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## Item 23-0022 Appleton Wastewater Treatment Plant Update regarding the Polymer Incident of December 26, 2023

Utilities Committee

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**Alderson Vered Meltzer (District 2) 11:17**

Moving down information items. Our first information item 23-0022 Appleton Wastewater Treatment Plant update regarding the Polymer Incident of December 26th. It says here 2023 but this should be 2022.

**Director Chris Shaw (Utilities) 11:34**

I apologize for that. I'll ask—

**Alderson Vered Meltzer (District 2) 11:35**

Happy New Year, everyone.

**Director Chris Shaw (Utilities) 11:40**

So, I'd like to hand out some materials just real quick.

**Alderson Vered Meltzer (District 2) 11:43**

Thank you. Sure. Okay.

**Director Chris Shaw (Utilities) 12:36**

Okay, I gave out two handouts. One is just the flow diagram of the plant. I believe your copy maybe came in black and white? Yeah, sorry about that. So, I just printed out a one with the bypass in color. And so, you can at least see, you know, from the from the line diagram, what we were doing.

So, there's a couple of X's. Those represent a stop in process and then the workaround. Also gave you just the latest brochure, which is a very old brochure, but it gives you some background on history. The hauled waste program, pretreatment program. It's just general information. It's kind of nice to have.

Then I wanted to talk about—excuse me—the hauled waste program. So, the hauled waste program takes in hauled waste from dairy, dairy waste, leachate from landfills, and food processing waste. We have a number of hauled waste stations at the plant, one for septic, two for hauled waste. Some actually enters the treatment facility and some enters the anaerobic digesters, and we're going to be spending a little bit of time on the anaerobic digesters.

Well, on the day after Christmas, which was a Monday, hauled waste program was open. We were not open for business, normal business hours, and a chemical delivery for an emulsion polymer, a cationic polymer, was delivered to the plant and was offloaded into the hauled waste station. So that cationic product represented four to five months' worth of treatment chemical for a post anaerobic digestion process for dewatering. We utilize about 35 gallons of that material a day, and at the time, we thought the whole tanker was entered into the digester. So, an order of mag—you know, a couple orders of magnitude kind of—too, too much product into a process that wasn't meant to have that at all. In fact, the anaerobic digestion process—I said it's the exact opposite.

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Everything in those reactors those bio reactors is meant to be in suspension. It's supposed to be like tomato juice. What that chemical is, that cationic polymer that flocculent, what that does is it actually is a liquid solid separator. So, it took the material in it, and immediately started to separate it.

So normally, we would have just in general (I know I'm going to talk a little technical here, but) normally, we would have 3% solids in a liquid matrix. There'd be 1.1 million pounds of solids, but it would be equally dispersed—right?—in the whole vessel. It completely separated it. So, 3% went to the bottom, and it turned into 16%. That's what our analysis showed. So, five times the concentration. So, it created like a concrete—not really concrete, but it started to be much heavier—right? And so that that's a problem for us for pumping. All right?

That top started to float with what we would call a dissolved air flotation. We were injecting gas, gas bubbles came up, and it formed a mat on the top like a little cap on the water, and it didn't allow the gas to go through. We collect the gas and use it for our treatment facility, the digesters themselves and then also the 19 buildings on the campus.

So, gas couldn't get out. And it started to create gas surges. And so the fire department was called—I'm just gonna talk about the initial response. And they responded, and they helped us with a gas release, because the gas releases were a surge. They'd actually break through that mat, that little cap on the top. And so, we reacted, and there was a number of surges. The vessel, the reactor, is not supposed to work that way at all. And we had system failures prior to that. And so, we had to make a decision on getting regulatory approval to just bypass the whole complete system. We did that.

I just actually had a back-to-back meeting with the DNR. They were very good about working through a holiday week. You know, it was the day after Christmas, let people take off. So, we did get that approval, they were great to work with up the chain. And we got that authorization within like a couple of hours. So that was that was great.

We then deployed our staff to make the changes. We had some construction workarounds where we could actually accomplish this. So, we bypassed anaerobic digestion, and took the material, the solid train, and worked around it and created not a biosolids that were normally digested, they weren't digested. So that's really the only thing that happened. We continued to meet our DNR compliance with our WPDS permit, which is the all the water leaving and going to the Fox River. That was not impacted.

