

# Exhibit 1

Ralph White, Ph.D. on 07/01/2021

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UNITED STATES DISTRICT COURT  
DISTRICT OF MINNESOTA  
Civil File No. 20-cv-00358-ECT-HB

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OXYGENATOR WATER  
TECHNOLOGIES, INC.,

**COPY**

Plaintiff,

v.

TENNANT COMPANY,

Defendant.

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Video Deposition of  
RALPH E. WHITE, Ph.D.  
Thursday, July 1, 2021  
9:00 a.m.

Court Stenographer:  
Myrina A. Kleinschmidt  
Registered Merit Reporter  
Certified Realtime Reporter

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25	Dr. Ralph E. White	

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1 APPEARANCES:

2

3 FOR THE PLAINTIFF:

4 Nathan D. Louwagie

5 Aaron W. Pederson

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14 R. Scott Johnson

15 Attorney at Law

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20

21 ALSO PRESENT: Sarah Kleinschmidt, Videographer

22

23 \* \* \* \* \*

24 ACCESS TO THE ELECTRONIC ORIGINAL TRANSCRIPT FILE

25 HAS BEEN GRANTED TO FREDRIKSON & BYRON, P.A.

\* \* \* \* \*

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1 VIDEO DEPOSITION, taken pursuant to Notice of  
 2 Taking Deposition, and taken before Myrina A.  
 3 Kleinschmidt, Registered Merit Reporter, Certified  
 4 Realtime Reporter, and Notary Public.  
 5 WHEREUPON, the following proceedings were  
 6 duly had:  
 7 (Deposition Exhibit Number 569 marked for  
 8 identification by the court stenographer.)  
 9 THE VIDEOGRAPHER: We are now on the record.  
 10 My name is Sarah Kleinschmidt. I'm a videographer with  
 11 Twin West Reporting. Today's date is Thursday, July 1st,  
 12 2021, and the time is 9 a.m. Central Time.  
 13 This is the deposition of Dr. Ralph White and  
 14 is being held in the matter of Oxygenator Water  
 15 Technologies, Incorporated, versus Tennant Company, Civil  
 16 File Number 20-cv-00358-ECT-HB.  
 17 Now, will counsel please identify themselves  
 18 for the record and who they represent, after which our  
 19 court reporter, Myrina, will administer the oath.  
 20 MR. LOUWAGIE: Nate Louwagie from Carlson,  
 21 Caspers for plaintiff Oxygenator Water Technologies, Inc.,  
 22 and Dr. White. And I suppose because I'm closer to the  
 23 mic, I'll also introduce my colleague Aaron Pederson for  
 24 all the same entities.  
 25 MR. JOHNSON: And I'm Scott Johnson with

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1 A Yes.  
 2 **Q When was the last time that you did that?**  
 3 A Let me think about that. I don't think I've been deposed  
 4 on claim construction matters, but I've issued  
 5 declarations on claim construction matters.  
 6 **Q And do you recall the cases in which you've issued**  
 7 **declarations in claim construction matters?**  
 8 A It's been some time. I don't recall details about those  
 9 at this time.  
 10 **Q Do you recall the technical nature of the cases?**  
 11 A Yes. The technical nature of the cases were typically  
 12 associated with lithium-ion batteries and separators  
 13 associated with lithium-ion batteries.  
 14 **Q And is battery technology your general area of expertise?**  
 15 A Well, my general area of expertise is really what I like  
 16 to call electrochemical engineering, and I say that  
 17 because we have worked over the years in a number of  
 18 different areas including batteries.  
 19 **Q And electrochemical engineering, can you tell me generally**  
 20 **what that is?**  
 21 A Well, thank you for asking.  
 22 It's something that I was able to learn under  
 23 what I would say most people agree is the number one  
 24 electrochemical engineer in the world and his name is  
 25 Professor John Newman formerly at the University of

