



Got **Batteries?**

IMPROPER DISPOSAL CAN:

- Be Expensive** **page 2**
- Cause Dangerous Fires . . .** **page 3**
- Pose a Toxic Hazard** **page 4**

**Batteries
are a serious
hazard. Learn
how disposing
of them properly
keeps our
community
safe!**

Batteries: Handle Responsibly or Pay the Price

Improper disposal risks the lives of workers and can cause millions in damages to our facilities

BY ANNE STOKES



Joe La Mariana, Executive Director of RethinkWaste, has seen an increase in the number of dangerous lithium-ion batteries that make it into material processing facilities in San Mateo County.
PHOTO BY GEORGE E. BAKER, JR.

In today's society, connectivity is king — whether answering emails on a smartphone or laptop, using cordless power tools for a home-improvement project or even exploring the surface of a distant planet with the Mars Curiosity rover. What makes this possible? In many instances, it's lithium-ion batteries.

For the most part, batteries provide a safe and compact source of energy that make our lives easier, but this convenience has a down side. Many are unaware of the hazards these batteries pose to sanitation workers, material handling facilities and the environment if they're thrown inside the trash or left in recycling bins. Most people are also unaware that proper disposal of batteries is easy and free.

According to Joe La Mariana, Executive Director of RethinkWaste* — a regional public agency that manages waste and recycling services for 435,000 residents in San Mateo County from Burlingame to East Palo Alto — keeping batteries away from trash and recycling processing facilities is critical because the alternative is both dangerous and expensive.

On September 7, 2016, the RethinkWaste-owned Shoreway Environmental Center experienced a catastrophic fire likely caused by a lithium-ion battery that became damaged on the materials sorting line. It caused nearly \$8.5 million in damage, shut down operations for three and a half months and risked the lives of the facility's materials sorting workers, who had to be laid off while repairs were made.

La Mariana noted that fire risks are especially daunting in a recycling plant where 60 to 70 percent of materials are paper — perfect fuel for a fire.

"Any time you get those batteries involved in a heavily mechanized process like ours, it's an opportunity for fire," he

said. "If they get jostled the wrong way, it will break the package seal and the next thing you know it's like a Roman Candle."

Even with the facility up and running, there are still challenges. After the fire, the facility was dropped by its insurance company and had trouble finding one willing to provide coverage. Now, the facility is covered by seven insurance providers to stay insured, with triple the premium costs. What's more, if the facility has another fire, it could become uninsurable in the future — a dangerous precedent for the recycling industry.

But residents can help reduce those risks and contain program costs by keeping their batteries and electronic waste out of the trash or recycling bin and disposing of them properly. The Shoreway Environmental Center handles half a million tons of materials annually, and the number of batteries that find their way into the facility is on the rise. During a 2017 count, more than five batteries an hour were found on the sorting lines, on average. During the latest 2018 count, that amount almost tripled.

"The worst-case scenario is you could have a \$35 million to \$40 million recycling plant like ours and not be able to use it for its intended purpose," he said. "At the end of the day, what happens to our facility will cost money, and that directly affects our ratepayers."

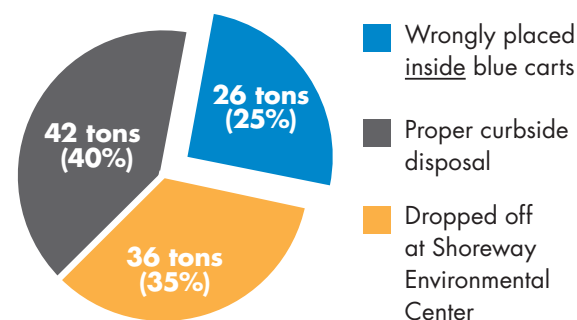
**RethinkWaste is a \$130 million regional solid waste and recycling agency that is made up of 12 member agencies in San Mateo County. The RethinkWaste service area includes Atherton, Belmont, Burlingame, East Palo Alto, Foster City, Hillsborough, Menlo Park, Redwood City, San Carlos, San Mateo, parts of unincorporated San Mateo County and the West Bay Sanitary District.*

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Joe La Mariana
Executive Director,
RethinkWaste

BATTERIES BY THE NUMBERS

104 tons of batteries were collected in 2017. Of that number, **25 percent** were improperly disposed of in RethinkWaste's blue carts. Here's the breakdown:



620,246 batteries were recovered from inside blue recycling carts in 2017 after being improperly disposed of

