Public Hearing Transcript
Proposed Nutrient Concentration Objectives and Loading Targets for the Red River
Transcript of Public Comment Period during the Red River Public Hearing in Fargo, ND on January 16, 2020

Commissioner Rob Sisson:
His honor, Brian Holmer. Mayor of Thief River Falls, Minnesota.

Brian Holmer:
My name is Brian Holmer, representing Thief River Falls, Minnesota and thank you commissioners for hearing what I have to say tonight. I am totally for clean water and the protection of Winnipeg. As resort to that, I currently am a member of both the Red River Basin Commission and the Coalition of Greater Minnesota Cities and co-chair of the environmental policy committee. My concerns are the target concentrations which possibly could have a negative impact on a point source like myself. And I feel that a total load would be a better way to take a look at the health of the river in terms of if there is impairments in, it's not just coming from the point source, we can also take a look at the non-point source as well and find out where the concentration of nitrogen and phosphorous pertain to. With that, if this is permitted in our permits of the targets, the social impact just alone for us to put in a mechanical rather than our ponds would be about $33 million with additional three employees.

Whereas, if we can narrow this down and figure out where the concentrations are coming from, there's other means of providing. Possibly cities contributing to credits and stuff for finding point sources or other non-point sources of this sources of impairments to the river. So, I'm going to yield the rest of my time to some of the more technical guys because this is more of a 30,000 foot view, but they will further acknowledge and get deeper into the issue. Thank you very much for your time and I will be submitting further comments online. Thank you.

Commissioner Rob Sisson:
Thank you mayor. Checking in with the commissioners online. Any need for clarification? Okay. Hearing none. We'll move on to the Honorable Jonathan Judd. Mayor of the city of Moorhead.

Jonathan Judd:
Good evening. May it please the commissioners of the IJC. My name is Jonathan Judd. I am the Mayor of the City of Moorhead. First I want to welcome you again to the Fargo Moorhead area as well as your staff. And also would like to thank you for granting our hearing request and for holding the hearing here in Red River Basin. This is an important step towards building consensus on the development of international water and quality objectives of the Red River and protecting Lake Winnipeg. Also, I want to thank again, recognize our local legislators in the room and our staff from our federal representatives. I know also present, we mentioned a few people earlier, but also we have Mr. Andy Martin from Senator Amy Klobuchar's office from the State of Minnesota. Also, Mrs. Alison Stokke from representative Collin Peterson's office. Also, I believe Carson Owlette from Senator, Tina Smith's office is here tonight. And also who walked in a little bit earlier was state representative Benally from Minnesota as well.

Jonathan Judd:
We are glad that you are here tonight and thank you for your time again. The city of Moorhead and our

Minnesota sister cities and the Red River Basin, have long been leaders in efforts to protect water quality in the river. We all own and operate wastewater treatment plants that will be impacted by IJC nutrient targets and the enforcement of any new nutrient objectives could have multimillion dollar impacts for our communities. As city leaders, we take our legal and ethical obligations to protect the environment seriously. In fact, over the last 10 years, Moorhead has made significant efforts to voluntarily reduce the city's phosphorus contribution to the Red River. We are also currently participating in the stakeholder process facilitated by Red River Basin Commission to work with other cities, agriculture groups and the State to develop strategies to protect water quality in the Red River. We support the IJC's effort to develop scientifically sound nutrient objectives for the Red River that apply consistently to Minnesota. Also, the North Dakota as well as Manitoba

Thank you. I believe where I was at was, we are also currently participating in the stakeholder process facilitated by the Red River Basin commission to work with other cities, agricultural groups and the State to develop strategies to protect water quality in the Red River. We support the IJC's effort to develop scientifically sound nutrient objectives for the Red River that apply consistently to Minnesota, North Dakota and Manitoba. It is critical that any nutrient objectives and strategies be based on the best available science to ensure that our investments will lead to meaningful water quality improvements. That being said, the city of Moorhead and our Minnesota sister cities have significant concerns with the current efforts to develop the proposed total phosphorous and total nitrogen targets. As a result, we asked our technical consultant, John Hall of Hall and Associates to prepare a short presentation to highlight our key concerns. I anticipate that you will also hear similar concerns from other Minnesota cities municipal organizations.

For Moorhead's perspective, it is vital that we work together to address these concerns so that we can build a consensus on the right nutrient targets. I strongly believe that the best path forward to protect water quality in the Red River Basin and Lake Winnipeg, is to achieve a consensus so that we can work jointly with all stakeholders to meet the established targets. To that end, we respectfully request that you delay action on the current proposal or the current proposed objectives so that we can convene a meeting between the city's technical experts and IJC's experts to determine if we can reach a consensus on this important matter. Thank you for your time and your consideration.

Commissioner Rob Sisson:
Then next up is Daniel Marx from the Coalition of Greater Minnesota Cities. Okay.

Daniel Marx:
Thank you and good evening commissioners and members of the public in Red River board. My name is Daniel Marx. I'm an environmental attorney with the law firm of Flaherty and Hood based in Saint Paul, Minnesota. And I represent what we call the Red River cities that have requested the hearing in this matter. So, Breckinridge, Moorhead, Thief River Falls, Roseville and Warroad. And then I also represent a municipal group based in Minnesota called the Coalition of Greater Minnesota Cities that works on all large kind of slated public policy objectives that affect rural cities in Minnesota. And as Mayor Hormel from Thief River Falls indicated they have an environmental committee that works on environmental policy issues. And this is a concern... This is a matter that affects potential statewide concerns for the CGMC and member cities. And all of those cities that we talked about in the beginning are members of the Coalition of Greater Minnesota Cities.

