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March 20, 2007



Town of Scituate Zoning Board of Appeals
Town Hall
600 Chief Justice Cushing Highway
Scituate, MA 02066

Attn: Mr. John F. Danehey, Chairman

Re: Comprehensive Permit Application Peer Review for Herring Brook Meadow Residential Community, 126 & 132 Chief Justice Cushing Highway, Scituate, MA

Dear Members of the Board:

Woodard & Curran, Inc. was engaged by the Town of Scituate Zoning Board of Appeals (ZBA) to review the "Herring Brook Meadow Residential Community" Comprehensive Permit application currently in public hearings before the Board. Herring Brook Meadow LLC, (the Applicant) proposes to build 60 units of multi-unit housing located in five large buildings, each containing 9 to 15 units, on a parcel of land located at 126 & 132 Chief Justice Cushing Highway (Rt. 3A). This memo summarizes our firm's review comments and findings to the plans and supporting material provided to us and offers recommendations to address data needs and deficiencies that were found to be significant and pose a potential risk of harm to public health, abutting property owners and/or the environment.

The ZBA engaged Woodard & Curran, Inc. to examine specific topics and technical matters in conjunction with another firm, Pennoni Associates, also providing technical review to the ZBA. To expedite the joint review and avoid duplication of effort by the two firms, the ZBA directed Woodard & Curran, Inc. to focus its review on: Bordering Vegetated Wetlands (BVW) area delineation and impacts; impact assessment to other resource areas, including Isolated Land Subject to Flooding (ILSF), Isolated Vegetated Wetlands (IVW), Riverfront Area and historic tidelands; impacts to endangered or listed habitat areas; stormwater management design and associated impacts pertaining to resource areas; site building design and layout; open space and visual quality; and site permitting, including state MEPA review and MADEP Chapter 91 jurisdiction. It is our understanding, also, that the Conservation Commission is conducting separate jurisdictional review of this project's Notice of Intent (NOI) under the Wetlands Protection Act.

The following information was provided and reviewed in the preparation of this memorandum:

- Comprehensive Permit Application, entitled "Herring Brook Meadow", prepared by SITEC Environmental, dated November 6, 2006.
- Preliminary Site Plans, entitled Herring Meadow Brook, prepared by SITEC Environmental, dated October 6, 2006.
- Environmental Setting - Stormwater Flood Analysis & Mitigation, for Herring Meadow Brook, prepared by SITEC Environmental, dated October 10, 2006.
- Proposed Open Space & MA Wetlands Protection Act Compliance Measures, for Herring Meadow Brook, prepared by SITEC Environmental, dated October 10, 2006.



- Wetlands Resource Area Report, for Herring Meadow Brook, prepared by SITEC Environmental, dated August 10, 2004.
- Town of Scituate Code of Bylaws Section 30770, Wetlands Protection Rules and Regulations by the Scituate Conservation Commission, dated November 17, 2003 Revised.

Our comments from the review of these plans, reports and reference materials are presented in the following sections, organized by each document of the application that was reviewed and by key technical topics or regulatory jurisdiction. Noteworthy comments are highlighted in bold.

40B SUBMISSION APPLICATION

The applicant has submitted a Comprehensive Permit application under MGL Chapter 40B, Sections 20-23 to the Scituate ZBA and filed a Notice of Intent under the Massachusetts Wetland Protection Act (WPA) to the Scituate Conservation Commission. This letter report is provided to the ZBA in accordance with Woodard & Curran's review conducted for the ZBA, as noted above.

The 40B submission application contains a summary describing the proposed development area, parking ratios, unit size and bedroom distribution. Included in the application are the following:

- Identification of the applicant's status as a limited dividend organization;
- Site approval letter from MassHousing;
- Copies of existing deeds indicating ownership;
- Reduced-scale plans and drawings;
- List of exceptions from the local Zoning By-Laws; and
- Traffic report

It is our understanding that Pennoni Associates is addressing the site/civil engineering, traffic, site drainage design, parking and related zoning by-law review topics.

