BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	)	
	)	AS 19-002
Petition of Emerald Polymer	)	
Additives, LLC for an Adjusted	)	(Adjusted Standard)
Standard from 35 Ill. Adm. Code	)	
304.122(b)	)	

To: See attached service list.

NOTICE OF ELECTRONIC FILING

PLEASE TAKE NOTICE that I have today filed with the Office of the Clerk of the Pollution Control Board ILLINOIS EPA'S CLOSING BRIEF IN SUPPORT OF DENYING PETITIONER'S REQUEST FOR AN ADJUSTED STANDARD, for the above-captioned proceeding, a copy of which is herewith served upon you.

Respectfully submitted,

Dated: March 11, 2020

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY,

Respondent,

BY: /s/Rex L. Gradeless
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THIS FILING IS SUBMITTED ELECTRONICALLY

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ILLINOIS EPA'S CLOSING BRIEF IN SUPPORT OF DENYING PETITIONER'S REQUEST FOR AN ADJUSTED STANDARD

NOW COMES the ILLINOIS ENVIRONMENTAL PROTECTION AGENCY ("Illinois EPA"), by and through its attorneys, Rex L. Gradeless and Christine Zeivel, Assistant Counsels of Illinois EPA, and for its closing brief in support of denying Petitioner's request for an adjusted standard hereby states as follows:

I. BACKGROUND

For decades Petitioner and its chemical manufacturer predecessors have claimed to be a special case, but this has proven to be untrue. Petitioner and its chemical manufacturer predecessors have claimed a toxic chemical, known as mercaptobenzothiazole[1] ("MBT"), was used in its processes in Henry, Illinois ("Henry Plant") and, after the use of the MBT, the MBT had nowhere else to go but through Petitioner's single effluent pipe and into the Illinois River. This contention can no longer hold in year 2020.

For decades Petitioner and its chemical industry predecessors have argued that it should not have to comply with Illinois' total ammonia nitrogen effluent limits for the Illinois River (3.0 mg/L per day) because the MBT prevented the ammonia nitrogen within its waste stream from

[1] 2-Mercaptobenzothiazole (MBT) is a heterocyclic aromatic compound produced in large amounts for various industries. (IEPA Ex. 19 p. 1) MBT is produced by the reaction of 2-aminothiophenol and carbon disulfide. MBT is very toxic to aquatic life with long lasting effects (TOXNET, 2009); therefore, releases to the environment are now regulated. (IEPA Ex. 19 p. 1)

breaking down (i.e. nitrifying). As a strategy conceived long ago, every owner of the Henry Plant has claimed that "nothing could be done" and consistently refused to act unless compelled. In the past, they requested a daily maximum of up to 225 mg/L per day, or 75 times the State's standard, claiming its business depended on that adjusted standard being granted.

Here, and just like decades before, Petitioner requests it be allowed to, *inter alia*, discharge its toxic effluent into the Illinois River at 140 mg/L per day – or over 46 times the State's standard. Petitioner here has the same strategy as in the past: wait for the expiration of its current adjusted standard to near, create a "team" that fights for the next adjusted standard, obtain a new adjusted standard, and do nothing unless compelled. When Petitioner's ammonia levels are within its adjusted standard, it does not work on reducing ammonia any further and, instead, focuses on other challenges at the Henry Plant. (Tr. January 14, 2020 at 52.)

Illinois EPA has argued Petitioner's previous requests for adjusted standards should be denied, and this case is no exception. Illinois EPA continues to believe Petitioner's request for an adjusted standard should be denied.

The Illinois Pollution Control Board ("Board") has been patient with Petitioner long enough. The Board has consistently lowered the limits on Petitioner: from 155 mg/L, in *Petition of Noveon, Inc. for an Adjusted Standard from 35 Ill. Adm. Code 304.122*, AS 02-5 (Nov. 4, 2004), and then to 140 mg/L in *Petition of Emerald Performance Materials, LLC for an Adjusted Standard from 35 Ill. Adm. Code 304.122(b)*, AS 13-2 (Apr. 16, 2015) ("AS 13-2"). In those previous cases, and based on certain affirmations from Petitioner, the Board held that Petitioner's discharge had unique characteristics making the plant unable to achieve nitrification, making Petitioner different from other industries and publicly operated treatment works ("POTWs"). Petitioner's own evidence in this case has proven this to be false.

Here, Petitioner's data shows MBT does not appear in Petitioner's toxic effluent (IEPA Ex. 14). In other words, it's technically feasible for MBT to not end up in the Illinois River. When Petitioner's latest "process improvement team" arrived in 2018 (forming solely in preparation of this adjusted standard), Petitioner's health, safety, and environmental manager was testified about "how little consistent data was available at the Henry Plant." (Tr. February 4, 2020 at 129.) Petitioner's chemical manufacturer predecessors and Petitioner itself have never done the work to thoroughly analyze or make tangible improvements to its system because they have never been compelled to do so. Petitioner will continue to rely on its adjusted standard and will only act to comply with the State standard if compelled by the Board.

Additionally, Petitioner must also act because nitrification occurs in the Henry Plant. Petitioner's utilities foreman, Mark Winters ("Winters"), testified that, in the summer of 2019, Petitioner was "…just shocked. We didn't realize that the ammonia would drop like that because everybody had told us that that's not possible." (IEPA Ex. 18 p. 32.)

> **Q. When you say everybody had told you it's not possible, who are those?**
> A. That would just be the legacy of previous reports, everybody saying that there's no way to get all the MBT out, there's no way to nitrify. Nitrification does not happen in our process.
>
> **Q. Do you remember who made those reports?**
> A. That would be Dave Giffin reports. I believe there's a Houston Flippin report that says nitrification is difficult to achieve. (IEPA Ex. 18 p. 32.)

Extensive discovery conducted by Illinois EPA for this case revealed several new facts for the Board to consider. Before the hearings in this case, Illinois EPA took part in eleven depositions, conducted lengthy written discovery, and was forced to compel information from Petitioner. This closing brief will highlight the evidence presented in the record during the four

days of hearings[2]. As a part of those highlights, this brief will discuss ways Petitioner can reduce and/ or eliminate the ammonia levels coming from its facility. The evidence in this case shows that there are "almost too many options" available to Petitioner to remove the excess ammonia coming from its toxic effluent. (Tr. February 3, 2020 at 273-278.) Therefore, the Board should compel Petitioner to take action to address the ammonia in its effluent by denying Petitioner's request for an adjusted standard.

II. ARGUMENTS

Petitioner has the burden of proof in an adjusted standard case. 415 ILCS 5/28.1(c) Illinois EPA does not have to provide a single piece of evidence or testimony and, in that example, the Board could still deny Petitioner's request for an adjusted standard. All that is required of Illinois EPA is the recommendation it filed on July 19, 2019.

Here, Petitioner failed to meet its burden of proof under Section 28.1(c) of the Environmental Protection Act ("Act"). Since 35 Ill. Adm. Code § 302.122(b) does not provide a specific level of justification required by a petitioner to obtain an adjusted standard, the level of the justification requires Petitioner to present adequate proof of the following under Section 28.1(c) of the Act:

(1) factors relating to that petitioner are substantially and significantly different from the factors relied upon by the Board in adopting the general regulation applicable to that petitioner;

(2) the existence of those factors justifies an adjusted standard;

(3) the requested standard will not result in environmental or health effects substantially and significantly more adverse than the effects considered by the Board in adopting the rule of general applicability; and

(4) the adjusted standard is consistent with any applicable federal law.

[2] January 14-15, 2020, and February 3-4, 2020.

If any one of the four elements have not been adequately proven, the Board must deny the adjusted standard. In this case, Petitioner has failed to meet the first three factors. Therefore, Petitioner's request for an adjusted standard request must be denied.

1. **Petitioner's adjusted standard petition should be denied because the factors relating to both Petitioner's influent and toxic effluent are not substantially and significantly different from the factors relied upon by the Board in adopting the general regulation applicable to Petitioner.**

The factors the Board relied on in adopting an ammonia nitrogen effluent limits include (1) the impact of ammonia nitrogen in wastewater discharges on dissolved oxygen demand in the receiving stream, and (2) technology present in 1974 allowed dischargers to treat their effluent to meet the 3mg/L limit. *See* Agency Recommendation filed July 19, 2019. Here, Petitioner argues that while there's an extensive list of technology that exists to treat its toxic effluent to meet the ammonia nitrogen limits, these technologies are expensive. Further, the Board has previously held that Petitioner's discharge has unique characteristics making the Henry Plant unable to achieve nitrification, which makes Petitioner different from other industries and POTWs. Pet. Ex. 1 at 40. This finding by the Board can no longer be sustained for the following reasons:

   a. ***Before*** **Petitioner's PVC tank, Petitioner accepts an ammonia-laden waste stream from Mexichem that is substantially and significantly similar to any other waste stream in Illinois.**

Adjusted standards are not granted for the purpose of managing someone else's waste. Here, Petitioner accepts a waste stream from an adjacent outside source referred to as "Mexichem" throughout this proceeding.[3] Mexichem contributes ammonia and nitrogen compounds to the Henry Plant before Petitioner mixes these constituents with its MBT. (Tr.

[3] Mexichem was bought by Vestolit and Vestolit is owned by a larger billion-dollar revenue corporation called Orbia. Petitioner has a service agreement with Mexichem, that rolled into an agreement with Vestolit, for the treatment of its waste stream. (Tr. January 14, 2020 at 62-63.)