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1 Fredrikson & Byron here on behalf of defendant Tennant  
 2 Company.  
 3 (Whereupon, the oath was administered  
 4 by the court stenographer.)  
 5 WITNESS RESPONSE: I do.  
 6 RALPH E. WHITE, Ph.D.,  
 7 a witness in the above-entitled proceedings,  
 8 after having been first duly sworn,  
 9 testified under oath as follows:  
 10 EXAMINATION  
 11 BY MR. JOHNSON:  
 12 **Q Good morning.**  
 13 A Good morning, Scott.  
 14 **Q Dr. White, could you please state your full name and**  
 15 **address for the record, sir?**  
 16 A Ralph Edward White, 5 Brandywine--that's  
 17 B-r-a-n-d-y-w-i-n-e--Lane, Columbia, South Carolina 29206.  
 18 **Q Dr. White, have you ever been deposed before?**  
 19 A Yes, I have.  
 20 **Q And when was the last time that you were deposed?**  
 21 A Oh, about a month or so ago.  
 22 **Q Was that in an intellectual property matter?**  
 23 A No.  
 24 **Q Okay. Have you ever testified before on claim**  
 25 **construction issues in a patent case?**

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1 California at Berkeley.  
 2 And he was in the department of chemical  
 3 engineering, but that department was well known for  
 4 electrochemical engineering because of his mentor, a  
 5 fellow named Charles Tobias, who was originally trained in  
 6 Hungary, I believe.  
 7 But the idea is that, well, we're really  
 8 studying charged transfer at interfaces when we say we're  
 9 studying electrochemical engineering. Chemical engineers  
 10 oftentimes study chemical changes, but electrochemical  
 11 engineers study chemical changes together with electron  
 12 transfer particularly at solid liquid interfaces producing  
 13 gases, storing energy, making materials, et cetera.  
 14 So that's really what differentiates an  
 15 electrochemical engineer from a chemical engineer.  
 16 **Q And your educational background, could you summarize that**  
 17 **for us?**  
 18 A Well, I went to high school in Baytown, Texas, and I start  
 19 there because at the time Texas A & M University was  
 20 nothing but an all male school and not known as a  
 21 university at all.  
 22 After graduating from high school, I went  
 23 into the United States Navy and went through several Navy  
 24 schools including the Nuclear Power Navy School, and was  
 25 stationed and after that on a submarine, a missile firing



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Ralph White, Ph.D. on 07/01/2021

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1 submarine, fleet ballistic missile (SSEN) submarines and  
 2 went through several schools associated with my activities  
 3 on that submarine.  
 4 I was a ship's photographer and had to go to  
 5 school, and I was a ship's scuba diver and had to go to  
 6 school, and the ship's engineering technician that  
 7 essentially was a health physics job.  
 8 This was a radioactive submarine, as you  
 9 know, using nuclear power for propulsion and so I had to  
 10 monitor the air quality and the water quality for  
 11 radioactivity.  
 12 And, also, I was an engineering laboratory  
 13 technician so I had all this training in the Navy and then  
 14 I got out of the Navy from Charleston and went to the  
 15 University of South Carolina.  
 16 And the reason I mentioned those Navy schools  
 17 is because I was given credit for that training toward my  
 18 undergraduate degree at the University of South Carolina.  
 19 **Q And what was that undergraduate degree in?**  
 20 A Chemical systems. It was really chemical engineering, but  
 21 they structured it as chemical systems at the time. It's  
 22 now chemical engineering.  
 23 After graduating from the University of  
 24 South Carolina, I went to the University of California in  
 25 Berkeley and studied chemical engineering there, obtained