And so what I wanted to cover today and I prepared just a brief handout and I'd like to hand it to you and I know that I can provide it electronically for other people online as well and will submit comments

during the public comment period. If I may step forward. And we provided this to IJC staff this morning as well. I will be brief, I know that there's other people that want to speak. I may go over five minutes, so please feel free to keep me on track. I will be as brief as I can and kind of cover the critical points. But first I just want to let you know what I handed you. So just very simple, these are often very difficult and technical issues. So, I just prepared a simple two page handout that summarizes the cities position on these issues and high-level concerns. And then I provided just a picture of who we are, who the member cities in the Coalition of Greater Minnesota Cities are. Several cities that are located in the Red River Basin.

And then just a copy of the consensus report from the International Joint Commission. So, they kind of peer reviewed at the International Joint Commission did on the RESPEC analysis, which is kind of the technical basis for the concentration objectives proposed. And then a few weeks ago and after we submitted the public hearing requests, we had previously identified some technical concerns with the concentration objectives and we had asked Dr. Steven Chopra who is an internationally renowned water quality modeling expert to review the consensus report and the RESPEC report and provide comments and feedback which was previously submitted. But I've included that as well. And I just wanted to kind of be going over the handout for the main points, but I wanted to just be real clear that from our perspective, the current proposal or the recommendation from the board to the commissioners, to the commission is distinct in terms of the load objectives for the Red River to be measured at Emerson flowing into Canada, designed to protect eutrophication and alga growth in Lake Winnipeg. And from the perspective of the cities in the Coalition of Greater Minnesota Cities, we really support that effort.

And our concerns that I'll kind of go into a little bit more, really are with the load targets for protection of Lake Winnipeg. We recognize that there are well documented eutrophication problems in Lake Winnipeg and we're supportive of that effort to identify loading targets for the Red River flowing into Canada. And we talked to staff this morning, we haven't received all of the background information to kind of evaluate where those targets come from. So, we've asked for that and we'll review that and provide additional comments as needed. But I want to just make clear that in the way we see things, there's a distinction between the proposed load objectives or targets and the concentration objectives for the river. And so I want to just focus the next piece of the discussion on the concerns that we have on the concentration objectives. And so the first thing that I want to make clear is that, our objection to the proposed concentration objectives for total phosphorus and total nitrogen is rooted in the fact that the currently proposed objectives, they directly conflict with the current applicable state and EPA approved river eutrophication standards in Minnesota. And I'll talk a little bit about how. And then our technical experts, Mr. Hall who you'll hear from a little bit later and then Dr. Chopra have identified, in my mind not a technical person, kind of the chief technical problem with those concentration objectives is that the RESPEC report failed to identify what's called a threshold where the nutrient targets that they're proposing, they didn't identify a threshold where the nutrients are actually having adverse impacts in the environment. And Mr. Hall, will talk about this a little bit more and what that means. But from the cities perspective, if targets like this get enforced through their wastewater permits, state and federally regulated wastewater permits could have multimillion dollar impacts.

And from our perspective, one of the critical analysis in any water quality based effort like this, it's to really identify at what threshold do nutrients, phosphorus or nitrogen have adverse impacts on the environment. Because if the cities are going to spend money for wastewater treatment, we want to make sure that there's an analysis done that shows that our investments are necessary to protect the environment and that they will lead, that they will achieve an objective in terms of environmental protection. And so I want to just highlight for you the conflict with the current proposal with the existing

state law in Minnesota. So, the concentration objectives for phosphorus and nitrogen, again distinct from the low targets. Presently in Minnesota, the pollution control agency, we went through a 10 year process at the Coalition of Greater Minnesota Cities and all cities were intimately involved in developing state and federally approved water quality standards.

Those standards presently don't regulate total nitrogen in the Red River. And so the proposed objective for total nitrogen directly conflicts with state regulatory findings and a lot of the initial technical analysis that was done by the NPC and others to support the current standards that we have, essentially finding that to protect the Red River from eutrophication, to protect rivers throughout Minnesota from eutrophication, the controlling problem or pollutant is phosphorous. And that the focus should be on phosphorus and not nitrogen. So from our perspective, that's a potential statewide precedential change in our current regulatory framework by looking at total nitrogen concentration objectives for the Red River. And then secondly, and this is a little nuanced, but in terms of the phosphorus concentration objective that's being proposed, it conflicts with the current state standards in a very critical way.

So, the proposed concentration objective from the board to the IJC, there's 0.15 milligrams per liter. That's the same number that the pollution control agency uses, but the standards on the state side critically, or there's a critical distinction in that. The standards on the state side say that phosphorus number doesn't come into play. You don't regulate for that phosphorus number unless there is evidence of a negative water quality impact generally problematic alga growth. And so in our state regulations we have a... It's called a causal response regulatory framework. So, the phosphorus causes a negative response measured generally by algae and the proposed objective from the board only utilizes phosphorous. And as I stated before, they didn't do that threshold analysis, which really demonstrates at what level, at what point will phosphorus cause a negative environmental impact. So, that's a critical distinction from our perspective, because if that report were to be finalized or recommended, it could have a precedential impact in terms of the current regulatory scheme impacting the Red River.

And finally, currently under state and federal law, the state has to go through a process every two years to identify impaired waters throughout the state. This is called the Federal 303(d) Listing Process. And presently the Red River is not listed as impaired for nutrients. And that's the current state and EPA approved impaired waters list and the PCA is currently in the process right now of proposing additional new impairments. And again, in those proposals, the Red River is not included as an impaired water for phosphorous eutrophication. And the RESPEC report essentially reaches a different conclusion, but again without doing that critical threshold analysis. And so from our perspective, the concentration objectives in the RESPEC analysis really has some critical conflicts with our current state regulatory framework that if adopted and move forward could have major economic impacts for the cities. And that's where I think our real goal is to try to sit down as the mayor articulated.

