Scenic Rivers Joint Study Committee
September 30, 2016
10:00 A.M.
City of Tulsa Mohawk Water Treatment Plant
3600 E. Mohawk Blvd.,
Tulsa, OK 74115

I. Call to Order and Approval of Minutes of August 10, 2016 Regular Meeting – Derek Smithee

SMITHEE called the meeting to order at 10:04 a.m. Roll was called and all member of the committee were present along with the Attorneys General representatives.

Members present:

Arkansas Representatives	Oklahoma Representatives
Brian Haggard (HAGGARD)	Shellie Chard (CHARD)
Marty Matlock (MATLOCK)	Shanon Phillips (PHILLIPS)
Ryan Benefield (BENEFIELD)	Derek Smithee (SMITHEE)

Contractor Ryan King (KING) - absent
Dara Hall (HALL), Arkansas Assistant Attorney General
Clayton Eubanks (EUBANKS), Oklahoma Assistant Attorney General – absent
See sign-in sheet for members of the public in attendance.

SMITHEE started the meeting with introductions and housekeeping items. He informed the audience that KING would not be at the meeting. SMITHEE instructed the audience that comments and questions will not be taken until the end of the meeting. CHARD offered a correction to the meeting minutes from previous meeting. SMITHEE asked for approval of minutes with corrections

MOTION 1: To approve minutes as presented including correction.

Representative		Yes	No	Abstain	Absent
Ryan Benefield		x			
Shellie Chard		x			
Brian Haggard		x			
Marty Matlock	motion	x			
Shanon Phillips	second	x			
Derek Smithee		x			

Dustin Davis (City of Tulsa) offered a welcome, building emergency procedures, and treatment plant history.

II. Administrative and Budget Report regarding the SRJSC's Contract with Baylor University for Performance of Water Quality Study – Shellie Chard

CHARD informed that there were no contract issues and project is on target for the approved budget.

SMITHEE stated he had not seen or heard about any invoices since our last meeting.

CHARD explained that the invoicing was done quarterly by Baylor University and since our meeting was moved up we were having a second meeting in this quarter and the next invoice is expected during the month of October.

III. Report on Performance of Referenced Contract – Ryan King
IV. Discussion on the study and fulfillment of the SRJSC charge – All
NOTE: this discuss of III and IV occurred at the same time due to the absence of KING

SMITHEE stated that KING was absent.

SMITHEE started discussion of slides and indicated that we would discuss the study and fulfillment of the committee charge at the same time. He questioned if the 200 mg/m^2 is the correct number to use for nuisance level benthic chlorophyll-a.

MATLOCK stated that the opinion of nuisance algae level has changed over the years.

HAGGARD said that this particular nuisance level may not be applicable to the Ozarks.

MATLOCK said that Cladophora is the main species of nuisance algae. Benthic chlorophyll takes off around 300 mg/m^2.

HAGGARD said the biovolume x axis changes between Year 1 and Year 2. First year is 290 mg/m^2 and the second year is 183 mg/m^2. This is where we are beginning to see Cladophora take off.

SMITHEE said the total phosphorus change point slide indicates that total phosphorus is in the strike zone between 0.027 and 0.047.

MATLOCK stated that the change point analysis can be tricky and depends on the quartile being used to analyze the change point – 50% or 75%, for example.

SMITHEE said he really wanted to discuss the nuisance threshold slides.

HAGGARD said the exceedance value of 200 has a change point 0.01-0.02 range. The 250 change point is between 0.01 and 0.04. The 300 change point maybe greater than 0.04 but it is still in the strike zone. The dashed line is the confidence interval. First dashed line is when something starts changing but is not prevalent. No values of zero past second dashed line.

MATLOCK said there is a 90% confidence interval between the upper and lower bounds.

SMITHEE said that if it was an ordinary river he would agree. However, this is a scenic river. There is a bit of a disconnect. He is looking at protection to prevent problem from occurring.

MATLOCK the question we must answer is the probability we are willing to accept.

HAGGARD said we want to look at frequency of the occurrence of nuisance conditions.

SMITHEE asked if the committee members at the other table wanted to chime in.

HAGGARD said that it is important to look at majority of points to the right of the change point.

SMITHEE said it was interesting seeing the upper bound of 0.048. He said he is still struggling with the 200. He thinks that 150 is where we start to see problems.

HAGGARD said Cladophora becomes more dominant higher than 200.

MATLOCK said that Cladophora is not dominant until around 180 to 290.

SMITHEE said that other algae can be nuisance strictly on biomass.

