

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY AND ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
ONE WINTER STREET, BOSTON, MA 02108 617-292-5500

September 18, 2008

In the Matter of Bluefin Partners, LLC

Docket No. WET-2008-036

File No. SE-48-1983

Nantucket

RECOMMENDED FINAL DECISION

This project involves the construction of a 19 lot cluster subdivision off Miacomet Road in the Town of Nantucket, Massachusetts. The work is subject to jurisdiction under the Wetlands Protection Act, M.G.L. c. 131, s. 40, because the roadway entrance and components of the stormwater management system are located within the buffer zone of bordering vegetated wetlands and Miacomet Pond. The project, known as “Ellen’s Way” and proposed by Bluefin Partners, LLC (the “Applicant” or “Bluefin”) was approved by the Nantucket Conservation Commission. A ten residents group, composed of members of the Miacomet Conservation Association, some of whom also are abutters, filed a request for action by the Department. 310 CMR 10.05(7)(a). The Southeast Regional Office of the Massachusetts Department of Environmental Protection (“the Department”) advised the Applicant to provide additional analysis and plan revisions to address runoff from the first fifty feet of the road, in part in response to concerns raised by the residents group. The Department then approved the project in a superseding order of conditions (“SOC”) on April 10, 2008 based upon the revised plans.

This appeal was filed by the ten residents group. 310 CMR 10.05(7)(j)2.. The issues identified for adjudication are limited to whether the project complies with the Department's Stormwater Management Standards applicable at the time the notice of intent was filed, specifically Standards 1, 2, 4, 8 and 9. See Stormwater Management Policy, originally issued in 1996, followed in 1997 by the Stormwater Policy Handbook and the Stormwater Technical Handbook, collectively the "1997 Handbook(s);" see 310 CMR 10.05(6)(p). Briefly, projects must comply with nine standards for stormwater management. Standard 1 prohibits new conveyances of untreated stormwater discharges. Standard 2 requires that post-development peak discharge rates be lower than pre-development rates. Standard 4 requires removal of 80% of total suspended solids. Standard 8 requires implementation of erosion controls during construction. Standard 9 requires an operation and maintenance plan to ensure the system functions as designed over time. The other standards are not in dispute in this case.

After the Applicant added two small detention basins along the entry from Miacomet Road that were approved in the SOC, the Petitioners claimed in their appeal that these basins, along with infiltration basin #1, would fail hydraulically due to insufficient distance above seasonal high water and the effects of groundwater mounding. Much of the testimony submitted at the hearing I conducted on August 20, 2008 related to the virtues and limitations of inputs to methods to determine seasonal high water and groundwater mounding, both of which are more fully described in the 2008 revisions to the Department's stormwater program. See Massachusetts Stormwater Handbook, Vol. 1: Overview of Massachusetts Stormwater Standards, Vol. 2: Technical Guide for Compliance with the Massachusetts Stormwater Standards, and Vol. 3: Documenting

Compliance with the Massachusetts Stormwater Standards (collectively, the “2008 Handbook(s);” see 310 CMR 10.05(6)(k). Although the 2008 Handbooks do not apply to this project, they are nonetheless helpful to an understanding of the competing testimony of the expert witnesses. The Department had not considered either of these specific issues when it issued its SOC, and the Applicant provided additional relevant data only after the submission of Petitioner’s direct case. Because adjudication under M.G.L. c. 30A is de novo, I considered the entire record. See Matter of Michael Solimando, Docket No. 2003-110, Recommended Final Decision (January 11, 2005), Final Decision (April 8, 2005). I conclude that recent data on seasonal groundwater elevations from observation wells at the site provide considerable assurance that the infiltration facilities will perform as designed, and any remaining ambiguities in the testimony may be resolved by the inclusion of a condition in the Final Order of Conditions requiring the Applicant to confirm that the groundwater levels identified in nearby observation wells and soil conditions in nearby test pits in fact reflect groundwater and soils at the proposed locations of the basins.

Motion Rulings

Prior to the hearing, I denied the Petitioners’ Motion to Remand to the Nantucket Conservation Commission. The Petitioners sought a remand contending that the Applicant failed to serve copies of plan changes to the Petitioners after the site visit as specifically required by the regulations. 310 CMR 10.05(7)(i). Additionally, the Petitioners questioned whether the revisions fell within the scope of the Department’s Plan Change Policy. Wetlands Program Policy 91-1 (Rev. 1995). The Plan Change Policy precludes the consideration of plans that are substantially different than those

before the Conservation Commission. The Petitioners argued that remand to the Nantucket Conservation Commission would allow for local public review and cure any prejudice to the Petitioners from their inability to respond to the project revisions. Bluefin opposed the motion, stating that the Petitioners learned of revisions at the site visit, the hydrological analysis was provided in a related matter, no prejudice resulted, and the revisions were not significant enough to require refiling with the Commission. The Department noted that the Petitioners would have a full opportunity to raise issues about the plan revisions in the hearing. Further, the Department stated that the revisions conformed to the Policy because the roadway configuration was shifted only slightly and did not result in increased impacts to wetlands resources.