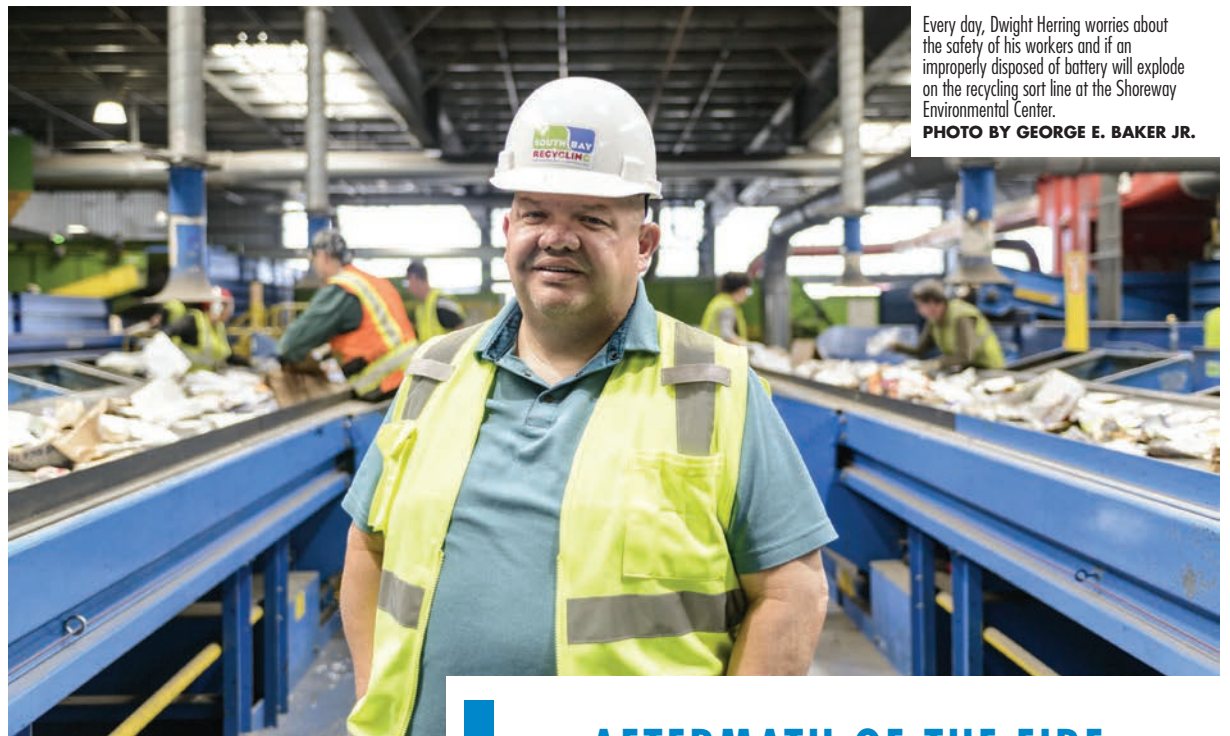


13 batteries are found **loose each hour** at RethinkWaste's Shoreway Environmental Center

A Little Battery, a Lot of Harm

Batteries pose an extreme risk to employees and facilities

BY ANNE STOKES



Every day, Dwight Herring worries about the safety of his workers and if an improperly disposed of battery will explode on the recycling sort line at the Shoreway Environmental Center.
PHOTO BY GEORGE E. BAKER JR.

Around 8:30 p.m. on September 7, 2016, employees at the Shoreway Environmental Center's materials recovery facility (MRF) had just started processing materials after a meal break when they noticed something was terribly wrong.

A small fire had started in one of the automated screens that mechanically separates mixed paper from other recyclables. The fire quickly spread deeper into the facility as materials continued to be conveyed.

"Staff sprang into action and began extinguishing the fires they could access," said Dwight Herring, General Manager of South Bay Recycling. "It was emanating thick, acrid black smoke and the supervisor at the time made the call to evacuate."

While there were thankfully no injuries, the building interior and processing equipment suffered extensive fire, smoke and water damage — damage significant enough to suspend the facility's ability to process recyclable materials. After examining the site, fire investigators strongly suspected the ignition source was likely a lithium-ion battery.

It was three months before the MRF could start processing materials again, and an entire year before the building and damaged equipment were fully restored. During this time, some employees were temporarily laid-off while repairs were made. After the repairs were finished, the facility's insurance coverage cost increased significantly.

"Just because the facility shut down doesn't mean the material flow stopped. We had to make arrangements to have third party haulers come in and remove that material," Herring said.

