

## 5.0 Groundwater

**Comment 5-1 (Mr. Mike Cindrich, Public Hearing, June 11, 2008):** Another issue that I have is with respect to well monitoring. And I would suppose I need an education more than anything on this because I'm certainly no expert on aquifers, but a project of this magnitude so close to my well, I'd be concerned that at some point it is going to dry up despite the estimates that are given in the report that the wells are pumping upwards at five times what the demand is. It speaks about a monitoring program and a need for a utility with a long term water level monitoring program, but it doesn't specify a timeframe. Is this something that's only going to go on for a year, is it something that's five years, is it open-ended? And I think that should explicitly say if there's a timeframe on it, and what that timeframe is or is it going to be open-ended.

Appropriate mitigation such as well maintenance or well replacement will be provided by the applicant should it be determined that project well pumping results in the loss of function of an off-site well. The off-site wells involve just the wells that -- the eight wells or so that you were testing or does that involve the other neighborhood wells. And if it should be determined that the project well pumping results in the loss of function, I'm curious to know what the process is to determine whether or not it's the project or some other factor that would contribute to that, not directly an answer obviously, but what the process is, number one.

***Response 5-1:** The well mitigation plan discussed in the DEIS provides a timeframe of at least two years of monitoring, following full build-out of the project. A two year period will provide an adequate period to establish typical water usage for the Salem Hunt project, and a period of at least two years should account for seasonal variations in rainfall and water usage.*

*The monitoring would be conducted on a selected number of those wells initially monitored, since these wells are closest to the Salem Hunt supply wells. If the Town Hydrogeologist determines that wells other than those initially monitored could be impacted by the Salem Hunt water system, then those wells could be added to the monitoring program.*

*The four wells recommended for monitoring are known as the Havell well located south of the property, Red Horse Farm well, located west of the property, the Seeley well located northeast of the property, and the Town Highway Facility well located southeast of the property. Drawdowns were observed in each of these wells during the 2006 Salem Hunt pump test. In addition, the Cindrich well located east of the property will be monitored, if agreed upon by Mr. Cindrich. The applicant has agreed to monitor these five wells once the proposed water supply system has been approved by the applicable agencies.*

*The applicant's consultant would submit quarterly reports regarding well monitoring to the Planning Board and to the Town's Hydrogeologist. If the Town's Hydrogeologist determines that the Salem Hunt project is impacting the function of an off-site well(s), then the applicant would fund appropriate mitigation, such as deepening or replacement of the affected well(s). The revised Well Monitoring and Mitigation Plan is provided in Appendix L in this FEIS.*

**Comment 5-2 (Chairwoman Curtis, Public Hearing, June 11, 2008):** The water pump test, back in the days when I was on the planning board the first time, when we did a draw down

test, the planning board played a very active role in working with the applicant to decide what wells would be tested and why they would be tested. In this case, as in rereading the file, I kind of saw a gap between April, when it was first discussed, April of 2007, and after the fact when the pump test already took place. While in general, it appears as though a good job was done because they were able to find some wells surrounding the property to test, the -- right next door is the school. Perhaps, one of the single biggest uses of water in the town of North Salem. They signed off that they would like to have their well tested. I know there was a comment in the EIS that because of the location of the well, it may not have been accessible. What does that mean? I mean, could we have worked with the school, could we have done something to make sure that their well was monitored? And now that we're hearing additional information about the school and its water and its wells, I think the planning board needs to be discussing this with its hydrogeologist and decide whether or not we are comfortable with the tests that we're taking and it constitutes our hard look and how it will take us out into projecting future uses.

**Response 5-2:** *The well testing protocol was submitted to the Planning Board, its consulting hydrogeologist Mr. Russell Urban Meade of the Chazen Companies, and the Town's Consulting Engineer, Hahn Engineering on October 24, 2006. The Protocol was also submitted to Ms. Louis Doyle of the Westchester County Department of Health. The Town's hydrogeologist provided specific recommendations for wells to monitor and reviewed and approved the final list. The Protocol was modified based upon comments from Mr. Urban Meade, and was resubmitted to the Planning Board on November 21, 2006, the original date was noted on the protocol as October 24, 2008 with a revision date of November 21, 2008. This protocol was submitted in the DEIS as Appendix G, Pump Test Protocol. In the draft and final protocol, the School District well was identified as a desirable well to monitor.*

*While the School District provided permission to monitor their well, the applicant reported that its construction did not allow monitoring. The school well is located inside a building, with a pump column that rises through a sanitary seal at the top of the well. In order to monitor the well, a crane would need to be assembled inside the building, or through the roof of the building, to pull the pump, and allow access to the standing water in the well. Water service to the school would reportedly have been interrupted and damage to the well may have occurred.*

*As suggested in the comment, the school may be one of the larger water users in the Town of North Salem. The school well is located approximately 2,200 feet southeast of the nearest Salem Hunt production well (Well TW-2). The Havell well, located approximately 405 feet southeast of Well TW-2 had an observed interference of up to 25 feet, while the Town well, located approximately 1,285 feet east of well TW-2 had a maximum interference of 5 feet. The Havell well and the school well are both south of the Salem Hunt wells. The school well is three times the distance between the test well and the Havell well. Based upon the data from the Havell well and the Town well, and because the pumping tests were conducted at peak rates rather than average rates, the School well would be expected to have interference of substantially less than 25 feet, which would not result in any short-term or long term impacts to water supply or the functioning of the well. The applicant would allow monitoring of one or more of the Salem Hunt wells during any future testing for School wells.*

**Comment 5-3A (Ms. Suzannah Glidden, Public Hearing, June 11, 2008):** I'm glad you brought up park lands and that you'll be reviewing that again because that is an opportunity to address that (indiscernible) of this size. Someone just mentioned that I believe you did, Cynthia, that the school is a large water user, and this will be a large water user. And I just wanted to remind the board that not far away, going north, on Fields Lane, you have dirt there, dirt and oil now in the business of water extraction. The state doesn't require any gallonage, the amount of drawn out to be reported on a monthly basis. We have no idea how much is being taken out of the aquifer.