I asked the Applicant to file the notice of intent plans for the record, so that I could evaluate the positions of the parties on the revisions between the notice of intent plans and the preparation of the SOC. The revisions to the plans appeared limited to a slight change in slope of the road and the addition of the two small detention basins at the entrance to Ellen's Way. Setting aside the specific issues related to groundwater at this site, stormwater management structures generally are intended to result in unchanged or reduced impacts to wetlands resource areas. I also concluded that the addition of the small detention basins is within the scope of "improvements to flow control or sediment control devices," an example of an insignificant plan change specifically provided in the Policy. Id. The Nantucket Conservation Commission had an opportunity to be heard on the revisions as a party in the appeal. Similarly, the Petitioners would have a full opportunity in the course of the adjudication to challenge the revised plan. Thus, remand was not warranted.

The Petitioners also raised the issue of access to the site. I noted that the revisions to the wetlands regulations in 2007 specifically address access by requiring applicants or property owners within five days of receipt of a written request to allow any person who has appealed to visit the site, upon reasonable conditions of the applicant or property owner. 310 CMR 10.05(7)(j)2.e. Thus, petitioners in wetlands appeals have an explicit regulatory right of access related to their appeal. To obtain a wetlands permit from the Department after an appeal is filed, applicants must allow access in accordance with the regulations. There is no evidence to suggest that the Petitioners were denied access, or that access was improperly restricted, after the appeal was filed.

I also denied a Motion for Summary Decision filed by Bluefin, contending that it had unquestionably demonstrated compliance with all relevant stormwater management standards and that the Petitioners could offer no material factual evidence to dispute that conclusion. Bluefin provided a supporting affidavit from its engineer, Donald F. Bracken, explaining how the standards had been met. The Petitioners filed an opposition, supported by affidavits from a hydrologist, Scott W. Horsley, and an engineer, George G. Preble. The Petitioners identified factors in the design of the detention basins, including lack of test pit data, insufficient separation from groundwater, and mounding, that may detract from the performance of the basins and result in failure to comply with the standards.

The Department's rules for adjudicatory proceedings allow parties to move for summary decision on any issue identified for adjudication. 310 CMR 1.01(11)(f). The moving party must show, through affidavits or other evidence, that there is no genuine issue of material fact and it is entitled to a decision in its favor as a matter of law. Id.

Once such a motion is made, the opposing party may not rest on allegations or denials in its pleadings but must come forward with affidavits or other evidence showing that a material factual dispute exists. Id. If the pleadings, together with the affidavits or other evidence, show that no genuine issue of material fact exists and the party is entitled to a decision as a matter of law, summary decision must be granted. Id. I denied the motion because the Petitioners had unquestionably shown a material factual dispute as to the stormwater management system within the buffer zone of this project.

Bluefin moved to add a witness, W. Jesse Schwalbaum, and submitted his prefiled direct testimony on August 1, 2008, within the scheduled timeline. I granted a Joint Motion to Extend Time for the Petitioners' Rebuttal to Respondent's Direct Case and Opposition to Bluefin's Motion to Add W. Jesse Schwalbaum as a Witness. The time was extended by five days, from August 8, 2008 until August 13, 2008. While the Petitioners filed an opposition to the additional witness, Petitioners' witnesses had additional time to file rebuttal to this testimony and did file rebuttal testimony. A review of Mr. Schwalbaum's testimony revealed that it appeared to supplement the testimony of Bluefin's other witness, Donald Bracken, and in fact, some paragraphs of their testimony appeared to be identical. I did not accept Bluefin's view that the question of groundwater mounding is novel and therefore required an additional witness, but I was also not persuaded of prejudice to the Petitioners. Bluefin had identified four witnesses at the time of the Pre-Screening Conference Report, and subsequently submitted testimony from only two witnesses. I therefore allowed the addition of W. Jesse Schwalbaum as a witness.

Finally, Petitioners filed a Motion in Limine immediately prior to the hearing seeking to preclude the Applicant from submitting any additional data. The Applicant did not seek to submit any additional data after this motion was filed. As noted above and more fully described below, I have recommended the addition of a condition in the Final Order of Conditions that would require verification of previously filed data.

Regulatory and Policy Framework

The project involves work within the buffer zone, the 100 foot area extending from bordering vegetated wetland and Miacomet Pond, located on the opposite side of Miacomet Road from the site. Thus, any alteration within the buffer zone is subject to review, including three components of the stormwater management system, and stormwater is subject to review where the point of discharge is within geographic jurisdiction. 310 CMR 10.05(6)(b). The two detention basins are less than 50 feet from the bordering vegetated wetland and about 70 feet from Miacomet Pond; infiltration system #1 is more than 50 feet from the bordering vegetated wetland and about 100 feet from Miacomet Pond. See Ellen's Way Definitive Subdivision Plan of Land, Sheet 5 of 17 (showing 50 foot and 100 foot lines).