Since the fire, the facility has increased staff fire safety training and installed additional fire suppression equipment throughout the MRF, including improved sprinkler systems and an automatic plant-wide system shutdown in the event of fire. But those safety measures can only do so much. What the facility really needs is for RethinkWaste service area* residents to make sure batteries don't get put into their recyclables and trash.

"When you're discarding a battery, and you're discarding it inappropriately — whether it's the black cart or the blue cart — you're basically putting a bomb in that container. It takes very little damage to a lithium-ion battery for it to explode," he said. "You're literally putting an incendiary device into a pile of paper."

**The RethinkWaste service area includes Atherton, Belmont, Burlingame, East Palo Alto, Foster City, Hillsborough, Menlo Park, Redwood City, San Carlos, San Mateo, parts of unincorporated San Mateo County and the West Bay Sanitary District.*

"It takes very little damage to a lithium-ion battery for it to explode. You're literally putting an incendiary device into a pile of paper."

Dwight Herring
General Manager, South Bay Recycling



Watch video footage of the fire at www.youtube.com/user/theRethinkWaste

AFTERMATH OF THE FIRE

The 2016 fire at RethinkWaste-owned Shoreway Environmental Center is a testament to the risk even a single battery can pose, both to multi-million dollar facilities and sorting worker safety.

"We now have frequent fire incidents caused by lithium-ion batteries that get damaged in the recycling process," said Hilary Gans, Senior Facilities and Contracts Manager with RethinkWaste. "As soon as they're crushed, run over or damaged in any way, they are a fire hazard."

The cost to restore the facility from the September 7, 2016, fire and improve its ability to respond to future fire risks included:



Three-month layoffs of 35 to 40 materials recycling facility (MRF) employees while repairs were made



\$8.5 million cost for facility restoration and fire suppressant upgrades



\$625,000 increase in the facility's yearly insurance premiums, with less coverage and the risk of not being insurable if there is another major fire

Handle With Care

BY RODNEY OROSCO

Know Your Household Batteries

Learn to recognize these common batteries found in many of your everyday household items.

Single Use



Alkaline

These are your basic AA, AAA, C, D and 9-volt batteries.

Found in:

- Toys
- TV remotes
- Flashlights
- Cameras



Button cells

Most button cell and coin cell batteries have a long shelf-life. Because they're so consistent and reliable, these types of batteries are great for use in products that require long, continuous service.

Found in:

- Watches
- Hearing aids
- Greeting cards
- Car fobs

Rechargeable



Ni-MH (Nickel Metal Hydride)

A battery that performs well in high-drain devices and can be recharged up to 1,000 times.

Found in:

- Cordless power drills
- Digital cameras
- Two-way radios
- Cordless phones



Ni-Cd (Nickel Cadmium)

This is the least expensive of the rechargeable batteries. It can be recharged up to 1,000 times.

Found in:

- Cordless power drills
- Digital cameras
- Two-way radios
- Cordless phones



SSLA/Pb (Small Sealed Lead Acid)

These batteries hold a charge for a very long time and are rechargeable.

Found in:

- Security systems
- Emergency exit signs
- Mobility scooters and golf carts
- Vehicles

POWERFUL DANGER

A battery tossed in the landfill is a toxic hazard waiting to happen.

All batteries are considered hazardous waste in California, no matter if they are single use or rechargeable. Batteries must be taken to an authorized recycling location or to a household hazardous waste facility.



Three billion batteries are thrown away every year.



0.55%: The percentage of disposable and rechargeable batteries that were properly recycled in California in 2001, of the over 500 million sold.



More than **350 million** rechargeable batteries are purchased annually in the U.S.



The **chemicals in batteries** can cause everything from serious skin irritation to cancer.

Lithium Batteries — The Biggest Danger

Lithium batteries are everywhere, in almost every electronic device we depend on or carry with us. But their compact and energy-filled designs can also make them very dangerous. Lithium batteries can be easily damaged and easily result in explosion and fire. Make sure these types of batteries are always disposed of properly!

Lithium primary battery



These batteries use metal lithium in their construction. They are non-rechargeable but long-lasting. These batteries react violently with water and must remain manufactured sealed. May be marked as "lithium" or "lithium cell" batteries.

Found in:

- Pacemakers
- Alarms
- Watches
- Remote car locks

Lithium-ion battery



These batteries are used in technologies that require recharging. They contain lithium-ions and highly flammable electrolytes, meaning they can overheat and explode if they short circuit. May be marked as "lithium-ion" or "lithium polymer (Li-Po)" batteries.

