High Springs Water Usage

This report is based on the information provided within the July 30, 2020 report NWNA High Springs Water Consumption Viability Analysis – Revision C by PET Systems.

I was asked to review the report and estimate the plant's expected daily water usage when averaged annually. My evaluation would support a proposed average water usage rate of 0.984 million gallons per day annually.

Potential Daily Packaged Volume:

I am in agreement with the potential daily production for all 4 packaging lines as presented by PET Systems (Table 1 below).

Table 1 – Water used by packaging lines for 1 day:

Line	Product Water per Bottle (oz)	Speed (bph)	Flow (GPM)	Spring Water used per day (MGD)	Assumed Average Line Efficiency[2]	Avg. Spring Water used per day (MGD)
1	17.24	81,000	182	0.262	85%	0.223
2	17.24	90,000	202	0.291	85%	0.247
3	17.24	90,000	202	0.291	85%	0.247
4	17.24	90,000	202	0.291	85%	0.247
			Total	**1.134**		**0.964**

The values above include a 2% intentional overfill and average packaging line efficiency of 85%. No process or potable water is included.

While glass bottles and cans are usually filled so they average the declared volume, a 2% overfill in PET bottles is reasonable. This allows some water loss through the plastic during storage and minimizes low fill rejects within the packaging operation.

The report states these lines typically run at 80-85% efficiency. This may seem low, but PET Systems included both planned and unplanned downtime in the 85% efficiency used in Table 1. Scheduled downtime for minor maintenance, line cleaning and equipment sanitation procedures would not typically be included in a packaging line's efficiency calculation. When including this downtime the 85% efficiency is reasonable.

Efficiency is normally a measure of what a packaging line actually produces against what it would have produced without any stoppage during a scheduled production run. Stoppages in production that impact this efficiency value are usually caused by a material or equipment failures. Typically these are short stops of 5 minutes or less and corrected by operators, but longer breakdowns requiring maintenance staff also occur and will be reflected in this average efficiency.