Although the Department has recently issued a revised version of its Stormwater Management Policy, there is no question that the prior version dated November 18, 1996, followed by the Handbooks in 1997, applies to this project because the notice of intent was filed before January 2, 2008. 310 CMR 10.05(6)(p). The 1997 Technical Handbook contains guidance for the design and review of the various best management practices that may be used to control stormwater runoff quantity and improve its quality. The 1997 Handbook includes descriptive information about infiltration basins, the technique used

to manage stormwater at this site, related to their capacity to store the design storm, remove pollutants, and provide groundwater recharge. At issue in this appeal are the guidelines for siting infiltration basins, specifically that the minimum depth to the seasonal high water table should be two feet from the bottom of the basin, that soil samples should be taken from the actual location of the proposed basin, and that the basin should be set back 100 feet from waters of the Commonwealth. 1997 Technical Handbook, p. 3.F-7 and 3.F-8. No method is identified to determine seasonal groundwater and the 1997 Handbooks are silent on groundwater mounding.

The 2008 Handbook reiterates that soil and/or water conditions should be evaluated at the location proposed for the installation of infiltration facilities. 2008 Handbook, Vol. 2, Chapter 2, p. 89. The 2008 Handbook contains a section entitled “Determining Seasonal High Groundwater.” 2008 Handbook, Vol. 3, Chapter 1, p. 12.

The section states:

Seasonal high groundwater represents the highest groundwater elevation. Depth to seasonal high groundwater may be identified based on redox features in the soil . . . When redox features are not available, installation of temporary push point wells or piezometers should be considered. Ideally, such wells should be monitored in the spring when groundwater is highest and results compared to nearby groundwater wells monitored by the USGS to estimate whether regional groundwater is below normal, normal or above normal (see: <http://ma.water.usgs.gov>). Procedures identified by MassDEP Title 5 Soil Evaluator Course, Chapter 4 may also be used.

Id. The testimony of the parties that seasonal high groundwater may generally be identified by soil characteristics (mottling or “redox”), observations of groundwater at the site, and/or USGS methodology (also used for Title 5 purposes) is consistent with the 2008 Handbook.

The 2008 Handbook includes a section on infiltration basins and specifies the same two foot separation requirement. 2008 Handbook, Vol. 2, Chapter 2, p. 89. The guidance on the design of infiltration basins states:

Estimate seasonal high groundwater based on soil mottles or through direct observation when borings are conducted in April or May, when groundwater levels are likely to be highest. If it is difficult to determine the seasonal high groundwater elevation from the borings or test pits, then use the Frimpter method developed by the USGS (Massachusetts/Rhode Island District Office) to estimate seasonal high groundwater. After estimating the seasonal high groundwater using the Frimpter method, re-examine the bore holes or test pits to determine if there are any field indicators that corroborate the Frimpter method estimate.

2008 Handbook, Vol. 2, Chapter 2, p. 90. An infiltration basin should be designed to exfiltrate within 72 hours. Id. An equation is provided to determine the time of drawdown of an infiltration basin. 2008 Handbook, Vol. 3, Chapter 1, p. 25.

The 2008 Handbook, in the volume on documenting compliance, contains a section entitled “Mounding Analysis.” 2008 Handbook, Vol. 3, Chapter 1, p. 28. While this provision does not apply to the Bluefin project, it provides a framework to assess this question where mounding has been raised as an issue and both the Petitioners’ and the Applicant’s expert witnesses addressed mounding. According to the Department’s 2008 Handbook, mounding analysis is required when there is less than a four foot separation between the seasonal high groundwater and the bottom of an exfiltration system and the recharge system is designed to attenuate a peak discharge of a 10-year or higher, 24-hour storm. Id. At the Bluefin site, the two detention basins are less than four feet from seasonal high groundwater and are designed for the 100-year, 24-hour storm, so if the 2008 Handbook governed this project, an analysis would be required.

The methodology specifically identified to conduct the analysis is the “Hantush” method, which predicts the maximum height of the groundwater mound beneath a

recharge area. 2008 Handbook, Vol. 3, Chapter 1, p. 29. A mound develops as a natural consequence of the desired recharge. The analysis is a tool to ensure that the mound will not prevent the full draining of the basin, which could cause additional runoff to bypass the basin, or emerge surficially. The mounding analysis must show that the recharge volume will exfiltrate within 72 hours and that the groundwater will not break out above the land surface or raise the water elevation in a resource area. Id. An equation to determine the time of drawdown of an infiltration basin is its storage volume divided by its bottom area times a hydraulic conductivity rate associated with the hydrologic soil group classification at the site. 2008 Handbook, Vol. 3, Chapter 1, p. 25. Thus, an evaluation of groundwater mounding is required to confirm that infiltration basins will perform as designed, resulting in compliance with the Stormwater Standards.