SITE PLANS AND REPORTS

The applicant has submitted a set of site plans that contains the existing condition plan, site layout plan, grading plan, stormwater management plan, utility plan, landscaping plan, open space plan, and design details. The submission also includes reports summarizing the environmental setting, stormwater/flood analysis and mitigation, proposed open space summary, and Massachusetts Wetlands Protection Act compliance measures.

Woodard and Curran, Inc. has reviewed the plan set and reports pertaining to the proposed Herring Brook Meadow Residential Community ("the Site"). The comments summarized below are made regarding environmental resource protection, public safety, site layout and regulatory jurisdiction for the topics that were within our scope.

Existing Conditions Plan (EC-1)

The existing condition plan depicts the 15.34 acre site on which the development is proposed. The plan indicates both existing developed areas of the Site, which includes House #126 to the southwest corner and House #132 to the northwest, both fronting onto Chief Justice Cushing Highway/Rt. 3A (CJCH); the former house is still standing and appears occupied, while the latter has been demolished. Abutting residential parcels are shown on the plans to be House #118 and House #5 to the south of the



Site, and House #146 and House #160 on one parcel to the north of the Site. The site also is bounded on the north by First Herring Brook, a tributary of the Herring River, which is demarcated as the northern property boundary of the Site. An extensive tidal salt marsh area is associated with the waterway across the northern and eastern sides of the Site. A wetlands delineation boundary is shown on the plan extending along the edge of the salt marsh and grassed meadow in the northern portion of the Site and running north to south along the eastern portion of the Site. It is indicated on the plan that a resource area delineation for the land was issued on November 16, 2004 by the Scituate Conservation Commission. A copy of the Order of Resource Area Delineation (ORAD) is included in the submission.

A grassed path (shown on the plan as a “gravel path”) also parallels the wetlands boundary along the northern part of the Site. From the edge of wetlands delineation, a 200-foot Riverfront Area buffer zone is shown on the plan along the northern portion of the Site. The area is labeled on the plans as “Existing Agriculture Field”; however, no evidence of recent agricultural activity was seen. A 300-foot “Scenic Corridor” also is shown on the plans occurring in the eastern portion of the Site. This area is part of the town’s North River Scenic River corridor designation along both sides of the river.

A 12,665 sq. ft. area in the center of the Site within the area shown as approximately elevation 7 ft. is indicated on the plans as Isolated Land Subject to Flooding (ILSF). Under the Massachusetts Wetlands Protection Act (WPA) regulations (310 CMR 10.57), ILSF is defined as an isolated depression without a defined inlet or outlet that is periodically flooded to a defined volume and depth. ILSF may provide flood storage capacity during storm/high water events, may protect groundwater quality and/or may also serve as important wildlife habitat. The ILSF boundary was approved by the Scituate Conservation Commission in the November 2004 ORAD.

The entire open meadow area of the Site is said to flood annually and photographs provided to Woodard & Curran, Inc. indicate extensive flooding throughout the central and rear portions of the Site, as well as adjoining properties, during flooding events occurring in the Spring and Fall of 1991, Spring and Fall of 2001, Winter 2005, and as recently as March of this year. From the photographs, it appears that the low-lying land area between First Herring Brook and the salt marsh in the northern portion of the Site and the wetlands to the east and south has flooded in recent times encompassing all of the land shown on the site plans as “Existing Agriculture Field” up to and including the abutting property of House #5 to the south.

Wetlands Protection Act

The Existing Conditions & Wetland Resource Areas Plan (10/6/06) depicts several Resource Areas (as defined in the WPA regulations), including:

- River (First Herring Brook) and associated 200 ft. Riverfront Area (RA);
- Bordering Vegetated Wetland (Salt Marsh);
- Land Subject to Coastal Storm Flowage (LSCSF); and
- Isolated Land Subject to Flooding (ILSF).

