STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL
89 KINGS HIGHWAY
DOVER, DELAWARE 19901

OFFICE OF THE
SECRETARY

PHONE: (302) 739-9000
FAX: (302) 739-6242

Secretary's Order No. 2012-W-0005

Re: Application of Tidewater Environmental Services, Inc. for a Permit to Construct the Wandendale Regional Wastewater Treatment and Disposal Facility near Lewes, Sussex County.

Date of Issuance: May 2, 2012
Effective Date: May 2, 2012

BACKGROUND

This Order considers Tidewater Environmental Services, Inc.'s (Applicant or TESI) application for a construction permit for the 'Wandendale Regional Wastewater Treatment and Disposal Facility' (Wandendale), which would be built along John Williams Highway (Route 24) west of Lewes, Sussex County.

In its permit application, TESI proposes to construct Wandendale in 12 phases, with capacity added as needed to meet the regional growth for TESI's public utility sewer service. At completion, Wandendale as proposed would have 1,450,000 gallons per day (gpd) of wastewater treatment and disposal capacity, which could serve approximately 4,833 residential houses.[1]

Wandendale's application was submitted to the Department's Division of Water, Groundwater Discharge Section (GWDS) for review as a large community on-site wastewater treatment and disposal system (OWTDS) under the Department's

[1] This assumes service to typical residential houses requiring 300 gpd of wastewater treatment and disposal capacity as an equivalent dwelling unit (EDU).

Regulations. [2] GWDS' review included the information required by the Department's Coastal Zone Act[3] (CZA) Permit No. 380 issued pursuant to Secretary's Order No. 2010-CZ-0022 (July 23, 2010). CZA Permit No. 380 allowed Wandendale's proposed use as a 1.45 million gpd wastewater facility based upon a finding that Wandendale's proposed advanced treatment process would provide an overall environmental benefit within the Coastal Zone[4] and the fragile Rehoboth Bay watershed.[5] The Department also required that Wandendale's construction application include additional information, including an operations plan directing spray irrigation disposal.

The Department's CZA decision added environmental protection beyond the treatment process by imposing a spray irrigation requirement in CZA Permit No 380's Special Condition No. 7 set forth below:

> The Permittee shall submit to the Department as part of its construction permit [application] an operations plan that established under normal operations a priority use of spray irrigation to the maximum extent practicable, particularly during the early phases of the project to maximize their environmental and agricultural benefit, and a priority use of spray irrigation of agricultural areas over use of spray irrigation of wooded areas.

In a January 5, 2011 letter, the Department's CZA Program approved TESI's proposed spray irrigation phasing as consistent with the CZA Permit No. 380. Accordingly, TESI's construction application included an operations plan that proposed the spray irrigation disposal of wastewater beginning in Phase 6.

---

[2] *Regulations Governing the Design, Installation and Operation of On-Site Wastewater Treatment and Disposal Systems, 7 DE Admin Code 7101.*

[3] *7 Del. C. Chap. 70*

[4] An area defined by the CZA near Delaware's coast line.

[5] Wandendale's 1.45 million gpd discharge of pollutants would take between 2-35 years to travel by groundwater to reach the Rehoboth Bay.

The Department will determine that actual amount of spray irrigation capacity when the Department reviews TESI's Phase 5 application to construct and use spray irrigation facilities submitted pursuant to the Department's *Guidance and Regulations Governing the Land Treatment of Wastes, 7 DE Admin. 7101.* Consequently, TESI's construction application seeks approval of rapid infiltration basin (RIB) disposal as the exclusive method of wastewater disposal for Wandendale's 495,000 gpd capacity constructed through Phase 5.

TESI's construction application also provided information on the other CZA Permit conditions that were required to be in the construction application, and GWDS determined that the application was complete.

The Department held a public hearing on August 31, 2011 before the Department's presiding hearing officer, who allowed public comments to be received until September 23, 2011. The record contains comments that supported and opposed the application.

GWDS assisted the hearing officer with its expertise in November 18, 2011 technical response memorandum (TRM) that recommended issuance of a construction permit subject to conditions, but indicated that the operations plan's proposed use of spray irrigation at approximately 190,000 gpd, or 13% of the 1.45 million gpd Wandendale proposed capacity, was not consistent with a priority of use of this disposal method. In the attached December 16, 2011, Hearing Officer's Report (Report) of recommendations, the Department's presiding hearing officer summarizes a record and recommends that the Department issue a construction permit for Wandendale's phased construction though the proposed Phase 5, which will provide 450,000 gpd of treatment

capacity, and three RIBs for disposal. The recommended approval is construction of a system that has less than 17% of the capacity of the originally proposed 3 million gpd facility. The Report recommended no action on the remaining phases' proposed construction of 1 million gpd of treatment capacity and three RIBs for disposal. The Report's recommendation was based upon finding that, while the permit application for the first five phases met the technical requirements of the regulations, that the the record lacked sufficient information on the disposal methods, particularly spray irrigation, to be used after Phase 5 to justify any construction beyond Phase 5.

The Staff Report accepts the proposed construction phasing as reasonable and consistent based upon the practical and engineering considerations in spray irrigation disposal for agricultural use and the Department's CZA Program's interpretation of Permit No. 380. While a pure spray system was not technically feasibly in the early phases due to seasonal and storage limitations, the Department still contends that comingled groundwater and treated wastewater could be used in an early phase to create a hybrid spray-on-demand/RIB system, which would both ensure the availability of a reliable source of irrigation water was available and that spray on agricultural lands would be the priority use of treated wastewater during the growing season and the RIBs would only be used only when there was insufficient demand. Because the proposal through the first five phases meets the necessary regulatory requirements, the Report recommends that the Department not deny the application based upon the public comments, which contended that the proposed phasing of spray irrigation disposal was not consistent with the CZA Permit or protecting the environment.

The Staff Report finds that the construction application satisfies the CZA Permit conditions, and recommends issuing a permit containing the conditions that GWDS prepared as reasonable and necessary to protect the environment.

FINDINGS AND DISCUSSION OF REASONS

The Report and its recommendations are hereby adopted to the extent it is consistent with this Order, which will focus on the following: 1) Wandendale environmental impact, 2) Wandendale's proposed 12 phase construction, and 3) Wandendale's proposed disposal methods.

1. Wandendale's Environmental Impact

The waters of the Inland Bays are impaired and will continue to be so unless nutrient loads are reduced significantly. This impairment, primarily from non-point sources of pollution, affects the populations of numerous fish and aquatic species, the safety of swimming and other recreational activities, and the clarity and overall visual experience of the Bays. Despite these impairments, Sussex County has approved housing development of several parcels in the Level 4 areas, including proposed Wandendale project area, which will further increase nutrient loads and further degrade the Inland Bays watershed unless steps are taken to minimize and mitigate any increase.

Since it is likely that some volume of the housing lots approved by Sussex County will be developed, the questions before the Agency are whether the proposed project meets the technical requirements of the applicable regulations and whether the future housing units should be served through community systems or individual septic systems, or whether a central system is preferable. For the first five phases, the project does meet the technical requirements and clearly from an environmental impact, the construction of

a central system with strict nutrient limits is preferable, because the nutrient limits are 10 times less for nitrogen and 36 time less for phosphorous for OWTDS large systems, when compared to the current regulatory levels for individual systems. In addition, the environmental benefits are increased greatly, if existing homes on septic systems connect to the system, compared to the more polluting alternatives. And while it is preferable for a central system to serve such housing units, the Department stands by its numerous concerns and the concerns of several other State Agencies about development in Level 4 and fully acknowledges that slowing the increase of nutrient loading alone will not nearly achieve the reductions necessary to ensure a healthy Inland Bays Watershed. For this reason, the Department strongly encourages local land use decision-makers to give greater consideration to the water quality implications of various proposals and seeks their partnership to improve water quality.

The Department's CZA permit decision considered Wandendale's environmental impact on the Coastal Zone and determined that, when compared to the alternatives for wastewater treatment for housing units already approved by Sussex County, the proposed advanced treatment process would provide a net-environmental benefit to offset any potential adverse impacts. The Department's CZA decision also recognized that Wandendale's construction was proposed to fulfill a demand for sewer service created by undue intensive residential and commercial development in a Level 4 area that the State has repeatedly contended should be protected from such development. Consequently, the Department's CZA Permit No. 380's directed that Wandendale's proposed use should include more environmental protection than the advanced treatment process, and the

Department added Special Conditions, including Special Condition No. 7 directing a "priority use of spray irrigation."

This Order reaffirms the CZA decision that advanced treatment process provided by a large OWTDS provides a significant environmental benefit over an individual OWTDS or individual septic systems, which are the only viable alternatives to wastewater treatment for any particular lots already approved in TESI's service areas. This Order also emphasizes the CZA decision that Wandendale's construction of 1.45 million gpd capacity will require a priority of use of spray irrigation, but accepts the practicable problems with spray irrigation use before there is sufficient wastewater flows for agricultural spray irrigation.

The consideration of multiple construction phases in a single application is reasonable because Wandendale's construction will add similar treatment units as needed for TESI's growth in demand for central sewer utility service. The Department and TESI do not want 1.45 million gpd capacity constructed at the outset of Wandendale's operations and have most of the capacity not used, possibly for decades. Thus, phased construction may be appropriate when TESI and the Department know what facilities are appropriate to construct to meet a reasonably expected demand for wastewater treatment and disposal.

The pace of construction from one phase to the next will depend on the demand for TESI's service, which, in turn, will depend largely upon Sussex County's approval of lots for development, and then the market for new houses to be built on the approved lots. The demand for Wandendale's capacity beyond service to the developments that TESI has identified is unknown at this time. The Department does not want to encourage any

excessive development of an environmentally fragile area in the Rehoboth Bay watershed. Indeed, the Department's comments opposed Sussex County's 2008 planning approval of Wandendale because of this concern that central sewer service would enable undue intensive residential and commercial development in an area designated by Delaware's planning office for protection from such development.

The Department continues to believe that Sussex County should not have approved the zoning change from the County's own adopted Comprensive Plan to allow Wandendale's construction. This approval will likelymake more intensive development attractive in an otherwise rural area.. The Department's opposition to Sussex County's planning approval was to protect the environment, particularly the water quality of the Rehoboth Bay, from the adverse impacts from intensive's residential development, particularly the impact from its wastewater discharges into the Rehoboth Bay watershed. However, given the likely approval by Sussex County of future developments, it is the Department's position that such developments should be served by centralized wastewater treatment systems rather than community or on-site septic systems.

There is no current feasible technology that prevents nitrogen and phosphorous pollution discharge when a lot is developed. The construction of a house will add to the nutrients discharged in a watershed. The Department's role is to select the wastewater method that best protects the environment from the discharge of the wastewater's pollutants from each structure constructed on an approved lot. Thus, the Department's responsibility is to best regulate the wastewater pollution produced by the development of approved lots. At the same time, the Department must work more effectively with

Sussex County to not just stabilize but to reduce the overall nutrient loading into the Inland Bays to achieve the total daily maximum loading.

Sussex County's approval of land development plans is based upon a developer's proposed wastewater disposal method. A lot or development approved by Sussex County may still not be improved by construction of a house because of the Department's regulation over the wastewater disposal. The OWTDS Regulations require certain testing and isolation distances to protect the environment and public health. The testing of soil conditions may result in an approved lot not being suitable for the installation of an OWTDS. Thus, the Department's role does impact land development, particularly in low lying areas subject to soil conditions that often are not suitable for any OWTDS.

The Department's OWTDS Regulations allow two wastewater treatment options for an approved lot, either an individual OWTDS or a large OWTDS such as Wandendale. An individual OWTDS discharges an estimated 50.0 milligram per liter (mg/L) of nitrogen and 18.0 mg/L of phosphorous.[6] Aa large WTDS in the Rehoboth Bay watershed,must use an advanced treatment process to meet Inland Bay PCS' limits of 5.0 mg/L for nitrogen discharges and 3.9 mg/L for phosphorous. Wandendale's treatment process will remove phosphorous to meet a 0.5 mg/L limit, or eight times better than required by the PCS. Thus, based upon the two choices for serving an approved lot, Wandendale provides the best protection for the environment.

The Department's role is to determine the wastewater treatment and disposal method that will protect the environment, including the consequences from local planning decisions that may cause undue residential and commercial development within the

[6] This is estimated because the Department OWTDS Regulations do not require an individual OWTDS to measure the discharges of pollutants, but the Department requires large OWTDS to measure and report to the Department the discharges to ensure compliance with permit limits.

fragile Rehoboth Bay watershed. Thus, Wandendale's treatment process would result in a developed residential lot discharging 10 times less nitrogen and 36 times less phosphorous than if the lot used an individual OWTDS, which clearly is an environmental benefit.

TESI has identified several developments to be connected to Wandendale, which represent approximately 2,034 Sussex County approved residential lots. If Wandendale is not built, then the only way the houses can be constructed would be to install 2,034 individual OWTDSs or if the owners of large parcels of land which are in TESI's original service area are successful in making the case that services will not be available in a reasonable period of time and thus they need to use another provider of the service. . Based upon these options, the Department's decision properly considers the environmental benefit of Wandendale's central sewer service option with its advanced treatment process as superior to the treatment process currently required by the Department's OWTDS Regulations.

Wandendale's advanced treatment will allow TESI to connect the estimated 1,600 houses in Wandendale's regional service area, which could, over time, result in the abandonment of 1,600 OWTDSs.[7] and reduce the nutrient loads discharged into the Rehoboth Bay watershed. Moreover, TESI's construction of sewer mains throughout the region to connect developments to Wandendale will allow Wandendale to connect more existing OWTDSs when they need to be replaced. Based on the existing laws, regulations and record, Wandendale represents the best treatment possible and should provide an overall environmental benefit that will mitigate the potential harm from

[7] The Department experts estimate a properly maintained individual OWTDS has a 20-30 year service life.

Sussex County's land development decisions that have resulted in approval of undue residential and commercial development of a fragile area.

Wandendale's proposed discharge of pollutants into the Inland Bays watershed will be significantly lower than the pollutants that otherwise would discharged by Wandendale's customers if they installed an individual OWTDS as an alternative to TESI's sewer utility service. Wandendale's environmental benefit to reduce pollution will depend on the lots that connect to it for service, with the greatest benefit from lots served by an existing OWTDS and the least benefit from connecting lots that could not have any OWTDS under the Department's OWTDS Regulations. The record does not provide any information on the type of lots that will connect to Wandendale. Nevertheless, the economics of wastewater service will result in Wandendale connecting mostly lots without an existing OWTDS because connecting to Wandendale will mean paying for TESI sewer service as opposed to an individual OWTDS' 'free' wastewater service.

Based upon these considerations, the Department determines that Wandendale's construction of an advanced treatment process will provide a sufficient environmental benefit because it will offer the best possible treatment of the wastewater produced from new house constructed in developments that Sussex County has approved. Moreover, Wandendale's construction will provide advanced treatment to be available to serve existing houses when they need to replace an individual OWTDS.

2. Wandendale's 12 Proposed Phases

The environmental benefit discussed above from the possible connection of houses either to be built in the current approved developments, and existing houses

served by an OWTDS, however, do not support this Order's approval of the construction of 1.45 million gpd of capacity. The Report discusses TESI's proposed Wandendale construction over 12 phases. The Report recommends a finding that the proposed construction phasing concept in a single application is a reasonable procedure for Wandendale, but the proposed phasing also allows the Department to phase its review of the application. This Order, however, disagrees with the Report that the Department may approve construction that extends as long as Wandendale's proposed construction. The Department's OWTDS Regulations require a construction period of only two years, which could be followed by a possible one year extension thereafter. Consequently, the Department's construction permit should authorize construction that reasonably may occur within the duration of the construction permit. This Order finds that Wandendale's proposed 12 phase construction contemplates a construction period well in excess of any the period allowed by a construction permit.

This Order does not determine how much capacity will be needed to be constructed in the term of the construction period, but instead accepts the Report's recommendation that Wandendale's initial construction permit be issued for the construction proposed through Phase 5. This decision allows TESI to meet any reasonable projection of the current demand for TESI's sewer service based upon Phase 5's 450,000 gpd capacity. This approval will require TESI to submit another construction application if more demand is needed or if the construction permit expires. This Order considers Phase 5 the appropriate phase to approve without extending the construction period too much into the future beyond any reasonable expectations of the construction period provided by the OWTDS Regulations.

