat 392	42 USC 1857 *et seq.*	X
89-272	The Motor Vehicle Air Pollution Control Act	10/20/65	S306	79 Stat 992	42 USC 1857 *et seq.*	
89-675	The Clean Air Act Amendments of 1966	10/15/66	S3112	80 Stat 954	42 USC 1857 *et seq.*	
90-148	The Air Quality Act of 1967	11/21/67	S780	81 Stat 485	42 USC 1857 *et seq.*	XI
91-604	The Clean Air Act Amendments of 1970	12/31/70	HR17255	84 Stat 1676	42 USC 7401 *et seq.*	XII
92-157	The Comprehensive Health Manpower Training Act of 1971 (Technical Amendments to PL 91-604)	11/18/71				XII
93-15	Clean Air Act, Extension	4/9/73	HR5445	87 Stat 11	42 USC 7401 *et seq.*	
93-319	Energy Supply and Environmental Coordination Act of 1974	6/24/74	HR14368	88 Stat 246		XIII
95-95	The Clean Air Act Amendments of 1977	8/7/77	HR6161	91 Stat 685	42 USC 7401 *et seq.*	XV
95-190	The Safe Drinking Water Act of 1977 (Technical Amendments to PL 95-95)	11/16/77				XV

[a] Congressional documents are identified by the number of the Congress and its session. Each Congress lasts two years. The first sessions are the odd years; the second session the even years. The Congresses over the period of this narrative run from the 81st (1950) through the 86th (1960), 91st (1970) and 96th (1980). Congressional documents, reports and public laws are given sequential numbers prefixed by the number of the Congress, e.g. 91–26. Bills introduced in the Senate are designated "S;" those in the House of Representatives "HR." They are separately numbered sequentially in each Congress, starting with "1" for the first bill introduced in each house in each Congress. A bill can emerge from a subcommittee or committee with the same number as a bill considered by the committee or, if the committee makes substantial changes on bills it considered, with a new number. When bills passed by both houses differ, they go to a conference committee of members of both houses to prepare a compromise bill. The committee can give the bill reported out either a Senate or a House number before returning it to both houses for final approval. The Congress can order the preparation and publication of the legislative history of any of its laws and has done so for many of the air pollution control laws.

Congressional hearings and reports are separately published by the Senate and the House. Their contents, debates and related matters are also published in the Congressional Record.

In December 1949 President Truman instructed his Secretary of the Interior to create a federal interdepartmental committee to organize the *First U.S. Technical Conference on Air Pollution*, which was held in Washington, DC in May 1950 with over 750 people in attendance.

The California delegation in Congress felt that air pollution research efforts and cost should be borne nationally rather than just by California, so they initiated federal legislative action in 1950 that has continued to this day. Resolutions to this effect were introduced in the House in 1950 but died in committee, and in 1952, when they passed the House on July 2, 1952 but died in the Senate on July 4, 1952, because of an objection by a conservative Republican senator during a Senate session that could pass bills only by unanimous consent. Similar resolutions were introduced in Congress in 1953 but not acted upon. Senators Thomas H. Kuchel (R.-Calif.) and Homer E. Capehart (R.-Ind.) on August 5, 1954 unsuccessfully tried to add funds for air pollution research to a housing bill. They then recommended that President Eisenhower form an Interdepartmental Committe on Air Pollution. As a result, in the fall of 1954, the Secretary of Health, Education and Welfare appointed an ad-hoc Interdepartmental Committee on Community Air Pollution. The Surgeon General of the Public Health Service was appointed Chairman and there were representatives on the committee of the Secretaries of Defense, Agriculture, Commerce, and Interior, the Atomic Energy Commission, and the National Science Foundation. [NOTE: Hereafter in this text, when the words "the Secretary" are used, they mean the "Secretary of Health, Education and Welfare.]

On January 6, 1955, in his State of the Union message, President Eisenhower asked the Congress to give its attention to the air pollution problems of the nation. In his special message on Health Programs, on January 31, he asked for increased Public Health Service appropriations to be used for air pollution studies. This led to the introduction in the Senate by Senators Kuchel and Capehart of S928, "The Air Pollution Control Act." There being no Senate or House committee charged with responsibility for air pollution legislation, the Senate Subcommittee on Flood Control-Rivers and Harbors, of the Committee on Public Works assumed responsibility and included air pollution in its hearings on Water and Air Pollution Control in April 1955. Although Senator Robert S. Kerr (D.-Okla.) was the subcommittee chairman, he allowed Senator Kuchel to chair the air pollution part of the hearings on the subcommittee bill. S928 was reported out on May 3, 1955, passed the Senate, authorizing $3,000,000 annually for 5 years for air pollution research, training, and technical assistance. When the House committee reported out the bill in June it increased the authorization to $5,000,000 annually for five years. (The actual 1956–60 appropriation was $16,500,000). The House passed the bill on July 5, 1955 by voice vote after making some amendments. On the next day the Senate agreed without debate, to the bill as amended by the House. It was signed by President Eisenhower on July 14, 1955 as P.L.84-159 (69 Stat. 322). The law authorized the Secretary to assist state and local air pollution control agencies by research, training, and technical assistance. The Secretary assigned the responsibility to the Division of Sanitary Engineering Services of the Public Health Service, which had anticipated congressional action by starting these activities at the Robert A. Taft Sanitary Engineering Center in Cincinnati, Ohio on January 1, 1955, using its previously appropriated general funds.

Public Law 86-365—Air Pollution Control Act, Extension (1959)[6-8]

There was no legislative activity in 1956 or 1957, although in 1957 the Surgeon General of the Public Health Service appointed a national advisory committee on community air pollution. Also in 1957, at the urging of the California House delegation, Rep. L. A. Fountain (D.-N.C.) took his Subcommittee on Intergovernmental Relations of the House Committee on Government Operations, to Los Angeles, CA for one day of hearings.

On March 11, 1958, the Special Subcommittee on Traffic Safety of the House Committee on Interstate and Foreign Commerce, with Kenneth Roberts (D.-Ala.) as chairman, held hearings on "Unburned hydrocarbons," after which Rep. Paul F. Schenck (R.-Ohio) introduced HR9368, a bill to require the Surgeon General of the Public Health Service to publish standards on the amount of unburned hydrocarbons from motor vehicles that are safe to human health. The bill was opposed by the Department of Health, Education and Welfare because of the inability of the Public Health Service to define what concentration of hydrocarbons should be considered "dangerous." The bill died in subcommittee. [NOTE: Hereafter in this paper when the word "Department" is used, it means the "Department of Health, Education and Welfare]. Later in 1958, the above noted House Subcommittee on Intergovernmental Relations touched on air pollution matters in a hearing at which Surgeon General Leroy E. Burney stated that the Department opposed being given air pollution enforcement power because of their inability to prescribe control technology.

On November 18–20, 1958, the Public Health Service held the first National Conference on Air Pollution in Washington, DC. On December 1, 1958 the Secretary (Arthur S. Flemming) recommended that the Federal Government be allowed to hold hearings, and make recommendations on air pollution problems, despite the fact that the Public Health Service was still opposed to assuming more than its then limited apolitical role of research, training, and technical assistance. In April 1959, still without the support of the Public Health Service for these same reasons, Secretary Flemming had his staff draft a bill to incorporate his views on the Department's role in air pollution control. Part of the Public Health Service's concern was that asking the Congress for greater authority might endanger the extension of its existing air pollution authority under the 1955 act which was due to expire, and which the Public Health Service wished to have extended without a date limitation or a limitation on authorized funding. What the Public Health Service really wanted at this stage of air pollution legislation development was not a separate air pollution law but rather incorporation of its air pollution authority in a revision of the organic Public Health Service Act.

In considering the extension of the 1955 act, the Senate Public Works Committee bill retained date and fiscal authorization limits, but changed them to a 4-yr further extension and a $7,500,000 annual authorization. In April 1959 the bill passed the Senate as reported out by the committee. In May and June 1959 the House Interstate and Foreign Commerce Committee Subcommittee on Health and Safety, with Kenneth Roberts (D.-Ala.) as its new chairman, held two days of hearings on the proposal to extend the Air Pollution Control Act of 1955. The committee's report recommended an annual authorization ceiling of $5,000,000 and only a 2-yr extension to allow the next Congress (the 87th) to reconsider the whole matter of air pollution legislation. The Committee's bill, HR7476, with these limits passed the House with little debate. The conference committee agreed on a 4-yr extension (which is what the Senate passed) and a $5,000,000 annual authorization (which is what the House passed). The Conference Committee bill HR7476 passed both houses of Congress as the Air Pollution Control Act Extension and was signed by President Eisenhower on September 22, 1954 as PL 86-365 (73 Stat 646). The actual appropriations for the years 1961–3 were $25,800,000.

It should be noted that the initiatives by the Senate Committee on Public Works and the House Committee on Interstate and Foreign Commerce resulted in these committees retaining thereafter responsibility for air pollution legislation, although the subcommittees these committees have used for this purpose have kept changing over subsequent years.

(Henceforth, in this paper, the phrases "Senate Committee" and "House Committee" mean these committees. [The Senate Committee changed its name to the "Committee on Environment and Public Works" in 1977]). Thus the House Committee used its Subcommittee on Health and Safety to hold hearings on July 8, 1959 on "Motor Vehicle Safety," that included testimony relating to automotive air pollution. Following these hearings, Rep. Schenck introduced a revision of his 1958 bill prohibiting the use of motor vehicles in interstate commerce if their emissions were dangerous to health, and, this time, calling for National Uniform Automotive Exhaust Standards. This bill was opposed by both the Public

Table X. Legislative history of PL 88-206, "The Clean Air Act of 1963."

