ILLINOIS POLLUTION CONTROL BOARD

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| IN THE MATTER OF: | ) | |
| | ) | |
| PETITION OF APEX MATERIAL | ) | |
| TECHNOLOGIES, LLC FOR AN | ) | |
| ADJUSTED STANDARD FROM | ) | No. AS 15-2 |
| PORTIONS OF 35 ILL. ADM. | ) | (Permit |
| CODE 807.104 AND 810-103 OR | ) | Appeal-Land) |
| IN THE ALTERNATIVE, A | ) | |
| FINDING OF INAPPLICABILITY | ) | |
| | ) | |

REPORT OF THE PROCEEDINGS had at the hearing on a motion of the above-entitled cause before the Honorable BRADLEY HALLORAN, Hearing Officer, Illinois Pollution Control Board, 375 West Briarcliff Road, Board Room, Bolingbrook, Illinois, on the 7th day of January, 2015, at the hour of 9:03 a.m.

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ALSO PRESENT: MR. LEE WELGS
MR. TIMOTHY RACETTE
MR. RAJANI PATEL

REPORTED BY:

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HEARING OFFICER HALLORAN: We're on the record. Good morning. My name is Bradley Halloran. I'm the Hearing Officer with the Illinois Pollution Control Board. I'm also assigned to this matter entitled In The Matter Of: Petition of APEX Material Technologies, LLC, for an adjusted standard from portions of 35 Ill. Adm. Code 807.104 and 810.103 or in the alternative, a finding of inapplicability.

It is docketed as AS 15-2. Again, it is an adjusted standard land. This hearing was noticed in accordance with the Illinois Pollution Control Board's procedural rules. The hearing will be conducted pursuant to Section's 101, 104 of the Board's procedural rules. Today is January 7th, by the way, 2015. It is approximately 9:00 and for the record it is cold outside.

I do not make the final determination in this adjusted standard petition. That is left to the four Board members. They will review the transcript generated from this hearing along with the exhibits, filings and post-hearing briefs. Before we go any further, I think I

should note that the petitioner on August 8th, 2015 (sic), and as part of its petition filed a trade secret claim letter stating that Exhibit's C, E and F are trade secrets. Also, on December 29th, 2014, in response to the Board's technical questions APEX filed another trade secret letter and protection of the entirety of its responses to and I quote technical questions 5, 12, 13, 15B and 22, certain portions of its responses to technical questions 3C, 6, 15A, 16, 17 and 18 and the entirety of Exhibit's 2, 3, 4, 6, 7, 8 and 12.

They state "all trade secret information has been marked and filed separately pursuant to the provisions of Part 130. When the questions regarding these claim trade secrets develop, the public and the Agency will have to exit the hearing doors. The doors will be closed until discussion regarding the claimed trade secrets have concluded. I will post a sign outside letting everybody know about that.

We will try to reserve all questions of this sort and address them at the same time so not to disrupt the hearing any more than necessary. Finally, I want to introduce the

members of the Board here. We have member Jerry O'Leary. We have staff attorney Timothy J. Fox. We have environmental scientist Alisa Liu and Anand Rao. The environmental scientists will probably be asking the majority of the questions and it should be noted that the Agency had filed a recommendation asking that the petition be denied.

At this point, APEX, would you like to introduce yourselves, please?

MR. LAVOIE: Certainly. My name is Daniel Lavoie. I'm an attorney with Pellis Law Group on behalf of the petitioner.

MR. TENUTO: My name is Michael Tenuto. I'm also an attorney with Pellis Law Group on behalf of APEX, the petitioner.

HEARING OFFICER HALLORAN: Thank you. You may be seated.

MR. WELGS: Hi. My name is Lee Welgs. I'm the executive vice president and general manager of APEX Material Technologies.

HEARING OFFICER HALLORAN: Thank you, sir. Ms. Ryan?

MS. RYAN: Michelle Ryan, assistant counsel for the Illinois Environmental Protection

Agency.

MR. DRAGOVICH: Ted Dragovich. I'm the manager of the Disposable Alternatives Unit, Permit Section, Bureau of Land.

MS. RIEGLE: Mary Riegle. I work for Ted.

HEARING OFFICER HALLORAN: Thank you. Mr. Lavoie, you stated you want to give an opening?

MR. LAVOIE: Yes, sir.

HEARING OFFICER HALLORAN: Proceed, please.

MR. LAVOIE: Thank you. Good morning. My name is Daniel Lavoie and with me here this morning is my colleague Michael Tenuto and we're attorneys for the petitioner APEX Material Technologies, LLC. The petition before the Board today is fairly straightforward. APEX seeks a finding of inapplicability, or in the alternative, an adjusted standard that states that Copper Ammonium Chloride, or CAC, when purchased for use as a feedstock in its manufacturing process is not a waste and, therefore, the APEX facility is not subject to regulation and doesn't

need a solid waste operating permit.

Our argument is also fairly straightforward. This Board in the matter entitled Southern California Chemical versus IEPA unanimously ruled that the exact same material that we're discussing here today, the CAC, was not a waste in the first instance. At that time, this Board relied on prior precedent in its Safety-Kleen decision that held that a material that is destined to be reused rather than discarded is not a waste. Since that time and for the last 35 years this Board in its Jo'Lyn and Westwood Lands decisions along with the Illinois Supreme Court in its alternative fuels decision have maintained a very consistent position that a material such as CAC, which is separated or processed and returned to the economic mainstream in the form of a raw material or a product, is not discarded and, therefore, is not a waste.

In the case before the Board today, there is really no genuine issue of material fact and APEX believes it is entitled to judgment as a matter of well-established Illinois law. The irrefutable fact is that CAC material

that APEX seeks to purchase and return to the economic mainstream is not a waste. For at least 35 years, CAC material has been sold in this state as a product and as far as we know has never been disposed of as a waste.

In addition, APEX does not plan to store or landfill or dispose or transfer or treat or incinerate any waste and, therefore, the APEX facility is not a pollution control facility that is subject to regulation. Accordingly, we believe that we have a very solid basis in both fact and with 35 years of legal precedent in our favor that would allow this Board to easily approve our petition for a finding of inapplicability.

In closing, I'd just like to note that APEX is incorporating into the record the facts and arguments as set forth in its initial petition dated August 8, 2014, its reply to the IEPA's recommendation dated October 28th, 2014, and its response to the Board's technical questions dated December 29th, 2014, and also for the record I'd like to note I presented Mr. Halloran a binder that has all of the

aforementioned submissions along with all of our exhibits to those submissions for the Board's review and note for today.

I'd also like to note for the record that we do have actually three representatives from APEX here today; Mr. Lee Welgs, the executive VP and general manager of APEX who introduced himself earlier. We also have Mr. Samuel Yang, the APEX plant manager with us today and also Mr. Timothy Racette who is also APEX's technical manager all of whom are prepared to be sworn in to answer any questions that either the Board or IEPA would like to ask or provide any additional information or clarification regarding our prior submissions.

