



March 14, 2013

Elizabeth Semple, Acting Director
NJ Department of Environmental Protection
Division of Coastal and Land Use Planning
401 E. State Street
PO Box 420, Mail Code 401-07C
Trenton, NJ 08625

RE: Proposed Cape May County Wastewater Management Plan (WMP) Future Wastewater Service Area (FWSA) map amendment

Dear Ms. Semple,

The undersigned members of the South Jersey Bayshore Coalition (SJBC) respectfully offer the following comments regarding the Cape May County Planning Department's Future Wastewater Service Area (FWSA) map. These comments, water supply analysis and Appendix A supplement the comments submitted by the SJBC on February 27, 2013, at the NJDEP Cape May County public hearing.

The SJBC is a collective of environmental and cultural organizations that seek to preserve the cultural and natural heritage of New Jersey's Delaware Bayshore region. Several SJBC members have been actively involved in the WQMP mapping process and have consistently advocated for the protection of many of the environmentally sensitive sites and areas, which the Department previously proposed to withdraw from future sewer service. The SJBC thanks the Department and Cape May County Planning Department for its consideration of these comments.

We urge the Department to follow the WQMP Public Notice and its rules by excluding all environmentally sensitive areas from the FWSA map, including areas mapped as endangered and threatened wildlife species habitat. In particular, the SJBC supports the mapping that is consistent with the data contained in the Department's Landscape Maps of Habitat for Endangered, Threatened or Other Priority Species ("Landscape Maps") Versions 2.1 and 3.1. Both Landscape Maps must be used because Version 2.1 is specifically identified in the Public Notice, and Version 3.1 is specifically referenced under the title "Landscape Project Data" by a link (<http://www.nj.gov/dep/gis/install.html>) at N.J.A.C. 7:15-5.24 (b)1. As described in more detail below, in many cases the FWSA mapping unlawfully ignores Landscape Map Version 2.1 or 3.1. Both Landscape Maps must be used.

The Cape May County map should be amended. The legend should read existing or proposed "future wastewater service areas" and not existing or proposed "sewer service areas." The former includes areas to be served by both sewers and septic systems, while the latter includes only sewers.

The NJDEP should not adopt the proposed Cape May County FWSA map as proposed, because it wrongfully includes all Pinelands Villages, regardless of circumstances, planning considerations or municipal consent, in expanded sewer service areas; and because it incorporates land into sewer service areas that are environmentally sensitive under the standards of the Water Quality Management Planning Rules at NJAC 7:15-5.24. The proposed FWSA would include all Villages in expanded sewer service areas without any basis in applicable Pinelands, Water Quality Management Planning (WQMP) or other land use regulations or municipal planning decisions and objectives.

In addition, the SJBC also has concerns about over-withdrawals from the aquifers and the resulting stream and river flow depletion that would accompany growth in the proposed Future Wastewater Service Areas of the WQMP, and water quality/natural resource issues that would ensue. The purpose of a WQMP is to establish policies, sewer service areas, procedures, and standards, which, wherever attainable, help to restore, enhance and maintain the chemical, physical and biological integrity of the waters of the State, including ground waters. We ask that the NJDEP follow their regulations and policies regarding water supply.

Upper & Dennis Townships

We object to the mapping of SSAs in the Pinelands Villages of Belleplain, Dennisville, Eldora, North Dennis and Petersburg and the Pinelands Town of Woodbine. More specifically The SJBC fully concurs with the comment letter dated Feb 15, 2013 from the Pinelands Preservation Alliance regarding the Cape May County Future wastewater Service Area Map. The proposed maps are not consistent with the WQMP Rules and wrongfully designate Pinelands Villages as Future SSA, based on erroneous guidance. Therefore, the maps should not be adopted as proposed.

In addition, no environmentally sensitive areas within proposed CAFRA Centers or Pinelands Villages and Towns, such as extensive wetlands and critical habitat for threatened and endangered species, should be mapped as future SSA. Examples of critical habitat within CAFRA Centers that should be excluded from the Future SSAs include the portions of Dennisville northeast of the railroad line and South of Delsea Drive (State Highway 47), as well as parts of South Dennis and South Seaville documented as habitat for State-endangered red-shouldered hawk (breeding) and Eastern tiger salamander. Widespread portions of Woodbine, mapped as proposed SSA, are constrained by wetlands and feature vast contiguous tracts of Rank 3 and 4 critical habitat. This includes critical habitat of Pine Barrens tree frogs, Cope's gray treefrog, barred owl, red-headed woodpecker, and northern pine snake, among other species. These must be excluded in compliance with the WQMP Rules. Similarly, the pinelands Villages of Eldora and Belleplain also feature critical habitat within proposed SSAs.

Middle Township

Whitesboro

The forested area between the Garden State Parkway South and Route 9, along Lena St. and Waccamaw St. should be removed from the FWSA. The DEP Landscape Project Database Versions 3.1 identify State Threatened and Endangered Species Habitat Rank 4 for State Endangered Eastern Tiger Salamander and State Threatened Barred Owl. Additionally, NJDEP 2007 Wetlands Database indicates that this area is deciduous wooded wetlands

Block 1464, Lots 16, 18, 19, 21, 22, 23, 26, 27, 29

The DEP Landscape Project Database Versions 3.1 identify State Threatened and Endangered Species Habitat Rank 4 for State Endangered Eastern Tiger Salamander and Cope's Gray Treefrog, State threatened Cattle Egret and Migratory Raptor Concentration Site

Rio Grande

Pier 47 Inc Property, Block 1526, Lot 1 and Block 793, Lot 21 off Route 47 towards Wildwood Crest
NJDEP 2007 Wetlands Database indicates that this area is saline marsh wetlands

Cape May Court House

West of Honeysuckle Lane and Route 620, North of Route 618, South of Sound Drive.

The DEP Landscape Project Database Versions 3.1 identify State Threatened and Endangered Species Habitat Rank 4 for State endangered Eastern Tiger Salamander and Cope's Gray Treefrog and State Threatened Barred Owl

NJDEP 2007 Wetlands Database indicates that this area is coniferous wooded wetlands

Conifer Property- Block 56.01, Lot 46

The DEP Landscape Project Database Versions 3.1 identify State Threatened and Endangered Species Habitat Rank 4 for State Endangered Eastern Tiger Salamander and Cope's Gray Treefrog and State Threatened Barred Owl and Cattle Egret. This property is entirely within the Cape May National Wildlife Refuge acquisition boundaries and almost-completely surrounded by Refuge-owned land. The US Fish and Wildlife Service's Comprehensive Conservation Plan (CCP) (www.fws.gov/northeast/planning/Cape%20May/PDF/CPYCCP.pdf) completed in 2004 states that, "there are 12 listed species in and around Cape May Refuge that are federally-listed endangered and threatened" (CCP, pg 21). It also states that, "there is a strong potential for their occurrence on lands currently owned by the Refuge, or proposed for acquisition" (CCP, pg 21). According to NJDEP's Landscape Project Vernal Habitat Database, there are at least three state-certified vernal pool wetland habitats adjacent to this property on the adjoining Refuge-lands. These habitats are protected in New Jersey. State documents indicate that pool-breeding amphibian species travel distances ranging from 400 to 4,000 feet from vernal pools to surrounding terrestrial upland habitat. Since several vernal pools harboring documented State Endangered amphibians occur adjacent to the site, there is a very high likelihood that protected species both occur on, and utilize the Conifer Property.

Lower Township

Lower Township is an incredibly important "stopover" and breeding area for migratory birds. The land is bordered on the East and the West by the Atlantic Ocean and the Delaware Bay. Avian species are funneled to this land and depend upon the habitat for food and protection. Threatened and Endangered avian and reptile species are documented in many areas of Lower Township, and no FWSA should be approved. Any water quality concerns can be remediated with an on-site disposal system which returns water to the aquifer. The following offers details about Lower Township's proposed FWSA:

Those FWSA mapped areas along and north of Tabernacle/Fishing Creek Road, adjacent to Lennox Avenue and east to Route 9 are located in a Habitat Rank 4 Forest Area (Deciduous Brush Scrubland). This area contains Natural Heritage Priority Areas, is a Raptor Winter Concentration Area and from the Delaware Bay Species Based Habitat maps, the following species reside in this area:

Species of Special Concern: Kentucky Warbler, Brown Thrasher and State Endangered Species: Bald Eagle, Cope's Gray Tree Frog, Eastern Tiger Salamander

Those FWSA mapped areas adjacent to and east of Route 9, Erma Park, are located adjacent to Cape May National Wildlife Refuge-Coastal Wetlands and Taylor Creek. The NJDEP Landscape maps show this as Rank 4 Habitat with the following species:

Species of Special Concern: Wood Thrush, Little Blue Heron, Tricolored Heron, Glossy Ibis & Snowy Egret; State Threatened Species: Black-crowned Night Heron, Yellow-crowned Night Heron & Cattle Egret

WATER SUPPLY ANALYSIS

The South Jersey Bayshore Coalition (SJBC) has reviewed the proposed amendment to the Cape May Water Quality Management Plan (WQMP), which would adopt a Future Wastewater Service Area (FWSA) map and a designated Sewer Service Area (SSA) map for Cape May County. This amendment proposes significant expansion of FWSAs in Cape May County.

According to the maps, no FWSAs or SSAs are proposed in the southern-most tip of the County, and except for Sea Isle City, none are proposed for the barrier island communities. These municipalities are nearly at build-out and all developable land is already sewered. Most of the remaining developable land in Cape May County is on the mainland, and this is where the proposed amendment to the Cape May County WQMP is focusing future sewers. This expansion will be in conflict with several of the New Jersey Department of Environmental Protection's (NJDEP) statutes, regulations and policies. Below is a description of each inconsistency and deficiency.

Issue #1 – Conflict with P.L. 2011, Chapter 203

The proposed amendment is in conflict with P.L. 2011, Chapter 203, which requires that a FWSA or SSA comply with the NJDEP's regulatory requirements of the 2008 Water Quality Management Planning Rule, N.J.A.C. 7:15, et seq. More specifically, P.L. 2011, Chapter 203 (4) states that "notwithstanding any other law, or rule or regulation adopted pursuant thereto, to the contrary, on or before the 180th day after the date of enactment of this act or such longer time as the commissioner may determine, each wastewater management planning agency, which has not submitted a wastewater management plan prior to the date of enactment of this act, shall prepare and submit to the department at least that portion of a wastewater management plan designating a sewer service area, which shall comply with the department's regulatory criteria. [Underline added]. The department may adopt the entire plan or a portion thereof, and upon adoption, the plan or portion thereof shall take effect. Any preexisting sewer service area designation or wastewater service area designation shall remain in effect until such time as the department adopts the new plan or portion thereof establishing sewer service area designations or other wastewater service area designations, as the case may be."

As per N.J.A.C. 7:15, these regulatory criteria include such provisions and analysis as build-out capacity constraints, nitrate dilution, water supply needs and capacity analysis, etc. Indeed, the NJDEP acknowledges that these provisions have not yet been completed in its Wastewater Management Plan Update – Status found in http://www.nj.gov/dep/wqmp/docs/wmp_tracker.pdf. Since the regulatory criteria provisions have yet to be satisfied, the proposed Cape May County WQMP/FWSA cannot be approved.

Issue #2 – In Conflict with the Current New Jersey Statewide Water Supply Plan

N.J.A.C. 7:15-5.25(f) specifies that the Department shall not adopt an amendment to a wastewater management plan if water supply needs associated with that plan are in conflict with the most current New Jersey State Water Supply Plan (NJSWSP). The most current plan is the 1996 NJSWSP, which indicates that Cape May County is in water supply planning area #23. According to the plan, the planning area had a 1990 water supply surplus of 4 million gallons a day (MGD), but was projected to have a water supply deficit of 1 MGD in 2010 and a 7 deficit by 2040 (NJDEP, 1996, pages 93 – 95). It described that the planning area is vulnerable to saltwater intrusion due to the fact that it is nearly surrounded by the Atlantic Ocean and the Delaware Bay, that there is little potential for sources of surface water, and the high summer demands that accompany the tourist season. The plan specifically declares that the yield of the shallow aquifer system (primarily the Cohansey aquifer) has been exceeded in the southern Cape area, allowing saltwater to replace formerly freshwater

supplies. It also underscores that the deeper Atlantic City 800-foot sand aquifer is being “mined” and the saltwater front is moving toward existing wells.

The 1996 plan mentioned that increased future demand would exacerbate the potential for saltwater intrusion, and that structural and non-structural water supply regional planning should be conducted and implemented. Among the initiatives that were recommended to mitigate the saltwater intrusion problem are:

- 1) Development of a countywide water conservation program. A robust and meaningful conservation plan is paramount to reducing current and future water demand in order to slow the advancement of saltwater intrusion. Indeed, the Cape May County Board of Chosen Freeholders received a \$125,000 grant in 1995 to: a) identify water users that characteristically demonstrate the potential for water savings, b) identify the most cost-effective and practical water conservation technique(s) for those users, c) implement these techniques, d) monitor the water savings effectiveness and progress subsequent to implementation, and e) develop a manual that can be used by other counties to reduce water use. The proposed target goal was to reduce countywide water use by 15 percent, with special emphasis placed on the barrier islands and southern Cape May County. The Freeholders placed the responsibility of implementing this plan on the Cape May County Water Resources Coordinating Council.

The water conservation plan proved to not be very successful. Since 1995, potable demand has been trending upwards (NJDEP, 2012, WMA 16), despite a loss of population of about ten percent (US Census, 2013, Cape May County Section). It is speculated that this increase is primarily due to the demolition of smaller homes on the barrier islands where larger units replace them and intensive water use landscaping is installed.

As discussed in detail below, Water Supply Bond funds for a renewed Cape May County water conservation plan have been allocated to the NJDEP as part of the Gibson Bill (<ftp://www.njleg.state.nj.us/20002001/AL01/165.PDF>). The SJBC hopes that a more meaningful demand reduction initiative will be successful this time around. The SJBC believes that a substantial reduction in demand is fundamental to slowing the rate of saltwater intrusion and other negative effects associated with excessive demand in Cape May County. In addition, a significant reduction in water use would result in a reduction in the magnitude of the needed wastewater infrastructure required to meet the County’s future population growth. The proposed WQMP/FWSA amendment is likely based on historic trends in water supply demand; implementation of a substantial water reduction program would reduce the size of pump stations, wastewater treatment plants, operating costs, etc. It is thus essential to develop the required water conservation plan prior to developing the County’s wastewater management plan and designing the needed wastewater infrastructure. This infrastructure would be over-sized, at the expense of the ratepayers.

- 2) The 1996 plan also recommended that these structural alternative water supply options be evaluated: Conjunctive water use of aquifers during peak demand, relocation or creation of new well fields, building of a desalination plant, wastewater reuse, improved interconnections between purveyors, and/or develop aquifer storage and recovery facilities selection and implementation are required to ensure a viable drinking water supply for this region. As also discussed below, most of these alternatives have been evaluated from a hydrologic perspective for southern Cape May County by the United States Geological Survey (USGS) as part of the Gibson Bill. This statute also required the NJDEP to develop cost-effective evaluations and engineering designs for sustainable structural alternative water supply options; however, these tasks have yet to be carried out.

As a consequence of the NJSWSP, the Gibson Bill, and the overall need to implement a long-term water supply alternative, it is certain that the cost of future water supplies will grow in Cape May County in the years ahead. It is also obvious that the residents of the County should be aware of these increased costs while also being made aware of the increased cost of future wastewater infrastructure. As discussed above, the cost of both

water supply and wastewater infrastructure may be reduced by conservation. Again, a strong argument is made that the countywide water supply plan required of both the NJSWSP and the Gibson Bill should be performed prior to moving forward with the Cape May County WQMP in an effort to keep the wastewater infrastructure costs as reasonable as possible.

- 3) On-site management program for wastewater reuse and aquifer recharge. The plan indicated that Cape May County's water resources would continue to be stressed as more municipalities turn to regional sewers instead of utilizing individual septic systems as their major mode of wastewater management. The latter would recycle water back into the shallow and deeper aquifers, rather than depletively send the water into the ocean. The plan recommended that municipal zoning that employed primarily septic systems be evaluated and implemented as soon as possible.

The proposed Cape May County WQMP amendment is in direct conflict with the 1996 plan. The recommended amendment would expand regional sewerage in the municipalities most affected by saltwater intrusion, and thus increase the rate of salty water migrating toward public wells. The use of septic systems that recharge the County's aquifers would shrink if the FWSA amendment were to be approved – not increase as called for in the 1996 plan.

- 4) Water resource protection programs. The 1996 plan recommended that wellhead protection and aquifer recharge initiatives be continuously implemented in Cape May County to protect the quality of its drinking water supply. Wellhead protection has been implemented by the NJDEP for the wells in the County that withdraw potable water from water table aquifers, while aquifer recharge has been implemented through NJDEP's Stormwater Management rules, N.J.A.C. 7:8 et seq., which specify stormwater management standards that are mandatory for new major development.

However, substantial development will be effectuated by the proposed expansion of sewers as part of the WQMP amendment on to the recharge area of the Cohansey aquifer, which is a major source of public water in southern and central Cape May County. The aquifer's confining unit begins to become discontinuous in the central part of the County, and further thins in a northerly direction. Large sections of the FWSAs are proposed within the recharge area of this important drinking water supply. The potential is substantial that fertilizers, pesticides, herbicides, accidental spills of chemicals, and other man-made substances will be released into the aquifer. The NJDEP's programs are helpful in reducing these substances from entering the aquifer, but are by no means going to prevent this from happening. The SJBC recommends that the recharge area be delineated as land to be preserved or as an area to be served by single residential septic systems on sufficiently sized lots accompanied by indigenous landscaping. This would have the added benefit of reducing future demand and slowing the rate of saltwater intrusion.

- 5) Institute a network of observation wells. The plan indicates that the USGS made this recommendation in order to better monitor and more accurately predict the advancement of saltwater intrusion. Since this recommendation was made, additional observation wells have been installed, but there are still inadequacies in the network.