We—as soon as we were done reacting—I'm sorry, we spent quite a bit of time reacting, because when we contacted others, this is uncharacteristic. You can go ahead and try to find this like even online like a case history for this, or literature. There's nothing that's out there for it. All right? Taking up 2.2 million gallon and 1.1 million pounds and, or even a small scale. It's just it's just very unusual that the circumstances ended up being the way that they were, I'll just say that.

And I should mention that there is an investigative effort afoot too—and I'm not a part of that—to look at the root causes, and what happened and all the you know, all the scenarios. There's also a financial effort going on, that is going to, you know, inventory all the costs, lost revenue, like even the gas. We're purchasing natural gas instead of utilizing our own biogas, the hauled waste station has done. That effort's going on too. Mine tonight is just a process and regulatory update. So, there'll be more updates, but there's just different matters that are going on concurrently. Right? And so, this is my role.

So anyway, to kind of recap, we've gone through a number of mechanical biological issues at the treatment facility. Because our main focus or objective is to return to traditional treatment, the design intent of the facility.

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That's been a little bit challenging for the people that are in the EOC. There's an emergency operation center that's also going on, and I appreciate the chair already knows this. I know so. But we've had a number of challenges because we've induced stresses on equipment that are not part of their design. So, these gas surges, and that sort of thing—they've done things to equipment. So, we're gonna—continuing on with the conditions assessment. We know right now and have high confidence that one digester is fully functional. And that would be enough to have treatment through for the community. Maybe not the hauled waste program. I don't know if you know what I mean. There's a limitation to what a digester can do, a capacity limitation. Having two we would have the, you know, the redundancy and be able to treat.

So, we're looking at right now. It looks like one—we have high confidence; I'll just say that. I, I hesitate to say anything. Because I don't want people to have expectations that we've done a full assessment. A lot of what we've done has been really fast paced. And so, we're just putting equipment back online. We haven't done the true diagnostic work that we would normally do—right?—when we're assessing, assessing things. So, the workload's just been very large, and we're working, and things are working. But we haven't done like analysis, right? I mean, you can test a pump. We haven't tested the pump. It's working kind of thing. Alright.

So that's working out well. Or it's working towards our favor. We want to return to treatment by like tomorrow to go back to anaerobic digestion through at least one if not two reactors or two digesters. So that's promising. That's our plan. And then we would ask for a compliance letter from the DNR, after analytical, for the biosolids product. Because there's different places where the biosolids would go, either landfill, or land application. Land application and—return to land application is our least cost. It's what we do. And it's about half the cost. Well, actually a third of the cost, almost a third of the cost of—and some communities do that. They landfill their biosolids. We don't. We have a beneficial reuse philosophy, where we want to get it land applied. So, in other communities—I know I'm kind of talking off the cuff here, but—some don't have a hauled waste program so they wouldn't have a loss. They wouldn't be utilizing their biogas the way we utilize ours so I mean, some of these are problems of our success in a way that we have a hauled waste program, you know, that we offset, reduce rates, because we have additional capacity, and we utilize that capacity.

But anyway, that's where we are, operationally. In two weeks, I would know much more. So, at the next committee meeting, I would be able to have more detail and more confidence in where we at—where we are at from a compliance and a robustness in treatment kind of analysis. I don't know if that all made sense? But that's kind of where we're at.

**Alderson Vered Meltzer (District 2) 22:40**

Thank you. Any questions from? Alderson Firkus?

**Alderson Brad Firkus (District 3) 22:47**

I'm—not so much a question, but just want to say thank you. I remember that that morning, the 27th when we got—mayor reached out to a couple of us with some phone calls. I had missed phone calls, missed text messages, I had heard sirens earlier. I'm like, oh, goodness, what because the voicemail said, you know, there was a situation at the wastewater treatment plant I want to talk about. So, you know, it's very good to know that you know, the situation [indiscipherable] as big as this was, we're not talking here talking about loss of life, health. We're not talking about a huge, like, spill into the Fox River type of environmental impact. And all that that. Just really grateful that the response, the follow through, and the work that's being done to keep things going is very much appreciated by you and the rest of the team.

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**Director Chris Shaw (Utilities) 23:33**

Thank you. There's, there's been a lot of help. So, Director Block, Director Gazza. The mayor has been phenomenal to work with even in the middle of the night. HR, I mean, to do the investigation, it's—things are happening as they I believe they should. And so, I'm just super appreciative of the efforts of everyone. I mean, it's really been a nice team approach.

