A Brief Look at Wastewater Treatment Equipment

Vehicle Service Facilities
Machine Shops
Other Small Shops

Regional Water Quality Control Plant

Operated by the City of Palo Alto for the communities of East Palo Alto, Los Altos, Los Altos Hills, Mountain View, Palo Alto, and Stanford

The Regional Water Quality Control Plant (RWQCP) treats wastewater from the sanitary sewer systems of East Palo Alto, Los Altos, Los Altos Hills, Mountain View, Palo Alto, and Stanford. In order to protect the water quality of San Francisco Bay, the RWQCP must restrict discharges of contaminants to the sanitary sewer. Do these restrictions affect your business? The answer is "yes" if your facility discharges wastewater, other than domestic wastes, to the sanitary sewer.

This brochure provides a step-by-step procedure for small facilities, such as automotive shops, machine shops, and corporate fleets, considering the purchase of an oil-water separator or a wastewater treatment system. The information is provided as general guidance and additional careful research should be undertaken in order to select the most appropriate and cost-effective wastewater treatment equipment for each individual facility. For a more extensive look at treatment equipment, please refer to the RWQCP document entitled "Thinking About Installing Wastewater Treatment Equipment? for Vehicle Service Facilities, Machine Shops, and Other Small Facilities."

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Step 1: Do You Need to Discharge?

If at all possible, be a "zero discharger!"

Over 80 percent of the vehicle service facilities in the RWQCP service area have already become "zero dischargers" by plugging their floor drains or discontinuing car washing on their premises. Can you do this too?

The following measures can help you become a "zero discharger:"

- Eliminate or plug all open floor drains
- Recycle wastewater
- Improve housekeeping
- Follow three-step mopping procedures (clean up spills, dry sweep, then mop; send mop water to sewer via sink or toilet).

STEP 2: Determine Your Flow Rate and the Pollutants in Your Wastewater

If floor drains or processes such as vehicle washing and engine cleaning are essential to your operations, you next need to consider the available wastewater treatment technologies for your facility. Before you begin your research or call a contractor, determine:

- Pollutants present in your wastewater
- Pollutant concentrations
- Pollutant sources
- Wastewater flow rate.

In order to do this, the RWQCP generally recommends that you:

- Sample your wastewater at least three times for:
  - Oil and grease — discharge limit= 200 mg/l
  - Copper — discharge limit = 2.0 mg/l
  - Lead — discharge limit = 0.5 mg/l
  - Zinc — discharge limit = 2.0 mg/l
- Refer to your water bill to estimate your flow rate

Knowing the pollutants in your wastestream, which of your processes are pollutant sources, your flow rate, and your total discharge volume will enable you to select the most appropriate treatment equipment for your facility. It is very important that you correctly size the treatment equipment you purchase. Poorly sized equipment will not work properly and may contribute to discharge permit violations!

STEP 3: Design and Selection of Oil-Water Separators and Simple Wastewater Treatment Systems

Once you have identified the pollutants in your wastewater and know your approximate wastewater flow rate, you can begin shopping for treatment equipment. Unfortunately, there is no "cookbook" formula or standard design for the ideal treatment equipment for your facility. In general, however, if the pollutants in your discharge are primarily oil and grease, a conventional oil-water separator may be sufficient. Facilities with metals in their discharge will need additional equipment or a more sophisticated system. Remember that your individual situation may also necessitate tailoring a system to your specific needs.

The basic treatment designs, appropriate for commercial facilities, are described below:

Oil-Water Separators

An oil-water separator is a multi-compartment unit that promotes the separation of oils and grease from wastewater so that the clearer water can be discharged to the sanitary sewer. There are two general types of separators:

- **Conventional separators** may have two or three compartments or "stages." The RWQCP highly recommends a three-stage model in order to adequately treat wastewater to comply with the discharge limits.
- **Coalescing plate separators** have the added feature of specially designed "plates" or "media" that increase oil removal by as much as 80 percent. A coalescing plate separator may be combined with a holding tank to create a zero-discharge system. A zero-discharge system is ideal for operations (such as steam cleaning) that generate high metal concentrations and for which purity of the reuse water is not an issue.

Wastewater Treatment Systems

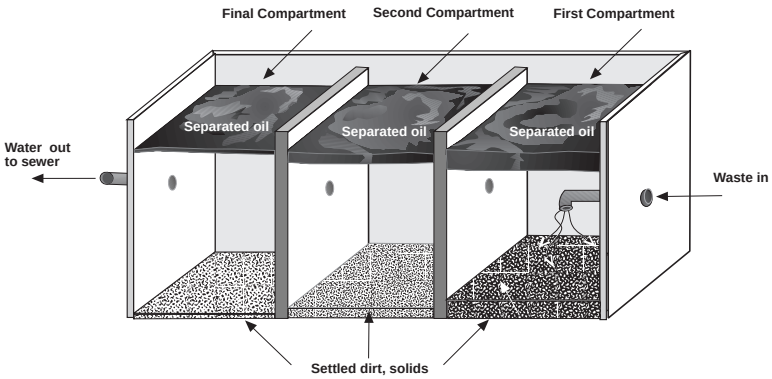
A wastewater treatment system may consist solely of an oil-water separator, but this term usually refers to a system with more "advanced" equipment designed to remove metals. Dissolved metals are typically removed from wastewater at small facilities using a clarifier (flow-through system) or a holding tank (batch treatment). These systems require more maintenance than oil-water separators. Again, there are two main types:

- **Flow-through treatment systems** require that you continuously add chemicals to adjust pH and a reagent, such as polymer, to bind to the metals. The flocculated (aggregated) metals settle to the bottom and the treated water exits at the top.
- In **batch treatment systems**, wastewater is collected in a tank. When the tank is full, the mixer is turned on and reagents are added. The reagents bind with the metals, causing them to flocculate and settle out. Batch-treated wastewater should be tested before discharge to the sanitary sewer to ensure that it is in compliance with discharge limits.