The Report does not recommend deciding whether to approve or deny the construction of the remaining phases until the Department has sufficient information on the disposal capacity, which, under the proposed phasing, will be information only available in Phase 5. This Order agrees with the Report, and finds that the Department could reasonably approve only the first 150,000 gpd of treatment capacity, which would require TESI to submit a new application for additional capacity closer to when more capacity would be needed. Indeed, this is the procedure for constructing similar sized wastewater treatment plants that discharge into the surface waters. Nevertheless, the existing demand supports more construction of capacity than just 150,000 gpd, but does not support full approval until the disposal capacity information is available. Thus, the Department finds that the phased construction is reasonable because it will allow TESI to add capacity when required to provide public utility sewer service and will avoid TESI constructing the entire 1.45 million gpd capacity when it may not be needed for decades.

The Department also considers approval of TESI's application to construct 1.45 million capacity based upon a phased construction schedule that would extend over many years is unreasonable because there is so much uncertainty. Any approval of a treatment process will be subject to change in the future if needed to protect the water quality of Rehoboth Bay. The Department finds that prudent regulation supports refraining from acting on all 12 phases at this time. Thus, the Department finds no good regulatory reason to approve construction so far in the future when there is so much uncertainty.

The Report's recommendation to approve construction only through Phase 5 is primarily based upon the lack of information on Wandendale's proposed spray irrigation disposal method. This Order agrees that this record has no spray irrigation construction

plans to approve and that the Department should wait until its review of the Phase 5 spray irrigation construction plans before allowing construction beyond Phase 5. At the same time, the Department has concerns about whether the RIBs systems will perform as proposed. For these reasons, the Department finds that the Report's reasons justify approval of Wandendale to only a 450,000 gpd capacity.

The Department's decision to defer further any decision in this Order on construction beyond Phase 5 also is based upon the fact that the current record cannot be adequately supplemented to obtain the information without any spray irrigation construction application or information that can provide the actual performance of the RIB disposal method. The Department experts expressed concern with reliance on Wandendale's RIB disposal capacity. This reliance is based upon computer modeling of groundwater impacts, which the Department experience has shown to differ from actual performance. While the first five phases of the proposed projects meet the technical requirements for a large OWTDS, the lack of statewide experience of permitting RIB systems of this capacity and the lack of any Department regulations specifically for RIB construction also supports a cautious approach to approving RIB disposal as the only method for the 1.45 million gpd capacity until the spray irrigation disposal is determined. Thus, limiting disposal construction to Phase 5 will provide the department additional data about the actual performance of RIBs systems compared to the modeling and as such the department will require performance reviews within the first five phases prior that will must demonstrate achievement of the required performance prior to additional construction. .

In sum, TESI's proposed 12 phase construction is reasonable in concept, but the Department's OWTDS regulations that impose a limit on the construction period that supports issuing a permit only for through Phase 5. Moreover, the Department considers that prudent regulation supports approval only through Phase 5 to allow changes to be made to construction after Phase 5 if needed to comply with regulations in effect at that time. Finally, the information on spray irrigation disposal capacity and the performance of the RIB disposal capacity is important information for approval of any construction beyond Phase 5 and is information that will only be available in Phase 5.

3. Wandendale's Proposed Wastewater Disposal Methods

TESI's phasing includes the proposed construction of six RIBs as the only disposal method capacity for 1.45 million gpd, and the RIB disposal method was opposed by many of the public comments. The Report recommends accepting the proposed phased construction of the three RIBs through Phase 5 and, as discussed above, deferring any decision on the proposed construction of the three remaining RIBs until TESI and the Department have more information, which will be available in Phase 5.

As noted above, the Department has environmental concerns with approving RIB disposal based solely on computer modeling of groundwater because of experience that has shown the computer modeling was not always accurate in predicting actual groundwater impacts from RIB disposal. RIB disposal was opposed by public comments that compared it to an open discharge on the land of untreated wastewater. RIB disposal entails the discharge of treated wastewater on a land area, which makes it similar to spray irrigation disposal. Consequently, RIB disposal requires less land and concentrates the groundwater impacts of wastewater disposal more than spray irrigation disposal.

The Department is sympathetic to the public comments' environmental reasons for opposing RIB disposal. Nevertheless, as discussed above, the Department finds that this planned construction of spray irrigation is consistent with existing regulations and with the CZA Permit No. 380's Special Condition No. 7 due to technical limitations. The Department also finds that TESI properly relied on the CZA Program's interpretation of CZA Permit No. 380 that Phase 5 construction is when TESI should submit an application to construct spray irrigation facilities for disposal of treated wastewater as soon as practicable. The permit condition was satisfied when TESI submitted its construction application that contained "an operations plan" that had Wandendale using "under normal operations" a "priority use of spray irrigation to the maximum extent practicable particularly during the early phases of the project..."

The phrase "priority of use of spray irrigation" was the subject of controversy with public comments and the GWDS disputing that TESI's plans were consistent with a priority of use. The Department experts do not consider Wandendale's current land area to support spray irrigation of equal to 1.45 million gpd; however the Department does not consider the land area currently leased to limit the spray irrigation capacity, particularly when the record has farmers seeking to use Wandendale's treated wastewater for spray irrigation. The Department finds that spray irrigation's 190,000 gpd capacity, or 13% of 1.45 million gpd capacity, is not adequate to protect the environment nor is it consistent with a priority of use contemplated by the CZA Permit and as such will look for greater focus on spray irrigation in phases after phase five. This finding is independent of the CZA Permit because spray irrigation disposal potentially provides greater protection of the Inland Bays' water quality by discharging the treated effluent

over a larger land area than the smaller land areas used for RIB disposal. Spray irrigation also reduces the need for agricultural application of nutrients, which provides a greater benefit than use of RIB disposal.

The Department will have to wait for Phase 5 before it has the full information on the spray irrigation disposal capacity. The Department advises TESI to submit an application for approval of construction of facilities that will have spray irrigation disposal capacity to allow spray irrigation's priority of use as Wandendale's disposal method. However, without details on the land area to be used, the Department does not have the information it needs, although, if the existing land area is all that will be available, then it will be insufficient for any priority of use of spray irrigation. Thus, TESI is placed on notice that more land area will be needed for spray irrigation disposal than currently available to obtain construction approval beyond Phase 5. Specifically, priority use for spray could be 51% of the effluent going to spray & 49% going to RIBs. Given the sandy soils in the vicinity of Wandendale, farmers would take free treated wastewater; however, the lands closer to the Inland Bays will be developed well before areas further away so TESI should look more inland for additional spray lands.

In sum, the Department approves TESI's operations plan that will have a spray irrigation construction application submitted in Phase 5, allow Wandendale to exclusively use RIB disposal method until spray irrigation facilities are constructed in Phase 6. The Department, however, will expect the spray irrigation disposal construction application will have sufficient capacity for Wandendale to use as a priority use consistent with the CZA Permit's direction and the need to protect the water quality of the Rehoboth Bay by using the best disposal method possible.

Conclusions

I find and conclude that sound environmental reasons support approval of the construction of Wandendale only through the proposed Phase 5. In sum, as more fully described in the reasons and findings above and in the Report, the Department directs the following:

1. The Department has jurisdiction under its statutory authority to make a determination in this proceeding;

2. The Department provided adequate public notice of Applicant's application and the public hearing;

3. The Department considered all timely and relevant public comments in the record and the advice of its experts in making its determination;

4. The record supports issuance of a permit for the proposed construction though Phase 5, and no decision on the remaining phases at this time. Post Phase 5 construction permit applications must demonstrate a preference of spray irrigation of treated wastewater over RIB disposal through the submission of a Spray Irrigation Design Development Report;

5. The construction permit shall be conditioned such that prior to proceeding with construction of RIBs 4 and 5 (RIBs F and B respectively), TESI shall submit a report to the Department demonstrating that the groundwater quality in the vicinity of the Phase 2 RIB (RIB C) has not deteriorated due to the disposal of treated wastewater into the RIB and that the facility has fully complied with the Pollution Control Strategy for the Inland Bays basin. Upon successful demonstration that such targets are being met, DNREC shall allow TESI to proceed with construction; and that

6. The Department shall publish this Order on its web site and otherwise provide notice to the persons affected by this Order, as determined by the Department.

Collin P. O'Mara,
Secretary

HEARING OFFICER'S REPORT

TO: The Honorable Collin P. O'Mara
Secretary, Department of Natural Resources and Environmental Control

FROM: Robert P. Haynes, Esquire
Hearing Officer, Office of the Secretary
Department of Natural Resources and Environmental Control

RE: Application of Tidewater Environmental Services, Inc. for a Permit to Construct the Wandendale Regional Wastewater Treatment and Disposal Facility near Lewes, Sussex County.

DATE: December 16, 2011

I. PROCEDURAL HISTORY

This Report reviews a record and makes recommendations to the Secretary of the Department of Natural Resources and Environmental Control (Department) on Tidewater Environmental Services, Inc.'s (TESI or Applicant) December 20, 2010 permit application. TESI submitted the application to the Department's Division of Water, Groundwater Discharge Section (GWDS) to obtain a permit to construct a large community on-site wastewater treatment and disposal system (OWTDS) for the 'Wandendale Regional Wastewater Treatment and Disposal Facility' (Wandendale). Wandendale would be located on four parcels totaling 296.55 acres along John William Highway and Camp Arrowhead Road west of Lewes, Sussex County. TESI proposes to construct Wandendale to 1.45 million gallon per day (gpd) of wastewater treatment and disposal capacity, but the construction would be phased to add capacity as needed to meet the demand for sewer service by TESI's public utility sewer customers.

In an April 8, 2011 letter, GWDS provided comments on the application, and TESI provided a May 2, 2011 response that revised the application.

On July 3, 2011, the Department published public notice of a completed application, which afforded the public fifteen days to present written comments. Public comments were received, including two requests for a public hearing.

On August 7, 2011, the Department published public notice of a public hearing to be held August 31, 2011 at the Cape Henlopen High School, Lewes, Sussex County, which provided another opportunity for public comments prior to the hearing.

I presided over the public hearing, which was attended by approximately twenty persons, including representatives of DNREC and the Applicant. At the conclusion of public hearing, I granted the unopposed request to extend the public comment period for written comments until September 23, 2011. Additional written comments were received during the extended public comment period.

On October 7, 2011, I requested technical assistance from experts in GWDS, which in a November 18, 2011 technical response memorandum (TRM) recommended issuance of a permit subject to conditions. In addition, in a December 7, 2011 letter I requested additional information from the Applicant on its proposed sewer utility customers, which the Applicant provided in its December 12, 2011 response. I consider the record adequately supported for this Report's recommendations.

II. SUMMARY OF THE RECOMMENDED RECORD[1]

The record of decision that I recommend be adopted to support this Report and any final Order that is consistent with the recommendations herein is based upon: 1) the 125 page verbatim transcript of the public hearing, 2) the documents submitted as hearing exhibits, as supplemented by documents identified in this Report, and 3) this Report and the attached TRM. The Department files contain other documents on the permit application, and the Secretary may revise this record to support the final decision.

[1] This summary reviews a record without determining its factual accuracy except for the information prepared by the Department.

At the August 31, 2011 public hearing, Ron Graeber, Manager of GWDS' Large Systems Branch, developed the administrative record[2] by introducing selected relevant documents from the Department's files, which I summarize as follows:

> DNREC Ex. 1 is the July 3, 2011 public notice of the completed application based upon the Applicant's May 2, 2011 submission of responses to the Department's April 8, 2011 letter requesting additional information.
>
> DNREC Ex. 2 contains the public comments received from John Austin, William Moyer, Richard Anthony and Kit and Bill Zak prior to the public hearing. Mr. Austin questioned the application's compliance with the Natural Heritage Report and the Coastal Zone Act permit. He asserted that the proposed treatment levels of 3.54 milligrams per Liter (mg/L) for phosphorous (P) and 0.05mg/L for nitrogen (N) would be higher than the average surface water levels for these pollutants. He also questioned whether the treatment would use the best achievable treatment technology capable of treating to 3.0 mg./L for N and 0.1 mg./L for P. He further questioned the compliance with the TMDLs for Love Creek and Burton Prong and whether the TMDLs can be achieved without a moratorium on further development in the basin. He commented on the differences in the time estimated for the plant's discharge to reach the surface waters.
>
> Mr. Moyer's letter commented on the application's alleged failure to comply with the Coastal Zone Act permit and the 2008 Sussex County Comprehensive Plan.
>
> Mr. Anthony claimed that proposed Wandendale plant would harm the Inland Bays' water quality by adding more nutrients to surface waters already impaired by nutrients. He claimed that the application lacked a surface water assessment report, which he claimed was required by the Coastal Zone Act permit. He questioned the reliance on the Inland Bays Pollution Control Strategy as compliance with a surface water assessment report particularly when the PCS is being challenged in court. He expressed concerns with the potential harm from a failure of wastewater treatment plants such as have occurred elsewhere.
>
> The Zaks commented as representatives of the Center of the Inland Bays. They noted the size of the project would equal the discharge from the City of Seaford's wastewater plant. They further noted the Inland Bays' impairment by excessive nutrients. They also questioned the use of the Rapid Infiltration Basin (RIB) disposal method as an unprecedented and relatively untested system of disposal. They quoted the CZA permit's Order that the construction permit application would require high performance standards, sound geologic science and rigorous technical review. They claimed that the RIBs will deposit nitrogen at levels of 1,634 pounds per acre while spray irrigation would deposit 120 pounds per acre, and be further reduced by one half through crop uptake. They claimed that RIBs usage in the early phases of the plant deposit nitrogen at levels

[2] The Department's role at the hearing is that it takes no position on the merits of the application until after a public hearing. Instead, the Department develops the hearing record with certain information relevant to the record of decision solely to assist the public in their public comments.

2x-5x higher than the 5mg/L level allowed by the PCS. They pointed out that the spray irrigation is not proposed until Phase 5, which is when flows would reach 450,000 gpd or 31% of the total capacity. Spray irrigation is proposed to be used as a backup disposal method, which they consider is at odds with the CZA permit's condition to use spray irrigation as a priority disposal method. The Zaks also commented that no surface water assessment study had been submitted by the Applicant, which they also claimed was contrary to the CZA permit.

DNREC Ex 3 is the August 7, 2011 public notice of the August 31, 2011 public hearing.

DNREC Ex. 4 contains several documents, which I now mark separately as follows: DNREC Ex 4A is Delaware Coastal Zone Act (CZA) Permit No. 386 issued July 30, 2010. DNREC Ex. 4B is Applicant's November 3, 2010 letter to Secretary O'Mara on the proposed plans for spray irrigation to satisfy Special Condition No. 7 as set forth in the March 3, 2010 letter to Jack Hayes of GWDS. DNREC Ex. 4C is Applicant's November 5, 2010 letter Lee Ann Walling regarding compliance with CZA Permit No. 386's Special Condition 9 for a surface water assessment report. DNREC Ex. 4D is Applicant's December 20, 2010 letter to Lee Ann Walling, which describes how Applicant plans to comply with all nine of the conditions imposed by CZA Permit No 386. DNREC Ex. 4E is Lee Ann Walling's January 5, 2011 letter to the Applicant, which states that TESI's proposed compliance with the conditions would satisfy CZA Permit No. 386's conditions.

DNREC Ex. 5 is Applicant's consultant, Terra Firma Consulting, Inc. (TFC), March 3, 2008 letter as a Notice of Intent to GWDS that a soil investigation for a Soil Investigation Report (SIR) for RIBs and spray irrigation groundwater disposal up to an estimated 3.62 million gpd of treated wastewater.

DNREC Ex. 6 is TFC's Soil Investigation Report (SIR) dated July 23, 2009 that was submitted to GWDS. The SIR reviewed two areas totaling 19.72 acres for RIBs disposal and 150.91 acres for spray irrigation disposal. The SIR indicated that the property was agricultural or forested. The SIR proposed that the RIBs would be used as the primary disposal method and that spray irrigation was to be used as a spare area. Department experts observed soil testing at the site on March 12, 17 and 25, 2008. The SIR determined that RIBs Area "A" and "B" meet the Department's criteria, and that Area "A" had better surficial soil conditions than Area "B." The SIR recommended a rate of infiltration of 2.5 minutes per inch or 24 inches per hour for Area "A" and a rate of 0.75 inches per hour or 80 minutes per inch be used for Area "B." The SIR also reviewed weekly monitoring data over extended time periods from seven wells installed in the Fall of 2007 for Area "A", which monitoring reported the highest water levels to be 17.53 to 23.28 feet beneath the surface. Area "B"'s data from three monitoring wells showed the highest water levels to be 9.81 to 10.60 feet below the surface. The SIR provided a use limitation based upon a maximum daily flow of 934,000 gpd for the RIBs. The SIR review of spray irrigation found soil suitability on 150.91 acres in three separate areas; including 54.16 wooded acres only suitable for drip spray. The soil investigation for spray was conducted December 19-27, 2006 under near normal to slightly above normal precipitation conditions. The SIR identified three areas for spray irrigation, and concluded that the proposed spray irrigation was well suited to year-round spray irrigation of treated

wastewater based upon the depths to the seasonal high water table/seasonal saturation are generally beneath 40 inches.

