COMMENTS BY DONALD SCHWINN ON THE DRAFT 208 CAPE COD AREA WIDE WATER QUALITY MANAGEMENT PLAN UPDATE-AUGUST 2014

NOVEMBER 19, 2014

TO THE READER:

Before I comment on the Plan I believe that telling you my background will help in your understanding of my comments.

I was professionally engaged in the practice of wastewater engineering for over 40 years. This included research, planning, design and operation of more than 100 facilities ranging in size from cluster septic systems serving a dozen homes to municipal systems serving populations of more than one million persons. As a professional I started working for the Town of Barnstable on nitrogen removal at the Hyannis WWTP and wastewater facilities planning for the eastern portion of the Town. After my retirement I continued to serve as a volunteer to the Town. I am now a Member of the Town's Citizens Advisory Committee for Wastewater Planning. I have been Vice-President of Three Bays Preservation Inc for more than 10 years and have worked closely with Lindsey Counsell, our Executive Director, on wastewater and related issues in that watershed.

One of the overriding issues in my mind relates to long-range wastewater goals. I think we need to question any wastewater treatment option that relies on biota in our wetlands, bogs, ponds and estuaries to act, either by dilution or by assimilation, as wastewater treatment mechanisms. To me the most satisfactory solution is not to let partially treated wastewater into the environment, but instead to collect it directly from its source and treat it to whatever level is environmentally necessary before releasing it to our groundwater and thence to our estuaries. I recognize that this can only be achieved over a long period of time but with the ever-increasing surprises we get on new contaminants, it is only by collection and proper treatment that we can be certain of controlling any contaminant we encounter. This is the long-range goal I would advocate.

Now to my comments.

In general I found the report to be an excellent summary of the myriad of factors affecting the determination of appropriate solutions to our nitrogen pollution problem. Hopefully, Barnstable's Comprehensive Wastewater Management Plan, delayed by the Massachusetts Estuaries Program and the debate over its computerized model, as well as this 208 Plan, can now move ahead to detailed planning of facilities needed to be built to solve the nitrogen and related nutrient issues.

One major area in which the report is deficient relates to life cycle costs. In USEPA's "Clean Water and Drinking Water Infrastructure Sustainability Policy" (http://water.epa.gov/infrastructure/sustain/upload/Sustainability-Policy.pdf) issued in 2010 cost effectiveness over the full life cycle of an infrastructure investment is stressed many times. And in its followup document "Planning for Sustainability"

(http://water.epa.gov/infrastructure/sustain/upload/EPA-s-Planning-for-Sustainability-Handbook.pdf) in the Foreword and in the document itself "full life cycle cost is stressed again and again. In fact, it is implied that if full life cycle costs are not considered, a proposed project will not be funded.

The existence of these USEPA documents and policies is erroneously omitted from the report and does not appear in the report's references.

Another area of the report I have difficulty with is the frequent reference to Cape Cod's low density as a driving force for non-conventional systems. There is no reference to the fact that there are many neighborhoods of 50 homes or more on ½ acre or less lots that lend themselves well to collection systems and either centralized or decentralized treatment.

In general one gets the impression from the report that conventional treatment technologies have been the same over time. This is far from the truth as there are now many options for nitrogen removal that were originally labeled as innovative. Several of the early pilot plant successes were built at full scale and after a few years, failed. These included ammonia stripping in cooling towers, ion exchange with clinoptilolite, and breakpoint chlorination. I was personally involved with the Hyannis WWTP in the 1980's proving that nitrification and denitrification could be performed in the same tank, an idea that was considered heretic by many at that time but is now the accepted approach to biological nitrogen removal. And I learned that it takes several years operating at full-scale before the operational and performance issues of a specific technology can be fully understood.

The widespread use of small-diameter pressure and vacuum sewers is another recent practice initially rejected as innovative and untried.

