

CA - Cranbury

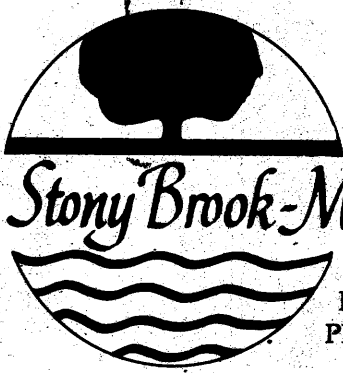
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Coverletter

- Watersheds Assoc.'s amendments  
to sections III A.Z.A, III A.Z.C. and  
Bibliography of report

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# Stony Brook-Millstone Watersheds Association

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December 7, 1984

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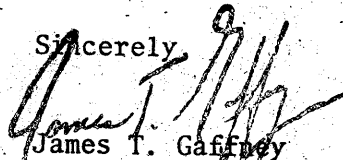
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Dear Mr. Payne,

I am submitting copies of the Watersheds Association's amendments to sections III A.2.a., III A.2.c. and bibliography of our report on Cranbury, Mount Laurel II and Water Resources based upon the Cranbury Township's most recent ordinance revisions. I have also added a copy of the title page and an index.

Sincerely,



James T. Gaffney  
Executive Director

JTG/nle  
encs.

**CRANBURY, MOUNT LAUREL II & WATER RESOURCES**

**Stony Brook-Millstone Watersheds Association**

**November 1984**

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III. A. 2. a.

- a. **Objective:** To maintain the proportion of precipitation which is recharged to ground water each year.

Four approaches to regulating groundwater recharge are discussed here. These are the following:

- i. Storm Water Management;
- ii. Reduction in Impervious Coverage;
- iii. Augmentation of Recharge;
- iv. Clustering.

i. **Storm Water Management:**

Water which recharges an aquifer is storm water. Recharge to groundwater should be primarily regulated by a performance standard which requires the following:

The volume of surface runoff per storm event from a site or other contiguous area shall be no greater after development than before development.

The township's most recent ordinance for storm water management reads as follows:

D. In order to duplicate as nearly as possible natural drainage conditions, regulations and control of stormwater runoff and erosion for any land area to be developed shall be through on-site water detention and/or ground absorption systems which include, but are not limited to the following:

1. Detention areas...
2. Rooftop storage...
3. Dry wells or leaching (infiltration) basins...
4. Porous pavement, concrete lattice blocks or gravel...
5. Any system of porous media, such as grass swales or gravel trenches...
6. Any combination of the above mentioned techniques...

Cranbury's new ordinance is a sizable improvement over its previous ordinance. Their previous ordinance was clearly directed to just monitoring storm water run off. If just peak runoff is controlled, the post-development volume of runoff leaving a site is usually greater than that during pre-development, because it only controls the amount of water leaving a site at one point in time. No longer does peak runoff seem to be the controlling factor.

We are most encouraged by a new Section in Cranbury's ordinance (150-58) Preservation of Existing Natural Resources or Man Made Assets, particularly subsection 2 which reads as follows:

The subdivision or site plan shall preserve existing critical areas on the site. Construction over areas designated as good or excellent for ground water recharge should be designated [sic] so as to create no net reduction in recharge capability over the total area of the site. On these location the use of infiltration basins should be encouraged.

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We feel that Cranbury Township needs to current language to read:

The subdivision or site plan shall preserve existing critical areas on the site. Construction over areas designated as good or excellent recharge shall be designed so as to create no net reduction in recharge capability over the total areas of the site and to maintain the proportion of precipitation which is recharged to ground water each year. On these locations the use of infiltration basins and other methods of recharge protection shall be encouraged.

We feel it more than appropriate that Cranbury Township should identify aquifer recharge areas as a critical areas in the identical way done for South Brunswick Township on pg. 7 of the Proposed Mount Laurel II Compliance Program for Cranbury Township, New Jersey prepared by Raymond, Parish, Pine & Reiner, Inc.

We recommend that Cranbury Township make improvements to its Environmental Impact Assessment Section (150-100).

Under Section (2) in the section "written and graphic material" to be presented is described, we hope you will consider the following changes:

(ee) Subsurface Water. A specific reference should be made to the Middlesex County's study: Recommended Action to Protect Groundwater Recharge Quantity and Quality.

(c). Impact

- (ee) Reduction of ground water capabilities should be amended to include
1. Net loss of recharge capacity provided by all impervious surfaces or changes in topography
  2. Net quantity of water lost to Cranbury Township water system: such as public water and sewer flows
  3. Common open space preservation techniques

ii. Reduction in Impervious Cover:

There are numerous ways in developing a site by which impervious cover, which blocks water from recharging the groundwater, can be reduced at lower cost. For instance, Cranbury's ordinance has called for parking spaces of 9' width and 18-1/2' length. The design standards of the Watersheds Association call for large car spaces not to exceed 8'6" in width by 17' in length, and small car spaces not to exceed 7'6" in width and 15' in length. [19] This change would reduce the space, paving, and recharge augmentation required for large cars by 15% and for small cars by 48% and even more when car stalls are not angled at 90 degrees. We also recommend the Drachman System of parking lot stripping. [20]

Curbings create cover which is often unneeded and which causes storm water runoff to pond instead of flowing in sheets. Sheet flow can more

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III. A. 2. a.

readily percolate into the ground because it causes a thinner film of water covering a larger area. Curbings with gaps are also useful. We recommend a minimum of curbings.