Additionally, there are other resource areas defined under the town’s regulatory bylaw “Wetlands Protection Rules and Regulations”, Revised November 17, 2003 (SWR 10.00):

- Town of Scituate Floodplain (SWR 10.02(1)(e)(f));
- 300 ft. Scenic River Corridor, associated with the North River and subject to the Town Bylaw (SWR10.11); and



- other Vegetated Wetlands, subject to SWR 10.00.

The proposed development of the property includes filling of land and construction of residential buildings within the Riverfront Area, LSCSF and ILSF, and relocation of ILSF. No alterations to First Herring Brook, appurtenant salt marsh or the Scenic River Corridor are proposed.

Riverfront Area

In association with grading plans for the proposed development, 4,280 sq. ft of the 200 ft. RA (along the northern portion of the site) will be disturbed and/or filled. In the SITEC document "Proposed Open Space & MA Wetlands Protection Act Compliance Measures" (10/11/06), no detailed "Alternatives Analysis" is provided for the project demonstrating that impacts to the RA can be avoided or minimized, and no specific mitigation measures to address this impact to the RA has been stated. Although performance standards for the Riverfront Area are addressed to some extent in this report from the Applicant's consultant, the Applicant relates the lack of an Alternatives Analysis to the opportunity for open space preservation of the open meadow area, rather than to specific technical feasibility or economic viability of the project. We believe that the project alternatives should be viewed based on the technical merits of the project itself and not be interrelated with any potential "gifts" of open space or conservation easements that have been proposed along with this project's approval. An Alternatives Analysis is required, in our opinion, to show that there are no siting options that would result in avoidance of resource areas or lesser impacts, and then mitigation can be addressed to compensate for "unavoidable" impacts. Given the amount of land available on this property, it appears that reconfiguration of the site design or reduction of development density allowing the buildings and parking areas to move back from the Riverfront Area edge is possible and would potentially eliminate all proposed impacts to the RA; these alternatives should be addressed by the Applicant.

Woodard & Curran recommends that the Applicant provide a detailed Alternatives Analysis evaluating other site layout designs or reduced building footprints for the project to avoid the RA, and clearly define why the proposed project design as submitted has avoided impacts to the RA to the greatest extent practicable. Woodard & Curran also recommends that the applicant provide a detailed mitigation plan that describes how proposed impacts to the RA will be mitigated or compensated to achieve the resource protection objectives (e.g., increased buffer areas, enhanced plantings, expanded view shed vistas, etc.).

Land Subject to Coastal Storm Flowage

Development (clearing, filling and grading of land, construction of buildings and associated roadway and infrastructure) is proposed for a relatively large portion (100,788 sq ft.) of LSCSF (elevation 11; this also includes the Town of Scituate Floodplain at elevation 10). This Resource Area plays an important role in the protection of landward areas from storm damage by controlling erosion and scouring. Up to seven vertical feet of fill material is proposed for LSCSF at the subject property; however, no rigorous evaluation of off-property effects on fill placement has been provided. Flood storage capacity is not the only aspect of LSCSF that will be affected by development within this Resource Area.

Woodard & Curran recommends that the Applicant indicate the extent of the "V" and "A" flood zones on site plans in addition to the 100-year floodplain, and provide a detailed, quantitative analysis of off-property impacts, such as wave deflection, scouring and sediment deposition (which may result in a decreased flood storage capacity in IVW or ILSF) resulting from the proposed development. This impact analysis should focus on the immediately adjacent



residential properties (as noted in the comments to Stormwater Plan DP-1, below) which are at greatest risk of harm during storm and flooding events.

Although, as the applicant states in the NOI submittal, there are no performance standards for LSCSF under the WPA, LSCSF is subject to the Town Bylaw, which does provide performance standards under SWR 10.38. Woodard & Curran recommends that the applicant evaluate how the proposed project design meets the Town performance standards for LSCSF. Furthermore, the ZBA should note that any new fill in a regulatory floodway, as is proposed in this project, may require review under MEPA (301 CMR 11.03(3)(b)), as noted in MEPA section below.