And I know we're talking about a catastrophic event. It could have been much worse. It really could have. And I won't I won't, you know, bring in my whatever analysis right now. But there's spills with that product that will create havoc on a treatment plan, and we're just fortunate that some things didn't occur too. Like containment, we did a containment right away. I actually had—just so you know, if there was more than a liter, a liter's close to a quart. If there was a release to a floor drain, there was to be an analys—uh a complete notification so that we could get it out of the drain. Because that's the kind of havoc it would it would create on the treatment train. So, it's got to be in its place.

And actually, even the make down is a 200 to 1 before you even use it. It looks like cottage cheese when it's made down. That means it's has 200 gallons of water to 1 gallon, and it looks like cottage cheese. And we fed it in what's called a [need? neat?] form, the concentrated form, just from the tanker truck into the process. So, at any rate, yeah, there was the environmental plan and there was a safety plan. I didn't talk about that. And a return to treatment plan. Because things can happen, like we've got to get in and get this done. And safety's safety protocols are breached. And you think you're doing somebody a favor, and somebody gets hurt. And we've really tried to take managed risks to get the treatment train back but do it in a smart way. So, at any rate, I'm going on and on, I apologize.

**Aldersperson Vered Meltzer (District 2) 25:40**

I'm so grateful for all of your hard work, and the entire team—all the lost sleep and working overtime on the holiday weekend. After the mayor called and, you know, he answered all my questions. And, you know, I was very devastated by what a huge tragedy this is for the digesters, but at the same time, I have also felt since I was first notified of this, that we're in very capable hands, and I have so much trust and confidence in your team.

**Director Chris Shaw (Utilities) 26:13**

And I do appreciate you reaching out. So, I mean—and I didn't talk about this, but gas production, which is a surrogate for biological health, has returned about 70% as of tonight. That's tonight. So that's a good—it's almost like a diagnosis/prognosis. You we have analytical to work with. And so that's really reassuring.

**Aldersperson Vered Meltzer (District 2) 26:35**

Like measuring its vital signs?

**Director Chris Shaw (Utilities) 26:37**

Yeah. Co2 is at 25%.

**Aldersperson Vered Meltzer (District 2) 26:40**

Awesome.

**Director Chris Shaw (Utilities) 26:41**

It is.

**Aldersperson Vered Meltzer (District 2) 26:43**

Aldersperson Schultz.

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**Aldersperson Alex Schultz (District 9) 26:44**

Thank you, Chair. So, it sounds like you still have some analysis to do on the systems and components of the systems and to make sure that everything is functioning the way it should, and that might take some time, two weeks or better. Is there any anticipation that there might be other components in the system that were damaged, might need to be replaced? How soon will you know, you know, the entire effect of...

**Director Chris Shaw (Utilities) 27:11**

That would take some time. We know impacted systems. And so, we'll just look to those systems. But we're not, we're not in a place where we can—our focus is actually going to be the hauled waste station. We've got pre planning—it's been going concurrently—to return those to service.

So, you might wonder why we would want to do that. One is revenue. I mean, that's just straightforward. Also, the microbes are hungry, and so that's a food source. It's going to take a couple of weeks at least to get the hauled waste program going even on a fast track. So, we wanted to start that early. We also got regulatory approval to do it.

So, a return would benefit the community too, because there's a financial impact of lost revenue. Now I know there's a cost to treat too, so we're not treating it. So, our costs are a little bit less. And we're also looking at what that is, and that'll be reported out in another committee meeting.

We also want to return and start utilizing our gas when it's completely stabilized. I talked about it being 25% and 75% of production, you know, so we'll go back to campus heat. We don't need regulatory approval for that. We just need a consistent, like 72-hour window, where we're not dropping out, you know, our building heat equipment and that sort of thing. So, there's a number of tracks that are going on to return to full—there's a regulatory track, right? I mean, I've got to go through that. There's the gas track, right? The hauled waste tracked. So, we're working through them.

**Aldersperson Alex Schultz (District 9) 28:49**

Thank you.

**Aldersperson Vered Meltzer (District 2) 28:50**

Aldersperson Doran.

**Aldersperson Chad Doran (District 15) 28:52**

Thank you. Director Shaw, I guess at this point, do you just have even a rough estimate as far as when the system gets back to normal?

**Director Chris Shaw (Utilities) 29:00**

No. I don't want to commit because I've done that. I've done that with my peer staff. And it's just I don't think it's good for me to do that. I really need a little bit more information.