I think what we would like to do, because a lot of this is very complicated. The technical stuff... We have the opportunity to have our expert sit down in a more detailed way with technical staff to really flush out what our concerns are and try to work on involving cities in the consensus process. As the presentation earlier, it gave a great picture of who is kind of at the table in terms of developing this in terms of the stakeholders. And it was a lot of state and federal agency participation in terms of government representation, but there weren't any cities on that list. And I think we now really want to be engaged in this process, because if these targets are to be enforced at some point the cities will play a significant role in achieving any of those particular targets and could have significant economic impacts. And so finally, I'll take two more minutes and then I will sit down. I promise. I just want to

highlight for you where I think from our perspective, there seems to be a consensus on some of the critical technical concerns that we have with the RESPEC analysis.

And I'm just going to show you. So, I handed to you the consensus report for the International Joint Commission. So, this the peer review request that the cities made after we initially identified concerns and the IJC graciously granted that request and had a review done. And the consensus report as I highlighted on page one here, identifies that a key goal of the RESPEC report. So, the work order to RESPEC, the consultant that did the report, was to identify these thresholds at which biological negative impacts were going to occur as a result of nutrients. And on page eight, and I won't quote or read from it, but paraphrasing, they plainly state that they did not achieve that objective. They didn't do that. And I think our technical expert, Mr. Hall, that was the first thing that jumped out to him that really raised our initial concern in which we had asked back in 2018 for some kind of review that this threshold analysis is really critical.

Dr. Chopra, if you look in the letter that I provided from Canton, this is what he points out essentially. And he calls this the crux of the matter. That this analysis or this failure to identify a threshold is the crux of the matter. And so I think what I wanted to just highlight for your information is that at least from our perspective, the cities have identified lots of technical concerns. But really I want to focus your attention on where it seems that there is an agreement from our expert, Mr. Hall, Dr. Chopra and the consensus reviewers about this threshold analysis. And I think in conclusion, I just want to reiterate our goal here in terms of the cities interest, is to... As the mayor said, really work to build a consensus. We really think that the approach that should be utilized, it seems like the underlying goal really should be protecting Lake Winnipeg because there are well-documented eutrophication concerns in Lake Winnipeg. And that the approach should be focusing on those low targets and then kind of working from those low targets to determine what Minnesota and North Dakota need to do.

But the current concentration objectives at least as they're being proposed, because of the conflicts that they have with our current state regulatory scheme, we have significant concerns and we could not support them unless those serious technical problems that we've identified get addressed. So, basically what we are asking, is just additional opportunity to sit down and develop a consensus on at least understanding where the cities are coming from and try to develop a consensus about how to kind of identify and work through some of those technical issues. So, with that I will conclude and I thank you very much for the time and for the hearing and for inviting us all here tonight.

Commissioner Rob Sisson:
Next I'd like to call up Andy Bradshaw from the city of Moorhead Wastewater Division.

Andy Bradshaw:
Good evening everyone. My name is Andy Bradshaw. I am the Wastewater, Stormwater Operations Manager for the city of Moorhead. I really appreciate the opportunity to speak that you chose to hold this hearing. So, I want to thank the IJC staff, the IRRB staff, the Basin Commission staff, everybody that was here through the conference and I always enjoy attending the conference and then what we learn here in all the networking and understanding where everybody's coming from. There's been a long history with the Moorhead permit as it relates to Lake Winnipeg. Back when our permit expired in 2011, it was contested and Lake Winnipeg of course was cited as the reason for nutrient limits in our permit and we were still negotiating and working on that to this day. So, it's been a number of years this has been going on. A lot of what I was going to maybe say has already been stated before by others that were up here before me, but just for a little perspective from our standpoint at the Wastewater Plant.

From the very beginning, we've always said that we've never had a disagreement in terms of there being of course a problem at Lake Winnipeg and we acknowledged that the nutrient issues there at the Lake, has been obviously well known and well documented and acknowledged by Moorhead and the other cities in the basin. So, we've always looked for was to have something of a TMDL type approach to addressing the problem, you have this downstream basin, let's work backwards from that. And so as was stated before, we really don't have any issues with looking at load as it pertains to Lake Winnipeg and working on that to identify how we can reduce that load and improve water quality in Lake Winnipeg. As others, like I said have stated, we do have some issues with the concentration approach, specifically if there's a load establish that it was deemed protective of Lake Winnipeg and is also a concentration in the Red River. And especially if that concentration goes somewhat against the grain of the Minnesota regulatory framework.

For us, we could be doing what we needed to do to protect Lake Winnipeg, but still be in violation of a permit limit for example, because there's a concentration exceedance in the river. And that's one of the big things we're trying to avoid by really stressing the loading approach. We are recently doing facility planning for the wastewater division and we've hired our engineer a little while back, but we've always been talking about phosphorus, the nitrogen target is something of a new thing that was more recently published. So, we don't have good numbers yet on what a nitrogen limit, whatever that may be. We don't know how. If the targets were to you use as the basis for a nitrogen limit, we don't know how that's going to translate and what that number is going to be at this point. And whatever that number is, however, that varies can vary a lot in terms of cost or for us in terms of compliance and modifications to our treatment plant.