Testimony of the Petitioners

The Petitioners submitted a Report prepared for the Town of Nantucket on Miacomet Pond with their notice of claim. See Miacomet Pond Annual Report 2005, dated February 2006. According to the Report, development in the 970 acre watershed of the 47 acre pond has changed its hydrology and water quality. Changes in land use have increased nitrogen and phosphorus in the groundwater, decreased infiltration, and increased surface runoff, resulting in eutrophication and greater potential for flooding. Id. Miacomet Pond is a surface water of the Commonwealth, and the two detention basins proposed by Bluefin are about 70 feet away. Horsley Direct Testimony at para. 21.

The Petitioner provided testimony from two witnesses, Scott W. Horsley and George G. Preble, respectively a hydrologist and a professional engineer; both are qualified as experts. Petitioners' challenge to the proposed work is based upon an

analysis indicating that the seasonal high water table had not been correctly identified at the site and that recharge will cause groundwater mounding at the infiltration basin and detention basins, causing them to fail hydraulically. If groundwater intercepts the infiltration facilities and their capacity is exceeded, they will not function as designed and the project will not comply with the Stormwater Standards. The challenge is essentially two-fold, first that the Applicant did not submit site-specific information and second that an evaluation by Petitioners' expert witnesses reveals that the systems will fail hydraulically. Mr. Horsley measured the soil test pits, the source of information about soil conditions on the property, as 70, 100 and 130 feet away from the infiltration facilities. Horsley Cross-Examination Testimony. He could not conclude that soil and groundwater conditions at the location of the infiltration basins would necessarily be consistent with the test pit data. Horsley Rebuttal Testimony at para. 4.

Mr. Horsley used the "Frimpter" method developed by the USGS to calculate the seasonal high water table. He stated that because there was no date associated with the 7.5 foot groundwater elevation shown on the plans, he used the 5.8 foot surface elevation of Miacomet Pond on November 3, 2006 and the reading for October 26, 2006 at the USGS observation well NBW 228. Horsley Direct Testimony at para. 30. Based on this information and the methodology described in USGS Water Resources Open File Report 80-1205, Probable High Groundwater Levels in Massachusetts, he calculated a seasonal high water elevation of 9.3 feet. Horsley Direct Testimony at para. 27 and 28. Because the bottom elevation of infiltration system #1 was 10 feet¹ and of the infiltration basins was 9.5 feet, he concluded that each failed to provide the necessary two foot separation to

¹ The Applicant used 9.5 feet, which is the elevation of the stone base. Bracken Direct Testimony at para. 49.

groundwater prescribed for infiltration basins. Horsley Direct Testimony at para. 31 and 39.

Mr. Horsley also testified that the basins had not been designed to take into account the effects of groundwater mounding and that mounding of the water table would impair the performance of the infiltration facilities. Horsley Direct Testimony at para. 35. He performed groundwater calculations using the “Hantush” method, identified in the 2008 Handbook. Horsley Direct Testimony at para. 37. For purposes of his analysis, he used an aquifer thickness of 20 feet and a hydraulic conductivity of 100 feet per day. Horsley Direct Testimony, Exhibit A, notes at bottom of page. At the detention basins, he calculated the height of the mound at 0.9 feet for the 10-year storm and 1.9 feet for the 100-year storm. Id. At infiltration system #1, he calculated the height of the mound at 1.1 feet for the 10-year storm and 2.3 feet for the 100-year storm. Id. In combination with the lack of the requisite two-foot separation between the bottom of the basins and seasonal high groundwater, he testified that they would fail hydraulically under the larger storm events. Horsley Direct Testimony at para. 39. He emphasized that seasonal high groundwater elevations and groundwater mounding are cumulative and must be added together to assess the infiltration facilities. Horsley Rebuttal Testimony at para. 9.

Mr. Preble noted that the Applicant did not provide detail of the detention basins or any data from field investigations specifically at their proposed locations. Preble Direct Testimony at para. 21. He stated that standard engineering practice would require a test excavation at each location to confirm high groundwater and soil conditions. Preble Direct Testimony at para. 22. Thus, the Applicant had not properly documented compliance with the Stormwater Standards. He also stated that groundwater mounding

analysis, while not required prior to the 2008 Handbook, is nonetheless an accepted engineering practice. Preble Rebuttal Testimony at para. 4. He concurred with Mr. Horsley that water table mounding would likely interfere with the performance of the infiltration facilities. Preble Direct Testimony at para. 24. He stated that if the basins fail, untreated stormwater will flow off the site directly to the bordering vegetated wetland and Miacomet Pond. Preble Direct Testimony at para. 38. In response to more recent data provided by the Applicant, Mr. Preble stated that readings from observation wells in April 2008 would support the design of the basins to the extent that April is a typical period for seasonal high groundwater to occur, but the wells were not located at the precise location of the basins. Preble Rebuttal Testimony at para. 10. Site-specific investigations were standard engineering practice, could have been performed, and were not performed. Preble Rebuttal Testimony at para. 10.