**Aldersperson Chad Doran (District 15) 29:14**

No, that's fine. I'm just asking because I think it's a question that everyone wants to know. Right? So, I just, and it's a fair answer.

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**Director Chris Shaw (Utilities) 29:19**

I reported out. I have this level of confidence and it's dropped, like in half in two days. Right? Right. So, I've done that over and over and over again. It should work this way. We had a completely unconventional thing happen. You know, there's no, there's no literature to guide us. We don't know impact to equipment. We didn't know impact to biology really. I mean, we had theory, right? And we're working off of, you know, our credentials kind of thing. You know what I mean? Our engineering folks can't help us. The state can't help us. They can—the chemical company couldn't help us. I mean with confidence. It's theory/conjecture kind of almost, right? Talking in circles. So, I prefer not to live in that world. I like evidence. I like evidence. Right? So, it's better to have evidence. I feel confident tonight...

**Alderman Chad Doran (District 15)**

That's good

**Director Chris Shaw (Utilities) 29:21**

...that within a month everything would be back. Right. The hauled waste. I mean, but I don't I can't commit to that. I would never commit to that.

**Alderman Chad Doran (District 15) 30:23**

That's, that's fair. I appreciate that. I think it's just, you know, it's a question I'm sure. We'll ask again as

**Director Chris Shaw (Utilities) 30:28**

It'll be reported out, right?

**Alderman Chad Doran (District 15) 30:30**

Yeah.

**Director Chris Shaw (Utilities) 30:30**

Obviously.

**Alderman Chad Doran (District 15) 30:31**

You talked a little bit about some of the revenue loss, some of the increase in expenses now, because of what's happening. I'm sure we're tracking that. You know, are—where are we with that at this point?

**Director Chris Shaw (Utilities) 30:43**

Sure. We're tracking everything. In fact, even the lost load, the cost just of the load was \$62,000. Right? And everything in utilities has an expense. Right? We're—it's a multimillion-dollar enterprise. Right? So, I think we should look at it in context too, and we are focused on "this is a rate payer issue". So, everything is being tracked. Everything is being tracked. Not just hours, like the loss of gas. So, if we're making natural gas purchases, we're get—that's being put in, and we have Kelli Rindt, our CPA, accounts, and she's in charge of that. So, she's putting everything in. Everything. There's a work order assigned to every hour of labor, right? That's been applied. Just everything, right. Even other departments if there's help, any kind of help. There's an interdepartmental billing that will go and be accounted for. Everything.

**Alderman Chad Doran (District 15) 31:46**

As far as kind of all those costs and stuff. I don't know if you know the answer this, but this is something insurance, our—the city's insurance will be involved in?

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**Director Chris Shaw (Utilities) 31:54**

Yeah, we're pursuing insurance. Now insurance really acts around acts of peril. Right. And then—[someone spoke off microphone] Oh, we're not going to talk about it? Okay. We're, we're pursuing investigating. Yeah.

**Aldersperson Chad Doran (District 15) 32:08**

Okay. Thank you. And I just had a question about the investigation itself. I guess you mentioned you're not involved in that. Is that? Is the staff doing the investigation—city staff? Or is an off-site group leading that I guess?

**Director Chris Shaw (Utilities) 32:23**

I don't know if the attorney?

**Unidentified Female City Employee 32:29**

At this point, it's been an internal investigation.

**Aldersperson Chad Doran (District 15) 32:33**

Okay. And then, just out of, I guess, curiosity, you mentioned—because obviously, it's holiday, you know, non-working day, generally speaking, the day this incident happened. Did we have staff at the plant? I mean, we generally have to have someone running the plant, I guess...

**Director Chris Shaw (Utilities) 32:47**

Right. There's...

**Aldersperson Chad Doran (District 15) 32:48**

...on an operational day.

**Director Chris Shaw (Utilities) 32:48**

There's an operator at the plant.

**Aldersperson Chad Doran (District 15) 32:50**

And the investigation is trying to just figure out how, you know, the cause of, you know, I don't want to say "fault" necessarily, but you know, what, what led to the circumstances where this was...?

**Unidentified Female City Employee 33:01**

The scope of the investigation is trying to determine root causes.

**Aldersperson Chad Doran (District 15) 33:05**

Okay. Thank you.

**Aldersperson Vered Meltzer (District 2) 33:07**

Thank you. Any other comments or questions? Well, thank you very much again.