But on the phosphorus side which we've been planning for a little while and we're just getting into some of the facility planning and design work with our engineers, we've been kind of going with roughly about a $10 million upgrade for us at the plant. At this point like I said though, we're not sure what it's going to mean for us in terms of trying to remove total nitrogen at the facility, but we will probably have an answer fairly soon and that would be something we would include in our comments before the comment period is up February 28th, as well as expressing any other concerns we have. I really appreciate the time, I really appreciate everybody being here. Hopefully the coldest day of the year, I don't want any more colder than this, so thank you again.

Commissioner Rob Sisson:
Thank you. Any clarifications from the commission or on the phone? Okay. Next I'd like to call up John Hall, water quality consultant to the Red River cities.

John Hall:
Good evening commissioners, members staff of the International Joint Commission and the Red River board. My name is John Hall from Hall and Associates in Washington, D.C. I hope you will not hold against me my point of origin for getting here, given everything that's going on in that city these days. But I'm here to talk about the water quality issues on development of nutrient criteria. And I had developed a PowerPoint presentation I guess that were hoping to be able to utilize, I don't know if we are going to be able to put it up on the screen or how was this going to work?

Very good. And Zahn if you'd be so kind just to press the little button to move it forward at the right time I think that'll help things. I just wanted to give a very brief background on who we are. Hall and Associates, we have 40 years experience in doing Clean Water Act implementation. It's all we do. It's all we have done. We focus on water quality criteria development. I myself am an expert on mathematical

modeling of pollutant in freshwater systems also estuaries. On the nutrient issue, we've been dealing with this for over 20 years. Probably at this point about 25 different states we've dealt with this. Even at one point in time I was invited by Environment Canada to come up and talk to them about how you do watershed trading for nutrients back in the early nineties when we first started spearheading that as an option to more cost effectively reduce nutrients. Important to this particular analysis. In 2010, we were the driving force on coordinating the federal peer review of EPA stressor response guidance for how you develop neutral criteria for streams.

And we also had a major role for, I guess it's going on 18 years for the lake water quality standards and the river standards in the state of Minnesota. First thing I'd like to just say is that nutrient criteria response and development is complicated. It is one of the most complicated things you can try to analyze under the Clean Water Act. There is a reason for that. Nutrients aren't toxics. They don't have a direct immediate response. You can't just say, "I know this concentration is going to produce that result." Unlike for example, ammonia where it could kill a fish. Or arsenic where it could have an effect on a human. Where you pick out a dose and you're like, that's the one, that's the effect, it applies everywhere. Multiple factors influence whether or not you get excessive plant growth from nutrients. And this chart that I've got up here is, this is right out of EPA stressor response document and I have no intention of going through it, but needless to say, all those little arrows or things that affect whether and how nutrients actually cause an adverse effect.

And some places they cause a very severe effect, other places the same level of nutrients cause no effect whatsoever. So again, it's complicated. Next. We've been involved with EPA for decades on developing and assisting in the development of their water quality criteria guidance on how you do nutrients issues properly. There's a few key issues and I just wanted to make sure everybody knows. I'm not trying to give the viewpoints of, this is John Hall's viewpoint of how nutrients are done pointing to what I'll say, some of the lead technical analysis that have been published on it over the decades. Usually nutrients in streams or lakes, you're looking at long term conditions. And then when you're trying to assess whether and how you should control nutrients, there's two key factors. You look for the nutrient relationship to how it influences plant growth, because that's what nutrients do. They grow more plants. It's a matter of fact, it's why we use them extensively in agriculture. We're trying to grow more plants. Of course, they run off and if they run off to the wrong place, you can cause adverse effects in streams, lakes, estuaries.

And there's plenty of that. Lake Winnipeg is actually a good example of an adverse effect happening from too much runoff getting into a lake. A critical aspect of this is to identify again, the nuisance alga level, the level which causes an impact. And then also the next slide, it's to determine the limiting nutrients, because you can regulate nitrogen, you can regulate phosphorus, you could regulate both, but you don't always have to. You look at the analysis and you see which one is the one that would be controlling. And for streams in particular, streams are extremely difficult. That's why the Science Advisory Board says it's such a detailed analysis on looking at EPA's guidance for how you develop numeric nutrient criteria for streams. I'll just read this one line. Habitat condition is a crucial consideration on streams. The amount of light canopy cover, hydrology, grazers, velocities, sediment type. I can tell you on some streams you can grow a lot of periphyton with a certain amount of plant growth. Other the streams, none. None whatsoever.

It's strictly the physical habitat. It's got nothing to do with the amount of phosphorus present. So, the issue on this that the Science Advisory Board focused on was if you actually either over or under regulate nutrients, you cause negative social and economic impacts. It's just unintended. You're thinking

you're trying to do the right thing and that this nutrient control is going to cause a certain benefit. Sometimes it doesn't. So, now you spent your money on something that wasn't the problem when you could've been spending it on something else. So, to be scientifically defensible you have to consider these factors and how they co-vary. Next. So, this is kind of just a shorthand summary of literally a dozen EPA documents Science Advisory Board reviewed on implementing nutrient criteria. The first thing you do, is you pick the proper response threshold. What's the nuisance alga level? What level of plant growth are we trying to prevent? By the way, you pretty much did that in Lake Winnipeg. That's how you decided what was excessive and how it had to be reduced to varying levels.