We would respectfully reserve the right to redirect questioning of each of these witnesses based on any examination that the Board or IEPA would like to conduct. We'd also respectfully reserve our right to present rebuttal arguments and any additional testimony regarding any statements or legal arguments that IEPA would like to make.

HEARING OFFICER HALLORAN: Thank

you.

MR. LAVOIE: Thank you very much.

HEARING OFFICER HALLORAN: Ms. Ryan, an opening?

MS. RYAN: Yes. Thank you. Illinois EPA has filed its recommendation in this matter recommending that the Board deny both of the requests in the petition.

In summary, we believe that the copper -- the spent etchant is a waste and needs a permit and we're very concerned with the possibility that some or all of that material may be a hazardous waste as well and we do not believe that the standard for an adjusted standard differentiating APEX from other competitors or other situated companies has been met. So we continue to maintain our position that the adjusted standard and the alternative be denied.

HEARING OFFICER HALLORAN: Thank you, Ms. Ryan. Mr. Lavoie, is it Mr. Welgs, is it, do you want to have him read a statement?

MR. LAVOIE: Yes, sir.

HEARING OFFICER HALLORAN: Do you want it under oath?

MR. LAVOIE: Yes, sir.

HEARING OFFICER HALLORAN: Then he can be crossed. Mr. Brickey, would you please.

WHEREUPON:

LEE WELGS

called as a witness herein, having been first duly sworn, deposeth and saith as follows:

HEARING OFFICER HALLORAN: Thank you. You may proceed.

MR. WELGS: Okay. Good morning, again, and what I'd like to do is give you some background on APEX as well as talk about the reasons for us bringing this filing and give you some -- what we think are some material facts in this case.

First of all, APEX or the company that was originally CP Inorganics was started in 1972 for the sheer purpose of doing CAC. So the company was originally founded to do Copper Ammonium Chloride. It was sold in 1994 to Phibro-Tech who then basically sold it to us in 2011. So we continue to manufacture high quality copper, cobalt and nickel products. By the way, we also make copper oxide using Copper Ammonium

Carbonate instead of Copper Ammonium Chloride. Copper Ammonium Chloride is a direct substitution for Cooper Ammonium Carbonate and by using Copper Ammonium Chloride we eliminate the use of Anhydrous Ammonium and liquid CO2 that we use in our process to make our copper oxide.

We currently employ 27 full-time employees, but we would anticipate hiring more. We pride ourselves on being responsible citizens. We went to the IEPA at the very beginning of this process. We did not try, you know, to go around them, try to just take the material in. We had determined that the material was not hazardous based on what we saw and we've continued to try to work with them in order to try to resolve this.

We initially engaged the discussion a year ago and prior to initiating these proceedings to make sure we were doing everything in our case to do the right things to comply with all the Illinois regulations. Unfortunately, we disagree with IEPA's assessment that we needed a solid waste handling permit to process the CAC.

Regarding our specific plans and

business objectives, in order to better serve our current customers, and to expand our product offerings to new customers, we want to begin the new service which will process copper rich Copper Ammonium Chloride etchant into two useful products. We plan to purchase a printed circuit board -- we plan to purchase the CAC from printed circuit board manufacturers and basically the CAC, again, is an ammonium-based fluid that is used to strip away copper from the printed circuit boards.

APEX will then process the used etchant into two separate products. We will make the copper oxide as I stated in the beginning and we will use the ammonium to make ammonium chloride, the etchant that will go back to the customers.

As outlined in our written submissions, APEX plans to sign long-term contracts to purchase the CAC from the customers at a unit price based on its copper content. Regarding the market for the products we produce, as we indicated in our submission the market to process used etchant is significant and is currently being underserved in Illinois and

throughout the Midwest. APEX is only aware of two other companies in America that process used etchant; Phibro-Tech in Santa Fe Springs, California and Micronutrients from Indianapolis, Indiana.

APEX has already secured the commitment of quite a number of customers throughout the Midwest that want APEX to get into this market. Why do the customers want us into the market? Because it's a monopoly. Everything west of the Mississippi goes to Phibro-Tech. Everything east of the Mississippi goes to Micronutrients. That was the agreement when Phibro-Tech sold their share of the eastern market to Micronutrients.

With respect to the legal issue before the Board regarding the CAC whether it should be classified as waste or not, I'll leave that argument up to our attorney Mr. Lavoie to address, but I can testify based on my personal knowledge and our customers have never disposed of CAC as a waste and the reason is simple. The material is far too valuable to dispose of as a waste. The copper content in the CAC makes the

used etchant more valuable than the fresh etchant. As far as I know, the CAC has always been sold as a product that was destined to be reused just the way APEX intends to process it and send it back into the economic mainstream.

Now, regarding some of the technical issues raised by the Board from a technical risk-based perspective we believe that CAC does not pose any threat to human health and the environment. That is especially true given our experience with handling liquid products and our detailed quality assurance, quality control and safety protocols that we have in place. We have provided our 60-page written protocols to both the Board and IEPA in our written submissions. In addition, we planned on spending up to $1 million to refurbish the facility. Along those same lines, we do appreciate the 25 technical questions the Board posed to us some weeks back and I would like to highlight and address one of them in my statement.

As you are aware, APEX provided in its written submissions some analyticals of three representative samples -- excuse me -- of

CAC from three different potential customers. All the samples demonstrated levels of metals below regulatory standards except two of the samples had exceedances of chromium. As we outlined in our response to the Board's technical question, the chromium identified in our testing is trivalent chrome, not hexavalent chrome and its distinction is very important.

As we pointed out in our submissions, trivalent chrome is a nutrient and is not in and of itself hazardous to human health and the environment. In fact, Micronutrients makes this product into chicken feed and the chromium goes right with the product. It goes right with the copper. In addition, according to the US EPA study, we cite in our submission trivalent chrome is an essential element to both human and animal health.

Now, with respect to our proposed product specification and the conditions as set forth in number 25 in the Board's technical questions that we are more than happy to accept, based upon our technical expertise with our circuit board customers, we would only expect to

see few metals within the CAC material. The trivalent chromium I've already addressed. We would also expect to see other metals that are naturally occurring with copper metal such as cadmium, nickel and zinc. We would potentially also see some lead, but most of the potential customers that we're purchasing from the CAC have moved away from using any type of lead within their manufacturing process, which they initially did.

And I want to emphasize we could possibly see some of these metals, but we have not seen any of them yet in our testing other than the trivalent chrome. This is the reason we have posed a range of levels for certain metals within our product specification table. I also want to emphasize that we believe in a very rigorous and comprehensive testing protocol to ensure that CAC meets our specifications and does not contain excessive levels of any hazardous constituents. As we have repeatedly said in our submission, we plan to test all incoming CAC from any new customer using a certified and accredited third-party lab, First Environmental Laboratories

in Naperville. The initial testing would be performed prior to shipment and include a comprehensive analysis for ignitability, for reactivity and toxicity pursuant to Illinois regulations.

