ment should be conducted where discharges of thermal significance are contemplated.

Such studies might include, but not be limited to:

(a) Natural background conditions of temperature, ecology, base flow, and physical and biological character of receiving waters

(b) Stream geology, hydrology, tides, currents, and man-made barriers

(c) Climate, winds, critical summer temperatures, and general meteorological conditions

(d) Effects upon assimilative capacity of receiving waters

(e) Stratification of heated liquids

(f) Need for full-channel or part-channel diffusion works

(g) Heat transfer calculations, against environmental factors determined above, to assess magnitude of expected change in receiving water quality.

These factors should be evaluated against the folowing criteria:

Trout waters

No thermal discharges will be permitted to waters classified for trout, stocked with trout, or supporting a naturally occurring propagation of trout, or in upstream reaches of such waters as would cause adverse effects thereon.

Nontrout waters

1. *Mixing zone.*—The mixing zone will be separately determined for each discharge so as to minimize detrimental effects. Fish and other aquatic life shall be protected from thermal blocks by providing for a minimum fifty percent stream or estuarine cross-section and/or volumetric passageway, or establishing artificial fishways where considered necessary.

Generally, the surface water temperature shall not exceed 90° F. within the mixing zone. Consideration will be given to effects of each discharge based on hydrodynamics and other factors of receiving waters.

2. *Outside mixing zone.*—Stream temperatures in excess of 86° F. will not be permitted after mixing. Further, no permanent change in excess of 5° F. will be permitted from naturally occurring background temperatures.

In multiple discharge situations stream capacity to meet such criteria will be apportioned among the discharges.

3. *Outside mixing zone: Fresh surface water classes.*—Temperature change rate shall be limited to 2° F. per hour, not to exceed 9° F. in any 24-hour period, further limited in that for any seven day period the average change will meet the 5° F. change of background criteria stated in item 2 above.

4. *Outside mixing zone: Tidal salt water classes.*—Discharges shall not raise monthly means of maximum daily temperatures more than 4° F. from September through May, nor more than 1.5° F. during June, July, and August.

Temperature change shall not be more than 1° F. per hour, not to exceed 7° F. in any 24-hour period at maximum, except when natural phenomena cause these limits to be exceeded.

Where necessary, cooling towers or other devices must be installed to meet these stream criteria. The State Conservation Department will act as a consultant to the Health Department insofar as fish life and aquatic biota are concerned.

This Bulletin was developed to advise and provide guidance to engineering firms, industries and others of water quality objectives and requirements for thermal aspects of discharges to the surface waters of New York State.

ROBERT D. HENNIGAN,
Assistant Commissioner, Division of Pure Waters.

Mr. CARPENTER. Let's get these other questions on the record.

Have you made any attempt to transfer space or military research results to application in pollution control? What mechanisms do you have to try to use such on-the-shelf technology. What is your experience so far? What would you recommend to improve interagency technology transfer?

In other words, have you gone to NASA or the Atomic Energy Commission and talked with their technology transfer people in terms