

Comment regarding Starwood Digital Ventures request for a status decision
(Project CZA-448SD)

Dear DNREC Staff,

I have followed the Starwood Data Center discussion for several months now, with particular concern for water usage. I believe the current application is seriously underestimating water need due to a technical misunderstanding on the part of Starwood,, which I will describe below. It's actual need, I believe, would be much larger, and could easily strain the local water aquifers.

The current question facing DNREC is (as I understand it) whether or not the Starwood project requires a CZA permit (which would involve assessing the actual and potential impact on the coastal zone), or can it go ahead without a CZA permit, or should it be blocked altogether as being a non-permitted enterprise. The crux seems to me to be around the phrase "heavy industry".

I suspect it might be hard to forbid the project outright on the basis of its being a heavy industry, although in my opinion anything which uses such enormous amounts of power and has hundreds of diesel generators (used occasionally) can legitimately be called a heavy industry. However, it would be quite legitimate to require a CZA permitting process, to see if the project is the sort the Coastal Zone Act was created for, to guard against. It is certainly enough of a "heavy Industry" to require that. And it would provide the opportunity to look into the situation described below.

I see a serious misunderstanding on the application's part, in its description of water use, described on p. 14 of the application. There it begins: "Maintaining heating and cooling requirements for the data center and equipment is vital to the operation of the facility. Options for advanced cooling systems are being explored....." I will pause there, because it indicates they haven't decided yet on a cooling system, and thus can't really report on how much water it will use. For large facilities, the typical "closed-loop" cooling system (with cooling on the roof) heats water to steam, which then carries the heat away from the facility. (I've

included a picture of Google's data center in The Dalles, which cools in this way). The Google center shown uses roughly a million gallons of water a day, and I believe it is less than 10% the size of the Starwood project.

The water-tower approach does recycle some water, but a huge amount of water is converted to steam and expelled. 1.2 gigawatts is a huge amount of power, and I estimate the facility could use 6-10 million gallons per day of clean water to be turned into steam to cool the facility. I wish I could be more precise, but the necessary numbers I found almost impossible to find.

And yet the application goes on to say "with one using a closed-loop system with a water/glycol coolant". It then goes on to estimate water usage at 9,933,000 gallons (roughly 10 million gallons) *per year*, which the local water service can provide. How can this be so much lower than the 6-10 million gallons *per day* estimate?

Forgive me for being so long-winded, but the problem only shows in the details. The typical cooling tower system involves two closed loops. *One loop* generally runs fluid through the server units, absorbing heat. It then discharges its heat through a heat exchanger to a *second* closed loop, which carries it as hot water to the water tower, where it is allowed to change into steam and carry the heat away. I've included a diagram of such a two-loop system, which is described in an excellent 2 ½ minute video, whose link is also given.

It seems almost certain to me that the Starwood group has confused the two closed-loop systems. The "water/glycol coolant" is presumably used in the first loop, which runs to the server chips. . No great amount is lost; the main need for water is for periodic flushing of the system. This is the kind of system the Starwood people looked at to get the low water use number they quote.

It is the second loop involving the rooftop water evaporator that is the real consumer of water in a water tower system, however- in the millions of gallons per day. The proposal doesn't mention this loop at all. I believe they confusedly thought the-cooling system they described would be all they needed. "After all, it's a closed loop, isn't it? Isn't that what we want? "

Technology can improve quickly, and some may think that a new method of cooling data centers will come along that doesn't need much water. One is up against laws of physics here, however. Removing heat requires a substance to carry the heat away. With the Salem nuclear plant, the heat is put into river water and sent back. Google's center mostly puts the heat into creating and blowing away steam. A large amount of water is used up. There is no silver bullet.

What would happen if the Starwood Digital Ventures project got a go-ahead from DNREC? My concern is that money in the millions could be spent, and then the developer (or its successor) would be forced to say, perhaps to the legislature or courts "We realize we need more water from the municipality than we thought. We cannot operate profitably without additional millions of gallons per day". I believe the aquifers in the area won't be able to handle this (especially if it threatens to limit how many new houses can be built-not enough water). Then tremendous pressure could arise (perhaps even from the federal level) to allow use of river water, as the Salem nuclear power plant does. (I've included a link to an article about how environmentalists tried to get the Salem nuclear plant to "come up to code" and stop using river water, but the parent company said they might have to close the facility, and a judge permitted the river water use to continue.)

Rather than get to that point, I urge you to require a CZA permit process. I believe this is your best chance to protect the coastal zone. (I apologize again for the length of this e-mail.) Your legal justification for this can certainly be that such a huge project needs to be examined, to see if it is the kind with heavy industry aspects that your review process was created to guard against. But a private motivation could be to forestall what looks like a real problem regarding water.

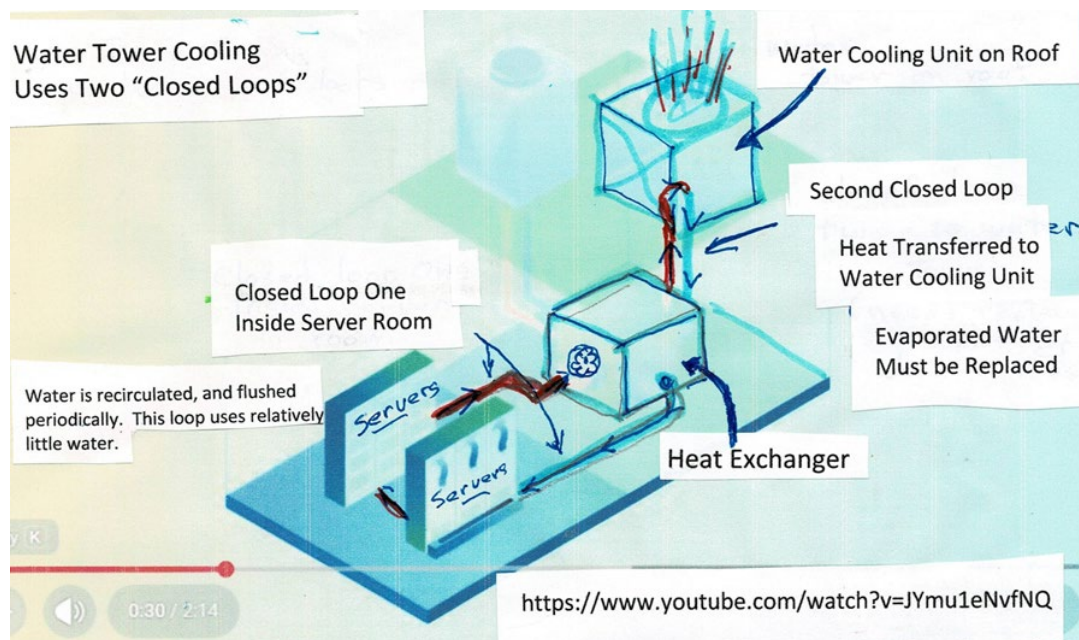
Yours truly,

Frank

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Steam rising from the Google data center in The Dalles, Oregon



From a two-and-a-half minute video on cooling: <https://www.youtube.com/watch?v=JYmu1eNvfNQ>

<https://spotlightdelaware.org/2024/02/27/fish-v-electricity-the-biggest-environmental-battle-youve-never-heard-of/>