Testimony of the Applicant

The Applicant provided testimony from Donald F. Bracken, Bluefin's engineer since 2006, and W. Jesse Schwalbaum, a hydrogeologist, both of whom were qualified as experts. Mr. Bracken identified the soils on the site as Evesboro series from Soil Conservation Service maps, with a hydrologic soil classification of "A" indicating a high infiltration capacity. Bracken Direct Testimony at para. 13. He testified that his Hydrological Analysis, submitted to the Department prior to issuance of the SOC, demonstrated that the project met the requirements of the Stormwater Management Standards for the two, ten, twenty-five and one hundred year storms. Bracken Direct Testimony at para. 18 to 24. He stated that, in addition, infiltration system #1 had .82 additional feet of freeboard, or 697 cubic feet of storage, above the 100 year storm

capacity. Bracken Direct Testimony at para. 41. The design of the two detention basins was, in his opinion, not particularly complicated because the drainage area for each basin is only .03 acres. Bracken Direct Testimony at para. 42. He stated that an operation and maintenance plan was included with the Hydrological Analysis and noted that the Department's permit had added special conditions to prevent erosion and sedimentation at the site.

Mr. Bracken relied on the work of a prior engineer, John Shugrue, who dug 38 test pits on the project site. See Bracken Direct Testimony, Exhibit 5. Two test pits were within 60 feet of infiltration system #1. Bracken Direct Testimony at para. 45. He stated that the test pit data revealed uniform conditions at the site, so that additional testing was not necessary and any unexpected variation could be addressed by minor adjustments in the final design. The groundwater elevation for the project design was originally established at 7.5 feet by the same engineer who submitted the data from the test pits, Mr. Shugrue. Bracken Direct Testimony at para. 46.

Mr. Bracken testified that he installed two monitoring wells, with the locations shown on the revised plans dated 11/16/07. Observation well #1 is approximately 70 feet from infiltration system #1 and observation well #2 is approximately 100 feet from the southerly detention basin and 105 feet from the northerly detention basin. Horsley Cross-Examination Testimony. See Ellen's Way Definitive Subdivision Plan of Land, Sheet 5 of 17. Readings in January 2007 determined the groundwater elevations at observation wells 1 and 2 as 6.83 and 6.93 feet respectively. Bracken Direct Testimony at para. 47. Readings from April 21, 2008 were 7.17 feet for observation well 1 and 7.26 feet for observation well 2, while the surface level of Miacomet Pond was 6.69 feet. Bracken

Direct Testimony at para. 48. Because April is the time of seasonal high groundwater and the basins are downgradient from the two wells, Mr. Bracken believed that this actual field data supports the 7.5 foot elevation used for design purposes as the estimate for seasonal high groundwater. Bracken Direct Testimony at para. 48. Because the stone base of infiltration basin #1 and the bottoms of the two detention basins are each at the 9.5 elevation, Mr. Bracken testified that the two foot separation had been provided.

Bracken Direct Testimony at para. 49. He also stated that the two foot separation in the 1997 Handbook is design guidance rather than a compulsory design parameter. Bracken Direct Testimony at para. 49. He believed that the Frimpter method may produce exaggerated results and that Mr. Horsley's estimate of an elevation of 9.3 feet is not reasonable. Bracken Direct Testimony at para. 50-51.

Mr. Bracken concluded that mounding would not have a significant effect on the performance of the basins and that Mr. Horsley's mounding analysis produced exaggerated results because of his inputs for hydraulic conductivity and aquifer thickness. He emphasized that the Applicant was not required by the applicable version of the Department's Stormwater Policy to perform a mounding analysis at all. Bracken Direct Testimony at para. 52-55. He stated his belief that the aquifer thickness could be 223 feet below sea level or up to 250 feet, and hydraulic conductivity for Nantucket soils can be up to 300 feet per day, relying on published sources. Bracken Direct Testimony at para. 55 and 56; see Hearing Exhibits. Mr. Bracken performed the calculations demonstrating that the infiltration facilities will drain within 72 hours, the criterion described in the 2008 Stormwater Handbook. Bracken Direct Testimony at para. 63. Using the "Static Method," he testifies that infiltration system #1 will drain the storage volume in 1.82

hours and the two detention basins will drain in 4.36 hours. Bracken Direct Testimony at para. 63.