SMITHEE reference the table and said that the total phosphorus change points by frequency of exceedance.

HAGGARD said that change points are generally les in value with a lower percent exceedance, and that change points don't vary much above 25% exceedance.

SMITHEE asked about the exceedance probability of 200 on the chlorophyll-a slide.

MATLOCK said that only 10 % of time there is a 50% probability of a concentration at 12 ppb. It is a rare occurrence.

SMITHEE said that this tells me that if 200 is the right biomass it doesn't take much phosphorus to reach that level of biomass.

MATLOCK said this is to try to understand the noise of the system for risk management purposes. He referenced the slide for the 250 change point and the slide for 300 change point.

MATLOCK stated that change point is a bit subjective, not scientifically determined. It depends on what you want to manage the system for. Data should drive discussions. This is a very noisy system and difficult to manage.

BENEFIELD said we have to relate species change and biomass together.

MATLOCK said that this answers the question when nuisance composition shifts. It is seasonally noisy. This is a management decision that should be discussed.

BENEFIELD said there are two graphs and two years. The change point is very different between the two years.

MATLOCK said that when dry conditions exist, the pools are green. In wet years, the pools are clean. This doesn't have anything to do with phosphorus concentration. It is highly variable.

HAGGARD said that KING could explain better. He is basically calculating return interval for storm events.

MATLOCK said that 200 is not supported by the data for protection – there is no impact at that level and this is not a toxicity test where any algae or phosphorus is bad; phosphorus is a critical nutrient for stream productivity, we just do not want too much productivity. The approach of managing for no impact (200) will kill the stream. You have a 90% confidence that you will see it between 30 and 60% of time.

SMITHEE said that this tells us what is happening, not what we want to happen. We need to be protective.

HAGGARD said how we need to be thinking is percent of sites exceeding. At 0.037 there is an 80% chance of exceeding 250. What are the chances we will see at x biomass?

SMITHEE asked what this tells us about prediction of biomass and Cladophora.

MATLOCK stated nothing.

PHILLIPS said these were the only blooms we were able to measure.

SMITHEE said if we affirm 0.037, what will that tell us of the predictive power for exceedance. I never want to see it over 200. That is the upper level of my comfort zone.

MATLOCK asked him what his comfort level is for mercury which is never attainable.

SMITHEE said he wants to avoid this as much as possible.

HAGGARD said the frequency of exceeding 300. There are a minimum number of low sites. We can't manage to zero. If managing in strike zone, there is a small chance to go above 300.

SMITHEE said that 300 is too high for a Scenic River.

MATLOCK said that you can't tell the difference between 200 and 300 if you look at a rock.

BENEFIELD said that he sees a shift between 190 and 300.

SMITHEE said that this is the Cladophora shift.

SMITHEE said that at 0.037 half the samples will be over 200.

MATLOCK said there is no flat point in this graph.

SMITHEE said this is the TITAN graph.

HAGGARD stated that this is chlorophyll-a response. Also, there is an increase in the biomass change point. It appears the nuisance change point is 300. Cladophora is 309. The cumulative effect is driven by Cladophora. This is just first year of data.

MATLOCK said the second year shows Cladophora moving down near 180. These slides are moving averages.

SMITHEE said he has never looked at the entire dataset this way, referencing the geometric mean vs arithmetic mean slide.

MATLOCK stated that r squared is straight line.

HAGGARD said there is really no difference between arithmetic and geometric mean. It is very interesting that the two values are essentially the same.

SMITHEE said there are no high flows to skew data while looking at the total phosphorus vs DO graph.

SMITHEE said he was shocked that we had over 18 DO.

MATLOCK said that's eutrophication.

HAGGARD said same strike zone with biomass, species and DO.

MATLOCK commented on the total phosphorus vs pH slide that he was surprised to see low DO with low phosphorus concentrations.

PHILLIPS wondered why KING only showed us just this date.

MATLOCK said he didn't know why.

SMITHEE said that he is concerned about minimums. With supersaturation he expects to see corresponding low values.

PHILLIPS said we wouldn't expect to see major DO crashes in September referencing the total phosphorus vs dissolved oxygen range slide.

HAGGARD said that 0.030 to 0.035 is where we see the change point. Basically, low nutrient concentrations result in a much lower range or difference (between min and max in DO concentrations.

MATLOCK said Arkansas has an ecoregion water quality standard based on a DO standard with that range. Supersaturation is impairment.

SMITHEE said OK this is the end of slides. KING didn't finish since we moved the meeting up.