**Comment 5-3B (Letter #4 Ms. Karen Kurrasch, July 10, 2008):** I would like the Salem Hunt people to address the situation with the aquifers under their proposed development and to make sure there will be sufficient water to support the neighborhood in case 65 families move in.

**Comment 5-3C (Mr. Mike Cindrich, Public Hearing, June 11, 2008):** And number two, how long it takes, because if I have to wait a week, six months, a year for somebody to figure out what the reason is, that's that amount of time where I'm short water in my own house. So obviously, that's a concern.

*Response 5-3A-C: Water usage and the project's potential impacts on neighbors and the Town is an important issue. The DEIS contained a thorough and detailed assessment of the local aquifer, potential recharge areas and water volumes (the amount of rainfall contributing to the aquifer), and estimated water usage, both on-site and locally off-site. The pumping test provided a rigorous, conservative testing of the on-site wells to determine potential off-site impacts to neighbors.*

*It should be noted that Fields Lane is lower in the watershed than the subject Salem Hunt property. Any withdrawals in that area should not influence water availability in the higher elevations where the Salem Hunt property is located.*

*If a problem with a neighboring residential well occurs during construction, or the initiation of the on-site water supply system, immediate relief can be provided by the applicant, with temporary water supply. The Town's designated hydrogeologist will then determine in a reasonable timeframe (two to three weeks) whether the observed off-site well impacts are the result of the Salem Hunt water supply system.*

**Comment 5-4 (Mr. Irvin Raboy, Public Hearing, June 11, 2008):** I'm wondering how you guys intend to water all your grasslands here, how you intend to maintain it, just because if you intend to suck it out of a well, that's a lot of water. I'm sure the well will going to be dry within a few years for both, you know, the school and your neighbors and me. And since you are in an area that you can take it, I see a basin, I assume that's for fire protection right now. But could they do a gray water setup where they actually are able to take the water and do their own fields with the water that's stored on the property? Could they even put up a treatment center where they could reuse their water and run the houses off of that, just because it's going to be an astronomical amount of water use?

*Response 5-4: The currently proposed FEIS Site Plan includes several provisions to reduce water usage. No irrigation is planned for the project. The project engineer has included notes on the Plans that all lawn irrigation systems and lawn watering systems are prohibited after the site has been stabilized. The applicant has committed to utilize*

*native and drought tolerant vegetation in the project landscaping which will eliminate the need for irrigation. Although individual residential units will have outdoor spigots, all lawn and landscape maintenance will be the responsibility of the homeowners association, and association rules and regulations would prevent individual homeowners from watering lawns and landscaping.*

*The project now includes 9.2 acres of low maintenance native grasses, which will form meadow areas. These areas will assist in retaining water on-site, thereby reducing stormwater run-off and increasing on-site recharge.*

*Water conservation for the project will be achieved through the use of low-flow, water efficient plumbing fixtures and appliances. The use of such water conserving fixtures can reduce water consumption by up to 20 percent, according to the U.S. Green Building Council. The project will utilize extra-low flow toilets that utilize 1.2 gallons per flush as compared to standard water saving toilets that use 1.6 gallons per flush, or a further 25 percent reduction in water use from toilets.*

*Water storage for fire fighting will be provided in two (2) underground tanks which will be located on the north side of the proposed recreation building, at the intersection of access Road A and B. One (1) additional underground storage tank will be utilized for the community water supply. This is a total of three (3) underground tanks for water storage.*

*As previously stated, a gray water recycling system was considered and was not pursued by the applicant because it is not appropriate or cost effective. Gray water recycle systems are typically most effective with commercial projects, where the need for gray water is higher than with residential projects. With a residential development, the only use for gray water is to flush toilets. This equates to only a few gallons per day per household. The gray water available for reuse would be a very small percentage of the daily flows. For commercial projects that have a design flow that is comprised mostly of toilets, a gray water recycling system is more appropriate and cost effective, since a higher percentage of the wastewater can be reused.*

**Comment 5-5 (Letter #7 Russell Urban-Mead, The Chazen Companies, July 24, 2008):** The pumping tests conducted at the site indicate that the desired water budget was met by the site wells. Off-site drawdown impacts were evaluated and appear acceptable.

As a note, during the public comment period, concerns were raised about potential drawdown impacts to the well at the nearby school. The school well was not monitored during the pumping test. It has been mentioned that a new well is being planned at the school to resolve water quality issues not related to Salem Hunt. During testing of any new wells at the school, we recommend that Salem Hunt allow the school to monitor one or more Salem Hunt wells to collect information that might define the extent of any potential aquifer interactions between the two properties.

