

110 Years

CAWD Connections



"Protecting your health and the environment"

CONSUMER NEWS FROM YOUR CARMEL AREA WASTEWATER DISTRICT

SPRING/SUMMER 2019

CAWD shines during storm outages

Severe storms kept CAWD staff hopping at the treatment plant and out in the field this winter. During the worst storm on Feb. 13, all our pump stations out in the community lost power, and we had to put the entire plant on backup generators to protect equipment from intermittent outages and surges. Our collections crew continually monitored backup systems at seven pump stations throughout the District, while other employees were put on standby in case of emergencies.

"We had to monitor one pump station for three days until power was restored there," said CAWD Collections Superintendent Daryl Lauer. In another instance, an upended tree pulled up a mainline. Our crews responded immediately, installing a temporary bypass and repairing the line in two and a half hours. "Our emergency response plan keeps us ready for any situation," said Daryl. "Besides onsite backup equipment at our lift stations, we also have mobile pumps and generators to serve as third, or even fourth fail-safes."

Backup pumps and generators are regularly serviced, topped off with fuel, and

ready for transport at all times. Collections employees who work in the field and operations staff at the plant regularly train together so they can help each other during emergencies.

"When you're working in the dark during a storm, there's no time to be figuring out how to attach a coupling," said Daryl. "It needs to be second nature."

Ready for anything

At the plant, redundancy in all treatment phases ensures continual operation of our interconnected plant systems in the event of power or equipment failures. As part of our preparedness plan, we also maintain emergency inventory such (Cont. on page 4)



CAWD maintains a footbridge over the Carmel River to ensure employee access to the plant even if roads are flooded.

MICROORGANISM OF THE MONTH

MEET "VERA" VORTICELLA

As a ravenous consumer of bacteria, "Vera" *Vorticella* is a welcome guest at the CAWD treatment plant, where she and billions of other microorganisms work hard to clean our wastewater 24 hours a day. The presence of ciliates like Vera is a sign that our biological cleaning system is working well to produce a high-quality effluent. In fact, scientists use *Vorticella* as a bioindicator to evaluate polluted waterways. A sudden reduction in numbers is a sign of toxins or organic pollutants.

Vera is one of 8000-plus known species of ciliates which use fine, hair-like structures for locomotion and food gathering. Humans also depend on cilia to sweep mucous from our lungs, transmit sound waves in our inner ears, and (Cont. on page 2)

This *Vorticella* is providing a home for *Chlorella*, a symbiotic algae.

© Wim van Egmond



Call CAWD immediately if you see a spill!

If you see water flowing out of a manhole cover, in the street, through cracks in the road or sidewalk, or coming out of the sewer relief valve in your yard it is a serious emergency! Please call CAWD immediately—anytime of the day or night—so we can find the source and resolve the problem. CAWD crews continually clean and maintain our sewer system, but with 84 miles of pipe to monitor we count on the public to be our eyes and ears in the community, helping to protect property, human health, and the environment. If you see anything out of the ordinary please call us at 624-1248. After-hours please call the Carmel Police Department at 624-6403.



— Sewer rate notice inside! —

Presorted Standard U.S. Postage PAID Watsonville, CA Permit No. 30

Carmel Area Wastewater District 3945 Rio Road Carmel, CA 93928 831/624-1248





Meet your new Principal Engineer

We welcome **Rachél Lather** as CAWD's new Principal Engineer. Rachél comes to us from the County of Santa Cruz where she worked for 22 years, first as the head of Environmental Planning, and then as Sanitation Engineer. Rachél was in charge of a 10-member department responsible for 200 miles of pipeline and 60 pump stations. Throughout her career she has earned a reputation for completing projects on time and within budget.

As a past president of the Monterey Bay Chapter of the California Water Environment Association (CWEA), Rachél has had a working relationship with other CAWD employees for many years. Before coming on board, Rachél also served as consultant for CAWD, working on grant funding for our Hatton Canyon Project (see page 3) and Carmel River Lagoon outfall replacement. Her extensive experience with design upgrades, the permitting process, and grant applications have proved an invaluable asset for us.

"I have a lot of respect for the CAWD staff, their work ethic, and their extensive knowledge of collections and treatment systems," said Rachél. "Working at CAWD is a great fit for me and opens up new opportunities for us both. I'm really happy to be in a place where I can use my entire skill set to make a difference!"

We hate to brag, but . . .

CAWD sweeps CWEA awards!

