

# OUR ENVIRONMENT

## Recycling Motor Oil

Used motor oil—that dirty, slimy black stuff you drain out of your car's crankcase. What do you do with it? Many states are hoping you'll recycle your used motor oil. Currently, 18 states have used-oil recycling programs, although the programs vary somewhat from state to state. While some states have legislation regarding the recycling of oil, others conduct their programs on a voluntary basis. Some states have one or two oil re-refiners or reprocessors; others have haulers who sell the oil without re-refining it.

But the important point is that used motor oil can be recycled, virtually forever. As the Association of Petroleum Refiners says, "Lubricating oil never wears out—it just gets dirty!" Not only does recycling motor oil keep it out of the ground and water, but it also reuses a valuable resource. With rising prices and current shortages of oil, it makes sense to recycle all the oil we can.

Just how much oil is out there, available for recycling? According to the American Petroleum Institute (API), about 190 million gallons of oil are generated each year by do-it-yourselfers who change their own motor oil. While some of this oil is recycled—either through re-refining or through use as a fuel or lubricant—most of it is dumped in sewers, in driveways, in trash cans, or even in the neighbor's backyard. Each year, as more and more people decide to change their own motor oil, this amount of used, potentially recyclable oil will increase.

Re-refined oil can be just as good as new oil, and even the API agrees. In Germany, where a government subsidized oil recycling program recovers 70 percent of the used motor oil, each new Mercedes-Benz contains re-refined oil.

In Minnesota, a large portion of the collected oil is used to lubricate railroad or farm machinery. Although little oil is re-refined for sale to motorists in Minnesota, this is a growing trend in many other states.

The Minnesota Pollution Control Agency (MPCA) has promoted an education program to encourage the public to recycle their used oil. Recently, the MPCA used TV news coverage and newspaper articles to publicize the program, which resulted in over 200 telephone calls from citizens with questions about oil collection sites. Many people said they were glad to hear about the program, as they had been saving their old oil and didn't know what to do with it.

Besides Minnesota, two other EPA Region V states—Illinois and Michigan—have statewide motor oil recycling programs. A fourth, Indiana, plans to begin such a program this month. Ohio and Wisconsin do not have state-sponsored recycling programs, although some private recycling does occur there.

## "Fingerprinting" Air Pollutants

What fingerprinting of people has done for crime detection, "fingerprinting" of air particles now promises to do the same for pinpointing the often elusive sources of air pollution.

A new technique, known as Suspended Particle Evaluation and Classification (srtec), identifies the individual air particle and—more important—tells where that particle came from: an electric generating plant, quarry, steel mill, or any other source.

"The bottom line is effective control of air pollution," said Edward Fasiska, president of Material Consultants and Laboratories (MCL). "But first comes source identification—we must know where all that pollution is coming from."

Fasiska founded MCL in Monroeville, Pa., nine years ago and personally conceived the idea of "fingerprinting" air particles. But to turn the idea into an effective technique, he needed help. Luckily, help was readily available at the U.S. Steel Research Laboratory nearby. He teamed up with Richard Lee of U.S. Steel to develop the technology that evolved into srtec.

Fasiska, who has a Ph.D. in crystallography, went to the Allegheny County Bureau of Air Control about a year ago and applied the srtec technique for the first time. In that study he found to his surprise that air pollution in Allegheny County came mostly from dust particles rather than industrial sources.

The srtec "fingerprinting" technique consists of identifying thousands of air particles, one by one. Size, shape, chemical, and other characteristics are then stored into computers for ready reference. Two types of air samples are collected on filter media, or thin sheets of film: one comes from the surrounding air of a region, the other from a suspected source of pollution. By matching the characteristics of the two samples, scientists can tell what pollutants are in the air, where they come from, and how much pollution comes from the suspected source.

To identify the air particles, the srtec

technique uses a scanning electron microscope, an x-ray fluorescent chemical analyzer, and an x-ray diffractor, plus two computers. With these tools, scientists are able to identify, or "fingerprint," air particles, even those invisible to the naked eye.

Robert K. Stevens, chief of the inorganic pollutant analysis branch at EPA's laboratory in Research Triangle Park, N.C., said: "EPA's major thrust is toward quantitative analysis—to identify as many sources of pollution as possible. In that respect, the srtec technique certainly helps."

"With srtec," he said, "we are not jumping off into the dark when we say that in a certain area 10 to 20 percent of air pollution comes from auto exhaust, 10 to 40 percent from combustion of fossil fuels (coal, oil), and the balance from a combination of industrial, agricultural, and natural sources, such as windblown dust." But he added, "No single technique can be expected to do all things; there has to be a combination of analytical methods." There must also be a change in the sampling method, he said. "We must have a lot more air samples to look at."

Up to now, EPA has been using the bulk analysis technique for identifying pollutants in the air. However, this technique needs to be modified, Stevens said, so that an air sample may be collected and analyzed directly by the srtec and other instruments right on the filter. This is different from the srtec technique, which requires the transfer of the air sample from one filter to another. Stevens explained.

The idea, he said, is to use both the srtec technique and the bulk analysis technique, so that they could complement each other.

Besides having been used in the Pittsburgh area, the srtec technique is scheduled to analyze air pollution around Philadelphia, Denver, Houston, and Champaign, Ill. Here, too, dichotomous (two-part) samples will be taken: one from the general air, one from a suspected pollution source.—R. John Rapsky, EPA.

## Oregon Surferboarder Attacked by Great White Shark

Cannon Beach, on Oregon's north coast near Seaside, has achieved the dubious distinction of becoming the northernmost area in which a person has been attacked by a white shark.



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