UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

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PROCUREMENT, LOGISTICS,
AND READINESS DIVISION

B-208825

SEPTEMBER 17, 1982

The Honorable Caspar W. Weinberger
The Secretary of Defense

Attention: Director, GAO Affairs

Dear Mr. Secretary:

Subject: Opportunities for Improved Oil Recycling Still Exist (GAO/PLRD-82-113)

We have performed a followup review of how Department of Defense (DOD) activities collect and dispose of used oil. In response to the recommendation in our prior report, 1/ DOD established in June 1979 an oil recycling and reuse policy and guidance for the military departments and defense agencies on collecting and disposing of used oils. The policy recognized used lubricating oil as a valuable natural resource and an asset because it possesses two basic reuse characteristics which offer significant economic benefits; that is, it is a renewable resource since it can be re-refined and reused or it can be burned as a fuel or fuel supplement.

The military departments and defense agencies were directed to (1) maximize the recovery and collection of used lubricating oil, (2) maximize the sale of used lubricating oil for the purpose of re-refining, (3) burn the used lubricating oil as a fuel or fuel supplement if no reasonable arrangements can be made for recovery by re-refining, and (4) discontinue any disposal practices that are not environmentally acceptable.

Our current review disclosed that many DOD installations and activities are not following this guidance. We found that collection and selling practices tended to mitigate against the re-refining of used oil. We also found that some activities were selling used oil when they could have burned it more economically as fuel.

1/"Ways the Department of Defense Can Improve Oil Recycling" (LCD-77-307, Sept. 28, 1977).

(943182)

BACKGROUND

With the advent of the energy crisis, conservation options once considered uneconomical or impractical have become much more attractive. One such option, re-refining used lubricating oils, has received a great deal of attention in recent years. About 50 to 60 percent of all automotive lubricating oil used in this country is recoverable. Thus, the potential energy savings are huge.

Because its lubricating properties never wear out, used oil can be re-refined to its basic characteristics and reused repeatedly. Although from an energy conservation standpoint, re-refining is the preferred approach, used oil also can be used as a fuel. In the past, used oil was frequently used to control weeds and dust or it was disposed of through open dumping, practices which are harmful to the environment.

The Congress has shown increased interest in promoting better use of the United States' renewable energy resources. Legislation has been enacted to reduce the Nation's dependence on foreign sources of petroleum products and to protect the environment through better used oil conservation. Since 1972 the Congress has passed at least four laws that address better conservation of used lubricating oils.

--The Federal Water Pollution Control Act Amendments of 1972, Public Law 92-500.

--The Energy Policy and Conservation Act of 1975, Public Law 94-163.

--The Resource Conservation and Recovery Act of 1976, Public Law 94-580.

--The Used Oil Recycling Act of 1980, Public Law 96-463.

Actions mandated by these laws included a study of the problems associated with achieving increased recycling of used oil, a program to develop test procedures for establishing the equivalency of re-refined oil to new oil, and the elimination of legal requirements that recycled oils be labeled as such.

Annual lubricating oil consumption by DOD activities is estimated to be in the tens of millions of gallons. Because these activities obtain and consume lubricating oils in numerous and diverse ways, comprehensive data on lubricant usage and used oil disposals are not available. However, we found that, during 1980, the Defense Fuel Supply Center, which buys petroleum products for all Federal agencies, issued about 26 million gallons of lubricants, hydraulic fluids, and related petroleum products. Military activities also made undetermined additional acquisitions locally and through contract maintenance.

About 50 to 60 percent of all lubricants consumed by DOD activities are recoverable. These products are used as fuel, sold, or given away.

OBJECTIVE, SCOPE, AND METHODOLOGY

Our objective was to assess DOD's implementation of recommendations made in our 1977 report on used oil recycling. The 1977 report recommended that the Secretary of Defense

- --institute an information system to provide a basis for developing policies and procedures for recovering used oil,
- --classify used oil as an accountable asset to better control its disposal, and
- --investigate the feasibility of making regional agreements with re-refiners to process used oil into resalable lubricants.