**Response 5-5:** *Comment noted. The applicant would allow monitoring of one or more of the Salem Hunt wells during any future testing for School wells.*

**Comment 5-6 (Letter #7 Russell Urban-Mead, The Chazen Companies, July 24, 2008):**

Since most aquifer recharge entering the site will be drawn to the site wells, the following protection measures should be explained.

- a. If road salt will be used to manage project roads, the Applicant should explain or develop measures to ensure how salt residues and salty snow piles will be managed to limit salt entry to the aquifer.
- b. The Applicant should explain or develop measures to manage any chemical or petroleum storage proposed on the site, whether for pool management, heating, lawn management or other uses.
- c. The Applicant should explain or develop landscaping practices to minimize the potential for groundwater quality defects caused by uses of fertilizers and herbicides.

***Response 5-6:** Road salt is not proposed to be used for winter traction for the project. Instead sand will be used by the contractor retained by the Salem Hunt homeowners associates for winter maintenance. This condition will be included in the proposed Homeowners Association "Declaration of Covenants, Restrictions and Easements", which will detail the maintenance requirements and methods for the Homeowners Association. The Association is further described in Section 1.3 Summary of Proposed Action.*

*No bulk storage of chemicals or petroleum is proposed for the project. Such storage is not necessary for routine operation and maintenance of the facilities. Pool chemicals will be provided and added to the pool as needed a facility maintenance contractor retained by the homeowners association. Similarly, landscaping maintenance equipment will be fueled and maintained off-site and there will be no need for on-site equipment maintenance or the storage of petroleum. Residences will be heated by electrical heat and propane will be used for cooking. A restriction on the bulk storage and chemicals will be included in the Homeowners Association "Declaration of Covenants, Restrictions and Easements" (see Section 1.3 Summary of Proposed Action).*

*As described in Section 1.0 Introduction and Response 5-4 and 5-7, landscaping for the project has been modified from that described in the DEIS. Lawn areas have been reduced by 46 percent, compared to the DEIS Plan and will now comprise a total of 2.5 acres of the 40 acre site. Instead of lawn, low maintenance native grasses will be incorporated into the landscaping. Native bushes, shrubs and grasses will be more resistant to pests and will reduce the need for pesticides. The limited area of lawn will also minimize the use of pesticides and fertilizers.*

**Comment 5-7 (Letter #7 Russell Urban-Mead, The Chazen Companies, July 24, 2008):**

To ensure long-term availability of recharge to the site wells, the Applicant should seek all opportunities to include infiltration practices on the site. The Applicant should explain their selected practices and demonstrate how they will mitigate the effects of impervious surfaces associated with proposed construction. Practices enhancing recharge could include rainfall gardens, gentle depressions to retain flow from small rainfalls, roof leader infiltration, grassed swales, other infiltration devices, and direction of runoff from pervious areas onto vegetated soils.

**Response 5-7:** *As described in Section 1.0 Introduction, the modified FEIS Site Plan includes Better Site Design techniques and infiltration practices to decrease stormwater run-off and increase on-site groundwater recharge. These measures are summarized as follows:*

- *Impervious surface has been reduced from 5.9 acres to 4.3 acres or 27 percent. The two cul-de-sacs have been eliminated and the total road length reduced. The width of proposed roads has been reduced and pervious pavement is proposed for driveways, parking areas and sidewalks.*
- *Areas of lawn have been reduced by 46 percent, and will now comprise 2.5 acres. Instead of lawn, low maintenance native grasses will be incorporated into the landscaping. These areas of meadow will reduce run-off.*
- *Approximately one-half of the roof run-off will be discharged to rain gardens or swales, prior to discharge to stormwater basins. The central common area between buildings will incorporate rain-gardens and swales to capture stormwater, increasing infiltration.*
- *Stormwater basins and facilities have been increased in size, allowing more infiltration. The majority of the developed site will be treated by two to three stormwater practices in series, which increases treatment levels and infiltration.*

**Comment 5-8 (Letter #9 Mr. Edward Gordon, Resident, July 26, 2008):** I am concerned also regarding the likely water usage. My well and others in the area are subject to shortages at times; witness chronic problems in the nearby Croton Falls Water District. Addition of an additional deep well will necessarily tap the same supply and deplete it. Can water be supplied by reservoir? The Croton aqueduct runs nearby. Tapping it or obtaining permission to connect to a nearby public water supply might be possible, although difficult.

**Response 5-8:** *The extensive pumping tests conducted for the project and described in the DEIS, demonstrate that there is adequate on-site water supply and the use of the wells would not impair the use of neighboring wells. No public water supplies are available in the vicinity of the project and connection with the NYCDEP water supply is not feasible. The Croton Falls Water District is a considerable distance away from the Salem Hunt project site and is located within a different portion of the regional watershed so that the pumping of the Salem Hunt wells will not effect it.*

**Comment 5-9 (Letter #13 Ms. Theresa Havell, Resident, July 28, 2008):** I wish to supplement my prior letter to comment on problems posed by the Salem Hunt DEIS regarding groundwater and septic system concerns.

**Response 5-9:** *Comment noted.*

**Comment 5-10 (Letter #13 Ms. Theresa Havell, Resident, July 28, 2008):** My home, located immediately south of the Salem Hunt property, receives its domestic water supply from a well located about 3 feet from the property line between my property and Salem Hunt. The well would be about 100 feet from the nearest proposed Salem Hunt buildings and also quite close to the proposed septic field.