Mr. Schwalbaum addressed the two specific issues of the seasonal high groundwater elevation and the potential for groundwater mounding during a major storm event. He testified that seasonal high groundwater may be determined from measurements of groundwater during April, soil mottling, or the Frimpter method, and stated that direct observation and measurement during spring was the best and preferred method. Schwalbaum Direct Testimony at para. 7. He drew a distinction between high groundwater level estimated by the Frimpter method and seasonal high groundwater identified in the Stormwater Policy. Schwalbaum Direct Testimony at para. 8. He also criticized Mr. Horsley's calculations using the Frimpter method, particularly reliance on the Nantucket index well NWB 228 which is at a higher elevation and farther from the water. Schwalbaum Direct Testimony at para. 9 to 11. He testified that the Frimpter method did not take into account lesser water level fluctuations at the site due to the proximity of Miacomet Pond and concluded that the elevation of 7.5 feet used by Mr. Bracken for design purposes was more accurate. Schwalbaum Direct Testimony at para. 11.

As to the issue of groundwater mounding, Mr. Schwalbaum pointed out that increased infiltration is a goal of the Department's Stormwater Policy and reiterated that mounding is not addressed in the 1997 Handbook applicable to the project. Schwalbaum Direct Testimony at para. 12 and 13. He stated that the mounding analysis described in the 2008 Handbook does not require a two foot separation between the bottom of the basin and any mounding, only that there be no breakout and the basin must dewater

within 72 hours. Schwalbaum Direct Testimony at para. 14. His critique of the aquifer thickness and hydraulic conductivity inputs used by Mr. Horsley was consistent with, but more extensive than, the testimony of Mr. Bracken.

Mr. Schwalbaum had used a hydraulic conductivity factor of 180 feet per day in the design of the Surfside Wastewater Treatment Plant on Nantucket, less than one mile from the Bluefin property, to estimate potential groundwater mounding. Schwalbaum Direct Testimony at para. 21. Based on various sources, he believed an aquifer thickness of 90 feet was more accurate than the 20 feet used by Mr. Horsley. He based this aquifer thickness on the elevation of the Bluefin site at ten feet above seas level and a deep boring reading at the Surfside site of a confining silty sand layer at -80 feet and an 80 foot estimate in a 2001 study. Schwalbaum Direct Testimony at para. 23. Using the parameters of a hydraulic conductivity of 180 feet per day and an aquifer thickness of 90 feet in the Hantush equation, Mr. Schwalbaum reached a maximum groundwater mound of 0.2 feet at a location under the basin for the 100 year storm. Schwalbaum Direct Testimony at para. 26. Based on that calculation, he concluded that mounding would not adversely affect the performance of the basins. Schwalbaum Direct Testimony at para. 28. He also modeled the basins using MODFLOW, the USGS “modular finite-difference flow model,” which yielded a 0.43 foot mound for the 100-year, 24-hour storm. Schwalbaum Direct Testimony at para. 31- 33. This confirmed his conclusion that the system would infiltrate the required volume within 72 hours and the mound would not reach the base of the system or break out to the surface. Schwalbaum Direct Testimony at para. 33.

Testimony of the Department

The Department's expert witness, Christopher Ross, testified that his review focused on the stormwater management provided at the site, particularly the section of the road from Station 0+50 to the intersection with Miacomet Road, a distance of approximately 50 linear feet. Ross Direct Testimony at para. 2. The notice of intent had not proposed any controls for this discharge, so that runoff from approximately 1,200 sq. ft. of impervious surface would flow to Miacomet Road and discharge to the bordering vegetated wetland and Miacomet Pond. Ross Direct Testimony at para. 3. In response to a request that the Applicant revise the plans to treat and control this discharge, Mr. Ross received the Hydrological Analysis dated January 2008 and plan revisions. Ross Direct Testimony at para. 5. Specifically, the plans were revised to include the two small detention basins at the entryway of Ellen's Way. Id. Mr. Ross concluded that the plans as revised met or exceeded the requirements of the applicable 1997 Handbooks. Ross Direct Testimony at para. 9-12.

Specifically, Mr. Ross found that of the 525 feet of roadway, 92% or 482 feet would discharge to the subsurface drainage system above Station 0+43 and the remaining 43 feet that had previously been untreated would be treated in the two new detention basins in compliance with Standard #1, no new direct discharge of untreated stormwater. Ross Direct Testimony at para. 9. Runoff volume had been reduced for all storm events, exceeding the requirement for Standard #2 for control of post-development peak discharge rates. Ross Direct Testimony at para. 10. Removal of total suspended solids exceeded 80% at both infiltration system #1 (86.5%) and the detention basins (82%), in compliance with Standard #4. Ross Direct Testimony at para. 11. He stated that Standard

#8 was met by the construction erosion control plan submitted by the Applicant and additional special conditions in the SOC, and Standard #9 was met by the operations and maintenance plan submitted by the Applicant in the Hydrological Analysis submitted in January 2008. Ross Direct Testimony at para. 12-13.