Now, so you link that, so you use impairment and then you identify the nutrient level that's going to prevent that level of plant growth from occurring. Usually applied on a growing season. Depends on which kind of system you've got quite frankly. Sometimes it's an annual average, a lot of times the growing season. You focus on limiting nutrient, but it's essential for streams that you account for the actual stream response. Because there's factors that will prevent nutrients from having an effect. Amount of TSS, tree canopy. Tree canopy will stop plants are growing. If any of you have a lawn where you've tried to grow grass under a very shady tree, we all know it doesn't really grow very well. Why? Plants need three things to grow. They need light, they need nutrients and they need temperature. I'm assuming we're on planet earth, so there's water. Of course if there's no water, you're not going to get anything. But those are the three factors and only one of them is nutrients. You'll notice. So, if any of those three factors can stop things.

And when Daniel was up before talking about the critical difference between Minnesota standards and the concentration limits the Red River Board is looking at, the critical thing that's missing is the actual stream response. That's what's not in those standards. We go on to the next. Now, you have actually picked out the single hardest endpoint. Just so you know. The single hardest endpoint for nutrient impact evaluation. You are analyzing periphyton in streams. Periphyton is the green stuff that grows on rocks on the bottom. It's not phytoplankton, the floating algae that go through. That's what's growing in Lake Winnipeg. All right? Periphyton. Periphyton are extremely different from phytoplankton. Next slide. When we were working in Montana, I guess now it's... My God, a decade goes by fast. 2009. This was some of the information that Mike Suplee, who by the way Steve Chapman worked with in looking at setting up some of the Montana standards. They looked at periphyton growth on the rivers.

These are three different levels of periphyton from negligible on the left hand side, 150 is usually considered, it's not hurting anything. 300, 400 that's not looking so good. You can get some big dissolved oxygen swings and at night the DL can get really, really low. Hurt the fishery. The amount of phosphorus that cause those three different results, which are very by an order of magnitude, identical. 18 micrograms of phosphorus periphyton can grow in very, very, very low nutrient levels. And it depends on the physical habitat as to whether in fact they actually grow. Next. We were dealing with this issue in Pennsylvania. We had half dozen communities that EPA was looking to regulate very stringently. And I just said, "Well, what's the data look like on this stream?" And we collected the data to show how much the periphyton we're growing depending on tree canopy. So, these were kind of smaller streams. It might be anywhere from five feet wide to 20 feet wide.

And they were going to try to control the periphyton. Well, the periphyton either, and these are all the same exact phosphorus level by the way. 35 micrograms. The periphyton was anywhere from 300 where there was no canopy. Somebody took all the trees down and let the light get right through to the stream. The periphyton grew like crazy. The moment we had canopy in other sections of the stream, low periphyton growth. So, the light limitation again is a critical factor when you're deciding whether or how

you would try to control the Periphyton. Next. It's interesting, one of the experts that you had on consensus peer review, Dr. Dodds. He's actually done a fair amount of work on a periphyton over the years. He published an addendum to an article, an earlier article that he did when he finally realized the following, attached algae, which are periphyton are able to attain impressive bio mass in nutrient poor water. Why? They can use the small amounts of nutrients that pass by them every day in the stream.

They just grab a little out of the water, a little out of the water, a little out of the water and they just keep growing. The number by the way, just so you know, it's somewhere around five to 10 micrograms. Is what's called the half saturation constant for periphyton. Which means, they can pretty much grow almost anywhere on the planet. Maybe there're some places in Alaska that are very low. In Northern Canada where you've got the Canadian Shield, we've got pretty low phosphorus levels, but three to five micrograms, five to 10 micrograms, that's common almost anywhere. In the Red River, the North would be completely unattainable. The natural condition in the Red River would be, I would guess somewhere about 50 to 70 micrograms just given the nature of the soils in the system. Next overhead. So, here's a classic example of where somebody thought spending a lot of money on phosphorus control was going to do something to periphyton. We got involved in this TMDL after the fact, this company was told they had to dramatically reduce the phosphorus level, which was running in the Jackson River.

They were about 300 micrograms in the Jackson River and the periphyton level was 200. Kind of pretty green. All right? They made them reduce it to 60 micrograms. They actually got it down to 50. Nothing changed, zero. The phosphorus removal had no effect in that stream. What they ended up going back to do, interestingly enough, is they had put a dam in on the Jackson River. And by reducing the stream flow out of this dam, it let the periphyton grow and grow and grow. So, now they periodically just released water from the dam so it [inaudible 00:42:09] it. So, it just knocks it off the rock and then it starts up again. But the phosphorus control had no effect whatsoever. Next. So, the periphyton issue did come up when we were dealing with the PCA in Minnesota. I guess that was 2014, 10. Yeah, 2014. And we had two things that we were trying to make sure that we nailed down with the state. One, what level of periphyton would you say if it's growing there and it's getting above that might cause an adverse aquatic life problem?

Start affecting the insects and the fish that are in the stream. 150 micrograms per meter squared is a growing season average. That's also what I think on... That's in EPA's recommendations too and most of their criteria documents, but it's a growing season average. And then after they looked at all the information that we had submitted to them, just what you can do to control or knock periphyton growth, the state came to this conclusion. It's not apparent that you can use phosphorus concentrations to control periphyton. You've got to check this very carefully on a case by case basis. Some places you might be able to, most places maybe not. And in particular, when I asked them about the Red River, the North, we did some detailed analysis on the datasets for the Red River. They said, "Well, you're right, the Red River, the North is not nutrient impaired." Why? It's not growing periphyton and it's not growing much phytoplankton neither.

We've got the data for the system, which is why Dan pointed out that the system has never been listed as nutrient impaired. The phosphorus in this river is not growing excessive plants. You can just get the data from the system and check it yourself, but there was a reason the RESPEC report came to a different conclusion and we'll get to that later. Next. Okay. So, I looked at of course, the background on how the IJC and this board makes its decisions. I didn't view it any differently than the way EPA or the state of Minnesota would make its decisions quite frankly. You do what's necessary to protect the environment, you use the best science available and then when you figure out that something's causing

an adverse effect and you make a recommendation, try to get it enforced. That's pretty much what every regulatory agency does. A great example of how the IJC works to do amazing improvements is of course the great lakes. Lake Erie for example, it used to be P-green.