1963	
Jan 17	President Kennedy's Budget Message to Congress asked for an increase in air pollution funds.
Jan 23	S 432 "The Clean Air Act" introduced in the Senate by Senator Abraham Ribicoff (D.-Conn.) former Secretary, with 19 co-sponsors, including Senator Thomas Kuchel (R.-Cal.), Mike Mansfield (D.-Mont.), Hubert H. Humphrey (D.-Minn.). Included 10 year/$74 million grant-in-aid program for ⅔ cost of establishing and maintaining air pollution control programs, grants allocated on basis of population, extent of air pollution control problem and financial need of recipient agency; special financial incentives for multi city, county, or state (i.e. regional) programs; allow the Secretary to request the U.S. Attorney General to bring suit on behalf of the U.S. to secure abatement of both interstate and intrastate pollution, with written permission of the Governor to initiate intrastate action.
Jan. 23	S 444 Introduced in Senate by Senator Clair Engle (D.-Calif.) and Maurine Neuberger (D-Ore.), with 9 co-sponsors, including three who were also co-sponsors of S-432.
Feb 7	President Kennedy's Special Message on Health to Congress endorsed the concepts included in S-432.
Feb 28	HR 4415 introduced in House by Rep. Roberts (D.-Ala.) Included a 5 year/$30 million grant-in-aid program for ⅔ cost of establishing and maintaining air pollution control programs. Federal enforcement of interstate pollution and state enforcement of intrastate pollution.
Mar 18–19	Rep. Seymour Halpern (R.-N.Y.) introduced bill identical to HR 4415. Rep. Peter Rodino (D.-N.J.), James G. Fulton (R.-Pa.) introduced bill almost identical to S432 except that it limited authorization for grants to 5 years and $30 million.
Mar 18–19	Hearings "Air Pollution" on HR 4415, HR 4750, HR 3507 and HR 4061, Subcommittee on Public Health and Safety, House Committee. 28 witnesses including Undersecretary Ivan Nestingen, Surgeon General Luther Terry, Vernon G. MacKenzie, Dr. Richard Prindle of the Public Health Service, the Mayors of Chicago and Pittsburgh, representatives from Los Angeles, Florida and the N.Y./N.J. and Conn. Interstate Sanitation Commission, of organizations representing city, county, state and industry.
Apr 30	New Chairman of Senate Committee (Pat McNamara (D.-Mich.)) creates Special Subcommittee on Air and Water Pollution, with Edmund Muskie (D.-Me.) as chairperson. (Members—Democrats—Jennings Randolph (W.Va.), Frank Moss (Utah), Lee Metcalf (Mont.), Birch Bayh (Ind.), Gaylord Nelson (Wis.); Republicans—Caleb Boggs (Del.), Josh Miller (Iowa), James B. Pearson (Kansas).
June 27	House Committee unanimously votes out an amended version of HR 4415—HR 6518. Amendments included limitation of grant authorization to $5 million for fiscal year with an additional $5 million for FY 64 and thereafter $20 million for FY 65, $30 million for FY 66 and $35 million for FY 67. Assurances required by Governor that a good faith effort had been made to resolve problem before requesting the Secretary to ask the U.S. Attorney General to bring suit.
July 9	Report on HR 6518 (Report 88-508).
July 16	Open rule from Ways and Means Committee for one hour debate on HR 6518.
July 24	Debate on HR 6518—9 speakers favorable and 4 opposed; move to recommit by Rep. Ralph Harvey (R-Ind.) rejected 41/29. Bill passed on roll call 272-102.
Sept 9–11	Hearings, "Air Pollution Control," Special subcommittee on Air and Water Pollution, Senate Committee in Washington, DC, on S 432, S 444, S 1009, S1040, S 1124, and HR 6518. 25 persons testified during 14 hours of hearings including Secretary Cellebreze and Vernon G. MacKenzie of the Department; the Mayors of Chicago and Pittsburgh, representatives of Los Angeles; associations representing city, county and state governments and industry; as well as four senators supporting the legislation.
Oct 31	Report by Special Subcommittee reporting out S 432 and HR 6518.
Nov 7	Senate Committee reports (Report 88-638) out bill approved by Special Subcommittee on Air and Water Pollution after rejecting two amendments by voice vote. Bill included 5 year/$182 million grant-in-aid program ($25 million for FY 65 to $50 million for FY 69), 12½% limit on funds to any one state. Retained ⅔ and ¾ limits on federal matching funds for grants. Secretary to pay attention to population, extent of air pollution problem and financial need of recipient agency in awarding grants. To be eligible for grants, an agency could not reduce its nonfederal funding of programs in previous year. State approval required of local requests for federal grants. The Secretary to have flexibility as to percent of grants to be reserved for interstate and inter-municipal programs; develop air quality criteria; undertake research on sulfur oxides and automobile exhaust; the Secretary to issue permits to federal installations for emission discharge. Written consent of Governor required before initiation of suit by U.S. Attorney General. Written reports from industry to be based on existing data thereby not requiring new tests to be made.
Nov 19	Senate debate and passage of S 432, accepted by voice vote after accepting two amendments by Sen. Jacob Javits (R.-N.Y.) to require consultation with state agency before approving grant to a municipality in that state, and giving State Governors choice of requesting federal technical assistance or requesting the Secretary to ask U.S. Attorney General to file a suit for air pollution enforcement.
Dec 5	Conference Committee report (HR 6518)—(House Report 88-1003). Conferees accepted Senate bill except to change grant authorization from $182 million over 5 years to $95 million over 3 years.
Dec 10	Conference report adopted by Senate by voice vote and by house, after some debate—273/109.
Dec 17	President Johnson signs PL 88-206 "Clean Air Act of 1963) (HR 6518) (77 Stat 392) (42 USC 1857 *et seq.*).

Health Service (for the same reason they opposed the previous bill) and the automobile industry, and died in subcommittee.

The Motor Vehicle Exhaust Study Act of 1960[6-8]

On February 23, 1960 the Subcommittee on Health and Safety of the House Committee again held hearings, this time on "Air Pollution Control Progress," after which Rep. Schenck introduced a bill, the Motor Vehicle Exhaust Study Act of 1960 (HR 3238), requiring the Secretary to report to Congress in two years on "Motor Vehicles, Air Pollution and Health." This bill passed in the House on August 17, 1959 and was referred to the Senate Committee on Labor and Public Works, which reported it out. The bill was passed by the Senate in May 1960. It was signed by President Eisenhower as PL 86-493 on June 8, 1960.

In 1960 the House Subcommittee on Health and Safety, with Rep. Kenneth Roberts as chairman, held hearings on automobile exhaust, and in June 1960 the Senate Committee on Public Works reported out a bill introduced by Senator Kuchel to allow the Surgeon General of the Public Health Service to hold hearings on air pollution problems. This bill passed the Senate, but, despite the fact that Rep. Roberts introduced a similar bill in the House, it died in the House Committee.

In January 1961, Senator Kuchel reintroduced his 1960 bill. In September 1961, the Senate again passed the bill only to have it again die in the House Committee.

In February 1961, President Kennedy in his Special Message to Congress on Natural Resources proposed new air pollution authority be given the Public Health Service. In November 1961, the House Subcommittee on Health and Safety held one day of hearings in Birmingham, AL at which the representative of the Public Health Service reiterated the desire of the Service to limit its air pollution responsibility to research, training, and technical assistance.

In his Special Message to Congress on Health Care on February 27, 1962 President Kennedy asked the House to pass the bill that had passed the Senate the previous year but which had died in the House. In February 1962, the Secretary, Abraham Ribicoff, announced that the *Second National Conference on Air Pollution* would be held in Washington in December.

Throughout 1961 and 1962 there was much internal debate on the federal role in air pollution, within the Department, the Bureau of Budget, the Bureau of Mines of the Department of the Interior, and the Bureau of Standards of the Department of Commerce. There was also debate with representatives of the organizations acting as spokesmen for city, county, and state governments, and of industry, about how deeply the Department should get involved in the elements of actually controlling air pollution; i.e. standard setting and enforcement of standards in both interstate and intrastate pollution problems. These discussions have been written up by Ripley[6] in greater detail than can be afforded in this paper.

In 1961 the Public Health Service combined the previously existing Air Pollution Engineering Program of the Division of Sanitary Engineering Services and the Air Pollution Medical Program into a new Division of Air Pollution.

Public Law 87-761—Air Pollution Control Act, Extension (1962)[6-8]

To accommodate the President, on March 1, 1962 Rep. Kenneth Roberts (D.-Ala.) Chairman of the Subcommittee on Health and Safety of the House Committee introduced an Administration bill which eliminated time and fiscal authorization limits on air pollution research; called for a conference procedure to resolve problems of interstate air pollution; and provided fiscal grants-in-aid to develop, establish, and improve state and local air pollution control programs. The bill died in committee, forcing the introduction of a bill to extend the life of the Air Pollution Control Act of 1955 (PL 84-159) which was again due to expire. This was done by the passage of S455 "Air Pollution Control Act Extension" by the congress in June 1962, which was signed by President Kennedy on October 9, 1962 as PL 87-761 (76 Stat 760). It provided a 2-yr extension at $5,000,000 annual authorization and required the Surgeon General to make the Public Health Service study of motor vehicle exhaust a permanent part of its program.

In June 1962, the Secretary delivered to the Congress the report, "Motor Vehicles, Air Pollution and Health" (House Document 87-489) required by PL 86-493.

In October and November of 1962 somewhat similar bills were introduced in the Senate by Clair Engle (D.-Calif.) and in the House by George M. Rhodes (D.-Pa.) which conferred more authority for air pollution control on the Department than had any previous bills, but neither of these bills was acted upon in 1962.

Public Law 88-206—The Clean Air Act of 1963[6-8]

Prior to 1963, air pollution had not engendered much national concern. Four events in 1962 that may have given impetus to the considerable ferment of air pollution legislative activity in 1963 were: a) the publication of Rachel Carson's *Silent Spring*;[9] b) the London Smog Disaster of 1962; c) an air pollution episode in Birmingham, AL, the constituency of Rep. Roberts; and d) the previously noted Second National Conference on Air Pollution held by the Department in Washington, DC on December 10–12 with an attendance of about 1500 people. By this time the Department had finally decided to seek to have its air pollution authority strengthened. The principal architects of the planning which led to this decision were Vernon MacKenzie of the Public Health Service, (assisted by Sidney Edelman and Samuel Rogers) and Wilbur Cohen, Assistant Secretary. A major spokesman for strengthening federal air pollution authority was Hugh Mields, representing the U.S. Conference of Mayors.

Patrick McNamara (D.-Mich.) who had just become chairman of the Senate Committee created a Special Subcommittee on Water Pollution, with Edmund Muskie (D.-Me.) as chairman. Later in the year this subcommittee was also given jurisdiction over air pollution legislation. Thus the principal Congressional leaders in 1963 became Roberts, Schenck, and Muskie. Rep. Roberts left the House in 1964. His role was assumed by Rep. Paul Rogers (D-Fla.). Roger's importance was not because he was initially Chairman of the Subcommittee on Health and Welfare but because the Chairman (John Jarman (D-Okla.)) allowed Rogers to have primacy in air pollution legislative matters, which he retained until he left the House in 1978. Mr. Muskie retained his primacy until he left the Senate in 1980 to become President Carter's Secretary of State. Senator Muskie's principal associates in the early years of the several Senate subcommittees were Thomas Eagleton (D-Mo.), Caleb Boggs (R-Del.) and Howard Baker (R-Tenn.).

The detailed legislative history of the Clean Air Act of 1963 is given in Table X. However Table X does not reveal the internal interplay among the staffs and officials of the Department, the members of Congress and their staff members, the Bureau of the Budget, and the lobbyists for organizations representing both nonfederal governmental agencies and industry, that occurred in 1963 and resulted in this landmark legislation. Ripley[6] is our best source of insight into this interplay.