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1 my Master's degree in 1973 and my Ph.D. in 1977.  
 2 And then I went to Texas A & M which had  
 3 become a university over the period of time of my being in  
 4 the Navy and doing my undergraduate education at  
 5 South Carolina, and taught there for about 16 years.  
 6 And I continue to learn. I take courses  
 7 through the Internet on a regular basis. In fact, I'm  
 8 supposed to be in one right now, but I was told I needed  
 9 to be here today, but...  
 10 **Q I appreciate that.**  
 11 A I continue my education is what I'm saying.  
 12 **Q Wonderful.**  
 13 **You said you got a Ph.D. from the University**  
 14 **of California of Berkeley in 1977.**  
 15 **Did you write a thesis paper for that?**  
 16 A Well, we call it a dissertation. Yeah.  
 17 **Q My apologies.**  
 18 **You wrote a dissertation? What was your**  
 19 **dissertation on, sir?**  
 20 A Partly on the formation of copper on a rotating disk. And  
 21 the reason we wanted to study that is because when you do  
 22 that, when you deposit using electrodeposition of material  
 23 like copper onto a substrate, it could be a copper  
 24 substrate or platinum substrate, you also generate gas,  
 25 typically hydrogen gas, because there's a follow-on

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1 reaction.  
 2 So we studied that, the electrodeposition of  
 3 copper, and I studied a few other things that were in my  
 4 dissertation.  
 5 **Q And you understand that the present litigation that you've**  
 6 **been asked to testify on claim construction issues with**  
 7 **regards to -- relates to water electrolysis; is that**  
 8 **correct?**  
 9 A Correct.  
 10 **Q And can you generally explain what water electrolysis is?**  
 11 A Well, when we say "water electrolysis," I think we  
 12 typically mean that we're producing oxygen and hydrogen by  
 13 the passing of current through typically water that has  
 14 conductivity that will support the passage of current  
 15 through the solution and will preferentially, and  
 16 preferably exclusively, produce oxygen at the anode, and  
 17 hydrogen at the cathode. That's typically what we mean by  
 18 electrolysis of water.  
 19 **Q And when was the first time that you ever perform -- well,**  
 20 **let me strike that and ask you the first question, I**  
 21 **guess.**  
 22 **Have you ever performed electrolysis of**  
 23 **water?**  
 24 A We looked at electrolysis of water and electrolysis of  
 25 brine when I was at Texas A & M with a company called Dow

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1 Chemical Company. And electrolysis, as I mentioned, was  
 2 something that I investigated to a limited extent while I  
 3 was in graduate school.  
 4 Again, what I was looking at was a number of  
 5 different things. One of them was studying the  
 6 nickel-cadmium battery and the nickel-cadmium battery  
 7 essentially has a feature associated with that charging of  
 8 that battery known as overcharge.  
 9 And in the process of overcharging, oxygen is  
 10 generated on the electrode and that is production of  
 11 oxygen by electrolysis of an electrolyte.  
 12 So I really started looking at it, well, even  
 13 before that. You know, you study things like that in high  
 14 school and college.  
 15 In fact, I think we had several experiments  
 16 in my undergraduate days in quantitative lab where we did  
 17 electrolysis of water and copper recovery and that sort of  
 18 thing. So I've been aware of it and have done experiments  
 19 over my adult life.  
 20 **Q And you mentioned that you've done electrolysis of water**  
 21 **and brine?**  
 22 A Yes.  
 23 **Q What is brine?**  
 24 A We use a term brine typically to mean a very concentrated  
 25 solution of sodium chloride and water. It can also mean



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1 brine seawater. But when I use the term brine within the  
 2 concept of electrolysis, I'm talking about production of  
 3 chlorine and hydrogen by electrolysis of very concentrated  
 4 sodium chloride and water, 300 grams per liter, for  
 5 example.  
 6 Q And you mentioned that there's brine seawater.  
 7 Where could we find brine seawater? Is that  
 8 just anywhere in the ocean?  
 9 A Well, no, what I meant to say was that oftentimes people  
 10 refer to seawater as brine. You know, we have songs of  
 11 "briny wave hit me in the face" or something like that.  
 12 So it's just a terminology differentiated  
 13 between what people are talking about. And when we're  
 14 talking about ocean water, some people call it brine or  
 15 seawater, and when we're talking about electrolysis of  
 16 brine, it's very concentrated sodium chloride and water.  
 17 It's a little bit different concept.  
 18 Q And you understand that there are plants and animals that  
 19 are capable of living in brine and seawater, correct?  
 20 A Well, of course we know that there are creatures in the  
 21 sea, that's for sure.  
 22 Q And in this case what have you been asked to do?  
 23 A You mean in this particular claim construction?  
 24 Q Yes. In front of you is what we've marked as  
 25 Plaintiff's -- or, I'm sorry, Defendant's Exhibit 569