**Response 5-10:** *The comment is correct in that the Havell well is approximately 100 feet from the nearest proposed residential building and approximately 330 feet from the proposed septic treatment field.*

**Comment 5-11A (Letter #13 Ms. Theresa Havell, Resident, July 28, 2008):** The DEIS notes the proximity of my well at page 5-16 and comments on the pumping tests, saying that the Havell well, which is the closet well to the proposed Salem Hunt project was the most influenced. "Routine use of the Havell well caused approximately 50' of water level fluctuation. The Red Horse Farm, the Town Highway facility and the Seely wells were all impacted to a lesser degree, by approximately 2 feet, 5 feet and 5 feet respectively," My well is impacted somewhere between 10 and 25 time more than the next nearest wells. The DEIS proposes "mitigation measures." But in fact, the only "mitigation" proposed, at pages 5-20 and 10-11, is a "monitoring program" for "at least two years following the completion and full occupancy of the Salem Hunt development"

**Comment 5-11B (Mr. Mike Cindrach, Public Hearing, June 11, 2008):** And number two, how long it takes, because if I have to wait a week, six months, a year for somebody to figure out what the reason is, that's that amount of time where I'm short water in my own house. So obviously, that's a concern.

**Response 5-11A-B:** *The monitoring program is provided to assess whether, in fact, off-site wells are impaired by the use of the Salem Hunt wells. Therefore, a consultant retained by the Town and paid for by the applicant would determine if a private well has reduced well yields due to the project. If confirmed, appropriate mitigation such as well replacement or well deepening would be fully provided by the applicant. A Well Monitoring and Mitigation Plan is provided as Appendix L. The Plan provides procedures for determination of well impacts, and the for the funding of private well mitigation (well deepening or well replacement).*

*If a problem with a neighboring residential well occurs during construction, or the initiation of the on-site water supply system, immediate relief can be provided by the applicant, with temporary water supply. The Town's designated hydrogeologist will then determine in a reasonable timeframe (two to three weeks) whether the observed off-site well impacts are the result of the Salem Hunt water supply system.*

**Comment 5-12 (Letter #13 Ms. Theresa Havell, Resident, July 28, 2008):** There is no detailed discussion in the DEIS of the effect of the proximity of the septic field to my well on my water quality. This is an obvious shortfall in the DEIS and requires supplementation.

**Response 5-12:** *The project has been revised and now includes a proposed Wastewater Treatment Plant that will treat effluent prior to its being discharged to the proposed Subsurface Sewage Disposal System (SSDS). The Havell well is located approximately 330 feet west of the proposed septic field. According to the NYSDOH regulations (Part 5, Subpart 5-1 Public Water Systems-Appendix 5D), the minimum separation distance to septic systems is 200 feet and therefore a sufficient separation distance is provided.*

*The existing natural topography and the proposed grading slopes towards the stream along the east side of the site, and away from the Havell well. Subsurface groundwater flow that would receive treated sanitary discharge would be expected to flow either to*

*the east to discharge naturally at the stream or travel downward into the shallow bedrock surface. Under either of the scenarios groundwater flow under the proposed sanitary field would not be expected to flow toward the Havell well. Nevertheless, now that wastewater is being treated prior to discharge, the SSDS is not expected to impact groundwater quality at the Havell well.*

**Comment 5-13 (Letter #13 Ms. Theresa Havell, Resident, July 28, 2008):** Obviously, a "monitoring program" after the development is built is no "mitigation" at all. This disclosed effect on my well already has diminished my property value, as well as raising health concerns for my family, and it will continue to do so throughout the period of consideration of and possible construction of the project. Analyses of these and other known issues will reveal the unfeasibility of this project in its current proposed location from a myriad of perspectives.

**Response 5-13:** *Refer to Response 5-12 concerning the now proposed WWTP that will treat effluent prior to its being discharged to the SSDS. As described above, the monitoring program is only a process put in place to determine if mitigation is needed for actual loss of a well or well function. The applicant will replace or deepen any affected well, as determined by the Town's hydrogeologist or a professional hydrogeologic consultant retained by the Town.*

**Comment 5-14 (Letter #14 Ms. Fay Muir, CWCWC, July 28, 2008):** The applicant conducted well tests from October through December. A better test period would have been July through September that is likely to be dryer.

**Response 5-14:** *The pump test analysis included projections made for 90 and 180 days without recharge. These results show a decrease in water levels in the wells during drought conditions, but not to levels that would affect the pumping rates or overall project water supply.*

*The pump test was conducted in December 2006. Precipitation data was provided in the Water Supply Report (DEIS Appendix H), in Chart 10. Precipitation data from the National Oceanic and Atmospheric Administration (NOAA) for the White Plains, NY station indicates that 6.72 inches of precipitation fell in November, 2006 and 2.53 inches fell in December, 2006. Historical precipitation data collected at the Poughkeepsie, NY station shows an average November precipitation rate of 3.21 inches and a December rate of 3.12 inches (1896 through 2005). Therefore, precipitation for November 2006, prior to the pumping test was higher than average and the December precipitation, during the test, was lower than average. As indicated above, the pump test analysis accounted for drought conditions and showed such conditions would not affect the project water supply.*

**Comment 5-15 (Letter #14 Ms. Fay Muir, CWCWC, July 28, 2008):** Coliform bacteria were found in the Salem Hunt test wells. On page 5-16, Vol. I, the applicant states: "Coliform bacteria is common (*sic*) found in newly installed wells during the drilling and pump testing process, by the introduction of material and equipment into the wells from the surface. Disinfectant treatment of wells typically removes the coliform." Rather than merely guessing, the applicant should determine precisely what is causing the presence of these bacteria in the wells and eliminate the cause. Relying on disinfectants - the applicant does not say how much might be needed — should be avoided by protecting the source water.