The information needed to satisfy our objective was obtained in the following ways. During the review, we

- --examined various public laws, regulations, directives, instructions, reports, studies, and other documents on used oil conservation and reuse;
- --interviewed personnel from DOD activities and from the private sector who are knowledgeable about used oil collection, disposal, and recycling;
- --obtained and analyzed available statistics on used oil collection and disposals by DOD activities;
- --evaluated used oil collection, storage, and disposal practices at 15 DOD installations (see enc. I).

The DOD installations were evenly distributed between the three services and included both large and small generators of used oil. We made this review in accordance with GAO's current "Standards for Audit of Governmental Organizations, Programs, Activities, and Functions."

DOD COLLECTION AND DISPOSAL PRACTICES NEED IMPROVEMENT

In June 1979 DOD established oil recycling and reuse policy and guidance for the services and DOD agencies. The services had adopted and, in most cases, incorporated the DOD policy into their own regulations. However, failure to aggressively implement this policy and guidance has resulted in the loss of numerous opportunities to achieve better conservation and economic use of used lubricating products.

The services did not provide adequate guidance to vehicle maintenance shops on how to properly collect and dispose of their used oils. In addition, they did not monitor used oil collection and disposal practices to identify those that were inefficient or not achieving program goals so they could be modified. We found that used oil was

--seldom segregated by type and often contaminated with water and trash,

--being sold when it could be burned more economically as fuel,

--being sold for purposes other than re-refining, and

--being sold in small uneconomical quantities.

We believe that by improving its collection and disposal practices, DOD can make used oil more attractive to re-refiners and also enhance the product's market value.

Used oil was seldom segregated by type and was often contaminated

Failure to segregate used oil by type and to minimize contaminants makes used oil more difficult and costly to re-refine and reduces its market value. Only 1 of the 15 installations we visited effectively segregated its used lubricating products.

One buyer told us that the re-refining process can be adjusted to accommodate some types of mixed products, but used oils that are clean and segregated produce a re-refined oil of better quality and the economics of the re-refining process are improved. The buyer told us used oil collected from DOD installations is generally of poor quality and that he recently terminated two purchase contracts because the used oil was too dirty to re-refine.

At the base segregating used oils, we found that from January 1979 through August 1980, the Defense Property Disposal Office at Kelly Air Force Base sold 17,000 gallons of used jet turbine oils, which had been segregated during collection, at an average price of 66 cents a gallon, with some selling for as much as 90 cents a gallon. Had the jet oils not been segregated, they would have been sold as part of the mixed oils at a much lower price. For example, 263,000 gallons of mixed used crankcase oils, sold by the same disposal office during a similar period, averaged only 14.3 cents a gallon.

At present, used jet oils are not re-refined, but are used to manufacture plastics. However, the Air Force is engaged in research which may lead to the technology needed to restore jet turbine oils to a condition suitable for their original use.

We found many instances of used oil being contaminated. For example, one storage site at Kelly Air Force Base consisted of a concrete slab with a 6-inch high retaining wall. The slab contained about 400 55-gallon metal drums of used oil, which were standing in a 5-inch deep water and oil mixture. Heat fluctuations had caused the drums to expand and contract, absorbing rain water and expelling it as an oily mixture which drained into a nearby stream.

One used oil buyer would no longer bid on used oil in 55-gallon drums because their small size makes them uneconomical to handle and process. Bulk tank storage is more economically attractive to a wider range of buyers who are likely to bid higher.

A bulk storage system has been used successfully at Fort Hood, Texas. The installation has over 100 bulk storage collection points equipped with 500- to 1,200-gallon storage tanks. The post has a contract with a re-refiner to periodically pickup the used oil at each storage site. In addition to getting a better price for the used oil, the installation is avoiding substantial costs that would be required to consolidate the products at one central collection point. Installation officials provided no cost data, but indicated that before the current arrangement, five to eight personnel and two vehicles had been required to collect and dispose of the used oil.