After that, we utilize our in-house lab to test every subsequent load of CAC to determine its chemical composition and specifically test for certain metals, which we do with all incoming raw materials by the way. As an additional QA/QC procedure and before any CAC is processed, we will test the material again to make sure it is consistent with our product specifications. Every six months as a validation to our in-house testing, we will send representative samples of all incoming CAC material back to First Environmental to once again perform a comprehensive analysis of the chemical composition of the material.

Lastly, we will rely upon certifications from our customers that they have inspected the CAC material and it is free from any foreign substances and is not a hazardous waste. Our customers will also pledge to notify us if

their manufacturing process changes in any way that might affect the chemical composition of the CAC. In this event, we will revert back to our testing protocols as dealing with the new customer. In addition to our testing and protocol and certification procedures, I want to emphasize that our waste water treatment process would capture and remove all ammonia and dissolved metals before discharge in compliance with our current discharge permit from the City of Joliet.

In fact, our current discharge permit already contemplates and specifically allows APEX to dispose of the waste water brime generated from the processing of the CAC. Further, we voluntarily test our waste water samples on a daily basis to ensure that our discharge meets regulatory standards. I would like to end by saying that APEX is not breaking new ground here.

Micronutrients and Phibro-Tech have been conducting these same exact operations for decades. APEX simply wants to get into the business and inject some competition that our existing customers have been asking for for years

and, again, remember Copper Ammonium Chloride is a -- has to be in that form for us to use. We make Copper Ammonium Carbonate. Copper Ammonium Chloride would be a direct substitution and it would need to be in that form or we would need to put it in that form to actually process it.

What we want to do is we want to do all this with the State of Illinois' approval and as I began by saying our goal is always to conduct our operations with the highest regard for and protection of human health and the environment. We truly believe our plan including our testing and safety protocols coupled with the conditions as set forth at the end of the Board's technical questions is sufficiently protective of both health and human environment -- health and the environment and we respectfully request that our petition be granted.

Thank you very much for your consideration and I'll be happy to answer any questions.

HEARING OFFICER HALLORAN: Thank you, sir. Do you have a copy of that? Mr. Brickey, might want it for his transcript.

That would be great. Thank you.

MR. WELGS: You're welcome.

HEARING OFFICER HALLORAN: Ms. Ryan, any questions?

MS. RYAN: I do. How -- in your -- I think it was in the responses to the Board's questions you indicated that you would analyze each customer's material for the metals that you reasonably expected to be found in their materials. How would you make that determination for each of your customers?

MR. WELGS: A, by knowing what the customer's process is, knowing what is going into -- what they're putting into the process and most of our customers are using copper laminated to fiberboard. So what we would expect to see is anything that was associated with copper or fiberboard and then the -- I'm not sure. We checked whatever additives they had, what they used to etch the process and see what metals potentially would be in there and that is pretty straightforward and I think it's pretty standard.

MS. RYAN: What information do you have about your generator's ability to avoid cross

contamination with their spent etchant with other processes that they may have at their facility?

MR. WELGS: I don't know that they have other processes in their facility that would cross contaminate.

MS. RYAN: How do the generators store their spent etchant -- how would they store it before shipping it to APEX?

MR. WELGS: They store it in drums or totes or in tanks.

MS. RYAN: Do you know how long that would be there?

MR. WELGS: Not very long I would imagine. They don't have a lot of room. This material is not -- not good to store for a long time in the sense that it takes up a lot of room. It is a lot of liquid and most of these board shops do not have quite the amount of room that you would need to store let's say a month's worth. They want to get it out of there on a regular basis.

MS. RYAN: The documentation that you filed indicated that APEX would not be storing it for a significant amount of time before

processing. How long is not a significant amount of time?

MR. WELGS: I would expect that our turnover would be easily every month and I would expect it to be probably every week.

MS. RYAN: I see.

MR. WELGS: In fact, I think there is information in the submission that we made on the -- on the storage capacity, et cetera, and what the turnover would be.

MR. RAO: Are you --

MS. RYAN: Go ahead.

MR. RAO: Are you saying each shipment will be stored for about a week or so?

MR. WELGS: I will say this. Our objective is to get the material into process, get it converted and shipped out as quickly as possible. All right? We don't want to have any inventory, but the reality of it is that we will probably have -- you know, when customers ship in we'll probably be turning what would amount to a -- I think it's about a truckload a day.

MR. RAO: So what would be the typical storage time period for a shipment that

comes in?

MR. WELGS: I would say typical time should be anywhere from two days to one week.

MR. RAO: Thank you. Sorry, Ms. Ryan, for butting in.

MS. RYAN: No, that's fine. I was going to change subjects. In response to the Board's questions about loads that did come from the customer and tested as hazardous, how were you planning to return those to your customers?

MR. WELGS: First of all, we wouldn't accept that from the customer. That would have to come about because there was a significant change in the customer's process. Number one, we prequalify the customer. Number two, the customer certifies that unless there is a significant change in their process that will materially affect the quality of the CAC then they're responsible for telling us before it ever comes in.

MS. RYAN: What if when you do test it turns out there is a hazardous level of constituents in the material?

MR. WELGS: Well, then the material

would have -- it would have to go to -- back to the customer.

MS. RYAN: And how would you manifest that back to them?

MR. WELGS: I would have to -- what we'd have to do is probably send it on a manifest.

MS. RYAN: So would APEX be listed as a generator on the manifest then?

MR. LAVOIE: I don't think APEX would be. They wouldn't be taking ownership of it. They would send it right back to the original generator.

MS. RYAN: Would they prepare a manifest for that?

MR. LAVOIE: I think we would have the original generator prepare the manifest and take responsibility for it. I mean, our contracts with the -- with the customers contemplate the fact that if the CAC does not meet our specification they will take it back and they will be responsible for the transportation and the manifesting of the material.

MR. WELGS: I guess the question presupposes something that I don't think exists.

It assumes that there is something that is going to be put in here that is a hazardous material and I don't understand where that could come in from because the copper is the copper. The -- the material that was probably in the past that used to come in was lead. Lead was eliminated I think five to ten years back from this process because of the cost of dealing with the product or the waste streams or the byproduct streams.

So as far as I know the only things that could come in are things that would probably be naturally occurring in the copper and that is not going to change tremendously over time as far as I know.

MS. RYAN: But you don't actually control the process at the generator's facilities?

MR. WELGS: No. Of course, like I don't control the process of anybody I buy a chemical from.

MS. RYAN: Exactly.

MR. RAO: May I ask a follow-up question?

MS. RYAN: Sure.

MR. RAO: Regarding the material

that -- that is shipped to APEX, are you saying that it will meet all threshold levels for hazardous waste?

MR. WELGS: It would meet all what?

MR. RAO: The threshold levels, the TCLP levels.

MR. WELGS: That's exactly what we're prequalifying the customers for. The only thing that we see -- if they don't meet that requirement, then we can't take in the material.