Found in:

- Cell phones
- Laptops
- Power tools
- Digital cameras

Lithium batteries that are not easily removable, such as those in cell phones or laptops, should be kept inside their device and taken to your local cell phone or electronics collection center.

EXTREME HAZARD



A "dead" battery still has some charge

Used lithium batteries can often contain 80 percent of their original charge.



They are everywhere

Compared to 2010, lithium batteries today are: 60 percent more powerful; 55 percent lighter; and 40 percent cheaper.



Fire hazard

Lithium-ion batteries are the most prevalent cause of fire in Materials Processing Facilities (MRF), according to the National MRF Survey.



In the garbage

Americans annually dump two billion lithium-ion batteries into the waste stream.

THE FUTURE OF POWER

It has been more than 25 years since lithium-ion batteries first hit consumer markets. Since then, they've made their way into our pockets, houses and even our cars. Batteries are hard to do without.

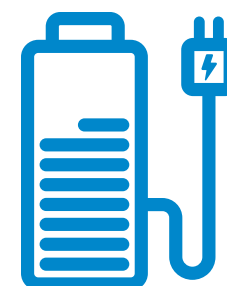
As society becomes more tech-driven, batteries are getting smaller to fit inside each sleek new device. However, as they get smaller and pack more of an energized punch, their designs become less stable and at increased risk for imperfections.

Lithium-ion batteries are known for their long life and rechargeable nature. Alkaline batteries have short lifespans, a **lithium-ion battery** can **maintain 80 percent** of its energy capacity after thousands of recharging cycles. The lithium-ion batteries of tomorrow — **lithium air batteries** — can hold up to **40 times more power** than current lithium-ion batteries.

As battery designs continue to change, they may be safe to use at home but could be even more catastrophic if put into the waste stream.

Call2Recycle, a nonprofit battery recycling program, estimates that over the next 25 years, batteries will become more pervasive, powerful and smarter, making it even more important to keep them out of the recycling stream. Contact Call2Recycle, RethinkWaste or your local electronic waste collection center for more tips on how to get rid of your lithium-ion batteries properly.

Properly dispose of your lithium-ion batteries, and protect our future!



Multi-family dwellings put batteries into a 3 gallon orange bucket for disposal.



Single-family dwellings put batteries into RethinkWaste's new orange battery bags for curbside collection.
PHOTOS COURTESY OF RETHINKWASTE

PUT BATTERIES IN THEIR PLACE — SAFELY

Proper battery disposal is not only good for the environment, in California it is the law! Batteries are considered hazardous waste, which makes it illegal for them to be tossed into the trash or recycling cart. Whether you live in a single-family home or apartment/condo, follow these simple steps to keep batteries out of the landfill and the recycling:

1. Bag or bucket

Single-family home residents:

Place all your household batteries into the orange zip-top battery bag provided by RethinkWaste. When the bag is at least half full, place it **ON TOP of your BLACK GARBAGE CART** on collection day. If you don't have an orange bag, use any clear zip-top plastic bag to collect the batteries and place on top of your black cart.

Multi-family dwelling residents:

Place all your household batteries into the orange bucket (as shown above) in your building. If you don't have one, contact your manager to get one.

2. Tape it up

For lithium-ion batteries, such as those found in electronics, tape the contacts to prevent inadvertent contact and possible fire.

What else you should know

- Bagged batteries are taken to the transfer station at the Shoreway Environmental Center, where they are picked up for proper disposal by battery recycling companies.
- Lead acid and car batteries are not accepted, so don't put them into your bags! Take them to Shoreway Environmental Center or San Mateo County's Household Hazardous Waste Program.



A Safer Place for Batteries

RethinkWaste residents can put used batteries in a bag, keeping them out of the recycling and landfill

BY RODNEY OROSCO

Batteries once sent to exile in a kitchen “junk” drawer can be properly disposed of with one easy step.

Starting in late August 2018, all single-family homes in the RethinkWaste service area* will be mailed two orange bags in which to place their used household batteries.

“The bags will serve as a reminder to residents to properly dispose of their used household batteries,” said Julia Au, RethinkWaste Recycling Outreach Programs Manager.

The program is simple — place used household batteries into the bags and starting September 3, 2018, put the sealed bag on top of the black cart on collection day.

“Battery bags are collected and taken to the transfer station, where they are placed in drums and then picked up by our battery recycler,” Au said.