And between the phosphorus reductions and the other things that we've done for a series of the lakes, water quality condition is dramatically better today than they'd been. Oh by the way, they did not regulate nitrogen and still have not. The nitrogen levels have gone up, the alga levels have gone down. Next one. Okay. Everybody knows that this is what's in the RESPEC report. I would make a note, the load limit issue, I didn't know if people were looking at establishing a load limit because it wasn't in the RESPEC report. So, the first place I saw it was in the announcements for this hearing. I am sure maybe it has been discussed previously. I certainly, I didn't personally see it, but then I understood it was when I read further. It's for Winnipeg, which by the way is a different issue. You would analyze Winnipeg differently than you would analyze the Red River itself. So, I can understand why a load limit would be specified for a lake. That would make sense.

Next slide. Okay. So, I was asked the following, this is how when we went to evaluate the documentation that was available. First question was, were the procedures use scientifically defensible and reasonable? Simple question usually. Did the applied methods address a real world concern? That's an unusual question to ask because usually you're sampling the plant growth that is actually occurring in the system, but that came up. Do the available data support the conclusions? And do the analysis confirm that TN control in assuming phosphorus control is necessary. Do the analysis show that you need to do TN control in addition? Because you were doing additional analysis to demonstrate that. Next overhead please. Okay. So, the first thing we did was to check the RESPEC report and I have to tell you the original scope of work had all the right things in it. Just so you know. You asked them the right questions.

There were two things they did not do though. They did not complete stressor response modeling and they did not identify the biological thresholds along the stressor gradient. What that means is, you look to see how the nutrients affect the concentration going up and up and up and is that causing the plant growth to go up with it? What are the factors that are affecting it? They didn't do those two things. They were in the scope of work. Just so you know. So, it's not like the board did not ask it to be done, but... So, next. So, this is what they did on periphyton growth. They floated periphytometers on the surface. That is not how you evaluate periphyton growth. Periphyton grow on the bottom. They are attached alga growth. I have been doing this for, oh, God 40 years now. Nutrients issues, actually nutrient issues that long. I have never seen somebody use a floating periphytometer to see what's happening in a river. Why? Because it's not what's happening in the river. It actually eliminates the factors in the river that are controlling the plant growth. How much light is getting through the water column?

And I'll give you an example. I think one of the Commissioners mentioned she's down in Florida. Well, in Florida there's a lot of water bodies that have high tannins in them. It looks like tea coming out of swamps. You'd go over and look at it and you'd go, "Oh my God, is there some industrial operation upstream?" Not at all. Perfectly natural. It looks like tea. Guess how much algae grows in that kind of water. Answer, next to none. Why? The light can't penetrate the water. In systems like the Colorado River, which when you look at the Colorado, the reason it's named Colorado, it's Spanish, it's red. The fines that are in that river are floating through. The light does not penetrate, alga growth is nil in the Colorado River. The nutrient numbers aren't small, but the alga growth is nil, because the light cannot penetrate. It's like you're under a canopy. It's the same thing.

Next slide. So, the stressor response document, there were some basic things that you are supposed to do and the RESPEC reports said it did these things. So, I can understand why staff might've said, "Well, they said it was there. I guess they did it." These things are not in the analysis. There's no impairment threshold identified. No confounding factor. And a confounding factor is, is there some other factor that's affecting plant growth? Like light penetration, like velocity in the stream. They could be a number of things, but were these factors evaluated? No, they weren't. Did you evaluate nutrients along a gradient? No. And critically, no evaluation showing phosphorus and nitrogen. You would do an additional analysis and I'll explain it in a moment, but you would have a second analysis where you'd go, "We can limit the algae growing to this level, if we reduce phosphorus here. Is that good enough or not? Maybe not. Can I control nitrogen more and make it go even lower?" That's the two steps you go through. It's not in the report anywhere.

Okay. Next. I kind of just went over these points. I will make a... The reason we asked Dr. Chopra to come in, I consider Steve Chopra to be one of the top water quality modeling experts in the world. For periphyton there was nobody in close second place. He just finished... Two years ago, he published this detailed paper, got a national award on how you're supposed to properly evaluate periphyton. So, Steve's the guy. He's the person you would go to if you're worried about periphyton growth. That information on periphyton and how you control it and whether you control it, none of that's in the RESPEC report. So, there is a lot of updated science that one could bring to bear that normally the IJC quite frankly you operate usually on best available science and you'd be applauded by that. In this area, this report does not reflect that.

Okay, next. All right. So, the consensus report was done from some of your experts. And as Dan mentioned, they confirmed there was no biological thresholds, they confirmed no stressor response along a nutrient gradient. But they added a new assessment and when I looked at it and then I sent it to Dr. Chopra, we both came to the conclusion this was a flawed edition. And the reason they added it, is they were trying to put something into the report that had been missing. That's why they added it. And the next slide will show you what it is. See that little graph on the right-hand side, that was included to try to imply that nutrients as they increased, could cause increased periphyton growth. Now remember, this isn't actual periphyton growth. This is in those little floaty things. The obvious mistake, and it's interesting, I know Dr. Dodds knows this. So, you could just ask him. Not a single one of these nutrient concentrations would ever limit periphyton growth ever. It would be growing at its maximum growth rate.