President Kennedy's February 7 special message on health recommended the same features as Kenneth Roberts' Bill of 1962 (S432) i.e. grants-in-aid to develop, establish and improve state and local air pollution control programs; a conference procedure to resolve problems of interstate air pollution; and elimination of time and fiscal authorization limits

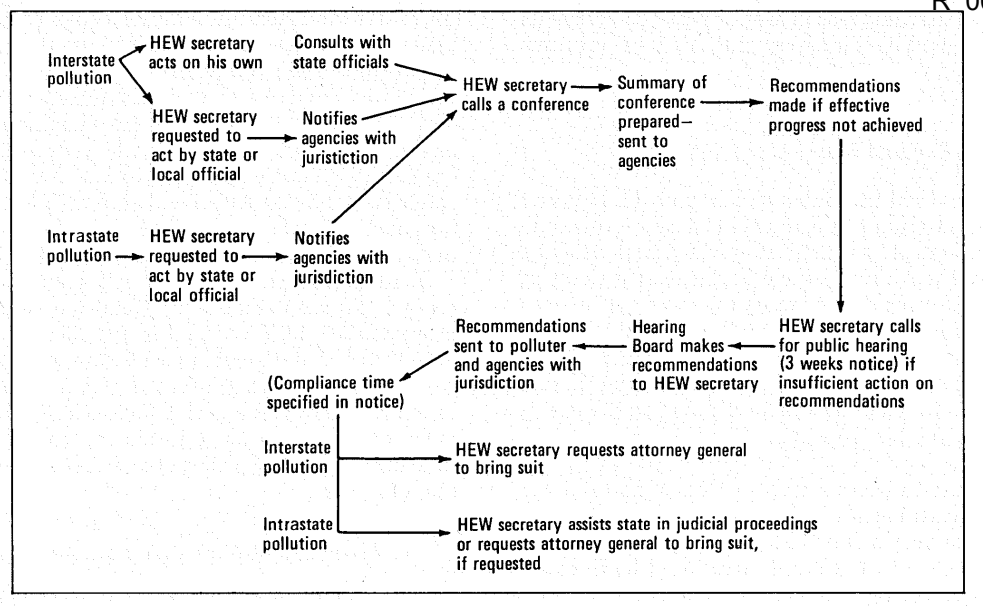

Figure 1. Air pollution abatement procedure of "Clean Air Act of 1963" (PL 88-206).[8 a]

[a] This figure is reprinted with permission from *Clean Air: The Policies and Politics of Pollution Control.* Charles O. Jones. University of Pittsburgh Press. 1975.

on air pollution research. The bill as signed by President Johnson contained these features, made permanent the air pollution authority of the Department; required semi-annual reports to the Congress from the Surgeon General of the Public Health Service on Motor Vehicle Emissions; established a technical committee to evaluate progress, and authorized appropriations of $65,000,000. Over the next three years, the actual appropriations for the period 1964–66 were $60,700,000. The conference procedure included for the control of air pollution is that of Figure 1.

By the time of the next major revision of the Clean Air Act in 1967, there had been no request to the Secretary for intrastate pollution abatement and only three requests for federal intervention in interstate pollution abatement. The Secretary initiated five interstate abatement actions on his own recognizance. Very little air pollution abatement was actually accomplished by these procedures, which were later abandoned.

The large increase in fiscal authorization was for the initiation of fiscal grants-in-aid to state and local air pollution control agencies.

Public Law 89-272-The Motor Vehicle Air Pollution Control Act (1965)[6-8,10-12]

In 1964 the Special Subcommittee on Air and Water Pollution of the Senate Committee held hearings on "Clean Air" and in October published a Staff Report "Steps Toward Clean Air."

In January 1965, the Surgeon General of the Public Health Service submitted his first semi-annual report on "Automotive Air Pollution" as required by P.L. 88-206, and Senator Muskie introduced S306. The Special Subcommittee on Air and Water Pollution of the Senate Committee held hearings on "Air Pollution Control" in Washington, D.C., Los Angeles, Denver, Chicago, Boston, New York, and Tampa. S306, among other things allowed the Secretary to set emission standards for new motor vehicles. This was opposed by James Quigley, Assistant Secretary, speaking for the Johnson Administration, in testimony April 6, 1965. The public reaction to this testimony was so adverse that the Administration reversed its position and allowed Mr. Quigley to testify on April 9 in support of S306, provided its language was improved.

The Motor Vehicle Air Pollution Control Act PL 89-272 (79 Stat 992) (42 USC 1957 *et seq.*) resulted from the passage of S306, and was signed by President Johnson on Oct. 20, 1965. The law allowed the Secretary to set emission standards for new motor vehicles but set no deadline for his so doing. However, in the hearings, the Department agreed to set standards for the 1965 model year. (They actually were set the same as the California standards for the 1967 model year.) The law also contained provisions for the control of international air pollution between the US, Canada and Mexico, and called for additional research into problems of sulfur dioxide and motor exhaust.

Public Law 89-675—The Clean Air Act Amendments of 1966[6-8]

The Surgeon General of the Public Health Service submitted his second, third, and fourth semi-annual reports to Congress on "Automobile Air Pollution" required by PL 88-206 in 1965 and 1966. Also in 1966 the Public Health Service created the National Center for Air Pollution Control to replace its Division of Air Pollution. It was one of five units in a new Bureau of Disease Prevention and Environmental Control. The Clean Air Act of 1963 (PL 88-206) was due to expire in 1966. Its life was extended by S3112 which was passed by both houses of Congress and signed into law by President Johnson as PL 89-675, the "Clean Air Act Amendments of 1966" (80 Stat 954) on October 15, 1966. PL 89-675 in addition to extending PL 88-206, also gave the Department the authority to make grants-in-aid to state and local agencies to maintain existing pollution control programs. This had not been covered by previous authority for grants to develop, establish and improve such programs. The appropriation authorized for 1965–66 was $55,500,000. The actual appropriations were $47,700,000.

Public Law 90-148—The Air Quality Act of 1967[7,8,10-15]

By 1966, Jennings Randolph (D-W.Va.) had become chairman of the Senate Committee. He was personally interested in air pollution legislation and had appointed himself to the subcommittee. Most of the same people who had been influential in drafting and passing the 1963 legislation were still on the scene and active in developing new legislation; particularly MacKenzie, Cohen, Coston for the Department. A new actor was Joseph Califano, Special Assistant to President Johnson.

William B. Spong (D-Va.) had become active on the Senate Subcommittee and the important influence of the Senate

Table XI. Legislative history of PL 90-148, "The Air Quality Act of 1967."

1967	
Jan 30	Message to Congress "Protecting our Natural Heritage" by President Johnson (House Document 90-47).
Jan 31	HR 4279 introduced by Staggers (D.-W. Va.).
Jan 31	S 780 introduced by Muskie (D.-Me).
Feb 13, 14, 20, 21	Hearings "Automotive Air Pollution—1967—Part I". Subcommittee on Air and Water Pollution, Senate Committee.
April 3, 4 (Feb 8)	Hearings "Air Pollution—Part 2." Subcommittee on Air and Water Pollution, Senate Committee.
April 6	Amendment 154 to S 780 (Randolph—D.-W. Va.).
April 24	Amendments 174 and 175 to S 780 (Randolph—D.-W. Va.).
May 1	HR 4509 introduced by Staggers (D.-W. Va.).
May 2	Amendment 181 to S 780 (Randolph—D.-W. Va.).
July 15	Senate Committee Report on S 780 (Senate Report 90-403).
July 18	Senate debate and passage of S 780 (80-0).
Aug 15	Hearings "Air Quality Act of 1967," House Committee (8 days of hearings).
Oct 3	House Committee report on S 780 (House Report 90-728).
Nov 2	House Debate and Passage of S 780 (362-0).
Nov 9	Senate insists on its amendments, requests conference and appoints conferees (Muskie, Randolph, Bayh, Boggs, Cooper).
Nov 13	House insists on its amendments, agrees to conference and appoints conferees (Staggers, Jarman, Rogers (Fla.), Springer, Nelson).
Nov 13	Conference report on S 780 (House Document 90-916).
Nov 14	Debate and passage of Conference Report (Voice Vote)—Both houses.
Nov 21	Signing of PL 90-148 "The Air Quality Act of 1967" (S 780) (81 Stat 485) (42 USC 1857 *et seq.*) by President Johnson.
1974	
Jan	Section-by-section Index of PL 90-148 and 91-604 (In "Legislative History of Clean Air Amendments of 1970" pp. 1575–1596, Vol. 2—See reference at the beginning of Table XII.)

Subcommittee staff, particularly of Leon Billings, was beginning to be felt. A key event that helped set the stage of the 1967 legislation was the third National Conference on Air Pollution held by the Public Health Service in Washington on December 12–14, 1966. Also in 1966 the Subcommittee on Air and Water Pollution of the Senate Committee held hearings—"Air Pollution—1966"

President Johnson sent a message "Protecting our National Heritage" to Congress on January 30, 1967, in which he recommended legislation incorporating national emission standards for stationary sources, regional air quality commissions to enforce regulations, federally financed and operated regional airsheds, federal assistance to initiate state automobile exhaust inspection, federal regulations on fuel additives, and increased research. The detailed legislative history of PL 90-148 "The Air Quality Act of 1967" (91 Stat 485) that was developed in 1967 is given in Table XI.

In the hearings, industry opposed national emission standards. The bill reported out by Senate Committee deleted national emission standards from the bill but instead required a report from the Department in two years on national emission standards. The bill as reported allowed California to set its own motor vehicle emission standards and included regional commissions as part of a stationary source enforcement process relying on state initiative. The House Committee report accepted the Senate position on national emission standards, deleted the waiver allowing California to set its own automobile emission standards and reduced the level of funding authorized in the Senate bill. During House floor action on the acceptance of the House Committee report, the California waiver was restored.

The law, as signed by President Johnson on November 21, 1967, added authorization for grants-in-aid to states and local air pollution control agencies to plan air pollution control programs, in addition to the previous authority for development, establishment, improvement, and maintenance grants. It provided for interstate air pollution control agencies or commissions, and expanded research provisions relating to fuels and vehicles. It also required the Department to define the atmospheric areas of the nation, to publish Air Quality Criteria and Control Technology Documents from which the states were to set air quality standards for the air quality control regions that were required to be established. States which set air quality standards were required to submit to the Department plans for their implementation (Figure 2). The Department was given power to seek federal injunctions in air pollution episode situations, was required to reconsider the SO_2 criteria document previously issued, to establish a fuel additive registration program and financial assistance to states for motor vehicle inspection programs. During 1967 the fifth and sixth semi-annual reports on "Automotive Air Pollution" were submitted to the Congress by the Surgeon General of the Public Health Service as required by PL 88-206.

The Department reorganized in 1968, abolishing the Public Health Service as an organizational unit but still retaining its

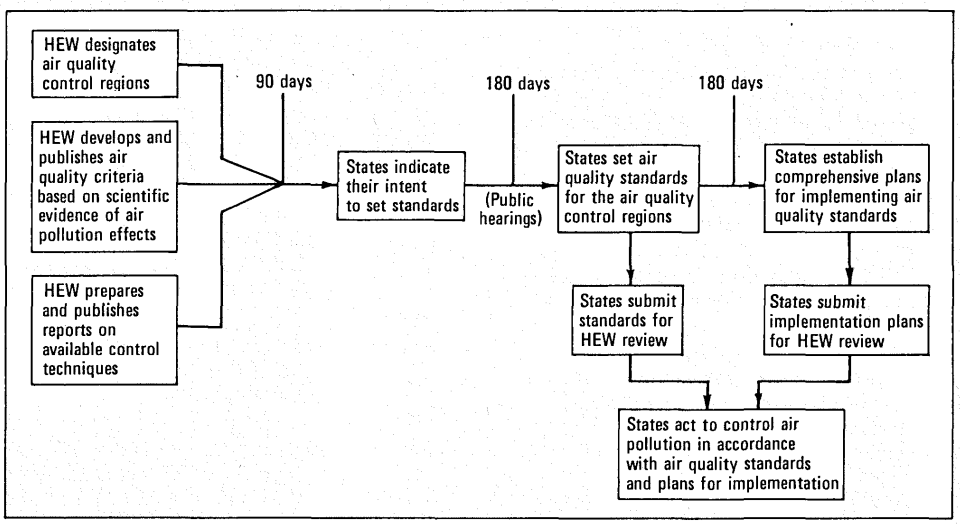

Figure 2. Air pollution abatement procedure of "Air Quality Act of 1967" (PL 90-148).[16]

commissioned corps. The National Center for Air Pollution Control was replaced by the National Air Pollution Control Administration which was one of the three units in a new Consumer Protection and Environmental Health Service. On June 28, 1968, the Department submitted to Congress the first annual report, "Progress in Prevention and Control of Air Pollution" (Senate Document 90–92) required under Section 306 of PL 90-148.