Multi-family dwellings with five or more units can request a free orange battery bucket from Recology San Mateo County. These buckets should be placed in easily accessible areas — like the lobby or mail room — for residents to place their bagged batteries into. Residents of multi-family dwellings should encourage their landlord or property manager to request a bucket.

This relaunched program helps residents obey California law — throwing batteries into

the trash or recycling carts is actually illegal — and makes batteries less of a danger in the recycling stream.

In 2016, a battery started a fire that caused around \$8.5 million in damages to the Shoreway Environmental Center in San Mateo County.

Using the battery bag will help prevent future fires, but residents should tape over the terminals of lithium-ion batteries to prevent any sparks during transportation and processing.

All household batteries are accepted, including single use, rechargeable and lithium-ion batteries. However, lead acid or

car batteries are not eligible for the program. Residents need to take

these kinds of batteries to the Shoreway Environmental Center for recycling or through the county's Household Hazardous Waste Program.

Can't find the orange bag? No problem.

“Residents can place their batteries in any clear zip-top bag and place it on top of their black cart, it will still be picked up,” Au said.

“The bags will serve as a reminder to residents to properly dispose of their used household batteries.”

Julia Au
Recycling Outreach Programs
Manager, RethinkWaste

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Following a few simple steps can keep recycling workers like Hilary Gans safe at work, and prevent other flammable recyclables from catching fire after a battery explosion.
PHOTO BY GEORGE E. BAKER JR.

“Tape the terminals and store batteries in a plastic bag before proper disposal.”

Hilary Gans
Senior Facilities and Contracts
Manager, RethinkWaste

Treat Your Batteries Right

Q&A with a battery recycling expert in San Mateo County

BY RODNEY OROSCO

Hilary Gans has been taking care of the environment his entire career. For the past 10 years, he has brought this commitment to RethinkWaste. In his job as Senior Facilities and Contracts Manager, he spends his time ensuring recycling is maximized at the Shoreway Environmental Center. Today, he is concerned about batteries because they pose a serious threat to his colleagues and are causing fires that threaten to burn down RethinkWaste’s recycling facility. We asked Hilary to explain why batteries are now a problem in handling and disposal.

Q: Are lithium batteries more dangerous than any other battery?

Yes, lithium batteries contain more power than other batteries and are delicately packaged. When damaged, the battery can short out, heat up and catch fire. This is a particular problem at the recycling facility that is full of paper. A fire in 2016 caused roughly \$8.5 million in damage to the recycling facility.

Q: Why is bagging batteries helpful?

Bagging *and* taping batteries helps because covering the terminals prevents the battery from shorting out and catching fire. Residents should tape the terminals and store batteries in a plastic bag before proper disposal.

Q: Are rechargeable batteries better than single-use batteries?

Rechargeable batteries are reusable — they save money and result in less waste. But, they need to be handled with extra care.

CANADA’S SOLUTION

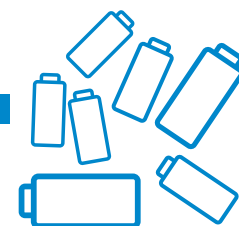
In San Mateo County and across the United States, taxpayers and local governments have to pay the bill for proper battery disposal.

Canada, and most of Europe, takes a different approach — battery manufacturers must pay for the recycling process. This is what is known as Extended Producer Responsibility (EPR).

Canada’s EPR program has been in place since 2010 and requires battery producers to have a proper end-of-life stewardship plan for any batteries they

sell. But rather than have each producer come up with its own plan, nonprofit Call2Recycle Canada acts as a steward for proper battery recycling management. The U.S. has a long way to go before it catches up to Canada where battery recycling is accessible and easy.

More than 90 percent of Canadians have a battery drop-off site within 10 miles from home, allowing Canadians to recycle over 24 million pounds of batteries since their EPR program began.



RethinkWaste staff is working closely with its legislative advocates and partners to bring battery EPR laws to California and the United States.

Protect San Mateo County

Dispose of your batteries correctly the first time

Throwing your batteries into your blue or black carts can cause serious damage to recycling facilities and their employees. Luckily, disposing of them correctly is simple and easy in the RethinkWaste service area*!



Recycle batteries correctly:

- Single-family dwelling residents can place batteries in the RethinkWaste-provided orange bag.
- Put the battery bag **on top** of your black garbage cart for collection.
- Don't have an orange bag? Place batteries in any clear zip-top plastic bag instead.
- Make sure to tape over the contacts of lithium-ion batteries.
- Don't include lead acid or car batteries in the battery bag. Make an appointment to drop off these items with the county's Household Hazardous Waste program by visiting www.smchealth.org/hhw.
- Multi-family dwellings can request an orange battery bucket from Recology San Mateo County to collect bagged batteries in.