For example, the location of the saltfront beneath the Delaware Bay or off the Atlantic Coast is unknown. Without a more precise location of the saltfront, the Lower Township Municipal Utilities Authority (LTMUA) and Wildwood Water Utility (WWU) potable supply wells may be impacted by saltwater intrusion well before or well after current predictions. The recent discovery of salty water at the WWU Rio Grande well field is substantiation of this uncertainty. The same is true of the barrier island's Atlantic City 800-foot aquifer potable supply wells; little is known about where the salt front is located along Cape May County's coast.

The USGS, in its most recent investigation, points out many instances where existing data is inadequate, where rudimentary assumptions and inferences had to be made, and where a wide range of model predictions was acceptable because of unavailable aquifer characteristics parameters (USGS, 2009, pages 74 – 111).

In addition, the USGS recently estimated relatively severe declines in ground water levels in the water table aquifers of southern Cape May County, as well as significant reductions in stream baseflow in southern and central Cape May County, as future demand increased (USGS, 2009, page 128). Potential impairment to vernal ponds as a result of pumpage from the LTMUA and WWU supply wells also appears to be occurring (USGS, 2009, pages 60 – 73).

The proposed Cape May County WQMP/FWSA would significantly facilitate these impacts by allowing for substantial new development that would require much more water than is presently used. It is imperative that the amendment address these impacts. An adequate water-monitoring network should be implemented to better understand the potential impacts to the water resources of the County.

Issue #3 – Sustainability Versus Dependable Yield

The Gibson Bill (P.L. 2001, Chapter 165) mandates that the NJDEP “prepare a report on sustainable water supply alternatives within Cape May County, but outside of the pinelands area, necessary to meet the current and future water supply needs of Cape May County while avoiding any adverse ground water or ecological impact on Cape May County.” The statute also states that “during the assessment and the preparation of the report authorized pursuant to this section, the Department of Environmental Protection may issue approvals or allocations for increased ground water withdrawals in Cape May County only upon a finding that such new withdrawals will not accelerate salt water intrusion, lower existing stream base flow or harm ecological functions or wildlife.” The SJBC asserts that these three parameters (not accelerate salt water intrusion, not lower existing stream base flow, and not harm ecological functions or wildlife) comprise the criteria for defining the amount of water that statutorily can be made available for Cape May County.

In contrast, the NJDEP claims that “a sustainable water supply has been defined as preventing the saltwater interface from reaching any of the supply wells to be utilized in the selected water supply design at the 50 year build-out (volume of water demand) for a 100 year period of time” (NJDEP, 2004, page 2). NJDEP did not establish a quantifiable definition for allowable ecological or ground water impacts. The agency did state that “the DWM (Division of Watershed Management) agrees that the selected water supply scenario should not result in the degradation of any ecosystem in such a manner as to change the function of that particular ecosystem” (NJDEP, 2004, page 2).

The above NJDEP criteria for saltwater intrusion established in 2004, however, is inconsistent with the Water Supply Management Act and the Act’s enabling NJDEP’s water allocation regulations. N.J.S.A. 58:1A(3)h of the Water Supply Management Act states that “safe or dependable yield” or “safe yield” means that maintainable yield of water from a surface or ground water source or sources which is available continuously during projected future conditions, including a repetition of the most severe drought of record, without creating undesirable effects, as determined by the department.”

The NJDEP’s water allocation regulations have two similar definitions. N.J.A.C. 7:19 – 1.3 specifies that “safe or dependable yield” or “safe yield” or “dependable yield” means that maintainable yield of water from a surface or ground water source or sources which is available continuously during projected future conditions, including a repetition of the most severe drought of record, without creating undesirable effects, as determined by the Department.”

Further on, N.J.A.C. 7:19 - 6.2 states that “dependable yield of subsurface sources” means that yield of water from a subsurface source or sources available continuously during projected future conditions, including a

repetition of the most severe drought or record, without creating undesirable effects. Undesirable effects may include adverse impact upon other wells of a depth of 50 feet or more, increased risk of introducing or spreading saline water or polluted water in the aquifer or unacceptable reduction of surface flow of streams.”

In addition, N.J.A.C. 7:19 - 6.3(b) 1 states that “a progressive reduction in the potentiometric surface of an aquifer will be considered presumptive evidence that dependable yield of a subsurface source is less than current withdrawals, subject to acceptable evidence to the contrary.”

As can readily be determined by the above, implicit in the definitions in the Act and its enabling regulations is that water availability is a fixed amount of water that can be continuously provided today and into the future without creating undesirable effects. The sustainability criteria that the NJDEP plans to utilize for purposes of the Gibson Bill is in conflict with the statutory and regulatory definitions of available water. The 2009 USGS hydrologic report that was developed as part of the Gibson Bill identifies water supply alternatives that will eventually be impacted by saltwater intrusion. In some cases, the identified water supply options will last only a few decades before they will be lost to advancing saltwater. The Act and its enabling regulations does not allow the NJDEP to define water availability as an amount of water that will sooner or later be contaminated by saltwater migrating into a freshwater source.

The SJBC believes that the Gibson Bill prescribed the criteria for the NJDEP to define water availability, at least in Cape May County. As discussed above, that criteria (not accelerate salt water intrusion, not lower existing stream base flow, and not harm ecological functions or wildlife) comprise the standards that the NJDEP should use for defining the amount of water that statutorily can be made available for Cape May County.

Moreover, allowing billions of gallons of freshwater to be contaminated by salty water, as the water supply options being considered by the NJDEP to meet the water supply needs of the development that the proposed Cape May County WQMP/FWSA would facilitate, is also in conflict with other State of New Jersey statutes and regulations.

For example, N.J.S.A. 58:1A-5 (Water Supply Management Act) states that “the commissioner shall have the power to adopt, enforce, amend or repeal, pursuant to the ‘Administrative Procedure Act,’ P.L.1968, c. 410 (C. 52:14B-1 et seq.) rules and regulations to control, conserve, and manage the water supply of the State and the diversions of that water supply to assure the citizens of the State an adequate supply of water under a variety of conditions and to carry out the intent of this act. These rules and regulations may apply throughout the State or in any region thereof and shall provide for the allocation or the reallocation of the waters of the State in such a manner as to provide an adequate quantity and quality of water for the needs of the citizens of the State in the present and in the future and may include, but shall not be limited to: b) standards and procedures to be followed by diverters to ensure that: (3) the water quality of the water source is maintained and the water standards for the use of the water are met; and e) standards and procedures to be followed to maintain the minimum water levels and flow necessary to provide adequate water quantity and quality.”

In addition, N.J.A.C 7:9B-1.5(a)1 (Surface Water Quality Standards) states that “water is vital to life and comprises an invaluable natural resource which is not to be abused by any segment of the State’s population or economy. It is the policy of the State to restore, maintain and enhance the chemical, physical and biological integrity of its water, and to protect the public health, to safeguard the aquatic biota, protect scenic and ecological values, and to enhance the domestic, municipal, industrial, agricultural and other reasonable uses of the State’s waters.” Last, N.J.A.C 7:9B-1.5(a)2 states in part that “in order to provide adequate, clean supplies of potable water, it is the policy of the State that all fresh waters be protected as potential sources of public water supply.” Based on the above, NJDEP’s proposed water supply and wastewater strategy in Cape May County is in conflict with its own laws, rules and policies.

Last is the issue of sodium in many of the wells in Cape May County. Nearly all Cape May purveyors that use the Atlantic City 800-foot sand aquifer in the southern half of the County already exceed the drinking water standard for this substance (USGS, 2009, page 128). As more water is withdrawn from the aquifer, sodium levels can be expected to increase as more sodium is released from the overlying and underlying clay confining units. This is a form of saltwater intrusion, and it certainly should be one of the “undesirable effects” that the NJDEP should be considering when defining water availability. The SJBC has concluded that the aquifer’s dependable yield has been exceeded (e.g., dependable yield is the amount of water that can be withdrawn without causing undesirable effects).

Issue #4 – In Potential Conflict with the Next New Jersey Statewide Water Supply Plan

The NJDEP committed to developing the next comprehensive NJSWSP by 2003 (NJDEP, 1996, page XIII). Due to frustrations on the plan’s late development, the legislature amended the NJ Water Supply Management Act to specify that the NJDEP prepare and adopt appropriate revisions and updates to the current NJSWSP no later than December 31, 2006 (N.J.S.A. 58:1A-13.3[a]). During the development of the current WQMP Rule, the NJDEP committed to releasing the plan by 2008 (NJDEP, 2008, page 770). The plan has yet to be released to the public.

It is purported that the next NJSWSP will establish a threshold on how much water can be made available from withdrawals from unconfined aquifers and surface water resources in a depletive (e.g., sewerage) and/or consumptive (e.g., irrigation) manner from the HUC 11 watersheds of the state without causing undesirable effects (USGS, [<http://nj.usgs.gov/projects/2454CJ4/>] 2006). The threshold would be used to ensure that these types of withdrawals do not cause excessive losses to streamflow during periods of low precipitation. There are five HUC 11 watersheds in Cape May County including the West/East Creek/Riggins Ditch, Dennis Creek, Cape May Tributaries West, Cape May Bays & Tributaries East, and Tuckahoe River. The Atlantic Coast (34th Street to Cape May Point) is also located in Cape May County and consists primarily of the barrier islands. For purposes of this assessment, this watershed has been consolidated with the Cape May Bays & Tributaries East watershed.

The above threshold supposedly assumes that 25 percent of the difference between the September median flow and the 7Q10 flow of a HUC 11 watershed is available for peak depletive and consumptive water withdrawals from surface water sources and unconfined aquifers during the growing season. The September median flow is typically one of the lower flows that occur throughout the year and the 7Q10 is a flow that is likely to occur during a drought. The NJDEP assumption is that 25 percent of the difference between these two flows can be removed from a HUC 11 watershed without causing severe impairment to natural resources.

Since the water supply information to be used in the next NJSWSP has yet to be released, the SJBC employed the threshold using water supply data readily available and, in general, the same assumptions as that used in the next plan. The September and 7Q10 flow information for the HUC watersheds was derived from the USGS (USGS, 2008) and the water supply information was drawn from the NJDEP (NJDEP, WMA 16 – Cape May, 2005). The SJBC analysis has some uncertainties, including:

- The NJDEP water supply information was for the years 1990 - 1999. There is the likelihood that demand and wastewater amounts have grown in the last 15 years. Thus, the SJBC analysis may be conservative.
- The new NJDEP threshold employs withdrawal demands during the peak summer month, while the 1990 – 1999 NJDEP demands were averaged during the summer months. This again would probably mean that the SJBC analysis may be conservative.
- The NJDEP water supply information did not specifically quantify whether the seasonal demand data was from confined or unconfined aquifers. In order to quantify demands from the unconfined aquifers, the SJBC estimated demand from these resources from the map legend (key for withdrawal data). The consumptive versus the non-consumptive rates that NJDEP employed by the NJDEP were then applied to these SJBC

estimates. The SJBC analysis thus had to make crude assumptions that may lead to either conservative or more generous conclusions.

- The NJDEP water supply information did not specifically distinguish the amount of allocated ground water with respect to whether it was from unconfined or confined aquifer. The SJBC consequently estimated the allocation as a proportion from the amounts withdrawn from 1990 – 1999.
- The SJBC followed the consumptive loss rates from the NJDEP water supply information. The latter did not assess depletive loss rates. For example, a public water withdrawal from the water table aquifer is probably totally depletive to the aquifer since the water likely will be conveyed to a regional sewerage treatment plant and discharged to the ocean. Since these types of losses were not assessed by the NJDEP, the SJBC assessment is almost certainly conservative.
- The SJBC assumed that domestic withdrawals are from the water table aquifer.
- If confined aquifer withdrawals were in the same HUC 11 watershed as that aquifer's recharge area, the withdrawals were assumed to affect streamflow in the same watershed (i.e., similar to that as from a water table aquifer). This too may lead to either conservative or more generous conclusions.

In addition, detailed analysis was conducted by the USGS to estimate losses to streamflow as a result of withdrawals, as well as withdrawals from confined aquifers in Cape May County as part of the hydrologic assessment required of the Gibson Bill (USGS, 2009, pages 128 – 132). The SJBC utilized the USGS analysis to determine the likelihood that current and future depletive and consumptive withdrawals in Cape May would potentially exceed the proposed NJDEP thresholds in the five HUC 11 watersheds.

While the SJBC watershed assessment may not be precise, it does provide insight on the status of Cape May County's water supply. The next NJSWSP is supposedly to be released this year. It should be employed to determine the effects that FWSAs will have on its thresholds. The thresholds have already been employed for several years now to make regulatory decisions in the Highlands. It should also be utilized to make these decisions in Cape May County.

The SJBC also assessed the potential for environmentally sensitive areas (ESAs) and designated uses to be impacted by withdrawals in these watersheds in the next section of its comments.

West/East Creek/Riggins Ditch HUC 11 Watershed

This 45.3 square mile watershed is located in northwestern Cape May and southwestern Cumberland Counties and flows into the Delaware Bay. A small portion of western Dennis Township in Cape May County occupies this watershed. The headwaters of West and East Creeks are in or flow through Belleplains State Park.

According to the FWSA maps for the Township of Dennis that are part of the proposed Cape May County amendment, two Pinelands Villages (Eldora near Route 47 and Belleplains near the Route 550 spur and Route 605) in the watershed are delineated for future wastewater discharges of greater than 2,000 gallons per day (GPD). Both are in the Pinelands Management Area. The map also indicates that two existing ground water discharges of greater than 2,000 GPD will be connected to the Belleplains Pinelands Village. This proposed Pinelands Village is upstream of the State Park. The remainder of the watershed is proposed to be served by individual septic systems with ground water discharges of less than 2,000 GPD. Since no water supply analysis has yet been conducted in the watershed, a water demand build-out of the amount of water that the FWSA would require is not available.

As per Appendix A, the estimated cumulative amount of water available at the outlet of the West/East Creek/Riggins Ditch HUC 11 Watershed is 1.4 MGD. Based on 1990 – 1999 demands, this watershed is presently stressed in accordance with the threshold that is to be used in the next NJSWSP as total depletive and

consumptive demand is estimated at 1.7 MGD, which is 119 percent of water availability (and 139 percent of the 7Q10 – see next comment on effects on ecological resources).

During severe drought, this watershed will experience extreme low flows based on the assumptions in the next NJSWSP. Some stream and wetland reaches of the watershed may go totally dry. There are significant public water supply Cohansey aquifer well withdrawals in the headwaters of Riggins Branch and agricultural water supply withdrawals in the headwaters of the West Branch (see <http://www.state.nj.us/dep/njgs/enviroed/HUC11/WMA16.pdf>). Since headwaters are known to have the least flow in a watershed, this area is quite susceptible to stream and wetland depletion. In addition, there are a number of agricultural withdrawals from the Cohansey aquifer adjacent to where the East Branch flows into the Delaware River. The potential thus exists that salty water will migrate up into the river and cause the freshwater wetlands to be impacted by saltwater intrusion and the possibility of loss of the wells. The potential environmental and regulatory consequences of these impacts are addressed in detail in the next comment.

It is noted that the above represents the effects on the proposed NJDEP that result from 1990 – 1999 water demands. It is quite likely that these previous demands have grown since this time, and the threshold is compromised more than described above. Furthermore, demands from the proposed Pinelands Villages are not included in the SJBC assessment; these villages do not yet have water allocations. In addition, as described further below, the effects of deep aquifer pumpage is not considered in the above assessment.

According to Appendix A, the majority of streamflow and wetland dewatering in the West/East Creek/Riggins Ditch HUC 11 Watershed is currently the result of agricultural withdrawals, followed by purveyor and domestic well withdrawals. If the Pinelands Villages are approved, they will likely be served by public supplies, and potentially have the greatest impact on the proposed NJDEP threshold. As discussed above, no water supply analysis has yet to be performed.

If all current withdrawals in the West/East Creek/Riggins Ditch HUC 11 Watershed eventually withdrew as much water that is allowed in their NJDEP water allocations, it would result in a depletive/consumptive demand loss to the watershed of 2.0 MGD, which is 147 percent of water availability and 168 percent of the 7Q10. Under these conditions, the watershed would be totally dewatered or at least partially dewatered during severe drought conditions if the NJDEP's assumptions are accurate. It is obvious that agricultural and public water supply demand is over-allocated in the watershed. In addition, domestic demand from individual wells will play a greater role in streamflow depletion as the watershed continues to develop, especially if outdoor irrigation is not properly managed. The proposed amendment to the Cape May County WQMP will obviously exacerbate these circumstances.

The above estimated losses in streamflow do not account for additional losses that can be expected as confined aquifer withdrawals increase to meet the water supply needs of the population served by the proposed expansion of sewers in Cape May County (and in Atlantic County since it also uses the regional confined aquifer system). As previously described, much of the land in northern Cape May County is composed of the recharge area for the region's confined aquifers, or is hydraulically connected to this area. The majority of water flowing to the confined aquifer wells is composed of water that originates in the recharge areas, especially where the wells are not too distant from the recharge areas.

There is some evidence that confined aquifer pumpage currently affects ground water levels in the West/East Creek/Riggins Ditch HUC 11 Watershed. Water levels in the Holly Beach water-bearing zone (water table) aquifer in Belleplain State Forest appear to decline a bit more and recover a bit more slowly, possibly due to withdrawals by the WWU (USGS, 2009, pages 59 – 60). If this is indeed the case, pumpage to meet water supply demands from the proposed FWSAs in this watershed, in conjunction with confined aquifer pumpage in other watersheds to meet the water supply demand from the proposed FWSAs in Cape May County (as well as

Atlantic County), will further compromise the NJDEP threshold in the West/East Creek/Riggins Ditch HUC 11 Watershed.