Early in 1969, President Nixon requested his Presidential Advisory Council on Executive Reorganization (Roy Ash, Chairman) to study whether federal pollution control programs should be reorganized. The Council recommended to the President in April 1970 that the several federal programs should be brought together under either a new Department of Natural Resources, or a special pollution control agency. The President adopted the latter recommendation and, on July 9, 1970 sent to Congress Reorganization Plan #3, creating, on December 2, 1970, a U.S. Environmental Protection Agency (EPA). Since Congress did not exercise its right to rejection of the plan by September 9, EPA was created on schedule. It absorbed the National Air Pollution Control Administration of the Department, which became the Air Pollution Control Office of EPA, with its staff reduced from 1000 to 300 employees. The remaining 700 employees were spread throughout the other offices of EPA.

This digression about the formation of EPA gets us a year ahead of our story, so to get back to other events of 1969, first it was necessary to pass legislation in 1969 to extend the research provisions of the previous acts. In May, the President created a cabinet level Interagency Environmental Quality

Table XII. Legislative history of PL 91-604, the "Clean Air Act Amendments of 1970."

Reference—Legislative History of Clean Air Amendments of 1970—2 vol. with section by section index prepared by Environmental Policy Division of Congressional Research Service of the Library of Congress for the Committee on Public Works, U.S. Senate, 93rd Congress, 2nd Session, Government Printing Office, Washington, D.C. 1974—Serial 93-18, Superintendent of Documents Y4 P 96/10:93-18, Vol. 1 and 2.

1969	
	Hearings "Air Pollution," Subcommittee on Air and Water Pollution, Senate Committee.
Dec 8	Ad-hoc Hearings "Automotive Pollution", New York City, Rep. Leonard Farbstein (D.-N.Y.) *et al.* Printed in Congressional Record (daily ed.) Feb. 5, 1970 pp. 640–661.
Dec 8–9	Hearings, "Air Pollution Control and Solid Wastes Recycling," Subcommittee on Public Health and Welfare, House Committee.
Dec 10	S 3229, "Air Quality Improvement Act," introduced by Edmund Muskie (D.-Me.) Introductory remarks in Congressional Record. (Extends emission standards to vessels, aircraft and other vehicles.)
1970	
Jan	Message of President Nixon, "State of the Union."
Feb 10	Special message of President Nixon on the environment—calls for national ambient air quality standards and emission standards for hazardous materials.
Feb 10	HR 15848 Administration Bill, introduced by Harley O. Staggers (D.-W. Va.) and Wm. L. Springer (R.-Ill.) Calls for same as noted above, fuel and fuel additive registration. Same automobile exhaust standard setting as in 1965.
Feb 17	Report of Farbstein, *et al.* ad-hoc meetings (see Dec. 8, 1969, above)—Congressional Record (daily ed.) pp. H900-3.
Feb 18	S 3466 Administration Bill, introduced by Hugh Scott (R.-PA), Jennings Randolph (D.-W. Va.) *et al.* (Same as HR 15848, above).
Mar 4	S 3546—Federal/State Air Quality Standard Setting—introduced by Edmund Muskie (D.-Me.) *et al.*
Mar 5–16 (7 days)	Hearings "Air Pollution Control and Solid Waste Recycling," Subcommittee on Public Health and Welfare, House Committee.
Mar 16–22 (10 days)	Hearings "Air Pollution—1970" Parts 1–5, Subcommittee on Air and Water Pollution, Senate Committee.
Mar 20	Report on S 3072 by Senate Commerce Committee, The Federal Low Emission Vehicle Procurement Act—Report 91-745.
Mar 26	Senate debate and passage of S 3072.
Apr 27	HR 17255 Administration Bill, introduced by Rogers (D.-Fla.) *et al.* Each state made an air quality control region, attainment deadlines shortened, control of emissions from aircraft and federal facilities added.
June 3	Report on HR 17255 by House Committee (Report 91-1146).
June 10	House debate and passage (335-40) of House Resolution 1069 permitting amendments to HR 17255 and allowing two hours of debate—this had been objected to by Leonard Farbstein (D.-N.Y.) on basis of too short notice.
June 10	Debate and passage (374-1) of HR 17255, all floor amendments including one for more stringent automobile emission standards having been defeated.
Aug 25	Subcommittee on Air and Water Pollution reported S 4358 to Senate Committee.
Sept 17	Report on S 4358 (Report 91-1196), "National Air Quality Act of 1970," by Senate Committee, contains dissenting views of Dill (R.-Kans.), who preferred congressional rather than judicial review of one year extension of automobile exhaust standards, if granted, and of Gurney (R.-Fla.) who preferred a two year rather than a one year extension. Bill, as reported, includes national ambient air quality standards, emission standards for stationary sources, state implementation plans to achieve national ambient air quality standards by 1975, 90% reduction in automobile emissions by 1975, citizen suits allowed and higher appropriation authority.
Sept 21–2	Senate debate on S 4358. Substitution of S 4358 for HR 17255 and passage (73-0) of S 4358. Both Dill and Gurney dissenting views rejected.
Oct 8	Conference Committee recessed to end of November because of mid-term elections.
Nov 17	Letter to Conference Committee from Secretary Richardson recommending relaxation of CO and HC automobile emission deadline (1975) and NO_x deadline (1976).
Dec 17	Conference Committee report (H 91-1783) to accompany HR 17255.
Dec 18	House and Senate agree to Conference report—Automobile companies allowed to request extension in 1972 rather than 1973 to allow lead time for model changes.
Dec 31	PL 91-604, "Clean Air Amendments of 1970" (HR 17255) (84 Stat 1676) (42 USC 7401 *et seq.*) signed by President Nixon.
1971	
Nov 18	Technical Amendments to PL 91-604 made by PL 92-157 "Comprehensive Health and Manpower Training Act of 1971."
1974	
Jan	Section-by-section Index of PL 90-148 and 91-604 (In "Legislative History of Clean Air Amendments of 1970" pp. 1575–1596, Vol. 2—See reference at the beginning of this table.)

Council. Later in the year Congress passed legislation, approved by the President (42 USC 4341), creating the Council on Environmental Quality. Also the second annual report under Sec. 306 (Senate Document 91-11) and the report on "National Emission Standards" (Senate Document 91-63), both required by PL-148 were submitted to Congress by the Department. Another important action was a consent decree by Chrysler, Ford, and General Motors to cease actions which might have impeded progress on automotive air pollution control. Congressional hearings held in 1969 are a part of the detailed legislative history of the Clean Air Amendments of 1970 which are outlined in Table XII. Appropriation authority for 1967, 1968, and 1969 was $340,000,000. Actual appropriations were $193,000,000.

During 1970, the Department submitted to Congress its third annual report required under Sec. 306 and a report on "Manpower and Training Needs for Air Pollution Control" required by PL 90-148.

Public Law 91-604—The Clean Air Act Amendments of 1970[7,8,10-12,17-19]
(Technical Amendments in Public Law 92-157—The Comprehensive Health Manpower Training Act of 1971)

By 1970, air and water pollution had climbed to top ranking in public concern and had thus become a very important political issue. The environmental activist organizations held an "Earth Day" convocation in Washington, DC that attracted both a large attendance and large media coverage.

When preparations were being made for 1970 legislation, responsibility had moved increasingly to Dr. John T. Middleton, who had become the Chief of the Public Health Services' air pollution activities in 1967, and to his staff. The chairmanship of the House Committee had devolved on Harley O. Staggers (D-W.Va.). The ranking Republican was William L. Springer (Ill.) but Mr. Rogers still held the subcommittee reins. Senator Muskie still held the reins of the Senate committee and was running for the Democratic Presidential nomination.

The roles of both Senate and House subcommittee and committee staffs had become much stronger, lobbying by both industrial and environmental groups had both intensified and become more sophisticated.

The Administration Bill (HR 15848) (Table XII) called for the Secretary to set ambient air quality standards within 6 months; for state and interstate agencies to adopt plans within 9 months to implement these standards; for the Secretary to establish technologically feasible stationary source emission standards (for both new and existing sources), fuel and fuel additive standards, regulations, and registration; and authorized him to test automobiles and engines for certification (and to revoke such certification) using the same emission standards as 1965. After hearings and committee action, the house reported out a revised bill (HR 17255) which added several additional authorizations—the establishment of standards for aircraft emissions by the Secretary after consultation with the Federal Aviation Administration; a requirement that federal facilities comply with federal, state, and local air pollution control regulations; authorization for assembly line testing of motor vehicles; and each state was made an air quality control region. HR 15848 noted above was amended to require the setting of national ambient air quality standards within 30 days instead of 6 months, and submission of implementation plans in 8 rather than 9 months; to allow states to adopt ambient air quality standards more stringent than national standards; and to relax the HR 15848 provisions on fuels and fuel additives.