Both types of treatment systems require that the metal-containing sludge be removed from the bottom of the tank. It must be disposed of properly, typically as a hazardous waste. Treated wastewater from both types may either be reused or discharged to the sanitary sewer system (according to discharge permit specifications).

A sampling location (for oil-water separators) or a sampling port (for treatment systems) is also required. A sampling port must be installed according to the specifications provided by the RWQCP.

Schematic of a Conventional Oil/Water Separator (3-stage)



Uribe & Associates

Research wastewater treatment equipment very carefully before you purchase. Work with a reputable vendor to ensure that the system you install will successfully treat your facility's wastewater. The RWQCP can provide you with a list of local treatment equipment vendors. Call the RWQCP at (650) 329-2598.

STEP 4: Estimating the Cost

The cost for purchasing, installing, and maintaining an oil-water separator or treatment system varies among shops. There are numerous equipment brands, designs, and optional features which results in a wide range of costs. Installation may be the most variable cost, as it depends on the specific conditions at each site.

STEP 5: Obtaining Permits

Plumbing Permit

Most city building divisions require a plumbing permit for any plumbing changes, including installation of an oil-water separator or a treatment system. Contact your city's building division for more information about their specific requirements.

East Palo Alto	325-9021
Los Altos	948-0226
Mountain View	903-6313
Palo Alto	329-2496

Wastewater Discharge Permit

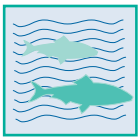
A wastewater discharge permit is required for vehicle service facilities, machine shops, and other commercial businesses that discharge wastewater, other than domestic wastes, to the sanitary sewer.

- The permit will require self-monitoring sampling and quarterly reporting. You will also be subject to random sampling and inspections by RWQCP staff.
- The permit will also require regular cleaning and maintenance of your treatment equipment.
- Sampling results will be used to determine your compliance with the discharge limits.

For more information about discharge permits, contact the RWQCP at (650) 329-2598 if your facility is in Palo Alto, Los Altos, Los Altos Hills, or East Palo Alto. If your facility is in Mountain View, call the City of Mountain View at (650) 903-6378.

STEP 6: Installation

Proper installation of an oil-water separator can be complex and may cost more than the equipment itself. If you are installing a washrack outdoors, you will also need berms and/or grading to prevent washwater from overflowing and running into a storm drain. You must also prevent runoff from flowing into the washrack when it rains. All washpads must be constructed of impervious materials, such as coated concrete. For competitive pricing, be sure to consult more than one contractor.



Maintenance

Unless your oil-water separator is regularly maintained, it will not function as designed and you run the risk of violating discharge permit limits. The RWQCP requires that separators be visually inspected, at least weekly, for oil and sediment buildup. Depending upon each facility's processes and wastewater flow, the RWQCP also requires that separators be cleaned out and maintained at least once per quarter.

A conventional separator is maintained by removing the oil layer from the top and the sediment/sludge (which may be a hazardous waste) from the bottom. A coalescing plate separator requires additional maintenance in regularly removing and washing the plates. Flow-through and batch treatment systems require more attention and daily maintenance than oil-water separators. The accumulated wastes must be disposed of properly, usually as a hazardous waste. Hazardous wastes must be removed from your site by a licensed waste hauler. Please call your county for a list of local licensed waste haulers.

Other Regulatory Requirements

Oil-water separators are subject to state regulations for hazardous waste treatment *if the wastes being treated are hazardous.* However, if the average monthly volume of recovered oil is less than 1,050 gallons, the oil-water separator may be considered "conditionally exempt" from many of the requirements for hazardous waste treatment. Secondary containment will be required for all hazardous waste treatment units, tanks, and associated piping. Contact your county's Department of Environmental Health, Hazardous Materials Division, for more information about hazardous waste treatment and disposal.

The Bay Area Air Quality Management District has additional requirements for design and operation of oil-water separators.

Call These Local Agencies for More Information

Wastewater Discharge

In East Palo Alto, Los Altos, Los Altos Hills Palo Alto, and Stanford	(650) 329-2598
In Mountain View	(650) 903-6378

County Environmental Health Hazardous Materials Division

Santa Clara County	(408) 299-6930
San Mateo County	(650) 363-4305

Regulators of Below-Ground Tanks and Treatment Systems

East Palo Alto (San MateoCounty Hazardous Materials Division)	(650) 363-4305
Los Altos and Los Altos Hills (Santa Clara County Hazardous Materials Division)	(408) 299-6930
Mountain View Fire Department	(650) 903-6378
Palo Alto Fire Department	(650) 329-2135

Bay Area Air Quality Management District

Compliance Assistance Hotline	(415) 749-4999

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