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July 26, 2020

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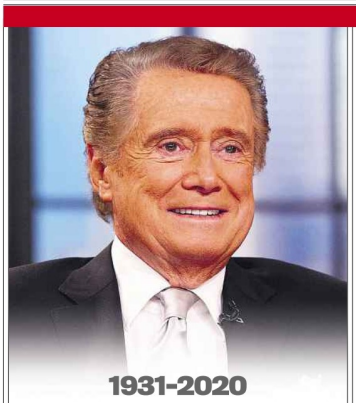

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WATCHDOG

BATTLING TOXIC PLUMES

How the government is removing the Brookhaven plume shows possible future for Nassau

JEFFREY BASINGER

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KNICKS NEAR DEAL TO LAND THIBODEAU AS COACH SPORTS

WATCHDOG

2 PLUMES: 1 GROWING, 1 RECEDING

Contamination at Grumman and Brookhaven similar, but cleanup results are far different

Brookhaven National Laboratory was placed on the

BY PAUL LAROCCO AND DAVID M. SCHWARTZ
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Long Island's largest mass of carcinogenic groundwater pollution, the Grumman plume is expanding a foot a day from Bethpage toward the Great South Bay, centerpiece of the region's South Shore estuary system.

The spread of its 24 contaminants, most notably the cancer-causing solvent trichloroethylene, or TCE, contrasts markedly with the shrinking of a similarly toxic groundwater plume from the property of the Brookhaven National Laboratory, 35 miles east.

Environmentalists and scientists who study the quality and movement of plumes say the cleanup methods have been similar, but not the comprehensiveness and commitment.

The federal Department of Energy is more than 20 years into a $360 million plan to extract the entirety of the pollution that leaked from Brookhaven. Its spread has been stopped and the contamination is on track to be virtually eliminated in another 40 to 50 years.

While spending hundreds of millions of dollars over the last 30 years on more-pinpoint cleanups and numerous studies, the entities responsible for the Bethpage pollution — Grumman's corporate successor, Northrop Grumman and the U.S. Navy — have rejected calls to fully contain and fully remove the contamination.

Instead, they have largely relied on water providers to clean up the supply before it comes out of the tap.

"It's really the tale of two Superfund sites," said Adrienne Esposito, executive director of the advocacy group Citizens Campaign for the Environment, using the state and federal term for former hazardous waste disposal sources.

JEFFREY BASINGER

Work is being done June 26 at the Bethpage Ballpark, which was once a dumping ground for a nearby Grumman facility.

Industrial contamination of Long Island's aquifer, the sole drinking water source for millions of residents, has become a defining environmental crisis, with the Grumman plume the most intractable example.

Comparing the cleanups at Brookhaven and Grumman offers a look at the future hoped for by many of the 250,000 people living in Bethpage and surrounding communities whose drinking water is in the path of the plume. It also provides an example of what could have been possible had more aggressive action been taken earlier in Bethpage.

After years of endorsing measured approaches, the state Department of Environmental Conservation, which regulates the Grumman plume, in December approved a plan aimed at full containment and cleanup.

"It's the state waking up to the argument that providing protection ahead of time, before you hit the [drinking] well screen, may make more economic sense," said Paul Granger, a longtime consultant for local water districts impacted by groundwater pollution. "Because you're paying for it one way or the other."

A Newsday investigation published in February found Grumman knew as far back as the mid-1970s that its practices were causing the contamination, but the company kept secret information that could have helped lessen its severity.

The state, meanwhile, long downplayed and underestimated the pollution and did little to contain its spread.

Much of this period overlapped with Brookhaven's embrace of the most-common plume cleanup method.

Called "pump-and-treat," the water purification technique used to surround the contamination there entails hydraulically pulling billions of gallons of toxic water from the aquifer, cleansing it in treatment plants and allowing it to seep back

BROOKHAVEN NATIONAL LABORATORY

federal list of hazardous waste sites in 1989. The pump-and-treat method to clean up the plume there is expected to remove contamination by 2065 to 2070.

into ground from holding ponds. The system has been adopted around the region, country and world, even though it can run for decades, if not longer.