After hearings and committee action, the Senate reported out S4358, which concurred with HR 17255 in the setting of national ambient air quality standards, the required compliance of federal facilities and the setting of aircraft emission standards. It added new provisions for authorization of citizen

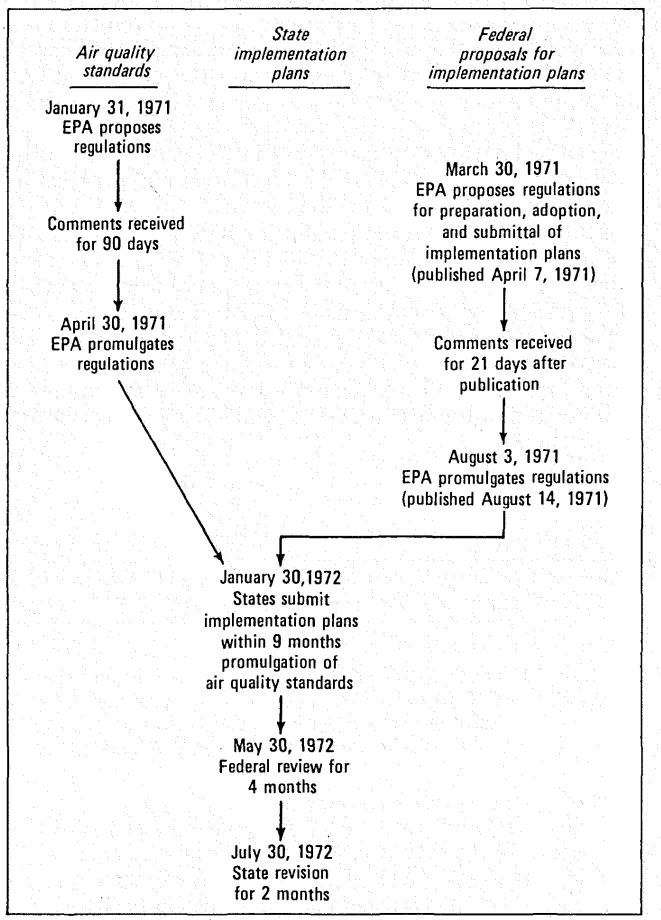

Figure 3. Implementation plan procedure of "Clean Air Act Amendments of 1970" (PL 91-604).[8 a]

[a] This figure is reprinted with permission from *Clean Air: The Policies and Politics of Pollution Control.* Charles O. Jones. University of Pittsburgh Press. 1975

suits for violation of standards, for authorization of aircraft engine testing by the Department of Defense and for judicial review of actions by the U.S. Court of Appeals. It offered a different approach than the House bill on several other issues. It gave the states 9, rather than 8, months for implementing plan adoption, with the requirement that the plan achieve standards within 3 years; limited stationary source emission standards to new sources, but allowed such standards to be set for existing sources of hazardous substances to be designated by the Secretary. It made the regulation, registration, and sale of fuel and fuel additives more stringent than HR 17255. Instead of making each state an air quality control region, it required the Department to expedite its prior program of air quality control region creation.

The most important new provisions of S4358 were those covering automobile emission standards, testing and certification. 1975 model year vehicles (with a possible extension to 1976) were required to have CO and HC emissions 90% less than 1970 models, warranted to provide such reduction for 50,000 miles. The Secretary was also authorized to set standards for used vehicle emission control devices.

The bill that was passed was signed by President Nixon on December 31, 1970 and became PL 91-604 "The Clean Air Act Amendment of 1970." It largely followed the Senate bill (S4358) except that the House bill requirement making each state an air quality control region was retained, and automobile companies were allowed to request an extension of the date of applicability of the stipulated standards in 1972, rather than 1973, to allow them more lead time for model changes. Most of the lobbying and in-fighting in the Conference Committee had been on the matter of the dates of applicability of the automobile emission standards and how (and for

how long) extensions of this date could be obtained. The section of the act that will have the greatest long range impact on air pollution control in the U.S. was the requirement for the promulgation of New Source Performance Standards (NSPS).[20]

Some technical amendments to PL 91-604 were made on November 18, 1971 in PL 92-157, "The Comprehensive Health Manpower Training Act of 1971."

Although Table XII lists under the date January 1974 a section by section index of PL 90-148 and PL 91-604, this index is much less useful than the corresponding index to the 1977 act listed under date August 1978 in Table XV.

The state implementation plan (SIP) procedure (Figure 3) set up by PL 91-604 quickly ran into problems caused by litigation, much of which was on the issue of "Prevention of Significant Deterioration (PSD)." Since I have previously recorded in *JAPCA* the history of PSD from its origin until it was codified in the Clean Air Act Amendments of 1977 (PL 95-95)(21), I will not repeat it here.

Because EPA came into being just as the Clean Air Act Amendments of 1970 were being finalized, all planning for air pollution legislation during the 1970s was the responsibility of the Administrators of EPA, first William D. Ruckelshaus (1970–1973); then Russell Train (1973–1977) and finally Douglas Costle (1977–1981). During the decade, the matter of air pollution legislation was much more important to these administrators, for whom it was but one of three issues of concern—air, water and wastes—than it had been to the Secretaries for whom it had a much lower priority among their many more numerous areas of concern.

Some of the new EPA names in legislative development in the 1970s were the several assistant administrators with re-

Table XIII. Legislative history of PL 93-319 "The Energy Supply and Environmental Coordination Act of 1974."

Reference: Legislative History of Energy Supply and Environmental Coordination Act of 1974. 2 vol., Government Printing Office, Washington, DC 1976—Superintendent of Documents—Y4.P96/10: 94-7, vol. 1 and 2.

1972	
Mar 25–May 22	Hearings, "Implementation of Clean Air Amendments of 1970" parts 1-3, Subcommittee on Air and Water Pollution, Senate Committee—Los Angeles, CA (3/25/72), Washington, DC (3/27-8 and 5/22/1972).
1973	
April 16	Hearings "Implementation of Clean Air Act Amendments of 1970," Subcommittee on Air and Water Pollution, Senate Committee
Sept 18	Hearings, "Nondegradation Policy of the Clean Air Act," Subcommittee on Air and Water Pollution, Senate Committee.
Oct 18	Introduction of S 2589, Jackson, Randolph, Magnuson.
Nov 7	Introduction of Committee Print #1, Amending S 2589.
Nov 9	Introduction of S 2680, Muskie, Randolph, Baker, Buckley, Biden, Burdick, Clark, Domenici, Gravel, McClure, Scott, Stafford.
Nov 12	Administration Testimony on S 2680, Russell Train and Robert Sansom, EPA.
Nov 13	Report to Senate Committee on Interior and Insular Affairs to accompany S 2589, "National Energy Emergency Act of 1973" (Report 93-498) Jackson.
Nov 13	Introduction of HR 11450, "National Energy Emergency Act," Staggers.
Nov 15	Senate debate on S 2589 and S 2680—Amendments by Haskell, Eagleton, Buckley, Muskie.
Nov 16	Senate debate on S 2589—Amendments by Nunn, *et al.*, McIntyre, Bentsen, Jackson, Mondale, Bartlett, Stevenson, Buckley, Proxmire.
Nov 19	Senate debate and passage of S 2589 (78-6), Amendments by Mathias, Javits, Helms, Ribicoff, Hansen, McClellan, Fannin, Jackson.
Dec 4	Introduction of S 2772, to amend the Clean Air Act
Dec 4	Senate Committee report on S 2772, "Automobile Emission Standards," (Report 93-598), Muskie.
Dec 10	House report to accompany HR 11450 (Report 93-710), Staggers.
Dec 11	Introduction in House of HR 11882, Staggers.
Dec 12	Introduction in House of HR 11450 substitute amendment for HR 11882—Staggers. Rule to consider HR 11450 agreed to—Amendments by Vigorito, Staggers, Murphy (NY), Nelsen, Eckhardt, Broyhill.
Dec 12	House consideration of S 921 "The Wild and Scenic Rivers Act (HR 12128)" Energy Emergency Act.
Dec 13	House debate on HR 11450—Amendments by Carter, Dingell, Staggers, Broyhill, Moss, Nelsen, Hastings.
Dec 14	House debate on and passage of HR 11450 (265-112)—Amendments by Adams, Wyman, Eckhardt.
Dec 17	Senate debate and passage of S 2772 (85-0) (Amendment-Scott-rejected (19/67)).
1974	
Jan 22	Conference report to accompany S 2589 (Report 93-763).
Jan 21–4	Senate debate on Conference report.
Jan 23	House agreement to Conference report (145/71)
Jan 29	Senate agreement to Conference report (57/37).
Feb 6	Second Conference Report (Report 93-681) Jackson, to accompany S 2589.
Feb 7 & 18	Senate debates on Second Conference Report.
Feb 19	Senate agreement to Second Conference Report (67-32); Amendments by Buckley, Abourez, Fannin.
Feb 27	House agreement to Second Conference Report (258/151)—Amendment by Staggers.
March 6	President Nixon vetos S 2589 (Senate Documents 93-61).
April 2	Senate failure to overide veto (58/40); lacked 2/3 majority.
April 2	Administration Bill (S 3267) introduced in Senate by Baker, Buckley
April 2	Hearings, on HR 13834 and S 3267, House Committee—Administration Testimony, Russell Train, Roger Strelow, Eric Stork, Michael Levin, EPA.
April 11	Statement by Sen. Jackson on S 3267 "Standby Energy Emergency Act."
April 19	Senate report to accompany S 3267 (Report 93-785).
April 24	Introduction in House of HR 14368, Hastings.
April 26	House report to accompany HR 14368 (Report 93-1013) Staggers.
April 29	House report to accompany HR 13834 (Standby Energy Emergency Authority Act" (Report 93-1014).
May 1	House debate and passage of HR 14368 (349/43); Amendments by Wyman, Moss, Broyhill, Bayh.
May 14	Senate debate and passage of substitute amendments to HR 14368—Unanimous
June 6	Conference report to accompany HR 14368 (Report 93-1085), Staggers.
June 11	House agreement to Second Conference Report—unanimously approved.
June 12	Senate agreement to Second Conference Report.
June 26	Signed by President Nixon—PL 93-319-(HR 14368) (88 Stat 246).

sponsibility for air pollution: Roger Strelow, Edward F. Turek, David Hawkins, and Eric Stork, Deputy Asst. Admin. for Mobile Source Air Pollution Control. Also important were the representatives of the Natural Resources Defense Council and the Sierra Club, lobbyists and members of Congress from automobile manufacturing, coal mining, metal smelting, and petroleum producing constituencies. No longer were legislative positions developed *de novo* by a small handful of Washington bureaucrats and lobbyists, but instead, they were distilled from numerous massive reports by EPA offices, consultants, trade associations, and environmental organizations from all over the nation.

Although the Department had had to promulgate a relatively small number of regulations in the 1960s, concerning grants-in-aid, interstate air pollution control, the designation of air quality control regions, etc., none of them were controversial nor engendered any important litigation. The situation altered in the 1970s, when EPA was required to promulgate a large number of controversial regulations arising from the 1970 Act and to have them changed and delayed time and again by litigation.

The matter of extension of dates for applicability of automobile emission standards became the focus of litigation in 1972 after EPA denied the automobile manufacturers' request for an extension. In June 1972, the manufacturers appealed this decision to the U.S. Court of Appeals, which on December 19, 1972 remanded decision to EPA. On December 30, 1972, the administration reaffirmed this denial of an extension, after which the manufacturers asked the Court to grant the requested extension.

The Clean Air Act Amendments of 1970 (PL 91-604) had required the Department to contract with the National Academy of Sciences for specified studies on motor vehicle emissions. This required semi-annual reports to the Congress and the EPA Administrator. These reports were submitted as required in 1971, 1972 and 1973, and were invoked by the Court in again remanding the matter to EPA. The Administrator, after hearings on March 12, 1973, granted a one year extension on April 11, 1973, but established a new set of interim automobile emission standards.

A somewhat different scenario followed when on May 31, 1972, EPA granted 17 states a two year extension in meeting the CO and oxidant National Ambient Air Quality Standards, only to have the extension rescinded by the Court of Appeals on January 31, 1973.

Public Law 93-319—The Energy Supply and Environmental Coordination Act of 1974[7,11,12,20]

PL 91-604 expired in 1973. It was extended by HR 5445 which became PL 93-15 "Clean Air Act, Extension" (87 Stat 11) when signed by President Nixon on April 9, 1973.