**Response 5-15:** *The source for the coliform bacteria cannot be readily determined since the bacteria can be introduced by any equipment containing soil particles, or the handling of equipment, pipes and tools with unwashed hands or work gloves. According to a USGS study<sup>1</sup> of coliform bacteria sources in watersheds, bacteria sources can include (but are not limited to) humans, cattle, poultry, horses, dogs, cats, geese, ducks, raccoons, and deer. As indicated in the DEIS well disinfection is a common practice and does not negatively affect water quality.*

**Comment 5-16 (Letter #14 Ms. Fay Muir, CWCWC, July 28, 2008):** During the pumping tests, eight off-site wells were monitored and four showed an influence from the pumping tests. The most seriously affected was the Havell well. The applicant suggests that a "hydrogeologic consultant" be retained by the Town who "will determine if the well impact is the result of project pumping or other factors, not related to the project." The applicant would provide appropriate mitigation such as deepening the well, if needed. Rather than the Town's responsibility, the study and remediation of any problems with this well should be the developer's responsibility, working closely with the Town engineer. No construction work of any kind should be permitted prior to the applicant establishing to the satisfaction of the lead agency that the projected drawdown of groundwater on the property will in no way affect any neighboring well, including the Havell well.

**Response 5-16:** *It is the applicant's responsibility for the well monitoring and any required mitigation, such as well replacement. It was suggested that the Town's hydrogeologist or an independent professional make the determination if the project has impaired off-site wells. Such a determination should not be made by a consultant working for the applicant. See Response 5-12, above.*

**Comment 5-17 (Letter #14 Ms. Fay Muir, CWCWC, July 28, 2008):** Two nearby big water users creating drawdown on the area's water source are North Salem Middle/High School on June Road and Durkin Water Company on Fields Lane, Southeast. The Salem Hunt water pump test should include the school. Durkin Water is drawing down unknown quantities of water to supply estates, swimming pools, businesses and municipalities outside the area. While New York State requires water suppliers to test water monthly for certain pollutants, no reporting is required on the quantity of water a big user is extracting. Durkin purchased a fleet of 6,000-gallon tankers, each of which can be filled in 20 minutes by high pressure pumps. Durkin also plans to build a 500,000 gallon holding tank that has been approved by Southeast planning board.

**Response 5-17:** *See Response 5-2 and 5-3A-C. The DEIS contained a thorough and detailed assessment of the local aquifer, potential recharge areas and water volumes (the amount of rainfall contributing to the aquifer), and estimated water usage, both on-site and locally off-site. The North Salem Middle School and High School was considered in the recharge analysis but the well could not be monitored (see Response 5-2).*

*The Durkin Water Company well was not monitored as part of the pumping test. Four private wells located close to the northern property border were monitored. It should be noted that Fields Lane is lower in the watershed than the subject Salem Hunt property.*

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<sup>1</sup> U.S. Geological Survey Water-Resources Investigations Report 03-4115, Patterns and Sources of Fecal Coliform Bacteria in Three Streams in Virginia 1999-2000, by Kenneth E. Hyer and Douglas L. Moyer. Website: [Http://pubs.usgs.gov/wri/wri34115/](http://pubs.usgs.gov/wri/wri34115/)

*Any withdrawals in that area is not anticipated to influence water availability in the higher elevations where the Salem Hunt property is located.*

**Comment 5-18A (Letter #14 Ms. Fay Muir, CWCWC, July 28, 2008):** Also not taken into account in groundwater review is nearby Peach Lake residences that will soon be sewered. All of the water now used by Peach Lake residents that goes back into area recharge will instead be exported to East Branch Reservoir. NYCDEP expressed concern their written comments on the Peach Lake sewer project that "...there will be significant removal of a recharge source from the local groundwater regime once residences are connected to the WWTP and the existing septic systems are taken off-line. The SEQRA review should evaluate the significance of potential impacts of the reduced groundwater recharge in terms of quantity," An Environmental Impact Statement for the Peach Lake sewer project was deemed unnecessary and hence, this priority topic was not fully examined. Hydrogeologist Russell Urban Meade recently commented at a North Salem public meeting that the problem of sufficiency can arise with concentrated over pumping of "too many straws in a small area." It would be prudent to wait for Peach Lake to be sewered first to then evaluate area water sufficiency by retesting Salem Hunt water pumping with the school. We are fortunate to be experiencing a wet period but a drought could have a devastating impact if the area is allowed to be over pumped.

**Comment 5-18B (Ms. Suzannah Glidden, Public Hearing, June 11, 2008):** And soon Peach Lake will be sewered, and all of the water that now goes into recharge is going to be exported to the East Branch Reservoir. So you've got those very major water impacts coming to this neighborhood, just to keep in mind, as you move forward with this project.