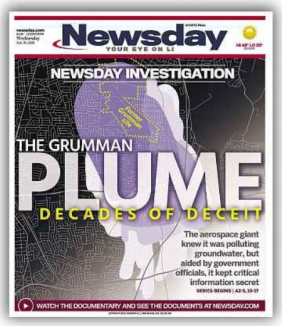
Pump-and-treat has also been used in spots within the now-4.3-mile-long, 2.1-mile-wide Grumman plume, but never around its perimeter in a way aimed at fully stopping its expansion beneath southeastern's densely populated suburbs.

"It does work if it's done correctly," said Kurt Pennell, a Brown University engineering professor who specializes in environmental contaminants and groundwater remediation technologies. "It's an effective containment strategy and it will clean the contaminants."

Speaking generally because he has not studied the Grumman plume, Pennell noted that hydraulic extraction well systems require proper design, constant monitoring and a long-term financial commitment to achieve a complete cleanup.

"It'll work pretty well on the plume," he said. "But you may be there for 100 years."

The new state plan would install 24 wells within and along the Grumman plume's perimeter. The wells would pump and treat millions of gallons of the contaminated water each day.



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Environmental conservation officials project the cost at $585 million over 30 years, with containment likely being achieved within several years but more than a century needed for a full return to clean groundwater. They said Northrop Grumman and the Navy would ultimately pick up the expense, even if the state began the work on its own and took them to court.

In a statement this week, Martin Brand, a deputy state environmental commissioner, said negotiations with the responsible parties are "nearing completion to ensure this work will begin in 2020."

Northrop Grumman and the Navy have argued that the plan is a political response to a public outcry about the pollution, rather than sound science. In formal comments submitted to the state, they have also said that a pump-and-treat system would be unfeasible on the needed scale and could interfere with the cleanup components they have already enacted or agreed to.

Those include a long-running containment system along the southern edge of the former Grumman property and the more-focused cleanups at plume "hot spots." They contend that the state's far bigger containment solution is unnecessary because local water providers clean the tainted water before delivering it to taps.

That purification has primarily been funded by the Navy and local taxpayers, not Northrop Grumman, the multinational defense contractor with tens of billions of dollars in annual revenue.

"We take our environmental remediation responsibility seriously, and we remain committed to working with all stakeholders to provide fact-based, scientifically sound remediation efforts that advance the cleanup and help protect the community without unnecessary disruption and potential harm," Northrop Grumman spokesman Tim Paynter said in a statement to Newsday.

Neither the company nor the Navy has historically expressed the same alarm as residents over the southward spread of the plume. Beyond noting that state and local authorities have deemed the drinking water safe, the company and the Navy endorsed plume models that predicted contamination decreasing by natural means.

In its plan published last December, the state confirmed that previously it had incorrectly backed those models, and that contamination levels in many areas of the plume have intensified, not lessened.

Similar solvents used

Brookhaven National Lab and Grumman used many of the same industrial solvents, such as TCE, that are now classified as carcinogens.

Brookhaven did so while conducting research and development projects for the Department of Energy. The lab contaminated the groundwater through spills, leaks and disposal of the solvents, as well as pesticides and radioactive material. Strontium and tritium leaked from a waste storage system of a nuclear research reactor that closed in 1969.

At its peak, the pollution extended underground as far as 2.5 miles from the Brookhaven National Laboratory property to Brookhaven-Calabro airport.

After being named to the federal list of former hazardous waste sites, or Superfund list, in 1989, the lab dismissed concerns raised by the community and the Suffolk County Department of Health about pollution flowing south toward residential drinking water wells through most of the 1990s, said Esposito, of the Citizens Campaign for the Environment.

Eventually, the Department of Energy changed course.

In 1997, U.S. Energy Secretary Federico Pena terminated his agency's contract with a

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A TALE OF TWO PLUMES

PLUME from A3

nonprofit entity that managed the lab over the group's handling of an underground leak of radioactive tritium. Pena said at a press conference that the lab "has lost the public trust from the citizens of Long Island."

Brookhaven Science Associates, a partnership between Stony Brook University and Battelle, an Ohio-based nonprofit research organization, took over the lab's management. After an extensive effort to map the plume, the energy department has funded a pump-and-treat cleanup aimed at stopping the plume's spread and cleaning it up.