The hearings and actions on further amending PL 91-604 are part of the legislative history of PL 93-319, "The Energy Supply and Environmental Coordination Act of 1974" (88 Stat 246), which is outlined in Table XIII. Although this act originally dealt mainly with matters other than air pollution, as it finally developed it contained significant legislation relating to air pollution. The 1972 hearings were largely concerned with automobile emission standards problems—emission averaging and assembly line testing. The 1973 hearings were on the "Nondegradation Policy and the Clean Air Act." The 1974 Hearings were on the substance of the bills under consideration.

One element of the legislation considered in 1973 was a bill by Senator Edmund Muskie (S2772) on "Automobile Emission Standards."

Several noteworthy aspects of PL 93-319 are that it is a mixture of energy and air pollution legislation and that the Congress rejected the bill recommended by its first conference committee in 1973, but agreed to a bill recommended by a second conference committee, only to have the bill vetoed in March 1974 by President Nixon, mainly because he disagreed with the energy aspects of the bill. As a result, the bill, which was developed by Congress after March 1974, passed, and was affirmed by the President on June 6, 1974, had a much stronger emphasis on air pollution than the 1973 legislation. PL 93-319 allowed EPA temporarily to suspend stationary source emission limits but put restrictions on so doing. Suspensions were to be on a case-by-case basis and were not allowed to result in a violation of National Ambient Air Quality Standards. EPA actions were exempted from the requirements by the National Environmental Policy of 1969 (42 USC 4341).

Table XIV. Bills introduced in Congress during 1975, 1976 and 1977 to amend The Clean Air Act.

1975		
Feb 10	HR 3118	Rogers (D.-Fla.)
Feb 17	S693, 694 and 695	Scott (R.-Pa.) *et al.*
Mar 6	HR 4369	Brown (D.-Calif.)
June 9	HR 7704	Aspin (D.-Calif.) *et al.*
July 29	S 2214	Baker (R.-Tenn.) *et al.*
Oct 31	HR 10498	Rogers (D.-Fla.) *et al.—Major Bill*
1976		
Jan 26	HR 11501	Rogers (D.-Fla.)
Feb 29	S 2895	Cannon (D.-Nev.) *et al.*
Mar 29	S 3219	Muskie (D.-ME) *et al.—Major Bill*
1977		
	HR 2633	Staggers (D-W. Va.) *et al.*
	HR 2650	Rhodes (D.-Pa.) *et al.*
Jan 14	S 251, 252 and 253	Muskie (D.-Me.) *et al.—Major Bill*
Feb 11 (Legislative Day-Feb 1)	S 719	Hart (D.-Col.)
	S 1053	
	S 1054	Scott (R.-Pa.) and Tower (R.-Tex.)
Feb 28	HR 4151	Rogers (D.-Fla.)—*Major Bill*
Mar 3	HR 4444	Dingell (D.-Mich.) *et al.—Major Bill*
Mar 4 (Legislative Day-Feb 21)	S 714	Riegle (D.-Mich.) and Griffin (D.-Mich.)
	S 919	Bentsen (D.-Tex.)
Apr 6	HR 6161	Rogers (D.-Fla.) *et al.—Major Bill*

The EPA 1975 interim automobile emission standards were extended through 1976, a one year extension of the 1977 HC and CO automobile emission standards was allowed subject to EPA concurrence. New 1977 interim HC and CO standards were set and NO_x emission limited to 2 g/mi for 1977. The legislation did not touch the critical issues of Prevention of Significant Deterioration or of intermittent control of stationary sources.

Through 1975, 1976, and 1977 a number of bills were introduced in the Congress for the amendment of the Clean Air Act (Table XIV). One of the bills introduced, not listed in this table, was S1996 introduced on June 23, 1975 (Legislative day—June 6) by Jennings Randolph (D-W.Va.), *et al.* for the extension of the Clean Air Act, as amended, to December 31, 1975, to prevent its expiration. This bill was passed and signed by President Ford.

Public Law 95-95—The Clean Air Act Amendments of 1977[22-27] (Technical Amendments in Public Law 95-190—Safe Drinking Water Act of 1977)

The most recent piece of air pollution legislation to be enacted was PL 95-95 "The Clean Air Act Amendments of 1977,"

Table XV Legislative history of PL 95-95, "The Clean Air Amendments of 1977."

Reference: A Legislative History of the Clean Air Act Amendments of 1977—A continuation of the Clean Air Act Amendments of 1970, with a section-by-section index, prepared by the Environmental Policy Division of the Congressional Research Service of the Library of Congress for the Committee on the Environment and Public Works, Senate Serial 95-16—95th Congress 2nd Session—Committee Print for Committee on Environment and Public Works—8 volumes*—U.S. Government Printing Office, Washington, DC—1978 (Superintendent of Documents Y4 P 96 10:95-16).

* (Note: Vols 1 and 2 are the Legislative History of the Clean Air Act Amendments of 1970, which form the basis for Table XII.)

1975	
Mar 3–12	Hearings, "The Energy Crisis and Proposed Solutions," House Committee on Ways and Means—"Petroleum Supply" (3/10); "Gas and other energy sources" (3/11) and "Automobile Efficiency and Conservation"(3/12).
Mar 12–13	Hearings, "Automobile Fuel Economy and Research and Development," Senate Committee on Commerce—on S 307, 499, 633 (and amendments), 654 and 783 (Miscellaneous Fuel Economy Bills)—(Senate Document 94-8).
Mar 13–26	Hearings, "Clean Air Amendments—1975," Subcommittee on Health and Environment, House Committee—Titles V and VI of HR 2633 and 2650 and other bills to amend the Clean Air Act (House Document 94-25).
Mar 19–20 Apr 21–23 May 13–15 May 20–21	Hearings, "Implementation of Clean Air Act—1975," Subcommittee on Environmental Pollution," Senate Committee, Parts 1 and 2; Parts 3 and 4 "Automobile Emissions," (Senate Document 94-H10).
Sept 8–17	Hearings, "Stratospheric Ozone Depletion," Subcommittee on Upper Atmosphere, Senate Committee on Aeronautical and Space Sciences.
Oct 31	HR 10498 introduced by Rogers (D.-Fla.) *et al.*
Nov 7–17	Hearings, "The Costs and Effects of Chronic Exposure to Low Level Pollutants in the Atmosphere," Subcommittee on Environment and the Atmosphere, House Committee on Science and Technology (House Document 74-49).
1976	
Mar 29	S 3219 "Clean Air Amendments of 1976," (Muskie (D.-Me.) *et al.*), Report of Senate Committee (Senate Document 94-717).
May 13	S 3438 "A Bill to Authorize Appropriations for FY 1977," (Senate Report 94-873).
May 15	House Committee report to accompany HR 10498, "Clean Air Amendments of 1976," with amendments (House Report 94-1175).
May 25	Supplemental Committee report (Report 94-1175-Part 2) on HR 10498.
May 28	Message to Congress from President Ford.
July 26–Aug 5	Senate Debate on S 3219 (7 days).
Aug. 4–Sept. 15	House Debate of HR 10498 (5 days).
Aug 5	S 3219 passed Senate (78-13)
	HR 10498 passed House (324-68).
Aug.–Sept. 2	Side-by-side comparison of HR 10498 and S 3219 (In "Legislative History of Clean Air Act Amendments of 1977", Senate Committee Print 95-16, Vol. 8, pp. 7147–7179). (See Reference above).
Sept. 22–29	House-Senate Conference on S3219.
Sept. 30	Conference report to accompany S 3219 (House report 94-1742).
Sept 31	The compromise measure reported out did not come to a vote in the Senate due to a filibuster prior to adjournment. Consequently the House did not have an opportunity to consider or vote on it.
1977	
Jan 14	S 251, 252, and 253 introduced by Muskie (D.-Me) *et al.*
Feb	Section-by-section analysis of S 252 and 253, prepared by Staff of Subcommittee on Environmental Pollution, Senate Committee (Document 95-2).
Feb 9–15	Hearings, "Clean Air Amendments of 1977," Subcommittee on Environmental Pollution, Senate Committee, on Bills S 251, 252, and 253 (Document 95-H7) Parts 1–3, Washington, DC. (2/9-11, Part 4—Denver, CO (2/15).
Feb 28	HR 4151 introduced by Rogers (D.-Fla.).
March 3	HR 4444 introduced by Dingell (D.-Mich.) *et al.*
March 8–11	Hearings, "Clean Air Amendments of 1977," Subcommittee on Health and Environment, House Committee, on HR 4151, 4758 and 4444 and other identical bills (Publication 95-59).
March 21–9	Hearings, "Coal Conversion," Subcommittee on Energy Production and Supply, Senate Committee on Energy and Natural Resources on S 272, 273 and 977. Parts 1 and 2 (Publication 95-46).
	Message to Congress from President Carter, "Environmental Protection," transmitting proposals for dealing with a variety of Environmental Issues (House Document 95–100).
Apr 6	HR 6161, "Clean Air Amendments of 1977," introduced by Rogers (D.-Fla.) *et al.*
May 10	Senate report to accompany S252 with amendments, Committee on Environment and Public Health, Senate debate on Report (Publication 95-127).
May 12	House committee report to accompany HR 6161 (Report 95-294).
May	Summary of HR 6161 "Clean Air Amendments of 1977," as reported by House Committee for Committee use (Committee Print 95-15).
May 24–5	House debate of HR 6161.
May 26	House passage (326-49) of HR 6161.
June 8	Agreement between United Automobile Workers and certain members of Congress on automobile emission warranty provisions of Mobile Source Control Amendments of 1977—Sen. Reigle (D.-Mich.).
June 8	Automobile Emission Fact Sheet (Edmund Muskie (D.-Mich.)). Rebuttal to above (Sen. Reigle (D-Mich.)).
June 8–9	Senate debate on S 252 and Amendment 377.
June 10	Senate passage (73-7) of S 252.
July 12	Side-by-side comparison of provisions of HR 6161 and S 252 ("Clean Air Amendments of 1977") and Conference report on S 3219 ("Clean Air Amendments of 1977") and Conference report on S 3219 ("Clean Air Amendments of 1976") by Maria H. Grimes and John E. Blodgett, Analysts, Environmental and Natural Resources Policy Division, Congressional Research Service, Library of Congress. (See Reference above).
Aug 3	Conference report to accompany HR 6161 (Document 95-564).
Aug 4	House and Senate consider and agree, by voice vote, on Conference report, Clerk of the House authorized to make corrections in the engrossment of HR 6161.
Aug 7	PL 95-95 (HR 6161) (91 Stat 685) (42 USC 7401 *et seq.*) signed by President Carter, President's Message on signing.
Nov 16	Technical Amendments to PL 95-95 in PL 95-190 "The Safe Drinking Water Act of 1977."
1978	
Aug	Section-by-section Index—Comparison of Sections of PL 95-95, S 252, HR 6161, House Report 94-1742 (1976 and prior existing law) (In "Legislative History of Clean Air Act Amendments of 1977," Senate Committee Print 95-16, Vol. 8, pp. 7433–7514.) (See Reference above).

the legislative history of which is shown in Table XV. Its history is bifurcated because it was first developed in Congress as "The Clean Air Act Amendments of 1976," which after separate passage by the House and Senate had its conference report fail to pass because of a filibuster by Senator Jake Garn (R-Ut) on the closing day of the 94th Congress in 1976. Therefore the 95th Congress had to start anew in 1977, although it followed closely the lines developed in the 1976 bills.