***Response 5-18A-B:** Although Peach Lake may overlies a contiguous aquifer that underlies the site, Peach Lake is located in a different section of the regional watershed and any water use changes around the Lake should not effect or change the water budget studies in the Salem Hunt project area. The DEIS Figure 6-8 Site Location within the Muscote Reservoir Watershed shows the drainage area for the project, compared to Peach Lake. Peach Lake is located more than 3,000 feet west of the site. Its influence upon the aquifer underlying the Salem Hunt site is not expected.*

**Comment 5-19 (Letter #14 Ms. Fay Muir, CWCWC, July 28, 2008):** Another potential problem for neighboring wells, although not mentioned by the applicant, is the possibility of infiltration of nitrates from the Sub Surface Sewage Treatment System (SSTS). From Vol. I, page 10-5, the applicant describes the modeling used for describing the transport of nitrates from the proposed SSTS. "In the Mean Flow Condition (low rainfall periods), the model predicts a nitrate concentration of slightly above 10 mg/l at a portion of the northern property line near the project entrance at June Road (see Figure 10-1 Nitrate Concentration). The 10 mg/l nitrate concentration is predicted to extend approximately 65 to 75 feet beyond the northern property border within the June Road right-of-way..." State and federal law allows 10 mg/l as the maximum allowable level of nitrate in drinking water. It has been well documented that nitrates in water can cause the dreaded "blue baby" syndrome. It is a matter of concern that, over time, nitrates in the groundwater could be drawn into the water supply of the nearby wells. The applicant would have to prove to the satisfaction of the lead agency that this will not be a problem either in the short or the long-term.

***Response 5-19:** Comment noted. The model described above shows conditions using the initially proposed subsurface treatment system (SSTS). A Wastewater Treatment Plant (WWTP) is now proposed to consistently and significantly reduce nitrate*

*concentrations to less than 10 mg/l. The WWTP is further described in Section 1.3 Summary of Proposed Action.*

**Comment 5-20 (Letter #14 Ms. Fay Muir, CWCWC, July 28, 2008):** The daily wastewater flow is anticipated to be 16,000 gpd provided that water-saving devices are installed.

The primary SSTS will be approximately 3.25 acres and the secondary SSTS also 3.25 acres, for a total of 6.5 acres. Details of the design are in Vol. I of Appendix K.

In Vol. I, page 10-5, the applicant states that: "Based on the simulation results, a limited area of the septic area will require filling to achieve sufficient cover to prevent breakout and maintain the trenches above the shallow groundwater levels. However, in Vol. II, page 2, the applicant states: "A geotechnical engineer is currently in the process of conducting a groundwater mounding analysis for the project. The mounding analysis will determine whether the project's design flows can be supported by the SSTS area's underlying soil," Whereas the statement in Vol. I would lead the reader to believe that only a small amount of fill will be required, Vol. II is far less definite regarding the amount of fill. This is an important difference since fill usually requires more frequent replacement than the natural soil. Large amounts of fill that need frequent replacing could present a problem.

**Response 5-20:** *Refer to Response 5-13. Extensive physical soils testing and a mounding analysis has been completed for the Salem Hunt project to assess the soil suitability and provide recommendations for the final design of the septic system. Fill will not need replacing, rather limited areas of fill will be placed during the septic system installation to provide separation distance between the discharge pipes and shallow groundwater. The engineer estimates approximately 5,000 cubic yards of selective fill will be required for grading purposes only. The majority of this fill will be placed in the southwest portion of the Subsurface Septic Disposal System (SSDS), as shown in the Grading and Utilities Plan (Drawing SP 3.1). New data described in the Supplemental Hydrogeologic Investigation (Appendix J) show that by redistributing the treated sewage, less fill is required than originally proposed. These conditions appear consistent with the assumptions and conclusions of the mounding analysis.*

**Comment 5-21 (Letter #17 Hilary Smith & Joe Bridges, MDRA, July 30, 2008):** The proposed community septic system is land-intensive and results in several adverse impacts, including:

- Loss of approximately 9 acres of wooded habitat immediately adjacent to a NYS regulated wetland and associated 100-foot Adjacent Area, which areas may currently be utilized by box turtles and other notable species.
- Conversion of forested lands into maintained grassed areas which will provide habitat for problematic wildlife, including Canada geese.
- The system does not provide the maximum level of available pre-treatment options.

It is our understanding that treatment of the effluent to a tertiary level would allow for treated effluent to be discharged below pavement areas. The change in disturbance, vegetation removal, habitat conversion and water quality that could be achieved with such a plan (or achieved by other measures) should be evaluated.

**Response 5-21:** *Based on a discussion with Dan Shedlo, P.E. of the NYCDEP on March 30, 2009, The NYCDEP will not allow subsurface treatment (conventional septic tank/absorption trench systems) below pavement. However, the NYCDEP will allow a Wastewater Treatment Plant (WWTP) followed by subsurface disposal with galleys below pavement areas. At the time this comment was made, a wastewater treatment plant was not proposed, and a galley system for the previously proposed SSTS would not be approvable by the NYCDEP. The current proposal includes the addition of a WWTP followed by a subsurface disposal.*

*Although the NYCDEP will allow subsurface disposal below pavement with galleys, the results of the geotechnical engineer's mounding analysis require the sewage effluent to be evenly distributed across the entire septic system area. It is also previously discussed in the DEIS that the location of the proposed septic system contains the best soils onsite for use as a septic system. In order to provide for subsurface disposal below pavement, the septic system would have to be relocated to the less desirable septic system areas. The increased loading to groundwater associated with a galley system at 24 feet on center is much higher locally than a 2 foot wide absorption trench spaced 7 feet on center. Also, there are not expansive pavement areas for the proposed project that would lend itself to galleys under pavement. The majority of the site pavement is for the roadways, which already contain water, sewer and drainage piping.*

*In summary, subsurface disposal below pavement was not allowed with the previously proposed subsurface sewage treatment system, and although it is allowed by NYCDEP with the WWTP followed by subsurface disposal, the groundwater mounding analysis shows that the septic system must be located in the area currently designated for the septic system.*

**Comment 5-22 (Letter #17 Hilary Smith & Joe Bridges, MDRA, July 30, 2008):** Limitations of the pumping test analysis regarding potential impacts on the nearby school well has not been included in the analysis and should be. Also, alternative methods to evaluate any potential impacts to the school's well should be proposed and implemented.