Streamflow depletion in the West/East Creek/Riggins Ditch HUC 11 Watershed has been estimated as demand increases in Cape May County (USGS, 2009, page 128 and page 132). At full allocation, mean baseflow is projected to be reduced by one percent in West Creek and three percent in East Creek. While these reductions appear on the surface to be relatively minor, it is important to note that these are declines in mean baseflow (i.e., 50 percent of the flows are higher, and 50 percent of the flows are lower). Drought flows, such as the 7Q10, occur at a reduced frequency as compared to the mean flow. There is only a ten percent chance of these flows occurring in any single year. These lower flows consequently can be expected to be reduced substantially more than the mean flow. As described above, the SJBC estimates that all of the 7Q10 is currently being “consumed” by current withdrawals in the West/East Creek/Riggins Ditch HUC 11 Watershed, and that these condition will worsen if all withdrawals in the watershed reach full allocation. To make matters even worse, the SJBC assessment does not consider water that is induced from the watershed as a result of confined aquifer withdrawals, nor does it include any new allocations that would be granted to the proposed Pinelands Villages if the WQMP amendment is approved, as well as homes served by private wells and septic systems. As shown in Appendix A, these homes are presently causing a 0.1 MGD consumptive loss in drought flow in the watershed.

From a “macro” perspective, the above issues are of concern to both Cape May and Atlantic Counties for three reasons as wastewater infrastructure is further expanded into the West/East Creek/Riggins Ditch HUC 11 Watershed and water demand grows.

First, the confined aquifer wells of the region will induce ground water into the aquifer in its recharge areas as the FWSAs in both counties are expanded and demand grows. This, in turn, will reduce streamflow even more than estimated above. During future drought, streams and wetlands will be depleted more excessively and for longer durations as water supply demand from the confined aquifers that is generated by the expanded sewer service areas in the future, as well as by upstream agricultural withdrawals. Water-dependent resource impacts will be exacerbated, including those ESAs and impaired waters described above. There are numerous vernal ponds that are likely to be impacted (USGS, 2009, pages 60 – 73). Attainment of designated uses for surface water resources will be a challenge as freshwater flow will experience less dilution or even cease to exist during drought. Impairment of ground water designated uses is likely.

Second, saline water from the Delaware River will travel further up the West/East Creek/Riggins Ditch HUC 11 Watershed as freshwater flow is replaced by brackish water. Where freshwater typically was recharged into the confined aquifers, more and more brackish water will be induced into the water supplies during drought periods. As sea level continues to rise, moreover, the concentrations in the brackish water will increase and migrate further upstream into the recharge areas of confined aquifer. Saltwater intrusion to the region’s confined aquifers will become more severe.

Third, not only will saltwater intrusion be worsened as demand grows in this region, contamination from increased human activity will become more problematic. The sewerage of an area concentrates development, which, in turn, concentrates pollutants. Since much of the expanded sewer service area in the West/East Creek/Riggins Ditch HUC 11 Watershed is in the recharge areas of the region’s confined aquifers, the threat of pollutants entering the drinking water supply will grow. As described below, the above deleterious effects can also be expected in many of Cape May County’s watersheds.

None of these impacts has been addressed in the proposed amendment to the Cape May WQMP/FWSA.

Dennis Creek HUC 11 Watershed

This 41.2 square mile watershed is located in northwestern Cape May just south of the West/East Creek/Riggins Ditch HUC 11 Watershed and flows into the Delaware Bay (see <http://www.state.nj.us/dep/njgs/enviroed/HUC11/WMA16.pdf>). Portions of Dennis and Middle Townships and the Borough of Woodbine occupy this watershed. The headwaters of Dennis Creek are primarily in Dennis Township. The area north of Route 47 and westerly of Route 610 are in the Pinelands Management Area. Nearly all of Woodbine is within the Pinelands Management Area. Most of Dennis Creek serves as the political boundary between Dennis and Middle Townships. The Dennis Creek and Beaver Swamp Wildlife Management Areas, as well as the Great Cedar Swamp, also occupy large amounts of land in the Dennis Creek HUC 11 Watershed.

According to the FWSA maps for the Township of Dennis that are part of the proposed Cape May County amendment, a Pinelands Village just north of Routes 47 and 610 in the watershed is delineated for future wastewater discharges of greater than 2,000 GPD. In addition, three Coastal Area Facilities Review Act (CAFRA) centers are delineated for future wastewater discharges of greater than 2,000 GPD near Routes 47 and 83. The remainder of the Township is delineated as being served by septic systems of less than 2,000 GPD.

The Borough of Woodbine is being proposed as a Pinelands Village with wastewater discharges of greater than 2,000 GPD, along with seven proposed ground water discharge areas with wastewater discharges of greater than 2,000 GPD. The southern and eastern portions of the Borough are delineated as being served by septic systems of less than 2,000 GPD. Woodbine's public supply wells, however, are located in the Tuckahoe River HUC Watershed and assessed for its water supply impacts in that watershed.

The northwestern section of Middle Township is within the Dennis Creek HUC 11 Watershed. This section is delineated as being served by septic systems of less than 2,000 GPD. Since no water supply analysis has yet been conducted in the watershed, a water demand build-out of the amount of water that the FWSAs would require is not available.

As per Appendix A, the estimated collective amount of water available at the outlet of the Dennis Creek HUC 11 Watershed is 1.1 MGD. Based on 1990 – 1999 demands, this watershed is presently at the threshold that is to be used in the next NJSWSP as total depletive and consumptive demand is also estimated at 1.1 MGD, which is 100 percent of water availability and 157 percent of the 7Q10.

During severe drought, this watershed will experience extreme low flows based on the assumptions in the next plan. Some stream and wetland reaches of the watershed may go totally dry as a result of current depletive/consumptive withdrawals. In order of importance, agricultural demand is the predominant reason that the watershed as a whole has reached the threshold, followed to a lesser extent by public water and domestic water supply demand. There are some Cohansey aquifer well withdrawals in the headwaters of the watershed. As previously discussed, these types of wells may contribute to localized stream and wetland dewatering. Because the watershed has reached the proposed NJDEP threshold, in conjunction with the possibility that drought flows are threatened, the potential exists that salty water from the Delaware Bay will migrate into the watershed and cause the freshwater wetlands to be impacted by saltwater intrusion and the possibility of loss of the wells. The potential environmental and regulatory consequences of these impacts are addressed in detail in the next comment.

The above assessment represents the effects on the proposed NJDEP that result from 1990 – 1999 water demands, and is thus likely conservative since demands have increased since 1999. Furthermore, the effects of deep aquifer pumpage are not considered in the above assessment. As previously discussed, the USGS estimated that ground water levels will decline and streamflow depletion will increase in the northern sections of Cape May County as confined aquifer pumpage increases. Consequently, this watershed can be expected to undergo many of the same effects that were described in the comments for the West Creek/East Creek/Riggins

Ditch HUC 11 Watershed. The potential for saltwater intrusion and contamination being introduced into the Cohansey aquifer that serves Middle, Lower and the Wildwoods deserves attention.

If all current withdrawals in the Dennis Creek HUC 11 Watershed eventually withdrew as much water that is allowed in their present NJDEP water allocations, it would result in a depletive/consumptive demand loss to the watershed of 2.5 MGD, which is 227 percent of water availability and 280 percent of the 7Q10. Under these conditions, the watershed would be totally dewatered or at least partially dewatered during severe drought conditions if the NJDEP's assumptions are accurate. It is obvious that the watershed is over-allocated with respect to the thresholds to be employed in the next NJSWSP.

Cape May Tributaries West HUC 11 Watershed

This 45.2 square mile watershed is located in western Cape May from about Goshen to Cape May Point, and is approximately one half of a mile west of Route 9. It consists of several Delaware Bay tributaries including Bidwell Creek, Diaz Creek, Green Creek, and Fishing Creek, and a some Delaware Bay beaches such as Reeds Beach, Kimbles Beach, High Beach, Miami Beach, and Highlands Beach (<http://www.state.nj.us/dep/njgs/enviroed/HUC11/WMA16.pdf>). Western Middle and Lower Townships occupy this watershed. Much of Cape May County's year-round population resides in the Cape May Tributaries West HUC 11 Watershed. The southern section of the Dennis Creek Wildlife Management Area is located in the Cape May Tributaries West HUC Watershed. There are several FWSAs proposed in the watershed.

According to the FWSA maps for Middle Township that are part of the proposed Cape May County amendment, a Designated Center is proposed for the Village of Goshen. The map shows that it will be served by individual septic systems. Goshen is located in the headwaters of Bidwell Creek. Two existing campground with wastewater discharges of greater than 2,000 GPD are located easterly of Goshen.

Relatively large land parcels are proposed to be sewered in the headwaters of Diaz Creek and Green Creek. Wastewater is proposed to be conveyed to either the Seven Mile – Middle Regional Wastewater Treatment Plant or the Wildwood – Lower Regional Wastewater Treatment Plan. Further, large parcels along Route 47 in Green Creek in Middle Township are proposed to be sewered by the Lower Township Municipal Utilities Authority (LTMUA). In addition, the remaining lands within Middle Township are proposed for either: 1) individual septic systems of 2,000 GPD or less, or 2) restricted septic systems of less than 2,000 GPD and less than six residential units. It is unclear what this specific category consists of.

According to the FWSA maps for Lower Township in the Cape May Tributaries West HUC 11 Watershed that are part of the proposed Cape May County amendment, very large land parcels in the Route 47, Fishing Creek Road and Route 9 areas are proposed to be sewered by the Lower Township Municipal Utilities Authority. Remaining lands within western Lower Township are proposed for individual septic systems of 2,000 GPD or less. Since no water supply analysis has yet been conducted in the watershed, a water demand build-out of the amount of water that the FWSAs would require is not available. The WWU and LTMUA have wells in the Cohansey aquifer in this watershed.

Potable supply for Cape May Tributaries West HUC 11 Watershed is primarily from the Cohansey aquifer, although some of this supply during the 1990 – 1999 originated from the water table aquifer. As described previously, the confining unit of the Cohansey aquifer becomes less constricted north of Cape May Courthouse. Pumpage from the confined portion of the Cohansey aquifer can thus cause streamflow depletion and dewater wetlands in these less-restricted areas.

As illustrated in Appendix A, based on the threshold that is proposed to be used in the next NJSWSP, the estimated collective amount of water available at the outlets of the Cape May Tributaries West HUC 11

Watershed is 1.0 MGD. Based on 1990 – 1999 depletive/consumptive demands, this watershed is presently near the threshold as total depletive and consumptive demand is estimated at 0.9 MGD, which is 90 percent of water availability and 60 percent of the cumulative 7Q10 for the watershed. During severe drought, this watershed will experience extreme low flows based on the assumptions in that plan. Some stream and wetland reaches of the watershed may go totally dry, especially in the northern section of the watershed where the confining unit of the Cohansey aquifer becomes less monolithic. Streamflow depletion and wetlands dewatering may also be severe in the southern section of the watershed due to public and agricultural wells in the water table aquifer.

In order of importance, public and domestic water supply demand, followed closely by agricultural demand are the predominant reasons that the watershed as a whole has nearly reached the threshold. Many domestic wells are expected to be connected to the LTMUA and WWU public system in the near future, which will translate to the latter becoming the most problematic water source. There are some public and agricultural water table well withdrawals in the headwaters of the Fishing Creek and Green Creek sub-watershed that may be contributing to localized stream and wetland dewatering. Because the watershed has more than likely reached the NJDEP threshold, in conjunction with the possibility that drought flows are threatened, the potential exists that salty water from the Delaware Bay will migrate into the watershed and cause the freshwater wetlands to be impacted by saltwater intrusion and the possibility of loss of some of the wells. Salty water has already resulted in the loss of many private wells in Lower Township (USGS, 2009, page 11). The potential environmental and regulatory consequences of these impacts are addressed in detail in the next comment, including impacts on vernal ponds.

The impacts described in above assessment may be underestimated. These deleterious impacts represent the effects on the proposed NJDEP threshold that result from 1990 – 1999 water demands; current demand is likely higher and the threshold may have been crossed today. Furthermore, the effects of deep aquifer pumpage are not quantified in the above assessment. As previously discussed, the USGS estimated that ground water levels will decline and streamflow depletion will increase in Cape May County as confined aquifer pumpage increases, especially from the Cohansey aquifer. Based on results of ground water model simulations, water levels in the water-table aquifer will decline as much as 0.7 feet and base flow in streams will decrease as much as 26 percent as pumpage increases in Cape May County (USGS, 2009, page 128). Maximum simulated declines occur near Cape May Court House where reduced confinement and withdrawals from the Cohansey aquifer create conditions for inducement of flow from the water table aquifer. The WWU and LTMUA Cohansey aquifer wells are primarily responsible for these impacts. Most of the water withdrawn by the WWU is exported to the Cape May Bays and Tributaries HUC 11 Watershed, while most of the water withdrawn by the LTMUA is utilized in the Cape May Tributaries West HUC 11 Watershed, but then discharged as treated wastewater to the Atlantic Ocean.

The NJDEP has allocated approximately 7.1 MGD to be withdrawn in the Cape May Tributaries West HUC 11 Watershed. While a significant portion of these allocations is from the Cohansey aquifer, withdrawals from this source may cause reductions in streamflow in the northern part of the watershed. If correct, up to 1.9 MGD in flow would be lost. This amount would cause the NJDEP threshold to be further exceeded. In this case, the threshold would be exceeded by 190 percent and all of the 7Q10 would be consumed (i.e., most or all of the streams in the watershed would be dry during severe drought).

Saltwater intrusion is a major near-term concern in the Cape May Tributaries West HUC Watershed. The hydrologic assessment conducted pursuant to the Gibson Bill estimated that saltwater will intrude into LTMUA well #1 at the current rate of withdrawal by 2050, and will reach (or very nearly reach) LTMUA well #2 and the WWU well field by 2050 if the withdrawals rates were at full allocation (USGS, 2009, page 115). The NJDEP recently made more precise projections, estimating that LTMUA well #1 would be impacted by saltwater intrusion by 2020 and the WWU well field by 2055 (NJDEP, 2010). Even these predictions may be over-

estimated; as previously discussed, there is some evidence that the WWU well field may presently be experiencing saltwater intrusion.

The proposed amendment to Cape May County WQMP and its consequent enlargement of FWSAs will make possible the above impacts unless alternative water supplies and/or robust water conservation and reuse programs are implemented. The Gibson Bill prescribed that a sustainable water supply plan be developed for Cape May County so as to minimize the above impacts. This plan has yet to be completed by the NJDEP.

Cape May Bays and Tributaries East HUC 11 Watershed

This 83.7 square mile watershed is located in eastern Cape May from about Cape May Point to just north of Sea Isle City, and is bordered approximately one half to one mile westerly of Route 9. It consists of numerous bays to the Atlantic Ocean including Jarvis Sound, Richardson Sound, Jenkins Sound, Great Channel, Great Sound, Ludlam Bay, and Corson's Sound. Several minor-in-length tidal tributaries flow into the bays including Cape Island Creek, Swan Channel, Gresse Creek, Gravelly Run, Crooked Creek, Holmes Creek, Deep Creek, Uncle Aaron's Creek, and Ben Elders Creek. The Marmora and Cape May Wildlife Management Areas as well as many shellfish harvesting areas are located in this watershed (see <http://www.state.nj.us/dep/njgs/enviroed/HUC11/WMA16.pdf>).

The Atlantic Coast (34th Street to Cape May Point) HUC Watershed consists of the brackish and saltwater of the bays and barrier islands of Cape May County. For purposes of this assessment, this watershed has been combined with the Cape May Bays and Tributaries East HUC 11 Watershed.

Municipalities that are located in the Cape May Bays and Tributaries East HUC 11 Watershed include West Cape May, Cape May City, southern and eastern Lower Township, Wildwood Crest, Wildwood City, West Wildwood, North Wildwood, Eastern Middle Township, Stone Harbor, Avalon, eastern Dennis Township, Sea Isle City, and eastern Upper Township. Much of Cape May County's summer population resides in the Cape May Bays and Tributaries East HUC 11 Watershed. Many of the bungalows that once existed on the barrier island and bay fronts have been demolished over the last decade or so, and replaced with larger multiple-bedroom summer homes and water-intensive landscaping, driving up water demand. The Cape May Wetlands and Marmora Wildlife Management Areas occupy much of the wetlands immediately easterly of the Garden State Parkway in the Cape May Bays and Tributaries East HUC 11 Watershed. There are several FWSAs proposed in the watershed.

According to the FWSA maps that are part of the proposed Cape May County amendment, no FWSAs are proposed in Cape May Point, West Cape May, Cape May City, Wildwood Crest, Wildwood City, West Wildwood, North Wildwood, Stone Harbor, and Avalon in the Cape May Bays and Tributaries East HUC 11 Watershed. These municipalities are nearly at build-out and all developable land is already sewered. Most of the remaining developable land in Cape May County is on the mainland, and this is where the proposed amendment to the Cape May County WQMP is focusing future sewers.

Several FWSAs are proposed to be served by the LTMUA in western Lower Township on the mainland, on the divide between the Cape May Bays and Tributaries East HUC 11 Watershed and the Cape May Tributaries West HUC 11 Watershed. Further north on the divide between the Cape May Bays and Tributaries East HUC 11 Watershed and the Cape May Tributaries West HUC 11 Watershed, several relatively large properties are proposed for sewers in eastern Middle Township along Route 9. These are proposed to be served by either the Wildwood/Lower Regional Sewerage Treatment Plan or the Seven Mile/Middle Regional Wastewater Treatment Plant. In eastern Dennis Township, three Coastal Area Facilities Review Act (CAFRA) centers are delineated for future wastewater discharges of greater than 2,000 GPD on or near Route 9. The remainder of the eastern part of the Township is delineated as being served by septic systems of less than 2,000 GPD or restricted septic areas (planning flows of less than 2,000 GPD and less than six residential units). As earlier

discussed, it is unclear to the SJBC what the latter consists of since there are no reports attached to the maps for the proposed amendment to the Cape May County WQMP.

Since no water supply analysis has yet been conducted in the watershed, a water demand build-out of the amount of water that the FWSAs would require is not available. Cape May Point, West Cape May, and Cape May City are served by a desalination plant. The plant was built in the late 1990s as saltwater intrusion threatened their last remaining potable wells in the Cohansey aquifer. Lower Township obtains its water supply from the Cohansey aquifer in the western portion of the Township. The NJDEP projects it will lose one of its major wells to saltwater by 2020.