MR. RAO: For example, in the information that you provided, we looked at some levels that were above the TCLP levels and chromium was one and you have provided some responses about the -- you know, the form of chromium that we should be concerned about, but the TCLP level doesn't make a distinction between, you know, Chromium 6 or Chromium 3, it's total chromium. So when you accept material, the CAC, are you going to ensure that the chromium levels will be below the TCLP level as a total chromium?

MR. WELGS: No. And as we stated the chromium is trivalent chrome, not hexavalent chrome. Number two, it's going into your animal

feed. It is being made into animal feed and the chrome is being concentrated. All right? Right now that material goes down to Micronutrients. They make it into tribasic copper chloride and it's fed to chickens.

MR. RAO: So the total chromium may be above the TCLP level, is that what you're saying?

MR. WELGS: I'm sorry? It may be above. Yes, that's what we're saying.

MR. RAO: Okay. Thank you.

MS. RYAN: One second. Assuming that you could get a load that would exceed the TCLP levels and would need to reject it, how long would the material be at APEX while you were waiting for the testing and the re-manifesting and the re-shipping back to the customer?

MR. WELGS: Days.

MS. RYAN: How many days?

MR. WELGS: I would say a couple of days. It certainly wouldn't sit there for more than a week.

MS. RYAN: In your responses to the Board's comments, you have -- on page 18, you have

a product specification chart with numbers listed for different types of metals. Some of these have a range and some of them have a less than. Particularly, I'm referring to the cadmium, which has a less than and a range and the -- there was another one, the lead, which has a less than and a range and I'm curious as to -- as to what that means. Is that less than 1 or is that between 0 and 5?

MR. WELGS: I would let my technical manager answer that.

MS. RYAN: Okay.

MR. LAVOIE: Why don't you come up.

HEARING OFFICER HALLORAN: Can we -- do you want to swear him in now or we can wait?

MS. RYAN: I can wait and ask him later. That's fine.

HEARING OFFICER HALLORAN: Okay. Yeah. Let's ask him later so it's a little cleaner this way, but thank you. Earmark that.

MS. RYAN: No problem.

HEARING OFFICER HALLORAN: Thank you.

MS. RYAN: In the -- in the process

that you're proposing to use the CAC in, what is the range of copper -- maybe this is also for your other technical person. This is regarding the table here again.

MR. WELGS: I might be able to answer it. Go ahead and ask it.

MS. RYAN: Maybe you can answer part of this. You have the range listed here as 7 to 20, but in some of the other documentation it indicates you may accept things outside of those numbers occasionally, but you didn't expect it to fall outside of those numbers.

What is the range of copper that would be acceptable to -- for use -- for APEX's use both technically in the process and then economically?

MR. WELGS: Economically, it can range -- first of all, 20 range is probably maximum. It is going to be saturated at 20 percent copper. It is probably going to be more like 16 copper percent on average. I would say if we got down to 5 percent we wouldn't want to take it in. It wouldn't be economical, but then again if it got down to 5 percent or even 10 percent the

people that are using the etchant aren't getting the economic value out of the etchant. They're not doing their job and it's costing them money. So it behooves both the generator and us to keep that level up and around that pound per gallon range.

MS. RYAN: Is there an amount outside of this range where it would no longer be technically feasible to remove the copper and make the copper oxide product?

MR. WELGS: Actually, no, you could make the copper oxide if there was one percent copper in it.

MS. RYAN: And if there is a -- I don't want to say 100 percent, but 90 percent --

MR. WELGS: If there is 90 percent copper, it wouldn't be Copper Ammonium Chloride. Like I said, at 20 percent it's saturated. You couldn't put more copper in there.

MS. RYAN: Okay.

MR. RAO: So are you saying that 5 percent copper may be the lower range?

MR. WELGS: Yeah, I'd say if you got down to -- one of the ways the customers know when

to take this out is when it becomes saturated. All right? They want to use it until it is no longer effective and as it builds up copper, it becomes ineffective. So, yes, you could say that below 5 percent it would be more -- it would cost us more to process it than it would if it was at 10 to 15 percent, but it would still work.

MR. RAO: So would it make sense in the conditions that you've proposed in the table to change the load threshold from 5 percent to 20 percent rather than 7 because once it's in the Board order then you've got to comply with it.

MR. WELGS: I would put it at 5 to 20. I would be okay with that. I would say this. If it gets down to 5, it's not going to last very long because the customer is going to be doing something on his end to get his system tightened up.

MS. RYAN: I don't have any other questions for this witness.

HEARING OFFICER HALLORAN: Thank you. Ms. Liu? Mr. Rao?

MS. LIU: Good morning, Mr. Welgs. Thank you for bringing everyone out on such a cold

day.

MR. WELGS: As I get older, it gets more brutal, too.

MS. LIU: We do have some questions and if they're more appropriate for someone else to answer or if you would rather defer those to the second part of the closed hearing, that would be fine, too. Just let us know.

MR. WELGS: Okay.

MS. LIU: Question 1(b) of the November 24th, 2014, Hearing Officer Order requested test results for the CAC or the used etchant solution for each supplier APEX is currently considering to demonstrate whether or not it exhibits any characteristics of hazardous waste.

APEX's December 29th response does not contain any such results. In this proceeding, does APEX plan to submit such test results?

MR. WELGS: We will -- first of all, we will test every customer that we consider. Right now there are currently I think 300, 400 customers out there. The financial burden of

doing that right now without a finding from the Board would be -- would be rather onerous on us. What we plan on doing is before we qualify a customer we would have the complete testing done. All right? It would be on record and on file and it would meet all the standards of Illinois. The only thing that I said that we are concerned about is the chromium level. All right? The chromium level is going to be higher, but if a customer is out on any other of those levels it will be rejected out of hand. We won't -- we won't take in their product.

MS. LIU: You already provided some test results for, I believe, three --

MR. WELGS: Right. Correct.

MS. LIU: -- Galaxy Circuits and two others. I can't remember right now. Is there a possibility to find -- supply a full spectrum of test results on those?

MR. WELGS: Sure.

MR. RAO: Again, like Ms. Liu said, if any of her questions -- if you want any other witnesses to answer, feel free.

Question 5 in the Board's

Hearing Officer Attachment A asks for a list of all potential suppliers APEX is considering. In your December 29th response, you provided Exhibit 3 which was supplied separately as a trade secret. In response to question three, APEX notes that, quote, the CAC material is currently being shipped across Illinois roads via bills of lading and not as a hazardous waste, unquote.

This is in your response at page five. Could you please explain the difference between bills of lading and solid waste or hazardous waste manifests for the record?

MR. WELGS: I think I will let my technical manager handle that.

MR. RAO: Then I will go on to the second part of the question. Please clarify if the CAC that is being shipped via bills of lading and not as hazardous waste is only the used etchant solution that has already qualified for the use or reuse exclusion specified at 40 CFR 261.2(e) and as such is not a RCRA solid waste (and thus not a RCRA hazardous waste) when it is fully utilized in the process per 40 CFR 261 .1(c)(5)(i) as it is for Heritage Environmental

Services, Inc.

MR. WELGS: I'm sorry. You lost me in the question.

