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# Micron's unmatched environmental impact at Clay chip fabs doubles in latest estimates

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Rendering shows Micron Technology Inc.'s planned semiconductor fabrication facility in Clay. Micron says the \$100 billion plant will create 9,000 jobs over 20 years and four times that many support positions at related suppliers and service companies. (Micron Technology)

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Syracuse, N.Y. – Last fall, it looked like [Micron Technology's](#) planned semiconductor plant in Clay would need a maximum of 20 million gallons of water every day.

With a water recycling program, officials said, the amount might be half that. In that case, the Onondaga County Water Authority said, it could provide that much without building an expensive water line from Lake Ontario to the plant.

But an environmental report recently [filed by Micron](#) now says that when the huge plant is done in 20 years, it would need 48 million gallons of water a day. That's [double the estimate](#) of less than a year ago, and it's more than the 40 million gallons the entire city of Syracuse uses in a day.

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Providing that much water to the Micron plant would require the construction of that 54-inch diameter line from Oswego to Clay, the company says.

That line could cost \$100 million, and it's not clear how much taxpayers would be on the hook for.

It's not just the water. The projected electricity use, which in October was estimated at more than the state of Vermont consumes, has also doubled. Now it looks like the plant will use as much power as Vermont and New Hampshire combined.

As the Micron project comes into sharper view, one thing is clear: It appears it's going to have a much bigger environmental impact than was forecast when President Joe Biden came to town in October to tout the deal.

It's also a reminder of why the abundance of water and power were among the key selling points that helped New York land Micron over other states. Local officials say now that the water and electrical systems can handle Micron's needs even at the newer, much higher estimates.

After decades of industrial decline, Central New York is starting to plan new infrastructure for a manufacturing behemoth. Micron's growth will affect regional water and energy systems for years to come.

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The estimates of the chip fabs' impact are expected to change as the project comes into clearer focus and the environmental review process begins, officials and Micron said.



“As part of this process, we have revised our estimates of utility usage over the next 20 years,” Micron spokeswoman Moira Whalen said in an email to [syracuse.com](mailto:rmoriarty@syracuse.com).

National Grid, which will supply the energy, always knew “that projected demands for utility service would need to be modified as plans evolve,” said Jared Paventi, National Grid spokesman. “That has proven to be the case, both in the scope of the project’s phases and their energy needs.”



This National Grid substation off Caughdenoy Road in Clay will provide power to the Micron chip fabs at White Pine Commerce Park. When all four fabs are in operation, 20 years from now, they are projected to use as much electricity as the states of Vermont and New Hampshire combined use today. (Rick Moriarty | [rmoriarty@syracuse.com](mailto:rmoriarty@syracuse.com))

The new estimates of water and energy use are for entire the complex when finished 20 years from now. The company plans to build the four fabrication plants, or fabs, sequentially: Construction of fab 1 starting in November

2024, and work on the fourth fab completed by 2043.

The energy and water needs will start smaller and ramp up as more fabs start producing chips.

Local officials say the new, much larger estimates represent worst-case scenarios that need to be studied when Micron submits more detailed environmental reports.

“It’s to be able to reserve potential capacity, if necessary, but it likely won’t be needed,” said Bob Petrovich, executive director of the Onondaga County Industrial Development Agency. The agency owns the 1,250-acre White Pine Commerce Park, where Micron plans to build.

## **A thirsty industrial process**

Micron is committed to using 100% renewable energy for the Clay complex and is “aiming to achieve 100% water conservation through reuse, recycling and restoration,” Whalen said. At other Micron sites, the company filters water from the factory floor and reuses it in boilers and cooling towers. Micron also gives money to local water restoration projects, including \$10 million to increase capacity at a Taiwan reservoir, [according to](#) the company’s 2023 sustainability report.

The county’s Water Environment Protection division, which operates six wastewater treatment plants, is studying how to treat wastewater and send it back to Micron for cooling and other ancillary uses. That water wouldn’t be clean enough to use in the actual chip-making process, nor would it be used for drinking water, said Shannon Harty, commissioner of WEP.

Semiconductor-making is water-intensive because the chips must be frequently washed to remove chemicals. The Clay complex would also need to heat and cool 8 million to 10 million square feet of building space, and much of the cooling is done with water.