Wildwood Crest, Wildwood City, West Wildwood, and North Wildwood are served by the WWU. The latter obtains its potable supply from the Cape May Tributaries West HUC 11 Watershed from (primarily) Cohansey aquifer wells in southern Middle Township. The WWU previously withdrew water from the Atlantic City 800-foot sand aquifer beneath the barrier islands. It lost these wells decades ago, and turned inland for a freshwater supply. The WWU appears to be threatened by intrusion, perhaps in the near-term as previously described. Both the LTMUA and WWU have preliminarily identified water supply alternatives; these alternative have been projected by the NJDEP to be lost to saltwater intrusion by 2075 and 2085, respectively (NJDEP, 2010).

The remaining barrier islands obtain their supply from the Atlantic City 800-foot sand aquifer. As described below, their wells are threatened by saltwater intrusion over the long-term. Middle Township is served by the NJ American Water Company, which withdraws water from both the Atlantic City 800-foot sand and Cohansey aquifers. While the USGS has made no projections when its Atlantic City 800-foot sand aquifer wells will be impacted by intrusion, the SJBC believes that this impact is a long-term problem.

Appendix A shows the estimated collective amount of water available at the outlets of the Cape May Bays and Tributaries East HUC 11 Watershed is 2.2 MGD. Based on 1990 – 1999 depletive/consumptive demands, this watershed is presently near the threshold that is to be used in the next NJSWSP as total depletive and consumptive demand is estimated at 1.9 MGD, which is 86 percent of water availability and 61 percent of the 7Q10. As a whole, low flows will be somewhat depressed during severe drought in the future. However, because most the wells in the watershed are in the headwaters of many streams, several stream and wetland reaches of the watershed may be more severely affected (see <http://www.state.nj.us/dep/njgs/enviroed/HUC11/WMA16.pdf>). These effects may be especially deleterious in the northern section of the watershed where the confining unit of the Cohansey aquifer becomes less restrictive.

In order of importance with regard to their estimated depletive and consumptive losses, agricultural demand, domestic and public water supply demand followed by industrial demand are the predominant reasons that the watershed as a whole has nearly reached the threshold that will be used in the next NJSWSP. Based on their intensity, public supply and irrigation wells are likely impacting the small tidal streams and wetlands in Lower Township by drawing in more salty water, possibly affecting shellfish harvesting. Agricultural and commercial wells in the central and northern sections of the watershed are possibly having similar impacts. Because the watershed has nearly reached the NJDEP threshold, the potential exists that salty water from the bays will migrate into the watershed and cause the freshwater wetlands to be impacted by saltwater intrusion and the possibility of loss of some of the wells. The potential environmental and regulatory consequences of these impacts are addressed in detail in the next comment.

As is the case with most of Cape May County's watershed, the impacts described in above assessment may be underestimated in the Cape May Bays and Tributaries East HUC 11 Watershed. The above impacts represent the effects on the proposed NJDEP threshold that result from 1990 – 1999 water demands; current demand is likely higher and the threshold may have been crossed today. Furthermore, the effects of deep aquifer pumpage are not quantified in the above assessment. As previously discussed, the USGS estimated that ground water

levels will decline and streamflow depletion will increase in Cape May County as confined aquifer pumpage increases, especially from the Cohansey aquifer. Based on results of ground water model simulations, water levels in the water-table aquifer will decline as much as 0.7 feet and base flow in streams will decrease as much as 26 percent as pumpage increases in Cape May County (USGS, 2009, page 128).

Employing the previously described SJBC assumptions, it is estimated that the NJDEP has allocated approximately 4.7 MGD to be withdrawn in the Cape May Bays and Tributaries East HUC 11 Watershed. This would result in up to 1.9 MGD in flow being lost. This amount would cause the NJDEP threshold to be further exceeded. In this case, the threshold would nearly be exceeded (95 percent) and 67 percent of the 7Q10 would be consumed (i.e., most or all of the streams in the watershed would be significantly stressed during severe drought). The proposed amendment to Cape May County WQMP and its consequent enlargement of FWSAs will facilitate the above impacts unless alternative water supplies, reuse or major demand-reduction initiatives are implemented.

Of all the watersheds in the state threatened by long-term saltwater intrusion (i.e., excessive chlorides, not sodium – see below), the Cape May Bays and Tributaries East HUC 11 Watershed probably leads the way. All of the barrier islands in the watershed use the Atlantic City 800-foot sand aquifer to meet their primary water supply needs. The hydrologic assessment conducted pursuant to the Gibson Bill estimated that saltwater will intrude into Stone Harbor's wells in approximately 800 years at the current rate of withdrawal and 400 years at full allocation (USGS, 2009, pages 128 and 129). When considered in this sole context, the NJDEP and affected parties are not substantially concerned. However, when considered in a larger context, three major issues arise.

First is the question of sodium concentrations increasing over time. Nearly all Cape May purveyors that use the Atlantic City 800-foot sand aquifer in the southern half of the County already exceed the drinking water standard for this substance. This includes Stone Harbor, Avalon, and New Jersey American Water Company at Cape May Court House; sodium concentration in water supplies from Sea Isle City also may exceed standards in the future as a result of continued withdrawals (USGS, 2009, page 128). As more water is withdrawn from the aquifer, sodium levels can be expected to increase as more sodium is released from the overlying and underlying clay confining units. This is a form of saltwater intrusion, except rather than salty water entering the aquifer from beneath the Atlantic Ocean, it is entering the aquifer from its confining units. As previously discussed, this is one of the reasons why the SJBC has concluded that the aquifer's dependable yield has been exceeded (e.g., dependable yield is the amount of water that can be withdrawn without causing undesirable effects).

It appears that it is only a question of time when users of the Atlantic City 800-foot sand aquifer will need expensive alternatives to ensure a safe potable supply. The time might be accelerated if other municipalities turn to the aquifer. For example, new withdrawals from this aquifer are considered an alternative supply for the LTMUA and WWU due to more imminent saltwater intrusion (USGS, 2009, page 139). If this alternative were to be implemented, barrier island wells may be subject to even higher levels of sodium due to the cumulative effects of these new withdrawals.

Another alternative to elevated sodium concentrations in the wells of Stone Harbor, Avalon, and New Jersey American Water Company at Cape May Court House (and eventually Sea Isle City) is to blend their water supplies with water from new Cohansey aquifer wells on the mainland. This may lead, however, to more saltwater intrusion in the Cohansey aquifer, and more streamflow depletion and wetland dewatering than previously predicted.

Needless to say, customers of purveyors that utilize the Atlantic City 800-foot sand aquifer can expect to pay more for their drinking water supplies due to the sodium problem. Planning for alternative supplies for these users has not commenced. Expanding wastewater infrastructure (and its consequent increase in water demand)

as proposed in the recently proposed amendment to the Cape May County WQMP amendment has not factored in this issue.

Second, while it may indeed take centuries for elevated chlorides to advance into Atlantic City 800-foot sand aquifer wells on the barrier islands and Cape May Courthouse, these withdrawals do in fact contribute to more imminent saltwater intrusion in the Estuarine Sand, Cohansey and Rio Grande water bearing zone aquifers, reduce ground water levels in these aquifers, and reduce streamflow and dewater wetlands throughout Cape May County as well as within its recharge area outside of the County. As shown throughout the 2009 USGS report, the County's confined aquifers, unconfined aquifers, and surface water resources are intertwined with those of the region. The proposed amendment to the Cape May County WQMP has yet to take this into consideration. The Gibson Bill prescribed that a sustainable water supply plan be developed for Cape May County so as to minimize the above impacts. This plan has yet to be completed by the NJDEP.

Third is the fact that withdrawals from the Atlantic City 800-foot sand aquifer currently cause ground water declines, streamflow depletion, and wetland dewatering throughout southeastern New Jersey. These withdrawals also contribute to near-term saltwater intrusion in other confined aquifers, such as the Cohansey aquifer in southern Cape May County. These impacts will be exacerbated as demand increases from the aquifer in the decades to come. While it may take hundreds of years for saltwater to reach the wells in the Atlantic City 800-foot sand aquifer, withdrawals are straightforwardly causing severe “undesirable effects” in other resources – now. The aquifer has exceeded its dependable yield, as per the NJDEP statutory and regulatory definitions. The proposed amendment to the Cape May WQMP would unequivocally allow the aquifer’s yield to be exceeded even more.

Tuckahoe River HUC 11 Watershed

This 101.2 square mile watershed is located in northern Cape May County, southern Atlantic County, and a very small section of eastern Cumberland County. The watershed flows into the Great Egg Harbor Bay, which then flows into the Atlantic Ocean. In Cape May County, Upper Township occupies most of the watershed. The Lester G. MacNarama Wildlife Management Area is located at the outlet of the Tuckahoe River HUC 11 Watershed. Major tributaries in Cape May County include the Cedar Swamp Creek and Mill Creek. The western portion of the watershed is in the Pinelands Management Area. The Tuckahoe River is by far the largest freshwater body in the County.

According to the FWSA maps for Upper Township that are part of the proposed Cape May County amendment, two Pinelands Villages/Designated Growth Centers (Tuckahoe and Petersburg off Route 50) in the watershed are delineated for future wastewater discharges of greater than 2,000 gallons per day (GPD). In addition, five new sewer areas with ground water discharges greater than 2,000 GPD are proposed off Route 9. Perhaps the most profound proposal includes a possible sewerage of a section of Marmora to the Ocean City Regional Wastewater Treatment Plant. The remainder of Upper Township in the watershed is proposed to be served by individual septic systems with ground water discharges of less than 2,000 GPD or restricted septic area (planning flows of less than 2,000 GPD and less than six residential units). There were also no maps of proposed FWSAs in the Atlantic County portion of the watershed, so it was impossible to generically assess potential cumulative effects. Since no water supply analysis has yet been conducted in the watershed, a water demand build-out of the amount of water that the FWSA would require is not available.

Appendix A shows the estimated collective amount of water available at the outlet of the Tuckahoe River HUC 11 Watershed is 5.3 MGD. Based on 1990 – 1999 depletive/consumptive demands, this watershed is presently using about 42 percent of the threshold that is to be used in the next NJSWSP and 14 percent of the 7Q10. With regard to the magnitude of estimated depletive and consumptive losses, mining, domestic and agricultural demand, are the predominant reasons that the above milestones have been reached.

As a whole, low flows should not be very depressed during severe drought conditions in the future at the current withdrawal rates. However, there are several locations where water is withdrawn in headwater areas that can have substantial impacts to localized flows including public water supply wells for Woodbine, significant surface water and water table aquifer well withdrawals used for mining operations in Dennis Township, and several agricultural wells near wetlands (see <http://www.state.nj.us/dep/njgs/enviroed/HUC11/WMA15.pdf>). In addition, there may be substantial reductions in ground water levels and subsequent losses to stream and wetland caused by present pumpage of confined aquifer in Cape May and Atlantic Counties. Furthermore, demand has likely increased since the 1990 – 1999 period used in the SJBC analysis.

The SJBC estimates that at full allocation, withdrawals would use about 91 percent of the collective threshold and consume approximately 32 percent of the combined 7Q10 in the Tuckahoe River HUC 11 Watershed. The effects described above would thus be exacerbated, especially those associated with withdrawals in the headwater streams and near wetlands.

The possible sewerage of a section of Marmora and conveying the wastewater to the Ocean City Regional Wastewater Treatment Plant stands out as a potentially large impact to the Tuckahoe River HUC 11 Watershed. All of water used to serve the sewerage area would be depletive and directly reduce streamflow and dewater wetlands. In addition, once one area of a municipality is sewerage, there is a strong possibility that development pressures will exert pressure to expand the sewers to other locations. The end result would thus be substantial changes to the hydrology of the municipality and its environs.

The draft NJSWSP has been completed for some time. In fact, it has been used for regulatory and land use decisions for years as part of the Highlands Plan. The SJBC strongly recommends that the NJSWSP be employed to assess the proposed amendment to the Cape May County WQMP/FWSA, and that the sustainable alternative water supply plan for Cape May County as mandated by the Gibson Bill be completed.

Issue #5 – Major Shortcomings in the New Jersey Integrated Water Quality Monitoring and Assessment Report (Integrated Report).

The Surface Water Quality Standards are used to develop regulatory requirements for other NJDEP programs that will serve to protect the existing and designated uses of the State's surface waters and their designated uses. These programs include the New Jersey Water Quality Management Planning (WQMP) Regulations, New Jersey Pollutant Discharge Elimination System (NJPDES) program, Site Remediation Program, and various programs implemented by the Division of Land Use Regulation. The standards also form the basis for the Department's Integrated Water Quality Monitoring and Assessment Report. The Integrated Report assesses use attainment for all waterbodies of the State, as well as the degree of use impairment, if any. Waterbodies that are impaired due to an exceedance of the standards require the development of total maximum daily loads (TMDLs), which represent the assimilative capacity of surface water for a given parameter of concern.

The Integrated Report evaluates several designated uses in the sub-watersheds of the State's surface water including aquatic life, fish consumption, primary contact recreation, public, industrial and agricultural water supply, and shellfishing. If a particular designated use is not being attained, the Integrated Report lists the possible causes and sources. For example, the designated use for aquatic life might not be attained in a sub-watershed, and low dissolved oxygen might be identified as the cause while the source might be identified as urban runoff/storm sewers.

Streamflow depletion in Cape May County has been documented by the USGS as part of the Gibson Bill (USGS, 2009, page 128). This phenomenon is also comprehensively evaluated in the next NJSWSP. Yet, the Integrated Report list streamflow depletion as potentially problematic in only one out of fifty sub-watersheds (Bidwell Creek). Significant streamflow depletion that results from excessive surface and ground water withdrawals may affect the designated uses of a sub-watershed as much, if not more than excessive pollutants.

If a stream goes dry due to disproportionate withdrawals in its watershed, all of its designated uses are impaired. Without considering streamflow depletion in the watersheds of Cape May efforts to mitigate surface water quality problems can be unsuccessful, especially in cases where depletion is severe.

The NJDEP has already evaluated depletive/consumptive losses in some of the State's watersheds as part of its water quality/natural resource protection programs. For example, the NJDEP incorporated the effects of water withdrawals in its development of the phosphorus TMDL for the Passaic and Raritan Rivers.

The SJBC evaluated potential streamflow depletion in the HUC 11 watersheds of Cape May County, employing the 7Q10 drought flow as a baseline (see comment below). Most water resource managers would agree that substantial reductions in this flow in a watershed could permanently harm its designated uses. As a whole, approximately 87 percent of the collective 7Q/10 of the County is presently consumed by depletive/consumptive withdrawals from surface water and unconfined aquifers. This amount is actually greater. The confined aquifer withdrawals are also affecting low streamflow, but the specific reductions have not yet been quantified. If all withdrawals from surface water and unconfined aquifers are allowed to go to that fully allocated by the NJDEP, 135 percent of the 7Q10 would be lost (not counting the withdrawal effects from confined aquifers). Many stream reaches are likely to go dry, freshwater wetlands converted to brackish water wetlands, and aquatic resources severely degraded. Efforts to restore and maintain the designated uses of the County's watersheds may not succeed in the absence of assessing the effects of losses to streamflow and wetlands.

Issue #6 - Inconsistent with the Surface Water Quality Standards

In the absence of comprehensive analysis, the proposed amendment to the Cape May County WQMP ignores the adverse impacts that the increase in water supply demand that would accompany the expansion of FWSAs and other modes of wastewater management would have upon the waters of Cape May County pursuant to the Surface Water Quality Standards (N.J.A.C. 7:9B-1 et seq). More specifically, N.J.A.C. 7:9B-1.5(a)6 stipulates "existing uses shall be maintained and protected. Designated uses shall, as soon as technically and economically feasible, be attained wherever these uses are not precluded by natural conditions." The designated uses of the state's waters, pursuant to N.J.A.C. 7:9B-1.12, are as follows:

(a) In all FW1 waters the designated uses are:

1. Set aside for posterity to represent the natural aquatic environment and its associated biota;
2. Primary contact recreation;
3. Maintenance, migration and propagation of the natural and established aquatic biota; and
4. Any other reasonable uses.

(b) In all PL waters the designated uses are:

1. Cranberry bog water supply and other agricultural uses;
2. Maintenance, migration and propagation of the natural and established biota indigenous to this unique ecological system;
3. Public potable water supply after conventional filtration treatment (a series of processes including filtration, flocculation, coagulation, and sedimentation, resulting in substantial particulate removal but no consistent removal of chemical constituents) and disinfection;
4. Primary contact recreation; and
5. Any other reasonable uses.

(c) In all FW2 waters the designated uses are:

1. Maintenance, migration and propagation of the natural and established biota;
2. Primary contact recreation;
3. Industrial and agricultural water supply;

4. Public potable water supply after conventional filtration treatment (a series of processes including filtration, flocculation, coagulation, and sedimentation, resulting in substantial particulate removal but no consistent removal of chemical constituents) and disinfection; and
5. Any other reasonable uses.

(d) In all SE1 waters the designated uses are:

1. Shellfish harvesting in accordance with N.J.A.C. 7:12;
2. Maintenance, migration and propagation of the natural and established biota;
3. Primary contact recreation; and
4. Any other reasonable uses.

(e) In all SE2 waters the designated uses are:

1. Maintenance, migration and propagation of the natural and established biota;
2. Migration of diadromous fish;
3. Maintenance of wildlife;
4. Secondary contact recreation; and
5. Any other reasonable uses.

(f) In all SE3 waters the designated uses are:

1. Secondary contact recreation;
2. Maintenance and migration of fish populations;
3. Migration of diadromous fish;
4. Maintenance of wildlife; and
5. Any other reasonable uses.

(g) In all SC waters the designated uses are:

1. Shellfish harvesting in accordance with N.J.A.C. 7:12;
2. Primary contact recreation;
3. Maintenance, migration and propagation of the natural and established biota; and
4. Any other reasonable uses.

7:9B-1.13 Designated uses of mainstem Delaware River and Delaware Bay

(a) The designated uses for the mainstem Delaware River and Delaware Bay are those contained in the DRBC Water Quality Regulations.

(b) The designated uses for other waters under the jurisdiction of the DRBC are as set forth at N.J.A.C. 7:9B-1.12.

7:9B-1.14 Surface water quality criteria

(a) Surface water quality criteria for FW1 waters shall be maintained as to quality in their natural state.