In response to the Petitioners' testimony, Mr. Ross stated that he relied on the Applicant's plan stamped by a professional engineer as to the groundwater elevation of 7.5 feet and that he is not familiar with the Hantush methodology. Ross Rebuttal Testimony at para. 14. He also believed that less than two feet of separation due to mounding would not cause hydraulic failure of the system. He stated his opinion that mounding would not result in a loss of capacity of the basin. Ross Rebuttal Testimony at para. 15. He relied upon the thirty eight test pits, attaching the Shugrue report to his testimony, as demonstrating consistency of soil conditions at the site and conducive to the siting of infiltration facilities. Ross Rebuttal Testimony at para. 17. He believed that the siting of the detention basins less than 100 feet from Miacomet Pond was acceptable because the 100 foot distance was a guideline and at this site the detention basins must be sited at the low point to capture the runoff. Ross Rebuttal Testimony at para. 18-20. He reiterated that the area contributing to the detention basins is very small and stated his conclusion that the infiltration facilities would function as designed. Ross Rebuttal Testimony at para 12.

Discussion

The Department appropriately required the Applicant to provide additional stormwater management at the site in the SOC through plan revisions intended to control runoff from Station 0+43 to Miacomet Road. The detention basins located at the entry

of Ellen's Way are designed to capture and infiltrate the 100-year storm. If the stormwater management system functions properly, it should prevent the discharge of untreated stormwater over Miacomet Road to wetland resource areas. The question is whether insufficient separation from seasonal high groundwater or groundwater mounding will impair the function of the infiltration system and result in noncompliance the applicable stormwater management standards.

The Department's 1997 Handbook, in the section on Infiltration Basin Guidelines, Site Criteria, states that the minimum depth to the seasonal high water table should be two feet, soil samples should be taken at the precise location of the proposed infiltration, and the distance to a surface water of the Commonwealth should be 100 feet. 1997 Handbook, Vol. 2 at 3.F-7 and 3.F-8. Although Miacomet Pond is a water of the Commonwealth with a guideline for setback of 100 feet for infiltration basins, by 2008 the setback was reduced to 50 feet. See 2008 Handbook, Vol. 1, Chapter 1, p. 8, Table RR. The 100-foot area between Miacomet Pond and the detention basins is not undeveloped under existing conditions, but instead contains Miacomet Road and the driveway currently serving the site which will be removed and revegetated. The Department's allowance of the siting of the basins at the low point to capture all runoff from the project was a reasonable exercise of professional judgment at this site. See Ross Direct Testimony at para. 18 -20.

There is no dispute that the Applicant did not perform soil or groundwater tests at the precise locations of infiltration system #1 or the two detention basins, that the Department did not require such site-specific testing, or that the Petitioners did not perform site-specific testing themselves in support of their position. Under the wetlands

regulations, the Petitioners have the burden of going forward and of proving their direct case by a preponderance of the evidence. 310 CMR 10.05(7)(j)3.b. A wetlands hearing is de novo and parties are not limited to evidence considered by Department staff in issuing the SOC. See, e.g., Matter of Michael Solimando, Docket No. 2003-110, Recommended Final Decision (January 11, 2005), Final Decision (April 8, 2005). The Department may consider plan changes from those filed with the local conservation commission, regardless of the benefit from local participation. Citizens for Responsible Environmental Management v. Attleboro Mall, Inc., 400 Mass. 658 (1987).

Seasonal high groundwater may be determined using direct observation of groundwater in the spring, mottling in the soil, or an estimate based upon a groundwater reading at a site correlated to a USGS observation well (the “Frimpter” method). No party identified any mottling at the site. The Applicant’s engineer, Mr. Bracken, initially relied upon the figure used by a prior engineer, 7.5 feet, to design the infiltration facilities. The Department’s staff did not question that figure, because it had been provided by a licensed professional engineer. The Petitioners’ expert estimated seasonal high water using the Frimpter method, casting doubt on the accuracy of the design elevation. Because the figure 7.5 feet was not accompanied by a date, Mr. Horsley used the figure for nearby Miacomet Pond of 5.8 feet on November 3, 2006 and the closest Nantucket well (NBW 228) reading for October 26, 2006, yielding a seasonal high water elevation of 9.3 feet. The Frimpter method described in Report 80-1205 was prepared in cooperation with the Department as a means to estimate probable high groundwater levels at a site, particularly for septic systems, from USGS observation well data and information from the site. The Department has relied on this methodology for septic

systems and, in part, for evaluation of stormwater systems. The methodology yields an estimate, it does not provide an actual measurement of high groundwater at a site.