ILSF

The applicant proposed to alter 12,665 sq. ft of ILSF, which will be relocated to the east and replaced with 13,965 sq. ft. of ILSF. Beyond the replication area, elevation and location, the applicant does not provide any details on ILSF mitigation, such as substrate type to be used, planting scheme or monitoring plan. **Woodard & Curran recommends that a detailed mitigation plan for the ILSF be provided prior to final application approval or as a condition of approval.**

SITEC characterized a portion of the ILSF as "isolated vegetated wetlands" (IVW), as documented through hydric soil morphology, depth of standing water and occurrence of wetland indicator plant species (SITEC, 8/10/04). Under the Town of Scituate Code of Bylaws, Wetlands Protection Rules and Regulations, vegetated wetlands are defined as "freshwater wetlands which do or do not border on creeks, rivers, streams, ponds and lakes, and may be isolated." (SWR 10.04). The ZBA should note that this IVW is subject to the Town of Scituate Wetlands Protection Bylaw, which protects both bordering and isolated vegetated wetlands. For such resource areas, the Bylaw also mandates a minimum 50-foot "continuous and unaltered" Buffer Strip. Mitigation plans of the applicant proposed in the NOI or provided to the ZBA do not address replication of altered IVW, do not quantify the area of disturbance and indicate the edge of fill will immediately border the relocated ILSF. **Woodard & Curran recommends that the applicant quantify the total area of IVW that will be altered as a result of development, address how the project has been designed to avoid, minimize or mitigate potential impacts to this resource area as it pertains to Town Bylaw, and provide mitigation plans for altered IVW.**

Additionally, ZBA should note that any filling of greater than 5,000 sq ft of isolated vegetated wetland is subject to both 314 CMR 9.00 (401 Water Quality Certification) as well as MEPA review. At this time, the area of IVW alteration has not been quantified by the Applicant, and it is unclear whether the proposed alterations exceed the 5,000 sq. ft. threshold. **Woodard & Curran recommends that the applicant provide area calculations and additional details on the delineation between IVW and ILSF at the subject property.**

MEPA Environmental Review and DEP Chapter 91 Filled Tidelands

As noted in the Wetlands review comments above, the potential exists that this project exceeds one or more state environmental review thresholds, thereby requiring the Applicant to file an Environmental Notification Form (ENF) under the Massachusetts Environmental Policy Act (MEPA) in 310 CMR 11.00. Chief among these thresholds are the discharge of greater than 10,000 gallons per day (gpd) of wastewater to the ground in an area of a Zone II water supply protection zone (301 CMR 11.03(5)(b)4.c.i) and new fill in a regulatory floodway (310 CMR 11.03(3)(b)e). Other potential MEPA thresholds that may be triggered by this project are: Disturbance of greater than 5,000 sq. ft. of BVW or IVW; and non-water dependent use of historically filled tidelands under DEP Chapter 91 license. The



Applicant should review this criteria and thresholds and address whether state environmental review or other jurisdictional requirements apply to the project, as stated below.

The Chapter 91 tidelands question is uncertain at this point and also requires additional review and assessment by the Applicant. The key data needed to answer the jurisdictional question regarding this state law is the elevation of the marsh relative to Mean High Water (MHW). The Applicant should provide this information now and may also wish to seek a Determination of Applicability Determination from the DEP Chapter 91 office in order to determine if additional state review is required. In our review of this question, we located historic maps of the area from 1870 (see attached) that show the general area so the site. It is unclear from these maps whether the site is filled tidelands or filled marsh land.

The combination of exceeding one or more of these MEPA thresholds and requirement that a state Groundwater Discharge Permit be approved by MADEP for the project (see section below) or a need for a curb-cut permit from the MassHighway Department, would result in a requirement that an ENF be filed. An ENF would then be reviewed by state and local agencies as well as interested public parties, a 30-day public comment period would be held along with a meeting in the area by MEPA Office, and the state Secretary of the Executive Office of Energy and Environmental Affairs (EOEEA) would decide if any further environmental review (such as an Environmental Impact Report) is necessary before MADEP or any other state agency can begin its permit review or issue a state permit.