In 1976, the Senate Committee was the first to report out a bill (S3219) on March 29. Between April 3 and August 2, major amendments were offered sequentially by Senators Packwood, Bentsen, Baker, Randolph, Moss, Scott, Domenici, Hart, Hatfield, Muskie, Williams, *et al.*, Tower, Inoye, *et al.*, Allen, and McIntyre.

The House Committee reported out HR 10498 on May 15, 1976. Major amendments were offered by Representatives Bumpers, Satterfield, Carter, Chappell, Macguire, Broyhill and Levitas. Preliminary and additional statements were entered into the Congressional Record sequentially, between November 10, 1975 and July 30, 1976, by Representatives Rogers, Brown, Maguire, *et al.*, Chappell, Preyer, Symons, Koch, and Long. The Conference Committee reported out S3219 on September 30.

A side-by-side comparison of the provisions of HR 10498 and S3219 is noted under date "August-September 1976" in Table XV.

Although as noted above S3219 did not pass, it nevertheless formed the basis for the legislation considered by the next Congress.

In 1977, the Senate Committee reported out S252 on May 10. Major amendments were offered between May 18 and June 9 sequentially by Senators Garn, Cannon, Baker, Hart, Reigle, *et al.*, Anderson, Dole, *et al.*, Nelson, Metzenbaum, *et al.*, Hatch, Bartlett, Wallop and Griffin, *et al.*, Scott, and Stevens. Preliminary and additional statements were entered into the Congressional Record on June 8 by Senators Garn, Hayakawa, Culver, and McClure.

The House Committee reported out HR 6161 on May 12, 1977. Major amendments were offered by Representatives Breaux and McKay. Preliminary and additional statements were introduced into the Congressional Record of the same

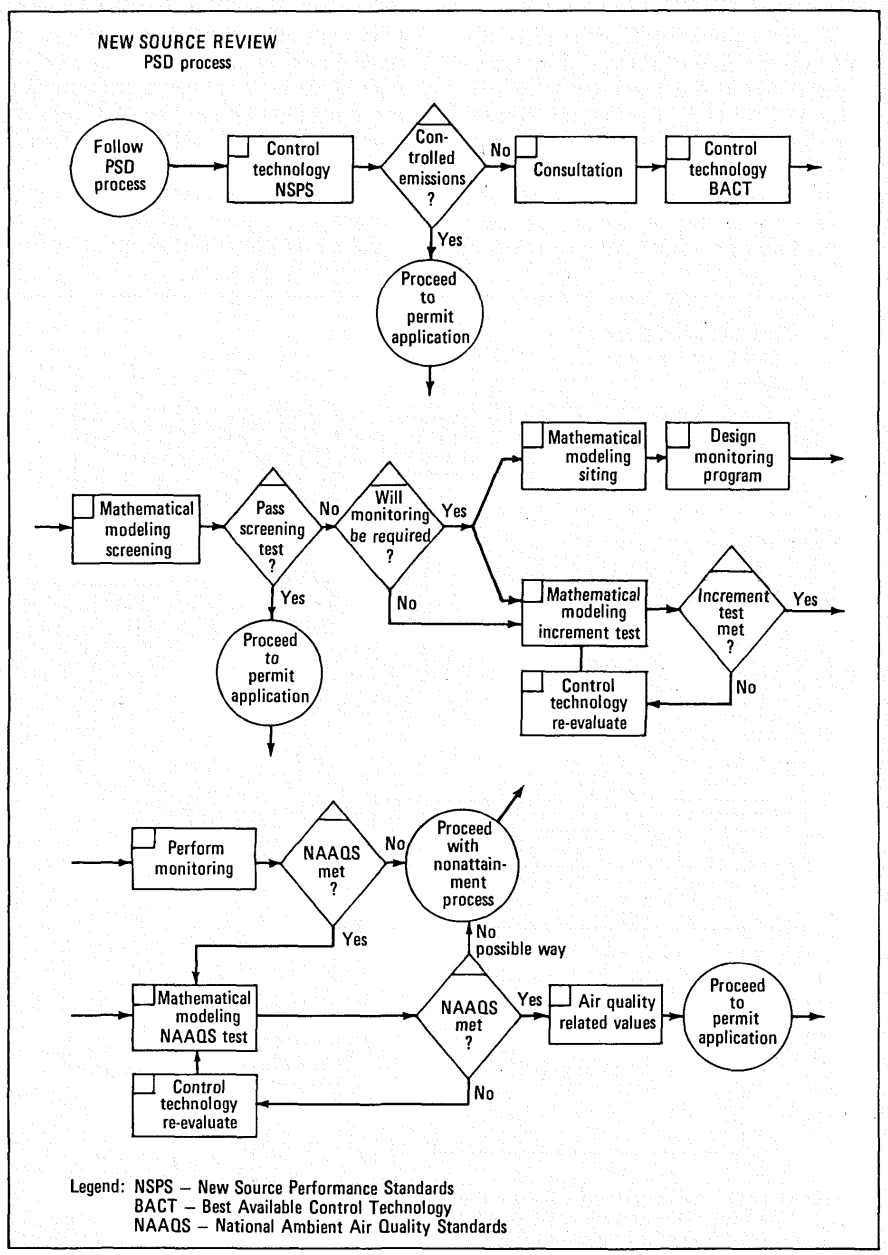

Figure 4. *Prevention of Significant Deterioration (PSD) actions required by EPA regulations of August 7, 1980.*[28]

date sequentially by Representatives Brown, Holtzman, Ashley, Broyhill, Dingell, Runnels, Archer, and Rogers.

A side-by-side comparison of HR 6161, S252 and the bill reported out of conference in 1976 (S3219) is noted under date "July 12, 1977" in Table XV.

The Conference Committee reported out HR 6161 on August 3. This bill became PL 95-95 'The Clean Air Act Amendments of 1977," on August 7, 1977. Some technical amendments to PL 95-95 were made on November 16, 1977 by PL 95-190, "Safe Drinking Water Act of 1977."

During the 1970s, Congressional Hearings gave attention to stationary source pollution from both sulfur oxides and particulate matter. The matter of the use of scrubbers on power plants received some attention in the 1974 and 1975 House subcommittee hearings, but only with regard to their use on existing power plants. However when the House subcommittee drafted its 1976 air pollution legislative bill (HR 10498) it included a requirement for use of the "best technological system of continuous emission reduction which, when defined in that bill, and explained in the Committee report on the bill, meant that the use of low sulfur-low ash coal or of intermittent control would not satisfy the meaning of the bill, only scrubbing would. The committee bill, with this provision, passed the House. The bill which passed the Senate (S3219) did not have a comparable provision, but the bill that came out of the conference committee did. Although the 1976 bill failed to pass Congress, the 1977 bill (HR 6161) retained the same features and the same back-up wording in the committee reports.

These provisions were the result of lobbying by a strange coalition: eastern high-sulfur coal miners who could protect their market if required installation would remove the incentive of their customers to burn low sulfur coal without scrubbers; and the environmental activist groups who saw mandatory scrubbers as a means to decrease sulfur emission even when low sulfur coal is burned.[22,24]

It was not until the passage of PL 95-95 in 1977 that provisions concerning the Prevention of Significant Deterioration (PSD) were actually a part of federal air pollution control legislation. Although the period of seven years between the passage of the 1970 and 1977 acts was one of great PSD activity by the courts and the U.S. Environmental Protection Agency, this activity was based entirely on the courts interpretation of the Congressional directive in the 1967 and 1970 acts that one of the purposes of the Clean Air Act was to "protect and enhance the quality of the Nation's air resources so as to promote the public health and welfare and the productive capacity of its population." As I noted earlier in this paper, I have previously recorded in *JAPCA* the history of PSD from its origin until it was codified in PL 95-95.[21] I will not repeat it here. However, what I will add here are the highlights of Congressional actions on PSD in the formulation of Part C "Prevention of Significant Deterioration of Air Quality-Subpart 1" of the act.

In 1974, legislative proposals, one originating in the Department of Commerce and one in the White House, would have amended the "protect and enhance clause" of the purpose of the act to preclude its permitting air quality standards more stringent than the National Secondary Ambient Air Quality Standards. Neither of these proposals reached the floor of Congress.

In the bills reported out by Congress in 1976, the PSD provisions were somewhat stronger than the 1975 EPA regulations but followed their basic format.[21]

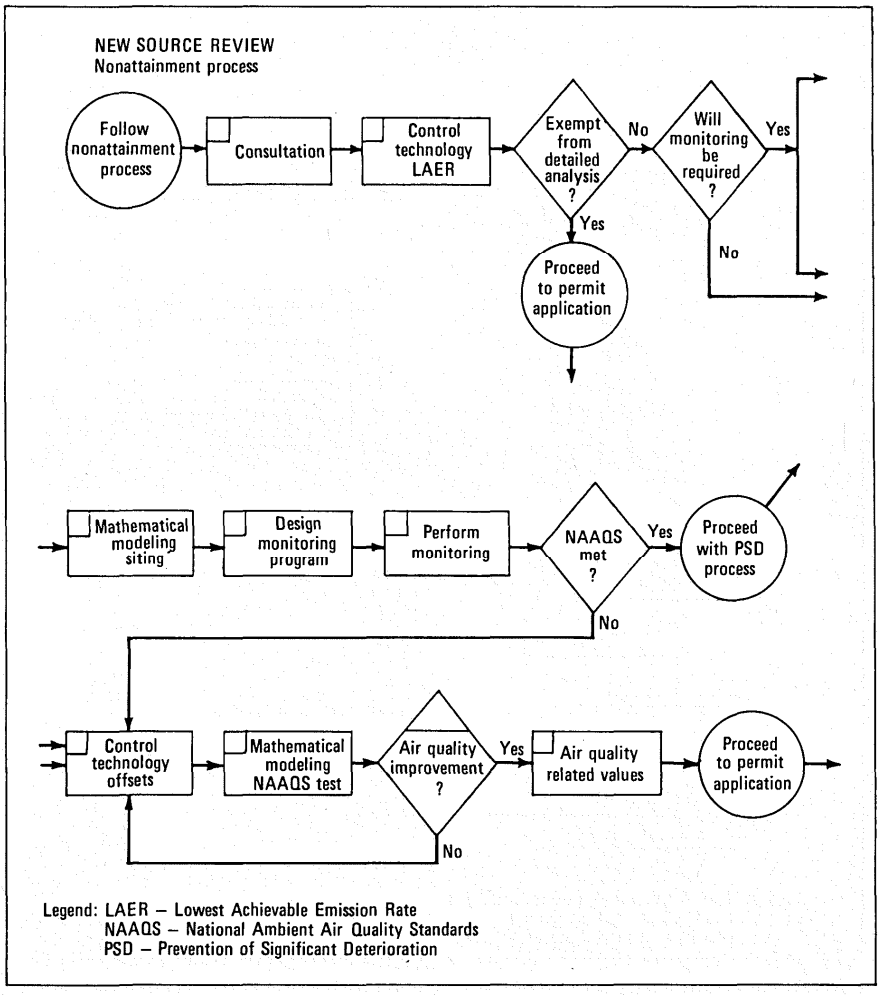

Figure 5. Plan requirements for nonattainment areas in PL 95-95.[28]