Brookhaven Science has drilled 79 wells to extract tainted water, including near sources of contamination in the middle of the plume and at the edges. Twenty-five are currently in operation, using groundwater data that mapped the plume.

"We used that information to develop a really robust regional groundwater model for the site," said William Dorsch, the lab's groundwater protection group supervisor. "It's proved out over time. Our predictions have been on target."

"BNL knew it would be in the community for a long time," said Esposito, who sits on a 30-member advisory board that meets with lab officials to monitor cleanup.

"It's not widespread panic here, that's for sure," said Raymond Keenan, also an advisory board member and president of the Manor Park Civic Association, based about a mile and a half south of the lab. "There's always a concern. But at least there's progress being made."

Brookhaven National projects that its pump-and-treat effort will extract that last of the solvent plume by 2065, and the radioactive by 2070.

Grumman's Bethpage property — once a 600-acre minicity of manufacturing plants, offices and even a runway — was declared a state Superfund site in 1983, six years before Brookhaven National. Since 1987, it has been deemed a higher-risk site requiring remedial action.

The soil and groundwater pollution began decades earlier, a result of the company's chemical waste storage and disposal methods. It had used the chief contaminant, TCE, for 40 years, in degreasing vats and spray guns, discharging the wastewater into basins to leach into the ground, and storing it a 4,000-gallon tank that leaked.

As early as 1990, the Bethpage Water District called for full-containment, pump-and-treat remediation for the groundwater pollution that had already spread from Grumman's site and reached the district's public supply wells.

But the state, in a written response to one of those requests, called a cleanup focused on off-site contamination a "waste of time and money."

Instead, plans issued in the 1990s and early 2000s focused primarily on cleansing the toxic soil on Grumman and Navy grounds and stopping further groundwater contamination from escaping beneath the site and at Bethpage Community Park, a former Grumman waste dump before its donation to the Town of Oyster Bay.

Since the late 1990s, Northrop Grumman has accomplished this "onsite containment" by running a five-well pump-and-treat system at the southern boundary of its former plant as well as a smaller one at the park. Since the mid-2000s, two Navy wells have also targeted plume "hot spots." A half-dozen more, some run by the Navy and the others by Northrop Grumman, are under construction.

The state's full containment plan, however, would nearly triple the total amount of contaminant extraction wells. It is a departure from 25 years of oversight that often fell back on the fact that Bethpage Water and other local providers already stripped the groundwater of contaminants before delivering it for drinking.

During that time, the spreading edges of the plume went largely unaddressed. The change began early last decade, when the state stopped effectively deferring to consultants for the Navy and Northrop Grumman — whose projections were later proved faulty — to formulate a cleanup.

"Merely relying on the Navy and Grumman to aggressively pursue remediating the plume wasn't sufficient," said Richard Humann, president and CEO of H2M + engineers, which has consulted for the Bethpage Water District for decades.

A 2014 bill sponsored by then-Assemb. Joseph Saladino (R-Massapequa), now the Town of Oyster Bay supervisor, called on state environmental officials to study pump-and-treat containment of the Grumman plume. Gov. Andrew M. Cuomo signed the bill into law over the objections of his previous environmental conservation commissioner.

In 2016, a preliminary study found that full containment could be feasible, albeit "extremely difficult."