Cranbury's current ordinance for sidewalks has a 5' minimum width requirements. We recommend a minimum width of 4'. In many developments we would recommend no sidewalks, or sidewalks only on one side of the street.

Also suggested is the use of porous paving for parking areas, driveways, and other surfaces which are not extensively used. Looking at such details will not only save water, but also money and the aesthetic appeal of the development. Green grass is much more pleasant to look at and walk on than concrete or macadam.

Limitation on the percentage of impervious coverage allowed is essential, if maintenance of the amount of water recharged to the ground is to be achievable. With too much coverage it becomes either too impractical and costly, or else impossible to recharge all the water that should not run off an area. Even the expensive method of pumping water back into the ground can be impossible, if there is more water to recharge than the aquifer around the well can receive.

The Lower Raritan/Middlesex County Water Resources Management Program has recommended coverage, or impervious surface requirements, for land uses. [21] A comparison of the Middlesex County recommendations with the current Cranbury regulations follows:

Zone	Maximum (Impervious Surface) Requirements	
	Middlesex County	Cranbury
PUD	n/a	40%
A-100	20%	No requirements
R-LI Residence - Light Impact	20%	No requirements except for open space: 10% wooded areas and land other than in flood ways, wetlands, channels, or retention basins: 15% active recreation.
R-LD, Residence-Low Density	20%	No requirements
PD-MD Planned Development Medium Density	20%	40%
PD-HD Planned Development - High Density	n/a	40%
OR Office & Research	25-40%	Professional offices... 50%; Corporate office park... 50%; Conference hotel/motel... 50%; Area & bulk... 50%.
C-H Commercial - Highway	25-40%	60%
C-V Commercial - Village	25-40%	No requirements
I-LI Industrial - Light Impact	25-40%	Professional offices... 50% Planned indus. parks... 50% Area & bulk... 50%
I-Industrial Zone	25-40	50%

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### III. A. 2. a.

We strongly advocate that the coverage regulations be changed to allow no more impervious surfacing than recommended by Middlesex County. Middlesex County failed in their effort to quantify maximum impervious surface requirement for planned unit developments. We recommend to the Township Planner that he review page 103 of the Watersheds Association's manuscript Approaches for Open Space Preservation and Utilization for further advice on PUDs.

#### iii. Augmentation of Recharge

Any additional coverage of the land after development, as compared to before development, with both residential and non-residential uses, requires that positive steps be taken to increase the recharge of storm water where the ground is not covered. The Middlesex County document lists various mechanisms by which the runoff from impervious surfaces can be trapped and allowed to infiltrate to groundwater. [22] These include:

- \* Retention/recharge basins;
- \* Injection wells;
- \* Dry wells;
- \* Trenches or swales;
- \* Rooftop detention;
- \* Subsurface drainfields;
- \* Porous pavement;
- \* Porous blankets.

These techniques, and other useful mechanisms for recharging water are explained further elsewhere. [23,24]

There is some mention in the townships' current ordinance on Soil Protection (150-69) of the means that should be taken to manage storm water "to facilitate groundwater." But there is an underlying question on how the detention basins are to be managed so that it keeps recharging groundwater. Besides the initial design and construction of recharge mechanism, there is the on-going need for maintenance. In some cases a regional/shared infiltration basins or other mechanism may be practical. Although the primary method of regulating groundwater recharge is the performance standard, i.e. no increase in the volume of runoff..., the municipality needs to consider how it will manage this program of building and maintaining sufficient recharge mechanisms so that the present proportion of precipitation entering groundwater is not reduced as development occurs.

#### iv. Clustering

An important means of reducing coverage and cost is clustering. We advise that clustering be encouraged in all residential zoning districts. Clustering should be required when a conventional, non-cluster development would adversely affect environmentally sensitive areas of a tract, remove excessive areas of land from agricultural use, or run contrary to the municipal land use plan for open space linkages and park space. [25]

For all major developments we recommend that 40% of the land be set aside



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for common open space. The definition of "common open space" excludes any streets, driveways, parking lots, school sites, club houses, indoor recreational facilities, house lots, private yards, and land owned by a utility authority. Cranbury's recent cluster ordinance contains this definition of "common open space":

An open space area within or related to a site designed as a development that is available for the use of all residents or occupants thereof. Common open space may contain such complementary structures and improvements as are necessary and appropriate for the use or enjoyment of residents, occupants and owners of the development.