January 14, 2020 at 60-61.) Mexichem does not contribute MBT to the Henry Plant. (Tr. January 14, 2020 at 60, Tr. January 15, 2020 at 141-142.) Petitioner can calculate the pounds per day of ammonia and organic nitrogen coming from Mexichem and it knows the flow rates from Mexichem. (Tr. January 14, 2020 at 62, 256.) Galen Hathcock, the Henry Plant site director ("Hathcock"), testified the high ammonia levels in Petitioner's toxic effluent can be attributed to a combination of the MBT in the Henry Plant, Petitioner's own toxic effluent, and Mexichem's contributing ammonia stream. (Tr. January 14, 2020 at 67.) Further, having Mexichem feed its waste stream, that contains the same constituent for which Petitioner claims to need an adjusted standard, into Petitioner's waste stream is virtually unheard of in Illinois. (Tr. January 15, 2020 at 178.)

Mexichem pays (i.e. credits) Petitioner nearly $2 million a year to treat its wastewater. (Tr. January 14, 2020 at 61, IEPA Ex. 9A p. 56-59, Ex. 9B) Petitioner prorates the costs to treat Mexichem's waste stream based on the actual cost of operation of waste treatment. (i.e. Mexichem's effluent flows versus Petitioner's flows and then prorated). Hathcock testified there is a "net zero" profit for treating Mexichem's waste stream because Petitioner charges Mexichem Petitioner's costs to treat the waste stream and, in turn, Petitioner shares electrical and broiler costs with Mexichem. (Tr. January 14, 2020 at 92.) Therefore, Hathcock concludes Petitioner does not make a profit on the operation of the wastewater treatment plant. (Tr. January 14, 2020 at 95.) "It's a zero-sum situation…in other words, we're not charging more than it's costing us." (Tr. January 14, 2020 at 96-97.) Mexichem, in turn, does not need a permit because it uses Petitioner's adjusted standard vicariously to discharge its ammonia into the Illinois River.

Petitioner could treat the Mexichem influent prior to entering Petitioner's facility (i.e. prior to the Mexichem influent entering Petitioner's PVC tank) to reduce or eliminate the

ammonia coming into Petitioner's facility. (Tr. January 15, 2020 at 108, IEPA Ex. 4, Tr. January 15, 2020 at 150-151.) If Petitioner treated the stream coming from Mexichem, that would undisputedly reduce the ammonia levels in Petitioner's toxic effluent. (Tr. January 14, 2020 at 77-78, 193.) Further, Petitioner has not proposed any treatment or separation of the Mexichem influent. (Tr. January 14, 2020 at 79, 192-193.) When Petitioner claims it has been unable to reduce its ammonia through process changes, cannot afford any technically feasible treatment, and then concedes that removing Mexichem's waste stream will cost it nothing because Petitioner only charges its costs, the Board should compel Petitioner to act. Petitioner's petition should be denied because the ammonia-laden waste stream from Mexichem is substantially and significantly similar to any other waste stream in Illinois.

b. *After* Petitioner's secondary clarifier, Petitioner's discharge is substantially and significantly similar to any other treatment facility in Illinois.

There is no more MBT in Petitioner's waste stream after its secondary clarifier. (Tr. January 14, 2020 at 68-69, 84, Tr. January 15, 2020 at 143-144, IEPA Ex. 15, IEPA Ex. 18 p. 42-43.) The MBT stays in the sludge in the biotreaters of the Henry Plant and does not show up in the final toxic effluent. (Tr. January 14, 2020 at 185.) After the secondary clarifier, where Petitioner has no more MBT, Petitioner's waste stream is substantially similar to just about any other industrial facility that has biological treatment, such as food or other chemicals industries, that does not have nitrifying inhibition. (Tr. January 15, 2020 at 158.) In fact, Petitioner's toxic effluent could be compared to municipal wastewater after the secondary clarifier because Petitioner has no nitrifying inhibition. *Id*.

Where there's no MBT after the secondary clarifier, nitrification can be achieved, and Petitioner does not need an adjusted standard. (Tr. January 14, 2020 at 185.) Petitioner can install tertiary nitrification after the secondary clarifier to meet 35 Ill. Adm. Code 304.122. (Tr. January

15, 2020 at 149.) Therefore, Petitioner's request for an adjusted standard should be denied because Petitioner's effluent is substantially and significantly similar to any other treatment facility in Illinois.

c. Treatment options considered by Petitioner show technically feasible alternatives are available to Petitioner for incremental or total removal of ammonia nitrogen in Petitioner's toxic effluent.

All six treatment options evaluated by Petitioner's consultant, Houston Flippin ("Flippin"), would cause reductions in ammonia and are technically feasible. (Tr. January 14, 2020 at 194.) Some of the technically feasible options evaluated would even achieve full compliance with 35 Ill. Adm. Code 304.122. Illinois EPA believes any one of these options could be implemented by Petitioner to help achieve the State standard. However, a review of the record shows Petitioner's conclusions are based on insufficient evaluations of these technically feasible treatment alternatives. Some additional facts not included in Petitioner's evaluations presented to the State are highlighted below:

River Water Dilution

River water dilution could be done seasonally to show incremental improvements in ammonia discharge when there was ample temperature. (Tr. January 15, 2020 at 8-9.)

Granulated Active Carbon ("GAC")

Petitioner reviewed whether granulated activated carbon could be used as treatment to aid in removing nitrification inhibition. Petitioner tested GAC on the wastewater in combination of the C-18 tank and the PC tank, but prior to the PVC tank. In other words, Petitioner tested GAC at one point and at 100% of the time. GAC was not analyzed throughout other parts of the treatment plant. (Tr. January 15, 2020 at 170.) At different points throughout the treatment plant, (e.g. the flocculation or either clarifier) Petitioner would have different constituents in the

wastewater, which could greatly affect the performance of the GAC. (Tr. January 15, 2020 at 170-171.)

Spray Irrigation/ Land Application

MBT has been used in the fertilizer industry to help retain nitrogen in the soil. (IEPA Ex. 18 p. 21.) Winters brought the idea of using the excess MBT as fertilizer to Petitioner, but Petitioner was not interested. (IEPA Ex. 18 p. 21-24.) Petitioner considered spray irrigation on the 80 acres it owns. (Tr. January 14, 2020 at 172-173.) In most cases of industrial spray irrigation, the permittee does not own the land.

Flippin's first Scope of Work document, dated August 19, 2019, had already concluded, without conducting any analysis, that Flippin was to conclude "spray irrigation on Emerald's 80 acres of farm is not the answer." (Tr. January 14, 2020 at 171-172, IEPA Ex. 13A.) This shows that Flippin had already made up his mind before conducting any kind of analysis or study.[4] Contrary to Petitioner's repeated misstatement of the law, land application is common practice throughout Illinois as there are over 100 operating permits for land application of industrial sludge within Illinois. (Tr. January 14, 2020 at 184, Tr. January 15, 2020 at 172-173, Tr. February 3, 2020 at 62) *See* 35 Ill. Adm Code 372 and 391.

For example, the Peoria Sanitary District land applies its waste stream. (Tr. January 15, 2020 at 174.) This fact also diminishes the argument that Petitioner made about the Greater Peoria Sanitary District being able to remove ammonia from a capital improvement project costing $0.81 per pound. (Tr. January 14, 2020 at 208.) Said differently, the Greater Peoria Sanitary District reduced its costs for the capital improvement project with land application –

[4] In AS 13-2, the Board ordered Petitioner to conduct a study on spray irrigation. Here, Petitioner did not conduct a scientific study. Instead, Petitioner hired Flippin, after the petition for an adjusted standard was filed, to simply conclude it would not work.

something Petitioner could avail itself to. Additionally, AkzoNobel Chemicals, also under the same category of facility as Petitioner under 40 CFR 414, in Morris, Illinois, spray irrigates its wastewater. (Tr. January 15, 2020 at 174-175.)

Process Improvement Team

Petitioner claims to be working on process stream improvements but has not provided the details of these claimed process improvements. (Tr. January 14, 2020 at 91.) Petitioner is focused on controlling MBT in its wastewater including source reductions at its processes. (Tr. January 14, 2020 at 45.) Petitioner has focused on better reaction efficiency upstream to keep fewer components out of the waste stream as well as some testing equipment for the lab to increase its ability to test. (IEPA Ex. 18 p. 17-18) Petitioner did not have Flippin evaluate internal process improvements. (Tr. January 14, 2020 at 189.)

Hathcock testified:

> **Q. You're not considering any of Mr. Flippin's alternatives at this time?**
> A. The changes that we can make internally will be far more cost-effective. Instead of spending the $10 million to $12 million that could be required for an end of pipe solution, if we spend much, much smaller funds simply to control the processes in such a way that MBT doesn't go to wastewater at all and reduce it. I don't know that we can achieve zero, but our goal is to reduce it as much as possible.
>
> **Q. Have you run those cost estimates?**
> A. We're still developing the projects. (Tr. February 4, 2020 at 87-88.)

This process improvement team assembled in 2018. Illinois EPA finds Petitioner's failure to undergo any processes improvements since the last adjusted standard (2014) inexcusable. *See* Petitioner's Written Answers to Board Questions filed March 6, 2020, p. 4.

Petitioner's failure to fully consider the above approaches, or combinations thereof, results in Petitioner's failure to meet its burden of proof and, therefore, the adjusted standard should be denied.

d. Treatment options not considered by Petitioner show technically feasible alternatives are available to Petitioner for incremental or total removal of ammonia nitrogen in Petitioner's toxic effluent.