DNREC Ex. 7 is Applicant's Consultant, Eastern Geosciences, Inc's "Hydrogeologic Evaluation for Subsurface Wastewater Discharge Capacity for the Lands of Wandendale Farms, Inc" submitted October 5, 2009 (Groundwater Investigation Assessment or GIA). The GIA evaluated the groundwater impacts for a 1.6 MGD discharge at RIB area "A" and found that flow paths with travel times ranging 15 to 35 years prior to discharge to the down gradient streams and bays except for the west side of RIB Area A, which would discharge 10% of the flow in approximately 2 years when the flow reaches 1.2 MGD. Greater than 80% dilution is calculated for the shortest flow path and 90% dilution is calculated for a five-year flow path within 2,000 feet of RIB Area A. The GIA concluded that given the treatment levels proposed, the travel times, and the expected dilution that the treated wastewater is expected to essentially be at background conditions prior to reaching any surface water bodies. The GIA indicated that the long travel times and low initial discharge volumes will provide sufficient time to monitor and verify ground-water quality long before any flow paths reach surface waters.

DNREC Ex. 8 is the June 18, 2010 memorandum from Scott Strohmeier, P. G., to Jack Hayes as Groundwater Protection Branch's (GPB) review of the GIA. This review found that the Wandendale disposal capacity was limited to 1.45 MGD because of the regulatory requirement for a spare disposal area in the event of failure of the primary area for the RIBs. The Applicant indicated that additional land may be purchased in the future to meet the 3 million gpd capacity requested in the CZA permit application. This memo also indicated GPB's April 10, 2010 approval of Applicant's proposed monitoring work plan for evaluating the RIBs. The memo reviewed the soil testing and concluded that the hydraulic loading rate of 2.5ft./day or 18.7 gpd/ square foot, which was a rate higher than the SIR's results. The memo recommends that GWDS permit the system in three phases with the first phase up to 1,665 equivalent dwelling units (EDU) connected. This phasing was recommended to evaluate the RIBs actual system performance over time because of the large capacity proposed for RIB disposal and the inherent risks in relying on computer simulation modeling for groundwater flows.

DNREC Ex. 9 is Jack Hayes June 28, 2010 letter on the Basin Infiltration Test Results and includes GPB's recommendations.

DNREC Ex. 10 is Derrick Caruthers' April 8, 2011 letter to Applicant indicating areas in the application that require more information before it is complete.

DNREC Ex. 11 is Applicant's Design Report that sets forth the engineering and provides the proposed 12 construction phases based upon incremental treatment units of 150,000 gpd until the last unit of 100,000 gpd.

DNREC Ex. 12 contains the 47 pages of plans for the Wandendale plant's construction.

DNREC Ex. 13 is Applicant's Department form application for an OWTDS permit based upon a Large, Community 1.45 million gpd capacity and the RIB disposal method.

DNREC Ex. 14 is GWDS' response to address the public comments GWDS received prior to the hearing. This response clarified certain aspects of the application's groundwater analysis, which used the United States Geological Survey's numerical groundwater flow computer model, MODFLOW. GWDS' comments also addressed the contention that the Wandendale plant should use the best achievable treatment levels, which are not required under the Department's current regulatory standards of 5.0 mg/L of nitrogen and 3.9 mg./L phosphorous, as established by Inland Bays Pollution Control Strategy (PCS).

The Applicant's representatives included its counsel, Jeremy Homer, Esquire, with the law firm of Parkowski, Guerke & Swayze and Bruce Patrick, TESI's Vice-President of Engineering. Mr. Patrick first stated that TESI and its sister water utility company, Tidewater Utilities, Inc., are owned by Middlesex Water Company, a 114 year old publicly traded company. He went on to discuss the Department's regulatory oversight of TESI for environmental matters, and the Public Service Commission's (PSC) regulation over rates and public utility sewer service, and Sussex County's regulation over the land use and building code. He indicated that TESI had PSC approval to serve customers in a service territory that the Wandendale plant would serve, and that Sussex County had granted conditional land use approval for the Wandendale plant.

Mr. Patrick indicated that TESI has four community systems nearby, but that Wandendale would be a more efficient way to provide sewer service. He stated that Wandendale will enable existing septic systems to be eliminated, which would reduce nitrogen and phosphorous going into the environment. He noted that TESI had conducted a study and found approximately 1,600 septic systems in a several mile radius of the Wandendale site.

He described the proposed location of the site and construction of the treatment building on 7.5 acres that currently are wooded. The RIBs would be in the fields and have woods on three sides and space for a proposed storage lagoon for future spray irrigation use.

He stated that the treatment process will use membrane bioreactor technology that removes nitrogen to meet the Department's 5.0 mg/L limit, as established by the Inland Bays

Pollution Control Strategy (PCS). In addition, the process will remove phosphorous to a 0.5mg/L level, which he indicated would be substantially (8x) lower than the Inland Bays PCS' 3.9 mg/L limit. He further stated that the treatment process would use ultraviolet disinfection and micro filtration to lower BOD, total suspended solids and nitrogen to below 5 mg/L. The treatment process will expand by adding 150,000 gpd capacity treatment units until the last 100, 000 gpd expansion.

He explained the phasing of the disposal of treated wastewater via RIBs and spray irrigation. First, he described RIBs as shallow basins, approximately 18 to 36 inches deep, built to hold the treated wastewater while it infiltrates into the ground. RIB disposal, he noted, has been used for over 100 years, and requires a deep water table or deep distance to the seasonal high water table and permeable soils. He indicated that only approximately 10% of Sussex County would be suitable for RIBs, and the Wandendale site had only 15.4 acres suitable for RIBs. He described the proposed six RIBs at total build out would be used in rotation so that one RIB would be used over a 24 hour period, and then the next one would be used for the next 24 hours period in a six day cycle of RIB use. He noted TESI's operation of five RIBs nearby along Camp Arrowhead Road.

Mr. Patrick described how spray irrigation would be used once flows reach 10% of the total facility's design flow, or 145,000 gpd, by the spray irrigation of the landscaping of the berms of the RIBs and expanding based upon flows to meet agricultural requirements as needed similar to Sussex County's spray irrigation at its Wolfe Neck, Piney Neck and the Inland Bays wastewater facilities.

Mr. Patrick described the soil suitability for the disposal methods and the testing methods used and the Department's review and approval of the testing and the use of the three dimensional hydrogeological model. The result was that the model showed that about 90% of

the RIB disposal flow would go to Love Creek after a groundwater travel time between 15 and 35 years and that 10% would flow towards Sarah's Run once the plant's flows reached 1.2 million gpd. He emphasized that the treated wastewater would meet drinking water standards, and that the travel times would provide 90% dilution before the discharge would enter Love Creek and an 80% dilution before it enters Sarah's Run. He noted that the studies showed no adverse impact on public water wells.

He described the initial start up phase in which 15,000 gpd, when wastewater would be collected in a storage tank and transported off site for treatment and disposal. He noted that the plant needs flows of about 10-20% of the treatment unit's capacity for the treatment process denitrification to operate properly. He stated that spray irrigation would begin when the plant's flows reached about 145,000 gpd by using water from a new well to irrigate the landscaping. He stated that spray irrigation would increase when flows reached 300,000 gpd and include crop irrigation. When flows reached 600,000 gpd, a spray irrigation storage lagoon for treated wastewater would be constructed to support agricultural use of the spray irrigation as needed. He indicated that RIBs would be used as the primary method when the crops did not need irrigation.

Mr. Patrick spoke about the flexibility provided by the treatment units, which allowed fewer units to be used during the winter months when flows would be lower. In addition, the treatment units provided a redundancy in the design.

Mr. Patrick addressed the compliance with the CZA Permit No. 386 and each of its nine conditions and that the CZA Program has accepted the proposed compliance plans, including the spray irrigation plans discussed above.

Mr. Patrick concluded his comments by stating that the proposed plant would provide state of the art treatment to satisfy the PCS' limits for protecting the Inland Bays from water

pollution from nitrogen and phosphorous and that the RIB disposal method was essentially a groundwater recharge mechanism and that the spray irrigation will preserve open space for continued farming use.

The first member of the public to speak was John Austin, who provided ten exhibits for the record that are summarized below:

Austin Ex. 1 is the prepared statement of comments that cited the Department's TMDLs and Section 303(d) water quality listings. He cited the TMDL for nitrogen as requiring a 40% reduction for loads entering the Inland Bays watersheds from non point sources, which was based upon 1,614 pounds per day base period loading down to the required 968 pounds per day needed to achieve the water quality standards. Similarly, he cited the TMDLs need to reduce phosphorous from 79 pounds per day to 49 pounds per day. He indicated that there was no waste load allocation for any new point source discharge allowed in the TMDLs and that all existing point source discharges were to be systematically eliminated. He noted that the proposed discharge would annually load 19,311 lb of nitrogen and 1,189 lb. of phosphorous. He claimed the Department failed to enforce any nutrient loading offset, which was cited as an error by the Coastal Zone Industrial Appeals Board.

Mr. Austin also argued that the Department not issues a permit until the OWTDS Regulations have been amended to reflect RIBs. He cited to the existing regulation 6.2 as prohibiting the discharge into RIBs as the same as cesspools and seepage pits for disposal.

Mr. Austin also claimed that Condition 9 of the CZA Permit was not met because no surface water assessment was conducted or submitted as part of the application. He addressed that the TMDLs and the PCS are separate and that a surface water assessment should have been done to show the impact on the additional discharge from the Wandendale plant. Moreover, he noted that the PCS has not been fully implemented due to the court striking down the PCS' buffer requirement around water bodies. He indicated that the uncertainty in the impact on the water quality justified a moratorium on new permits until a new PCS is in effect.

Austin Ex. 2 is the Google image of the area.

Austin Ex 3 is a Delaware Geologic Survey report number 74 for locating groundwater areas near Rehoboth Bay and Indian River Bay.

Austin Ex 4 is a report written by Horsley and Witten on groundwater modeling.

Austin Ex. 5 is the Exhibit 1M from the CZA application.

Austin Ex. 6 is Exhibit M2 from the CZA application.

Austin Ex 7 is Scott Strohmeier's June 16, 2010 memorandum.

Austin Ex. 8 is Jack Hayes's July 20, 2010 memorandum to Ron Graeber.

Austin Ex 9 is TESI's November 5, 2010 letter to Lee Ann Walling.

Austin Ex 10 is TESI's January 11, 2011 letter to Lee Ann Walling.

The next public speaker was William Moyer, who submitted a prepared statement of testimony. Moyer Ex. 1. Mr. Moyer's comments recommended that the permit application be denied because: 1) it was incomplete; 2) the plant is not consistent with the State Planning Office's comments; 3) the application does not meet the CZA permit conditions; and 4) the plant does not prevent discharges of untreated or partially treated wastewater due to a failure of the treatment process.

His comments on the application sought to reject it because he claimed it failed to comply with CZA Permit No. 380's Special Condition No. 7, which required TESI to submit an operation plan in its construction permit application that "establishes under normal conditions a priority use of spray irrigation to the maximum extent practicable, particularly during the early phases of the project." He noted that TESI's November 3, 2010 letter to Secretary O'Mara complained that compliance with the special condition was too costly. TESI's letter set forth a proposed construction of spray irrigation facilities in the seventh of the twelve phases and using landscaping irrigation with a new well in the second phase. He also questioned the lack of the surface water assessment required by the CZA permit special condition no 9.

Mr. Moyer's second point to support his position the Department should deny the permit is based upon his claim that the Wandendale plant would violate the Sussex County comprehensive land use plan. He cited the State Planning Office's June 13, 2008 letter to Sussex County for support of this claim. He also cited the concerns the Department raised in its CZA permit approval, and that this construction permit application should allow the Department to deny the permit application based upon the application of all the Department's environmental laws.

Mr. Moyer's third argument is based upon the January 5, 2011 letter from Lee Ann Walling, which he claims is unusual because it concluded that TESI's proposed plans for

complying with the CZA permit were satisfactory prior to when TESI had filed an application. He noted that the construction permit application does not have any spray irrigation plans to approve. He seeks some elaboration on the justification for the CZA program's decision that interpreted the CZA permit contrary to the CZA permit and Secretary's Order.

Mr. Moyer's fourth argument is based upon protecting the groundwater from the adverse consequences of a failure of the treatment process.

The third public speaker was Mable Granke, who expressed concerns with the proposed use of RIBs for disposal. She noted that the City of Rehoboth Beach rejected using RIBs. She also questioned any benefits from the plant from connecting existing septic systems given that TESI has no authority to mandate such connection.

The next public speaker was Sallie Callanen, who spoke in opposition to the permit as a representative of the Sierra Club's Delaware Chapter. She read a letter from the Sierra Club's counsel, Ken Kristl, Esquire, of the Widnener Environmental Natural Resources Law Clinic. The letter questions the compliance with the Coastal Zone Act permit and includes as attachments the CZA Permit as Sierra Club Ex 1A, TESI's November 3, 2010 letter as Sierra Club Ex. 1B, TESI's November 5, 2010 letter as Sierra Club Ex. 1C, the CZA Program's technical response memorandum as Sierra Club's Ex. 1D, and the Secretary's Order as Sierra Club Ex. 1E. The comments cited the legal argument the Department's counsel made in the oral argument before Judge Graves in the appeal of the CZA permit of the importance of the construction permit review to ensure compliance with the CZA permit.

Ron Wuslich provided comments that opposed the permit based upon the need to protect the Inland Bays from pollution. He cited the Department's concerns with the project as encouraging development in a Level 4 environmentally sensitive area. He cited a study on the Chesapeake Bay, which he claimed sets forth a classification system that if applied to the Inland

Bays would establish that the Inland Bays would be the more highly enriched than the 32 subestuary systems in the Chesapeake Bay. He claimed that the Inland Bays has some of the highest nitrogen loads found anywhere. He concluded that approval of a permit would make a mockery of the efforts to improve the Inland Bays' water quality.

Steve Callanen spoke in opposition to the permit. He questioned the withholding of documents prior to the CZA public hearing and he indicated that the Department should have a healthy skepticism towards reports that TESI funded as "client science." He cited the study by Scott Andies of the Delaware Geologic Survey for using RIBs for disposal at Cape Henlopen State Park, which he claims supports denial of the RIB disposal proposed for Wandendale. He questioned Sussex County's land use approval process. He noted that TESI employs several former high level Department employees that he claims creates an undesirable perception of conflict with the public interest. He questioned proposed RIBs as dwarfing other RIBs in Delaware based upon disposing of discharges equal to the City of Seaford's discharges from its treatment plant. His written comments were marked as Callanen Ex. 1.

William Ullman spoke in opposition and indicated he was a Professor of Geological Sciences at the University of Delaware. He stated that the best possible wastewater treatment and disposal is needed for the Inland Bays. He advocated application of the best practice in the industry, and recommended requiring the regular improvement of the plant's facilities and operations throughout the lifetime of the plant. He requested that any permit include monitoring of the nutrients in the groundwater and that the operations include the incorporation of wastewater from current septic systems or the restoration of ecosystems that mitigate nutrient loads to the surface water. He sought a permit condition that any authorized increase in nutrient loads allowed by this permit be offset by reductions from other sources. His prepared statement was marked as Ullman Ex. 1.

Chris Bason spoke as the Deputy Director for the Center for the Inland Bays and opposed issuing a permit. He indicated that any new wastewater facility will add new nutrient loads to a watershed. He cited 2006-2010 data from Burton's Prong that indicated nitrogen loading was 226 % over the TMDL's level and that phosphorous was 251% of its TMDL level. He cited a University of Delaware study that showed significant increase in dissolved inorganic nitrogen concentrations over 1998 to 2008. He discussed the adverse impact on fish from the poor water quality. Using assumptions, he indicated that the RIB disposal method would contribute 7% of the nitrogen TMDL for Love Creek and 37% of the nitrogen TMDL for Burton's Prong. He commented on the opportunity to eliminate 1,600 existing septic systems in the vicinity, but noted that existing septic users cannot be forced to connect to the plant. He requested a permit condition include the development of a detailed and comprehensive surface water loading report that uses the best available science to demonstrate how the loading from the plant will allow the creeks to meet their TMDLs with an acceptable level of certainty.