By collecting used oil in larger, more economical quantities, we believe the potential for contract re-refining will be enhanced. However, should re-refining prove to be not feasible, the product is still likely to be more attractive and to sell at a higher price. We believe the Defense Property Disposal Service (DPDS) regions can effectively consolidate used oil sales on a geographic basis and lower its administrative costs by reducing the number of individual disposal transactions.

Most used oil is sold for purposes other than re-refining

Although DOD policy stresses that used oil should be sold for re-refining, current management practices do not assure buyers will use it for that purpose. In most instances, used oil was sold to firms dealing in fuel oil and road oiling or it was sold to firms acting as brokers who sell the product for whatever use their buyer wishes.

DOD installations generally collect their used oil centrally and report it to their local Defense Property Disposal Office for disposal. DPDS advertises the used oil for competitive sale and sells it to the highest responsive bidder. Eleven of the 15 DOD installations were selling their used oil through DPDS. Used oil from the other four installations was being burned as fuel. The buyers were engaged in the following types of businesses.

Type of buyer	No. buyers	Gallons sold	Percentage of total gallons
Re-refiner	1	128,842	22.6
Plastics manufacturer	1	9,033	1.6
Fuel oil sales	6	298,031	52.3
Road oilings	3	a/4,600	.9
Broker	1	128,900	22.6
Total	b/12	569,406	100.0

a/Estimated.

b/One installation had two buyers--one for synthetic jet oils and one for other products.

Frequently, re-refiners cannot or will not compete for used oil offered for sale by DPDS. According to the President of the Association of Petroleum Re-refiners, the largest problem facing re-refiners is their inability to compete in the marketplace for used oil. While re-refiners have substantial collection, processing, administrative, and overhead costs, other types of used oil buyers incur significant costs only for collection and distribution. Consequently, buyers marketing used oil as a fuel or for road oiling are difficult to compete with. Additionally, used oil collected by Federal installations was frequently so contaminated with water and trash that it was unacceptable for re-refining.

Since revising its specification for engine lubricating oil for administrative service vehicles in 1980 to allow use of re-refined products, DOD has done little to promote the use of these products by its activities. Its policy and guidance memorandum states that large installations should consider negotiating for "closed loop" 1/ re-refining arrangements as a way to further enhance the net value of used lubricating oil and thus reduce the cost of replacing it with more expensive virgin lubricating products.

The closed loop concept is used extensively in the re-refining industry. Railroads and industrial firms frequently contract with re-refiners to have their used oil restored to its original condition. In Government, the State of North Carolina uses a closed-loop system to collect used oil generated by State and municipal vehicles, re-refines it, and returns it to users. During the first year of operation, which ended in March 1982, the North Carolina program recycled 250,000 gallons of used oil through its closed-loop system.

1/Collecting used oil, having it re-refined, and returning for reuse.

In May 1981 the Mobility Equipment Research and Development Command (MERADCOM) at Fort Belvoir, Virginia, proposed a demonstration project to set up a closed-loop system to collect used oil at military installations in Virginia and North and South Carolina. The used oil was to be re-refined under contract and used in MERADCOM vehicles to evaluate product performance.

The U.S. Army Material Development and Readiness Command discouraged MERADCOM from initiating the plan because it believed the project would impose an unnecessary burden on the installations involved and because the responsibility for selling used oil rests with DPDS. Consequently, MERADCOM did not move forward with the project.

Used oil can be used effectively as a burner fuel

DOD policy requires that used lubricating oil be burned as a fuel or fuel supplement if no reasonable arrangement can be made for recovery by re-refining. We found that it is frequently not used for this purpose and often is sold to buyers who do use it as fuel.