We're happy to report that your Carmel Area Wastewater District was recognized for excellence in nearly all areas of operation during the 2019 California Water Environment Association (CWEA) awards ceremony. Awards were for the Monterey Bay Section

which includes Santa Cruz, Morgan Hill, Monterey Bay, King City, and Hollister. Winners are nominated and chosen by their own peers in the CWEA, which is the premier wastewater industry association in California, responsible for training and certification since 1927.

Special congratulations goes to CAWD Collection Worker Barry Blevins who was twice-honored, at the local level and as California Collections Worker of the Year, beating out some of the largest wastewater districts in the state. Barry has earned the highest level certifications possible for his position, as well as going above and beyond with three additional maintenance and electrical accreditations. This is not the first time Barry has been honored at the state level. He previously received the Gimmicks and Gadgets award for his invention of a compact, quick deploying hose puller that saves staff time and is safer to operate in remote locations. Currently he is working to patent a second labor-saving device that reduces friction during line pulling.

"I love science and learning new things," said Barry. "Doing the best job means going that extra mile and reaching out for as much knowledge as possible. That helps us all make good decisions in the field and watch out for each other's safety." Also honored were Barry's boss, Supervisor of the Year Daryl Lauer; Maintenance Worker of the Year Mike Skinkle; Lab Person of the Year Trevor Holland; and Pre-treatment, Pollution Prevention, and Stormwater Person of the Year Ray De Ocampo. In addition, Mike, Trevor, and Ray were all runners-up for statewide awards in their categories. We congratulate these employees for their ongoing work to protect human health and our environment!



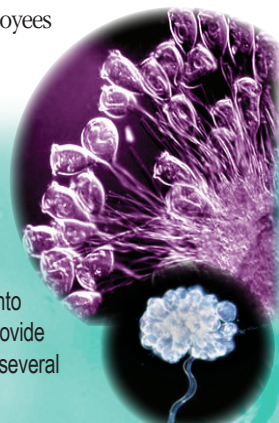
STACKIN' UP THE AWARDS Shown are: (center) Barry Blevins, Collections Worker of the Year for the State of California, and (from left) Collections Superintendent Daryl Lauer, Lab Supervisor Ray DeOcampo, Maintenance Mechanic Mike Skinkle, and Lab Analyst Trevor Holland who all received Person of the Year awards for their area of expertise.

Microorganism (from front page)

perform many other vital functions. Vera looks somewhat like an inverted bell attached to a springy stalk, which is anchored to a substrate. Sometimes she affixes her stalk to the shell of a snail or crustacean, allowing her to move around and access new food sources. *Vorticella* uses three rows of beating cilia to create a vortex in the water that directs food into the mouth. If habitat degrades, the microbe will form temporary cilia around the body to provide locomotion. Individuals are known to migrate en masse like a flock of birds, settling down several inches away to grow new stalks.

A superpowered microbe

The stalk, or "spasmoneme" of *Vorticella* is famous for being one of the fastest, most powerful cellular machines in existence, able to collapse into a tightly coiled helix at amazing speed to capture prey or get out of harm's way. Vera can retract in as little as five milliseconds—compare that to the 100 to 150 milliseconds it takes for you to blink your eye! Viewed in real time, the bell of *Vorticella* seems to disappear, then reappear where the stalk is attached to the substrate. Her speed can be compared to a midsize car moving at 15,000 mph! After contracting, Vera's cilia pull the stalk upwards again to continue feeding. Scientists have only recently discovered that *Vorticella* uses a "mechanochemical" action to achieve her mind-boggling speed. Calcium is the fuel, and her calcium-binding proteins create the flawlessly coordinated spiral movement. *Vorticella* is often found thriving on dead mosquito larva, so scientists are also studying the microbe to find new ways to control malaria, yellow fever, and other mosquito-borne diseases. Researchers are also investigating the sticky substance Vera uses to anchor her stalk, in the hope of developing a new adhesive that sets under water.



Vorticella's cousin, *Carchesium*, is a colonial ciliate. Instead of contracting its stalk for protection, all the individuals pull in to form a tight ball.

© Micrographia.com

This group of *Vorticella*, attached to a dwarf flat ramshorn snail, is visible to the naked eye. Photo by Aliwok



Carmel Area Wastewater District

3945 Rio Road Carmel, CA 93923
(831) 624-1248 ■ CAWD.org

Free 24-hour sewer back-up service:
Call 624-1248, or 624-6403 after-hours.
If water is backing up in your tub or toilet it is an emergency. Call us immediately day or night.