MR. RAO: Basically, we're asking for you to clarify the used etchant that is being shipped using bills of lading --

MR. WELGS: Yes, it is.

MR. RAO: -- and not as hazardous waste. It's only used etch solution that has already qualified for use or reuse exclusion specified under 40 CFR 261(e).

MR. WELGS: That would be my understanding. I don't know that personally, but that would be my understanding because that was a process that Micronutrients went through to gain the exception and all those people on the list are customers of Micronutrients. All right? So they're all shipping into Micronutrients not on a manifest, but on a bill of lading.

MR. RAO: Okay.

MR. WELGS: And again --

MR. RAO: Is this something you can check and let us know later?

MR. WELGS: I don't know how I would

be able to check with Micronutrients. They're a competitor. All right? I don't know that they would allow me to get into their records.

MR. RAO: No. But with your potential customers, would they be aware of other --

MR. WELGS: Yes, I can check with potential customers and we have -- actually, the list you see is pretty long. That list of potential customers we have we can probably boil down realistically to people within, you know, the area and those are people that we could talk to directly.

MR. RAO: Okay. Please explain what type of paper tracking (either bills of lading or waste manifests or some other tracking system) is required for shipping used etchant solution that is already qualified for use/reuse exclusion specified at 40 CFR 261.1(e) between states or countries.

We're asking this question because the list that you provided had, you know, multiple states and also I think Canada was part of the list.

MR. WELGS: Correct. What you need is you need a bill of lading obviously. You need the proper labeling. So you have to have the proper labeling for Copper Ammonium Chloride. You have to have an MSDS and then when the material is brought into the facility, our facility, Micronutrients' facility, Phibro-Tech's facility for that matter, the material is sampled and tested to make sure that it conforms to whatever, you know, it is supposed to conform to and at that point then it is scheduled for production and that whole process of getting the proper paperwork in, proper documentation and testing being added to it probably takes no more than a day or two.

MR. RAO: Okay. Thank you.

MS. LIU: Mr. Welgs, question 7 on the Hearing Officer Order talked about the sample profile procedure. In APEX's response, you note that one of the factors for the specifications is, quote, the CAC is nonhazardous and does not pose any threat to APEX employees, its customers, human health and the environment and that was on page ten of your response.

Administratively speaking,

how -- could you explain how compliance with that specification would be determined?

MR. WELGS: There are several issues regarding the material. There is -- that could potentially give hazards. One is the metals that we talked about. The other one would be the pH. All right? In fact, right now if you look at the current MSDS that Micronutrients uses, it uses -- saying it ships at either a pH below 2 or above 12. Well, the material is about a pH of 8. It actually is -- when it is made -- when the fresh etchant is made, it's 11, I think around 10 or 11, and when it comes back to us because of cooking up the copper it's almost neutral. So the way that we would check compliance was, number one, you have the customer's prequalification of the material. All right? And it is going to be within that pH range and it is also going to have so much copper in it as we talked about and it's going to have a minimal amount of metals in it and under the TCLP metals with the exception of chrome under 5 parts per million.

So what we do is the customer certifies that he has not made a material change

to his process, which is exactly the same as the supplier of any of my raw materials does. All right? I don't test in the sense that -- test for metals that I don't know are not there. All right? I don't test for the periodic table of elements. I test for the metals that should be there. So we know to test for the TCLP metals because of the nature of them and if there is no other change to the process we would just reuse the same testing protocol when it came in.

So if you're asking how do we guarantee before the material is shipped, the customer is the one that guarantees. The customer warrants that the material that he is sending into us is consistent with what he sent into us and there has been no material changes in his process. Our check comes when the material actually hits to confirm that that is the case if that answers your question.

MS. LIU: It does. I'd like to ask you a question on something you mentioned earlier in your opening statement. You mentioned that most potential suppliers are eliminating the use of lead. Was that something they used in the

solder?

MR. WELGS: What was that?

MS. LIU: Lead, is that something that gets used in solder or --

MR. WELGS: I actually have somebody here who is an expert in the printed circuit board industry here and they could possibly answer that question for you if you would like because I'm not exactly sure where it came from because it's no longer there in most cases.

MS. LIU: I guess that would be a question we defer when the next witness is called.

HEARING OFFICER HALLORAN: That would be great. Thank you.

MR. RAO: Mr. Welgs, in your response to the Board's question number 9(b), we asked about the chemical constituent that would be sampled, APEX responded, quote, regarding TCLP testing of the CAC material, APEX will test for constituents of concern that it knows based upon its experience in this area, could potentially be problematic on the customer side and might be found in the raw material in response at page 11.

Would you please elaborate on

what the constituents or concern might be, you know, generally focusing on those constituents which are not listed in the specifications what would be typically --

MR. WELGS: First of all, let's take a step back. First of all, we prequalify against a wide range of things initially that go beyond our concern, but, secondly, when the material comes in the one area that would be concerned is what is coming in on the copper. When you buy copper, copper is not 100 percent copper. Copper has trace elements in it and it's mined oftentimes with lead, with zinc. You find it in zinc mines, you find a little bit of cadmium in it because in the same mine they often find copper. It's just the nature of how copper -- how copper mines operate.

So what we will do is we look for those things that are potentially in the copper. All right? And the things that we identified and things that are generally found in the copper. The customer is not adding anything to the mix that will contaminate it. He is etching things away from the board. He is taking

copper away from the board, not adding things to the board. So the only thing we expect to find in there is the copper and the constituents that would come in with the copper itself and those are the ones that we test for.

MR. LAVOIE: And if I may just add to this and this sort of goes back to Ms. Ryan's question a little bit earlier regarding the specification table that we have in -- in question or in response to question three in the -- in the Board's technical questions.

The reason we have a certain range for cadmium and lead is the very fact that what Mr. Welgs just said. Cadmium and lead we would expect to see some range of those two elements within naturally occurring substances within the copper itself. So that's why we wanted to place a little bit of a range to give ourselves some flexibility to see some naturally occurring substances within the -- within the copper itself.

MS. LIU: When you refer to the copper, you're referring to the copper that the circuit board manufacturers use?

MR. LAVOIE: Within the CAC, yes.

MR. RAO: So would you say that the list of constituents that you are proposing the specifications is a good representation of constituents of concern?

MR. WELGS: Yes.

MR. RAO: Are there any others that we may want to add to it?

MR. WELGS: Those are the ones that we would be concerned about. Most of the other elements -- it is not possible to measure the periodic table. So you look at what do you normally find. What are customer's concerns on the back end and you've got a couple -- a couple guidelines here.

Number one, what would make the material hazardous as we discussed? Number two, what are your customer specs on the outside? If I'm making copper oxide, my customer has a specification that I need to meet. So if the material -- the raw material I'm using doesn't meet it, then that's a problematic raw material for me and then, number three, anything that would be a concern in the manufacturing process or cause an upset to the manufacturing process and that

would be the three criterion that we would use in determining what elements we test for.

MR. RAO: All right. Thank you.