(b) Surface water quality criteria for PL waters are as follows:

1. These waters shall be maintained as to quality in their existing state or that quality necessary to attain or protect the designated uses, whichever is more stringent.

i. For Nitrate-Nitrogen a level of 2 mg/L shall be maintained in the surface waters unless it is shown that a lower level must be maintained to protect the existing surface water quality.

For waters regulated by the DRBC, Article 3 of the DRBC Water Quality Regulations specified the following (DRBC, 2010, page 4 – 5):

3.10.2 Water Uses.

A. Uses Paramount. Water uses shall be paramount in determining stream quality objectives which, in turn, shall be the basis for determining effluent quality requirements.

B. Uses to be Protected. The quality of Basin waters, except intermittent streams, shall be maintained in a safe and satisfactory condition for the following uses:

1. agricultural, industrial, and public water supplies after reasonable treatment, except where natural salinity precludes such uses;
2. wildlife, fish and other aquatic life;
3. recreation;
4. navigation;
5. controlled and regulated waste assimilation to the extent that such use is compatible with other uses;
6. such other uses as may be provided by the Comprehensive Plan.

C. Other Uses

1. Current uses of intermittent streams may, at the discretion of the Commission, be maintained.

3.10.3 Stream Quality Objectives.

A. Antidegradation of Waters.

1. Interstate Waters.

It is the policy of the Commission to maintain the quality of interstate waters, where existing quality is better than the established stream quality objectives, unless it can be affirmatively demonstrated to the Commission that such change is justifiable as a result of necessary economic or social development or to improve significantly another body of water. In implementing this policy, the Commission will require the highest degree of waste treatment determined to be practicable. No change will be considered which would be injurious to any designated present or future use.

In addition, N.J.A.C. 7:9B-1.4 states that "category one waters" means those waters designated in the tables in N.J.A.C. 7:9B-1.15(c) through (i), for purposes of implementing the antidegradation policies set forth at N.J.A.C. 7:9B-1.5(d), for protection from measurable changes in water quality based on exceptional ecological significance, exceptional recreational significance, exceptional water supply significance or exceptional fisheries resource(s) to protect their aesthetic value (color, clarity, scenic setting) and ecological integrity (habitat, water quality and biological functions).

The SJBC maintains that substantial reductions in natural streamflow of the waters of Cape May County as a result of excessive surface and ground water withdrawals would potentially impair the designated uses of these waters or not allow the NJDEP's antidegradation and nondegradation policies to be successfully implemented.

For example, reductions in the low flows in a stream result in reduced dilution. Reduced dilution, in turn, would change the water quality of the stream. If severe enough, the reduced dilution will compromise the designated uses of that stream and/or not allow the stream to meet the Surface Water Quality Standards. It may no longer be capable of meeting the primary contact recreation due to higher bacterial counts during low flow periods. Alternatively, flows may become so low that maintenance, migration and propagation of the natural and established biota can no longer occur, and the stream can no longer serve as a public, agricultural or industrial supply. In cases where the stream has been totally dewatered, all designated uses have been lost. Estuaries can be similarly impacted. Excessive withdrawals from upstream would cause salty waters to disproportionately migrate upstream, potentially impacting shellfish harvesting, reducing dilution near the freshwater/brackish water interface, increase temperature, cause freshwater wetlands to evolve to saltwater wetlands, and degrade the natural and established biota.

Expanded wastewater infrastructure leads to dense development. Dense development, in turn, leads to higher water demands. Higher water demands, consecutively, lead to accelerated streamflow depletion and the consequent impacts discussed above. The highest water demands generally occur in the summer months, when outdoor water use is highest due primarily to irrigation. In Cape May County, the demands are greatly exaggerated when summer tourist increase the population from about 100,000 to 600,000 (and one million on

holiday weekends). Concurrently, evapo-transpiration is peaking during the summer months and streams are at their lowest flows. If precipitation is very low, streams are likely to flow at the 7Q10. Substantial withdrawals during this period can reduce the 7Q10, resulting in severe impacts to a stream's designated uses and water quality.

N.J.A.C. 7:9B-1.5(a)9 states that the NJDEP use "the Integrated Water Quality Monitoring and Assessment Methods developed pursuant to N.J.A.C. 7:15-6.2 to evaluate water quality data and identify waters where water quality does not meet the Surface Water Quality Standards at N.J.A.C. 7:9B as required by Section 303(d) and 305(b) of the Federal Clean Water Act." To date, there has been no evaluation of how the diminished flow in the watersheds of Cape May County and counties to the north (where ground water is induced into the aquifers that Cape May County uses) could affect water quality, designated uses, or environmentally sensitive areas (ESA) if the expanded wastewater infrastructure is approved as delineated in the proposed WQMP/FWSA amendment. As described further on, several of the watersheds are already not attaining their designated uses for numerous parameters. Approval of the amendment will exacerbate this condition by reducing low streamflows and the dilution capacity during these low flows. This phenomena will be exacerbated by other entities outside of Cape May County that directly or indirectly use these resources.

In addition, N.J.A.C. 7:9B-1.5(c)2 and 7:9B-1.5(c)3 states that "water quality criteria are expected to be maintained during periods when nontidal or small tidal stream flows are at or greater than the MA7CD10 flow (the 7Q10 flow), except as provided below:

- i. For acute aquatic life protection criteria, the design flow shall be the MA1CD10 flow;
- ii. For chronic aquatic life protection criteria for ammonia, the design flow shall be the MA30CD10 flow; and
- iii. For human health criteria for carcinogens listed at N.J.A.C. 7:9B-1.14(f)7, the design flow shall be the flow which is exceeded 75 percent of the time for the appropriate "period of record" as determined by the United States Geological Survey.

3. Water quality criteria are expected to be maintained in intermittent streams during all natural flow conditions. When an intermittent stream does not contain natural flow of sufficient magnitude to determine water quality, the criteria to be maintained in the intermittent stream will be those pertaining to the measurable natural flow immediately downstream of the intermittent stream.

Further, the Surface Water Quality Standard includes several policies regarding antidegradation and nondegradation. More specifically, N.J.A.C. 7:9B-1.5(d) states that "antidegradation policies applicable to all surface waters of the State are as follows:

1. Existing uses shall be maintained and protected. Designated uses shall be maintained or, as soon as technically and economically feasible, be attained wherever these uses are not precluded by natural conditions.

- i. The maintenance, migration, and propagation of threatened or endangered species (as defined under the Federal Endangered Species Act of 1973 as amended, 16 U.S.C. 1531 *et seq.*, and/or the New Jersey Endangered and Nongame Species Conservation Act N.J.S.A. 23:2A-1 *et seq.*) is considered an existing use that must be maintained.

- ii. No irreversible changes may be made to existing water quality that would impair or preclude attainment of the designated uses of a waterway.

- iii. No changes shall be allowed in waters which constitute an outstanding National or State resource or in waters that may affect these outstanding resource waters.

- iv. Where water quality exceeds levels necessary to support the designated uses, including but not limited to, propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality shall be maintained and protected unless the Department finds, after full satisfaction of the intergovernmental coordination and public participation provisions of the Department's continuing planning process as set forth in the Statewide Water Quality Management Plan (see N.J.A.C. 7:15), which includes, but is not limited to, the

NJPDES Regulations (N.J.A.C. 7:14A), that allowing lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located.

v. Where a lower classification of water (including the antidegradation designation) may impinge upon a higher classification/antidegradation designation of water, the Department shall ensure that the quality and uses of the higher classification/antidegradation water are protected.

vi. A waterway or waterbody from which water is transferred to another waterway or waterbody shall be treated as a tributary to the waterway or waterbody receiving the transferred water.

vii. Modifications of water quality-based effluent limitations established to implement the antidegradation policy may be granted pursuant to N.J.A.C. 7:9B-1.8 and 1.9.

2. Antidegradation policies applicable to a waterbody are as follows:

i. The quality of nondegradation waters shall be maintained in their natural state (set aside for posterity) and shall not be subject to any manmade wastewater discharges. The Department shall not approve any activity which, alone or in combination with any other activities, might cause changes, other than toward natural water quality, in the existing surface water quality characteristics.

ii. For Pinelands waters, the Department shall not approve any activity which alone or in combination with any other activities, might cause changes, other than toward natural water quality, in the existing surface water quality characteristics. This policy shall apply as follows:

(1) This policy is not intended to interfere with water control in the operation of cranberry bogs or blueberry production.

(2) New or expanded discharges are not allowed, unless authorized by the Pinelands Commission in accordance with Pinelands Comprehensive Management Plan, N.J.A.C. 7:50-4.61 through 4.70.

iii. Category One Waters shall be protected from any measurable changes (including calculable or predicted changes) to the existing water quality. Water quality characteristics, that are generally worse than the water quality criteria, except as due to natural conditions, shall be improved to maintain or provide for the designated uses, where this can be accomplished without adverse impacts on organisms, communities, or ecosystems of concern.

iv. For Category Two Waters, water quality characteristics that are generally better than, or equal to the water quality standards shall be maintained within a range of quality that shall protect the existing/designated uses as determined by studies acceptable to the Department, relating existing/designated uses to water quality. Where such studies are not available or are inconclusive, water quality shall be protected from changes that might be detrimental to the attainment of the designated uses or maintenance of the existing uses. Water quality characteristics, which are generally worse than the water quality criteria, shall be improved to meet the water quality criteria.

v. For waters of main stem of the Delaware River designated as Special Protection Waters pursuant to the DRBC Water Quality Regulations Article 3 Section 3.10.3A2, the antidegradation policies are as specified in the DRBC Water Quality Regulations.

The SJBC conducted an additional supporting analysis to determine if the NJDEP's designated uses, ESAs, and surface water classifications potentially are being/would be affected by withdrawals in the watersheds of Cape May County. The SJBC estimated how the flows of the watersheds would be affected by current and allocated depletive and consumptive water withdrawals by analyzing "7Q10" flows (Appendix A). The 7Q10 is a "natural" drought flow that the Department employs to protect water quantity and quality, and maintain and protect the natural resources of a watershed. If depletive and/or consumptive withdrawals substantially exceed the 7Q10 in a watershed, streamflow can be totally depleted in that watershed (i.e., they go dry), and the designated uses and ESAs of that watershed would be highly impaired. Ample supporting data and specific ESAs that are likely to be impacted are identified in detail below.

The SJBC analysis found that current water withdrawals in the five HUC watersheds in Cape May County are reducing (consuming) the 7Q10 from 14 to 119 percent, averaging 86 percent. In other words, many of the

watersheds of Cape May County will be dried up during extended future drought based on current demand. The majority of streams in Cape May County are not attaining their designated uses for aquatic life. The SJBC believes that severe streamflow depletion is contributing to this impairment in many of these waterbodies. Aquatic life requires ample freshwater flows to survive. As the FWSAs and SSAs expand and other development grows, and water demand increases toward full allocation, withdrawals are expected to reduce (consume) the 7Q10 from 32 to 280 percent, averaging 135 percent. This means that several watersheds in the County will be dried up during non-drought conditions. It is difficult to argue that the designated uses of the streams of Cape May County can be attained or ESAs adequately protected within its watersheds if streams that do not flow any longer during low rainfall periods. In addition, the SJBC analysis does not include the effects of confined aquifer pumpage; these effects are supposed to be included in the next NJSWSP. These current and projected conditions have not been assessed in the WQMP amendment proposed for Cape May County.

West/East Creek/Riggins Ditch HUC 11 Watershed

This 45.3 square mile watershed is located in northwestern Cape May and southwestern Cumberland Counties and flows into the Delaware Bay. A small portion of western Dennis Township in Cape May County occupies this watershed. The headwaters of West and East Creeks are in, or flow through, Belleplain State Park. Two Pinelands Villages in the watershed are delineated for future wastewater discharges of greater than 2,000 gallons per day (GPD). Both are in the Pinelands Management Area. Two existing ground water discharges of greater than 2,000 GPD will be connected to the Belleplain Pinelands Village. This proposed Pinelands Village is also upstream of the State Park. The remainder of the watershed is proposed to be served by individual septic systems with ground water discharges of less than 2,000 GPD.

The stream classifications for the West Creek are as follows (NJDEP, 2011, page 77):

(Halberton) - Source to the boundary of the Pinelands Protection and Preservation Areas, except those portions described separately, below: PL

(Belleplain) - The portion of the tributary that originates about 0.9 miles southeast of Hoffman's Mill and is located entirely within the boundaries of Belleplain State Forest: FW1

(Belleplain) - Those tributaries that originate about 0.5 miles upstream of Hoffman's Mill and are located entirely within the boundaries of Belleplain State Forest: FW1

(Belleplain) - Eastern branch of the easterly tributary to Pickle Factory Pond from its origin to its confluence with the western branch: FW1

According to the NJDEP's New Jersey Integrated Water Quality Monitoring and Assessment Report (NJDEP, 2012), West Creek (above Route 550) is attaining its designated uses for agricultural and public water supply, and primary contact recreation. This is where the two Pineland Villages and the existing ground water discharges that will be connected to the Villages are proposed in Dennis Township. Remaining land is proposed to be served by septic systems.

Below Route 550 to Paper Mill Road, the West Creek is also attaining its designated uses for agricultural and public water supply, and primary contact recreation. From Paper Mill Road to Moores Beach, the West Creek is not attaining its designated uses for fish consumption and shellfishing.

As per Appendix A, 139 percent of the cumulative 7Q10 of the West/East Creek/Riggins Ditch HUC 11 Watershed has been consumed, based on 1990 – 1999 depletive and consumptive demands. During severe drought, this watershed will experience extreme low flows based on the assumptions in the next NJSWSP. Some stream and wetland reaches of the watershed may go totally dry. At full allocation, 168 percent of the 7Q10 is projected to be lost. This would exacerbate the present stream and wetland losses in the watershed. These impacts do not include those that would occur if the proposed Villages are developed; nor does it include the stream and wetland losses associated with current and future pumpage from the deeper aquifers in Cape May and Atlantic Counties, as previously described. It also does not include any effects that may result in the Cumberland County portion of the watershed.

The West Brook from its source to the outer boundary with Pinelands Protection and Preservation Areas is classified as C1. As discussed above, the Department shall not approve any activity which alone or in combination with any other activities, might cause changes, other than toward natural water quality, in the existing surface water quality characteristics. In addition, tributaries to the West Creek flow into the Belleplain State Forest, which is classified as FW1. As described above, the designated uses for FW1 streams are that they be set aside for posterity to represent the natural aquatic environment and its associated biota; as well as the maintenance, migration and propagation of the natural and established aquatic biota.

The SJBC maintains that inclusion of the two Villages as well as allowing the remaining lands to be served by septic systems would be in conflict with this NJDEP policies for C1 and FW1 waterbodies, as well as compromise the NJDEP's policies on maintenance, migration and propagation of the natural and established biota, and impair shellfish harvesting, unless specific mitigation practices were strictly implemented. These include such practices as water conservation, elimination of the use of fertilizers, pesticides and herbicides, septic system management, aquifer recharge protection, septic system management, etc.

Dennis Township is also proposing a Pinelands Village in a headwater stream of the East Creek. The stream classifications for East Creek are as follows (NJDEP, Surface Water Quality Standards, 2011, pages 71 – 71): (Dennis) - Source to boundaries of the Pinelands Protection and Preservation Area, except those portions described separately below: PL

(Belleplain) - A stream and tributary that originate just south of East Creek Mill Rd., 1.2+miles north-northeast of Eldora and are located entirely within the boundaries of Belleplain State Forest: FW1

(Belleplain) - All tributaries to Lake Nummi from their origins downstream to the Lake: FW1

(Eldora) - Boundary of the Pinelands Protection and Preservation Area to Delaware Bay, except segment within the boundaries of the Dennis Creek Wildlife Management Area: SE1

(Eldora) – All named and unnamed tributaries of East Creek from the boundary of Pinelands Protection and Preservation Area to Delaware Bay, except segment within the boundaries of the Dennis Creek Wildlife Management Area: FW2-NT/SE1

(Dennis Creek) - Segment within the boundaries of the Dennis Creek Wildlife Management Area: SE1(C1)

Savages Run (East Creek)

(Belleplain State Forest) - Entire length, except portions described separately, below: PL

(Belleplain State Forest) - Those two tributaries and portions thereof downstream of Lake Nummi and all tributaries to Lake Nummi that are located entirely within the boundaries of Belleplain State Forest: FW1

This watershed is not attaining its designated uses for fish consumption and shellfishing. There is insufficient information to determine if its other designated uses are being attained. The SJBC has the same comments for this stream as it does for West Creek. There are additional FWSAs proposed in Dennis Township that are located in other watersheds; these will be discussed below for the applicable watersheds.

Dennis Creek HUC 11 Watershed

This 41.2 square mile watershed is located in northwestern Cape May County and flows into the Delaware Bay. Portion of Dennis and Middle Townships and the Borough of Woodbine occupies this watershed. The area north of Route 47 and westerly of Route 610 are in the Pinelands Management Area. The Dennis Creek and Beaver Swamp Wildlife Management Areas also occupy large amounts of land in the Dennis Creek HUC 11 Watershed. A Pinelands Village is delineated for future wastewater discharges of greater than 2,000 GPD, as well as three Coastal Area Facilities Review Act (CAFRA) centers are delineated for future wastewater discharges of greater than 2,000 GPD in the watershed. The remainder of the Township is delineated as being served by septic systems of less than 2,000 GPD.

The Borough of Woodbine is being proposed as a Pinelands Village with wastewater discharges of greater than 2,000 GPD, along with seven proposed ground water discharge areas with wastewater discharges of greater than 2,000 GPD. The southern and eastern portions of the Borough is delineated as being served by septic systems of less than 2,000 GPD. The northwestern section of Middle Township is within the Dennis Creek HUC 11 Watershed. This section is delineated as being served by septic systems of less than 2,000 GPD.