CAWD is a special district dedicated to protecting public health and the environment with the cost-effective collection and treatment of wastewater and the return of clean water to the environment.



We welcome the public to attend CAWD board meetings, held the last Thursday of each month at 9 am at the CAWD office.

Board of Directors

Greg D'Ambrosio Charlotte Townsend
Michael Rachel Ken White
Robert Siegfried

General Manager, Barbara Buikema

How do we stack up to other utilities?

Approximate monthly utility cost comparison for a typical California family of four



gas/electricity
\$235



cell phone
\$180



Cable bundle
\$160



water
\$140



CAWD proposed sewer fee
\$68.82

Capital project update

Grant will safeguard Hatton Canyon

Your Carmel Area Wastewater District is pursuing a Hazard Mitigation Grant from the California Office of Emergency Services, to upgrade infrastructure in Hatton Canyon and protect the environment there. The grant will fund the replacement of 5,500 feet of clay sewer mainline to protect the area from overflows caused by high rainfall and flooding.

Hatton Canyon is a local hiking route that includes pine forest, grassland, and wetland meadow. It runs parallel to Highway One behind Carmel High School for approximately two miles, ending at Carmel Valley Road. For decades, this hidden canyon was eyed as the future site of a Highway One freeway bypass, but public outcry led to the property being signed over to California State Parks in 2002. Since Caltrans stopped maintaining the Hatton Creek channel it has overtopped its banks during winter storms, and high velocity flows have excavated CAWD's mainlines.

The mainline will be replaced with a larger, seamless HDPE (high-density polyethylene) plastic pipeline. The sealed system will be anchored into upgraded manholes for the entire length of the canyon so it cannot pull apart during flood events. We will also be raising the level of manholes as an extra safeguard. We have nearly completed the vegetation plan for the project, which is the final grant requirement, and anticipate construction beginning next year.

"Our wastewater system includes not only the treatment plant, but the entire 84 miles of mainline which delivers wastewater from every house and business in our community," said CAWD General Manager Barbara Buikema. "The Hatton Canyon Project is just one example of how CAWD is constantly striving to maintain the safest, most effective wastewater system possible."



Hatton Creek has overspilled its banks during El Niño events, and high velocity flows have excavated CAWD mainlines. The Hatton Canyon Project will upgrade infrastructure to prevent spills and protect the environment.

CARMEL AREA WASTEWATER DISTRICT PROPOSED BUDGET

July 1, 2019-June 30, 2020

Sources of Cash \$13,783,265

Sewer User Fees	PBCSD* Fees	Property Taxes	Capital Reserve Fund	Reclamation Project	Interest Income/Other
\$8,206,479	\$1,943,290	\$1,812,897	\$769,137	\$557,837	\$493,625

59.5%

14.1%

13.1%

5.6%

4.1%

3.6%



Our current 15-year capital plan shows that we need to spend \$15 million on the CAWD treatment plant and \$33 million on collection infrastructure (\$48 million total) to keep our wastewater system safe and reliable. One third of the plant cost is paid for by Pebble Beach Community Services District, per our agreement to provide them with wastewater treatment.

* Pebble Beach Community Services District

Uses of Cash \$13,783,265

Operations & Maintenance	Capital Projects	Reclamation Project	Debt Service
\$7,773,903	\$5,321,800	\$471,937	\$215,625

56.4%

38.6%

3.4%

1.6%



Ratepayers will see annual, incremental fee increases to fund rehabilitation of the plant and collections system. As a self-supporting, nonprofit agency, CAWD depends on user fees to fund replacement of infrastructure, as well as maintenance costs. Our goal is always to match revenues to expenses, leaving no profit.



Minimize microplastics in your laundry: 8 tips

Yoga pants, fleece jackets, fuzzy robes—unfortunately, our comfy synthetic clothes are a top source of microplastics, shedding hundreds of thousands of fibers in each wash load. Here are tips to reduce the menace of microplastics in our oceans, lakes, and rivers:

■ Avoid synthetics such as polyester, acrylic, nylon, spandex, rayon, etc. Opt for natural fabrics such as cotton, linen, hemp, and bamboo. Buy less clothing but choose higher quality; and wear out your clothes before buying more.

■ Buy resale from a benefit shop. Clothes shed most during the first washes.

■ Extend the life of your clothes by washing them less. Air them out and spot-clean instead. Wear cotton undershirts under synthetic tops, or use sweat shields.

■ Wash synthetics in a filter bag such as the “Guppyfriend” (available online), which captures some fibers and protects clothes.

