Central waste disposal: New service looks for some action

Disposing of other people's wastes may become one of pollution control's most profitable business ventures

Ask anyone with an industrial waste disposal problem what he would like to do about it if given the choice, and chances are that he would just as soon hand the problem on to someone else. The trouble with this wishful thinking is, of course, that there is generally no one to pass the buck to. Even though a few enterprising garbage collectors have ventured into the business of carting away the wastes that industry cannot or does not wish to treat, evidence is mounting that such small operators do not have the knowledge (or, unfortunately, in many cases, the wish) to dispose of the wastes in a pollution-free manner. The story is told of the large oil refinery which contracted with a small local entrepreneur for the latter to take away large quantities of a particularly noxious waste. According to the contractor, the waste was being dumped into a deep well approved by local health authorities. In fact, the contractor merely was pouring the liquid into a lagoon he had scooped out of nearby land. When the waste started seeping through the ground and into local waterways, both the contractor and the oil refinery were severely embarrassed.

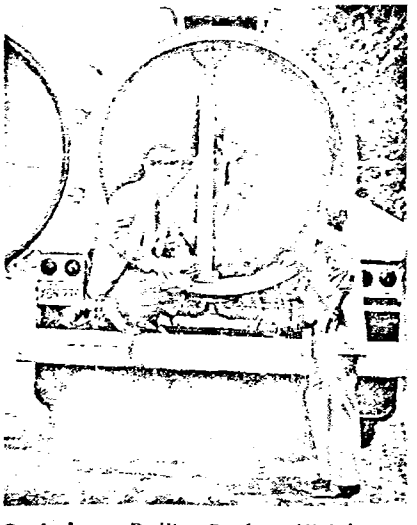
Central disposal makes sense

Two facts have emerged in recent years concerning the treatment of industrial wastes:

- It is the responsibility of every industry to ensure that its wastes are properly treated.
- The processes needed for the destruction of most industrial wastes are relatively sophisticated and not easily undertaken by those unfamiliar with a whole range of waste treatment technology.

For many small firms which have waste streams unacceptable to the local municipal treatment plant and which now are restrained from polluting local bodies of water, the prospects of having to install in-plant treatment equipment are not pleasant. Small firms often are ignorant of the technology required (if, indeed it is available) or, perhaps just as important, cannot justify the often large capital investment. Larger firms, too, may balk at having to tie up a large amount of capital in treatment plants when it does not contribute one cent to earnings. This is particularly true now, when the price of borrowing money is so high.

This background may help to explain why the concept of contract waste disposal—paying someone else to treat one's wastes—seems to be finding increasing favor with industrial executives.



Optimism. *Rollins-Purle officials say centralized waste disposal will pay*

For instance, Dow Chemical Co. president Herbert D. Doan says that "it is entirely likely that pollution needs will establish a major new service business" (see this issue, page 179). One of the reasons Doan can speak authoritatively on the matter is that his own company has shown that centralized waste disposal makes sense both technically and economically. Dow does not treat anyone else's wastes, of course, but it has so much of its own at its huge Midland (Mich.) manufacturing facility, that it has built what many industry observers call a model integrated waste treatment plant.

The plant covers 50 acres and serves more than 500 processing units in the adjacent manufacturing area. Incoming wastes are segregated by chemical nature: Strong phenolic liquid wastes are blended with cooling water and the phenol removed in trickling filters; general organic wastes are neutralized with lime, sent to settling basins and then subjected to activated sludge treatment; burnable solid wastes and certain tarry liquids are incinerated in a fashion designed to eliminate air pollution. Solids from the treatment plant either are burned, sent to a sanitary landfill, or disposed of in underground caverns (where certain brine wastes also are pumped).

Separate treatment steps

An essential feature of Dow's plant, and one which appears to be neces-

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Which treatment process R-P uses depends on nature of waste

- **Acids.** Neutralized with lime or other alkali. Calcium sulfate precipitate can be landfilled, soluble neutral salts are disposed of in ocean. Ocean disposal also used for fluffy iron precipitate from spent pickle liquors, where precipitate is difficult to dewater.
- **Alkaline wastes.** Often are alkaline detergents contaminated with organics from equipment washing. Alkali is first neutralized and neutral solution is treated biologically.
- **Water soluble organics.** Biologically treated. Contaminants such as trace metals must be oxidized or precipitated out of solution.
- **Insoluble organics.** Incinerated. When present in aqueous emulsion, emulsion is first broken physically or chemically, organic phase is skimmed off and burned. Aqueous phase receives appropriate treatment (generally biological). Heavy emulsions can be burned directly.
- **Metals in solution.** Chemical treatment used to precipitate salts or oxides.