MS. LIU: Question 15 of the Hearing Officer Order asked about selling fresh etchant back to the original customers.

Would you please clarify whether the Products Supply Agreement that you had in Exhibit 1 requires a customer to purchase the exact same amount of fresh etchant solution as the used etchant solution that they provide to you or simply does the agreement just require them to purchase 100 percent of whatever fresh etchant from you exclusively?

MR. WELGS: Let me clarify that, first of all. When we send out the fresh etchant, the customers lose about 15 percent of it in their process. So -- between evaporation and between waste water treatment. So they will only send us back about 85 percent of the fresh etchant that they generate and then our requirement in the contract is that they purchase 100 percent of their etchant from us. So we would actually have to supplement the etchant that we send back to

them. So we will use some fresh anhydrous ammonia, which we already have on the facility, which we're permitted for, to make it and some fresh hydrochloric acid.

MS. LIU: In your introductory statement, you mentioned that you purchased -- the purchase price of the CAC is based on the copper content. Does that mean that the price you pay for CAC varies from supplier to supplier?

MR. WELGS: Yes.

MR. RAO: The next question relates to your response to the Board's question 25. I think you have already touched on this issue about product specification where you proposed sort of a range for certain constituents. I need a clarification. For example, in -- for cadmium and lead, APEX listed a range of less than 1 ppm to less than 5 ppm.

MR. WELGS: I think.

MR. RAO: And also -- let me just finish.

MR. WELGS: I'm sorry.

MR. RAO: I think for lead it was less than 5 ppm or less than 2 ppm. Could you

clarify when you say less than 5 to -- less than 1 to less than 5 ppm essentially you mean less than 5 ppm?

MR. WELGS: My guess is it was a typo on my technical managers part which is why I threw him under the bus and said I would throw the question to him as I think what it should mean there is 1 to 5 ppm. It can be 0 obviously, but 1 to 5 ppm would be what --

MR. RAO: Thank you.

MS. LIU: Question 25(5)(b) of the Hearing Officer Order had proposed a condition and it was on a daily testing on representative samples from each shipment for the copper content and in its response APEX didn't agree with the provision to require daily sampling, but rather that each shipment would be tested once -- before it was accepted and placed into the process. And that was on your response at page nine.

Would you please clarify if the testing should also include the other chemical parameters that you would have had set forth in your product specification on pages 18 and 19 of the response in addition to the copper?

MR. WELGS: In addition to the copper? What we do -- just to clarify what we do. When a shipment comes in of anything, samples are taken. It is tested. When it is put into process, so if I take product A and product B and I put them together in a tank that is then tested and unless that tank changes materially or something else is added in and that tank stays the same, it is not tested again until it is moved and added to another product, all right, or something else is introduced.

So every step of the process the material is being tested and the elements that you're asking about aren't tested based on customer specification. So we're tracking the elements. We don't test every element of everything once we put it in the mix, but we do when we get to the very end because we have to qualify our products.

So we have copper oxide that we're now going to sell and we're going to have anhydrous ammonia that is now being made into fresh etchant that also has a qualification, which include no metals. All right? So you have here a

product qualification or specification over here and then you have here a product qualification on the copper oxide. So basically material is tested every step of the way and all the metals that are of concern or tested at the beginning and at the end based on the product -- the final product that we make.

MS. LIU: Is there a way that you can propose revision to that proposed condition? I think it's 5(b) --

MR. WELGS: Sure.

MS. LIU: -- to reflect what you're saying --

MR. WELGS: Sure.

MS. LIU: -- rather than what we had come up with?

MR. WELGS: Sure.

MR. RAO: Exhibit N of the original petition is a letter from US EPA Region 5 dated August 3rd, 1995. In the attachment to the letter, an issue number 3 and Exhibit 3 are identified, however both a discussion of issue three as well as Exhibit 3 of the letter do not appear to be included in Exhibit N of the

petition. The letter on page three of the attachment refers to, quote, the legitimacy issue discussed below, end quote, but there is no following description of such an issue.

Would you be able to supply the complete letter and attachments for the record?

MR. LAVOIE: Well, I think we have in the materials that we provided to Mr. Halloran prior to the start of the hearing. There is an Exhibit No. 1 and an Exhibit No. 2 in Exhibit N. So I'm not sure if that might answer your question. I don't know.

MR. RAO: We were looking at issue number 3 and Exhibit 3. We can take a look at the issue you supplied during the break.

MR. LAVOIE: I see. I see that. We have Exhibit 1 and 2 included. This is the way that we got this information and it did not have an Exhibit No. 3 in the original that we had obtained. We can endeavor to try to obtain Exhibit No. 3 for you.

MR. RAO: Thank you. That's all we have for the open part of the hearing.

HEARING OFFICER HALLORAN: Do you

have any questions? Any redirect?

MR. LAVOIE: No redirect, sir.

HEARING OFFICER HALLORAN: Ms. Ryan, you're fine?

MS. RYAN: Yes, thank you.

HEARING OFFICER HALLORAN: You may step down or step aside as the case may be. Thank you. Mr. Lavoie, do you want to call your next witness? Is everybody okay?

MR. LAVOIE: Unless the Board or Ms. Ryan had any other additional questions that they reserved, unless we answered them sufficiently, then we weren't planning on calling another witness.

MR. RAO: I think there were two --

HEARING OFFICER HALLORAN: Two deferred. One. I have it marked here.

MR. WELGS: There was a question on the specification sheet.

HEARING OFFICER HALLORAN: Mr. Racette?

MR. LAVOIE: Racette.

HEARING OFFICER HALLORAN: And then there was another one.

MR. LAVOIE: So we'll ask Mr. Racette to come up.

HEARING OFFICER HALLORAN: Great. Raise your right hand and Mr. Brickey will swear you in.

WHEREUPON:

TIMOTHY RACETTE

called as a witness herein, having been first duly sworn, deposeth and saith as follows:

HEARING OFFICER HALLORAN: Any direct, Mr. Lavoie?

MR. LAVOIE: No direct.

HEARING OFFICER HALLORAN: Ms. Ryan, did you have --

MS. RYAN: My reserved question was related to the chart that's on page 18 of the responses to the Board's questions, I guess, and also 19, it continues into 19, which is for cadmium you have listed here less than 1 to 5 and for lead on page 19 you have less than 5 to 50 and my initial question was whether that is a range or whether that is basically a less than 50 for lead?

MR. RACETTE: It's the latter. I'm not sure because the copy I have doesn't have that

so it should be just less than.

MR. LAVOIE: Well, it does. I scratched it out as we were talking.

MR. RACETTE: I'm working from a different copy.

MS. RYAN: So your proposal then for cadmium is 1 to 5?

MR. RACETTE: Less than 5.

MS. RYAN: Okay. Just less than 5. So you're crossing out the 1 then?

MR. RACETTE: Right.

MS. RYAN: And you're aware that the characteristic hazardous waste limit for cadmium for DLL 06 is 1 rather than 5?

MR. RACETTE: Yes.

