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Supplementary Report in Response to Rangen, Inc.'s Response to City of Pocatello's Discovery  
Requests to Rangen Made Pursuant to March 4, 2013 Order Denying IGWA and Pocatello's  
Motion to Compel Production of Research List

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In the Matter of Distribution of Water to  
Water Right Nos. 36-02551 and 36-07694

This supplementary report is provided in response to Rangen, Inc.'s Response to City of Pocatello's Discovery Requests to Rangen Made Pursuant to March 4, 2013 Order Denying IGWA and Pocatello's Motion to Compel Production of Research List (Rangen's Response), which identified new bases for research constraints at the Rangen Research Hatchery. My comments focus on Rangen's Response to Interrogatory No. 2, which requested a list of "research projects that Rangen did not initiate for which insufficient water supplies was the deciding factor."

### Summary

My review of Rangen's Response resulted in five general observations. First, Rangen's claim that it is unable to supply a list of future research projects is highly unusual. All researchers have a list of potential projects on the top of their mind. Second, the statements and information taken from research project reports cited in Rangen's Response were taken out of context. These reports when read in entirety, undercut opinions expressed in Rangen's Response. Third, Rangen's research problems in my opinion are attributable to project design issues, not insufficient water supplies. Fourth, Rangen's Response never provided a response to the question of what research Rangen did not conduct for lack of sufficient water. Lastly, the opinions expressed in my original report in this matter remain unchanged.

#### I. Comments on Interrogatory No. 2: Rangen's Documentation of Research Proposals

Rangen provided a response but did not answer Interrogatory No. 2. Rangen's Response to Interrogatory No. 2 included the statement that Rangen,

"does not maintain a database or centralized repository containing information related to research projects that it planned, but was unable to carry out because of low water flows and is unable to provide the information requested."

Rangen's Response, page 3.

This response was puzzling especially when this opinion was combined with the deposition testimony of Rangen's researcher Doug Ramsey and nutritionist David Brock, where neither would identify specific research projects that Rangen could not perform due to a lack of water. In my experience conducting both pure and applied research projects, research needs and topics are developed through time and usually do not disappear if the work cannot be performed, perhaps especially if the research cannot be performed. Researchers I have worked with can typically list an exhaustive series of projects they would like to perform. Future research projects are usually based on results of prior projects and new problems that appear and multiply over time.

Rangen's Response also included the comment that: "Rangen generally does not document the research it cannot do, but instead, plans what it can do with the water flows it has available." Rangen's Response, page 3. Rangen may not "*document*" research projects that they assert cannot be done. However, Rangen researchers have a personal list of appropriate research questions if the Rangen Research Hatchery is the research facility that the company claims to operate.

My review of Rangen's past research projects demonstrated that the Greenhouse and Hatch House now sit idle for all or most of each year, while water is available for research projects. Rangen's own research reports noted that research performed in the Greenhouse and Hatch House result in better data than raceway projects. Rangen's inability to identify potential future research projects combined with the availability of the Greenhouse and Hatch House allowed me to conclude that factors other than water supply contribute to the reduced number of Rangen research projects.

## II. Comments on Rangen's Response to Interrogatory No. 2: Additional Replicates

Rangen's Response included a desire to increase the number of replicates in future research projects to improve the statistical significance of large raceway projects. The projects cited by Rangen do not support Rangen's claim. Rangen's Response incorporated passages that alleged impacts from reduced water supplies. However Rangen's Response did not include other conclusions and observations in the same research reports that identified the demonstrable issues with Rangen's research: a lack of precision in measurements and counts.

Rangen's Response referenced Rangen research projects N0003 and N0004 (Rangen's Response, pages 4 and 5) when claiming additional replicates are needed to obtain statistically significant results from large raceway projects. Both projects included a statement that statistical significance may be improved if additional replicates are incorporated into the project design. However, both projects concluded that the best solution was to do future projects in the Greenhouse and not in the raceways. RANGENWJ001081, RANGENWJ001100. Both the N0003 and N0004 final reports included the observation that utilization of small controlled tanks such as those found in the Greenhouse is preferred over raceway exposures. The written report for N0003 included the statement that:

“[S]tudies which involve small tanks where numbers and weights of fish can be determined accurately at both the beginning and ending of the experiment and where increased numbers of replications are used remains the method of choice for nutritional studies.”

RANGENWJ001081.