Sludge from biological treatment processes is surface landfilled. Ash from incinerator is washed to dissolve water soluble materials, then landfilled.

sary for the optimum operation of any central waste treatment facility, is the segregation of incoming waste streams. If the wastes from a variety of chemical manufacturing steps were allowed to mix in one central sewer line, then the total volume of liquid would have to undergo all the treatment steps needed to remove every contaminant. Quite apart from the obviously uneconomical aspects of such a procedure, there is also a real risk of explosions in the transfer line as chemical reactions proceeded unchecked.

Despite the disadvantages inherent in having to treat a mixed liquid waste containing many different, and probably nonbiodegradable, components, several municipalities have shown interest in treating industrial wastes as well as domestic sewage (ES&T, October 1969, page 887). Although they generally do not have the technological capability to treat industrial wastes, many municipalities feel that the sheer volume of these wastes will enable them to build very much bigger treatment plants than they otherwise would need to treat only domestic sewage. They hope to achieve the economies that a large plant could make possible.

Profit in waste disposal?

A growing number of companies in the last year have come to the conclusion that there just may be profits in waste. E.S. "Bud" Shannon, waste control manager for Dow at Midland, thinks that a well designed and integrated plant could charge customers prices they could afford to pay to get rid of their liquid and solid wastes and make money in the bargain. Plants of this type are being built by Rollins-Purle, Inc. (Lansdowne, Pa.).

Shannon's views are not shared by everyone who has looked into the possibilities, however. Spokesmen for Hytek, Inc. (Cleveland, Ohio), say that, at one time, they were interested in setting up a pilot plant to treat a variety of wastes from chemical and other plants in the Cleveland area. But the company ran right into the plans of the City of Cleveland, whose municipal treatment plant presently accepts and treats (quite inadequately, according to many) wastes from any source whatsoever. "How can you compete with the city?" asks Hytek. Cleveland authorities apparently are determined to have one of the largest and most efficient municipal plants in the world. Nevertheless, R. C. Sargent, Hytek's vice president for engineering, says that his company has Ohio Board of Health approval and still intends to go ahead with a central disposal project "when the time is ripe."



Complex. *Dow plant spans 50 acres*

The ripe time is not now, according to COPE, Inc. (Houston, Tex.), another company hoping to make an entry into the disposal business. COPE (Consolidated Oxidation Process Enterprises) has done considerable groundwork to discover just how profitable contract waste disposal would be for them. For instance, the company has calculated that customers would have to pay anywhere from $8-14 per ton of liquid or solid waste treated. COPE has looked extensively at prospects in the heavily industrialized Houston area, and also at industrial locations "in the northeast." The company has concluded, however, that the climate is not favorable at present, and gives two main reasons:

- Pollution laws on the books are not being enforced to the utmost, so that it may be cheaper to pollute than to find cleanup methods.
- Prospective customers are not willing to sign up with COPE for long-term (five years or more) contracts, because many firms believe they can engineer around pollution problems and get rid of their wastes at the source within a few years.

Active plants

The number of operational central waste treatment plants in North America is, by all indications, very small. There are probably many plants that are able to treat a limited number of types of waste from multiple sources—such as the Friendswood Development Co. facility (Bayport, Tex.) described at last month's ACS meeting in Houston. The Friendswood plant is selective in accepting wastes from the chemical plants it serves, however. Its activated sludge unit can treat only biodegradable wastes and sets acceptability criteria in terms of biological oxygen demand, pH, etc., even for those.

One of the few waste treatment complexes in the continent is that of Goodfellow Enterprises (Corunna, Ont.) which has been in service since 1957 and modernized in 1968 at the urging of the Ontario government. The Goodfellow plant accepts liquid and solid wastes from the numerous chemical plants in the Sarnia (Ont.) area, and disposes of them by burning, burial, or deep-well injection. The plant is highly regarded in Canada, and Goodfellow reportedly is planning to build another similar facility in the Toronto area, although company spokesmen are loath to discuss

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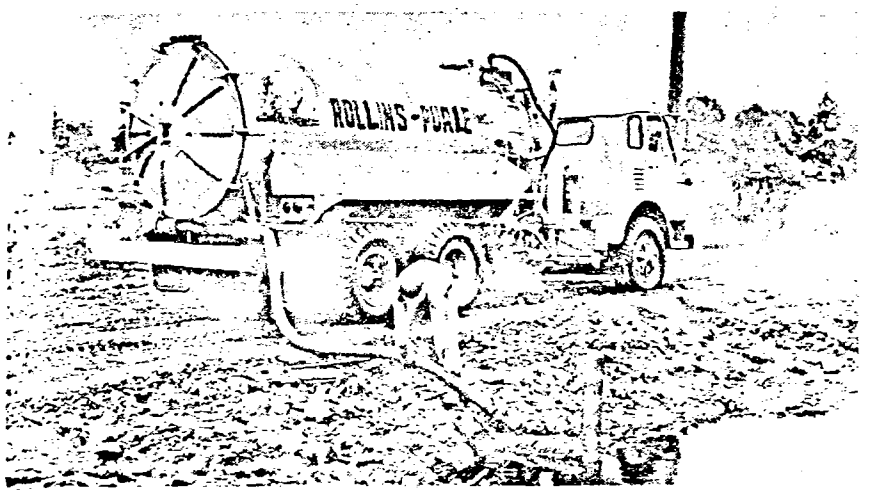

Sludge gulper. *Special tank truck vacuums sludge from industrial waste lagoon*

plans while negotiations with Toronto industries and government officials are going on.

