



BrewMonitor® at Terrapin Beer Company

*Large Craft Beer Institution Leverages
Real-Time Fermentation Monitoring for
Proactive Quality Assurance Management and
Efficiency Gains Across Brewery Operations*

Stellar Growth, and the Opportunity for Greater Impact

Athens, Georgia-based Terrapin Beer Company is a legendary Southeastern US craft beer organization that focuses on both the creation of great craft beer and its positive impact on the world. Having started out in 2002 as a two-man, 25-barrel operation, describing the company's success is a bit dizzying: Not only are production levels currently at approximately 100,000 barrels per year, but the company's acquisition by Molson Coors' Tenth and Blake division in 2016 elevated the business to a much broader mandate than the average regional craft beer producer.

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- Abbey Vickers, QA Manager

QA professionals. Also, the company recently announced the launch of ongoing sustainability initiatives, collectively named "Terraprint" – internal programs to boost water conservation, soil conservation, and responsible energy use, as well as external programs to help educate the public about their importance.

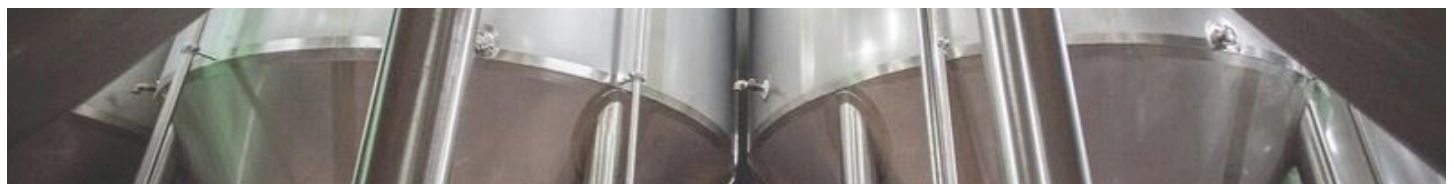
The company does it all for their beloved ecosystem known as the "Terrapin Tribe" – all Terrapin employees, distribution partners, and customers – to positively affect as many people as possible through the momentum of creating and sharing great craft beer.

However, at the heart of it, the company remains steadfastly loyal to its roots, priding itself in creating not just "the finest quality craft beers," as their mission statement puts it, but also a sustainable company with a strong sense of responsibility to its community. Terrapin's commitment to positive impact is reflected in its inclusive company culture, including an industry-leading high percentage of women brewing and



Benefits

- ✔ BrewMonitor saves brewing and QA staff many hours in labor each month.
- ✔ Comprehensive data reporting provides QA team with the visibility required to be more proactive in solving problems and successfully managing fermentation outcomes.
- ✔ BrewMonitor helps improve operational workflows, increases productivity, and reduces stress.
- ✔ Real-time monitoring helps improve management of the cellar, including preventing tank over-pressurization events.
- ✔ Precision Fermentation's excellent customer support helps ensure team success.



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The Challenge: Product Quality and Operational Efficiency for Large-Scale Production

Brewery operations at Terrapin seeks to constantly improve how beer is made from all perspectives, including sustainability and, of course, efficiency. Getting beer into cans faster and out to market provides the opportunity to create more new beer. And for Terrapin's quality assurance department, getting beer out of the tanks at peak quality levels and as quickly as possible – this is where they start their average day.

With 31 fermentation tanks in total, brewing roughly six days per week, 24 hours each day, and maintaining approximately 30 brands at any given time, the three-person quality assurance team – Abbey Vickers, QA Manager, and QA Technicians Angela Harris and Olive Overmoyer – certainly has its collective hands full. The team maintains close alignment with brewing operations, executing well-defined processes that ensure the realization of intended flavors, maintain batch-to-batch consistency, keep tight production schedules, and report to the wider organization on quality results and trends. As Abbey put it, “We’re busy, all day long. It’s just the three of us, so we spread out the coverage as much as we can, including Saturdays and Sundays.” Angela added, “QA is definitely slammed constantly. We just try to keep up with the brews. That basically is our job.”

In addition to processing each new brew, testing requests can also come in from anywhere, and they need to be

assigned and addressed, often on short notice. Angela said, “Our main task for any given day is microbiology, so we’ll go sample the fermentation tanks, brite tanks, can samples, keg samples, whatever is needed that day. There’s also can-line analysis, and more, with PCR testing as the last line of defense.”

Critical to effectiveness is the ability to be proactive, in order to head off problems early. Angela said, “We try to be on the offensive, as much as we possibly can, instead of on the defensive – meaning, let’s go find these areas that may become a problem and then try to find a way to combat it. There being just three of us in the department, we have to be on top of it.” Olive, having originally moved to the QA department from brewing, agreed and offered a somewhat broader context: “It’s definitely important to stay in front of things. Everyone is human, obviously, and we’re bound to make mistakes, and that’s in every department. So, we need to manage that risk.”

Fermentation management presents challenges to both the brewing and QA teams, with labor and time for sampling being a major component. The process for each sample taken is laborious, for either department. Abbey explained, “Every time we go to sample a tank, we have to spray with peracetic acid, wait 30 seconds, then clear out the zwickel by letting beer flow out for a little while. Then you grab the sample and you have to spray it again with peracetic acid. We’ve never had a micro issue so far, but still, it’s a concern.” With so much effort surrounding proper sampling process, the labor and time adds up quickly, and this takes time away from other important duties.