The Clay plant is expected to be massive: Each of the four fabs will cover 1.2 million square feet of what is now forest and farmland. Office buildings, a parking garage and other structures will take up millions more. It would be Micron's biggest factory. The company, with annual sales of about \$31 billion, has nine manufacturing locations, in the U.S. and Asia.

"The New York fabs will be, collectively, the largest campus in Micron's network and thus will likely use more energy and water than any other single campus," Whalen said.

Whalen said the Clay fabs will use newer machinery and produce far more chips than any of the company's other fabs.

When the Clay complex is complete in 2043, it would use more water and more electricity than all of the company's factories and offices use today. The Clay complex will consume 16 billion kilowatt-hours of electricity per year; according to the 2023 sustainability report, all of the company's fabs now use a combined 11 billion kilowatt hours.

The 48 million gallons estimate for water use in Clay would also be about 6 million more than all of the company's locations worldwide use now, including fabs and offices.

OCWA says it has enough water to serve the first fab, expected to begin producing chips in 2026. After that, though, Micron says that OWCA will have to build a new water line from Lake Ontario to the treatment plant in Oswego, upgrade that plant, build a 54-inch line from Oswego to Clay, and construct a 15-million-gallon storage tank on the agency's land in Clay.

The line alone would cost \$100 million and take seven to 10 years to build, said Jeff Brown, executive director of the water agency. He said there's no estimate yet for the cost of the tank and other upgrades.

"We still are working on that, and until we know exactly how much water they're going to need we're not going to be able to put a hard and fast number on that," Brown said.

It's also not clear yet who would pay for the line and other improvements.

"We have not worked that out," Brown said. "We are still talking with Micron about how that's going to be paid for."

One 54-inch water line already runs from Oswego to Clay, a distance of about 25 miles. It was built in the 1960s to open development in Syracuse's northern suburbs, including Clay. Brown said county taxpayers footed that bill.

"It was seen to benefit the majority of Onondaga County," he said.

A second line would be built parallel to the first. OCWA already owns the rights to build the line next to the first one.

Water from Lake Ontario, the 14th largest freshwater lake in the world, was a big selling point for Micron. So was the National Grid substation across Caughdenoy Road from White Pine.

## **Where will the power come from?**

In 2021, the county conducted a preliminary environmental report for a theoretical semiconductor plant that would employ 4,000 people at White Pine. That's a little half of the 9,000 jobs Micron says it will create over 20 years.

The county's estimates for water and power in that report weren't even close to what Micron says it needs now for the much bigger project. In 2021, the county projected that a chip plant at White Pine would require 5 million gallons of water per day. Micron's new estimate is almost 10 times greater.

That 2021 report also estimated a chip plant would discharge 4 million gallons of wastewater a day into the sewage treatment system. Micron now says that it will discharge 8 million and 20 million gallons per day.

Micron's latest projections show that the company would use a staggering amount of electricity by the time its four planned chip fabs are running.

Sixteen billion kilowatt-hours per year is enough for more than 2 million average households.

The Micron fab would use about the same amount of electricity as Vermont and New Hampshire combined, according to data from the U.S. Energy Information Administration.

“While it is a tremendous amount of energy, it’s also an unprecedented project for this region,” said Paventi of National Grid. “One of the reasons that Onondaga County identified White Pine as a potential home for a project of this magnitude was its proximity to high-capacity transmission lines and a major electric substation.”

To deliver all that power, National Grid will have to upgrade its Clay substation, which sits across Caughdenoy Road from the chip fab site. Micron will pay for the upgrades, Paventi said.

Micron plans to begin drawing huge amounts of electricity as soon as 2025, according to plans filed with the New York Independent System Operator, which oversees the power grid. That may force the NYISO to find new sources of electricity.

A preliminary analysis shows that the statewide power grid might have too little reserve generating capacity in 2025, partly as a result of the demand from Micron’s first chip fab, according to a July 14 planning report from the NYISO. That means grid operators might have to bring on new power sources, or delay the retirement of older ones, to make sure there is enough reserve power to supply customers if a large power plant shuts down unexpectedly.

Several new industrial users are scheduled to come online in 2025, the largest of which is Micron, the report said. NYISO officials say they have been working closely with Micron to plan for the chip fabs.

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