He also requested that the Applicant demonstrate that nutrient load from the plant will be offset from the connection of existing septic systems. He also commented on the apparent waiver of Special Condition No. 9 for a surface water assessment. His document was marked as Bason Ex. 1.

Bill Zak provided comments as the Chair of the Citizens Advisory Committee of the Center for Inland Bays. He commented on the lack of any surface water assessment that he claimed was required by the CZA permit. He also requested an independent monitoring protocol be established if the plant is built. Third, he requested that the CZA permit special condition number 7 on spray irrigation be followed. He commented on the proposed plan to not submit any spray irrigation plans until phase 5 or 31 % of the plant's total requested capacity. He questioned the private negotiations that resulted in the "new understanding" on spray irrigation.

He also commented as a private citizen that the plant will allow massive growth equal to the total discharge authorized for the City of Seaford for an extremely vulnerable physical environment on the margins of the overtaxed Inland Bays. He commented on the use of RIB disposal technology that he claimed has a limited and checkered history. He requested action for any failure of the plant to meet its design criterion and that TESI fund to cover any environmental liability caused by the plant. He commented on TESI's pending 90% rate increase before the Public Service Commission as an example of the need for public ownership of an essential public service without the profit motive. His public statement document was marked as Zak Ex 1.

Harry Haon spoke as the vice chairman of the Sierra Club of Southern Delaware in opposition to the permit. He questioned the Applicant on the apparent switch from spray irrigation to RIBs as the primary disposal method and Mr. Patrick provided an answer. He questioned the cost calculations for using RIBs when the cost to clean up the Inland Bays would exceed the cost savings from using RIBs.

Gary Warren spoke as President of the Delaware Farm Bureau. He commented on the proposed development in a Level 4 planning area. He supported the use of spray irrigation based upon its use by farmers near Middletown. He indicated that spray irrigation is a very effective way to recharge the groundwater and should be used for farm lands. He commented that residential sprawl is the enemy of crop lands. He commented on the need to grow more food and double food production in the next 35 years to feed the population. He commented that 200 bushels of corn is grown on an acre using 75% of the nitrogen used in the past, but that water is needed. He commented on increased power boats usage on the Inland Bays as a possible cause of the water pollution. He wanted spray irrigation to be used for the bulk of the disposal He also called for a time to eliminate the use of existing septic systems.

Michael Tyler spoke as president of Citizens Coalition. He questioned the construction of the plant in a level 4 area. He also wanted more research and study conducted before any construction permit is issued.

Mr. Moyer also sought a response to his question on the RIB disposal capacity and Mr. Patrick provided an explanation on the flexibility among the two disposal systems that would be used.

The Department received written comments from Blue Water Development, LLC that supported the permit application. This comment noted the environmental benefit for the advanced treatment process, the economic benefit from the investment in the project from private investors, the benefit to those who cannot gain access to Sussex County central sewer service, the benefit from the possible connection of existing septic systems, and the benefit to farming from spray irrigation. Bluewater Ex. 1.

Carl M. Freeman Companies submitted a letter in support of the permit application and the 300 construction jobs it may bring to the area and the benefit of allowing the Marsh family to continue farming. CM Freeman Ex. 1

NV Homes submitted a letter in support that indicated the plant will eliminate the need for smaller systems and allow farming to continue and maintain open space. NV Homes Ex 1.

Daft McCune Walker, Inc. submitted a letter in support and noted that the project and noted that it will allow compliance with the EPA mandated water quality standards and avoid the construction of 1000s of septic systems in the area. DMW Ex. 1

The Inland Bays Foundation provided written comments dated September 21, 2001 that opposed the permit based upon 1) the lack of compliance with CZA permit conditions, 2) the encouragement of development and sprawl in a Level 4 area, and 3) the use of RIBs as the primary disposal method and only method able to treat the total capacity. IBF Ex. 1

William Moyer also submitted written comments dated September 9, 2001 that cited the beneficial use of spray irrigation as set forth in the technical response document in the CZA permit record. Moyer Ex 1.

TESI provided a response dated September 23, 2011 that addressed the public comments from John Austin, William Moyer, Mabel Granke, Sallie Callanen, Ron Wuslich, Steve Callanen, William Ullman, Chris Bason, Bill Zak, Harry Haon, Gary Warren and Michael Tyler. This response addressed the claim that wastewater disposal by the RIB method was equivalent to a seepage pit by noting that the regulations define a seepage pit as receiving wastewater from a septic tank, which does not apply to Wandendale's proposed RIB method. The response indicated that surface water assessment information was satisfied by the information in the record in the application and the compliance with the PCS' standard for treatment.

The reply to Mr. Moyer's comments addressed the planning approval and that the treatment process has adequate safeguards for any malfunction. TESI's reply to Ms. Granke's comments indicated that Department of Transportation had approved all site plans submitted for approval and that the entrance permit would be sought when needed. The reply to the Sierra Club comments addressed the CZA compliance based upon the acceptance by the CZA Program of the proposed plans. The reply to Steve Callanen's comments addressed the DGS study and its recommendation of advanced treatment prior to any RIB discharge. The analysis for possible RIB usage is site specific and TESI indicated that the information and analysis support the RIB usage at the Wandendale site. The response addressed the differences between the planning approval by Sussex County and the Department's permit process, and the Applicant's appropriate reliance on people who have the appropriate experience and expertise even if they worked at the Department many years ago. The reply comments addressed Professor Ullman's comments by stating that the plans submitted are consistent with best practices of treatment and

that the surface waters will not be adversely impacted by the proposed discharge. The reply to Mr. Bason's comments was that the discharges would be better quality water than in the receiving waters and that the nitrogen loads were high because of past regulation that only now was being changed by the PCS and TMDLs, which envision a long-term solution to the water quality solutions, including the advanced treatment process proposed by Wandendale. The response to Mr. Haon was to clarify that spray irrigation would be dependent of crop requirements. The response to Mr. Warren addressed the Level 4 area boundary being guidance and not a law and his support of spray irrigation to support farming. The response to Mr. Tyler indicated that nothing would be trucked into the Wandendale. The response also enclosed the reforestation plan and the compliance with the Natural Heritage program's comments, which were both conditions in the CZA permit.

In an October 7, 2011 memorandum, I requested that GWDS provided a technical response memorandum (TRM), which GWDS provided in a November 18, 2011 TRM that also provided a draft permit. The TRM is attached hereto. The TRM indicated that TESI's response to the public comments was factually correct. GWDS indicated that it relied on the CZA Program for purposes of determining the compliance with the CZA permit. GWDS indicated it had suggested the construction of spray irrigation facilities sooner than proposed by TESI's phasing plan that the CZA Program accepted. Consequently, TESI did not submit any construction plans for spray irrigation, which under TESI's phasing will not be submitted until Phase 5, which is when wastewater flows would reach 450,000 gpd.

The TRM indicated spray irrigation as needed basis for crops is estimated to allow about 190,000 gpd, or 13%, of the proposed 1.45 million gpd total treatment capacity. The TRM discussed the relative nitrogen discharge from a conventional septic was 50 mg/L, which will be reduced to 20 mg/L under the PCS for any new or replacement system. In contrast, the plant

would reduce nitrogen to 5 mg./L. The TRM indicated that Wandendale, if built to its proposed 1.45 million gpd capacity, would discharge approximately 22,000 lbs. of nitrogen into the groundwater. This loading of nitrogen would eventually reach the Inland Bays at Sarah's Run after an estimated travel time of two years, and reach Burton Prong after an estimated travel times between 15-35 years.

In contrast, the use of spray irrigation would result in reduced nitrogen loads assuming the agricultural use would reflect a one for one reduction for the nutrients in the water that was used for spray irrigation. The TRM concluded that the proposed construction phasing plan does not establish a priority of use of spray irrigation. In addition, I requested additional information from the Applicant in a December 7, 2011 letter, and this information was provided in a December 12, 2011 response. This information was on the projected customers who may connect to the plant and Department policies to allow the connection of sewer users.

III. DISCUSSION OF FINDINGS AND REASONS

A. Legal Background

The Department regulates this permit application pursuant to the authority provided in *7 Del C. §6003(a)(4),* which allows the Department to regulate by permit "any activity... [i]n a way which may cause or contribute to discharge of a pollutant into any surface or ground water...." The Wandendale facility would, if approved and built over its 12 proposed construction phases to its 1.45 million gpd capacity, discharge annually 22,062 lbs off the pollutants nitrogen and 2,205 lbs of the pollutant phosphorus into the groundwater. These pollutants will flow into the surface waters of the Inland Bays after travels time ranging between 2 and 35 years.

This discharge will occur despite the proposed wastewater treatment that meets or exceeds the Department's current regulatory standards, as established by the: 1) *Regulations*

Governing the Control of Water Pollution, (Water Regulations); *7 DE. Admin. Code 7200,* 2) *Regulations Governing the Design, Installation and Operation of On-Site Wastewater Treatment and Disposal Systems* (OWTDS Regulations); *7 DE Admin Code 7101,* 3) *Regulations Governing the Pollution Control Strategy for the Indian River, Indian River Bay, Rehoboth Bay and Little Assawoman Bay Watersheds* (PCS); *7 DE Admin Code 7403*, 4) *TMDLs for Nutrients for the Indian River, Indian River Bay and the Rehoboth Bay* (TMDLs); *7 DE Admin. Code 7407,* 5) *Surface Water Quality Standards, 7 DE Admin. Code 7401;* and 6) *Guidance and Regulations Governing the Land Treatment of Wastes* (Spray Regulations)[3], *7 DE Admin. Code 7103.*

The OWTDS Regulations provide that the Department may deny a permit "when it determines that a denial "best implement the purposes of *7 Del. C. Ch. 60* and these Regulations." *7 DE Admin 7101 section 5.5.1.*

In addition, the Department in Secretary's Order No. 2010-CZ-0022 issued TESI Coastal Zone Act (CZA), *7 Del. C. Chap. 70,* Permit No. 386, which authorizes Wandendale's proposed use as a privately operated wastewater and disposal use as industrial manufacturing within the designated Coastal Zone.[4] This permit imposed several conditions that were the subject of most of the public comments in opposition to the current construction permit based upon TESI's OWTDS application.

B. TESI's Proposed 12 Phase Construction.

TESI seeks a permit to construct a 1.45 million gpd capacity large community OWTDS in 12 phases under the OWTDS Regulations and the Spray Regulations. The specific timing of the construction of each phase will be dependent on the demand for sewer service within TESI's

[3] These apply to any land application of treated wastewater and the biosolids (sludge) from treatment.
[4] A CZA permit is required only for privately owned wastewater companies under the CZA Regulations while exempt public owned wastewater facilities from any CZA permit requirement.

PSC regulated service territory. Applicant's proposed construction's 12 phases is set forth in detail in Applicant Design Report. DNREC Ex. 11, I-4-7.

I find the proposed phasing is reasonable in concept because it will allow a gradual and extended construction of the Wandendale facility that will coincide with the demand for sewer service, but I do not recommend approval of the 12 phases now. The proposed phasing of construction allows the Department the opportunity to phase its review of the construction, including requiring changes when the Department determines a permit modification is appropriate. The Department also will have further regulatory review possible for the operating permit and its amendments, as will be required periodically as construction goes forward on the 12 phases. Indeed, the Department does not have any OWTDS application for the holding tank that will be used in Phase 1. I find the lack of a construction permit application for Phase 1 reasonable because no holding tank would be needed if the Wandendale facility does not receive this permit.

I also find that Applicant's 12 phases are appropriate in that they will follow the increased demand for sewer service. This demand may be from new residential and commercial development, and the abandonment of existing OWTDS users. The abandonment of existing OWTDS users may occur voluntarily or be required by the Department's OWTDS Regulations. The demand from new construction is shown by 2,034 equivalent dwelling units (EDU) in approved subdivisions that need central sewer utility service. TESI has identified EDUs will require 610,000 gpd capacity of the 1.45 million gpd capacity at full build out, although when this capacity will be needed entails many factors that are unknown at this time.

The potential demand from existing OWTDSs is harder to predict as it may arise from: 1) the failure of an individual OWTDS or a large community OWTDS; 2) the higher cost of advanced treatment individual OWTDS that will be required by the PCS for any new or

replacement OWTDS; or 3) mandated by Department regulations based upon the proximity of TESI's facilities. I find the connection of existing OWTDS an important environmental reason for constructing Wandendale, and requested more information from TESI on how such connections may occur and the Department's regulatory policies that would or could be used to encourage such connection of existing OWTDS users. Applicant's December 12, 2011 response to my request indicates the difficulty in predicting the demand for sewer service. I agree that any prediction is difficult given the many variables involved, but it is clear that the Department also should encourage the connection of existing OWTDS users to Wandendale as much as possible to realize the environmental benefits of the construction. I find that the proposed construction may take decades to complete, which allows the Department time to defer a decision until later on the proposed construction of Phases 6-12. The Department will benefit from the additional time and information available in order to evaluate the pace of connection to Wandendale, particularly from existing OWTDS users, and to step regulatory action to promote such connection as the best method for Wandendale's use to reduce pollutant entering the Inland Bays.

The above discussion of the demand for sewer service I find will apply less to TESI than if a land developer were proposing to build Wandendale. TESI, as a public utility, has a public service obligation to serve its service territory under the terms, conditions and rates approved by the Public Service Commission. TESI has determined, in its exercise of managerial discretion, the need to construct Wandendale as a regional treatment and disposal facility. I do not consider the Department's statutory authority to directly question TESI's decision, but instead the Department's role is to protect the environmental impact from harm from the decision in a permit process that could deny the permit or impose conditions designed to reasonably protect the environment. I agree that in the Department's analysis it should consider alternatives based

upon environmental considerations, but absent some new wastewater treatment and disposal technology I find that the central sewer utility alternatives available to TESI are limited to constructing smaller OWTDS plants as opposed to a regional plant such as Wandendale.

TESI's decision to build a regional plant means that TESI also will construct mains to transport untreated wastewater to Wandendale. The construction of these mains will allow existing OWTDS users and any potential OWTDS users the opportunity to connect to Wandendale. Indeed, such connection may be required by the Department's OWTDS and PCS Regulations. Thus, the construction of Wandendale using phased construction is appropriate, reasonable and can benefit the environment, subject to such reasonable conditions and Department policies that will encourage or require more existing OWTDS users to connect. The phasing is subject to the specifics in the operating plans to be submitted after each construction phase is completed, and the Department's ongoing authority to make permit decisions on each phase as part of its ongoing regulatory oversight.

Based upon the above discussion and findings, the record provides ample support for approval of the proposed construction through Phase 5 and holding off on any decision on the proposed construction of Phases 6-12. TESI's proposed phasing also allows the Department to exercise a phased approach to its review and approval of the construction phases. I find that the Department could require Phase 1 to be complete before even considering a Phase 2 construction application and require 12 separate construction permit applications. I do not recommend such a procedure and find that the proposed phasing is reasonable and should be adopted subject to the recommendations herein that will extends the review and approval in order that more information may be available at critical points in the phases.

I find that the phased approval is consistent with the Department's administration of Chapter 60 authority's statutory purposes, as set forth below:

> The State, in the exercise of its sovereign power, acting through the Department should control the development and use of the land, water, underwater and air resources of the State so as to effectuate full utilization, conservation and protection of the water and air resources of the State.
>
> (c) Purpose. -- It is the purpose of this chapter to effectuate state policy by providing for:
>
> (1) A program for the management of the land, water, underwater and air resources of the State so directed as to make the maximum contribution to the interests of the people of this State;
>
> (2) A program for the control of pollution of the land, water, underwater and air resources of the State to protect the public health, safety and welfare;
>
> (3) A program for the protection and conservation of the land, water, underwater and air resources of the State, for public recreational purposes, and for the conservation of wildlife and aquatic life;
>
> (4) A program for conducting and fostering research and development in order to encourage maximum utilization of the land, water, underwater and air resources of the State;
>
> (5) A program for cooperating with federal, interstate, state, local governmental agencies and utilities in the development and utilization of land, water, underwater and air resources.