Running Reactions Further

MBT hardly exists in Petitioner's waste stream when Petitioner drives its reactions to completion. (IEPA Ex. 18 p. 19, Tr. January 15, 2020 at 146, 148-149) Petitioner has reacted all of the MBT before and made a product so there was no more MBT left in the waste stream. (IEPA Ex. 18 p. 19.) Petitioner has the goal of replicating this process with the rest of its products. (IEPA Ex. 18 p. 20) This would give Petitioner the ability to nitrify and remove ammonia in its waste treatment system. (IEPA Ex. 18 p. 54-55.)

For the last 20 years, Petitioner and its chemical manufacturing predecessors have claimed that there was no way to not have MBT in Petitioner's toxic effluent; this is not true. Petitioner can run its reactions differently. (Tr. January 15, 2020 at 146-147, 204-205, Tr. February 3, 2020 at 274.)

Additionally, flow rates and level of production do not necessarily correlate with Petitioner's MBT levels. Winters testified:

> "during the course of this month (December 2019), we've been actually doing some recipe changes and tests with one of our processes that we didn't expect to be a big MBT contributor because of how little it runs, but despite its smaller flow rate compared to others in the waste stream and how little it runs, it turned out to be a much bigger offender than we had thought. So we identified it and we're working on recipe changes right now to see what we can make better." (IEPA Ex. 18 p. 32.)

Removing MBT with Hydrogen Peroxide

MBT is known to be oxidized by hydrogen peroxide alone. (Tr. February 3, 2020 at 267, Tr. February 4, 2020 at 61-62, IEPA Ex. 19 p. 2) Hydrogen peroxide injections into Petitioner's waste stream can remove the MBT and Petitioner knows this. Winters testified as follows:

> **Q. Any in process treatments, anything additional that you discussed?**
> A. I discussed with a couple of people some alternatives, alternative ways to pull MBT out of the water supply, including hydrogen peroxide. That's what it is. Hydrogen peroxide can actually oxygenate the MBT and pull it out.
>
> **Q. So if you mix hydrogen peroxide with the MBT, what happens?**
> A. I am not familiar with the chemistry. I just know that it oxidizes the MBT and destroys it inside the wastewater. I don't know how it works though. (IEPA Ex. 18 p. 42.)

Illinois EPA has permitted hydrogen peroxide injections. (IEPA Ex. 20.) ExxonMobil has added hydrogen peroxide as part of its treatment to break down sulfides; Petitioner's MBT is a sulfide. (Tr. February 3, 2020 at 38-42, 256-260, IEPA Ex. 20.) Thus, Petitioner could utilize hydrogen peroxide injections and a means to remove MBT.

Removing MBT with Soybean Peroxidase

Crude soybean peroxidase ("SBP") is an oxidoreductase extracted from the soybean seed coat which has been found to be effective in removing various phenols and aromatic amines from water. (IEPA Ex. 19 p. 1) SBP is a suitable enzyme for the peroxidase-catalyzed conversion of the aromatic thiol, MBT. *Id*. An enzyme-based method has several advantages over other treatment methods, as a result of the enzyme active-site's high specificity for the target pollutant, high efficiency in pollutant removal, lower cost, and ease of handling and storage of the enzyme. In other words, soybean peroxidase can be used for catalyzing the removal of MBT from water. *Id*. This would be a viable and cost-effective method of MBT removal which would allow single stage nitrification in Petitioner's waste stream. (Tr. February 3, 2020 at 266-267.)

Refurbished Biotreaters (Tertiary Nitrification)

Petitioner has four biotreater tanks with capacities of 360,000, 360,000, 440,000 and 1.4 million gallons. (Tr. January 14, 2020 at 27.) During the last adjusted standard case Petitioner

has two biotreaters running, but now Petitioner has only one operational biotreater. (Tr. January 15, 2020 at 139, Tr. January 15, 2020 at 202-203, AS 13-2.) Despite having only one operational biotreater today, Petitioner's data shows single stage nitrification of ammonia has been happening in Petitioner's biotreater. (Tr. January 14, 2020 at 66, IEPA Ex. 18 p. 50-51, 54.)

Flippin testified that Petitioner could modify one of its biotreaters by introducing fixed fill media (e.g. fed with ethanol) to create tertiary nitrification. (Tr. January 14, 2020 at 193, IEPA Ex. 18 p. 51-52) Petitioner could eliminate the ammonia in its toxic effluent by rerouting a pipe from the end of the secondary clarifier back through a modified biotreater (i.e. one of the currently unused biotreaters refurbished with fixed fill media inside) to achieve ammonia nitrification. (Tr. January 14, 2020 at 257, IEPA Ex. 18 p. 51, Tr. January 15, 2020 at 152-153, 155, 159-160.) Tertiary nitrification of ammonia, such as this, has been done at almost every industrial and municipal facility in Illinois with BOD and ammonia in their discharge. (Tr. January 15, 2020 at 155, Tr. February 3, 2020 at 97.) Petitioner knows this is possible. (Tr. January 15, 2020 at 160-161.)

Instead of this option, Petitioner now claims to have a multiyear "plan" to refurbish the three biotreater tanks not currently in operation. Petitioner provides this reason for not implementing such a simple solution without providing the Board any plans on using the three idle biotreaters as backup despite not doing so for the past 25 years. (Tr. January 14, 2020 at 31, Tr. January 15, 2020 at 202-203.) Even if true, Petitioner claims the backup capacity is needed during refurbishments of its largest tank, but once completed, that backup should not be needed for decades to come and Petitioner could get 20 years of tertiary nitrification with very little additional investment in equipment. Petitioner claims to have privately discussed bringing the other biotreaters online as additional biotreater capacity but does not propose to do so here.

(IEPA Ex. 18 p. 52.)

Finally, Petitioner could purchase, but has never evaluated, one more biotreater for the tertiary nitrification needed to achieve the ammonia limits.

Baffled System (Tertiary Nitrification)

A baffled system (e.g. a separator dividing the biotreaters into halves) could be added to Petitioner's biotreaters when they are being refurbished. Petitioner could run the waste stream through one side on the first pass, thereby collecting the MBT in the sludge, and then run the waste stream on the other side, during a second pass, to achieve nitrification and eliminate the ammonia in Petitioner's toxic effluent. (Tr. January 15, 2020 at 154, 156-157.) The baffled system occurs in several systems throughout Illinois – specifically, the ExxonMobil Joliet refinery[5]. This crude oil refinery discharges to the Des Plaines River just prior to it mixing into the Illinois River and its ammonia limits also fall under 304.122(b) limits that are the same ammonia limits from which Petitioner seeks relief. (Tr. January 15, 2020 at 158-159, 161-164.) Illinois EPA believes this option should be evaluated.

Separation of Waste Stream

Petitioner makes ten different products: BBTS, Cure-rite or C18, 3114, MBDS, OBTS, 50% MBT, x-15, Vanlube, Stalite and 9317. (Tr. January 14, 2020 at 33.) MBT is used in four: BBTS, MBDS, OBTS, and 50% MBT. *Id*. Petitioner could re-pipe the waste streams for the products using MBT and, therefore, separate out the MBT from Petitioner's waste stream and treat the rest of its waste stream (i.e. the waste stream not containing MBT) for ammonia. (Tr. January 15, 2020 at 148.)

Combination of Approaches

[5] Another example provided during the hearing was the Citgo oil refinery that also previously had problems meeting the 304.122(b) standard. (Tr. January 15, 2020 at 164-165.)

Combinations of treatment alternatives were never evaluated. For example, Petitioner has not evaluated whether a combination of tertiary nitrification, land application and granulated active carbon would reduce the ammonia levels. (Tr. January 14, 2020 at 72, 189.) Petitioner would consider the possibility of a combination of treatments but has not evaluated that possibility. (Tr. January 14, 2020 at 89-90.) More can be done to evaluate combinations of practices and treatments that would lower Petitioner's ammonia levels. Petitioner's failure to consider a combination of approaches shows a lack of effort towards resolving the ammonia issues within the Henry Plant.

Petitioner's failure to evaluate any of the above approaches, or combinations thereof, results in Petitioner's failure to meet its burden of proof and, therefore, the adjusted standard should be denied.

2. Petitioner's adjusted standard petition should be denied because Petitioner failed to show adequate justification for the adjusted standard.

The Board must consider economic reasonableness when adopting regulations. Section 27 of the Act provides: "The Board shall take into account…the technical feasibility and economic reasonableness of measuring or reducing the particular type of pollution." Economic reasonableness alone, however, is not an element in the required level of justification to obtain an adjusted standard as set forth in Section 28.1(c) of the Act.

Petitioner can no longer dispute technical feasibility. Petitioner must prove that all the technically feasible ways to reduce ammonia are also economically unreasonable. In other words, Petitioner must show the best degree of treatment alternatives, or any combinations thereof, are in no possible way economically reasonable to implement.

a. Petitioner Provided Imprecise Cost Estimates

Petitioner produced imprecise cost estimates. Flippin conducted a Class 5, as defined by

the Association for the Advancement of Cost Engineering ("AACE"), cost estimate when evaluating the costs of six end-of-pipe treatment options. (Tr. January 14, 2020 at 138, 199.) AACE describes a Class 5 cost estimate as a "ratio", "ballpark", "blue sky", "seat-of-pants", "ROM", "idea study", "prospect estimate", "concession license estimate", "guesstimate", and "rule-of-thumb". (Tr. January 14, 2020 at 200, IEPA Ex. 17) A Class 5 cost estimate contemplates approximately 0% to 2% of an entire design completion and the accuracy of the Class 5 cost estimate is typically a range of minus 50% to plus 100%. (Tr. January 14, 2020 at 138, 180, IEPA Ex. 17.)