The stream classifications for the Dennis Creek HUC 11 Watershed are as follows (NJDEP, 2011, page 71):

(South Dennis) - Entire length, except segments described below: FW2-NT/SE1

(Woodbine) - All tributaries within the boundaries of the Pinelands Protection and Preservation Areas:

PL

(Dennis Creek) - Segment of the Creek, all tributaries, and all other surface waters within the boundaries of the Dennis Creek Wildlife Management Area: FW2-NT/SE1(C1)

Based on 1990 – 1999 water demands, 157 percent of the 7Q10 was being consumed by depletive/consumptive withdrawals. This represents the most severe impact on the 7Q10 in Cape May County. During severe drought, consequently, this watershed will experience extreme low flows based on the assumptions in the next NJSWSP. Some stream and wetland reaches of the watershed may go totally dry. Because of excessive withdrawals in the watershed the potential exists that salty water from the Delaware Bay will migrate into the watershed and cause the freshwater wetlands to be impacted by saltwater intrusion and the possibility of loss of the wells. The maintenance, migration and propagation of the natural and established aquatic biota will likely be challenged. The above assessment represents the effects on the 7Q10 that result from 1990 – 1999 water demands, and is thus likely conservative since demands have probably have increased today. Furthermore, the effects of deep aquifer pumpage are not considered in the above assessment. As previously discussed, the USGS estimated that ground water levels will decline and streamflow depletion will increase in the northern sections of Cape May County as confined aquifer pumpage increases. Sluice Creek will be particularly impacted by the withdrawals.

If all current withdrawals in the Dennis Creek HUC 11 Watershed equal that allowed in their present NJDEP water allocations, it would result in a 280 percent loss of the 7Q10. This would characterize the watershed as being the most stressed in the County. Under these conditions, the watershed would be totally dewatered or at least partially dewatered during severe drought conditions if the NJDEP's assumptions are accurate. The aquatic resources in headwater streams in the watershed may even be stressed during average rainfall conditions. It is obvious that the watershed is over-allocated with respect to the 7Q10. The above effects to the 7Q10 drought flow do not factor in the FWSAs proposed in the amendment to the Cape May County WQMP.

According to the NJDEP's New Jersey Integrated Water Quality Monitoring and Assessment Report (NJDEP, 2012), Dennis Creek (east of Route 47) in the Great Cedar Swamp is not attaining its designated uses for aquatic life and fish consumption, but is attaining its shellfishing use. There is insufficient information to determine if it is attaining its primary contact recreation use. Where not publicly owned, this area has been delineated for septic systems of less than 2,000 GPD. Dennis Creek (from Route 550 to Route 47) is meeting its designated use for shellfishing, but not for fish consumption and aquatic life. It is quite probable that the proposed Pinelands Villages and Woodbine developments will have deleterious impacts to the area's designated uses unless proactive planning steps are taken.

For Sluice Creek, the designated uses for fish consumption and shellfishing are not being attained. This area is also slated for septic systems. If environmental best management practices are not implemented in this area, it is likely that these non-attainment conditions will worsen, and existing designated uses will be stressed, especially as confined aquifer pumpage increases south and easterly of these areas.

Dennis Creek (from Route 47 to Jakes Landing Road) is meeting its designated uses for agricultural and public water supply, and primary contact recreation, but not for fish consumption and shellfishing. As previously discussed, this where a large CAFRA center with a wastewater discharge of greater than 2,000 GPD is

proposed. Unless properly planned, this center has the potential to further impair the water resources of this area. Below, Jakes Landing Road, Dennis Creek is attaining its designated uses for agricultural and public water supply, and primary contact recreation, but not for aquatic life, fish consumption, and shellfishing. This is where the two Pineland Villages and the existing ground water discharges that will be connected to the Villages are proposed in Dennis Township. Remaining land is proposed to be served by septic systems.

There are three primary issues related to the policies of the Surface water Standards that will need to be assessed for the Dennis Creek HUC 11 Watershed in the amendment to the Cape May County WQMP/FWSA that is under consideration.

First, as shown above, the Dennis Creek Wildlife Management Area is classified as C1, where the NJDEP is not permitted to allow activities that can cause measurable changes to water quality. There are numerous FWSAs upstream of the Wildlife Management Area, as well as the potential for hundreds of septic systems, that will likely lead to measurable changes unless the most robust environmental management programs are implemented and managed.

Second, the streams and tributaries within the boundaries of the Pinelands Protection and Preservation Areas are classified as PL. These waters shall be maintained as to quality in their existing state or that quality necessary to attain or protect the designated uses, whichever is more stringent. Several Pinelands Villages are proposed in the PL watersheds that have the substantial potential to not maintain their existing state or that quality necessary to attain or protect the designated uses, whichever is more stringent. Even though these Villages are proposed to be served by ground water discharges, there is the potential that surface water can be impacted as the wastewater subsequently becomes baseflow to the stream. Simultaneously, there is the potential to compromise the NJDEP ground water policies.

Third is the fact that the USGS has shown that this part of Cape May County is presently subject to declining ground water levels, streamflow depletion, and wetland dewatering, and that these impacts will be exacerbated as pumpage in the watershed and the County increases. This is in conflict with both of the above policies.

Cape May Tributaries West HUC 11 Watershed

This 45.2 square mile watershed is located in western Cape May County. It consists of several Delaware Bay tributaries including Bidwell Creek, Diaz Creek, Green Creek, and Fishing Creek. Western Middle and Lower Townships occupy this watershed. The southern section of the Dennis Creek Wildlife Management Area is located in the watershed.

A Designated Center to be served by individual septic systems is proposed for the Village of Goshen. The SJBC questions whether these systems will properly function in such a dense setting. Goshen is located in the headwaters of Bidwell Creek. Two existing campground with wastewater discharges of greater than 2,000 GPD are located easterly of Goshen. Relatively large land parcels are proposed to be sewered in the headwaters of Diaz Creek and Green Creek. Wastewater is proposed to be conveyed to either the Seven Mile – Middle Regional Wastewater Treatment Plant or the Wildwood – Lower Regional Wastewater Treatment Plan. This would represent an inter-basin transfer with the potential to increase streamflow and wetlands depletion in the Cape May Tributaries West HUC 11 Watershed. Further, large parcels along Route 47 in Green Creek in Middle Township are proposed to be sewered by the LTMUA. In addition, the remaining lands within Middle Township are proposed for either: 1) individual septic systems of 2,000 GPD or less, or 2) restricted septic systems of less than 2,000 GPD and less than 6 residential units. Very large land parcels in the Route 47 and Route 9 areas are proposed to be sewered by the LTMUA.

The NJDEP stream classifications for the Cape May Tributaries West HUC 11 Watershed are as follows (NJDEP, 2011, page 72):

HIGHS BEACH (Highs Beach) - All waters within the Wildlife Management Area south of Highs Beach: FW2-NT/SE1(C1)

HIGBEE BEACH (Higbee Beach Wildlife Management Area) All waters within the boundaries of Higbee Beach Wildlife Management Area: FW2-NT/SE1(C1)

The DRBC stream classifications and designated uses were previously described. These designated uses are nearly identical to those employed by the NJDEP.

As illustrated in Appendix A, an estimated 60 percent of the combined 7Q10 of the Cape May Tributaries West HUC 11 Watershed was lost (consumed) as a result of 1990 – 1999 depletive/consumptive demands. At full allocation, it is projected that 127 percent of this drought flow would be consumed by depletive/consumptive demands. During severe drought, this watershed is expected to experience extreme low flows, and some stream and wetland reaches of the watershed may go totally dry, especially northerly of Cape May Court House where the confining unit of the Cohansey aquifer becomes less profuse. Saltwater is likely to intrude up the watershed's tidal streams further, and freshwater wetlands are likely to be converted to brackish water wetlands. In addition, as discussed previously, the USGS estimates that vernal ponds will dry up earlier as demand from the aquifers increases in the watershed (USGS, 2009, pages 60 – 73). There are numerous vernal ponds in the Cape May Tributaries West HUC 11 Watershed, as well as in the other watersheds of Cape May County. As also previously discussed, public and private wells are projected to be lost to saltwater intrusion as demand increases in the watershed, and from southern Cape May in general.

Many of the watershed's NJDEP and DRBC designated uses have already been impacted by development in the watershed. Bidwell Creek in Middle Township, both above and below Route 47, is not attaining its designated uses for aquatic life, fish consumption, and shellfishing. The proposed Goshen designated center is at this location, as well as an expansion of the sewer service area of the Seven Mile – Middle Regional Wastewater Treatment Plant. Unless a restoration program to mitigate current impairment to this stream reach's designated uses is planned and implemented, these uses will be further damaged by the new center and expanded FWSA.

The WQMP/FWSA amendment would allow for hundreds of new septic systems as well as an expansion of the Cape May Courthouse sewer service area of the Seven Mile – Middle Regional Wastewater Treatment Plant in the Diaz Creek watershed in Middle Township. This waterbody is not attaining its designated uses for aquatic life, fish consumption, and shellfishing. Further, as described above, all waters within the Wildlife Management Area south of Highs Beach in the Diaz Creek watershed are classified as C1, which does not allow the NJDEP to approve activities that would result in measurable changes to existing water quality. A proactive restoration and comprehensive environmental plan must be developed that would ensure that this watershed's designated uses can be attained.

The Green Creek in Middle Township is not attaining its designated uses for aquatic life and fish consumption, but is meeting its use for shellfishing. The proposed WQMP/FWSA would allow for hundreds of new septic systems as well as an expansion of the Middle Township's sewer service area of the Seven Mile – Middle Regional Wastewater Treatment Plant and LTMUA in the Green Creek watershed in Middle Township. A restoration and proactive plan is thus needed in this watershed. Also, as described in the NJSWSP comments, considerable streamflow depletion as a result of LTMUA and WWU Cohansey aquifer wells will need to be addressed.

Fishing Creek is located in both Middle and Lower Townships. Its designated uses are not being attained for aquatic life, fish consumption, and shellfishing, but the creek is meeting its use for primary recreation. The LTMUA is proposed to expand sewer service areas in the headwaters of Fishing Creek. The remaining area is delineated for septic systems. Both the WWU and LTMUA Cohansey aquifer wells are in the watershed. As previously discussed, these wells have been shown to cause both localized and regional declines in ground

water levels and streamflow depletion. Consequently, these reductions in flow and the water quality implications associated with existing and new development associated with the WQMP amendment pose serious challenges to the designated uses of this watershed.

Cox Hall Creek/Mickels Run flows in the Townbank/Villas area of Lower Township. Its designated uses are not being attained for aquatic life, fish consumption and primary contact recreation, but it is meeting its use for shellfishing. The LTMUA is proposed to expand sewer service areas in the headwaters of these streams, while the remainder is delineated for septic systems.

Cape May Bays and Tributaries East HUC 11 Watershed

This 83.7 square mile watershed is located in eastern Cape May from about Cape May Point to just north of Sea Isle City, and extends approximately one half to one mile westerly of Route 9. It consists of numerous bays to the Atlantic Ocean including Jarvis Sound, Richardson Sound, Jenkins Sound, Great Channel, Great Sound, Ludlam Bay, and Corson's Sound. Several minor-in-length tidal tributaries flow into the bays including Cape Island Creek, Swan Channel, Gresse Creek, Gravelly Run, Crooked Creek, Holmes Creek, Deep Creek, Uncle Aaron's Creek, and Ben Elders Creek. The Marmora and Cape May Wildlife Management Areas as well as many shellfish harvesting areas are located in this watershed.

Several FWSAs are proposed in western Lower Township on the mainland, on the divide between the Cape May Bays and Tributaries East HUC 11 Watershed and the Cape May Tributaries West HUC 11 Watershed, to be served by the LTMUA. Septic systems are proposed for remaining areas.

On the divide between the Cape May Bays and Tributaries East HUC 11 Watershed and the Cape May Tributaries West HUC 11 Watershed, several relatively large properties are proposed for sewers in eastern Middle Township along Route 9 to be served by either the Wildwood/Lower Regional Sewerage Treatment Plan or the Seven Mile/Middle Regional Wastewater Treatment Plant. In eastern Dennis Township, three Coastal Area Facilities Review Act (CAFRA) centers are delineated for future wastewater discharges of greater than 2,000 GPD on or near Route 9. The remainder of the eastern part of the Township is delineated as being served by septic systems of less than 2,000 GPD or restricted septic areas (planning flows of less than 2,000 GPD and less than six residential units). As previously described, this watershed is projected to experience saltwater intrusion in the Atlantic City 800-foot sand aquifer, albeit many years from now. Cape May City constructed a desalination plant about 15 years ago due to intrusion.

The NJDEP stream classifications for the Cape May Tributaries West HUC 11 Watershed are as follows (NJDEP, 2011, page 72):

ATLANTIC OCEAN

(New Jersey Coast) - All those streams or segments of streams that flow directly into the Atlantic Ocean or into back bays of the Ocean which are not included elsewhere in this list, are not within the boundaries of the Pinelands Protection or Preservation Areas and are not mapped as C1 waters by the Department: FW2-NT/SE1

(New Jersey Coast) - All streams or segments of streams which flow directly into the Atlantic Ocean or into back bays of the Ocean, are mapped as C1 waters by the Department, are not trout maintenance waters, and are not classified as FW1 in this Table: FW2-NT/SE1(C1)

BIG ELDER CREEK

(Sea Isle City) - Segment within the boundaries of Marmora Wildlife Management Area: SE1(C1)

(Sea Isle City) - Segment outside the boundaries of Marmora Wildlife Management Area: SE1

BLUEFISH BROTHERS (Stone Harbor) - Entire length: SE1(C1)

BLUEFISH CREEK (Stone Harbor) - Entire length: SE1(C1)

EDWARD CREEK

(Ocean City) - Source to the boundary of Marmora Wildlife Management Area: SE1

(Ocean City) - Boundary of Marmora Wildlife Management Area to Horn Creek: SE1(C1)

GREAT SOUND (Avalon) - All waters within Great Sound State Park: SE1(C1)

JACOVY CREEK (Stone Harbor) - Entire length: SE1(C1)

JOSH CREEK (Stone Harbor) - Entire length: SE1(C1)

LITTLE SCOTCH BONNET

(Stone Harbor) - Entire length, except segment described below: SE1

(Stone Harbor) - Segment within the boundaries of Marmora Wildlife Management Area: SE1(C1)

LOWER LONG REACH (Stone Harbor) - Entire length: SE1(C1)

LUDLAM CREEK (Marmora) - Entire length: SE1(C1)

MARMORA WILDLIFE MANAGEMENT AREA

(Strathmere) - All waters within the boundaries of Marmora Wildlife Management Area: FW2-NT/SE1(C1)

MASONS CREEK (Marmora) - Entire length: SE1(C1)

NORTH CHANNEL POND (Stone Harbor): FW2-NT/SE1(C1)

OLDMAN CREEK (Stone Harbor) - Entire length: SE1(C1)

RING ISLAND CREEK (Stone Harbor) - Entire length: SE1(C1)

SALT CREEK (Stone Harbor) - Entire length: SE1(C1)

SHARK CREEK (Stone Harbor) - Entire length: SE1(C1)

SHELL THOROFARE (Wildwood Gables) - Entire length: SE1(C1)

SOUTHEAST CREEK (Stone Harbor) - Entire length: SE1(C1)

TAUGH CREEK

(Whitesboro) - Entire length, except segment described below: SE1(C1)

(Whitesboro) - Portions outside the boundaries of Marmora Wildlife Management Area: SE1

Appendix A shows that 1990 – 1999 depletive/consumptive demands have consumed 61 percent of the cumulative 7Q10 in the Cape May Bays and Tributaries East HUC 11 Watershed, and at full allocations these demands would consume 67 percent. As a whole, low flows will be stressed during severe drought in the future. However, because all of the wells in the watershed are in the headwaters of the streams, estuaries and bays, these waterbodies and nearby wetland reaches are likely severely affected by current withdrawals, and these circumstances can be expected to worsen in the future as demand grows. This is especially true in the northern section of the watershed where the confining unit of the Cohansey aquifer becomes less restrictive.

Based on their intensity (see map of watershed withdrawals in 2005 NJDEP report -

<http://www.state.nj.us/dep/njgs/enviroed/HUC11/WMA16.pdf>), public supply and irrigation wells are likely impacting the small tidal streams and wetlands in Lower Township by drawing in more salty water, possibly affecting shellfish harvesting. Agricultural and commercial wells in the central and northern sections of the watershed are possibly having similar impacts. Because much of 7Q10 of the watershed has been consumed, the potential exists that salty water from the bays will migrate into the watershed and cause the freshwater wetlands to be impacted by saltwater intrusion and the possibility of loss of more wells. In addition, the reduced dilution that results from increased withdrawals will likely result in worsening surface water quality problems.

As is the case with most of Cape May County's watersheds, the impacts described in above assessment may be underestimated in the Cape May Bays and Tributaries East HUC 11 Watershed. The above impacts represent the effects that result from 1990 – 1999 water demands; current demand is likely higher and the 7Q10 drought flow might be impacted more than estimated. Furthermore, the effects of deep aquifer pumpage are not quantified in the above assessment. As previously discussed, the USGS estimated that ground water levels will decline and streamflow depletion will increase in Cape May County as confined aquifer pumpage increases, especially from the Cohansey aquifer. Based on results of ground water model simulations, water levels in the water-table aquifer will decline as much as 0.7 feet and base flow in streams will decrease as much as 26 percent as pumpage increases in Cape May County (USGS, 2009, page 128). In addition, the proposed amendment to Cape May County WQMP and its consequent enlargement of FWSAs were not evaluated. The

Gibson Bill prescribed that a sustainable water supply plan be developed for Cape May County so as to minimize the above impacts. This plan has yet to be completed by the NJDEP.

According to the NJDEP's New Jersey Integrated Water Quality Monitoring and Assessment Report (NJDEP, 2012), the Atlantic Coast sub-watershed (Cape May Inlet to Cape May Point) is not attaining its designated uses for aquatic life and fish consumption, but is attaining its primary contact recreation shellfishing use. The Atlantic Coast sub-watershed (Hereford Sound to Cape May Inlet) and Atlantic Coast sub-watershed (Townsend Inlet to Hereford Sound) are not attaining their designated uses for aquatic life and fish consumption, but is attaining their primary contact recreation and shellfishing uses. The eastern portions of these sub-watersheds are in Lower and Middle Townships. Much of the FWSAs proposed in the amendment to the Cape May County WQMP for are proposed in these sub-watersheds (or at least partially in these sub-watersheds. New substantial FWSAs in Lower Township are proposed to convey wastewater to the LTMUA, while new FWSAs in Middle Township to convey wastewater to either the Wildwood – Lower Regional Wastewater Treatment Plant or the Seven Mile – Middle Regional Wastewater Treatment Plant.