7 Del. C. §6001.

The above statutory language allows the permit process to be crafted to meet the particular circumstances. The Department readily could require the Applicant to submit a new application for each construction phase, but I do not recommend this procedure when the phasing is appropriate so long as the Department may effectively regulate the phases as recommended herein. This construction permit is unique because of its size and location of the discharge in the Inland Bays watershed, which is subject to the Department's highest protection from pollution, particularly wastewater containing the pollutants nitrogen and phosphorous, which, as

nutrients, could harm to the Inland Bays' water quality based on the fact that the TMDLs require reducing the annual loading of nutrients.

C. TESI's Proposed Operations Plan for Spray Irrigation Disposal.

Applicant's proposed operations plan for spray irrigation disposal received the most opposition from the public comments based in part on CZA Permit No. 386's Special Condition No. 7 (Condition 7), which states as follows:

> The Permittee shall submit to the Department as part of its construction permit [application] an operations plan that establishes under normal operations a priority use of spray irrigation to the maximum extent practicable, particularly during the early phases of the project to maximize the environmental and agricultural benefit, and a priority use of spray irrigation of agricultural areas over use of spray irrigation of wooded areas.

The public comments claim that TESI's proposed operations plan's spray irrigation in Phase 3 using water from wells is not true spray irrigation within the meaning of the CZA permit condition. Instead, the public comments claim that spray irrigation of treated wastewater within the meaning of the CZA Permit would only commence in Phase 6, which the comments claim is contrary to the CZA Permit condition that directs "a priority of use of spray irrigation to the maximum extent practicable, particularly during the early phases of the project..." Applicant relies on the Department's CZA Program's January 5, 2011, which approved the proposed spray irrigation plans after a series of meetings and correspondence with the Applicant. GWDS's TRM accepts the proposed phasing based upon the CZA Program's approval.

The Secretary decision on this permit application is not bound by the CZA Program's interpretation. Nevertheless, I recommend a finding that the CZA Program approval of when spray irrigation would commence is reasonable and consistent with a reasonable interpretation of the CZA Permit. Moreover, the CZA Program's interpretation should be given considerable weight when interpreting the CZA Permit it drafted and administers, albeit subject to the

Secretary's oversight. I find that CZA Program's interpretation of Special Condition No. 7 is reasonable insofar as it allows Wandendale to be built to a sufficient capacity that will produce treated wastewater flows that can be used for crop production. This interpretation is based upon the flexibility provided in the CZA permit, which allows the Department to consider practical considerations, as opposed to requiring the construction of spray irrigation facilities before an adequate amount of treated wastewater is available to use for spray irrigation of crops. Thus, I recommend finding that the practical considerations contemplated by the CZA Permit condition 7 supports the operations plan's Phase 5 spray irrigation application filing with the Department and the Phase 6 construction and use of spray irrigation facilities.

I agree with the public comments that operations plan's Phase 3 installation of an irrigation well to produce water for irrigation does not constitute the spray irrigation of treated wastewater as contemplated by the CZA Permit Condition 7, which required the spray irrigation of treated wastewater. The term "spray irrigation" within the common sense and regulatory meanings of wastewater treatment plant regulation uses treated wastewater from the plant, not drilling a new well that does not use treated wastewater. If TESI intend to spray irrigation treated wastewater, then it will have to comply with the Department regulations for spray irrigation. Thus, while drilling a well for spray irrigation of landscaping may provide some environmental benefit, I recommend a finding that it is not the spray irrigation of treated wastewater required by the CZA permit.

I recommend a finding that the Applicant has satisfied the CZA Permit by submitting an operations plan that has proposed spray irrigation, but I find that the operation plan's spray irrigation will commence in Phase 6. Several public comments also were critical of the delay in the use of spray irrigation until Phase 6, but I agree with the CZA Program's approval that spray irrigation commencing in Phase 6 is consistent with Condition 7 requirement for spray irrigation

to occur "as soon as practicable." While there could be a substantial delay before any spray irrigation faculties are constructed and used, I recommend finding that any delay is based upon practical considerations of the flow required for spray irrigation and the fact that having two disposal systems installed at the beginning would not be practical.

I also recommend finding that CZA Program's approval aided Applicant's submission of the construction application because otherwise TESI could had to incur considerable cost to submit a spray irrigation application with the construction application if "as soon as practicable" was interpreted to be at the very beginning. The pre-filing resolution of when spray irrigation was to commence was appropriate prior to filing a permit application to avoid mistakes and confusion in the construction application. There is nothing improper in providing guidance to an applicant for a permit and the Department often does, particularly for complex applications such as for Wandendale. The series of pre-filing meetings with Department personnel was to assist the permit application process by determining when the CZA Program considered was as early as practical. I find that the CZA Program's approval of when spray irrigation would commence is not unusual or improper. Thus, I recommend approval of the spray irrigation use commencing in proposed Phase 6 as consistent with the CZA Permit Condition 7.

D. TESI's Proposed Plans for Spray Irrigation Use.

Several public comments were critical of the proposed spray irrigation disposal as not consistent with Condition 7's "priority of use" for spray irrigation disposal. GWDS' also concluded in the TRM that the proposed construction was not consistent with a priority of use. As noted above, the CZA Program's acceptance of the spray irrigation's proposed use is not binding on this permit and GWDS' recommendations have ample statutory authority to require spray irrigation usage when necessary to protect the Inland Bays. I am not sure from this record

whether the CZA Program performed any spray irrigation analysis. Instead, I rely on the expertise of GWDS.

I find that this record does not provide much useful information to make an informed decision on how much spray irrigation is possible. This information will only be received in Phase 5 if my recommendation to accept the proposed phasing is adopted. Absent TESI's spray irrigation application to be submitted in Phase 5, the actual approval on how much spray irrigation facilities should be required and how the spray capacity should be used should be deferred to this application when additional information will be available.

If my recommendation that spray irrigation construction commences in Phase 6, absent an agreement on sooner use if practicable, then this issue entails accepting TESI's conceptual use and limits. GWDS now estimates that TESI is proposing spray irrigation use based upon a disposal of only 19% of the 1.45 million gpd treatment capacity. A priority of use is not defined by Condition 9, but I find 19% as not sufficient capacity to be remotely considered a priority use of spray irrigation disposal. Instead, this application proposes RIB disposal as the priority of use. Thus, this finding supports delaying any approval of disposal methods to be used and their construction until after more information is received on spray irrigation in the application to be submitted in Phase 5.

This recommendation is not a denial of the plans submitted in this application for Phases 6-12, but it also is not approval of them. This recommendation instead allows the Department to consider spray irrigation alternates to any use of RIBs to be constructed after Phase 5. Indeed, given the long anticipated time until Phase 5, other disposal options may become available for consideration. As discussed above, I find that the phased construction permit process allows the Department to also phase its review and approval process in order to have better information

before making a decision and the spray irrigation application to be submitted in Phase 5 will provide better information to determine if more spray irrigation will be possible.

The 19% limitation that GWDS calculates does not support a finding that the application provides a priority of use of spray irrigation after Phase 5. Accordingly, the Applicant should be placed on notice in this permit application that more spray irrigation may be required for permit approval beyond Phase 5. I note that when the Applicant proposed a 3 million gpd facility in the CZA permit application, that it mentioned that disposal deficiency in the RIB capacity could be remedied by acquiring access to more land for spray irrigation use. Thus, I would recommend to the Applicant that prudent management would pursue more spray irrigation in order to address GWDS' concerns that the proposed 19% use is not consistent with a priority of use and consistent with protecting the Inland Bays from nutrient pollution.

Further support for spray irrigation to the maximum extent possible and practicable (even without Condition 7) is found in the record based upon the value for use by farmers, as noted by the President of the Delaware Farm Bureau. This public comment suggested that the treated wastewater should be transported to provide a valuable source of crop irrigation for farmers, which would increase food production from the land. I agree and find that the Spray Regulations go into considerable detail on the spray irrigation's benefits as a preferred disposal method over other forms of wastewater disposal, such as RIB disposal.

This finding does not impact approval of the construction permit based upon the phasing through phase 5. I recommend that approval beyond Phase 5 be withheld in the construction permit pending the submission of the spray irrigation plans so that the Department may evaluate whether the RIBs proposed to be installed after Phase 5 are needed. The CZA Permit properly included spray irrigation as a disposal method to maximize the environmental protection of the Coastal Zone. I find such a method appropriate to require as a condition of the construction

permit even without a CZA permit because of the importance of protecting the Inland Bays. As the comments pointed out, the buffer required by the PCS was not upheld by the courts. The Department required buffers to protect the Inland Bays' water quality in order to meet the Department's TMDLs as required by the federal Clean Water Act. Consequently, without the buffers, the PCS currently may not sufficiently reduce nutrient loads, which provide further support for greater use of spray irrigation than TESI now proposes in its construction plans.

E. TESI's Proposed Plans for Phase 6 Construction of Spray Irrigation Facilities Satisfy The CZA Permit.

Several public comments raised an issue with the OWTDS application being complete based upon CZA Permit No. 386's Special Condition 9 (Condition 9), which requires Applicant to prepare a surface water assessment report to demonstrate that the project meets the TMDLs established for the surrounding watersheds. Condition 9 states "[t]he Permittee shall prepare a surface water assessment report to demonstrate that the project meets Total Maximum Daily Loads (TMDLs) established for the surrounding watersheds."

I find that Condition 9 does not establish any time deadline or link the submission of surface water assessment report to this construction permit. I would agree that the Department wants a report done and likely would have intended to submit it with the application, but the CZA Program accepted TESI's explanation why no specific report should be submitted as part of the application. I agree that the strict reading of Condition 9 finds support for TESI's position that nothing was required to be submitted as part of this application, but this may be required by the CZA Program as part of its oversight of the CZA permit. I find that the CZA Program's acceptance of Applicant's reasoning that it complied with Condition 9 supports not requiring TESI to submit any report as part of this application process. I agree with the CZA Program's acceptance that Applicant's construction permit application should not depend upon the

preparation and submission of any surface water assessment report, although it could be required at any time in the future in order that Condition 9 has some meaning.

My finding also is based upon the Department's lack of regulations on what is a surface water assessment report. The Department may want to require such a report when and if such requirements are established as part of its operating system permit review requirements. I do not see any reason for the construction permit to be delayed now while a yet unidentified criteria for such a report is prepared, which should be when the Department's issues a regulation on what is required in such a report.

I also agree with the Applicant and the Department's expert on TMDLs and PCS that the proposed advanced treatment will meet the entire Department's current regulatory standards established in the PCS, which was issued for the sole purpose to allow the Inland Bays meet its TMDLs. A report may be useful, but it is not necessary to show that the discharge will be consistent with the PCS and the TMDLs. Thus, the lack of report in this record does not provide justification to deny the construction permit, although such a report may be useful to have when and if such a report criteria are developed and to assist in the regulatory process during the 12 phases.

A public comment sought the Department to prepare a report that the comment claimed was required by the Department's anti-degradation policy, as posted on the Department's web page. I have reviewed the policy and found that no regulation was promulgated. I find that no anti-degradation report is required before a construction permit is issued, although the Department could issue a report. Hence, the policy established was advisory and not binding on the Department. The Department would violate OWTDS Regulations if it would deny a permit based upon not following advisory policies. I am not aware of any report ever being prepared for

any project, although one could be prepared at any time pursuant to the advisory policy should the Department want such a report prepared.

I find that the record has ample information on the water quality impact from the proposed discharge, and the groundwater analysis at least to approve the permit for construction though Phase 5. I do not consider that an additional report is needed to make a decision on the construction permit except for the future information required consistent with the recommended phased review process discussed herein.

F. TESI's Proposed Use Of RIBs

Several public comments raised concerns with TESI's proposed use of the RIB wastewater disposal method. The Department shares the concerns raised by the public comments with the use of RIBs as the primary disposal method for such a large discharge. This concern is reflected in GWDS seeking greater use of spray irrigation, as discussed above. GPB also recommends that further testing and evaluation should occur with each 1,665 EDU, which would be approximately 500,000 gpd of treatment and disposal capacity. Thus, under GPB's recommendation this assessment of the actual performance of the RIBs would be required after construction of Phase 5.

To the extent the draft permit is not clear on this, I recommend such approval be included in the construction permit to ensure that no construction is approved for Phase 6 without the Department's evaluation and approval of information from the actual RIB usage. Despite Applicant's assurances of that RIBs work properly, the Department's experience with RIBs is mixed. There have been OWTDS failures caused by using RIB disposal even when the Department approved the use based upon computer modeling in a permit application. Thus, there is a need to require testing after the RIBs are in use in order to determine if the computer modeling is accurate.

One public comment recommended that the Department not approve any RIB disposal until the RIB disposal method is an approved method in the OWTDS Regulations. I reject the contention that the Department must not issue a construction permit or delay issue any permit until the OWTDS Regulations are amended to specifically address the RIB disposal method. The OWTDS Regulations allow the use of alternative methods in Section 5.12, and the Department has used this section along with guidance documents for approval of permits for RIBs disposal. The lack of specific regulation for RIBs, however, does support the phased permit review recommended by this Report based upon approval for through Phase 5. Thus, based upon GPB's and the public comments, I recommend that RIB construction only be approved through phase 5. Any future approval of construct of additional RIBs would depend on the result of further testing of the RIBs based upon actual usage results. The installation of capacity also would not be approved until the disposal methods were approved based upon the spray irrigation and RIB studies are considered in Phase 5.

I agree with the public comments that the OWTDS Regulations should be amended to reflect RIBs in order to provide the Department, the regulated industry and the public with a better understanding of this disposal method, which may become used more frequently for wastewater disposal in the Inland Bays' watershed given the TMDLs that seek to eliminate all point source discharges of nutrients into the Inland Bays.

G. The CZA Permit and Wandendale's Potential Overall Environmental Benefits.

CZA Permit 386 included nine conditions and I find that the Applicant has satisfied the conditions necessary for consideration for the construction permit to be issued through proposed Phase 5. The CZA permit also relied on weighing the adverse impact with environmental offsets, and public comments questioned whether the construction permit would provide the overall environmental benefit, particularly if no priority of use of spray irrigation as proposed.

This issue was central to the CZA permit process, but obviously important in the construction permit application to ensure that the environmental benefits are achieved as expected. I find the overall environmental benefit is established by the proposed treatment process, and can be increased by the priority of use of spray irrigation in the disposal process. The environmental benefit can vary depending on what type of customers connects to the plant. I find that that the type of OWTDS that actually connects to the plant is speculative as part of the demand for sewer serve discussed above.

GWDS has calculated that the disposal by spray irrigation can further add to the Wandendale facility's environmental benefit over alternative systems currently available, and this supports requiring more spray irrigation than the estimated 19% capacity in the construction plans for spray irrigation. The use of spray irrigation on farm land will reduce the need to apply fertilizer, which allows spray irrigation allow farmers to use less fertilizer when spray irrigation disposal is used for agricultural purposes. Wandendale's discharge of nitrogen and phosphorous by use of spray irrigation disposal for agricultural allows reduced application of nitrogen and phosphorous fertilizer that otherwise may be applied.[5] Thus, spray irrigation disposal has a double benefit to the environment and is appropriate to use for Wandendale's spray irrigation disposal method in order to protect the Inland Bays.

The CZA Permit was based upon the assumption that the Wandendale discharge would replace less effective treatment systems. I agree with this assumption at least based upon the current technology. The treatment process will provide substantial environmental benefits to reducing nitrogen and phosphorous loads when compared to existing an existing standard OWTDS or the advanced OWTDS required by the PCS. The comparison of the environmental impact of nitrogen and phosphorous loading from available OWTDS systems and the advanced

[5] GWDS estimates that the typical farming of 100 acres will cause an annual average of 3,000 lbs of nitrogen to be discharged into the groundwater by fertilizer application

treatment OWTDS that the PCS will require be installed for new or replacement OWTDS beginning in 2015 is graphically shown below that highlights the pollution reduction from usage of Wandendale, particularly if an existing OWTDS connects to Wandendale:

Nitrogen and Phosphorous Loadings Under Different OWTDS Alternatives			
pollutant	OWTDS options		
	Wandendale 1.45million gpd	Standard OWTDS *	Inland Bays PCS effective 2015 OWTDS
Nitrogen mg./L discharge	5.0 limit	Estimated 50.0 w/no limit	20.0 limit
Phosphorous mg/L discharge	0.5 in specs. below PCS 3.39 limit	Estimated 18.0 w/no limit	Same as standard w/no limit
EDUs	4,833 w/growth	1,600 w/no growth	4, 833 w/ growth.
Total N discharge lb/yr	22,062	73,032	88,247
Total P discharge lb/yr	2,205	26,292	79,417
Annual N lb. load increase v Wandendale		50,970	66,185
Annual P lb. load increase v Wandendale		24,087	77,212
*Individual OWTDS=300 gpd avg. design capacity=equivalent dwelling unit (EDU). **Annual mass load=(annual design capacity) x (mg. /L discharge rate) x (3.785 l/gal)/ /(454,000 mg. per lb)			

As the above chart demonstrates, the Wandendale plant currently represents the best treatment option available to provide sewer service requirements of lots approved for development. The Wandendale plant will allow existing OWTDS users to connect, and such connections will provide by far the most environmental benefit to the Inland Bays' water quality. For example, removing one existing OWTDS provides enough pollution reduction equal to TESI connecting 10 new houses. Wandendale becomes less attractive as a pollution reduction if it only connect new houses approved for development, particularly if it enables more development to occur than would be possible if only individual on-lot OWTDS was used to serve the new lots.