This question is further emphasized by a recent letter from MADEP to the Applicant dated March 14, 2007 regarding the issuance of a Wetlands Protection Act file number (# SE 068-1988) for the project. In this letter, which supersedes and revises an earlier finding by the state, the MADEP states that although a file number is being issued the proposal to fill Inland Vegetated Wetlands (IVW) and/or ILSF may require review under applicable regulations for Water Quality Certification under S. 401 administered by MADEP, S. 404 of the Clean Water Act administered under the federal U.S. Army Corps of Engineers regulations, and state MEPA review (as noted above). The DEP further recommends that the Applicant address these jurisdictional resource issues of the IVW and ILSF in accordance with 314 CMR 9.00.

As further restatement of the necessary analyses and information that is needed from the Applicant to better define and address these issues, particularly those relating to resource areas as noted above, we offer the following recommendations.

1. **It is recommended that the Applicant address these comments and jurisdictional questions raised, including the IVW, ILSF, LSCSF and Chapter 91 and its applicable MEPA jurisdiction, as part of the ZBA public hearing process now underway. This is essential, in our opinion, because if MEPA environmental review jurisdiction is triggered, it has the potential to require alteration of the site design and engineering plans currently before the Board. Hence, continuing the present review and public hearing in the absence of a definitive MEPA determination is not in the public interest. Based on our review of the key resource elements of the plan as noted in the Wetlands and MEPA sections above, and reflecting the comments of the MADEP in the letter noted above, we recommend that the Applicant address the questions and data needs below and provide back-up to the Board of its findings:**

- a) **Does any of the ILSF meet the definition of IVW under 314 CMR 9.02, and if so, what is the surface area of IVW that will be altered?**



- b) Please provide spot elevations in the salt march sufficient to identify the elevation of the Mean High Water line of the waterway and adjacent salt marsh subject to MADEP Chapter 91 filled tidelands jurisdiction.
- c) Does the project meet any of the conditions under the U.S. Army Corps of Engineers for wetlands requiring a Programmatic General Permit for Massachusetts?
- d) Does the proposed discharge of wastewater in a Zone II trigger a MEPA ENF review?
- e) Does the proposed new fill in a regulated floodway trigger MEPA review?

At this time, it appears that there is a potential that MEPA review thresholds would apply for both groundwater discharge in a Zone II and fill in a floodway criteria. The Applicant may also wish to seek a MEPA determination of applicability or have a consultation meeting with MEPA to establish whether jurisdiction applies. Depending on the answers from the Applicant to these questions, including documentation of its basis and findings, the Board may determine whether it has sufficient information with which to proceed with its review.

Site Layout (SP-1)

The proposed 60-unit development as shown on the plans includes five residential buildings with associated parking areas accessed from a single entrance/exit driveway off of CJCH. Woodard & Curran, Inc. has only examined selective topics and impact review pertaining to the site plan design, as the majority of engineering and site plan review is being done by Pennoni Associates. We offer the following comments in regards to the site layout.

The massing of the buildings and surrounding parking areas are concentrated in the western third of the Site along CJCH. This is done, one would assume, to avoid the protected resource areas to the north and east, as well as minimize the flooding effects in the central low-lying area of the Site. It also minimizes the length of access road to reach the residential units. From the plans, the project will fill and/or displace the existing ILSF area in the center of the Site. A portion of the existing ILSF is designated as isolated vegetated wetlands. The Applicant proposes to create a new ILSF area in the same general area, adjacent and to the east of the present ILSF. The existing ILSF is mapped by the Application as 12,665 square feet (SF). The new area proposed will be 13,965 SF. No detailed ILSF mitigation plan has been provided as part of the application.

Much of the proposed development extends into LSCSF. Although the proposed buildings are situated at elevations above the 100-year floodplain elevation of 11 NVGD, the application does not address suitability of the fill material that will be subject to coastal storm surges and flooding, or potential off-property impacts associated with wave deflection, erosion/scouring, flooding or sediment deposition.