Significant impacts to the Shell Thorofare and Marmora Wildlife Management Area can be anticipated if the amendment to the Cape May County WQMP/FWSA is approved. These areas are classified as C1, where no measurable changes in water quality are permitted. Water quality is quite likely already affected by existing development and withdrawals that are causing these waterbodies to become more brackish.

The Atlantic Coast sub-watershed (Corson to Townsends Inlet) is not attaining their designated uses for aquatic life and fish consumption, but is attaining their primary contact recreation and shellfishing uses. The eastern portion of this sub-watershed are in Dennis Township is located in this sub-watershed. Three relatively large CAFRA centers to be served by ground water discharges adjacent to Route 9, as well as numerous areas to be served by septic systems are proposed in Dennis Township. About a dozen ground water discharges of 2,000 GPD already exist.

The Corsons Sound & Inlet/ Ludlam Bay sub-watershed in Upper Township is not attaining its designated use for aquatic life, while it is meeting its designated uses for primary contact recreation and shellfishing. The Mill Creek/Sinks Creek/Big Elder Creek sub-watershed in Upper Township is attaining its designated use for aquatic life, while it is not meeting its designated use for shellfishing. The Cape May Bays (Reuben Warf/Big Elder Creek) sub-watershed in Upper Township is not attaining its designated use for aquatic life, while it is meeting its designated uses for primary contact recreation and shellfishing. The proposed amendment to the Cape May County WQMP is proposing five ground water discharges over 2,000 GPD, five relatively large land parcels to convey their wastewater to the Ocean City Regional Wastewater Treatment Plant, and the remainder of private land to be served by septic systems. These sub-watersheds are C1, which is subject to the NJDEP's "no measurable change in water quality" policy. In addition, as noted above, this area is vulnerable to losses in freshwater as a result of withdrawing water from the aquifers of Cape May County. Attaining and maintaining the designated uses have not been addressed by the proposed amendment to the Cape May County WQMP.

Tuckahoe River HUC 11 Watershed

The Tuckahoe River HUC 11 Watershed has a drainage area of 101.2 square miles and is located in northern Cape May County, southern Atlantic County, and a very small section of eastern Cumberland County. The watershed flows into the Great Egg Harbor Bay, which then flows into the Atlantic Ocean. In Cape May County, Upper Township occupies most of the watershed in Cape May County. The Lester G. MacNamara Wildlife Area is located at the outlet of the Tuckahoe River HUC 11 Watershed. Major tributaries in Cape May County include the Cedar Swamp Creek, Mill Creek, Willis Thorofare, Willetts Creek, Jacobs Creek, Mirey Run, Plummers Creek, and Tarkiln Run. The western portion of the watershed is in the Pinelands Management Area. The Tuckahoe River is by far the largest freshwater body in the County.

According to the FWSA maps for Upper Township that are part of the proposed Cape May County amendment, two Pinelands Villages/Designated Growth Centers (Tuckahoe and Petersburg off Route 50) in the watershed are delineated for future wastewater discharges of greater than 2,000 GPD. In addition, five new sewered areas with ground water discharges greater than 2,000 GPD are proposed off Route 9. The most profound proposal includes a possible sewerage of a section of Marmora to the Ocean City Regional Wastewater Treatment Plant. The remainder of Upper Township in the watershed is proposed to be served by individual septic systems with ground water discharges of less than 2,000 GPD or restricted septic area (planning flows of less than 2,000 GPD and less than six residential units).

The NJDEP stream classifications for the Tuckahoe River HUC 11 Watershed are as follows (NJDEP, 2011, pages 45 - 56):

TUCKAHOE RIVER

(Tuckahoe) - Edge of Fish and Wildlife Management Area at confluence with Warners Mill Stream to Great Egg Harbor, except segment described separately below: FW2-NT/SE1(C1)

(Tuckahoe) - River, tributaries and all other waters within boundaries of the MacNamara Wildlife Management Area: FW2-NT/SE1(C1)

CEDAR SWAMP CREEK

(Cedar Spring) - Entire length, except segment described separately below: FW2-NT/SE1

(Marmora) - Creek and tributaries within the boundaries of the MacNamara Wildlife Management Area: FW2-NT/SE1(C1)

ABRAMS CREEK

(Marmora) - Entire length, except portion outside the boundaries of the MacNamara Wildlife Management Area: FW2-NT/SE1(C1)

(Griscom) - Portions of the Creek and tributaries outside of the MacNamara Wildlife Management Area

BABCOCK CREEK (Marmora) - Entire length: FW2-NT/SE1(C1)

BANKS CREEK (Marmora) - Entire length: SE1(C1)

Appendix A shows the estimated collective consumptive loss to the 7Q10 in the Tuckahoe River HUC 11 Watershed would be 14 percent based on withdrawals that were accounted for 15 years ago. This is expected to increase to 32 percent if all the depletive/consumptive withdrawals reach full allocation. As a whole, low flows should not be very depressed during severe drought conditions in the future at the current withdrawal rates. However, there are several locations where water is withdrawn in headwater areas that can have substantial impacts to localized flows including public water supply wells for Woodbine, significant surface water and water table aquifer well withdrawals used for a mining operation, and agricultural wells near wetlands. In addition, there may be substantial reductions in ground water levels and subsequent losses to stream and wetland caused by present pumpage of confined aquifer in Cape May and Atlantic Counties. Further, demand has likely increased since the 1990 – 1999 period used in the SJBC analysis.

According to the NJDEP's New Jersey Integrated Water Quality Monitoring and Assessment Report (NJDEP, 2012), the lower Tuckahoe River sub-watershed is not attaining its designated use for aquatic life, but is attaining its primary contact recreation and public water supply. The Mill Creek sub-watershed is meeting its designated uses for aquatic life and shellfishing. The Halfway Creek is meeting its designated uses for shellfishing, but there is insufficient information to determine if other uses are being attained. The Cedar Swamp Brook sub-watershed (above Route 50) is also meeting its designated uses for shellfishing, but there is insufficient information to determine if other uses are being attained. Further, the Cedar Swamp Brook sub-watershed (below Route 50) is meeting its designated uses for shellfishing, but there is insufficient information to determine if other uses are being attained. The Willis Thorofare/Hughes Creek sub-watershed is another waterbody that is meeting its designated uses for shellfishing, but there is insufficient information to determine if other uses are being attained. The Tuckahoe River (below Route 49) is meeting its designated use for shellfishing, but there is insufficient information to determine if other uses are being attained.

As a whole, the above sub-watersheds in Upper Township are probably the most environmentally “wholesome” in Cape May County. This is likely due to the limited development and ground water withdrawals in this part of the County. However, a substantial amount of new development is being proposed in the Cape May County WQMP/FWSA amendment, including new Pinelands Villages, large ground water discharges, new homes on septic systems, and an out-of-basin transfer to the Ocean City Regional Wastewater Treatment Plant. Being that many of the potentially affected streams are classified as PL or C1, in conjunction with expected losses in streamflow as a result of deep aquifer pumpage, it will be a challenge ensuring that this area’s designated uses and NJDEP’s policies for these stream’s classifications will be met. Attaining and maintaining the designated uses in the Tuckahoe River HUC 11 Watershed have not yet been address by the proposed amendment to the Cape May County WQMP/FWSA.

In summary, based on the above assessments of the watersheds and sub-watersheds of Cape May County, the FWSA maps proposed in the amendment for the Cape May County WQMP are substantially inconsistent with the Surface Water Quality Standards in numerous areas. While not all-inclusive, the following inconsistencies are identified:

First are the numerous sub-watersheds where the designated uses are not being attained or may be compromised in the future if the WQMP is approved. N.J.A.C. 7:9B-1.5(a)6 stipulates “existing uses shall be maintained and protected. Designated uses shall, as soon as technically and economically feasible, be attained wherever these uses are not precluded by natural conditions.” N.J.A.C. 7:9B-1.5(d)ii stipulates “no irreversible changes may be made to existing water quality that would impair or preclude attainment of the designated uses of a waterway.”

It would seem that these provisions would be paramount in a proposed WQMP. Of the 40 sub-watersheds, only ten (25 percent) are meeting their designated uses. Moreover, because there was insufficient information for the other uses, these ten may not actually be attaining their designated uses. Most of the sub-watershed possibly meeting their designated uses are in the Tuckahoe River HUC 11 Watershed; these uses may be impaired based on the intensity of development being proposed in the WQMP amendment. The remaining sub-watersheds are not meeting their designated uses for two to four parameters (aquatic life, fish consumption, water supply, or shellfishing). It is fair to conclude that the majority of Cape May County’s waters are environmentally unhealthy.

In addition, the Surface Water Quality Standards state that “the maintenance, migration, and propagation of threatened or endangered species (as defined under the Federal Endangered Species Act of 1973 as amended, 16 U.S.C. 1531 *et seq.*, and/or the New Jersey Endangered and Nongame Species Conservation Act N.J.S.A. 23:2A-1 *et seq.*) is considered an existing use that must be maintained.” These species and their habitats have not been delineated on the FWSA map.. The potential for these species to be impacted by areas to be sewerred or served by septic systems, or by withdrawals to meet the demands of future sewerred and non-sewerred populations can be significant, based on the above assessment.

Thirty of forty of the County’s sub-watersheds are not attaining their designated uses for between one and four parameters. In addition, ESAs and Endangered and Nongame Species occupy several of these sub-watersheds, and thus may be impacted by non-attainment. Approval of the proposed amendment to the County’s WQMP will exacerbate these conditions, especially as the higher water demands associated with the expanded sewer systems cause additional dewatering of the County’s water resources and new pollutants are introduced into these water resources.

Issue #7 - Inconsistent with the Ground Water Quality Standards

The Ground Water Quality Standards (N.J.A.C 7:9C *et seq.*) establish the designated uses of the State's ground waters, classify ground waters based on those uses, and specify the water quality criteria and other policies and provisions necessary to attain those designated uses. Designated uses are assigned as primary or secondary uses

of ground water and include maintenance of special ecological resources, potable water, agricultural and industrial water supply.

The designated uses of ground water can be impaired by excessive well withdrawals from both a quantity and quality perspective. For example, ESAs can be severely impacted if excessive well withdrawals dewater wetlands that are inhabited by these natural resources and are dependent upon them for specific hydrologic functions. Potable, agricultural and industrial water supplies can be lost if excessive well withdrawals result in saltwater intrusion. Freshwater wetlands along streams in the outcrop areas of confined aquifers can be converted to freshwater wetlands as confined aquifer wells increase pumpage. These withdrawals may also increase the concentrations of pollutants as freshwater dilution is reduced. The 2009 USGS report analyzed the ground water declines in the water table aquifer that can exacerbate the above effects. Dozens of ground water discharges greater than 2,000 GPD and hundreds of septic systems of less than 2,000 GPD are being proposed in the watersheds of Cape May County. Their effects have not been addressed in the amendment to the WQMP/FWSA for Cape May County.

Issue #8 - Inconsistent with P.L. 2001, Chapter 165 (Gibson Bill)

P.L. 2001, Chapter 165, otherwise known as the Gibson Bill, was enacted in 2001 due to local frustration with the NJDEP in approving water allocations in Cape May County due to the saltwater intrusion problem. This statute allocated \$2 million from the Water Supply Bond Act of 1981 to develop a sustainable alternative water supply plan for Cape May County. It is interpreted that said plan would allow for the NJDEP to approve proposed water allocations that are consistent with the plan so that the County could continue to grow.

P.L. 2001, Chapter 165 required the NJDEP and other agencies to assess and prepare a report on sustainable water supply alternatives within Cape May County, but outside of the pinelands area, necessary to meet the current and future water supply needs of Cape May county while avoiding any adverse ground water or ecological impact on Cape May County. The assessment and report is to incorporate a countywide ground water hydrological assessment, a countywide water supply cost effectiveness study, and a countywide water supply design. This initiative is also required to identify water conservation and re-use methods to protect the water supply of Cape May County. The studies, surveys and assessments authorized by this section shall include analyses of potential future water supply demands based on future development potential and environmental constraints within Cape May County.

The statute also specified that during the assessment and the preparation of the above report, the NJDEP may issue approvals or allocations for increased ground water withdrawals in Cape May County only upon a finding that such new withdrawals will not accelerate saltwater intrusion, lower existing stream base flow or harm ecological functions or wildlife.

In addition, P.L. 2001, Chapter 165 required the NJDEP to hold one or more public hearings to explain and receive comments upon the scope of the work and research work plans for each of the studies authorized by the statute. The NJDEP is required to consider such public comments in framing the final scope of work and research plans authorized by the statute.

To date, only two of above six assessments required of the statute have been completed. These include the water supply demand analysis and countywide ground water hydrological assessment. The countywide water supply cost effectiveness study, and a countywide water supply design, water conservation and re-use methods to protect the water supply of the County have yet to be even initiated.

Furthermore, the SJBC has concluded that the countywide ground water hydrological assessment and its evaluation of water supply alternatives applied criteria for saltwater intrusion, lower existing stream base flow and acceptable impacts to ecological functions or wildlife that are inconsistent with the provisions set forth in

the Gibson Bill, the Water Supply Management Act (Act), and the NJDEP Water Supply Allocation Regulations.

The countywide ground water hydrological assessment evaluated water supply alternatives that would allow saltwater intrusion. The Gibson Bill, Act and NJDEP regulations specify that alternatives should not accelerate saltwater intrusion. The hydrological assessment evaluated water supply alternatives that would allow the lower existing stream base flow. The Gibson Bill, Act and NJDEP regulations specify that alternatives should not lower stream base flow. The hydrological assessment evaluated water supply alternatives that would harm ecological functions or wildlife. The Gibson Bill, Act and NJDEP regulations specify that alternatives should not harm ecological functions or wildlife. These inconsistencies are described in more detail in Comment #3 and in other related comments.

Moreover, the statute specifically states that “during the assessment and the preparation of the above report, the NJDEP may issue approvals or allocations for increased ground water withdrawals in Cape May County only upon a finding that such new withdrawals will not accelerate saltwater intrusion, lower existing stream base flow or harm ecological functions or wildlife.” The SJBC believes that the proposed amendment to the Cape May County WQMP/FWSA would be in conflict with this provision since approval of the plan will accelerate saltwater intrusion, lower existing stream base flow, and/or harm ecological functions or wildlife.

Last, a review of the scope of work that the NJDEP developed to fulfill the Gibson Bill clearly shows that several work items have yet to be completed, and thus confirms that the amendment should not proceed (<http://www.state.nj.us/dep/watershedmgt/DOCS/Gibsonbillscopefinal4-04.pdf>). Missing items include an evaluation of multiple-aquifer conjunctive use options, seasonal conjunctive use of shallow and confined aquifers, passing flows to regulated withdrawals, aquifer storage and recovery, wastewater reuse, conservation options, an on-going monitoring program to evaluate the selected alternatives, determinations of the sensitivities of water-dependent ecosystems, such as those in freshwater wetlands and the brackish water/salt water bays to hydrologic changes that could result from ground-water pumpage and development, potential regulatory policies to protect aquatic resources, the advancement of saltwater intrusion and streamflow depletion, the hiring of an engineering firm to assess the feasibility and viability of each water supply scenario and design the selected plan, holding meetings at important phases of the project, development of a implementation plan and summary report, etc. As stated in Comment #12, NJDEP management has failed to follow through with many of its planning initiatives for Cape May County, but continues to approve development schemes that simply allow for the County’s water resources to degrade.

Issue #9 – Inconsistent with the Water Supply Management Act – Pinelands Provisions

N.J.S.A. 58:1A-7.1 (Transport of water from Pinelands National Reserve; prohibition) states that “the provisions of any law, rule or regulation to the contrary notwithstanding, no person shall transport, or cause to be transported, more than 10 miles outside the boundary of the Pinelands National Reserve, any ground or surface water therefrom; provided, however, that nothing in this section shall prohibit the continued transportation of any such water utilized for public water supply purposes prior to the effective date of this act.

As used in this section, "Pinelands National Reserve" means the approximately 1,000,000 acre area so designated by section 502 of the "National Parks and Recreation Act of 1978" (P.L. 95-625), and generally depicted on the map entitled "Pinelands National Reserve Boundary Map" numbered NPS/80,011A and dated September 1978.”

The USGS shows that water withdrawn from wells in the Atlantic City 800-foot sand, Rio Grande, and Cohansey aquifers in southern Cape May County are inducing water from their recharge areas within the Pinelands National Reserve, more than ten miles outside the boundary of the Pinelands National Reserve (USGS, 2009, pages 111 – 142).

The SJBC interprets this statute that these existing water allocations from wells in southern Cape May County may continue to transport water from the Reserve, but that increases in these allocations or new allocations that will transport (or cause to be transported) water more than ten miles outside the boundary of the Reserve are strictly prohibited.

Several of the water supply options being considered by the NJDEP to meet Cape May County's increasing demand would transport water more than 10 miles outside the boundary of the Pinelands National Reserve. In addition, existing allocations, where the NJDEP is not planning alternative water supplies but will need increases in their allocations, would transport water more than 10 miles outside the boundary of the Reserve.

Furthermore, P.L. 2001, Chapter 165(3.a) (the Gibson Bill) states that "the Department of Environmental Protection shall, in cooperation with the United States Fish and Wildlife Service, the National Marine Fisheries Service and the United States Geological Survey, assess and prepare a report on sustainable water supply alternatives within Cape May County, but outside of the pinelands area, necessary to meet the current and future water supply needs of Cape May county while avoiding any adverse ground water or ecological impact on Cape May County." In the view of the SJBC, an alternative in Cape May County that induces water from the Pinelands Area should not be considered a water supply alternative for Cape May County.

As described above, approval of the proposed amendment to the Cape May WQMP will significantly increase the need for alternative water supplies in Cape May County. Existing statutes prohibit some of the alternatives being considered.