This should be changed because it negates a primary purpose of open space which is to retain recharge areas. Our definition of "impervious surface" is "the building coverage plus the areas of all impervious surfaces on a site, such as parking areas, driveways, service areas, streets, walkways, patios and plazas, expressed as a percentage of the total lot area."

Cranbury requires that a minimum of 25% of the total residential development shall be left as common open space. Section (150-79) specifically states that common open space shall be divided in this manner:

- (a) a minimum of ten percent (10%) of the gross area of the development shall be retained in natural features, such as significant wooded areas, and usable open space, which shall be defined as lands other than in channels, floodways, waterbodies, wetlands or retention basins.
- (b) active recreation facilities may consist of any of the following:
  - (1) Trails and bikeways
  - (2) Playlots
  - (3) Playgrounds
  - (4) Tennis courts
  - (5) Swimming pool

Such land uses either require impervious surfaces, or else compact the soils so water can not percolate through it. In order to maintain recharge such areas should not be classified as "open space". Cranbury Township should amend the General Provision Section of their regulations to differentiate between the two uses of open space: natural features protection as user oriented recreational facilities.

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**III. A. 2. c.**

**c. Objective: To maintain or decrease groundwater withdrawal rates.**

In order to allow no deterioration in the present groundwater resource, it is, of course, essential that no more water than at present be pumped from the ground. In order for Mount Laurel II housing to be built, extra water supplies will likely be needed. In order for an equilibrium between available water supplies, and water demands to be achieved, water conservation measures, or demand management, must be a predominant component in the whole water supply strategy for Cranbury. These are the approaches to decreasing groundwater withdrawals which we shall examine:

- (a) Limit pumpage;
- (b) Build new surface water supplies;
- (c) Import surface water supplies;
- (d) Conserve water.

**(a) Limit pumpage.**

The State will not permit any new wells drawing over 100,000 gallons per day. However, smaller wells can be built without the State's permission. We urge that Cranbury, in so far as reasonable, prohibit the construction of new wells. Any new wells built should be consistent with the objective of decreasing groundwater water withdrawal rates.

**(b) Build new surface water supplies.**

Any use of surface water which would decrease the dry weather base flow of a stream would be counter to the objective sought. Base flow comes from groundwater. To use it, instead of allowing it to flow downstream, would change for the worse the downstream ecosystems and the pollution in the Millstone River. However, storm water that runs off into streams is lost water unless it is caught in a surface reservoir or other storage system. This surface runoff water may be caught by flood skimming, or by piping roof and pavement runoff into cisterns. In semi-arid lands catching and storing storm water for water use is commonplace. Technologies available ought to be usable in Cranbury, especially for agricultural use. (30)

**(c) Import surface water supplies.**

Surface water can be imported from surface water supplies via the Elizabethtown Water Company. The company now has rights to enough water to supply Cranbury. However, we strongly advise that Cranbury carefully consider the disadvantages to using water from Elizabethtown. These disadvantages include the following:

**A Poorer water quality.**

The water is collected from over a large catchment area and carries many different compounds. Although the company has one of the best treatment facilities in New Jersey, it still does not remove all of these materials. Furthermore, the water has to be moved long distances from the treatment plant to Cranbury. In this process heavy chlorination is required to keep the water bacteriologically safe, but chlorination forms toxic chemical compounds in the water. Also, dirty or leaky pipes can introduce new contamination.

**A Cost.**

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### III. A. 2. c.

Elizabethtown water is more costly than groundwater, and its cost will rise as demand increases.

#### A. Future availability.

As pointed out in section III. A., demand for water from the Elizabethtown Water Company is likely to increase very rapidly in the near future. At some future time, probably before the year 2000, the company will not have enough water to supply all its customers. It is likely to discontinue service to its distant customers first, such as Cranbury. Thus, importation of water is the least desirable method mentioned here.

#### (d) Conserve water.

It is imperative that Cranbury carry out an aggressive program to conserve water. Only by major reduction in demand can the municipality achieve both maintenance of the current groundwater resources and livable, affordable housing for low and moderate income people. There are numerous references on how to conserve water, such as those listed in the bibliography. (31, 32, 32a). The New Jersey Department of Environmental Protection has an Office of Water Conservation, which should be contacted for aid. Municipal ordinances should be amended to make aspects of water demand management mandatory. Requirements for plumbing fixtures in new development is a type of conservation measure which can be made obligatory. We advise that regulation of plumbing fixtures be of the performance standard type, because if a toilet does not flush the first time, then more water is used to get it to flush. Most important, however, is to make water conservation a community project so everyone starts thinking of ways that they can use less water.

We encourage the people of Cranbury to make saving water the "in" thing to do. We wish them well in their efforts to solve their piece of the water crisis in New Jersey. The Stony Brook-Millstone Watersheds Association is here to help in these efforts.

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III. A. 2.

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