Major amendments to these PSD provisions were offered in both 1976 and 1977 in both houses of Congress to weaken or to strengthen these basic provisions. In 1976, amendments to weaken the Senate bill were offered by Senator Moss (D-Utah), Scott (R-Va) and Allen (D-Ala), and to strengthen the bill by Senators Hart (D-Colo) and Hatfield (R-Ore). These were all rejected by the Senate. Amendments to weaken the House bill were offered by Representatives Chappell (D-Fla) and Carter (R-Ky), and to strengthen the bill by Rep. Macguire (D-NJ). These were also rejected by the House. In 1977, amendments to weaken the Senate bill were offered by Senator Stevens (R-Alaska) and Garn (R-Utah), both of which were rejected by the Senate. Amendments to weaken the House bill were offered by Rep. McKay (D-Utah), which was rejected by the House, and by Rep. Breaux (D-La) to allow state governors to permit Class I and II areas to exceed PSD limits for a specific number of days per year, which was passed by the House. The bill which emerged from the conference committee and eventually became law closely followed the 1975 EPA regulations. EPA adopted regulations on June 19, 1978 to implement its interpretation of PL 95-95. However, in a decision by the DC Circuit Court of Appeals on June 18, 1979 in the case of "Alabama Power Co. *vs.* Costle," many portions of the EPA 1978 regulations were invalidated to the extent that the Court felt that they went beyond the language of PL 95-95. EPA amended its regulations August 7, 1980 to conform to the Court's decision. Figure 4 shows the flow of action required by these regulations for a source that would need a permit to operate.

When this flow reaches "Proceed to permit application," the state regulatory agency or EPA, whichever receives the application, has to decide whether or not to hold a public hearing before issuing a permit to construct. It must be recognized that these regulations and Figure 4 apply only to SO_2 and particulate matter emissions, so-called Set I pollutants.

PL 95-95 also requires EPA to apply PSD regulation to the pollutants, other than SO_2 and particulate matter, for which National Ambient Air Quality Standards have been promulgated i.e., hydrocarbons, carbon monoxide, nitrogen oxide, ozone and lead—so-called Set II pollutants. As of writing this paper, EPA regulations applying to Set II pollutants had not yet been promulgated.

PL 95-95 specified that the National Academy of Sciences should conduct a study of the implementation of the PSD provisions of the Act; and also established a National Commission on Air Quality, required to report to the Congress. Both the Commission's report[29] which contained recommendations concerning PSD, and the Academy's report[30] were presented to Congress on March 2, 1981.

The amendments also include a section on "Plan Requirements for Nonattainment Areas" (i.e., areas where one or more of National Ambient Air Quality Standards are not being met), which are shown as a flow chart in Figure 5, for a source that would need a permit to operate, where flow beyond permit application is the same as noted for Figure 4.

These are but three segments of our present law of 173 pages. It also contains completely new sections; Visibility Protection for Federal Class I Areas; Ozone Protection; and extensive revisions of sections of the 1970 act in other areas. The best way to trace the evolution of a particular section of the 1977 act from its beginning in the 1963, or some subsequent act, is the section-by-section index listed under date "August 1978" in Table XV. (Note: The acts between 1955 and 1963, although vital to our understanding the history of federal air pollution control legislation, were not the basis for our present legislation. That basis was provided by the 1963 act).

Conclusion

This history ends with the 1977 act. Since 1977, there has been much debate, litigation, hearings, and proposals as to the next major changes in our federal air pollution legislation, but, as of the writing of this paper, none of them has materialized as either new law or amendment to the 1977 law.

References

1. Sidney Edelman, "The Law of Air Pollution Control," Environmental Research and Applications, Inc., Stamford, CT, 1971.
2. Frank L. Seamans, "Air Pollution Legislation" in P. L. Magill, *et al.* (eds.) *Air Pollution Handbook*, McGraw-Hill, New York, 1956.
3. Arthur C. Stern (ed.), *Air Pollution*, 3rd Edition, Vol. V, Academic Press, New York, 1977.
4. Arthur C. Stern (ed.), *Air Pollution*, 2nd Edition, Vol. III, Academic Press, New York, 1968.
5. Werner Martin, Arthur C. Stern, "The World's Air Quality Management Standards—Vol. II. The Air Quality Management Standards of the United States," U.S. Environmental Protection Agency, Washington, D.C. (Publication EPA-65019-75-001-b—Miscellaneous Series), 1974.
6. Randall B. Ripley, "Congress and Clean Air" in Frederick N. Cleaveland and Associates (Eds.) *Congress and Urban Problems*, The Brookings Institute, Washington, DC., 1969.
7. J. Clarence Davies III, Barbara S. Davies, *The Politics of Pollution*, 2nd Edition, Pegasus-Bobbs-Merrill, Indianapolis, 1975.
8. Charles O. Jones, *Clean Air*, U. of Pittsburgh Press, Pittsburgh, PA., 1975.
9. Rachel Carson, *Silent Spring*, Houghton Mifflin, Boston, 1962.
10. Henry D. Jacoby, J. D. Steinbrenner, *et al.*, *Cleaning the Air—Federal Policy in Automobile Emissions Control*, Ballinger, Cambridge, MA, 1973.
11. James E. Krier, Edmund Ursin, *Pollution and Policy—A Case Essay on California and Federal Experience with Motor Vehicle Air Pollution 1940–1970*, U. of California Press, Berkeley, 1977.
12. Edwin S. Mills, Lawrence J. White, "Government Policies toward Automotive Emissions Control," in Ann F. Friedlaender (Ed.), *Approaches to Air Pollution Control*, MIT Press, Cambridge, MA, 1978, pp. 348–421.
13. Robert Martin, Lloyd Symington, "A guide to the Air Quality Act of 1967," *Law and Contemporary Problems* **33:** 239 (1968).
14. James E. O'Fallon, "Deficiencies in the Air Quality Act of 1967," *Law and Contemporary Problems* **33:** 275 (1968).
15. Jeffrey Fromson, "A history of federal air pollution control," *Ohio State Law Journal* **30:** 516 (1969).
16. "Guidelines for the Development of Air Quality Standards and Implementation Plans," National Air Pollution Control Administration, May 1969.
17. Helen Ingram, "The Political Rationality of Innovation: The Clean Air Act Amendment of 1970," in Ann F. Friedlaender (Ed.), *Approaches to Controlling Air Pollution*, MIT Press, Cambridge, MA, 1978, pp. 12–56.
18. *Ecology Law Quarterly*, Vol. IV, Winter 1974-Fall 1975, Univ. of California, Berkeley, CA 1975 [Containing a number of papers on the Clean Air Act Amendment of 1970].
19. "The 1970 Clean Air Act Amendments," in Robert B. Stewart, James E. Krier, *Environmental Law and Policy—Readings, Materials and Notes* (2nd Edition), Bobbs-Merrill, Indianapolis, 1978, pp. 340–371.
20. Shirley K. Tabler, "Federal standards of performance for new stationary sources of air pollution—A summary of regulations," *JAPCA* **29:** 803 (1979).
21. Arthur C. Stern, "Prevention of significant deterioration—A critical review," *JAPCA* **27:** 440 (1977).
22. Bruce A. Ackerman, William T. Hossler, *Clean Coal-Dirty Air*, Yale University Press, 1981.
23. Richard J. Tobin, *The Social Gamble—Determining Acceptable Limits of Air Quality*, Lexington Books, 1979.
24. Peter Navarro, "The politics of air pollution," *The Public Interest*, **59:** 36 (Spring 1980).
25. David P. Currie, "Relaxation of implementation plans under the 1977 Clean Air Act Amendments," *Michigan Law Review*, 155–203 (1979–80).
26. Marc J. Roberts, Susan O. Farrell, "The Political Economy of Implementation: The Clean Air Act and Stationary Sources" in Ann F. Friedlaender (Ed.), *Approaches to Controlling Air Pollution*, MIT Press, Cambridge, MA, 1978, pp. 152–190.
27. *Harvard Environmental Law Review*, Vol. 3, 1979, [Contains several papers on the Clean Air Act Amendment of 1977].
28. Adapted from diagram in "ERT Handbook on Industrial Expansion Under the Clean Air Act," Environmental Research and Technology, Inc., Concord, MA, June 1981.
29. "To Breathe Clean Air," Report of the National Commission on Air Quality, Washington, DC, 1981.
30. *On Prevention of Significant Deterioration of Air Quality*, National Academy Press, Washington, DC, 1981.

Revised Agency Procurement No. FA-19202

Two Year Intergovernmental Agency Agreement Between Illinois Environmental Protection Agency (Agency) and City of Chicago, Department of Public Health (Contractor)

CONTRACTOR
City of Chicago
Department of Public Health
333 South State Street, 2nd Floor
Chicago, Illinois 60604

AUTHORITY
This contract is entered into pursuant to the Intergovernmental Cooperation Act, 5 ILCS 220/1 et seq and is subject to all applicable State, Federal, and local statutes and regulatory requirements.

ENTIRE CONTRACT
This Intergovernmental Contract for Services, and any attached exhibits, incorporated herein and made a part hereof, constitute the entire Contract between the PARTIES. Said Contract Documents constitute the entire agreement between the parties.

SCOPE OF SERVICES

A. Environmental Justice
The Contractor is committed to ensuring Environmental Justice for all of the City's residents. Environmental Justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. The Contractor will continue working with the Illinois EPA to facilitate administration of its Environmental Justice program, as well as continuing to engage in community outreach and education on the City level and cooperating with the Department of Zoning to ensure proper siting of new facilities. The Agency's Illinois EPA's Environmental Justice policy and additional information may be found at http://www.epa.illinois.gov/topics/environmental-justice/index.

B. Compliance and Enforcement Services
The Contractor will assist in compliance inspections of sources affected by certain federal area source National Emission Standards for Hazardous Air Pollutants (NESHAP). Specifically, assistance from the Contractor shall be provided for the following NESHAPs:

Autobody Shops – 40 CFR 63 Subpart HHHHHH-NESHAP for Paint Stripping and Miscellaneous Surface Coating Operations promulgated January 9, 2008; the compliance date for new or reconstructed sources is January 9, 2008 or upon startup and for existing sources by January 10, 2011.

Dry Cleaners – 40 CFR 63 Subpart M-National Emission Standards for Dry Cleaning Facilities promulgated July 27, 2006 (encompassing previous final rule September 22, 1993). The compliance date for dry cleaners is July 27, 2009.

Chrome Platers – 40 CFR 63 Subpart N-National Emission Standards for Chromium Emissions from Hard and Decorative Chromium Electroplating and Chromium Anodizing Tanks, promulgated on September 19, 2012 (encompassing previous final rules and amendments). The compliance date for implementing the housekeeping requirements is March 19, 2013. The compliance date for the revised emission limits and surface tension limits is September 19, 2014. The compliance date for eliminating the use of Perfluorooctane sulfonic acid based (PFOS-based) fume suppressants is September 21, 2015.