Throughout all of the QA department’s array of critical daily responsibilities, there is order to the frenetic pace, and this is accomplished through data. Abbey explains, “I keep up, using many, many spreadsheets that basically outline all on-going quality: I have a section on microbiology, a section on ABVs, a section on color and a section on sensory. These make up my weekly reports that are discussed with the head of operations and upper management.” She continued, “Also, I have a spreadsheet that tracks every gravity. In the



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- Abbey Vickers, QA Manager, Terrapin Beer Company



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past, I could look at a tank's data and see, for example, that if we're on day eight it should not be at the reported number. And that is a way we would catch problems historically. But usually if it had gotten to that point, it was already too late."

How BrewMonitor is Helping Terrapin Beer Company

Abbey became aware of BrewMonitor through a personal connection, back in 2018. She said, "It sounded really cool, so I said yes, let's team up with them. At the time, I was not aware of this technology even being a possibility." But over time, BrewMonitor has become a key part of Terrapin's strategy to manage fermentations and streamline operations, across brewing and QA.

On the brewing side, the team sees dramatic time savings through the reduction of one critical manual reading in particular. Abbey remarked, "BrewMonitor has really cut down on brewers' labor because it has allowed them to stop taking hydrometer readings. Before, at 5:00 or 6:00 AM you would have to collect a sample from every single tank, decarb it in a pitcher, put the hydrometer in the pitcher, take the reading, and record it. And now, instead, there's BrewMonitor – we can actually just pull up the web page and, oh, that's the gravity. We have stopped doing hydrometer readings entirely on tanks that have BrewMonitor Sensor Hubs on them."

Citing her experience working in the brewing department, Olive added, "As a brewer, I had been taking a lot

of gravities, so not needing to get hydrometer readings would save at least 20 to 40 minutes of work per tank. It varies, because for eight of our tanks you need to use a ladder to get the sample, and so just getting the samples takes more time."

No longer needing to take gravities, also offers time savings in the QA department. Angela said, "In QA we run samples on the densitometer and that takes about 40 minutes each time, but if we can just click on the BrewMonitor web page and see what that gravity is, we don't need to do that whole process. It just takes a quick glance to get what we need to know at that moment."

Further, the insight provided by comprehensive fermentation data saves the QA team time in troubleshooting problems. As Angela described it, "In identifying an issue in a certain tank, if BrewMonitor has been on it, we can simply go back and look at the fermentation curve or just the raw data and identify if there was some kind of dip or spike that we didn't know about. This would save me a lot of additional time that would be required to try to identify the issue without all of that data."

Additionally, BrewMonitor helps Terrapin manage one of its flagship beers that would be otherwise, quite literally, unmanageable. Abbey explained, "In Recreation Ale, the final gravity goes down to zero degrees Plato, and hydrometers cannot read zero, so we have to have a Sensor Hub on that tank. Otherwise, we have to take daily readings in the lab, which is cumbersome, and we don't have the time for it. We always try to ensure that the brewers put BrewMonitor on this ale. It's just less work for everyone."

There are some very simple operational benefits to direct tank monitoring, as well. As Abbey put it, "I can't tell you how many times the pressure readings have come into play. I mean, typically, 9 times out of 10, the pressure is where it needs to be, and there's not much interesting things going on there. But every once in a while, a brewer



Being able to put out a consistent beer every time is also very important to us, and that translates into a customer having the same beer every time he goes to grab one. I think BrewMonitor really helps.

- Angela Harris, QA Technician, Terrapin Beer Company



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will walk by a tank and close the blowoff valve. Then there's a pressure spike and Precision Fermentation support will reach out and ask us, 'What's going on with Tank 217?' I look at the pressure spike in Brew-Monitor and then I go check the tank."

Angela remarked, "Brew-Monitor gives us a peace of mind. You can just go on the web page and see those data points that you want, and you can see the gravity into the pH and the ABV relatively, and so that's always

super helpful because you don't have to invest any more of your time into that product – you can spend it on something else. Also, the user interface on the website is just so nice to like to look at. It's wonderful." Abbey considered the impact on operations, adding, "BrewMonitor saves us monthly labor costs, but just for the peace of mind – I don't know. What is that worth?"

Olive agreed, describing how automating the sampling process streamlines their efforts: "Gravities are one of the first things that you do, and if that can be taken care of by a machine that's incredible. You can move on to all the other tasks, like a dry hop or brewing or filtering up.

BrewMonitor saves time and energy to do things that are not exactly more important, but rather, things that can't be taken care of automatically. It makes the day less stressful."

Abbey pointed out Precision Fermentation's excellent customer support: "Honestly, what I like the most is the customer service and the support that we've gotten so far. I know I would never get the same good customer service [elsewhere] that I get from this team."

Looking toward the future, Abbey indicated plans to add 600-barrel tanks to the current lineup of predominantly 200-barrel tanks, mentioning, "I would definitely want to put BrewMonitor on those – that's a bigger investment." She noted that during the time they've been using Brew-Monitor, the system's improvements have been remarkable, commenting, "I look forward to continuing to work with the Precision Fermentation team and I would say that when you started at Terrapin it was already a good product, but every single version that comes out is better and bigger and badder." Angela added, "It's crazy the amount of product improvement that's happened. That's been really nice to see."

The QA and brewing teams at Terrapin leverage Brew-Monitor to support the company's mission. Abbey said, "BrewMonitor really cuts down on labor and time. At the of the day, that's what it does for us. The more beer we can produce, the fresher beer we can get on the market, the better off we all are. Get beer out of tanks faster. That gives us more room to do things like specialty brews and one offs, and that's always fun. That's why people love Terrapin."



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- Olive Overmoyer, QA Technician, Terrapin Beer Company