A Class 5 cost estimate is generally prepared based on very limited information, and subsequently have wide accuracy ranges. (Tr. January 14, 2020 at 179, IEPA Ex. 17.) As such, some companies and organizations have elected to determine that due to the inherent inaccuracies, such estimates cannot be classified in a conventional and systemic manner. (Tr. January 14, 2020 at 179, IEPA Ex. 17.) Class 5 estimates, due to the requirements of end use, may be prepared within a very limited amount of time and with little effort expended - sometimes requiring less than an hour to prepare. Often, little more than proposed plant type, location, and capacity are known at the time of estimate preparation. (Tr. January 14, 2020 at 179, IEPA Ex. 17.) A Class 5 estimate is the least accurate of all the classes of AACE cost estimates. (Tr. January 14, 2020 at 179, 195, Pet. Ex. 12 p. 5.)

As he was paid to do, Flippin provided his best guesstimate on the potential costs of the six end-of-pipe treatment options as follows: ozonation ($11 million); alkaline stripping ($3.65 million); tertiary nitrification ($5 million); breakpoint chlorination ($2.05 million); ion exchange ($3 million); and land application ($3 million). (Tr. January 14, 2020 at 196-197, 210, 211) Flippin has no idea to what degree these are accurate. (Tr. January 14, 2020 at 211) Further,

Flippin did not know how to calculate operating profit versus the cost of partial or full compliance. (Tr. January 14, 2020 at 168-169; IEPA Ex. 12.) Because these imprecise cost estimates do not adequately prove these six end-of-pipe projects are economically unreasonable, Petitioner's request for an adjusted standard should be denied.

b. Fair Market Value Must be Economically Reasonable

The treatment options analyzed in this case for the common practice of nutrient (ammonia) removal are all extremely common technologies. The technologies are so common that Illinois developed design criteria for nearly all the options considered in the 1990s. *See* 35 Ill. Adm. Code 370. Assuming, *arguendo*, that Petitioner's guesstimates are 100% accurate, Petitioner failed to provide the Board with evidence on why the fair market value of these six proposed end-of-pipe solutions are not economically reasonable. Given these are extremely common treatment technologies, Petitioner essentially argues that the treatment of ammonia nitrogen can no longer be accomplished in Illinois.

The Board must take the technical feasibility *and* economic reasonableness into account. Petitioner concludes that some of the most typical ammonia-removing technologies[6] used for nutrient ammonia removal are all economically unreasonable. However, that is not what the Board concluded in promulgating the ammonia nitrogen standards applicable to all other effluents that do not contain MBT. Petitioner's request for an adjusted standard should be denied.

c. Petitioner's Controlled Consultant[7]

Flippin has consulted for Petitioner for 31 years. Pet. Ex. 9 and Ex. 10. Emerald

[6] *See* 35 Ill. Adm. Code 370.

[7] The hearing officer is responsible for weighing the evidence, determining the credibility of the witnesses and resolving conflicts in testimony. *Prato v. Vallas,* 331 Ill. App. 3d 852, 861 (2002); *Tate v. Illinois Pollution Control Bd*., 188 Ill. App. 3d 994, 1022 (1989).

Performance Materials, LLC ("Petitioner's Parent") paid Flippin to conduct consulting work and authorized Flippin to spend $63,700 for the October 11, 2019, report. Petitioner paid Flippin another $18,400 to appear at the deposition and hearings (Tr. January 14, 2020 at 175, 180-181, Tr. February 4, 2020 at 59.) Thus, a total of $45,300 for the 13-page October 11, 2019, report consisting of 13 total pages. (i.e. $3,485 per page). The same fees and schedule of costs applied to the report Flippin prepared for Petitioner on April 17, 2018 – after Petitioner filed this petition for an adjusted standard. (Tr. January 14, 2020 at 182.)

Flippin is not an economist and holds no degree in financial planning. Instead, he was tendered as an expert in "the design and operation of wastewater treatment systems and the design and operation of treatment systems to nitrify ammonia nitrogen in wastewater." (Tr. January 14, 2020 at 130, 158.) Flippin prepared at least two Scope of Work documents, IEPA's Ex. 13A and Ex. 13B. The Scope of Work documents laid out the work Flippin was to complete for Petitioner (i.e. Petitioner's Ex. 12). These Scope of Work documents were created *after* Petitioner filed the instant request for an adjusted standard in April 2019.

Flippin did what he was paid to do. He was never asked to solve Petitioner's ammonia problems or to look at any of the process improvements that Petitioner claims it plans to someday evaluate. Essentially, Flippin was paid to look at six end-of-pipe one-size-fits-all solutions (i.e. not any small-scale combination of treatment alternatives that would cumulatively result in compliance) and conclude they are too expensive. (Tr. January 14, 2020 at 188-189.) Flippin was never asked to evaluate how to remove the MBT in Petitioner's BBTS process. (Tr. February 4, 2020 at 60.) Flippin was never asked to evaluate how to reduce the MBT in Petitioner's MBDS process. (Tr. February 4, 2020 at 60.) Flippin was never asked to evaluate how to reduce the MBT in Petitioner's OBTS process. (Tr. February 4, 2020 at 60-61.) Flippin

was never asked to evaluate how to reduce the MBT in Petitioner's 50% MBT process. (Tr. February 4, 2020 at 60.) Flippin was never asked to look at oxidizing the MBT with hydrogen peroxide at the Henry Plant. (Tr. February 4, 2020 at 62.)

Nowhere in Flippin's Scope of Work document does Flippin state he would conduct anything other than a Class 5 cost estimate. (Tr. January 14, 2020 at 177, IEPA Ex. 13B) Nowhere in Flippin's October 11, 2019, report does Flippin refer to his cost estimates as anything other than Class 5 cost estimates. (Tr. January 14, 2020 at 178.) Flippin never described his cost estimates as anything other than Class 5 cost estimates in his deposition. Nowhere in Flippin's pre-filed testimony does Flippin mention that he ever conducted anything other than a Class 5 cost estimate. (Tr. January 14, 2020 at 225)

In fact, it was not until the hearing when Flippin testified, after prompting from Petitioner's counsel on direct examination, that "some people" consider part (the process and design portion) of what he did to be a "class 4" cost estimate. (Tr. January 14, 2020 at 137, 178.) Notably, Petitioner received supplemental discovery from Illinois EPA on the AACE classification system a few days before the hearing on January 9, 2020, (i.e. IEPA's Exhibit 17).

d. NACWA Surcharge Rates are Not the Yardstick

The surcharge rates for members of the National Association of Clean Water Agencies[8] ("NACWA") does not provide the yardstick for economic reasonableness. The surcharge rate is extra and on top of the rates of regular domestic sewage. The surcharge rate fails to provide information concerning how much the underlying domestic populations were paying for regular-strength domestic sewage. Further, these surcharge rates only account for one year. (Tr. January

[8] NACWA is a member organization of utilities that provide water and wastewater treatment services to both municipal and industrial customers. These members self-report, in a periodic volunteer water survey, what costs they incur in treating each extra pound over and above the base load of ammonia that comes with domestic sewage. (Tr. January 14, 2020 at 142, IEPA Ex. 16.)

14, 2020 at 206.)

In this case, Flippin compared the NACWA median cost for surcharge of ammonia-nitrogen to the Class 5 valuations per pound of ammonia removed. (Tr. January 14, 2020 at 141, 210.) Flippin had no financial information from Petitioner and only made the comparisons to the median surcharge rates of the 17 random reporting NACWA members from across the United States. (Tr. January 14, 2020 at 209-210)

These 17 randomly participating NACWA agencies self-calculated their surcharge costs. There is no standardized methodology on how to determine or report these surcharge calculations. (Tr. January 14, 2020 at 143, 234.) In order to recover costs of treatment *beyond* that needed for domestic strength sewage, it is common for some, not all, utilities to charge an additional high strength surcharge to industrial facilities that exceed a certain threshold concentration of a given parameter. (Tr. January 14, 2020 at 206, IEPA Ex. 16.) Only 17 total agencies across the United States reported an ammonia nitrogen surcharge rate. (Tr. January 14, 2020 at 204-205, IEPA Ex. 16.)

Some of the 17 total responding agencies are also connected to POTWs. (Tr. January 14, 2020 at 206) Petitioner failed to provide whether those connected to POTWs received grants or loans to fund parts of the industrial ammonia reduction projects and to what degree the POTW's payments towards those projects (i.e. the persons within the POTW's service area) contributed to and/or offset the overall project costs thereby reducing the surcharge rates on the industrial NACWA member. (Tr. January 14, 2020 at 207.) Further, the NACWA surcharge rates fail to show whether the rates were going to fluctuate in the future - similar to the 2%-3% increases POTWs will enact over the length of a loan from Illinois EPA's State Revolving Loan Program. (Tr. January 14, 2020 at 284-285.)

Flippin used $1.50 per pound of ammonia, the median rate by NACWA survey responders, in making his economic comparisons to his estimates to recover costs of ammonia treatment. (Tr. January 14, 2020 at 144, 205, 210.) Flippin did not use the average rate of $1.60 or the maximum rate of $5.03 per pound. (Tr. January 14, 2020 at 205, IEPA Ex. 16.) Finally, and fatal to Petitioner's entire economic reasonableness argument, Flippin could not provide the Board with a ceiling for the cost in pounds of ammonia removed that would be economically unreasonable stating he hadn't "settled on a number myself". (Tr. February 4, 2020 at 63.) Flippin stated that he would not suspect NACWA members to build treatment facilities what were economically unreasonable. (Tr. February 4, 2020 at 64.) Therefore, and because Petitioner provides no ceiling, the highest NACWA surcharge figure of $5.03 per pound must also, at a bare minimum, be economically reasonable. (Tr. January 14, 2020 at 142, 204, IEPA Ex. 16.)

