through recharge of ground waters with treated waste effluents and, more directly, through the complete renovation of waste waters for deliberate recirculation in municipal or industrial water systems.

More answers to more difficult pollution problems can be achieved through a successful water purification and reuse research program than through any other research.

Answers are required now and more will be required soon in reaching decisions on the need for expenditures of billions of dollars on:

(a) Design and construction of municipal and industrial waste treatment works.

(b) Storage of water in Federal reservoirs for regulating stream flows for water quality control.

(c) Storage of water in Federal reservoirs for municipal and industrial water supply purposes.

(d) Source development for public water supplies; and

(e) Importation of water from water-surplus to water-short areas.

The development of a successful advanced waste treatment technology would have a tremendous impact on our whole water resource problem. These techniques could conceivably allow the development of "dry" industries and municipal treatment plants from which absolutely no pollution would enter our surface or ground waters; these processes could completely change our present concepts of "adequate" waste treatment and could drastically reduce the otherwise necessary expenditure of multiple billions of dollars for provision of low flow augmentation dilution water to reduce pollution from presently untreatable wastes; advanced waste treatment could allow continued economic growth and development in water-short areas of this country whose future developable water supplies are presently limited. In short, a successful advanced waste treatment technology, by renovating waste waters for deliberate reuse, would simultaneously alleviate two of our major water resource problems—water pollution and water supply.

The solution of water pollution problems will require the application of existing techniques, plus additional research and development for new and improved techniques. Research and development generally goes through a series of steps ranging from exploratory studies through laboratory research, field evaluation, and demonstration. In the past, our efforts have been mainly in laboratory research and there has been a recognized deficiency in the application of research findings. The application of research findings requires that someone undertake the construction and operation of new type facilities which are often very expensive and which are associated with a greater risk of failure than with processes which are already proven in practice. The construction of remedial facilities in water pollution control is the responsibility, to a considerable extent, of local authorities who may have limited financial resources. Often these authorities feel that they cannot afford the risk associated with trying new methods. It may very well be in the best public interest for the Federal Government to design, construct, and operate full-scale facilities to develop and demonstrate new ways of pollution control. Such facilities could be built in cooperation with existing or new municipal installations or at Federal installations.