Executive Summary

In the INTRODUCTION, third paragraph of the second column the words are a damnation of the thousands of successful treatment facilities throughout this country and the civilized world. There may be some projects that are "too costly to build and maintain, and unimaginative designs…" but on a national scale these are a tiny fraction of the projects in place.

On page iii under "POPULATION GROWTH" the statement is made that Cape Cod is missing urban density characteristics. In the Town of Barnstable and in other Towns west of Chatham there are many neighborhoods of 50 or more homes on ½ acre or less lots that would meet urban fringe density standards that equate to 1.6 persons per acre. It is those developments that are in watersheds requiring high nitrogen removal that should be the initial targets for collection systems and cluster or small satellite treatment facilities, or in the case of the Town of Barnstable, possibly connected to the Hyannis WWTP.

On page xiii "Why Hasn't There Been More Progress" the summary dodges the fact that although estuaries such as the Three Bays have been in violation of MADEP water quality standards for 15 to 20 years, the use of septic systems in those watersheds, the cause of the violations, was allowed to continue.

CHAPTER 3

Under "USER INFORMATION " and "GENERAL NOTES". These sections and other sections of the report seem to ignore the life cycle of each of the technologies presented in the chapter. For example it is known that the life of sewers, especially those constructed with modern materials, can be measured in hundreds of years. And there are many treatment plants in the USA that have been in successful operation for 75 to 100 years, likely with some upgrades to meet new standards.

The chapter goes into great and excellent detail about the workings of Innovative and Alternative technologies. It also describes in detail the workings of various solids processing methods. However it does not describe in any detail the workings of the liquid side of conventional or advanced conventional treatment technologies. These would be:

-Primary treatment
-Biological treatment including nitrogen removal
-Chemical and biological phosphorus removal
-Effluent filtration processes
-Granular carbon adsorption
-Reverse osmosis
-Disinfection
Giving these technologies the same detail as the others will give the layman a more complete picture of all the technologies.

Page 3-17 the discussion of trench PRB's should mention that in areas where high ground surrounds the estuary, such as in the Three Bays area, the trenches would have to be excessively deep and with the sandy soils would require sheeting to prevent cave-ins during construction.

CHAPTER 4

Although the watershed approach has been known to professionals for a long time, The report does well to further advocate that approach.

Page 4-5 In the last paragraph the last sentence should be changed to: "Some disadvantages of conventional technologies include the higher cost of constructing collection systems in areas of lower population density and the fact that…." The way it is written makes it seem that the entire Cape is low density when there are many high density neighborhoods.

Page 4-9 the first paragraph wherein it states that seasonal populations cause facilities to be overbuilt 48 of 52 weeks a year is an exaggeration. The shoulder months of the year are nearly as populous as the peak month.

And in the first paragraph in the second column was the assumed stormwater and fertilizer nitrogen reduction applied equally to the Traditional approach?

Page 4-10 in the third column there seems to be a typo. The text says four alternative technologies when 10 are listed.

Page 4-17 The sub-paragraph labeled .3 contains the essence of how we need to solve the nitrogen problem—look for those highest density areas in the most polluted watersheds for the construction of sewers and decentralized or centralized treatment. And install innovative technologies in other areas unlikely to be sewered.

Incidentally there seems to be a typo in the numbering of the sub-paragraphs.

CHAPTER 5

As mentioned in my preamble on life cycle costs, USEPA's Policy entitled "Clean Water and Drinking Water Infrastructure Sustainability Policy" should be added and discussed in this chapter of the report.

PAGE 5-9 under "Comprehensive Wastewater Management Plans" it should be stated that that a major goal of these plans is to arrive at a buildable solution that defines the physical components to be used and where and when they should be constructed.

CHAPTER 7

PAGE 7-2 the second paragraph states that "The Water Qualities Matrix, discussed in Chapter 3, provides a "confidence rating" for each technology…" I could find no such ratings anywhere in Chapter 3.