BREAK 11:09-11:19

SMITHEE said he is convinced in terms of Cladophora that we are in strike zone. He is concerned about biomass because too much of anything is a problem. He referred back to a slide from previous meeting on chlorophyll-a vs total phosphorus.

HAGGARD said that the exceedance here is half of the data points but not half the time. What you want to protect is over 200, right?

SMITHEE said absolutely.

HAGGARD stated that we don't have average total phosphorus vs average chlorphyll-a at least the 250 is defined here.

SMITHEE said we chose streams where we thought we might have a problem and streams where we didn't think we would have a problem.

HAGGARD said we wanted sites with low phosphorus to high phosphorus to observe the shift in algal biomass and or species composition. We tried to pick sites with similar habitats to reduce environmental sensitivity.

SMITHEE stated that this is our last chance to ask KING for anything what we want for our next meeting in November.

HAGGARD said that he would like to see means of these measurements of benthic chlorophyll-a vs total phosphorus for the 10 events.

SMITHEE said that this could tell us that if the phosphorus concentrations were previously very high and now it is tied up in biomass.

HAGGARD said that phosphorus concentrations don't change much at the sites at base flow. It was pretty stable at most sites. There were seasonal variations in some areas, where the graphs show a lot of seasonal variations between events.

SMITHEE said that he thinks that 150 biomass is where biomass starts becoming a problem.

HAGGARD said that these are individual data points not averages.

HAGGARD said we need to have a discussion of how we put these pieces together for our report.

SMITHEE said that we need to have 3 or 4 individual graphs to support our decision for the executive summary.

MATLOCK and HAGGARD voiced agreement.

HAGGARD said that biomass is best expressed by mean biomass. The average is not likely going to exceed 200.

MATLOCK said that HAGGARD was very helpful.

SMITHEE asked what need to ask of KING.

HAGGARD showed graph of change points and said that this gives us an idea of where the shifts occurs. Looks like it is right in the strike zone

SMITHEE said that if we want to have a couple of graphs that most effectively demonstrate biomass and Cladophora, what do we need to get from KING by end of October?

HAGGARD said that mean benthic chlorophyll-a vs phosphorus across the two years of the study and the mean Cladophora biomass vs phosphorus over the two years. These two plus TITAN graphs would be good for exec summary. Individual graphs help to understand change points. These averages would be best for exec summary.

CHARD stated that we need some of the information in the executive summary and a more detailed report. Graphs with significant explanation should be given in report.

SMITHEE thought that we should present graphs in simplest form for the executive summary. It needs to speak in general terms. I think we can boil it down to a few paragraphs.

PHILLIPS said that she agrees.

HAGGARD said another area to consider might be frequency distribution of all change points.

SMITHEE said we can have KING provide the rest of the presentation by the end of October and determine the magnitude portion of our charge.

SMITHEE said that we need to talk about flow: base flow, critical flow, etc. This study only encompassed ordinary flows.

HAGGARD said we should use the technical term, “seasonal base flow.”

SMITHEE said the point of contention is that our current criterion is based on all flows. Geometric mean was used to account for higher flows. How do we deal with that issue?

CHARD asked if we should caveat that this study only included normal base flow conditions.

MATLOCK said the purpose of this study is to better manage this Scenic Rivers water system. When we look at managing for compliance, flow is relevant for discussion. We don’t do rulemaking. We are charged with making recommendations. I would like for us to resolve scientific method of making evaluations.

SMITHEE said it is not in our charge to address implementation or assessment.

MATLOCK said he thought we should recommend a threshold and how to measure it.

PHILLIPS said the Second Statement of Joint Principles says magnitude, duration and frequency. It is very clear. There is value discussing it, but we need to stay within our charge.

HAGGARD said two years ago when we selected king, it was stated we needed to differentiate between storm and base flow.

SMITHEE said we need to wordsmith about flow to prevent saying things we don’t mean.

MATLOCK said we need to avoid using “shall”. We should recommend management strategies without saying “shall”.

PHILLIPS said a cursory review of data shows high flow measurements to not drive assessments.

MATLOCK said that from management perspective, low flow is most sensitive indicator. That is probably as much as we can say.

SMITHEE said the data collected during this study only allows us to make recommendations at seasonal base flow conditions. That doesn't mean we have to be blind to all other information available.

MATLOCK said we need to be careful because we don't want this to turn into "yes you will" or "no you won't."

SMITHEE said both states have been working on reducing phosphorus over the last 20 years.

SMITHEE asked how we should proceed.