Another Rangen research report (N0102) ended with the conclusion, “Do not test further raceway tests because of lack of sensitivity.” Raceway Experiment Reviews as of July, 2002, Deposition Ex. 87, page 1. A reoccurring theme of Rangen research reports is the idea that Greenhouse projects produce statistically defensible results while large raceway projects are not conducted in a manner conducive to production of statistically significant results. Rangen appears to recognize the difficulties inherent in large raceway projects where past research reports noted the “[i]nitial numbers of fish are at best, an estimate as are weights” and that “more accuracy in final weights are necessary to get significantly valid results.” RANGENWJ001081. Both fish counts and weight measurements appear to be performed in a more accurate manner in Greenhouse projects.

a. Rangen’s assertions regarding N0003

Rangen’s Response to the City of Pocatello’s Discovery Request incorrectly asserted that low water levels in part forced a reduction in replicates and a premature ending to Rangen project N0003. Rangen’s Response, page 4. Rangen project N0003 initially involved use of six raceway sections. The top, middle and bottom sections of large raceways 6 and 7 were initially stocked with appropriate sized trout. RANGENWJ001078, Table 1. Control fish were reared in Raceway 7 and fish fed a modified diet were reared in Raceway 6. Only two raceway strings were utilized in this experiment. The experiment was conducted in the late fall months; a time of relatively higher seasonal water flows at the Rangen Research Hatchery. Rangen has adequate water in the late fall to supply both raceways (top, middle and bottom sections) used in project N0003. Rangen decreased the amount of space that could be allocated to project N0003 because of “weight and space restraints.” RANGENWJ001080. The consolidation must have been mandated by production priorities or other planning, since more than enough water is present in the fall to utilize Raceway 6 and Raceway 7 in the large raceways.

b. Rangen’s assertions regarding N0004

Raceway project N0004 was performed to supply additional support for a hypothesis that had already been statistically proven in the Greenhouse project N9904. However, project N0004 failed to detect significant differences between the same treatments that had previously been found in Greenhouse project N9904. Lack of precision in weighing fish at the end of the experiment was a likely cause of the absence of significant results, rather than water supply availability as asserted by Rangen. Rangen project N0004 was conducted in the same manner as project N0003 utilizing the top, middle and bottom sections of Raceway 3 and Raceway 4. RANGENWJ001098, Table 1. Rangen has enough water to supply two raceways at all times of the year. One conclusion in Rangen’s report for project N0004 was: “At the conclusion of the test, all ponds were weighed in total by pumping the fish into a tank and estimating weight by the amount of water displaced.” RANGENWJ001098. Additional replicates cannot offset precision issues which arise when the weights of fish are estimated by water displacement. In general, an additional replicate alone is not likely to improve the outcome of projects in large raceways.

Rangen's large raceway projects appear to be undertaken to provide customers with further assurance that the results from Greenhouse projects apply to raceways and not to test unproven hypotheses. Raceway projects at Rangen appear to be an advertising tool more than a research program.

Rangen's Response to the City of Pocatello's Interrogatory No. 2 also referenced a conversation between Lonny Tate, David Brock and Joy Kinyon, where Lonny informed the other two that "there probably would not be enough water flow in the small raceways to conduct a planned research study." Rangen's Response, page 3; *see also* Brock Deposition, page 123, line 25–page 125, line 2. Water to the small raceways is limited more by unit design than flow levels. The only water that can be used in the small raceways comes through a pipe originating in a box below the Curren Tunnel. Much of the water used for fish rearing is taken from Billingsley Creek in a manner such that the water cannot be used in the small raceways. Additional water is available for use in the small raceways by installing a redundant pump system as discussed in Thomas Rogers (Table 2.4) December 21, 2012 expert report in this matter.

c. Rangen's assertions regarding N9709

Rangen's Response also claimed that water levels have reduced the ability to perform raceway research projects, "because, among other things, by the inability . . . to achieve statistically significant results." Rangen's Response, page 4. Rangen cited project N9709 to support the claim that water levels restrict research. Rangen's Response noted that researchers recommended that the "study be continued in a raceway setting" and that, "Researchers actually recommended using another facility in order to increase replication and stocking density." Rangen's Response, page 4.

Despite Rangen's claims, a review of the report associated with Rangen research project N9709 demonstrated that no allegation was made that water would have been insufficient to conduct a follow up project in a raceway. Instead, the recommendation regarding using another facility was made in regards to using indoor tanks at the University of Idaho Hagerman Station. RANGENWJ001789. The University of Idaho Hagerman Station does not have the ability to conduct side by side raceway projects. J. Woodling Telephone Conversation with Station Personnel, April 1, 2013. The University of Idaho site was recommended because of "current tank commitment[s]" in the Rangen Greenhouse. RANGENWJ001789. Evidently, Rangen did not have Greenhouse space to perform the proposed project at the Rangen Research Hatchery due to other research obligations or other factors. Rangen project N9709 reported the results of a test performed in five gallon buckets and concluded, "We need to get away from using 'quick and dirty' experiment designs." RANGENWJ001789. None of the issues Rangen research personnel encountered while conducting project N9709 had any connection to limited water supply issues.

## Conclusion

Rangen failed to provide an answer to the question of what research has not been performed at their hatchery due to a lack of water. Instead Rangen presented a series of excerpts taken out of context from research reports cited in my original report. These reports actually demonstrate that Greenhouse projects are the preferred method of research at the Rangen Research Hatchery. These reports do not support Rangen's contention that their research needs are not being met due to water shortages. I am still of the opinion that all the types of research historically performed at the Rangen Research Hatchery can still be performed at existing water levels and at the same frequency as observed over the last 20 years.