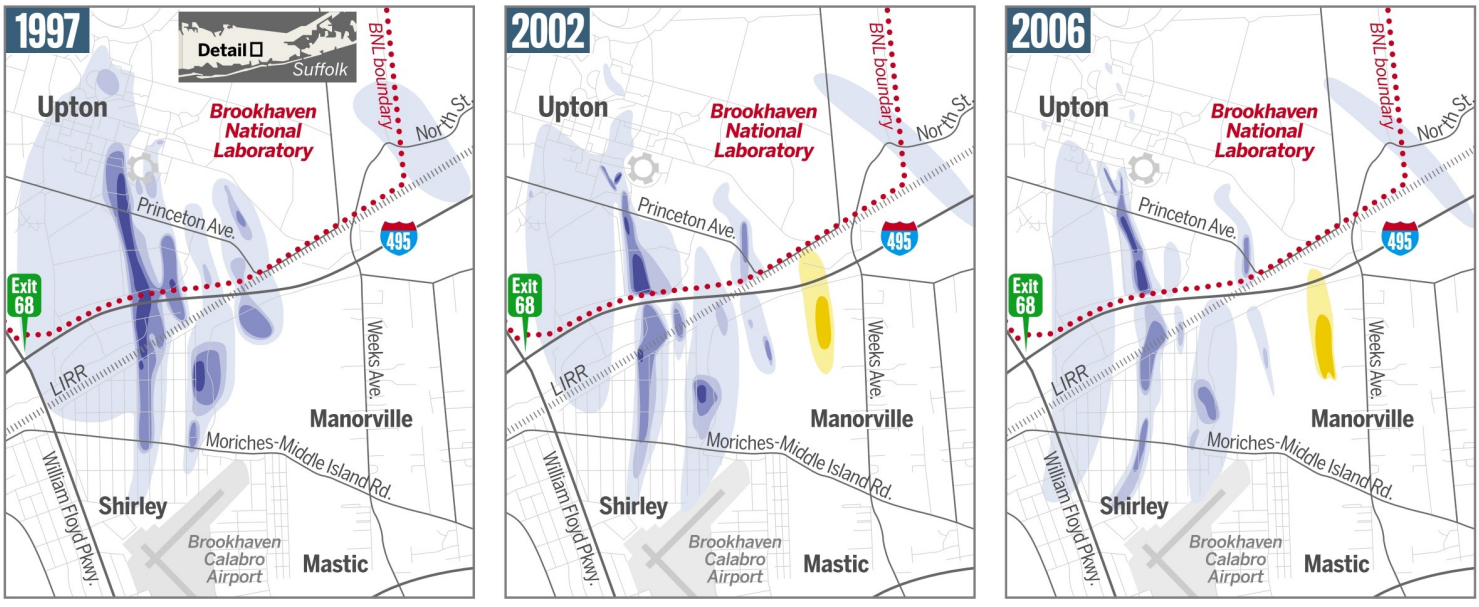
Still, that set the course for the state's current $585 million plan, which calls for containing the plume by digging 16 extraction wells hundreds of feet deep along its margins and pumping so much contami-

CLEANUP AT THE LAB

While the Grumman plume in Bethpage expanded, groundwater pollution at Brookhaven National Laboratory has been contained and shrunk. Maps show contaminants in micrograms per liter.

Total volatile organic compounds
5-49
50-99
100-499
500+

Pesticide
0.05-0.99
1+



JEFFREY BASINGER

A groundwater treatment system in Manorville is mitigating the plume near Brookhaven National Lab.

nated water from the ground that the pollution couldn't spread. Those wells would be supplemented with eight wells in the interior of the plume designed to capture the bulk of contamination.

Pumped out of the ground at a rate of 12,100 gallons per minute, contaminated water would be piped to five plants for cleansing. Most of the treated water would be returned to the aquifer through a new 10-acre basin within Bethpage State Park. Water would also be deposited in Massapequa Creek and used to irrigate the park in summer.

'Slow and expensive'

Pump-and-treat systems are "generally good for containing plumes and reducing the contaminant mass," said Lenny Siegel, executive director of the Mountain View, California-based Center for Public Environmental Oversight, which advises communities on pollution cleanups.

But, he said, "It's going to be slow and expensive. It's a big problem."

Local water providers have celebrated the state's about-face, saying their early calls for a comprehensive plan have been proven right.

"Is it technically feasible? Absolutely yes," said Granger, superintendent of the Hicksville Water District, who previously consulted for the Massapequa Water District, which is in the path of the plume.

Obstacles would include obtaining property and rights of way to place the wells and run 24 miles of piping underground.

"The problem is that this is just on such a large scale," he said.

Brand said the state's data refutes the previous Northrop Grumman and Navy assertions that experts believe a full containment is unfeasible.

"We've done the expert analysis and we know that this can be done," he said. "This community deserves nothing less."

Brown University's Pennell, who has reviewed numerous extensive groundwater contamination remediations, said objections to hydraulic containment based on its supposed ineffectiveness or disruption to the community were not compelling.