Several of the public comments noted that TESI does not have any authority to order any lot to connect to Wandendale. TESI also acknowledged this regulatory barrier to getting customers from existing septic systems that essentially provide lower cost sewer service than would be provided by TESI. The Inland Bays PCS provides some regulatory requirements that should accelerate the migration of septic systems to Wandendale's central sewer, particularly with OWTDS within close proximity to TESI's sewer facilities. The Department could impose a permit connection that ensures more existing septic systems are connected, but the best regulatory action would be for the Department to take the necessary regulatory steps for a regulation. At the minimum, the only way the Wandendale plant improves the environment is if it connects a sufficient number of existing septic systems for an environmental offset as contemplated by the CZA approval.

The phased approval process also will allow the Department to regulate based upon new planning and improved treatment and disposal methods, and stricter regulatory requirements. The phasing of the approval process will allow the Department to order upgrades, as recommended by Professor Ullman, who sought to have the permit reflect ongoing improvements in the treatment technology. The Department should retain the authority to reflect updated changes in planning and treatment technology as part of its operating permit review of each phase. This phasing should be established in the construction permit to the extent it is not clear and avoid any claim that the Department's construction permit is continued approval for a treatment of disposal process that is no longer acceptable or appropriate or for service to areas that should be protected. The Department permits often are used to establish a certain legal status that is used to oppose such changes under a "grandfather" status, but this phasing should allow the Department to keep the permit current with changes over the extended construction period anticipated by the 12 phases.

In sum, I find that Wandendale's construction of the treatment process is an environmental benefit at least based upon current technology. Nevertheless, the construction beyond Phase 5 should not be approved pending a review of the disposal methods, and to allow for a review of the technology for treatment at that time as suggested by a public comment.

H. Wandendale is Consistent with Sussex County's Planning Approval

The public comments point to the Office of State Planning Office Coordination's (OSPC) classification of the Wandendale construction area and the public utility service area as within the Level 4 classification. The comments claim that a Level 4 area is not supposed to have a sewer system such as Wandendale constructed to provide sewer service to an area that is designated rural and to be protected from intensive development such as possible if Wandendale is constructed. I agree that a the Level 4 classification applies to those areas that OSPC has designated as the most environmental sensitive, and which are to be protected from undue development. The Level 4 classification protects Level 4 areas from undue development by withholding governmental support for certain infrastructure improvements, such as a central sewer system, but the Level 4 designation does not prevent the Department from issuing Wandendale a construction permit. The Department considers the designation as one of the overall environmental impacts and considerations. TESI, as a private sewer utility, does not require government financing for the sewer system, which the Public Service Commission already has authorized TESI to provide utility service to the potential customers who would connect to Wandendale.

I find that the OSPC's classification, if it still is applicable, does not prohibit the issuance of the construction permit, but that the Department should consider Wandendale's impact on a Level 4 area. This impact provides further support for requiring construction of spray irrigation facilities capable of more use than TESI has proposed in concept based upon GWDS's 19%

estimate of the total Wandendale capacity. The spray irrigation facilities contemplated to be built and used in the Phase 5 spray irrigation application should be consistent with preserving the Level 4 area's farms and open space. In sum, the Level 4 area is an important consideration because even though Sussex County's Ordinance No 2019 authorized Wandendale as an approved conditional use in an Agricultural Residential (AR) District, the Department still must determine whether the proposed land use satisfies Delaware's environmental laws and regulations.

The existence of Wandendale and its capacity to treat up to 4,000 customers presents a regulatory dilemma whether the plant will foster new lots being developed or provide service to existing customers. Unfortunately for the environment, it is likely to foster new development, but the Department's regulatory authority is limited to responding to local land use decisions to approve new developments. Sussex County's approval of new developments under its local land use zoning authority remains dependent upon the Department's approval of a proper wastewater disposal method for each approved lot in each approved development. Hence, the public comments in support of the application submitted by home builders and developers.

The Department's current OWTDS Regulations require soil analysis and sufficient space on a one half acre parcel, which limits the density of any residential development, but that density will increase as lots can be approved that are smaller based upon the plant's existence. Some may argue that greater density is better than sprawl. I find that the greater density will ultimately allow more wastewater users within the watershed and they will produce more wastewater flows that will increase the nutrient loading of the Inland Bays. Thus, this consideration provides further support for increased usage of spray irrigation than TESI has proposed.

V. RECOMMENDED FINDINGS AND CONCLUSIONS

Based upon the discussion findings and reasons, I find and conclude that the record supports the issuance of a permit to allow Applicant to construct a 1.45 million gpd treatment facility in 12 phases in order to serve TESI public utility service territory. This recommendation is made based upon the conditions in the draft permit prepared by GWDS, and the discussion of the phased review and approval process discussed in connection with spray irrigation plans and the need to assess the RIBs performance periodically. I find that granting the application's proposed primary disposal method to use RIBs is premature at this time, but recommend that all proposed construction be approved in the application through the phase 5's construction. I recommend that the Department require Applicant to comply with spray irrigation as a priority use when it submits its spray irrigation application and operating plans. I recommend that approval beyond phase 5 should be withheld at this time without prejudice to the Applicant's future approval upon review of further study of the environmental impacts of RIB usage, as recommended by GPB. I find that deferring approval of phases 6-12 is better than to try and speculate about conditions that may exist possible 10 years or more from now. Thus, the limited approval preserves the Department's options in the event that conditions in the Inland Bays or technology change in a way that makes the record developed now no longer appropriate to use for a decision to expand ten years from now.

Based upon the record developed I also find that full approval could be justified with the exception of the primary disposal method, but again I recommend limited approval of the first five phases without any prejudice to later approval when the capacity beyond 450,000 gpd may be needed.

I recommend that the Department in this construction permit application should provide Applicant direction on the disposal methods than waiting until the operations permit review

process. This will allow Applicant sufficient time to take the necessary planning steps to gain access to spray irrigate on additional land, such as Applicant intended when the plant was to discharge 3 million gpd. I find that the Inland Bays' protection warrants the Department to exercise more regulatory authority to enable the Applicant to connect the existing OWTDS to provide the environmental offsets, as consistent with the CZA permit and reducing the emission of nutrients into the Inland Bays, particularly from standard septic systems.

I recommend the Secretary adopt following findings and conclusions:

1. The Department has jurisdiction under its statutory authority to make a determination in this proceeding;

2. The Department provided adequate public notice of a complete application;

3. The Department held a public hearing in a manner consistent with the law and its regulations;

4. The Department considered all timely and relevant public comments in making its determination;

5. The Department should issue the Applicant the permit as drafted by GWDS and as amended as needed by the Secretary's Order; and

6. The Department shall provide: a) the Applicant with the Order and otherwise publish its decision on the Department's web site; b) and shall provide such other public notice as required by Regulations and the Department determines is appropriate, including the right to appeal to the Environmental Appeals Board pursuant to Section 6008 of Chapter 60.

Robert P. Haynes, Esquire
Hearing Officer

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES &
ENVIRONMENTAL CONTROL
DIVISION OF WATER
89 KINGS HIGHWAY
DOVER, DELAWARE 19901

MEMORANDUM

To: Robert P. Haynes, Esp., Senior Hearing Officer, Office of the Secretary
Thru: Dave J. Schepens, Program Manager II 11/18/11
From: Ronald E. Graeber, Program Manager I
Re: Response to request for comments, Wandendale construction permit application
Date: November 18, 2011

This memo is in response to your October 7, 2011 request for information relative to the Wandendale wastewater Facility construction permit application.

During the August 31, 2011 Public Hearing conducted to review the Wandendale Wastewater Facility construction permit application, opposition to the Wandendale construction permit application was raised based on concerns that the application did not comply with the July 30, 2010 Coastal Zone Permit. The comments contend that the Wandendale construction permit application focused on wastewater disposal via RIBs instead of spray irrigation as required by Condition #7 of the Wandendale Coastal Zone Permit (CZA Permit); and that TESI had not submitted a Surface Water Assessment Report as required by Special Condition #9 of the CZA Permit. In a letter dated September 23, 2011 Tidewater Environmental Services Inc. (TESI) provided comments in response to the issues and concerns raised during the Hearing. Ground Water Discharges Section (GWDS) staff reviewed this letter and found the responses provided by TESI to be factual and correct.

As the Program Manager of the Large Systems Groundwater Discharge Section (GWDS) I am responsible for administering the groundwater discharge permits for large systems that are subject to the Department regulations set forth at 7 Del. C., Ch. 60 . The Coastal Zone Act (CZA) permit was issued by the Coastal Zone Act program, and was subject to the CZA regulations. The CZA program determined, after a series of meetings as set forth in correspondence in this record, that the proposed construction permit would comply with the CZA permit. As I have no responsibility to enforce the CZA permit, I accept the CZA Program's decision that the proposed construction permit would comply with the CZA permit. GWDS reviewed TESI's application based upon the regulations applicable to constructing an on-site waste water treatment and disposal system and any applicable orders and permits, such as the CZA permit and order.

Special Condition #7 of the July 30, 2010 Wandendale Coastal Zone Permit requires (TESI) to .... "submit to the Department as part of its construction permit an operations plan that establishes under normal operations a priority use of spray irrigation to the maximum extent practicable, particularly during the early phases of the project..."

In a November 3, 2010 letter to Secretary O'Mara (attached) Bruce Patrick of TESI addressed Condition #7. Mr. Patrick stated that these are both economic and agronomic reasons that make it impractical to spray irrigate in the early phases of the permit. The economic constraints centered on the cost of preparing a Spray Irrigation Design Development Report (DDR) and the cost of designing and construction a storage lagoon. The agronomic constraints were based on the concern that there will be an insufficient volume of reclaimed water "to make spray irrigation meaningful to the consumptive needs of a crop".

It was previously suggested that TESI consider constructing a smaller lagoon (~3 Million Gallon capacity) to facilitate spray irrigation during the earliest phases of the project. This idea was also rejected in the November 3, 2010 letter, wherein Mr. Patrick stated, "a well meant suggestion was made by your staff to build a smaller storage lagoon, 3.0 million gallons for the start up phase of the project. However, incrementally building lagoon earth works is totally impractical and also adds unnecessary costs". Instead, TESI proposed to "install" a well to potentially recover the treated effluent while comingling it with existing groundwater to provide sufficient volume to meet crop needs". As this would involve the pumping of ground water, no wastewater disposal permit would be required to pump the water onto crops; however, a water allocation permit may be required.

In a December 20, 2010 letter to Lee Ann Walling (attached) Bruce Patrick of TESI explained how TESI proposed to comply with the condition of the July 30, 2010 Coastal Zone Permit. In addressing Condition #7, Mr. Patrick provided a breakdown of the 12 phases of the Wandendale project. When actual flows reach 145,000 gallons per day (gpd) TESI plans to spray irrigate on an as needed basis onto landscaped areas of the exterior berms of the RIBS. As TESI will not have constructed any storage lagoons by this point, one must assume that the irrigation water will be ground water, not treated effluent.

TESI does not plan to submit a spray irrigation Design Development Report (DDR) until Phase 5, before flows to the Wandendale Wastewater Treatment Plant reaches 450,000 gpd. Currently, the GWDS does not know the extent of the spray irrigation component of the Wandendale project; however, I am willing to provide an estimate based on other information provided by TESI and their consultants. In Bruce Patrick's November 3, 2010 letter to Secretary O'Mara, Mr. Patrick stated that spray irrigation will only occur on an as-needed basis, and only during periods of maximum crop demand in the summer. As-needed irrigation rates vary based on the amount and timing of precipitation. Work performed by Mr. James Glancey for the Middletown as-needed spray irrigation pilot project indicated that irrigation needs would vary between 12 to 18 inches per year. In a March 3, 2008 letter to Jack Hayes, Lisa Wood stated that approximately 170 acres of land would be available for spray irrigation. Assuming an average need of 15 inches of irrigation water annually onto 170 acres, the agricultural spray irrigation component of the project would be limited to an average daily flow of 190,000 gpd which

equates to 13% of the total design flow. Thus, spray irrigation of treated wastewater at the Wandendale facility will be a minor component of the overall wastewater disposal plan.

Special Condition #9 of the CZA Permit stated "the permittee shall prepare a surface water assessment report to demonstrate that the project meets the Total Maximum Daily Loads (TMDLs) established for the surrounding watersheds." TESI addressed this requirement in a November 5, 2010 letter to Lee Ann Walling (attached) wherein TESI argues that the requirement is redundant because TESI had already demonstrated compliance with the established TMDLs for the watershed by complying with the Performance Standards developed in the Inland Bays Pollution Control Strategy.

It must be noted that TESI's plan to discharge highly treated wastewater to a series of RIBs is in compliance with the Inland Bays Pollution Control Strategy. TESI is proposing to treat the wastewater to $\leq$5 mg/l total nitrogen and $\leq$0.5 mg/l total phosphorous. For comparison, the average nitrogen and phosphorus concentrations in the effluent from a conventional septic system average 50 mg/l and 18 mg/l respectively, and the effluent nitrogen limits for new septic systems established in the PCS is 20 mg/l (there is no phosphorus limit for individual septic systems in the PCS). The treatment levels proposed for the Wandendale wastewater treatment plant will meet or exceed the Performance Standards established in the Inland Bays Pollution Control Strategy.

It must also be noted that both spray irrigation of treated wastewater and disposal of highly treated wastewater through RIBs are both permittable wastewater disposal methods in Delaware. Furthermore, both disposal methods cited by TESI in the Wandendale construction permit application comply with the Inland Bays Pollution Control Strategy. However, any discharge to RIBs will add additional nutrient loads to the Inland Bays Basin. At a design flow of 1.45 MGD, with an effluent nitrogen concentration of 5 mg/l the nitrogen load from the Wandendale facility would be 22,000 pounds of nitrogen per year.

Conversely, spray irrigation of treated wastewater on an as-needed basis could be performed in a manner that would not add any additional nutrient loads to the site, providing the farmer incorporates the utilization of the nutrients in the treated wastewater into their nutrient budget of the Nutrient Management Plan. In this case, the additional nutrients provided by the treated wastewater would be offset by a similar reduction of commercial fertilizer, resulting in no additional nutrient loads to the area.

Because the Wandendale construction permit application complies with the Inland Bays Pollution Control Strategy, and will not cause any violation of Delaware's drinking water standards, the Ground Water Discharges Section recommends issuing a permit to TESI authorizing the construction of the Wandendale On-Site Wastewater Treatment and Disposal System (OWTDS). However, it must be noted that the proposed construction phasing plan focuses primarily on disposal of the treated wastewater via RIBs, and does not, in my opinion, establish a priority use of spray irrigation.

A Draft Wandendale Construction permit is also attached for your review and consideration. It must be noted that the attached permit authorizes construction only; a separate Operating permit must be obtained by TESI before wastewater may be discharged to the Wandendale OWTDS. The attached permit identifies and authorizes construction of the 12 phases of the Wandendale project. The permit also states the level of treatment and nutrient effluent limits to be achieved by the Wandendale wastewater treatment plant. These limits are in compliance with the Regulations Governing the Pollution Control Strategy for the Indian River, Indian River Bay, Rehoboth Bay and Little Assawoman Bay Watersheds (October 2008). The GWDS believes that the conditions cited in the attached construction permit will protect both surface and ground water resources.

The attached draft construction permit also addresses several special conditions in the CZA Permit. Section A of the draft construction permit limits the design effluent flow to 1.45 million gallons per day in accordance with Special Condition #4 of TESI's CZA Permit. Special Conditions 5 and 6 of the CZA permit which address deforestation concerns and requires compliance with the recommendations of the Natural Heritage Program are addressed in Part III, Special Condition # 15 of the draft construction permit which requires TESI to comply with the September 11, 2009 written recommendations of the Natural Heritage Program.