Petitioner failed to comment on its ability to take a private loan or an interest-free loan from Petitioner's Parent to spread out the capital costs any of the technically feasible treatment alternatives. (Tr. January 14, 2020 at 201) When the costs of the treatment alternatives are evaluated over the span of a 20-year loan, and also considering the cost per pound analysis conducted by Flippin over 20 years, every treatment alternative would be affordable. Why does Petitioner compare one year of NACWA data as if Petitioner must pay for a treatment alternative within one year? In other words, the reporting NACWA members could also be spreading out the costs of the capital projects over 20 or more years so that the surcharge level appears to be lower.

Finally, Mark Liska, ("Liska") testified about why Petitioner's measure of cost per pound for economic reasonableness is problematic:

> "For an industrial discharge what we should really be looking at is simply the cost to treat the wastewater to its required limits. In this case, the 3/6 limits. If I were to give an example of why costs per pound wouldn't work, let's imagine Chemical X that any facility produces, and it produces one pound of that

> chemical. Now, in order to treat for that -- say one pound per day of that chemical. In order to treat for that one pound per day chemical, it would cost them $50 on that day.
>
> Now, under what I've mentioned something that costs $50 per day to treat to meet a limit would not seem unreasonable at all. Under the testimony given where we're talking about costs per pound, the costs now instead of what has been mentioned before as… higher than $1.50 per pound is too much. In this…case, it's now $50 per pound because it's one pound of it…and $50 to do it. So… under a cost per pound basis…it would not be feasible to do because it would cost $50 per pound, which is 50 divided 1.50, a very high multiple times more than the cost of one pound per day -- $1.50 per day. It would cost $50 per day for that one pound. However, the total cost of $50 -- or it could be $50 per month, the total cost would obviously be very affordable. So when we're talking about affordability and whether something is both technically feasible and economically reasonable, the economically reasonable part we should be talking about total cost and not costs per pound." (Tr. January 15, 2020 at 193-194, Tr. February 3, 2020 at 247-248.)

e. How to Evaluate Economic Reasonableness[9]

Before cost of treatment becomes a factor in an adjusted standard, a petitioner must demonstrate that the costs are substantially and significantly different than the costs of treatment that the Board initially considered when promulgating the ammonia nitrogen effluent limit. The existence of MBT in Petitioner's waste stream does not justify the Board's granting of an adjusted standard because the cost of treatment of ammonia is not substantially and significantly different for Petitioner than for other wastewater treatment plants. Petitioner presents no evidence that the cost of treating its toxic effluent, or common influent from Mexichem, for ammonia nitrogen is higher than the costs expended by a statistically significant sample of Illinois POTWs or, and more relevantly, other industrial plants with similar amounts of ammonia discharge, or higher than the costs contemplated by the Board when adopting Section 304.122.

"Economic reasonableness" is not defined in the Act or the Board's regulations.

[9] *See* Illinois EPA's Response Opposing Petitioner's Motion to Exclude Relevant Evidence filed with the Board on December 30, 2019, for a complete legal analysis.

However, the Board has had occasion to apply an economic reasonableness standard in a variety of cases. Typically, the cases are interpreting, as in this case, whether the Board has determined that implementation of a particular control technology or compliance with a rule will be economically reasonable pursuant to the Board's mandate to take economic reasonableness "into account" under Section 27(a) of the Act.

The question is whether Petitioner, not Illinois EPA, has been reasonable (or not arbitrary) in determining that implementation of all technologically feasible alternatives is economically unreasonable. Further, the question includes an analysis of whether Petitioner has provided the Board with enough information to determine whether all technically feasible alternatives (e.g. complete overhauls, partial improvements, or a combination of projects) are economically unreasonable with appropriate consideration given to all possible funding avenues available to Petitioner and a complete financial analysis of Petitioner's partial compliance.

A variety of cases that reflect the Board's analysis of economic reasonableness over many decades provides a roadmap for the economic reasonableness analysis of a control technology. The variety of cases dealing with an economic reasonableness standard include but may not be limited to: adjusted standards cases (e.g., *EPA v. Pollution Control Board*, 308 Ill. App. 3d 741 (2d Dist. 1999); rulemaking matters (e.g., *In the Matter of: Proposed Amendments to Clean Construction or Demolition Debris Fill Operations (CCDD): Proposed Amendments to 35111. Adm. Code 1100*, R12-9, February 2, 2012); and site-specific rulemakings (e.g., *In the Matter of' Proposed Site-Specific Rule Change for Reilly Chemical Corporation, Granite City Facility: 35 I11. Adm. Code 307.1102*, R88-9, October 18, 1989; and, *Central Ill. Light Co. v. PCB*, 159 Ill. App. 3d 389 (3d Dist. 1987)).

While the Board has on occasion used a cost per pound yardstick[10] in certain cases involving air pollution, there are a number of other concerns that should factor into the cost. The Board has certainly not limited its analysis to arbitrarily assessing whether a certain cost per pound of pollution reduction is sufficient to establish whether implementation of a technology is economically reasonable.

First, the Second Appellate District of Illinois has articulated that the Board should be willing to look at any non-speculative, tangible benefits of installing the subject technology. *EPA v. PCB*, 308 Ill. App. 3d 741, 751 (2d Dist. 1999). **Second**, costs for compliance and the environmental harm addressed by the control technology should be viewed relative to other operating costs and other environmental problems addressed by existing operations. *Central Ill. Light Co. v. PCB*, 159 Ill. App. 3d 389 (3d Dist. 1987). **Third**, the Board has also found affordability or economic impact an appropriate factor to consider in determining whether the implementation of a particular technology can be considered economically reasonable. *In the Matter of: Proposed Amendments to Clean Construction or Demolition Debris Fill Operations (CCDD): Proposed Amendments to 35 Ill. Adm. Code 1100*, R12-9, February 2, 2012, affirmed in *County of Will v. Pollution Control Bd*., 2019 IL 122798 (Ill. Sup. Ct. 2019). **Finally**, whether alternative methods of partial compliance were adequately investigated may be a factor in the overall assessment of economic reasonableness. *See In The Matter Of' The Petition Of The City of Havana For A Site-Specific Rule-Making Rule Change To The Combined Sewer Overflow Regulations*, R88-25 (February 22, 1990).

[10] *See EPA v. PCB*, 308 Ill. App. 3d 741, 746-747 (Court found that installation of a powder coating system would be economically reasonable. The Board, in the underlying case, used the average control cost per ton in the Reasonably Available Control Technology rules as a yardstick. Those rules, however, were based on an Illinois Institute of Natural Resources study that determined an average cost-- in 1980 dollars-of complying with [air] pollution regulations. The cost related to air pollution control for VOM, not water pollution control measures for ammonia.) *See also In the Matter of: Petition of Greif Packaging, LLXC, For An Adjusted Standard From 35 Ill. Adm. Code Part 218*, Subpart TT, AS 2011-01, (April 5, 2012).

This brief will not rehash the entire legal analysis on economic reasonableness previously provided to the Board in Illinois EPA's Response Opposing Petitioner's Motion to Exclude Relevant Evidence filed with the Board on December 30, 2019. The following facts supplement the December 30, 2019, legal analysis:

Economic Impact on Petitioner

In 2013, Petitioner's Parent[11] was the legal entity petitioning the Board for this same adjusted standard. *See* AS 13-2. Petitioner's Parent serves as a "pooled cash" hub for four subordinate entities known as 1) Kalama Chemical, LLC, 2) Emerald Specialty Polymers, LLC, 3) Emerald Performance Hong Kong Limited, and 4) Petitioner. (IEPA Ex. 9A p. 20-23, IEPA Ex. 10 p. 26, 45-48, IEPA Ex. 11A, 11B and 11C.) Petitioner's Parent pays all the bills for the Henry Plant.[12] (Tr. January 14, 2020 at 53, IEPA Ex. 10 p. 45-47.)

Petitioner's Parent has used the revenues from one of its subordinate entities to finance a capital improvement project of one of its other subordinates. (IEPA Ex. 10 p. 48, IEPA Ex. 11A, 11B and 11C.) Petitioner's Parent pools the financial resources together from all four subordinates and cash flows from Petitioner's Parent to Petitioner when needed. (IEPA Ex. 10 p. 45-47, Ex. 9A p. 20-23, IEPA Ex. 11A, 11B and 11C.) At a minimum, Petitioner's Parent forecasts more than half a billion dollars in collective revenues for fiscal year 2019. (IEPA Ex. 10 p. 26, 45-48) If compelled by the Board, Petitioner's Parent would pay for the technically

[11] Petitioner's Parent is owned by an investment firm, American Securities, that owns a portfolio of $10 to $14 billion in revenues. (IEPA Ex. 10 p. 9-10)

[12] Even though Petitioner's Parent pays all the bills, Petitioner has never submitted a capital improvement proposal, aimed at fixing the ammonia issues at the Henry Plant, to Petitioner's Parent for consideration. (IEPA Ex. 10 p. 40)

feasible treatment(s) in this case.[13] (IEPA Ex. 10 p. 14-15)

Any liability which may ultimately be incurred with respect to this case will not have a material effect on the combined financial position or operations of Petitioner. (IEPA Ex. 11A Note L, IEPA Ex. 11B Note J, IEPA Ex. 11C Note J.) Hathcock[14] does not know when a treatment alternative becomes economically prohibitive and believes Petitioner's Parent would make that decision. (Tr. January 14, 2020 at 74-75.) Petitioner's Parent has previously paid $10 million to install a NaSH system to reduce air emissions at the Henry Plant. (Tr. January 14, 2020 at 79-80.)