Issue #10 – Potential for Saltwater Intrusion Faster than Expected

The following article appeared in a recent Cape May County newspaper: Tests showing more salt in Wildwood Water Utility (WWU) wells than expected may be delaying the state Department of Environmental Protection (DEP) from issuing a water allocation permit to Lower Township Municipal Utilities Authority (MUA) to allow water in newly installed water mains in Town Bank. At a Wed., Aug. 1 meeting, Lower Township MUA Executive Director Matt Ecker said DEP had evidence from a recent sampling of saltwater migrating into the Wildwood Utility well field near the intersection of Fulling Mill Road and Route 47. "All this modeling that's been done to evaluate all these recommended scenarios was based on salt not getting to that recently detected level for another 30 years," he said. "Now, it's there." (Cape May Herald, August 3, 2012).

If salty water is actually now reaching the WWU's wells, it is quite possible that much of the predictions made by the USGS regarding saltwater intrusion in Cape May County are inaccurate. Many of the USGS's predictions estimated that saltwater intrusion is decades and even hundreds of years off into the future. The status of the County's water supply would be substantially more severe if the WWU wells are about to be seriously affected. History has shown that once the sodium/chloride saltwater front intrudes as far as the WWU well field, chloride concentrations in some wells may increase about 50 mg/L/yr, similar to the intrusion rate observed in former production wells that tapped the Cohansey aquifer in other parts of Cape May County. Model results indicate that without careful management, saltwater intrusion will render the water from all WWU production wells open to the Cohansey aquifer unfit for potable supply (unless desalinated) within a few years of the intrusion into the first well (USGS, 2002, page 121).

Issue #11 – Implementation of Unsustainable Alternative Water Supplies

LTMUA and WWU are in the process of implementing alternatives that are not sustainable, even according to the flawed saltwater intrusion criteria employed in the Countywide ground water hydrologic assessment. As previously described, the Gibson Bill mandated that the NJDEP develop a sustainable water supply plan for Cape May County. An initial objective of this plan was to establish limits of saltwater intrusion, stream

depletion and habitat impact to be used in determining acceptable pumping limits. (NJDEP, 2004, page 2). For saltwater intrusion, according to the NJDEP, a sustainable water supply has been defined as preventing the saltwater interface from reaching any of the supply wells to be utilized in the selected water supply design at the 50 year build-out (volume of water demand) for a 100 year period of time (NJDEP, 2004, page 2). No such limits were established for allowable ecological or ground water impacts.

The NJDEP is presently considering an increase in the allocation for the LTMUA. The LTMUA is requesting that a new well (#8) be permitted at the Cape May County Airport. This increase in allocation is essentially Scenario 4 in the 2009 USGS investigation. According to the USGS, the saltfront would be within 1,100 feet of LTMUA Well 2, and reach LTMUA Well 1 under this scenario under the NJDEP saltwater criteria (USGS, 2009, page 146).

In addition, the WWU is proposing to transfer much of its current withdrawals from the Cohansey aquifer to the Rio Grande water-bearing zone aquifer. This also is fundamentally Scenario 4 in the 2009 USGS investigation. According to the USGS, the saltfront would be within 2,900 feet of the WWU well field under this scenario under the NJDEP saltwater criteria (USGS, 2009, page 146). This estimate does not account for the recent finding that the WWU wells may be presently impacted by salty water, as discussed above.

Furthermore, the NJDEP has yet to define the criteria for acceptable ground water and ecological impacts, as directed by the Gibson Bill. Without acceptable criteria, it is unknown what it is permissible.

Issue #12 - Failure to Follow Up on Water Supply Initiatives

The NJDEP has a history of not completing planning initiatives to resolve the water supply problems in Cape May County, while simultaneously considering proposals to increase water use in the County – which would exacerbate the water supply problems. Not only did the NJDEP fail to follow recommendations of the 1996 NJSWSP and the mandates of the Gibson Bill, as described above, but it fell short in completion of a major water supply planning initiative.

In 2003, the NJDEP drafted the report entitled the Status of The Water Supply of Southeastern New Jersey (NJDEP, 2003). The draft report was in reaction to water supply problems that were being experienced during the drought of 2001 – 2002. Two public hearing were held in 2004 on the draft report. The forward of the draft report reads as follows:

“Executive Order 32 and subsequent actions required the New Jersey Department of Environmental Protection (NJDEP) to “assess the adequacy of the water supply in relation to approved and anticipated growth in Egg Harbor, Galloway and Hamilton Townships” in consultation with Atlantic County, the Pinelands Commission, the New Jersey Department of Community Affairs, Rutgers The State University, the State Climatologist and the United States Geological Survey. This Executive Order was effectuated due to uncertainties regarding the adequacy of the water supply of the region to support the substantial growth that was occurring in these municipalities. This Status of the Water Supply of Southeastern New Jersey report fulfills the above requirement.

This draft report evaluated water supply issues associated with the withdrawals from the above municipalities, as well as those for the region with which these municipalities share their water supply, and describes approaches to address them. The water supplies that are withdrawn in Egg Harbor, Galloway and Hamilton townships are not “independent” resources; rather, these townships share the more expansive regional supply of Southeastern New Jersey. This regional supply consists of the deep confined Atlantic City 800-foot sand aquifer from Cape May to Ocean County, and the shallow unconfined Kirkwood-Cohansey water table aquifer in the Great Egg Harbor River, Mullica River and Southern Barnegat watersheds. This report examines this regional supply.

Based on this report, the NJDEP has concluded that this region will experience both immediate and long-term problems associated with its water supply. Among the more immediate problems are streamflow depletion as a result of surface water withdrawals and ground water withdrawals from the water table aquifer. The long-term problem is the migration of saltwater into the deeper aquifer systems in Cape May County, and possibly in Ocean County. In both cases, the fundamental problem is that most of the water withdrawn from these resources is not being returned to them after use. Additional development in the region will exacerbate these problems. Compounding these circumstances are threats to the quality of the drinking water supply in the water table aquifer system.

The NJDEP seems committed to working with the stakeholders of the Southeastern New Jersey Study Area to initiate an interim strategy that would reduce the effects of new development on water quality and aquatic resources, as well as to coordinate the development of a regional water supply plan that would ensure that the integrity of the region's water resources is maintained over the long term.”

It has been nearly ten years since the above report was drafted and public hearings were held on it. The report was never finalized, and its recommendations never implemented. Since then, the water supply problems in Cape May County and in the southeastern region of the state have not improved; in contrast, they have likely worsened as demand has increased, streamflow and wetland dewatering has been intensified, and the salt front has migrated closer to public wells. Yet, the report and its recommendations were never fulfilled. Now, the NJDEP is proposing to approve a countywide water supply plan worsen an already severe water supply quandary.

Issue #13 – Inconsistent with the Water Supply Management Regulations – Water Supply Bond

N.J.A.C. 7:19-6.1(a) of the Water Supply Management Act regulations states that “the Statewide Water Supply Master Plan represents the planning mechanism by which the State approaches its water needs. Inclusion of a project in the Master Plan is a prerequisite for the expenditure of funds under the Water Supply Bond Act of 1981.” This provision is included in the Act to ensure both that proposed water supply and drinking water projects do not impair the waters of the State, and as an “incentive” to implement truly beneficial projects.

As previously discussed, the 1996 NJSWSP and the 2009 USGS study clearly indicates that Cape May County has major water supply problems. It is assumed that the next NJSWSP, which has yet to be disseminated to the public, will describe that the County has similar, if not worse, problems with its water resources.

The countywide ground water hydrologic assessment described potential water supply alternatives to mitigate the purveyor's water supply problems in Cape May County. As discussed above, however, these alternatives are inconsistent with the saltwater intrusion, streamflow depletion, and ecological impact criteria specified in the Gibson Bill, the Water Supply Management Act, and the NJDEP Water Supply Management Act regulations.

The SJBC recommends that the NJDEP only expend funds from the 1981 Bond Act for water supply projects in Cape May County that will directly or indirectly increase demand “upon a finding that such new withdrawals will not accelerate saltwater intrusion, lower existing stream base flow or harm ecological functions or wildlife” pursuant to the Gibson Bill.

Issue #14 - Absence of Holistic Assessments and Environmental Capacity-Based Planning

To date, the wastewater management plan evaluations that were submitted to the NJDEP were not holistic. They focused on localized effects and ignored regional activities that may have significant environmental impacts. For example, much of Cape May County relies on confined aquifers that cross county borders. The combined withdrawals from these aquifers are leading to saltwater intrusion in the wells closest to the saltfront,

streamflow depletion, wetland dewatering, and impairment to natural resources. These impacts were not evaluated. Alternatively, watersheds often cross county borders. Activities in watersheds upstream or upgradient of the county border can lead to water quality degradation in the county undergoing an amendment to its WQMP/FWSA.

The proposed amendment to the Cape May County WQMP/FWSA ignores holistic and Environmental Capacity-Based Planning. According to the NJDEP's Office of Planning and Sustainable Communities (OPSC) website, "environmental capacity-based planning recognizes both the environmental limits and opportunities for growth. Environmental limits include drinking water and available sewer service capacity. Opportunities include the redevelopment of brownfield sites, the preservation of open space and natural resources including rare plant and animal species and representative ecological communities.

DEP initiatives that seek to implement environmental capacity based planning include water quality management planning, the Statewide Water Supply Master Plan and the Landscape Project. OPSC planners work across program lines – both within the Department and through other state agencies - to ensure environmental capacity based planning is integrated and translated into tangible actions that can be applied at the local level." (<http://www.state.nj.us/dep/opsc/envcbp.html>).

As cited in these comments, there are a number of investigations and analysis that have been conducted that assessed the inter-relationships of aquifer behavior, stream and wetland effects of surface and ground water withdrawals, water quality implications, etc. Despite the enormous public financial investments made on these initiatives, they are not being utilized for carrying capacity planning.

Issue #15 - Absence of Wastewater Management Plans

Some towns and agencies have not yet submitted updated wastewater proposals to Cape May County, or that recent updates were not available for review at the NJDEP. This precluded the SJBC from conducting an adequate environmental review of the amendment to the Cape May County WQMP/FWSA.

Issue #16 – Need to Declare Cape May County as an Area of Critical Water Supply Concern Criteria

When completed to reflect these comments, the Gibson Bill will identify a sustainable water supply plan for Cape May County. The SJBC assumes that the NJDEP will recognize this sustainable plan as the alternative that will meet the water supply needs of the development that will be facilitated by the proposed amendment to the Cape May County WQMP.

The Gibson Bill sustainable water supply plan undoubtedly will require the reduction of existing public and private withdrawals where these withdrawals are causing saltwater intrusion and/or harming aquatic resources, and the subsequent implementation of the more sustainable water supply plan. The Gibson Bill, however, does provide the legal authority to require the plan to be implemented. Only the NJDEP's authority granted under the Water Supply Management Act does the agency have the power to require the implementation of a regional water supply plan. More specifically, N.J.S.A. 58: 1 A - 6 states that:

b. In exercising the water supply management and planning functions authorized by P.L.1981, c.262 (C.58:1A-1 et al.), particularly in a region of the State where excessive water usage or diversion present undue stress, or wherein conditions pose a significant threat to the long-term integrity of a water supply source, including a diminution of surface water supply due to excess groundwater diversion, the commissioner shall, after notice and public hearing as provided by and required pursuant to the "Administrative Procedure Act," P.L.1968, c.410 (C.52:14B-1 et seq.), designate that region as an area of critical water supply concern.

In designating an area of critical water supply concern, the department shall be required to demonstrate that the specific area is stressed to a degree which jeopardizes the integrity and viability of the water supply source or poses a threat to the public health, safety, or welfare. This designation shall conform to and satisfy the criteria of

an area of critical water supply concern as defined in rules and regulations adopted by the department pursuant to the "Administrative Procedure Act," P.L.1968, c.410 (C.52:14B-1 et seq.).

Those specific areas previously designated by the department as water supply critical and margin areas, considered as Depleted or Threatened Zones, respectively, prior to the effective date of P.L.1993, c.202 shall be considered to be areas of critical water supply concern for the purposes of P.L.1981, c.262 (C.58:1A-1 et al.) or P.L.1993, c.202 (C.58:1A-7.3 et al.).

c. In designated areas of critical water supply concern, the department, in consultation with affected permittees and local governing bodies and after notice and public hearing, shall:

- (1) study water supply availability;
- (2) estimate future water supply needs;
- (3) identify appropriate and reasonable alternative water supply management strategies;
- (4) select and adopt appropriate water supply alternatives; and
- (5) require affected permittees to prepare water supply plans consistent with the adopted water supply management alternatives.

Further, N.J.S.A. 58:1A – 7 states:

b. Every diversion permit issued or water usage certification approved pursuant to section 6 of P.L.1981, c.262 (C.58:1A-6) shall be renewed by the department upon the expiration thereof, with any conditions deemed appropriate by the department, for the same quantity of water, except that the department may, after notice and public hearing, limit that quantity to the amount currently diverted, subject to contract, or reasonably required for a demonstrated future need. In designated areas of critical water supply concern, the department may, after notice and public hearing, modify the conditions of an existing diversion permit or water usage certification in order to (1) limit or reduce the quantity of water which lawfully may be diverted to the safe or dependable yield of the resource; (2) transfer the point of diversion; or (3) require a permittee to utilize alternate sources of water, upon a determination that the existing diversion or continued use of the same source in excess of the safe and dependable yield, as the case may be, adversely impacts or threatens to adversely impact the water resources of the State.

The Water Supply Allocation Regulations interprets the above statute in greater detail. N.J.A.C. 7:19-8.2 states that “The Commissioner shall, after notice and public hearing, designate as areas of critical water supply concern those areas in which the Department determines that adverse conditions exist, related to the ground or surface water, such that special measures are required to ensure the integrity and viability of the water supply source and to protect the public health, safety or welfare. The Department shall demonstrate that the designation is warranted through the use of a water supply availability study. The adverse conditions upon which the designation of an area of critical water supply concern is based shall include one or more of the following:

1. Shortage of surface water due to diversions from surface or ground water sources which leave insufficient surface water for permitted, certified, or registered diversions or for environmental protection purposes within a drainage area of at least ten square miles.
2. Shortage of ground water due to diversions exceeding the long- term, safe or dependable yield of an aquifer in an area of at least ten square miles. The Department may demonstrate such a shortage by a verified mathematical ground water model, or if such a model is unavailable, by one or more of the following:
 - i. A progressive lowering of ground water to the extent that existing wells of 50 feet or more in depth are threatened by declining water levels or rendered inoperative;
 - ii. A reduction of the average potentiometric surface in a confined aquifer such that the 30 foot below mean sea level contour is within five miles of salt water or intersects the 250 part per million chloride isochlor;
 - iii. A reduction of the average potentiometric surface in an unconfined or semi-confined aquifer to the zero foot contour (mean sea level) or lower, such that the contour line is either within five miles of salt water or intersects the 250 part per million chloride isochlor.

Based on the analysis described above, in conjunction with the 2009 USGS study and previous investigations, Cape May County is surely experiencing all or most of the above “adverse conditions” and that “special measures are required to ensure the integrity and viability of the water supply source and to protect the public health, safety or welfare.” The County’s water supplies have undoubtedly been over-allocated. And clearly, the NJDEP will identify the Gibson Bill’s sustainable plan to meet the water supply needs of the proposed amendment to the Cape May County WQMP/FWSA.

As described above, however, the mandates of the Gibson Bill have not been completely fulfilled. Furthermore, there is no mandate underway for the implementation of the sustainable water supply plan developed under the Gibson Bill. Consequently, a viable water supply plan to meet the needs of the proposed amendment to the Cape May County WQMP/FWSA cannot as yet be identified.

The SJBC has concluded that Cape May County meets all the statutory and regulatory criteria to be declared an Area of Critical Water Supply Concern.

Issue #17 – Significant Financial Investment in an Area Vulnerable to Future Hurricanes

According to Ben Strauss, chief operating officer and director of the Program on Sea Level Rise at Climate Central, a total of 23 percent of the population of Cape May County lives less than 5 feet above the high tide line, said Strauss, with 19 percent living less than 4 feet above the high tide line (Cape May County Herald, July 27, 2012). During Hurricane Sandy, storm surge elevations were as high as nine feet above ground level in Monmouth and Middlesex County. It is estimated that repairs to waste, water and sewer services in the storm-ravished sections of New Jersey will cost about \$3 billion (Asbury Park Press, February 12, 2013).

Fortunately, the surge caused ocean water to rise only two to four feet in Cape May County. But, one has to ask “what would be the implications if the County experienced the same surge as did northern counties?” The State’s taxpayers will fund much of the wastewater infrastructure if the proposed amendment to the Cape May County WQMP/FWSA is approved. At this point, there has been no evaluation of whether this is a wise investment to the residents of New Jersey.

Issue #18 – Antiquated Water and Sewer Systems

Many of Cape May County’s water and wastewater infrastructure is decades old. Consequently, water distribution systems have unacceptable leaks, and wastewater collection systems experience substantial infiltration/inflow. These conditions contribute to the County’s water supply problems by prematurely dewatering its aquifers. Millions of gallons of water are lost as a result.

Issue #19 – Potential for Increased Drought Warnings and Drought Emergencies

The NJDEP monitors hydrologic conditions during low rainfall periods. During very dry periods, various stages of drought warnings and emergencies are declared, based on ground water and streamflow conditions. Approval of the proposed WQMP amendment in the absence of a viable water supply alternatives plan will exacerbate low ground water and streamflow conditions and thus require the premature implementation of the drought actions. Several of these actions can have severe economic implications to Cape May’s tourism industry, including mandated water cutbacks, water surcharges, and water rationing.

Cape May County is an area rich in historic, cultural and environmental resources, and is a major flyway and breeding area for migratory birds. Resident livelihoods and critical habitats rely on a sustainable use of these resources. It is evident that the proposed amendment to the Cape May County WQMP/FWSA will worsen an already severe water supply problem. We ask the NJDEP to uphold their regulations, protect residents and ecosystems, and deny the proposed FWSA for Cape May County.

We again thank the Department and Cape May County Planning for its consideration of these comments.
Sincerely,

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