Periphyton growth is limited at somewhere around 20 micrograms. Off the chart to the left. And so where we see this little jump up in the day to here between 250 micrograms and 350 micrograms, I have no idea why the periphyton jumped for that particular set of measurements, but I can assure you it had nothing to do with phosphorus changing from 0.25 to 0.35. It was already so high to begin with. There was nothing stopping it from growing. The question is, what changed at those sites if something changed? And again these are floating periphytometers. So, I would suggest one to go check the bottom to see what's growing actually in the system. So, the other thing that they did is they did the same exact chart for nitrogen and the RESPEC report itself noted. Well, it looks like something else is actually controlling plant growth. It's TSS. That's correct. The amount of suspended solids in the system is what limits the ability to plants to grow.

By the way, once you get to Lake Winnipeg, the reason that changes, is very, very simple. It's a big Lake. This high sediment load comes in, hits the Lake and the first thing it does is settle right to the bottom and then the water gets clear. And as soon as the water is clear, guess what happens? The algae grow.

So, that's why you're seeing a much different reaction up in Lake Winnipeg than you're seeing anywhere along the Red River of the North. Next slide. Okay. So, Dr. Chopra looked at this stuff because I didn't want somebody to... I was trying to not turn this into a debate among experts. I didn't really know that that was that helpful. So, Dr, Chopra was asked to look at what we originally had submitted and what the consensus report said. And he said, "Our concerns were valid, the peer review really didn't address the key issues we pointed out." That simple relationship on that chart really was not a scientifically defensible way to set a nutrient number.

And by the way, if you use that chart, the number you would have picked would have been 250 micrograms of phosphorus. It would have been higher, it wouldn't have been the number that was picked. And lastly there's no justification presented that he could see for TN control, which was the observation we made. Okay. So, we were just trying to get somebody to take a second look who I knew was a top expert. Somebody. If Steve would've turned around and said, "John, you and your team got it all wrong." We would have informed you immediately. Because if Steve Chopra is telling me that I've misplaced an analysis, I've misplaced an analysis. But when he says, "No, you got it right." I'm pretty sure we've got it right. So, now let's go onto Lake Winnipeg. Winnipeg's different. I was looking at some of the aerial photos of Winnipeg, shockingly green during certain times of the year. There's a lot of phytoplankton growth in that system. I don't need to explain that to anybody from Canada. Certainly no one that lives up by Winnipeg. You get some big alga blooms in that system.

My problem was, I had never seen the background data on why the targets were chosen there. I have no reason to think they're wrong, but I didn't know whether or how they were right. The one thing I will say was the TN suggestion for Winnipeg. That one I think we're going to suggest one needs to take a close look at. Go to the next one. Standard practice is usually this. And this is how you get to a TN control decision. You control phosphorus, you see what it does and then you can use modeling to estimate whether or not nitrogen control is needed. So, the modeling comes in handy. And the first question is, will phosphorus control obviate the need for TN? Yes or no? There's a reason for this. If you reduce TN levels, you can worsen blue-green algae blooms. Blue-green algae is the worst algae you would ever want to have in the water column. They can put out toxins. Matter of fact, I think everybody probably is aware of the Western Lake Erie Toledo, when they had to shut down the water supply. It's blue-green algae.

By the way, the phosphorus numbers were not that high in that area. Interesting. What happens with blue-green algae, is once you lower nitrogen, the other algae that need nitrogen to grow, blue-green algae can take it from the atmosphere. They're the only ones that can. They're actually probably the most ancient organism on the planet. Literally, a billion years old. They can take nitrogen right out of the atmosphere. So, if you reduce nitrogen too much in Winnipeg, you will give blue-green algae a competitive advantage. Of course, it doesn't always happen, but you have to be careful as to doing the analysis. So, that's why when I saw that I was scratching my head and going, "Hmm, this may not necessarily work out the way people thought," because blue-green alga blooms were a key issue in the two Winnipeg reports I looked at. And you certainly didn't want to do anything to give them a leg up. So, I think this is the last slide hopefully. Oh, yes it is. Thank you. So, our request with the board is simple. One, we're actually here to help.

I don't like coming ever to meetings where I just... As I say, pick on how somebody's playing piano. It's not usually a good idea. What you try to do is come in and offer some suggestions as to how to address a problem and do a better job. With that said, I'm kind of stuck where we are with doing the initial review on this, but we would look forward to working with this board and the commission on coming up

with what's actually going on in the Red River. What do you really need to or don't need to regulate there? And then an opportunity to review and comment on Winnipeg, because you do need to reduce the nutrient levels to Winnipeg.

There is no question about it. You just want to make sure you don't inadvertently cause something else to happen in doing it. And we would be also bringing Dr. Chopra in on that review. So, you'd be getting one of the top people on the planet to take a look at the modeling and how it works. So, that's just where I'd like to leave it. And thank you very much for allowing me to walk through this presentation. I knew it was a considerable burden to allow it and I certainly appreciate it.

Commissioner Rob Sisson:
Thank you John. I'd like to call up Ayn Schmit from the U.S EPA please.

Ayn Schmit:
Good evening co-chairs Corwin and Beland and Commissioners. I am pleased to be here tonight. My name is Ayn Schmit and I'm the senior water policy advisor for EPA region eight's office in Denver. And I'm here to offer a brief perspective from EPA on the proposed nutrient objectives and targets for the Red River Basin. First I want to say that EPA is strongly supportive of protecting downstream waters as is required by the U.S Federal Clean Water Act. Some in this room are aware that EPA has been working with Canadian officials to try to achieve protection of the trans boundary Lake Koocanusa in the United States, which is downstream and affected by Canadian mining activity. So, similarly in this case, we have supported the IRRB's efforts to develop nutrient threshold for the Red River Basin to help protect Lake Winnipeg. It's an important resource for our downstream Canadian neighbors that as others have observed regularly experiences impacts related to nutrient enrichment.