Special Condition #7 of the CZA Permit which requires TESI to establish under normal operations a priority use of spray irrigation is addressed in Part III, Special Condition # 13 of the draft construction permit which requires TESI to submit a spray irrigation Design Development Report prior to the initiation of Phase 6 construction activities that explains how TESI will prioritize spray irrigation at the Wandendale facility.

The rapid infiltration basins have been relocated away from the northern portion of the site in accordance with Special Condition #8 of the CZA Permit.

Special Condition #9 of the CZA Permit required TESI to prepare a Surface Water Assessment Report to demonstrate that the project meets Total Maximum Daily Loads for the watershed. However, in a January 5, 2011 letter from DNREC Chief of Planning Lee Ann Walling to Bruce Patrick of TESI, Ms. Walling stated that DNREC is satisfied that TESI meets the CZA Permit requirements if TESI adheres to the phasing of the project as described in TESI's December 20, 2010 correspondence and complies with the Natural Heritage recommendations. The 12 construction phases of the Wandendale project are listed in Part I, B of the draft construction permit and are in accordance with TESI's December 20, 2010 letter. Furthermore, as stated earlier, the Natural Heritage recommendations are included as permit requirements in the attached draft construction permit. Based on these factors, along with the level of treatment to be provided, the Ground Water Discharges Section has not incorporated any requirements in the draft construction permit requiring TESI to submit a Surface Water Assessment Report for the Wandendale project.

CZA
Mailed 11/4/10

TIDEWATER
ENVIRONMENTAL SERVICES, INC.
1100 SOUTH LITTLE CREEK ROAD
DOVER, DELAWARE 19901

November 3, 2010

The Honorable Collin O'Mara
Secretary
Delaware Department of Natural Resources & Environmental Control
844 Kings Highway
Dover, DE 19901

RE: Wandendale Coastal Zone Act Permit (CZA) – Tidewater Environmental Services, Inc.
Special Condition 7 regarding spray irrigation preference

Dear Secretary O'Mara:

This letter is a follow-up to my August 4, 2010 letter and also intended to address Special Condition 7 in the above referenced permit. Special Condition 7 in the referenced CZA permit requires that we prepare and submit a plan, coincident with our construction permit application, that uses spray irrigation as the preferred discharge method to the extent practical, particularly early and preferably not in the woods.

As mentioned in my August 4, 2010 letter there are both economic and agronomic reasons that make it impractical to spray irrigate in the early stages of this project. We discussed these issues at a meeting with Lee Ann Walling and other members of your staff on October 26, 2010. I was accompanied by our engineering consultants, Lee Beetschen and Scott Hoffman of CABE Associates. We presented an outline of our plan to meet the "spray early as soon as practicable" essence of Condition 7. Obviously, we thought it appropriate to have a meeting of the minds on the plan concept before the plan is submitted with our construction permit application.

The economic constraints on spray first and earliest are many, but perhaps the greatest impediments in this case are the costs to do the field work and prepare the necessary Design Development Report (DDR) as required by the land treatment regulations and the costs for designing and building a storage lagoon.

To date, TESI has spent in excess of $1,450,000 on the project, much of it to address various DNREC regulatory concerns. The very expensive soils and geohydrologic testing and analysis that has been completed and reviewed by your staff has proven the suitability of RIBs. My March 3, 2010, letter to Mr. Jack Hayes, with DNREC's Division of Water Resources, cited some of the work and asked for DNREC's concurrence that the RIBs area be used first and, once half the RIB area capacity (725,000 gpd of 1.45 MGD) is reached, additional work be done to demonstrate the acceptability of using the spray irrigation area. DNREC's written response concurred with that approach (See attached letter.)

The support of DNREC's Division of Water Resources for use of the RIBs before spray irrigation is grounded in practicality because the scientific work for using RIBs has been completed and approved by DNREC. To shift gears at this time and make spray the preferred method would involve the additional costs mentioned above and in my August 4, 2010 letter. Such additional costs are prohibitive in the early stages of service where relatively few users would have to bear unreasonable rates for service.

In the early stages of the project, there are agronomic constraints as well. There will not be enough water to make spray irrigation meaningful to the consumptive needs of a crop. Also, the argument for using spray irrigation is based in large part on the advantages of nutrient uptake when the wastewater is sprayed on the fields (see Special Condition 7 which references the "agricultural benefit" of spray irrigation), but in this case, after treatment at ~~the~~ our state-of-the-art wastewater treatment plant, the effluent will have less nutrients than native groundwater.

Now, to the issues of the DDR and the storage requirements associated with implementing the spray first concept. The soils and hydro-geological investigation that are an important scientific component of the DDR are needed to establish the infiltration capacity of a particular field with the thought of maximizing the capacity for disposal purposes. Performing this work now would be both time consuming and expensive. The storage needed for spray disposal sites for periods when the ground is frozen or saturated and to work around the agronomic practices of the farmer tilling the field is certainly warranted for those purposes but brings with it a high financial burden at the beginning stages of the project. A well meant suggestion was made by your staff to build a smaller storage lagoon, 3.0 million gallons for the startup phase of the project. However, incrementally building lagoon earthworks is totally impractical and also adds unnecessary costs.

In light of the above constraints, we have a plan that we believe satisfies Special Condition 7, while allowing TESI to defer the issues mentioned above in accordance with the phasing plan outlined in my March 3, 2010 letter. At the October 26, 2010 meeting with your staff and in this letter, TESI is proposing to meet the requirements of Special Condition 7 by spray irrigating only on an as needed basis for one field (the field closest to the RIB system) during periods of maximum crop demand in the summer at, or below, the consumptive use of the crop. This will defer the need for the DDR and associated work in accordance with my March 3, 2010 letter that DNREC has already approved. As there will not be sufficient flow under any scenario to provide sufficient treated wastewater to meet consumptive crop needs in the early stages of development, TESI proposes discharging into the RIB and storing the water in the ground as a reasonable interim substitute for the lagoon storage. Therefore, lagoon storage under the consumptive use early scenario will not be needed for agronomic practices, or for frozen or saturated ground conditions. Two factors that support this concept of using groundwater comingled with treated effluent are the lack of nutrients in the treated effluent and the slow movement of the water once it enters the groundwater. The TESI wastewater system was never intended to supply crop nutrient needs. The slow movement means that much of the

groundwater will remain on Wandendale site for years. TESI would install a well to partially recover the treated effluent while comingling it with existing groundwater to provide sufficient volume to meet crop needs. This type of activity could be permitted by approving the RIB discharge as outlined in my March 3, 2010 letter and also permitting the spray on demand in conjunction with Senate Bill 129 from the 145th General Assembly that permits farmers to accept reclaimed water through irrigation systems. This would be similar to what was recently implemented in the Middletown area.

All of the treated water would not be collected, but it would not matter under this scenario as the RIB discharge would be permitted as DNREC has already confirmed the suitability of RIBs for this site. The Secretary's environmental assessment report states:

> "As proposed and as reviewed by DNREC's Watershed Assessment Section, the Wandendale wastewater facility will meet the applicable provisions of the Inland Bays Pollution Control Strategy."

In addition, I have enclosed a Wastewater Technology Fact sheet from the United States Environmental Protection Agency (US EPA) that supports the concept of recovering water from RIB systems with a well for beneficial reuse.

We believe this plan satisfies Special Condition 7 and respectfully request your timely concurrence as we need to finalize our construction permit application so we can move forward with other aspects of this project. Ms. Walling had promised us a response on, or before, November 2, so time is of the essence.

Thank you for this opportunity to correspond directly with you. Should you have any questions regarding this matter, please feel free to contact me at 302-734-7500, ext. 1023.

Sincerely,

Bruce E. Patrick

Bruce E. Patrick, P.E.
Vice President of Engineering

cc: Lee Ann Walling, DNREC
Gerard L. Esposito, President
Lee J. Beetschen, P.E., Cabe Associates

Enclosure – DNREC letter
(US EPA Wastewater Technology Fact Sheet on Rapid Infiltration Land Treatment)

TIDEWATER
ENVIRONMENTAL SERVICES, INC.
1100 South Little Creek Road
Dover, Delaware 19901

December 20, 2010

Ms. Lee Ann Walling
Department of Natural Resources
and Environmental Control
89 Kings Highway
Dover, DE 19901

Re: Wandendale Coastal Zone Act (CZA) Permit Number 386 Special Conditions
- Tidewater Environmental Services, Inc.

Dear Ms. Walling:

This letter is intended to address how the Conditions in the above referenced permit will be addressed.

Standard Condition 1 – We will be complying with all other applicable permit requirements, regulations and laws of the State of Delaware.

Standard Condition 2 - We will be complying with all building permit and other applicable code requirements of Sussex County.

Standard Condition 3 – We will notify the Secretary as soon as possible if there are significant deviations from the plan and operations approved by the Secretary.

Special Condition 4 – We will be submitting a construction permit application for 1.45 MGD, under separate cover, to the Department.

Special Condition 5 - We have minimized the environmental footprint, particularly as it relates to deforestation, 7.5 total acres will be deforested in total in all 12 phases of the project. We will be submitting a reforestation plan equal to 130% (9.9 acres) of the estimated loss of mature forest as part of the construction permit referenced above. The reforestation plan will be implemented in phases as land is deforested.

Special Condition 6 – We will be submitting a plan as part of the construction permit application to comply with the recommendations of the Natural Heritage Program's report.

Special Condition 7 – As noted above, our facility is being implemented in multiple phases. Treatment capacity will be expanded in increments of 150,000 gpd, except for the last phase at 100,000 gpd. The initial, overall construction permit application will be for 1.45 MGD, for RIB

disposal. Three of the six RIB beds shown in the attachment will be built with the land area for the other three reserved as spare capacity until the DDR work for the spray sites has been completed and the spray capacity established. Then most of the spray sites will become the backup for the RIBs, which can then be expanded to the full six beds. However, spray will be implemented in the early phases as described below in this plan of implementation:

Phase 1 – Pump and haul for up to 15,000 gpd. The wastewater will be hauled to a TESI approved facility that is already in operation such as Hart's Landing or Bay Front, where excess capacity exists. It will be treated to Total Nitrogen (TN) of 5 mg/l or less.

Phase 2 – Construct a 150,000 gpd treatment plant (two units of 75,000 gpd each). One unit will be placed into operation (75,000 gpd) once the 15,000 gpd flow is achieved, this is 20% of one of the 75,000 gpd treatment units and will allow proper treatment to meet the pollution control strategy limits as proposed. A single Rapid Infiltration Basin (RIB) will be built, temporarily portioned into six beds and used for disposal of treated effluent.

Phase 3 – Place the second 75,000 gpd treatment unit into operation as the flows increase and provide both treatment units with enough flow to perform at design standards. RIB Disposal will be used. This will allow up to 150,000 gallons per day to be discharged to the RIBs. When flow approaches 145,000 gpd (10% of the overall construction permit), TESI will begin spray irrigating as needed on landscaping on the exterior berms of the RIBs. This will be done as an activity not requiring a permit in accordance with Section 3.4.1.10 of the Regulations Governing the Control of Water Pollution.

Phase 4 – Construct an additional 150,000 gpd plant capacity (Total plant capacity will be 300,000 gpd) to be discharged to RIBs. Another RIB will be built at this time bringing the cell total to 2 of the 6 that will eventually be built.

Phase 5 - Construct an additional 150,000 gpd plant capacity (Total plant capacity will be 450,000 gpd) to be discharged to RIBs. A third RIB will be constructed during this phase. In addition, an irrigation well, tentatively sized at 600 gpm, will be installed in the Columbia formation down gradient from the RIBs to withdraw groundwater and co-mingled treated water. The well will be used for spray on demand for the field closest to the RIB site. The wetted area under the center pivot depicted is 28 acres. Should we elect to use a travelling gun; the spray area can be expanded to a total of 43 acres. Spray from the well will begin after 300,000 gpd flows are reached, so at 20% of the overall 1.45 MGD permitted flow. A Design Development Report (DDR) will be submitted for the agricultural spray areas before flows to the treatment plant reach 450,000 gpd, to demonstrate the full capacity of the Agricultural Spray fields.

Phase 6 – Construct an additional 150,000 gpd plant capacity (Total plant capacity will be 600,000 gpd) to be discharged to RIBs. In addition, infrastructure including storage to spray irrigate treated wastewater onto Spray Area 3 will be in place prior to flows reaching 600,000 gpd. It is anticipated that the irrigation well will still be used to meet

peak crop consumptive demands that cannot be met with the volume of treated wastewater available during this phase. Additional RIBs will be constructed during this phase. The total RIB operating capacity at this time shall not exceed the spray area reserve capacity established by the DDR. The RIB permit capacity is expected to be 1.45 MGD.

Phase 7 - Construct an additional 150,000 gpd plant capacity (Total plant capacity will be 750,000 gpd). Spray irrigation on an as needed basis will take place on Spray Area 3 and the excess will go to RIB discharge. In addition infrastructure to spray irrigate on Spray Area 8 (7.21 acres) must be in place prior to flows reaching 750,000 gpd.

Phase 8 - Construct an additional 150,000 gpd plant capacity (Total plant capacity will be 900,000 gpd). Spray irrigation on an as needed basis will take place on Spray Areas 3 and 8 and the excess will go to RIB discharge.

Phase 9 - Construct an additional 150,000 gpd plant capacity (Total plant capacity will be 1,050,000 gpd).

Phase 10 - Construct an additional 150,000 gpd plant capacity (Total plant capacity will be 1,200,000 gpd).

Phase 11 - Construct an additional 150,000 gpd plant capacity (Total plant capacity will be 1,350,000 gpd).

Phase 12 - Construct an additional 100,000 gpd plant capacity (Total plant capacity will be 1,450,000 gpd).

Special Condition 8 – The RIB on the northern portion of the site has been eliminated.

Special Condition 9 – This condition has been addressed in my November 5, 2010 letter.

We respectfully request your concurrence regarding the approaches described herein to address the mentioned conditions. Should you have any questions regarding this matter, please feel free to contact me at 302-734-7500, ext. 1023.

Sincerely,

Bruce E. Patrick

Bruce E. Patrick, P.E.
Vice President of Engineering

BEP
cc: Gerard L. Esposito, President (W/Attachments)

Jerry Homer, Esq.
Parkowski, Guerke & Swayze (W/Attachments)

Mr. Lee J. Beetschen, P.E., DEE
CABE Associates, Inc. (W/Attachments)

Attachments

AUTHORIZATION TO CONSTRUCT
UNDER THE LAWS OF THE
STATE OF DELAWARE

1. **Pursuant to the provisions of 7 Del. C., 6003**
Tidewater Environmental Services, Inc.
1100 South Little Creek Road
Dover, DE 19901

Is herein authorized to construct the Wandendale regional on-site wastewater treatment and disposal system to service:
areas as approved in Sussex County Conditional Use 2019.

Located on (tax map # 2-34-11.00-50.00, 2-34-11.00-48.00, 2-34-7.00-127.00, and 2-34-7.00-130.00)):
both sides of Route 24 and Camp Arrowhead Road, south of Love Creek, Sussex County.

The wastewater treatment plant and disposal system shall consist of:
One (1) Hycor Rotoshear screen; One (1) RotoPress Screenings Compactor; Two (2) Membrane Bioreactor (MBR) Treatment Tanks; Three (3) Trojan UV disinfection systems; Six (6) Rapid Infiltration Basins (RIBs); and all appurtenances thereto.

Designed to accommodate:
domestic waste generated by dwellings within the Sussex County Conditional Use #2019 (Phased approach for construction and operation).

2. **The construction requirements, and other permit conditions are set forth hereof and shall include the following:** (1) Construction permit conditions as noted in this permit. (2) Design Engineer's Report and Technical Specifications with DNREC approved stamp dated 10/20/2011, as submitted by Scott C. Hoffman. of CABE Associates, Inc. (3) Plans noted as sheets 1 through 47 as submitted by Scott C. Hoffman of CABE Associates, Inc. with DNREC approved stamp dated 10/20/2011.

_____ _____

Ronald E. Graeber, Program Manager
Ground Water Discharges Section
Department of Natural Resources
and Environmental Control

Date:

A. GENERAL DESCRIPTION OF DISCHARGE

The Wandendale Regional Wastewater Facility has been designed to treat 1.45 million gallons per day (mgd) generated by dwellings from developments located within the service area identified by Sussex County Conditional Use #2019. The wastewater shall be treated by a MBR treatment process with and disinfected using ultraviolet (UV) disinfection. Six RIBs shall be utilized for disposal.