Stormwater Plan (DP-1)

The proposed grading within the development consists of 1%-5% slopes within the general building and parking area and a 33% (1:3) slope surrounding the north and northwest perimeter of the development. The 1:3 slope is designed to blend into the existing grade just beyond encroaching into the 200-foot Riverfront Area. Filling and grading will also occur within the existing Land Subject to Coastal Storm Flowage at 100-year flood elevation 11'. The applicant has proposed to fill and subsequently replicate the existing Isolated Land Subject to Flooding (ILSF) on the Site.



The applicant has provided a Stormwater/Flood Analysis and Mitigation Report documenting the quality and quantity of the proposed stormwater and flood impacts from the proposed development. Woodard and Curran has reviewed this report in conjunction with the grading plans and offers the following comments regarding the grading plan and report:

2. **The applicant should provided sizing calculations for the proposed rip-rap dissipaters at the flared end outlets. The applicant should demonstrate that the dissipaters will prevent erosion of the runoff area, particularly in the Riverfront Area. Additionally, we recommend that applicant consider soft-treatment alternatives where possible for stormwater management, such as vegetated drainage swales.**
3. **The applicant has provided documentation regarding the quantity of stormwater during pre- and post-development conditions. The applicant has designed the stormwater controls in a manner that would increase the amount of run-off to the salt marsh and decrease amount of run-off to the ILSF. The applicant has stated that by decreasing the amount off run-off into the ILSF, the design will reduce upland stormwater runoff flow rates on to the abutting property to the south (House #5).**

However, the applicant has relocated the ILSF and increased the overtopping elevation from 7.5' to approximately 8.5', but has not documented the volumes to be replicated, while modifying the surface area of the ILSF. W&C acknowledges that the runoff flow rate to the ILSF may be decreased, but the effects of flooding on the property to the south due to these changes should be analyzed further, particularly given the history of major flooding that has recently occurred in this area. The increased height of the ILSF may disrupt the run-off flow patterns from the abutting property (House #5) and increase the potential for flooding. The applicant should demonstrate that by increasing the overtopping height, evaluating the proposed volume of the ILSF, and taking into account the offsite contributory area to the ILSF, flooding will not occur onto the properties to the south due to the development. The applicant should provide a stage-storage analysis of the proposed ILSF, similar to the existing stage storage analysis documented in the report. The limits of the proposed ILSF should be shown on the plans and correspond to the report.

4. **The applicant has submitted watershed plans depicting the existing and proposed design points at the Salt Marsh and ILSF. At these design points the quantitative aspects of the stormwater were calculated for each storm event. However, as shown by the flow paths provided on the Proposed Drainage Area Plan, the stormwater run-off to these design point flows beyond the development parcel and through the abutting properties before being calculated at the design points. W&C raises the concern that the current design will increase stormwater run-off onto the parcels to the North (Houses 146 and #160) and South (House #5). The applicant should provide documentation showing that the project will not increase the amount of run-off onto the abutting parcels by providing a sub-watershed area evaluation for Proposed Watershed #3 and #4. The appropriate stormwater measures to control peak flows from entering these parcels should also be provided if warranted.**
5. **The applicant has demonstrated that the stormwater from the existing parcels do not discharge to the JCHW/Rt. 3 main thoroughfare. The applicant has increased the amount of stormwater run-off onto the JCHW as depicted by Proposed Watershed #4 on the Proposed Drainage Area Plan. The applicant should demonstrate that the existing system within JCHW is capable to convey the increased amount of stormwater or provide an alternative location for discharge.**



6. The applicant has proposed constructing its project within the Land Subject to Coastal Storm Flowage, also known as a Special Flood Hazard Area (100-year flood elevation 11'), thereby filling and displacing this area. The National Flood Insurance Programs allows encroachment into the special flood hazard area (SPHA) as long as it does not increase the base flood elevation by more than one foot (Code of Federal Regulations - 60.3.10).

The applicant should provide an expanded narrative accompanied by a larger topographic plan as requested by the Coastal Zone Management office to further demonstrate that the project will not cause flooding onto adjacent properties as a result from placing fill within a SPHA. The construction of the proposed development should follow the applicable rules and regulations of the National Flood Insurance Program.