MS. RYAN: And my understanding from Mr. Welgs' testimony was that the reason that is 5 is because that is what is expected to be found naturally occurring with copper?

MR. RACETTE: Yes.

MS. RYAN: And, likewise, for lead the characteristic hazardous waste limit is 5 and you're changing that to less than 50 from the same --

MR. RACETTE: Less than 50.

MS. RYAN: That was my question. Thank you.

HEARING OFFICER HALLORAN: Thank you, Ms. Ryan. Any questions?

MS. LIU: Mr. Racette, you're the person we were going to ask about the difference between bills of lading and hazardous or solid waste manifests --

MR. RACETTE: Yes.

MS. LIU: -- or is that someone else?

MR. RACETTE: I was the person identified. I'm not prepared to answer that today.

MS. LIU: You're welcome to respond in post-hearing comments, I believe, if you'd like some time to research the question and get back to us.

MR. RACETTE: Yes, I'd like to do that.

MS. LIU: There was another question we had about lead in the circuit board manufacturing process and I believe someone

identified someone as an expert.

MR. RACETTE: We're going to talk to a --

MS. LIU: Was that you or someone else?

MR. RACETTE: No, that was one of the people that actually runs one of those operations.

HEARING OFFICER HALLORAN: With that said --

MS. LIU: Thank you.

HEARING OFFICER HALLORAN: -- you may step down. So we can just wrap this up. One more witness who was going to answer that last question, please.

MR. LAVOIE: Marty?

MR. WELGS: Marty, we talked about the process.

THE AUDIENCE: I think it would be better to have the customer. Rajani is the engineer.

WHEREUPON:

RAJANI PATEL

called as a witness herein, having been first duly sworn, deposeth and saith as follows:

HEARING OFFICER HALLORAN: And your name and spell it, please.

MR. PATEL: Name is Rajani, R-A-J-A-N-I. Last name is P-A-T-E-L.

HEARING OFFICER HALLORAN: Thank you, sir.

MS. LIU: Mr. Patel, when Mr. Welgs was talking earlier this morning, he mentioned that most of the potential suppliers that APEX is considering are discontinuing or have already discontinued the use of lead in the circuit board manufacturing process.

Could you describe what the lead is used for?

MR. PATEL: Sure. In the olden days, the way the process work is we selectively mask the circuit that we want to create or leave it on the board and in order to protect the copper on that trace in the etchant process people used to use tin lead as a plating resist, etchant

resist. So what happened is when the board go through the process it will not attack the copper underneath the tin lead. Okay?

Nowadays because of all these things everybody use as tin as etchant resist, not tin lead. So there wouldn't be any traces of lead coming into the contact in the etchant process. Every one of the shops nowadays use tin plating as etchant resist.

MS. LIU: What metals are used to make up tin?

MR. PATEL: Tin is just like a regular copper, copper plating. It's a plating process. What it does is they have a tin solution. With electrification it will place the tin on the -- on the copper where we want it to mask for the etchant and after 20 minutes of plating in it and it's a sulfuric acid base solution with the tin in it and they're anodes on it --

THE COURT REPORTER: Tin?

MR. PATEL: Not tin lead. Not anymore. It's a pure tin anodes.

MS. LIU: Anodes, A-N-O-D-E-S.

MR. PATEL: So with electrification when you power the tank with the plating -- plates in it, it will dissolve the pure tin into the tin ion and the tin ion from the solution will plate onto the board. It is like same as the copper plating process. In the copper, copper would be anode and it would dissolve the copper ion and it will plate it onto the copper, on the boards. It's the same process.

Before, they were using the same thing, but they were using tin lead as a plating process and they were using solder as anode, tin layer anode to replenish the solution.

MS. LIU: Is tin an element or is it made up of metals together?

MR. PATEL: No, tin is regular -- regular metal like copper. It's just like you buy off the shelf. It's a comax. You can buy whatever size and chips. People use it in a basket as chips. Some people use a solid slab as anode.

MS. LIU: Would you be able to identify potential suppliers that lead existed in their process still through the testing that you

proposed to do when they become initial customers?

MR. PATEL: No. Our process really does not involve any of the metal. The way the process work, etchant is work, is it's controlled by the automatic -- the mounting controller. So there is a set point for the copper to be in the solution when we etch. So when the copper goes above that, automatically feed the fresh and when you're etching into the tank and it's like a constant process. If I -- it's not a manual process. If I do manual, then I will not able to etch it when the copper goes too high and I will be making scrap. So it's a consistent process that is feed and bleed and the pH is controlled at 7.2. So the fresh etchant comes at 9 pH and then when it fills into the sump when the pH goes above -- below 7.2 it automatically replenishes the placed chemical for continuous etching. So two controller on it.

MR. LAVOIE: Ms. Liu, if I can just clarify, and we should have clarified this at the beginning, Mr. Patel is a potential customer of APEX and just for the record, Mr. Patel, could you let us know what the name of your company is.

MR. PATEL: Delta Precision.

MR. LAVOIE: Delta Precision.

MR. PATEL: In Elk Grove, Illinois. I've been a process engineer and I've been in this industry for 25 years and most of the process once you set it up they don't change. So, basically, raw material that we etch is a plated -- tin plated copper that goes through the etching and generally the circuit and the laminate we buy is a copper plate laminate therefore in the metal.

MS. LIU: The constant process that you described where the fresh etchant resupplies the etchant solution, what method do you determine when another solution is too saturated to use anymore? Is it through pH or is it through conductivity testing or --

MR. PATEL: We have two things on the pH. Once a pH go below, we worry on the etching problem because it's not going to etch and we're going to create scrap. So the pH is controlled and then we do with the lab analysis, the pH, where the pH is and a feed and bleed is based on the Baume. So we have the hydrometer that is set at 20 -- no. On a normal solution at

whatever the 20, 22 Baume is, so we set the solution at 22 Baume and then when it goes up the sensor kicks in and it comes up trace amounts from the drum or a tank, wherever it's coming from, on the process and it automatically feeds it into the sump.

MS. LIU: When you say 20 to 22 -- what was the word that followed?

MR. PATEL: It's a specific gravity that they call Baume or, you know, Baume is the known word, but -- what is the specific? 1.7 something?

THE AUDIENCE: 1.20.

MR. PATEL: 1.20.

THE AUDIENCE: Baume.

MR. PATEL: So there is a controller that you can set it up at 1.20. It's a direct correlation of Baume for specific gravity.

MR. RAO: How do you spell that unit --

MR. PATEL: Baume?

MR. RAO: -- for the court reporter?

MR. PATEL: It is BE with a dash on it.

THE AUDIENCE: B-A-U-M-E with --

MR. PATEL: But normally in the scientific term --

HEARING OFFICER HALLORAN: Hold on. We can't have anybody talk from the back. We have a court reporter. He's having a hard time and I can't blame him.

MR. PATEL: It's B-A-U-M-E and like in a chemical compound it's BE. Just like tin is -- like copper is Cu.

MS. LIU: Do you use a type of an instrument to measure that?