**Response 5-22:** *See Responses 5-2 and 5-5. The applicant would allow monitoring of one or more of the Salem Hunt wells during any future testing for School wells.*

**Comment 5-23 (Letter #17 Hilary Smith & Joe Bridges, MDRA, July 30, 2008):** If the demand on the Town's wells is not currently coincident with the permitted maximum withdrawal, what impacts, if any, could be anticipated when both the Town's wells and Salem Hunt's wells are operating at full demand (maximum withdrawal)?

**Response 5-23:** *The pumping test was performed to simulate maximum withdrawal conditions and potential drought conditions were simulated. As required by the NYSDEC and the Westchester County Department of Health, the wells were tested at twice the daily demand (peak flow) with the best well out of service. In addition, the test was run assuming 90 residential units (proposed for an earlier project plan). Given the conservative pumping test, no negative impacts are anticipated to any off-site wells, during maximum water use.*

**Comment 5-24 (Letter #17 Hilary Smith & Joe Bridges, MDRA, July 30, 2008):** The DEIS should detail a plan/mechanism which is formally proposed to address the potential for project-related impacts on adjacent water supplies. The plan should include:

- How impacts will be identified;
- How will impacts be remedied;
- Timeframes for obligations;
- Who will bear the cost for remedies (noting that the plan should be set up so that any costs are not borne by the future homeowners); and
- Provisions for reporting to / coordinating with the Planning Board.

**Response 5-24:** See Response 5-1, above. The impacts will be identified by collection and examination of water level data submitted in quarterly reports from a selection of off-site wells to the Planning Board and its hydrogeologist. Any problems with water levels or residential well yields would be reported to the Planning Board. The monitoring is proposed for at least two years following full build-out and occupancy of the project. This time-frame will provide an adequate period to establish typical water usage for the Salem Hunt project and account for seasonal variations in water usage. A Well Monitoring and Mitigation Plan is provided as Appendix L. The Plan provides procedures for determination of well impacts, and the for the funding of private well mitigation (well deepening or well replacement). If the Town's Hydrogeologist determines that the Salem Hunt project is impacting the function of an off-site well(s), then the applicant would fund appropriate mitigation, such as deepening or replacement of the affected well(s). This cost would not be the responsibility of the future homeowners. A bond will be established and held by the Town for costs related to well mitigation.

**Comment 5-25 (Letter #17 Hilary Smith & Joe Bridges, MDRA, July 30, 2008):** Low Impact Development (LID) stormwater techniques recommend eliminating curbs and allowing for stormwater to be pitched into grass swales which direct stormwater to landscaped depressions ("rain gardens") instead of piping to a central collection point (the basins). Such measures can reduce the volume of runoff needing to be handled by the stormwater basins which can reduce the extent of land needed for such features, and have a consequent reduction in related impacts (e.g., loss of forest, wildlife habitat, ineffective natural site buffering, etc). The use of LID stormwater techniques should be evaluated and appropriate measures should be incorporated into the project plans.

**Response 5-25:** See Section 1.0 Introduction and Response 5-7, above. The project has been redesigned based on the New York State Department of Environmental Conservation (NYSDEC) Publication Better Site Design dated April 2008. This publication provided numerous better site design and low impact development techniques in order to reduce the stormwater impacts associated with the project. The proposed site plan has implemented such techniques as pervious pavement, rain gardens, and roadway reduction. Approximately half the roof runoff will be directed to rain gardens and/or grass swales prior to discharge to the stormwater basins.

**Comment 5-26 (Letter #17 Hilary Smith & Joe Bridges, MDRA, July 30, 2008):** A reporting mechanism to the Town should be detailed to ensure the long-term monitoring, maintenance and operation of the stormwater management controls, in accordance with Code Chapter 193.

**Response 5-26:** *As required by the NYSDEC SPDES General Permit for Stormwater Discharge the applicant will be responsible for long-term maintenance in monitoring the stormwater management facilities. The Stormwater Pollution Prevention Plan (SWPPP) prepared for the project details the long-term maintenance requirements which includes annual inspections and inspection after significant rainfall events. The applicant agrees to submit copies of these reports to the Town. In addition, the project will be required to inspect, maintain and report on the long term effectiveness of stormwater facilities in accordance with the requirements of the North Salem Stormwater Law (Chapter 193). A further discussion of the Town Stormwater Law is provided in Response 2-38.*

**Comment 5-27 (Letter #17 Hilary Smith & Joe Bridges, MDRA, July 30, 2008):** It is unclear if the proposed "storm filter" near June Road addresses the County DOT's comments to provide drywells.

**Response 5-27:** *The proposed storm filter near June Road is intended to address stormwater quality impacts associated with the project. The overall stormwater management plan for the project addresses peak flows discharging from the site. Drywells are not appropriate for locations with high groundwater.*

**Comment 5-28 (Letter #18 Scott Ballard, NYSDEC July 30, 2008):** Water Supply (Article: 154 Title 15). The applicant will be required to obtain a water supply permit for the formation of a new water district and the construction of a public water supply and distribution system.