MATLOCK said from his perspective we need to wordsmith the low flow conditions to make a recommendation. We need to see words on paper before November so we can work on wordsmithing recommendations. I can take a stab at writing a paragraph.

SMITHEE said that he thinks we all should.

MATLOCK said we can compare and combine them.

SMITHEE said that all 6 of the committee members can write up the critical components and then we can put them together to see where we are.

HAGGARD said that this will provide a framework for discussion.

SMITHEE asked about the duration of the criteria.

HAGGARD asked if we were talking about a geometric mean or an arithmetic mean. He thinks that confidence intervals went down when we used means. Instantaneous was much larger.

PHILLIPS said what we are really talking about with duration is how long we can be above the criteria without violation.

HAGGARD asked how many samples over what time frame need to be collected.

PHILLIPS said the Second Statement of Joint Principles asks for recommend on frequency and duration, not number of samples.

HAGGARD commented that the Second Statement of Joint Principles says that a study shall be designed to address frequency and duration

PHILLIPS said that frequency gives an idea of the number of excursions over specified amount of time and still meet beneficial uses. The duration is the specified amount of time that this can occur.

HAGGARD stated the joint study shall include a sampling population.

PHILLIPS stated that the study was based on how much we could afford to do.

HAGGARD said the study didn't or may not have provided an adequate sampling population.

HAGGARD asked PHILLIPS if we need to define how many samples over what time frame.

SMITHEE asked if he was referring to collecting information for assessment purposes.

BENEFIELD said that no sampling program is ever adequate. You can always have more data. He said his focus is not on when you sample.

SMITHEE said that part of the problem is that we aren't sampling frequently enough to rely on instantaneous maximum. I don't want to rely on a 30 day period and only have one sample for assessment.

BENEFIELD stated that we always have a problem with not having adequate samples. You have to assume that one sample in a month is representative. We don't only use criteria for assessment but for other things as well.

SMITHEE said like permitting decision, etc.

SMITHEE said that maybe we could say that the joint committee recommends the two states get together to come up with a sampling protocol that would be fine. It should not be the joint study committee that does that.

SMITHEE asked how long of a duration before nuisance conditions occur.

PHILLIPS said what we have to go on is the time between a scour event and the next sampling event.

MATLOCK said the longer the stream condition is at a concentration, the more likely you are going to have an exceedance. It is clear that if you don't want an undesirable response you don't want the condition to last over a threshold for very long at all. How long can we have it over 0.037? It depends. Exceedance should trigger a second sampling event. There will need to be more data to determine this.

PHILLIPS stated that it is almost always above 0.037.

MATLOCK said at some places.

SMITHEE said we may need to look at speciation.

PUBLIC stated that we continue to go back to assessment. Frequency and duration are standards not monitoring for assessment. Monitoring should not be addressed based in any agreement coming out of the joint principles.

SMITHEE said this group should not be looking at assessment. It should be about when we see a response.

HAGGARD said we have to qualify that the shift of algal biomass was within the strike zone based on water samples collected x times over the range of flow observed in the study.

SMITHEE said that he thought what HAGGARD said is okay.

HAGGARD said he is okay with that as long as we say how many times we sampled over how much time of the study and over what flow conditions. It is important to define the limitations of the study.

SMITHEE said he doesn't want anyone to say we have been failures based of the limitations of the study.

HAGGARD said that X milligrams per liter we in the strike zone based on y number of samples during seasonal base flow conditions over the duration of the study.

MATLOCK thinks this would help to quantify the discussion for the reader.

HAGGARD asked if there was any data that is out there that will help us with that decision.

SMITHEE said there was; some of it anecdotal and some lab studies.

HAGGARD stated that it tends to peak out at 12-27 days.

SMITHEE said he thought that description adequately frames the issue for future discussions.

MATLOCK said scientists will have to become more versed in regulatory terminology. We need to make sure we have a common understanding of the language.

SMITHEE stated we need to be careful. The outgrowth of our work should be for management of the watershed, not to constrain watershed management. We do not want to force someone's hand.

HAGGARD states that what we don't know is if the concentration changes over a short time of sampling. We do know that phosphorus and chlorophyll are closely associated based upon data collected in this study.

SMITHEE said that he didn't really care about phosphorous but we can't regulate based on chlorophyll-a.

MATLOCK said that this is okay for us to leave it there with every other month sampling. The relationship of the study is an average of every other month sampling. This is the study and should not imply that is how the assessment should be performed.

BENEFIELD stated that it is OK to say that it is a standard, but not to determine assessment.

SMITHEE stated that a 30 day geometric mean is great for permits, but not for assessment. We should have been more vague when the original standards were set.