Even though Petitioner's Parent pays all the bills at the Henry Plant, Petitioner has never submitted a capital improvement proposal, aimed at fixing the ammonia issues at the Henry Plant, to Petitioner's Parent for consideration. (IEPA Ex. 10 p. 40)

Petitioner Failed to Evaluate Alternative Funding Sources

Flippin used the numbers as reported by NACWA and did not consider the possibility of a contributing funding source, such as Mexichem, to Petitioner that could offset Petitioner's capital improvement costs. (Tr. January 14, 2020 at 201.) If Petitioner was required to make a large capital improvement project to its facility, Mexichem would have to pay Petitioner more to treat its waste stream to offset the cost. (Tr. January 14, 2020 at 66.)

Illinois POTWs

Illinois EPA identified that Petitioner's estimated capital costs are comparable or lower than the capital costs expended by Illinois POTWs. (IEPA Ex. 1) Illinois POTWs must treat

[13] The largest capital improvement project approved by Petitioner's Parent in recent history was for an approximate 36€ million (approximately $39,928,572.00) purification capacity project in Rotterdam, Netherlands. (IEPA Ex. 10 p. 16-17)

[14] Hathcock is the site director at the Henry Plant and his boss, Jan Eland, works in Europe. (Tr. January 14, 2020 at 56.) Hathcock has never given Flippin's report to Mexichem. (Tr. January 14, 2020 at 57.)

ammonia. Several POTWs obtain low-interest 20-year loans from the State of Illinois' State Revolving Loan Program. (Tr. January 14, 2020 at 268) To obtain a loan from the State of Illinois, POTWs must submit items such as an actual project plan that identifies a need, costs, alternatives if analyzed, the impacts to residents, the user charges, environmental clearances, and a loan application package detailing ability to repay the loan as well as establish a debt ordinance or some other vehicle authorizing the POTW to borrow the money. (Tr. January 14, 2020 at 268, 280) Illinois EPA obtains financial audits and five-year *pro forma* budgets from POTWs. (Tr. January 14, 2020 at 280) Illinois EPA requires a Class 3 cost estimate for its project plans. (Tr. January 14, 2020 at 282-283) Illinois EPA eventually receives the final 100% design before allowing projects to go out for competitive bidding to award the contracts to the low responsive, responsible bidder. (Tr. January 14, 2020 at 207-207, 279, 283-284) When these projects go out for bid, and before Illinois EPA grants a loan, the loan applicant has submitted a Class 1 cost estimate. (Tr. January 14, 2020 at 284) Some of the projects discussed further at hearing showed that treating ammonia nitrogen in Illinois was economically reasonable as follows:

> Batavia, IL completed a capital improvement project for a total of approximately $10.8 million as bid. (Tr. January 14, 2020 at 290, IEPA Ex. 1) These costs included multiple upgrades that had nothing to do with ammonia-nitrogen removal including the additions of influent flow measurement, mechanical bar screen, primary clarifier equipment in existing tanks, intermediate pump station pump, UV disinfection, effluent flow meter, and rehabilitation of sludge digestion. The only upgrades liked to ammonia-nitrogen removal would be addition of aeration tanks, blowers, diffusers, and secondary clarifier. These upgrades also provided increased capacity to treat higher flow, BOD, and TSS. (Tr. January 14, 2020 at 190-191, 219, Pet. Ex. 12, IEPA Ex. 1) Thus, the actual total cost attributable to ammonia-nitrogen removal in Batavia, Illinois was far less than $10.8 million.
>
> St. Charles, IL completed a capital improvement project for a total approximately $8.4 million as bid. (Tr. January 14, 2020 at 290, IEPA Ex. 1) These costs included multiple upgrades that had nothing to do with ammonia-nitrogen removal including the additions of headworks modifications, new scum troughs, existing aeration basin rehabilitation, baffles in existing secondary clarifiers,

excess flow pump station and clarifier rehabilitation, new return activated sludge and waste activated sludge pumps, UV disinfection, and piping and electrical system upgrades. The only upgrades linked to ammonia-nitrogen removal were the addition of aeration tanks and blower building. These upgrades also provide increased capacity to treat higher flow, BOD, and TSS. (Tr. January 14, 2020 at 191, 219, Pet. Ex. 12, IEPA Ex. 1) Thus, the actual total cost attributable to ammonia-nitrogen removal in St. Charles, Illinois was far less than $8.4 million.

Geneva, IL conducted a two-phased capital improvement project for a total of approximately $10.9 million dollars as bid. (Tr. January 14, 2020 at 290, IEPA Ex. 1) This project included multiple upgrades that had nothing to do with ammonia-nitrogen removal including additions of fine screens, raw sewage pumps, grit tank, primary clarifier, UV disinfection, sludge digestion, sludge dewatering, flood proofing, and remodeling of administration/ laboratory facilities. Flippin claimed the only upgrades linked to ammonia-nitrogen removal would be the addition of aeration tanks, blowers, and a final clarifier. These upgrades also provided increased capacity to treat higher flow, BOD, and TSS. (Tr. January 14, 2020 at 189-190, 219, Pet. Ex. 12, IEPA Ex. 1) The upgrades attributable to ammonia-nitrogen removal all occurred in phase II of the Geneva, IL project, costing $5.5 million. *See* IEPA Ex. 1 p.1 Thus, the actual total cost attributable to ammonia-nitrogen removal in Geneva, Illinois was far less than $5.5 million.

Mount Carmel, IL completed a capital improvement project for a total approximately $1.6 million. These costs included replacement and relocation of an effluent line and river outfall structure which had nothing to do with ammonia-nitrogen removal. Additionally, the plant replaced an existing mechanical aeration system with a diffused aeration system. (Tr. January 14, 2020 at 191-192, 219, Pet. Ex. 12, IEPA Ex. 1) Thus, the actual total cost attributable to ammonia-nitrogen removal in Mount Carmel, Illinois was far less than $1.6 million.

3. Petitioner's adjusted standard petition should be denied because releasing its toxic effluent into the Illinois Rover has negative environmental impacts.

Petitioner's final undiluted effluent is toxic to the Illinois River. (Tr. January 14, 2020 at 253, Tr. February 3, 2020 at 270.) Petitioner's effluent is so toxic that if Petitioner land applied Petitioner's undiluted toxic effluent on corn and soybeans there would be nothing but barren ground and nothing would grow. (Tr. February 4, 2020 at 13, 63.) Furthermore, Petitioner's MBT is very toxic to aquatic life with long lasting effects; therefore, releases to the environment are regulated. (IEPA Ex. 19 p. 1) As opposed to previous adjusted standard cases, however,

Petitioner's data presented in this proceeding shows its MBT no longer leaves the Henry Plant. (IEPA Ex. 19 p. 1)

Petitioner argues that there will be no environmental or health impact because the discharge will not cause the winter and summer acute ammonia nitrogen water quality standards to be exceeded at the edge of the zone of initial dilution (ZID[15]), or the winter summer acute and chronic standards at the edge of the mixing zone. In addition, Petitioner argues the whole effluent toxicity ("WET") testing of the Henry Plant's discharge has not identified any toxic impacts from the discharge considering the dilution achieved by the multi-port diffuser. Thus, Petitioner says the impacts will not be significantly more adverse than that contemplated by the regulation of general applicability.

The Board has previously concluded that Petitioner's requested adjusted standard would not cause negative environmental or health impacts and the Appellate Court upheld that finding. *See* AS 13-2, p. 61-62; *Emerald Performance Materials v. IPCB and IEPA*, 2016 IL App. (3d) 150526, 1130-31. However, Illinois EPA is concerned, as it was in AS 13-2, about the whole effluent toxicity within Petitioner's toxic effluent. Besides the toxicity from ammonia, there are other substances that are likely toxic to aquatic life – such as the TDS levels now known to be in Petitioner's effluent from Flippin's testimony about field application. (Tr. February 4, 2020 at 13, 63.)

A test conducted in 2017 showed an LC50 result of 3.87%, which is technically permissible given the amount of mixing Petitioner has been given. However, in the present day, LC5O values this toxic are not found at any other Illinois facility.

A mixing zone is improper here because Petitioner is not providing the best degree of

[15] Petitioner has a zone of initial dilution (ZID) which is a plume of water that is essentially toxic within a defined boundary following of which they must meet standards. (Tr. January 14, 2020 at 317-318)

treatment. Brian Koch testified as follows regarding the toxicity of Petitioner's toxic effluent:

> "The tests that the facility conducted used a standard solution series of 100% effluent, 50% effluent mixed with 50% lab water, 25% effluent with 75% lab water, 12.5% effluent and 6.25% effluent. The reason why the dilution series is bracketed in that manner is because most -- most often toxicity arrives somewhere between 6.25% and 100% of the effluent concentration. In this case, toxicity occurred in every treatment so much that we could not determine what the actual LC50 value would be as far as percent effluent goes because the 6.25% effluent treatment had complete mortality." (Tr. January 14, 2020 at 312, IEPA Ex. 2 and Ex. 3.)
>
> At that point, when I made the recommendation to the permit section, which I believe was Mark Liska, I revised the dilution series. So it would bracket, if you will, the in-stream waste concentration which is the concentration that this facility is authorized via their zone of initial dilution. That was equated to about 2.1% effluent. So I revised the dilution series so there were treatments both above and below 2.1% effluent. (Tr. January 14, 2020 at 314-315.)
>
> Petitioner has essentially a maximum limit of 2.1% effluent as the LC50 value. There is no evidence that they have exceeded that and by exceeded, I mean had a lower LC50 value of 2.1. All we know is that they had one that was less than 6.25% effluent. That's why we recalculated the dilution series. What that 2.1% LC50 means is that if you were to conduct a test on this effluent, they would be authorized to have a sample of 2.1% effluent and 97.9% control water, mix the two solutions together and that would kill half the organisms." (Tr. January 14, 2020 at 319.)