As indicated in our August 2019 letter, to the IRRB co-chairs, EPA does support the approach that was taken in developing the nutrient objectives and targets. We're pleased that the IRRB worked with the commission to have the approach independently reviewed. EPA notes that the objectives and targets are non-enforceable values. They're meant to facilitate and guide nutrient reduction efforts to reduce local and downstream nutrient pollution in the basin. Should the states in the Red River Basin choose to adopt them as water quality standards, they would come before EPA for review and action under the Clean Water Act. The peer review does note that the targets and objectives may not be sufficiently low to protect the downstream uses of Lake Winnipeg. EPA's letter emphasize that modeling work for Lake Winnipeg indicates that downstream uses will likely drive upstream nutrient reductions. Therefore, establishing nutrient objectives for the Red River helps ensure progress to reduce nutrient loadings to Lake Winnipeg.

The water quality committee's approach anticipates ongoing data collection and analysis that will be used for the continued refinement of the nutrient objectives and targets. EPA supports this adaptive management framework and encourages refinement of the objectives and targets as the process moves forward and as more information becomes available. This adaptive management approach is consistent with EPA's 2011 nutrient framework memo that encouraged states in the U.S to set nutrient reduction goals based on the best available information. And then to use those goals to make near-term progress in reducing nitrogen and phosphorous loads in high priority watersheds. In short, don't let uncertainty be the enemy of progress in improving water quality. In the spirit and moving forward with immediate reductions in nutrient loads, EPA region eight has been supporting our states to work with municipal wastewater facilities to optimize operations for nutrient reductions. We've been able to offer training

from experience contractors for state permitting staff and facility operators as well as some onsite evaluations and technical assistance from mechanical plants.

We certainly recognize that some communities, particularly smaller ones, may not have the rate payer base to enable them to implement large capital improvements to address nutrients. And so optimization offers a low cost mechanism to achieve immediate improvements. The results that we've been seeing have been very promising, especially in terms of significantly reducing nitrogen effluent concentrations and often energy savings turn out to be a side benefit of optimizing. We view this as a good example of making short term cost effective progress in reducing nutrient impacts to our watersheds. And we hope to offer an optimization training in North Dakota in the coming year. Given the nutrient reductions that are observed through optimization, reduction of nitrogen loads may not be as cost prohibitive as previously assumed, which brings me to my last point on EPA's perspective on the need for controlling both nitrogen and phosphorus.

EPA considers implementation of both nitrogen and phosphorus thresholds a requisite to adequately address nutrient enrichment and both have a role in protecting downstream waters. In 2015, EPA issued a fact sheet articulating the need and the scientific support for dual nutrient criteria. Within region eight, states that have adopted numeric criteria have conducted studies demonstrating that controls are needed for both nitrogen and phosphorus. For these reasons, EPA is firmly committed to working with our states to establish short term nutrient objectives, for both nitrogen and phosphorus as well as longer term numeric criteria for both nutrients. In summary, I want to commend the IRRB and the water quality committee specifically on their work in this matter and convey to the commission EPA's support for adoption of the proposed objectives and targets. Thank you for the opportunity to offer EPA's perspective.

Commissioner Rob Sisson:
Thank you Ayn. Next is Jim Ziegler from the Minnesota Pollution Control Agency.

Jim Ziegler:
Thank you commissioners. I appreciate the opportunity. I want to make sure clarification as I think a lot of people know, I'm also a member of the International Red River Board and tonight my comment, I just have one, is from my position at the MPCA, it has nothing to do with my position on the board there, at the International Red River Board. So, as I said, I just do have one very quick comment and it comes from a statement that attributes something to the actions of the MPCA that we have concerned about its accuracy. So, when you look at the report that Dr. Chopra submitted, there's a statement about controlling nitrogen and the potential negative impacts from doing that. As it was just talked about and the potential for the blue-green algae to have a competitive advantage.

So I don't have any problem with that statement, but the next sentence says, the state of Minnesota has premised all its adopted nutrient criteria for lakes and streams on this understanding. And referring to the understanding that lowering nitrogen can favor blue-green algae. So, there's no cite for that statement. They don't document where that statement came from and so I can't comment directly on how that got in there or where it came from. What I'd like to say though, is I've looked through our SONAR, which is our statement of need and reasonableness for our development of our nutrient criteria. And I've talked to our staff that helped develop the nutrient criteria.

And while there are a lot of things that went into the decisions on what our phosphorus criteria are, whether or not we have criteria for eutrophication for nitrogen or not, there was a lot of things

discussed. It's much broader than this simple statement would have us believe. And then secondly, I would add that we could not find any reference actually to this being a justification at all. I'm not saying it wasn't discussed, we couldn't find it in the SONAR and the people that work on this don't recall that being one of the criteria. So, I just want to make sure that you understand at least from our position that we have some concern about that one statement. So, thank you.

Commissioner Rob Sisson:
Thank you. That concludes the list we have of people who signed up or registered to make a comment. Is there anyone else that would like to make a comment at this time before we... Okay. Any last questions from commissioners? Jane, Pierre. Henry?

Okay. So, let me thank everyone for attending tonight, providing us your input and comments. We deeply appreciate it. Remember we will continue to accept written submissions up until February 28th. And information on how you can do that can be found online @ijc.org\nutrient2020. Please go there if you have the opportunity or desire to do so. Thank you everyone. Good night and stay warm.