U.S. critics, nevertheless, point out that the Goodfellow plant in Corunna is not a particularly good model for the pollution control service industry to follow. They cite such things as the plant's lack of any biological treatment processes and the relative unsophistication of its incinerators (which have few or no controls to prevent air pollution).

Optimistic entrant

Among all the hesitant entrants in the field of central waste treatment, it is somewhat surprising to find a company that is decidely optimistic about prospects for making money in the business. John W. Rollins, Sr., chairman of Rollins International, Inc. (Wilmington, Del.), stated in March 1969 that he expected his company's subsidiary, Rollins-Purle, Inc. (R-P), to be doing $50 million worth of business providing pollution abatement services within five years. R-P, said Rollins, would build 20-25 waste treatment plants across the U.S. "in the next five years." Since Rollins first made these projections, he has upped his estimate of construction to 100 plants within the same period.

R-P presently is just completing its first central treatment plant (Gloucester County, N.J.) to treat wastes from an area 50 miles around Philadelphia, and expects to start operation of another plant (Baton Rouge, La.) in mid-summer. R-P's marketing director, James J. McLaughlin, indicates that the company has about 50 industrial firms lined up (under contract or negotiating) to have their wastes treated either at the New Jersey plant or at a smaller facility (Wilmington, Del.) where acids and alkalis are neutralized and the resultant salts shipped for ocean disposal. McLaughlin says that R-P has had little trouble in signing up firms for 2-3 years. Although many of the firms who have contracted with R-P are big names in the chemical industry, they are not willing, at the moment, for their identities to be revealed—apparently out of a fear that they would be admitting that they had pollution problems.

A trump card in R-P's hand is its access to the large fleet of tank trucks operated by Matlack Bulk Distribution Services, another Rollins International subsidiary. These trucks, supplemented by about 30 specially designed "Sludge Gulper" vacuum tankers, are the main means by which customers can send their wastes to an R-P plant. R-P also can arrange for wastes to be piped into a plant if the client is located nearby. McLaughlin further indicates that R-P is willing to operate existing pollution control facilities or to build and operate a plant on the customer's site.

For the moment, however, the main thrust of R-P's business is in relieving a company of its wastes at the plant site. This is to the client's advantage, since contracts are so written as to remove his responsibility for the waste once it is off his property.

R-P will accept all types of liquid and solid wastes except those that are radioactive or explosive. All the company's centralized plants will treat wastes by one or more chemical, biological, or physical processes; which one is used depends on the chemical nature of the waste (see box). Ability to segregate wastes is vital, says R-P's technical manager, Peter Williamson; only by separating incoming streams is it possible to ensure that plant operations are safe, and to provide complete waste deactivation at a price reasonable to the client.

An important feature of all R-P plants will be an insistence that they do not contribute to any form of pollution. Thus, incinerators will be equipped with scrubbers, and the large amounts of insoluble wastes produced in a plant will be disposed of in landfills with leachate collection systems.

Naturally, control of the wastes coming into a central plant is vital: R-P emphasizes that it must know the composition of a waste before it can quote prices on cost of disposal. So emphatic is R-P on this point that it is reluctant to accept wastes from independent contractors who may misrepresent or may not know the chemical nature of the wastes that they pick up from their industrial customers.

Costs

The cost to a customer for having wastes treated at a central plant obviously depends on many factors in addition to the nature of the wastes: The volume to be picked up, the distance of the customer from the plant, etc. But Williamson does give some general guidelines:

- Wastes that require just one-step treatment might be charged as little as 3 cents per gallon
- Wastes requiring two treatment steps might cost from 4.5-6 cents per gallon.
- Difficult wastes such as mixed chlorinated hydrocarbons—which have too low a caloric value to support combustion and from which the chlorine must be removed—could cost as much as 30 cents per gallon.
- Baled trash that can be directly landfilled might cost $2-4 per ton. These costs are very similar to estimates made by COPE in Houston.

It remains to be seen whether R-P plants will be able to generate the large dollar volume in business projected for them by company chairman Rollins. What is certain is that if R-P appears to be making a going proposition of its stake in the new pollution control service business, it will not be without competition for long. Apart from the firms mentioned here, there is good evidence that comparative heavyweights such as Zurn Industries (Erie, Pa.) and Petrolite Corp. (St. Louis, Mo.) are watching with interest on the sidelines.

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