HAGGARD said that we are going to have to be careful with our language.

V. Discussion on location, timing, expectations, etc. of next meeting – All

SMITHEE asked for comments from the audience.

PUBLIC asked why the meeting was moved, KING not present, and when the committee received the presentation.

SMITHEE stated that MATLOCK developed a conflict so the meeting was moved to the first available date. KING was not able to finish the presentation before today's meeting since it was moved up. KING was planning to attend today but had a family emergency. KING sent the incomplete presentation to the committee this morning. SMITHEE stated that he received the representation during his drive to Tulsa this morning.

PUBLIC asked if the presentation be posted will be posted on the website.

SMITHEE stated that this presentation and the completed presentation will be posted on the website.

PUBLIC asked to clarify that the committee has said that the 0.037 is in the strike zone.

MATLOCK, HAGGARD, and SMITHEE all commented that they haven't seen anything that would lead us to think otherwise.

PUBLIC stated that when we are considering protection of a scenic river rather than any other river, the threshold needs to be pushed down. For scenic rivers we should not be protecting the point where the use is threatened it should be much lower to protect the river.

PUBLIC stated that the critical condition is where the use is most threatened. We are tending to limit ourselves in how this information can be used.

PUBLIC stated that OWRB could provide information on how to use consistent terminology.

MATLOCK stated that the study is clearly set up to determine where phosphorus results in nuisance conditions.

PUBLIC asked about using this data from this study to perform assessments.

PUBLIC asked if the committee was going to determine the timeframe needed to determine assessments of the waterbodies.

BENEFIELD asked if we are able to recommend how the standard is applied.

SMITHEE said we aren't restricted but should use caution and make sure we are only making recommendations based on the study data.

MATLOCK said he will be pushing hard to include recommendations on how we should go forward.

SMITHEE said there will be differences of opinion within this group. He doesn't want to say something like this is only applicable at base flow but we can't go too far outside the box.

BENEFIELD said he thought the committee could give a recommendation of how and when the standard is applicable.

SMITHEE said that you can neuter a standard with bad implementation.

MATLOCK said we need to see recommendations from everyone to combine in one document that is a consensus. He is optimistic that we can do it.

SMITHEE asked if there is any interest in the committee to look at 100 mg/m^2 and 150 mg/m^2 in the study.

MATLOCK said that he was not against it.

HAGGARD said that we can ask KING for it. He also thinks there needs to be more text to explain the graphs.

BENEFIELD said that the committee is handcuffed by KING not being here today.

SMITHEE said we need to make sure KING does not send email to BENEFIELD at his old ADEQ email address. He needs to make sure he has the right email address for him.

SMITHEE said we will clearly have more discussions at the next meeting. He asked each committee member to share a bullet list of what information are keys to that person that needs to be included in our report. We cannot share through conference calls but we could through email similarly to how we handle minutes review and comments.

MATLOCK asked if that would be procedurally okay.

SMITHEE said he thought it would but would verify.

HAGGARD asked if there was anything else we want to see from KING.

SMITHEE said there was a lot more data that KING collected. He wondered if there was anything else out there that may help us.

MATLOCK said that he generally expected not. All of the information should be available. He asked when KING's final report was due.

SMITHEE said he is not sure that we have given him a firm date.

HAGGARD said we need to have a first draft by our November meeting. KING isn't doing an interpretation, just providing information. That should allow us to review and give comments.

SMITHEE said we need the rest of his presentation from today completed and a draft technical report before our next meeting.

HAGGARD said that we can put the draft on the website. We can tell KING to exclude information from the report if it is not being used. However, it will need to be in the appendix.

HAGGARD confirmed that our next meeting will start on afternoon of November 17th and resume morning of 18th.

SMITHEE said we will go until we are done on the 18th.

SMITHEE said we are going to have to figure out what will be in the final report.

SMITHEE stated that we will meet November 17 and 18. We will start after lunch around 1:00 on the 17th and will work most of the 18th.

SMITHEE stated that the draft minutes from this meeting will be on the website before the meeting but will not be final until the next meeting.

VI. New Business

SMITHEE asked if the committee member had any new business. Since there was none, he asked for a motion to adjourn.

VII. Adjournment – Derek Smithee

MOTION 2: To adjourn meeting

Representative		Yes	No	Abstain	Absent
Ryan Benefield		X			
Shellie Chard	Motion	X			
Brian Haggard		X			
Marty Matlock		X			
Shanon Phillips	Second	X			
Derek Smithee		X			

Meeting adjourned at 12:57