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1 which is your Notice of Deposition, and you'll see in the  
 2 title there it's Defendant's Notice of Claim Construction  
 3 Deposition of Dr. White.  
 4 What have you been asked to do for claim  
 5 construction purposes in this case, Dr. White?  
 6 A Well, I've been asked, as you know, to prepare a  
 7 declaration to opine on my understanding of the mean --  
 8 the meaning of the terms in the patent that's -- patents  
 9 that are in dispute.  
 10 Q And who asked you to do that?  
 11 A Counsel for the plaintiff.  
 12 Q Is that Mr. Louwagie?  
 13 A Yes.  
 14 Q And have you spoken with Mr. Louwagie before today?  
 15 A Yes.  
 16 Q And when was the first time that you spoke with  
 17 Mr. Louwagie?  
 18 A That's a good question. It's been several months ago. He  
 19 interviewed me for the possibility of becoming an expert  
 20 witness in this case. I don't remember exactly how many  
 21 months. Three, six, something.  
 22 Q And have you been asked to do other things besides provide  
 23 your claim construction opinions in this case?  
 24 MR. LOUWAGIE: Objection. Vague. Outside  
 25 the scope.

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1 BY MR. JOHNSON:  
 2 Q And I'm okay with it being outside the scope.  
 3 My question really is: Do you intend to file  
 4 any further declarations or reports in this case?  
 5 MR. LOUWAGIE: Same objections.  
 6 A Do I intend to file -- I guess it's really up to counsel.  
 7 If I'm asked to do so, I'm willing.  
 8 BY MR. JOHNSON:  
 9 Gotcha. You have not been asked to do so to date?  
 10 A No.  
 11 Q Okay. And so to date you've filed or provided, I should  
 12 say, two declarations in this matter on claim construction  
 13 issues; is that correct?  
 14 A Yes.  
 15 Q All right. Sir, I think earlier you mentioned that we use  
 16 brine and define brine as a high concentration of sodium  
 17 chloride and water.  
 18 Who is the "we" to which you are referring to  
 19 there?  
 20 MR. LOUWAGIE: Objection to the extent it  
 21 misstates the testimony.  
 22 BY MR. JOHNSON:  
 23 Q You can answer.  
 24 A By that I meant the people that I was working for at Dow  
 25 Chemical Company.

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1 Q And we've been talking about your limited purpose and the  
 2 limited purpose of today's deposition is to understand  
 3 your declarations on claim construction issues.  
 4 Do you know what claim construction is, sir?  
 5 A Interpretation of the terms that are in the claim.  
 6 Q And do you know how are claims to be interpreted?  
 7 A Their broadest sense.  
 8 Q Have you ever heard the term "person of ordinary skill in  
 9 the art"?  
 10 A Yes, I have.  
 11 Q And have you made a determination as to what a person of  
 12 ordinary skill in the art is with regard to the patents in  
 13 this case?  
 14 A Well, I think we have done that. I'm not sure if we have  
 15 it in here, but I think it's typical where -- is it in  
 16 this? Should we read it or --  
 17 Q You're free to look through it, of course, sir. And just  
 18 so the record is clear, could you tell us -- you've  
 19 brought some documents with you.  
 20 Could you tell us what you brought and what  
 21 you're looking at there?  
 22 A Yes. I brought with me -- the first document is the  
 23 Expert Declaration of Ralph E. White and the second one is  
 24 a Responsive Expert Declaration of Ralph E. White.  
 25 Q And can you tell me, sir, what do you consider to be a



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