Influent and effluent flow metering have been incorporated into the design. The on-site wastewater treatment and disposal facility (OWTDS) shall be constructed in 12 phases, as follows:

Phase 1 - Pump and haul for up to 15,000 gpd. The wastewater will be hauled to a Tidewater Environmental Services, Inc. (TESI) approved facility that is already in operation, where excess capacity exists. It will be treated to Total Nitrogen (TN) of 5 mg/1 or less.

Phase 2 - Construct a 150,000 gpd treatment plant (two units of 75,000 gpd each). One unit will be placed into operation (75,000 gpd) once the 15,000 gpd flow is achieved, this is 20% of one of the 75,000 gpd treatment units. A single Rapid Infiltration Basin (RIB) will be built, temporarily portioned into six beds and used for disposal of treated effluent.

Phase 3 - Place the second 75,000 gpd treatment unit into operation as the flows increase and provide both treatment units with enough flow to perform at design standards. RIB Disposal will be used. This will allow up to 150,000 gallons per day to be discharged to the RIBs. When flow approaches 145,000 gpd (10% of the overall construction permit), TESI will begin spray irrigating as needed on landscaping on the exterior berms of the RIBs.

Phase 4 - Construct an additional 150,000 gpd plant capacity (Total plant capacity will be 300,000 gpd) to be discharged to RIBs. Another RIB will be constructed at this time.

Phase 5- Construct an additional 150,000 gpd plant capacity (Total plant capacity will be 450,000 gpd) to be discharged to RIBs. A third RIB will be constructed during this phase. In addition, an irrigation well, tentatively sized at 600 gpm, will be installed in the Columbia formation down gradient from the RIBs to withdraw groundwater and comingled treated water.

Phase 6 - Construct an additional 150,000 gpd plant capacity (Total plant capacity will be 600,000 gpd) to be discharged to RIBs. In addition, infrastructure including storage to spray irrigate treated wastewater onto Spray Area 3 will be in place prior to flows reaching 600,000 gpd. Additional RIBs will be constructed during this phase.

Phase 7 - Construct an additional 150,000 gpd plant capacity (Total plant capacity will be 750,000 gpd). In addition infrastructure to spray irrigate on Spray Area 8 (7.21 acres) must be in place prior to flows reaching 750,000 gpd.

Phase 8 - Construct an additional 150,000 gpd plant capacity (Total plant capacity will be 900,000 gpd).

Phase 9- Construct an additional 150,000 gpd plant capacity (Total plant capacity will be 1,050,000 gpd).

Phase 10 - Construct an additional 150,000 gpd plant capacity (Total plant capacity will be 1,200,000 gpd).

Phase 11 - Construct an additional 150,000 gpd plant capacity (Total plant capacity will be 1,350,000 gpd).

Phase 12 - Construct an additional 100,000 gpd plant capacity (Total plant capacity will be 1,450,000 gpd).

B. CONSTRUCTION REQUIREMENTS

1. Prior to initiating construction of the on-site wastewater treatment and disposal system, a preconstruction meeting shall be held onsite to be attended by the following individuals: DNREC Soil Scientist, DNREC Environmental Engineer, Project Design Engineer, General Site Contractor, On-Site System Contractor, and any other necessary parties.

2. The system must be installed by a DNREC licensed Class E System Contractor (Contractor) who is qualified and has experience with RIB installation. The contractor must have an approved permit on site during construction of this system.

3. The Contractor shall notify the Ground Water Discharges Section (GWDS) at (302) 739-9948, **72** hours prior to construction start-up to receive an authorization number. Upon receipt of the authorization number, the contractor shall notify a representative from the Large System Program, of the GWDS (permit writer) in order to give an installation timeline. Upon receipt of timeline, the GWDS may request weekly status reports (verbal), or that monthly progress reports (written) be submitted.

4. All disposal systems are to be surveyed in by a licensed surveyor or professional engineer.

5. There shall be no soil disturbance to the disposal areas except the minimum required for installation. A substantial barrier must be placed around the disposal areas (including spare area) prior to subdivision construction activities beginning.

6. A silt fence shall be placed at the interior base all RIB berms during construction and remain until stabilization of the berms is complete.

7. Efforts shall be made to minimize the trafficking on the basin area. Vehicles within the basin area shall be low ground pressure track style equipment only. No wheeled vehicles shall be used in clearing vegetation in the basin area.

8. The disposal system shall be installed according to the cross section in the design plans. Any deviations must first be approved by the Design Engineer who must also seek approval from the GWDS.

9. Engineered "sandy fill" to replace slowly permeable material shall have a uniformity coefficient of <5, minimum 95% pass #4 sieve, and maximum of 10% passing the #10 sieve.

10. A DNREC licensed soil scientist shall be on site during excavation to verify removal of slowly permeable material.

11. A Geotechnical Engineer shall be on site to verify engineered fill and placement procedures.

12. A permanent fence with signage posted every 200' depicting wastewater system in use must be installed around the RIB disposal system.

13. Final grading in the area adjacent to the RIBs shall provide for positive drainage away from the disposal areas.

14. The permittee must obtain all necessary collection system permits. Prior to the system being put into operation the permittee must supply the GWDS with written approval from Sussex County for the construction of the collection system. If the collection system does not require county approval, the permittee must supply the GWDS of testing procedures and results conducted on the collection system (including any lift stations).

15. The Contractor shall notify the Design Engineer and the GWDS for a dual inspection prior to covering or putting any part of system into operation. Approval from both parties must be given upon completion of installation. The Design Engineer shall provide the GWDS with an approved inspection report(s) of the installation.

16. The permittee is responsible for supplying the GWDS with a certificate or letter of completion/approval from the wastewater treatment plant (WWTP) manufacturer once the construction of the WWTP has been completed (if applicable). Approval must be sought for all phases.

17. The permittee must ensure that a manufacturer's representative of the WWTP provide proper operator training. Proof of operator training must be submitted to the GWDS prior to the system being placed into operation.

18. All electrical connections shall be waterproof and corrosion resistant.

19. Roof downspouts, foundation drains, storm sewers, combined sewers or appurtenances thereto, or any sewer or device carrying or discharging storm water,

surface water, groundwater, cooling water, oil, or water softener brine shall not be connected to the system.

20. It is the responsibility of the contractor to verify that all isolation distances, as noted and approved in the permit, can be maintained. Furthermore, the Contractor shall notify the Design Engineer if field conditions exist that prohibits his/her ability to maintain the approved isolation distances and/or meet regulation requirements.

21. The distribution system must be pressure tested by the Design Engineer. A representative from the GWDS must be on-site to verify the distribution test(s).

22. Final site restoration must comply with Section 6.01070 of the Regulations Governing the Design, Installation and Operation of On-Site Wastewater Treatment and Disposal Systems (Regulations).

C. MANAGEMENT REQUIREMENTS

1. Change in Usage or Operation Changes

   Any anticipated facility expansions, production increases, or process modifications which will result in new, different, or increased discharges must be reported by submission of a written report to the DNREC for approval prior to changes being made. A new permit may be required.

2. Licensed Operator

   a. Operation of this wastewater disposal facility requires a Licensed Operator. The operator is responsible for operation, maintenance, and sampling of the facility. Proof of operator qualifications and copy of the executed contract between owner and operator must be submitted to the Department before the facility is put into operation.

   b. The Operator shall be on-site at the time the system is put into operation and is to receive all proper training as necessary to operate the system.

3. Power Failure

   An alternative power source, which is sufficient to operate the wastewater treatment and disposal facilities, shall be available. If such alternative power source is not available, the permittee shall halt, reduce, or otherwise control discharges upon the reduction, loss, or failure of primary source of power to wastewater facilities. It is the permittee's responsibility to ensure that all required permits regarding generators are obtained.

D. RESPONSIBILITIES

1. Right of Entry

The permittee shall allow, at reasonable times, the Secretary of the DNREC, or his authorized representative, upon the presentation of credentials and such other documents as may be required by law:

a. To enter upon the permittee's premises or where any records are required to be kept under the terms and conditions of this permit; and

b. To have access to and copy any records required to be kept under the terms and conditions of this permit; to inspect any monitoring equipment or monitoring method required in this permit; to inspect any facility, equipment, practice, or operation permitted or required under this permit; and to sample or monitor for the purpose of assuring permit compliance with any condition of this permit, or the regulations of 7 Del. C., Chapter 60.

2. The permittee shall submit to the GWDS an "as-built" set of plans of the facility bearing the seal and signature of a DNREC Class C licensed Professional Engineer registered in the State of Delaware. The as-built shall include a full equipment list and technical specifications for all equipment used if different than permitted. The as-built must also incorporate the new topography elevations of the RIB basin bottoms and berms; elevations of new monitor/observation wells at the top of the casing, at the ground surface, and local topography tied to a common benchmark. The location and screen depth, length of stick up, and well ID's must also be provided for each new monitor well. The as-built plans must be submitted to the Department at least 30 days prior to the issuance of any authorization to utilize or discharge wastewater to the OWTDS.

4. Transferability

No person shall transfer a permit from one person to another unless thirty (30) days written notice is given to the DNREC, indicating the transfer is agreeable to both persons, and approval of such a transfer is obtained in writing from the DNREC, and any conditions of the transfer approved by the DNREC are complied with by the transferor and the transferee.

The notice to the DNREC shall contain a written agreement between the transferor and the transferee, indicating the specific date of proposed transfer of permit coverage and acknowledging responsibilities for compliance with, and the liability for the terms and conditions of this permit. The agreement shall also include a copy of the current permit signed by the transferee.

5. Availability of Reports

   All reports submitted with the application and those reports required in accordance with the terms of this permit shall be available for public inspection at the office of the Division of Water Resources, Ground Water Discharges Section (GWDS). Knowingly making any false statement on any such report may result in the imposition of criminal penalties as provided for in 7 Del. C., § 6013. Any person who causes or contributes to the discharge of a pollutant into State waters either in excess of any conditions specified in this permit or in absence of a specific permit condition shall report such an incident to the DNREC.

6. Permit Modification, Revocation and Termination

   After notice and opportunity for a hearing, this permit may be modified, terminated, or revoked in whole or in part during its term for cause including, but not limited to, any of the following:

   a. Violation of any terms or conditions of this permit, the Regulations, 7 Del. C., Chapter 60 or failure to pay applicable DNREC fees.

   b. Obtaining this permit by misrepresentation or failure to disclose fully all relevant facts;

   c. If the DNREC finds that public health, safety or welfare requires emergency action, the DNREC shall incorporate findings in support of such action in a written notice of emergency revocation issued to the permittee. Thereafter, if requested by the permittee in writing, the DNREC shall provide the permittee a revocation hearing and prior notice thereof. Such hearing shall be conducted in accordance with 7 Del. C., Chapter 60.

7. State Laws

   Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State law or regulation.

8. Property Rights

   The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.

9. Severability

   The provisions of this permit are severable, and if any provision of this permit, or the application or any provision of this permit to any circumstances is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

9. Reapplication for a Permit

   At least 60 days before the expiration date of this permit, the permittee shall submit a new application to continue construction of facility. The GWDS will then review the permit application and permit file and render a decision.

E. EFFLUENT CHARACTERISTICS

The Wandendale Regional Wastewater Treatment Plant with disinfection has been designed to achieve the following concentrations:

1. BOD monthly average concentration of 5 mg/l
2. TSS monthly average concentration of 5 mg/l
3. Total Nitrogen annual average concentration of 5 mg/l
4. Total Phosphorus annual average concentration of 0.5 mg/l
5. Fecal coliform limits of $\leq$ 200 col/100 ml

Sampling parameters and frequencies will be outlined in the operation permit.

F. SPECIAL CONDITIONS

1. This permit authorizes construction only. No wastewater may be discharged to the system under the terms of this construction permit without written approval from the Department. Upon final approval of construction, the permittee shall apply for an operation permit. At this time an advertisement fee will be required.

2. Construction shall occur in 12 phases as outlined in the Design Engineer's Report, and Page 2 herein. Each phase shall be approved by the Department prior to being placed into operation.

3. This construction permit must remain valid until all phases have been completed.

4. If a temporary holding tank is permitted for a development to be serviced by this system, the phase to service the temporary holding tank may not exceed five years.

5. If well pointing is required during construction, the wells must be installed by a licensed well driller, and a permit to construct such wells must first be obtained from the Well Permit Branch of the Water Supply Section.

6. All construction shall be in agreement with plans and specifications submitted under this project and approved by the GWDS.

7. All construction shall be in accordance with Ten States Standards and other applicable local utility construction specifications and standards.

8. The Design Engineer shall provide the GWDS with operation and maintenance (O&M) manuals for the OWTDS. The O&M manual must be approved by the GWDS prior to the issuance of any authorization to utilize or discharge wastewater to the OWTDS.

9. The permittee must submit a sludge hauling contract with a licensed waste hauler to the GWDS prior to the operating permit being issued.

10. All clearing activities shall be supervised by a Class D Soil Scientist.

11. The permitte shall comply with the recommendations within the Natural Heritage Program's report. The permittee must have a maintenance plan to ensure the success of reforestation in the areas to be reforested.

12. No tree clearing shall take place during the period beginning on April 15th and ending on July 31st.

13. Upon completion of construction of Phase 5, and prior to initiation of Phase 6 construction, the permitte shall submit a Design Development Report (DDR) for the spray irrigation component of the project. The DDR must demonstrate how the permitte shall comply with Condition 7 of Delaware Coastal Zone Act Permit #386, which requires Tidewater Environmental Services, Inc. to spray irrigate treated effluent to the maximum extent practicable.

14. The permitte shall submit to the Department an operations plan that establishes under normal operations, a priority use of spray irrigation to the maximum extent practicable.

15. The permittee shall comply with the September 11, 2009 recommendations of the Natural Heritage Program regarding the removal and replacement of forested areas.

G. MONITORING AND REPORTING

1. A ground water monitoring plan must be submitted to the GWDS prior to the system being permitted for operation. The plan shall include the location of observation and monitoring wells as approved by the Ground Water Protection Branch to be installed and sampled.

2. The monitoring wells shall be installed according to the guidelines for construction of monitor and observation wells prior to the operation of the system.

3. A monitoring well plan must be developed and approved by the GWDS before system startup. The plan shall include monitoring for the following parameters:

Parameter	Unit Measurement	Sample Type
pH	S.U.	Field Test
Temperature	°F	Field Test
Specific Conductance	µS/cm	Field Test
Dissolved Oxygen Or Oxidation Reduction Potential	mg/L or mv	Field Test
Depth to Water Table	Hundredth of a foot	Field Test
Ammonia Nitrogen	mg/L	Grab
Arsenic	mg/L	Grab
Cadmium	mg/L	Grab
Chloride	mg/L	Grab
Chromium	mg/L	Grab
Copper	mg/L	Grab
Fecal Coliform	Col/100 ml	Grab
Hardness	mg/L	Grab
Iron	mg/L	Grab
Lead	mg/L	Grab
Manganese	mg/L	Grab
Mercury	mg/L	Grab
Nickel	mg/L	Grab
Nitrate as Nitrogen	mg/L	Grab
Nitrite as Nitrogen	mg/L	Grab
Organic Nitrogen	mg/L	Grab
Selenium	mg/L	Grab
Sodium	mg/L	Grab
Sulfate	mg/L	Grab
Total Dissolved Solids	mg/L	Grab
Total Kjeldahl Nitrogen	mg/L	Grab
Total Coliforms	Col/100 ml	Grab
Total Phosphorus	mg/L	Grab
Total Suspended Solids	mg/L	Grab
Zinc	mg/L	Grab

A minimum of 3 samples shall be collected at least one month apart and analyzed. A summary report which includes all analyses shall be submitted to the GWDS prior to discharge of wastewater to any RIBs.

H. LEGAL REQUIREMENTS

1. If a utility is going to own and operate the OWTDS, and the utility has been given a CPCN by the Public Service Commission; the following legal documents must be submitted and approved by the GWDS prior to the system being put into operation:

    a. Binding Agreement; and

    a. Purchase of Sales Agreement.

2. The permittee must seek approval from the Ground Water Discharges Section for all proposed additions of individual developments. The following must be submitted for review:
    a. Development Name

    b. Plans identifying site location

    c. Zoning certificate(s)

    d. Design flows for proposed development to include the number of homes and/or community facilities

    e. Binding agreement between the development and permittee

    f. Prior to the connection and operation of the proposed individual Development, the permittee must submit the following to the GWDS for approval:

        i. Approved Collection system permit number;

        ii. All collection system inspection approvals, if applicable or utility inspection reports.