7. The proposed project lies within a Department of Environmental Protection delineated Wellhead Protection Area (ZONE II). The applicant has not provided a recharge component within the proposed stormwater management system. The applicant should include a recharge component into the stormwater system that would at least meet the minimum DEP standards for infiltration (Standard #3).
8. The applicant has proposed street sweeping, deep sump catch basins, and a non-mechanical self operating sedimentation removal devices manufactured by CDS Technologies. The applicant is claiming a 10% removal rate for street sweeping, 25% for deep sump catch basins, and 80% for the CDS units in order to achieve a 80% TSS removal rate for the stormwater system.

It is Woodard & Curran's opinion that the removal rate used for the CDS units is overly optimistic. Massachusetts Stormwater Technology Evaluation Project's (MASTEP) database performance of these units suggests a TSS removal rate lower than 80%, typical of other non-mechanical separators. It is our recommendation that the applicant provide additional BMPs beyond the CDS units in order to provide adequate water quality treatment for the stormwater run-off. The applicant should also confirm that the CDS units are sized for "critical areas" (1" of run-off), as the proposed project is located within a Zone II aquifer.

9. The location of the development within a Zone II and proximity to the protected resources areas should be considered when selecting the appropriate BMPs. The applicant should refer to the DEP Stormwater Management Policy for selection of BMPs within a critical resource area.
10. Woodard & Curran recommends that the applicant incorporate "Low Impact Design" (LID) techniques in the stormwater design in order increase the stormwater run-off quality and improve the overall development function in this location that abuts sensitive and protected resource areas. General examples of possible measures to be applied include vegetated drainage swales rather than rip-rap outlets, vegetated buffers between the developed and undeveloped areas, alternative roof-water management techniques such as dry wells to provide onsite recharge.

Stormwater Management Standards

Woodard and Curran has reviewed the project with respect to the Massachusetts DEP Stormwater Management Standards. The following discussion highlights elements of the proposed project pertaining to stormwater management that should be re-examined and in some cases modified by the



Applicant to ensure that stormwater impacts do not result to resource areas, adjoining residential properties, or the adjoining public roadway.

Standard #1 - No new stormwater conveyances (e.g., outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.

The 80% TSS removal rate for the CDS units is overly optimistic, in our opinion. W&C recommends that additional BMPs be added to the stormwater system in order to claim that the stormwater is “treated” in accordance with the policy in order to meet this standard.

The applicant should also provide sizing calculations for the proposed rip-rap dissipaters at the flared end outlets. The calculations should demonstrate adequate protection from scouring and soil erosion from stormwater run-off in order to meet this standard.

Standard #2 – Stormwater management systems must be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates.

The applicant should re-evaluate the pre- and post development peak flows at the property line of the development in order to confirm that that project will not increase the amount of run-off onto the abutting properties.

Standard #3 - Loss of annual recharge to groundwater should be minimized through the use of infiltration measures to the maximum extent practicable. The annual recharge from the post-development site should approximate the annual recharge from the pre-development or existing site conditions, based on soil types.

The proposed stormwater system does not provide the prescriptive amount of infiltration as recommended in the Stormwater Management Policy (SWMP). The stormwater design should include and quantify the amount of infiltration as recommended by the policy in order to meet this standard.

Standard #4 - For new development, stormwater management systems must be designed to remove 80% of the average annual load (post-development conditions) of Total Suspended Solids (TSS). It is presumed that this standard is met when:

- *Suitable nonstructural practices for source control and pollution prevention are implemented;*
- *Stormwater management best management practices (BMPs) are sized to capture the prescribed runoff volume; and*
- *Stormwater Management BMPs are maintained as designed.*

The 80% TSS removal rate for the CDS units is highly conservative. WC recommends that additional BMPs be added to the stormwater treatment train to increase the stormwater runoff quality in order to meet this standard.

Standard #5 - Stormwater discharges from areas with higher potential pollutant loads require the use of specific stormwater management BMPs. The use of infiltration practices without pre-treatment is prohibited.