In Brian Koch's 14-year history at Illinois EPA, he believed this may be the only facility that he developed a new dilution series to bracket where the level of effect was occurring. (Tr. January 14, 2020 at 316.) In Flippin's Scope of Work document, Flippin proposed to "discuss WET test results and fractions potentially assignable to salt and ammonia-nitrogen". (Tr. January 14, 2020 at 174; IEPA Ex. 13A.) However, Petitioner declined to have Flippin make those calculations. (Tr. January 14, 2020 at 174-175.)

Over the expansive history of this adjusted standard, Petitioner has presented alternatives that achieve 100% or less ammonia reduction. Petitioner has the tools available to eliminate ammonia nitrogen concentration in its toxic effluent but overtly fails to act. Illinois EPA strongly

encourages the Board to require Petitioner to implement ammonia reductions rather than granting the relief requested by Petitioner. Petitioner has failed to meet its burden of proof under Section 28.1(c)(3) of the Act and its petition should be denied.

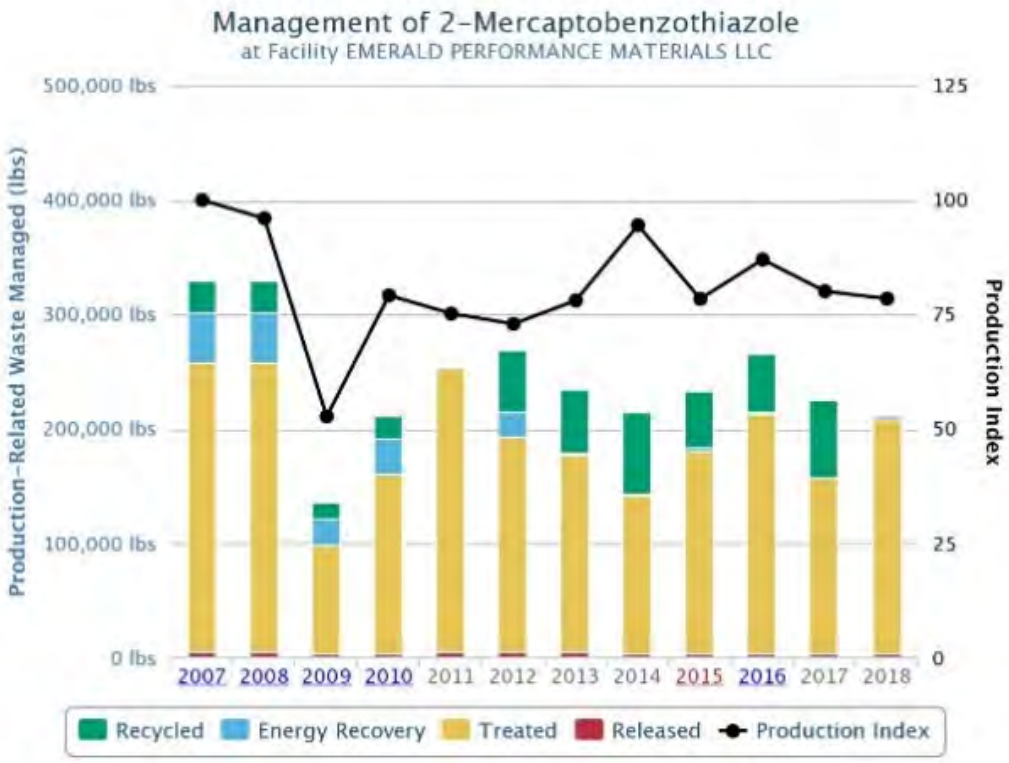
4. Petitioner's adjusted standard petition should be denied because the adjusted standard limits requested were arbitrary.

Petitioner requests a daily adjusted standard of 140 mg/L and 1,225 pounds and a 30-day average adjusted standard of 110 mg/L and 631 pounds. Instead of proposing an incremental reduction, Petitioner requests the same concentration limits granted by the Board in AS 13-2. Instead of making any reasoned calculation, Petitioner justifies its request to serve as an economic buffer in the event its production levels increase. (Tr. January 14, 2020 at 69-70.) This is not a valid justification for an adjusted standard. Petitioner has provided no analysis and has run no models to come up with its proposed concentration numbers. (Tr. January 14, 2020 at 71, 77, Tr. January 15, 2020 at 20.)

When given the opportunity to develop and propose effluent limits with which Petitioner could comply reliably given historical effluent data, Petitioner rejected that approach. (IEPA Ex. 13A, Ex. 13B.) Instead, for load limits, Petitioner arbitrarily took 25 percent off its current adjusted standard (1633 pounds per day and 841 pounds average per 30 days) without taking daily monitoring reports or production numbers into account. (Tr. January 15, 2020 at 184, IEPA Ex. 7.) In contrast, Illinois EPA's recommendation (see below) is made using best professional judgement after review of historical data. Specifically, Illinois EPA reviewed all load limit and daily concentration DMR data from 01/31/2014 through 07/31/19 and 30-day average concentration data from 10/31/16 through 07/31/19.

By volume, in 2018, approximately 70% of Petitioner's products relied on MBT. In 2019, approximately 50% relied on MBT. (Tr. January 14, 2020 at 34.) 2018 was a record year for

production of BBTS. (Tr. January 14, 2020 at 37-38.) The graphs below (obtained from the USEPA at https://enviro.epa.gov/triexplorer/tri_release.chemical), illustrate the production-related waste management quantities that Petitioner must report to the USEPA pursuant to the Pollution Prevention Act of 1990:



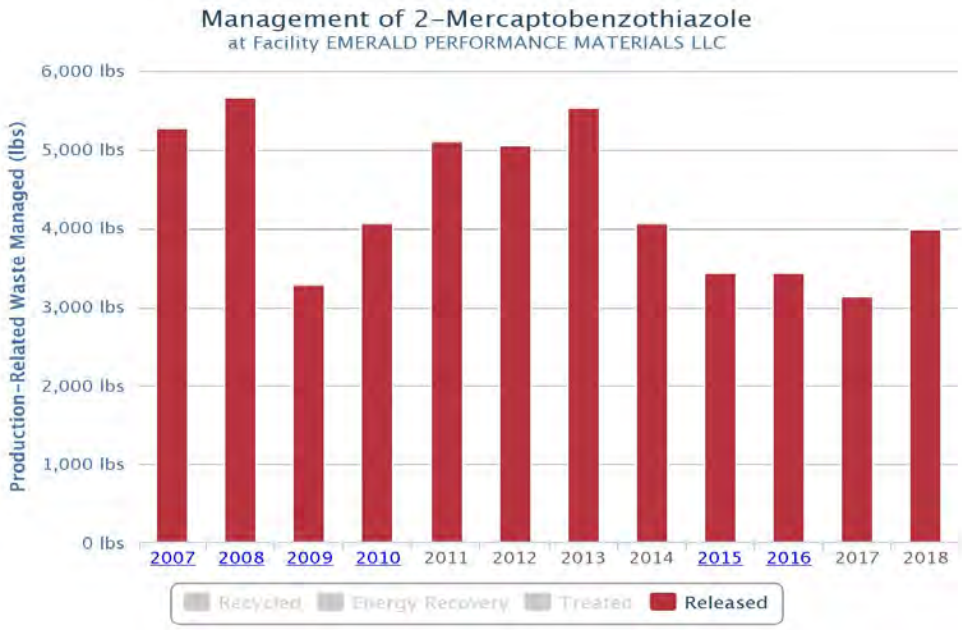


Figure 1-2 - The production index is a measure of production in a given year relative to production in the base year. For any given year, the value of the production index is equal to the value for the prior year multiplied by the production ratio for the current year. The value in the base year is set equal to 100. The base year is either the first year shown on the graph or the first year for which production information is continuously available. (Production index values are not shown for years prior to the base year). The production index is used to put year-to-year changes in TRI quantities into the context of production. If a facility first reported a chemical in 2008 and its production index in 2011 was 150, this means that production in 2011 was 50% higher than in 2008.