"You can definitely do it," he said.

Charles Rich, a hydrogeologist who has studied Long Island groundwater for nearly 50 years, said of the state plan, "the best we can expect or hope to accomplish would be preventing its spread further."

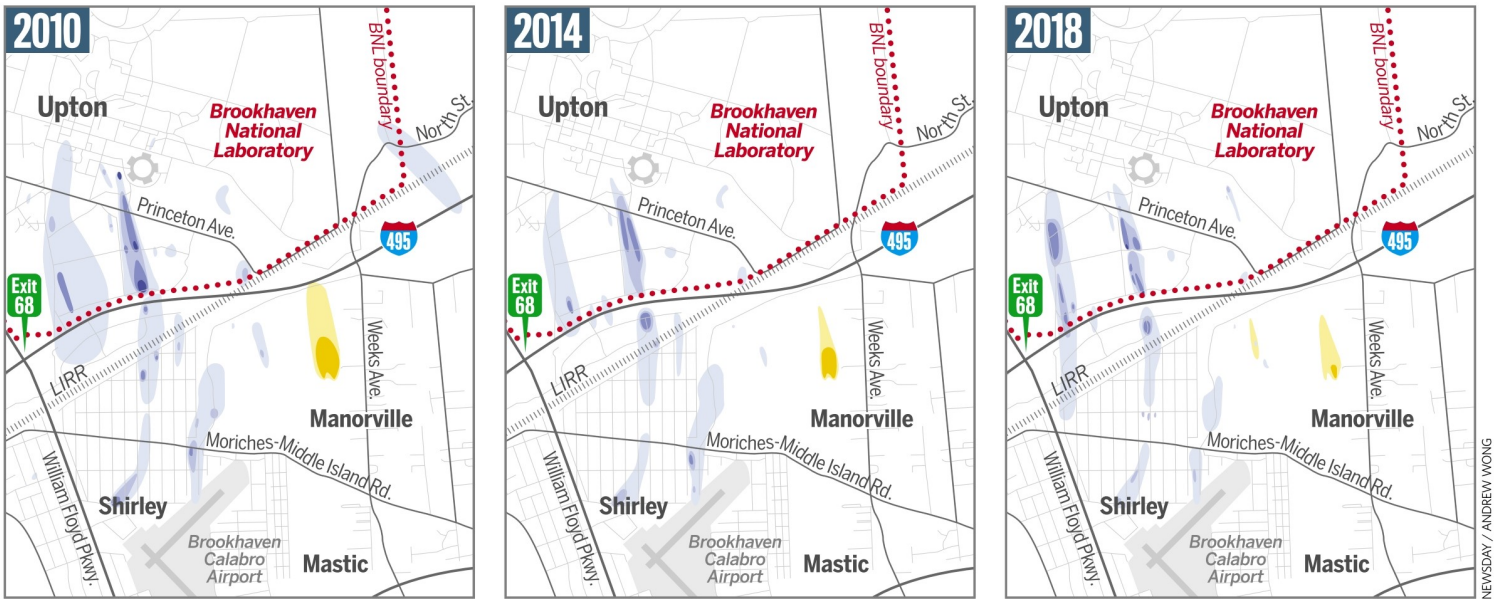
But, generally, he fell in line with assertions by Northrop Grumman and the Navy that removing the mass entirely will be impossible because the contaminants settle so deeply into the layers of sand and clay that compose the aquifer.

In that regard, the state plan "will lead to false expectations and money ill-spent," said Rich, president of CA Rich Consultants in Plainview and a former employee of the United States Geological Survey.

But leaving the pollution in the ground would violate basic principles about pollution cleanup, according to other experts.

Federal and state environmental laws were fashioned on the principle that polluters should have to pay for full cleanup, not just remove the pollution to regulatory standards before it comes out of the tap.

"Someone made a pile of money on the process that resulted in the contamination. Shouldn't they have to clean it up? That's the real question," said Dr. David Carpenter, director of the Institute for Health and the Environment at the University at Albany. "The basic principle from that legislation is that the polluter pays and is responsible for cleanup."



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