■ Wash with cold water and reduce agitation time. Use the gentle cycle and a low pH detergent meant for delicate fabrics. Front loading machines cause significantly less shedding than top loaders that agitate clothes.

■ Solid items such as washing balls and shoes cause more breakdown, as do “harder” fabrics like jeans and coats. Wash plastic-based textiles separately and air dry.

■ Divert your washing machine greywater for yard irrigation instead of sending it into the sewer system.

■ Perhaps most importantly, support legislation to reduce the flood of plastics and compel manufacturers to take responsibility for the pollution they produce. Share information with friends and family, and urge your favorite clothing brands to find solutions.

Microplastics: a macro problem

The grocery bags, water bottles, and fishing gear that end up in the ocean are just the tip of the iceberg when it comes to plastic pollution. Instead of decomposing, plastic degrades into even more dangerous plastic particles which accumulate in food webs.

Dubbed “the biggest environmental problem you’ve never heard of,” microplastics are now found in every corner of the planet: in beach sand, mangrove forests, arctic ice, bottled water, table salt, seafood—and inside our own bodies. In the ocean, animals of all kinds accumulate plastic in their guts which causes blockages and starvation. A recent necropsy study of 100 sea turtles washed up from three different oceans revealed microplastics in every single turtle, and the same is true of similar marine mammal studies. To make matters worse, plastic also attracts bacteria and toxins, causing disease. Disturbingly, one of the biggest sources of microplastic comes from washing machines—our synthetic clothes shed huge amounts of plastic fibers (see sidebar).



Humpback whales use their baleen to capture anchovies (shown jumping here) and krill in Monterey Bay. Both prey species are filter-feeders which can concentrate microplastics, passing it up the food web to whales and market fish consumed by humans.

Photo © Kate Spencer, Fast Raft Ocean Safaris, fastraft.com



A Monterey Bay Aquarium Research Institute (MBARI) study showed that larvaceans, a free-swimming, filter-feeding invertebrate, can transfer microplastics to the deep ocean. Bathochordaeus, the small, blue, tadpole-like animal at center, builds a mucous house up to three feet wide to collect plankton (and microplastic). The abandoned houses drift to the ocean floor, where they are an important food source for deep sea animals. A recent study found that 100 percent of crustaceans collected from six deep-sea trenches around the globe contained microplastics.

Photo © 2000 MBARI

Curbing plastic in the environment

As awareness builds, research is just beginning on how wastewater treatment plants and washing machine manufacturers could capture microplastic before it reaches the environment. While conventional sewage treatment plants remove 60 percent or more of microplastics, vast amounts still make it into oceans, lakes and rivers. The plastic that is captured ends up in sewage sludge which is often used as fertilizer. Once on agricultural fields, microplastics contaminate soil and can enter waterways as runoff.

Unlike the vast majority of wastewater treatment plants, CAWD filters out microplastics with our sophisticated Microfiltration/Reverse Osmosis (MF/RO) treatment process. The MF/RO removes microparticles, salts, and other impurities, reclaiming our wastewater so it can irrigate the Pebble Beach golf courses. Filtered microplastics and other debris are disposed of at the landfill, along with our sewage sludge. The MF/RO is always in operation except for an approximate one-month period during the rainy season when the Forest Lake Reservoir is full.

As scientists sound the alarm about the deadly impact of plastic, efforts are building to compel manufacturers to take responsibility for the entire life cycle of their products, instead of leaving the burden to taxpayers. Less than 10 percent of waste stream plastics are recycled, and markets for these commodities are drying up. Help curb the plastic tidal wave: choose non-plastic products and packaging whenever possible, and let manufacturers, vendors, and legislators know you want alternatives. Shun single-use plastic. Bring your own water bottle, coffee mug, take-out containers, and grocery bags. Use plastic containers and bags until they wear out, then recycle and replace with a green alternative.

Storms (Cont. from page one)

as lighting backup systems, hip waders, food rations, sleeping bags, camping equipment, etc. to support onsite staff during extended outages or flood events.

The District’s Emergency Response and Action Plan uses past El Niño events as a model to anticipate flood risk. If our entrance road near the Carmel River is in danger of flooding, we stage vehicles offsite to keep them accessible. The District also maintains a footbridge so employees can reach the plant when they can’t drive in.

“Being prepared is all in the details,” said Daryl. “We train all year long so we’re ready to handle the critical hours of an emergency in the safest, most efficient manner possible.”