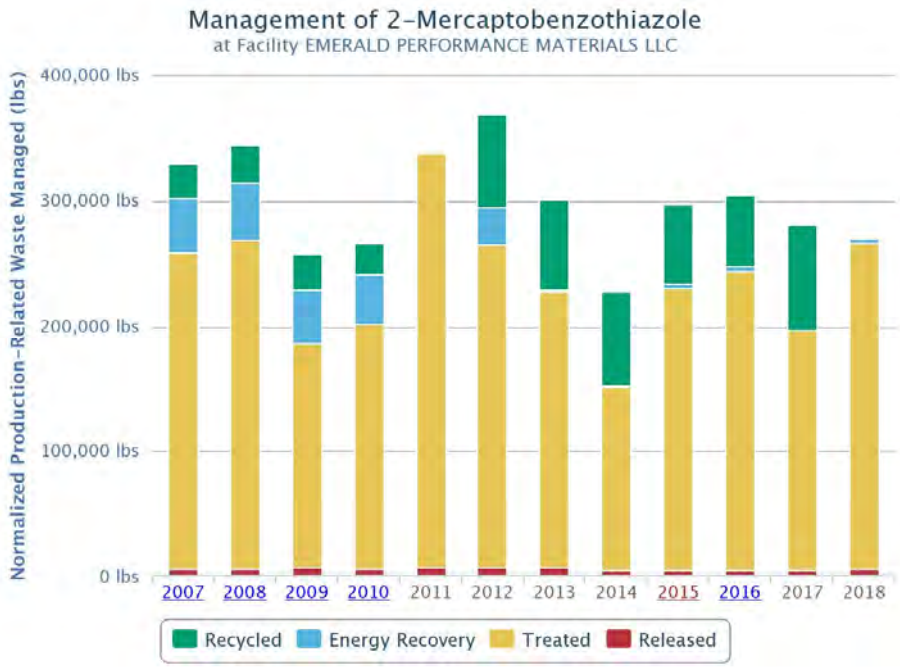


Figure 3 - Normalize waste quantities relative to production - Normalized production-related waste managed is a normalized measure of waste calculated by dividing the reported waste management quantity by the production index for a given year. This metric provides a rough guide to how much chemical waste would have been generated each year had production levels remained constant over time. If normalized production-related waste decreases, this means that less waste is being generated per unit of production. All quantities shown in this graph are normalized relative to production levels in the first year shown on the graph.

Because the adjusted standard limits requested were arbitrary, Petitioner's adjusted standard request should be denied by the Board.

III. CONCLUSION AND RECOMMENDATION

The time has come for Petitioner to finally avail itself to the multitude of options it has to eliminate the ammonia levels in its toxic effluent. Petitioner must act and Illinois EPA believes Petitioner will not meaningfully act unless compelled to by the Board.

WHEREFORE, for the reasons stated herein, Illinois EPA respectfully recommends that the Board fully DENY Petitioner's petition for adjusted standard as Petitioner has not met its burden of proof to obtain an adjusted standard. In the event the Board decides to do anything other than fully DENY Petitioner's request for an adjusted standard over Illinois EPA's recommendation, Illinois EPA provides language for consideration attached hereto as Exhibit A.

Dated: March 11, 2020

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THIS FILING IS SUBMITTED ELECTRONICALLY

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY,

Respondent,

BY: /s/Rex L. Gradeless
Rex L. Gradeless

BY: /s/Christine Zeivel
Christine Zeivel

EXHIBIT A

1. Any adjusted standard granted by the Board should not exceed a daily maximum of 110 milligrams per liter (mg/L) and no more than 553 pounds per day ("lbs/day") and Petitioner's 30-day average should not exceed 89.9 mg/L and no more than 475 lbs/day.[16]

2. Any adjusted standard granted by the Board should not be effective any longer than 5 years after the Board's order because a sunset provision "is appropriate and a valid means to inspire Emerald to attempt to comply with the pollution regulations." *See Emerald Performance Materials v. IPCB and IEPA*, 2016 IL App (3d) 150526 (¶41).

3. Within 180 days of the Board's Order, Petitioner must submit to Illinois EPA a proposed plan for installation and/or implementation of additional treatment, including a state construction permit application and a schedule for completion. Such treatment may include methods for removing MBT to allow for single-stage nitrification such as hydrogen peroxide or soybean paroxidase or end-of-pipe treatments such as tertiary nitrification or granulated activated carbon. Petitioner must implement its plan according to any Illinois EPA-approved schedule.

4. In the event that that the Board decides to grant Petitioner's request for an adjusted standard and does not impose a requirement to install any additional treatment soon after issuance of the Board's Order as recommended in Paragraph 3 above, Illinois EPA recommends that any interim adjusted standard granted by the Board should also be subject to all the following conditions:

a. Petitioner must work to minimize MBT getting to the treatment plant and

[16] This recommendation is made using best professional judgement after review of historical data. Specifically, Illinois EPA reviewed all load limit and daily concentration DMR data from 01/31/2014 through 07/31/19 and 30-day average concentration data from 10/31/16 through 07/31/19. It is important to note that Petitioner has not exceeded Illinois EPA's proposed load limits in that 5.5-year period. This recommendation serves only as a ceiling for any adjusted standard granted by the Board. This should not be construed as Illinois EPA changing its previous position that a lower standard is more appropriate to compel Petitioner to act. *See* Illinois EPA's Recommendation in AS 13-02.

its overall ammonia discharges. Petitioner must investigate improvements to all of Petitioner's reaction processes, as well as investigate any new production methods and technologies that generate less ammonia and nitrification inhibitors in Petitioner's discharge at least annually. Where practicable, Petitioner must substitute current production methods or technologies with new ones where the substitution generates less ammonia in Petitioner's discharge. Petitioner must also annually investigate new treatment methods and technologies prior to or following the secondary clarifier and evaluate implementation of new and existing treatment technology based on current plant conditions including, but not limited to, existing MBT concentrations. Where practicable, Petitioner must substitute current treatment methods or technologies with new ones so long as the substitution generates less ammonia in Petitioner's discharge.

b. Beginning six months following the Board's Order and every twelve months following, Petitioner must provide Illinois EPA with a written report summarizing all work completed in the preceding six months and detailing any improvements made to its reaction processes, any plans to improve the reaction processes, and any new treatment technologies considered or implemented, along with corresponding timetables for implementation. The written report must include capital costs or expected capital costs for improvements to these processes.

c. Within 180 days of the Board's Order, given the effluent from Petitioner's secondary clarifiers does not contain MBT and can be nitrified, Petitioner must investigate and provide to Illinois EPA how much treatment capacity it needs prior to and following the secondary clarifiers to complete nitrification.

d. Following rehabilitation of all of Petitioner's biotreaters[17] and within two years of the Board's Order, Petitioner must reevaluate its options to optimize use of the three smaller biotreaters in providing treatment capacity for purposes of reducing ammonia discharges and provide that evaluation in a written report required by condition 4(b).

e. Petitioner must continue[18] quantifying the amount of ammonia and TKN attributable to Mexichem entering Petitioner's treatment plant and provide that information to Illinois EPA in its written annual reports submitted pursuant to condition 4(b).

f. Within 180 days of the Board's Order, Petitioner must provide to Illinois EPA evaluations of the removal and the pre-treatment of Mexichem's waste stream and any impact such changes may have on Petitioner's waste stream and treatment processes.

g. Should Petitioner fail to meet the ammonia discharge limits in Section 304.122(b) before expiration of any adjusted standard granted by Board Order, Petitioner must submit to Illinois EPA a state construction permit application to install end-of-pipe treatment, along with a schedule for project completion.

h. Petitioner must continue to maintain the high-rate, multi-port diffuser for the discharge into the Illinois River to achieve an effluent dispersion necessary to meet the applicable ammonia nitrogen water quality standards at the edge of the mixing zone and zone of initial dilution.

i. Petitioner must, at a minimum, maintain the following ammonia reduction

[17] See Tr. January 14, 2020 at 52.

[18] As of Petitioner's March 6, 2020, filing, it appears as if Petitioner began daily monitoring of Mexichem's stream at the PVC lift station in November 2019.

measures: maintenance of the BBTS Wet Scrubber with a dust collector; and maintain upgrades to the instrumentation of the acetonitrile recovery column.

j. Petitioner must conduct semi-annual monitoring of ammonia nitrogen in the Illinois River (within no more than 10 feet from the edge of the mixing zone (300 feet from the diffuser)) to demonstrate compliance with the ammonia water quality standards in accordance with 35 Ill. Adm. Code 302.212.

k. Based upon review of the written progress reports required by condition 4(b), Illinois EPA may petition the Board to modify the relief granted by the Board

l. Petitioner must operate in full compliance with the Clean Water Act, its National Pollutant Discharge Elimination System permit, the Board's water pollution regulations, and any other applicable requirements.

CERTIFICATE OF SERVICE

I, the undersigned, on affirmation state the following:

That I have served the attached **ILLINOIS EPA'S CLOSING BRIEF IN SUPPORT OF DENYING PETITIONER'S REQUEST FOR AN ADJUSTED STANDARD** by e-mail upon Thomas W. Dimond at the e-mail address of Thomas.Dimond@icemiller.com, Kelsey Weyhing at the e-mail address of Kelsey.Weyhing@icemiller.com, Christine Zeivel at the e-mail address of Christine.Zeivel@illinois.gov, upon Don Brown at the e-mail address of don.brown@illinois.gov, and upon Carol Webb at the e-mail address of Carol.Webb@illinois.gov.

That I have served the attached **ILLINOIS EPA'S CLOSING BRIEF IN SUPPORT OF DENYING PETITIONER'S REQUEST FOR AN ADJUSTED STANDARD** upon any other persons, if any, listed on the Service List, by placing a true copy in an envelope duly address bearing proper first class postage in the United States mail at Springfield, Illinois on March 11, 2020.

I herein certify that each hearing exhibit being electronically filed is an accurate reproduction of the corresponding exhibit offered at the hearing.

That my e-mail address is Rex.Gradeless@Illinois.gov.

That the number of pages in the e-mail transmission is forty-one (41).

That the e-mail transmission took place before 4:30 p.m. on the date of March 11, 2020.

/s/Rex L. Gradeless
March 11, 2020