**Response 5-28:** *Comment noted.*

**Comment 5-29 (Letter #18 Scott Ballard, NYSDEC July 30, 2008):** State Pollutant Discharge Elimination System (Article 17). The proposed wastewater discharge to groundwater requires a SPDES (sanitary discharge) permit (although not discussed in the DEIS), as water usage for this project is noted to be "20,500 gpd". Also, if construction of the project results in more than one separately owned property (i.e., the 65 proposed individually owned condominiums), the sponsor will be required to form a sewage disposal corporation pursuant to Article 10 of the NYS Transportation Corporation Law. This sewage works corporation, or other suitable entity, must be in place before a SPDES permit can be issued. The FEIS must address this additional DEC jurisdiction. B. Stormwater discharges resulting from construction activities that disturb one or more acres must comply with the SPDES Stormwater General Permit (Stormwater Discharges from Construction Activities, GP-0-08-001). As the proposal will disturb approximately 21.1 acres, a Stormwater Pollution Prevention Plan (SWPPP) must be submitted along with other permit applications for concurrent review by DEC. Authorization for coverage under the SPDES general permit is not granted until approval of the SWPPP and issuance of other necessary DEC permits.

**Response 5-29:** *Comment noted. The applicant will apply for a SPDES sanitary discharge permit and a SPDES Stormwater General Permit, during the Site Plan review and permitting process.*

**Comment 5-30 (Letter #20 Edward & Ervin Raboy, E&Y Operating Corp., July 31, 2008):** We urge the Board to carefully study, independently, the whole issue of the availability of subsurface water in this area. For all of the detailed studies and analysis contained in the Plan, our 'anecdotal' information is that on average it is taking deeper and deeper drilling to come up with acceptable gpm wells in the whole area. Is the developer truly realistic in terms of servicing

65 units with only two or three wells? Are the developer's estimated water usage figures really realistic for the number of units and persons involved?

**Response 5-30:** *The project water supply wells varied from 650 to 833 feet deep and were drilled to these depths to ensure long term effectiveness and water supply. The estimated water usage was prepared using professional engineering and planning estimates for residential projects. The applicant's estimates and plan for a community water supply requires review and approval by the NYSDEC and the NYS Department of Health. The well testing protocols were reviewed and approved by the Town's hydrogeologist and the use estimates were reviewed and confirmed by the Town's engineer.*

**Comment 5-31 (Letter #20 Edward & Ervin Raboy, E&Y Operating Corp., July 31, 2008):**

As an agricultural enterprise we rely heavily on water usage — for irrigation, horticulture, horse and livestock care. Moreover, we have seven residences on our property. We note that even though we are located in the downgradient area shown on the developer's Figure 5.1, and that one of our two wells is located only about 1100 feet from the Salem Hunt site, the developer arbitrarily decided that it would test only wells within 1000 feet of the site, and so ours were not included in its testing (even though we are probably one of the heaviest users of all the wells in the area).

**Response 5-31:** *The wells monitored during the pump test on the Salem Hunt Property were carefully chosen in and agreed upon through a protocol created for the DEIS Scoping outlined and ultimately approved by the Lead Agency (Town of North Salem and their consultant - The Chazen Companies). Wells were not selected based upon water usage but rather proximity to the site and on each of the four sides of the property. During a pumping test, wells in close proximity to the test wells are generally affected to a greater degree than wells located at a further distance. It should be noted that three wells located between the Salem Hunt property and the comment writer's farm (Mirus, Depauli and Vassak) showed no influence during the pumping test (see DEIS Figure 5-3 Pumping Test Monitoring Locations).*

**Comment 5-32 (Letter #20 Edward & Ervin Raboy, E&Y Operating Corp., July 31, 2008):**

The Plan specifically states that the total estimated water use in the areas upgradient and downgradient from the site is approximately 31,350 gal per day, of which the school uses 23,660 gal per day. With all due respect, based on our knowledge of just the amount our farm uses daily, the total of 31,350 is much, much too low, and shows a lack of proper research in ascertaining it.

**Response 5-32:** *The water use estimates provided for the school were made using engineering estimates for school uses. Assuming 20 gallons per day (gpd) per student and assuming 780 student, demand is estimated at 15,500 gpd. The 23,660 gpd estimate is for the upgradient aquifer area. The water use numbers provided were estimates based upon known land uses which are primarily low density single family residences. The North Salem Middle School and High School, the Red Horse Farm west of the site and the comment writer's farm are expected to use more water than single family homes. The recharge analysis, supplied in Appendix H of the DEIS, indicates that the proposed site alone receives sufficient recharge to meet the project water requirements and that the pump test results, conducted at rates exceeding expected average pumping rates, predict few off-site impacts. These two conclusions combined*

*suggest that the proposed site will have few to no impacts on any distant off-site conditions.*

**Comment 5-33 (Letter #20 Edward & Ervin Raboy, E&Y Operating Corp., July 31, 2008):**

Condominium Association: We recommend the developer's decision to prohibit all irrigation of lawns, etc, and request that the Board ensure that the various rules pertaining to this- for plants, irrigation and all use of water outdoors- will be made permanently binding on the condominium association.

***Response 5-33: Comment noted. See Response 5-4.***