MR. PATEL: Yeah, we have the controller that we set it up on the machine and then we also have the cylinder and hydrometer that you put it in the lab and it shows you the Baume.

MS. LIU: The hydrometer?

MR. PATEL: Yes.

MS. LIU: Thank you. I wish I could see it.

MR. PATEL: That's fine. I know you guys aren't involved. We involved day-to-day so obviously we know. That's why all these elements that's -- it's not in our process. Again, like

copper coil we buy or laminate we buy they may have traces of those that they come into the etchant solution, but normally APEX will not get way low on the copper because we control feed and bleed and etchant process.

In order to maintain our quality, we have to control that. Otherwise, we'd be over that, under that, and it would be scrap. So they normally get within the range that we are setting up on that. On that normal day, they will get very close to that copper what we set it at.

MS. LIU: Thank you.

HEARING OFFICER HALLORAN: Any further questions of APEX's potential customer, Mr. Patel?

MR. LAVOIE: I just had one question. Is there any reason that there would be any outliers of any other hazardous constituents within the CAC material that you would potentially be sending to APEX?

MR. PATEL: Not really. The way it works is we plate the traces that we want to keep it in mask of the tin. The other copper we want to etch it out is protected with drive resist. It

is organic resist. So in the plating it will not plate their copper because it's -- it's basically a photographic process. It's a photographic film, but it's in the other environment. It reacts with the UV. So whatever the circuit we wanted to produce is the one that's open.

So they will -- and then when we go in the plating process only the circuits are plated with copper and tin and then we strip the photographic film out to open up the copper underneath that we need to remove in the etching. So basically we get the laminate, we clean it, we apply the dry film, take the picture of the circuit and we plate, double up and etch it and then we process further down, we tin strip and then we put it in the mask. So basically the direct contact of the thing is a laminate material, dry plating and a tin plating in the etchant process.

MR. LAVOIE: So --

MR. PATEL: So, again, other tin comes out. It could be -- like I say, it could have come from the copper foil or, you know, things like that and there won't be any chromium

or anything else, but I don't know if somebody has any samples.

MR. LAVOIE: So you wouldn't expect to see any PCBs or any solid material that might be hazardous or some other kind of hazardous constituent within it because the process is so controlled on your end?

MR. PATEL: Yeah. I mean, our raw material is strictly doesn't have anything except for the laminate with the copper foil laminated on it and those copper foils are produced by the copper manufacturer as ED plating. So what they do is they plate on a drum the copper plate to the thickness they want, one ounce or two ounce, and then they peal it off and then they send it to us and sometimes they make the material using that foil or if we make multilaminate material we reuse the foil, but we buy it from the manufacturer.

After that, nothing else go in there except those copper laminate, striping and a plating and an etching process. So I don't see anything that come up and, like you say, most of -- currently, we have our sample analyzed once a year. If there is a process change, then they

do it again, but normally it's so very consistent because we have to keep the chemistry on a consistent basis in order to make good quality. Otherwise, we would have nothing but scrap, either under it or over it. So it has to control at the pH, at the Baume, and speed and temperature.

MS. LIU: Is your process typical of other circuit board manufacturers?

MR. PATEL: It's the same process for everybody. It is a computerized machine basically that has a sump with an ammonia solution. You feed the panel, it sprays it on that, it comes out, it goes to the double, triple range, water rinse out the waste treatment system and then it dries it out.

So it's like you feed it on one side and it will come out another side and if you don't control that we will not be able to make any product because it is going to be underetch or overetch. So it has to be maintained within those specs.

MR. RAO: Mr. Patel, currently the spent etchant that you generate you're sending it to APEX's competitor or what do you do?

MR. PATEL: We are sending it to Micronutrients because we are buying the raw material, the ammonium etchant from them, use it, and then we add more copper into it and when the copper is saturated we -- we take it back into the sump. So it's -- again, that is also automatic for us. When my label goes in my sump, but by filling it it automatically pumps it out into the drum and once the drum is full, we label it and then we call Micronutrients that we have ten drums to pick up. So what they do is when they bring a replace etchant to us they will pick it up those other ones and we --

MR. RAO: So they come and pick it up --

MR. PATEL: Yes.

MR. RAO: -- from your facility and it's done through bills of lading?

MR. PATEL: Yes, bill of lading and then they take it and they recover and I heard that they make chicken feed, but, you know -- so basically they are using it as a raw material.

You know, our byproduct is their raw material basically and the same thing with

etchant, but that's another different things.

MR. RAO: Thank you.

MS. LIU: Thank you very much.

MR. PATEL: Thank you.

HEARING OFFICER HALLORAN: Any further questions?

MR. LAVOIE: No further questions.

HEARING OFFICER HALLORAN: You may step down. Thank you, Mr. Patel. When we come back -- I think I want to take a 10, 12-minute break. When we come back, I think we're going to get into the trade secret claim questions. With that, I would like only APEX to be present. Members of the public, potential customers and the Agency will just wait outside. I don't know how long it will take. Maybe 20 minutes. And then we can all come back in and talk about briefing schedules and closing arguments.

Keep in mind as you're kind of sitting around it looks like the transcript will be completed by January 19th. So you can key off that as far as the petitioner's brief and the Agency's brief and the reply. So thank you.

(Whereupon, a break was taken to go into a closed session involving trade secrets and the open portion was resumed and proceeds as follows.)

HEARING OFFICER HALLORAN: We're back on the record. We finished with the closed session subject to the trademark -- trade secret claim. We've been discussing post-hearing briefing schedules such as they may be. Anyway, APEX's post-hearing brief, and they do have some follow-up questions they will be filing with the Board, that is due February 2nd. The Agency's post-hearing brief, if any, is due February 17th. APEX's reply, if any, is due February 24th. Public comment is due on or before January 29th. And we think that's it. But we want to go into closing arguments. Mr. Lavoie, would you like to do a closing?

MR. LAVOIE: I'll waive closing argument.

HEARING OFFICER HALLORAN: Ms. Ryan?

MS. RYAN: I'll reserve mine for the brief. Thanks.

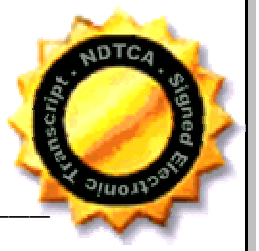
HEARING OFFICER HALLORAN: Any other questions? I thank you all for your civility and professionalism and thanks for making it on this brutally cold day and, Mr. Lavoie, I hope you have a good flight back to New York. Safe travels, everyone.

MR. LAVOIE: Thank you very much. Thank you, everyone.

STATE OF ILLINOIS )
) SS.
COUNTY OF COOK )

I, Steven Brickey, Certified Shorthand Reporter, do hereby certify that I reported in shorthand the proceedings had at the trial aforesaid, and that the foregoing is a true, complete and correct transcript of the proceedings of said trial as appears from my stenographic notes so taken and transcribed under my personal direction.

Witness my official signature in and for Cook County, Illinois, on this _____ day of _____, A.D., 2015.

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