Use of the Frimpter method was reasonable as a basis for Mr. Horsley's expert testimony, but the Applicant provided recent additional information from the site in its direct case. The Applicant had installed two monitoring wells and shown their locations on the revised plans dated November 16, 2007, although apparently had submitted no documentary evidence related to readings from a data logger or mapping of groundwater contours, referenced in Mr. Bracken's testimony, in the Hydrological Analysis, as revised January 7, 2008 for submission to the Southeast Regional Office, or elsewhere for the record. See Bracken Direct Testimony at para. 47. Nonetheless, Mr. Bracken testified that readings from the observation wells indicate groundwater elevations of 7.17 and 7.26 feet in April 2008 upgradient of, and reasonably proximate to, the infiltration facilities. Thus, the Applicant was able to provide data from the site on seasonal high groundwater elevations. In accordance with the instructions for determining seasonal high groundwater, I confirmed that the USGS April 2008 Water-Conditions Statement, available as indicated by the Department's 2008 Handbook, states that groundwater levels were "normal" at that time on Nantucket. 2008 Handbook, Vol. 3, Chapter 1, p. 12. Therefore, I conclude that 7.5 feet is a reasonably accurate seasonal high groundwater elevation near these infiltration facilities and more accurate than an estimate using the Frimpter method. 2008 Handbook, Vol. 2, Chapter 2, p. 90. The 7.5 foot design elevation should provide the two-foot separation between the 9.5 foot elevation of the bottom of these facilities and seasonal high groundwater.

As to the issue of groundwater mounding, I conclude that the relevant question is whether the infiltration facilities will exfiltrate within 72 hours and whether there will be breakout above the land surface or a rise in elevation of a resource area. 2008 Handbook, Vol. 3, Chapter 1, p. 29. I need not decide the dispute between the parties as to the inputs for aquifer thickness or hydraulic conductivity for the Hantush method to resolve this question. Assuming the Petitioner's mounding heights derived from the Hantush methodology, the 2.3 foot mound height for the 100 year storm at infiltration system #1 could exceed its 9.5 foot elevation. However, as the Applicant's engineer testified and as shown on Sheet 16 of 17, there is freeboard above the design storage capacity sufficient to address mounding. Bracken Direct Testimony at para. 41; Ellen's Way, Definitive Plan of Land, Sheet 16 of 17, Details. There is no specific testimony to refute the Applicant's assertion that no breakout would occur, and the petitioner's witness stated a concern about bypass from loss of capacity as opposed to breakout. Horsley Cross-Examination. The freeboard at infiltration system #1 appears sufficient to maintain its capacity, and the lower mound heights calculated by the Petitioner should not result in a loss of storage capacity.

The Applicant has provided calculations for the 72 hour drawdown analysis, as described in the 2008 Handbook, based on a formula that the drawdown time is the storage volume divided by the hydraulic conductivity rate times the bottom area of the basin. 2008 Handbook, Vol. 3, Chapter 1, p. 25. The Applicant's unrefuted calculations indicate that infiltration system #1 and the two detention basins will each exfiltrate well within this 72 hour limit. Thus, I conclude that groundwater mounding should not cause

hydraulic failure of the infiltration facilities. Tests prior to construction of the infiltration facilities can provide confirmation that the system will function as designed.

Conclusion

I conclude that to provide assurance that the stormwater management system will function properly, there should be a two foot separation from seasonal high groundwater, groundwater should not break out above the land surface, and the infiltration facilities should drawdown in less than 72 hours. Based upon the information provided by the Applicant and approved by the Department at the time of the SOC, there was some uncertainty whether the infiltration systems would prevent any runoff from reaching Miacomet Pond. The recent data provided by the Applicant, however, resolves the ambiguity and allow a Final Order of Conditions which does not turn on the variables for either the Frimpter method for determining seasonal high groundwater or the Hantush method for determining groundwater mounding. Instead, this matter can be resolved in accordance with the 2007 Handbook, by verifying that conditions at the sites of the three infiltration facilities are in fact consistent with the nearby observation wells and will provide a minimum of two feet separation from seasonal high groundwater.

I recommend that the Southeast Regional Office draft a condition to add to the SOC which requires that such verification be submitted prior to construction, and submit the draft text for transmittal to the Commissioner with this Recommended Final Decision. If tests reveal that the groundwater levels at the sites of the infiltration facilities are higher than the levels at observation wells 1 and 2 or the presence of “redox” features in the soil, indicating insufficient separation from seasonal high groundwater, the Applicant

may request an Amended Order of Conditions for approval of minor plan revisions or file a new notice of intent.

This final document copy is being provided to you electronically by the Department of Environmental Protection. A signed copy of this document is on file at the DEP office listed on the letterhead.

Pamela D. Harvey
Presiding Officer

NOTICE- RECOMMENDED FINAL DECISION

This decision is a Recommended Final Decision of the Presiding Officer. It has been transmitted to the Commissioner for her Final Decision in this matter. This decision is therefore not a Final Decision subject to reconsideration under 310 CMR 1.01(14)(e), and may not be appealed to Superior Court pursuant to M.G.L. c. 30A. The Commissioner's Final Decision is subject to rights of reconsideration and court appeal and will contain a notice to that effect.

Because this matter has now been transmitted to the Commissioner, no party shall file a motion to renew or reargue this Recommended Final Decision or any part of it, and no party shall communicate with the Commissioner's office regarding this decision unless the Commissioner, in her sole discretion, directs otherwise.