We found that used oil generated at only 4 of the 15 installations we visited was being burned as fuel. These installations were Fort Bragg; Quantico Marine Base; Naval Operating Base, Norfolk; and Little Creek Amphibious Base.

Facilities engineers of each military department told us any heating plant using number 6 fuel oil can burn used lubricating oil. The Army indicated that most of its installations have at least one heating plant that uses number 6 fuel oil. The Navy estimated that about half of its bases have such equipment and the Air Force estimated that a third of its bases can burn used oil as heating fuel.

During the 12-month period ended in February 1981, the naval complex in Norfolk burned nearly 4 million gallons of reclaimed diesel and used lubricating oil in installation heating plants. The Navy Public Works Center purchased these products from the Navy fuel depot for 35 cents a gallon or about 56 percent less than regular number 6 fuel oil, which sold for 79 cents a gallon.

At Fort Bragg, essentially all of the installation's used oil is burned in the 82d Airborne Division's heating plant. During 1980 the installation disposed of about 60,000 gallons of used oil in this way.

CONCLUSIONS

By improving their collection and disposal practices, DOD activities can make their used oil more suitable for re-refining and also enhance the product's market value. This can be done by:

--Collecting them in ways that segregate recoverable products, such as automotive and jet turbine oils, by type (when economically feasible) and keeping them clean.

--Storing them in bulk containers to reduce storage and handling costs.

--Disposing of used oils at installations in the same geographic area collectively to offer large quantities of used oil which make re-refining more feasible and reduce disposal costs.

DOD activities should also cease the practice of selling used oil when it can be burned more economically as fuel.

Finally, we believe that the closed-loop re-refining arrangement has excellent potential for economically improving the use of used oil at large installations. Although DOD policy and guidance stresses the importance of most of these factors, we found they generally had not been put into practice.

RECOMMENDATIONS

Accordingly, we recommend that you direct the Secretaries of the Army, Navy, and Air Force to follow DOD's guidance in the collection and disposal of used oil. We also recommend that you direct a trial of the closed-loop arrangement for re-refining used oil generated at a large user installation or several installations in close proximity to one another. If this trial shows this arrangement to be a beneficial way of using used oil, it should be extended to as many locations as is feasible.

AGENCY COMMENTS

We discussed a draft of this report with DOD officials. They agreed that improvements could be made in collecting and segregating used oils at military installations. They did not agree with our overall conclusions and recommendations. They felt that we had not adequately addressed the economics of an existing capability for re-refining. We have modified our conclusions and recommendations accordingly.

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As you know, section 236 of the Legislative Reorganization Act of 1970 requires the head of a Federal agency to submit a written statement on actions taken on our recommendations to the Senate Committee on Governmental Affairs and the House Committee on Government Operations not later than 60 days after the date of

the report and to the House and Senate Committees on Appropriations with the agency's first request for appropriations made more than 60 days after the date of the report.

We are sending copies of this report to the Secretaries of the Army, Navy, and Air Force; the Director, Defense Logistics Agency; the Director, Office of Management and Budget; and the Chairmen of the appropriate congressional committees.

Sincerely yours,

Donald J. Horan

Donald J. Horan
Director

Enclosure

DOD INSTALLATIONS VISITED

DURING THE REVIEW

Department of Army

Fort Belvoir, Virginia
Fort Bragg, North Carolina
Fort Campbell, Kentucky
Fort Hood, Texas

Department of Navy

Norfolk Naval Operating Base, Virginia
Norfolk Naval Air Station, Virginia
Little Creek Amphibious Base, Virginia
Navy Yard, Washington, D.C.
Quantico Marine Base, Virginia

Department of Air Force

Andrews Air Force Base, Maryland
Bowling Air Force Base, Washington, D.C.
Kelly Air Force Base, Texas
Langley Air Force Base, Virginia
Randolph Air Force Base, Texas
Wright-Patterson Air Force Base, Ohio