Need more information?

Visit www.rethinkwaste.org/batteries

WHERE TO RECYCLE BATTERIES

Don't throw your used batteries and electronics in your blue cart or trash! In addition to curbside recycling, there are plenty of alternative locations throughout the county that will accept your unwanted batteries.

ATHERTON

1. **Atherton Town Hall**
91 Ashfield Road
650-752-0500

BELMONT

2. **Hassett Ace Hardware**
1029 Alameda de Las Pulgas
650-593-4072

BURLINGAME

3. **Burlingame Recreation Center**
850 Burlingame Ave.
650-558-7300
4. **Burlingame City Hall**
501 Primrose Road
650-558-7200
5. **Burlingame Ace Hardware**
235 Park Road
650-340-1818

EAST PALO ALTO

6. **The Home Depot**
1781 E Bayshore Road
650-462-6800

FOSTER CITY

7. **Foster City, City Hall**
610 Foster City Blvd.
650-286-3200

MENLO PARK

8. **Menlo Park Ace Hardware**
700 Santa Cruz Ave.
650-325-2515

9. **Menlo Vacuum**
1179 El Camino Real
650-322-9333

REDWOOD CITY

10. **Hassett Hardware**
282 Woodside Plaza
650-474-2223
11. **Interstate All Battery Center**
570 El Camino Real #160
650-839-6000
12. **Redwood City, City Hall**
1017 Middlefield Road
650-780-7000

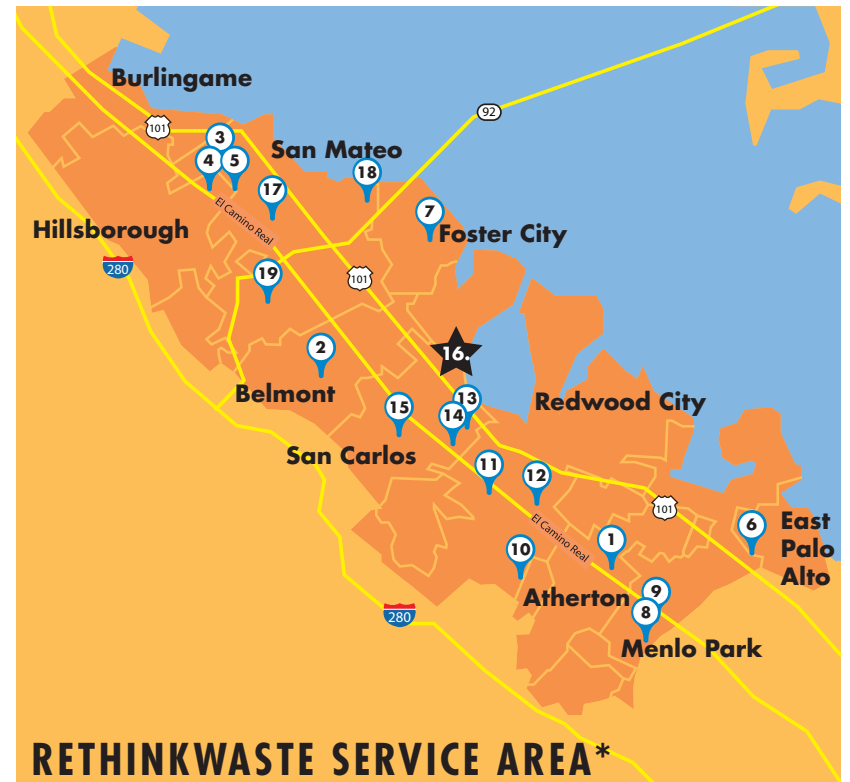
SAN CARLOS

13. **Best Buy**
1127 Industrial Road
650-622-0050
14. **The Home Depot**
1125 Old Country Road
650-592-9200
15. **San Carlos City Hall**
600 Elm St.
650-802-4100

16. **RethinkWaste's Shoreway Environmental Center**
333 Shoreway Road
650-802-8355

SAN MATEO

17. **Hassett Hardware**
545 First Ave.
650-348-1082
18. **The Home Depot**
2001 Chess Drive
650-525-9343
19. **San Mateo City Hall**
330 W 20th Ave.
650-522-7000



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