This Standard is not applicable.



Standard #6 - Stormwater discharges to critical areas must utilize certain stormwater management BMPs approved for critical areas. Critical areas are Outstanding Resource Waters (ORW), shellfish beds, swimming beaches, cold water fisheries and recharge areas for public water supplies.



The development is located within a critical area. The applicant should consult the DEP SWMP for the use of stormwater management BMPs approved for critical areas.

Standard #7 - Redevelopment of previously developed sites must meet the Stormwater Management Standards to the maximum extent practicable. However, if it is not practicable to meet all the Standards, new (retrofitted or expanded) stormwater management systems must be designed to improve existing conditions.

This Standard is not applicable.

Standard #8 - Erosion and sediment controls must be implemented to prevent impacts during construction or land disturbance activities.

The applicant has provided an erosion and sedimentation control plan.

Standard #9 - All stormwater management systems must have an operation and maintenance plan to ensure that systems function as designed.

The applicant has provided an operation and maintenance (O&M) plan. W&C recommends that the applicant increase the street sweeping frequency to once a month during the spring, summer, and fall; and at the period immediately following winter snowmelt as recommended in the SWMP in order to meet this standard..

Utility Plan (UP-1)

The applicant has proposed a communal on-site septic system and leach field and public water supply. WC offers the following comments in regards to the wastewater utility plan.

The plans shown for septic system design are only conceptual and no engineering studies, hydrogeology analyses or other necessary engineering data was provided. The applicant has stated that the detailed plans and reports are under review by MADEP, as part of the separate state review of the necessary Groundwater Discharge Permit application, and have not been provided as part of the Comprehensive Permit application. Notwithstanding this separate state review, we recommend that the Board request of the applicant that selected additional information be provided to the ZBA related to the design and location of the proposed treatment wastewater treatment system proposed for the project, as well as the hydrogeology analysis when it is completed. It is noted, also, that the MEPA review threshold pertaining to groundwater discharge, as noted in the MEPA section above, may also apply to the project.

It is our understanding that the proposed project consists of 53, 2-bedroom units and 7, 3-bedroom units, which results in a total bedroom count of 127. For this sized facility the Title 5 design flow would be approximately 14,000 gallons per day (gpd).

With a design flow greater than 10,000 gpd, the project must receive a Groundwater Discharge Permit (GWDP) from the Massachusetts Department of Environmental Protection (MADEP). Typically the GWDP would require a Total Nitrogen (TN) and Nitrate Nitrogen concentration of less than 10 mg/l in the treatment plant effluent. Stricter effluent nitrogen concentrations, less than 5 mg/l have been established by MADEP in nitrogen sensitive areas. As part of the GWDP application process the project will also be required to complete a detailed hydrogeologic evaluation, which must include a mounding analysis and an assessment of down-gradient and cross-gradient receptors.



If the discharge is to a Zone II, as is the case here, additional limits would be placed on BOD, turbidity, TSS and Fecal Coliform. See MADEP Interim Guidelines on Reclaimed Water, dated January 1, 2000.

The project indicates that an "Amphidrome Plus System" is proposed for the development. These systems have been installed elsewhere in Massachusetts with some success, although it has been reported that they have not consistently achieved the 10 mg/l permit limits for total nitrogen. In addition, if lower nitrogen limits are required by the GWDP, it is expected that additional treatment would be required for the Amphidrome Plus System to meet those limits or an alternative treatment system would be needed. It should also be noted that under Title 5, the Amphidrome System has only received "Provisional Use Approval" from the Massachusetts Department of Environmental Protection (MADEP). This means that if the proposed system fails to meet the required discharge limits of the GWDP, then the owner must be able to replace it with a conventionally-approved system.

It is noted, also, that the GWDP application does not require the submission of detailed plans and specifications for the wastewater treatment facility to the MADEP. All that must be submitted is a detailed Engineering Report including detailed plans of the effluent disposal system plus a certification statement signed by a registered professional engineer in Massachusetts stating that the wastewater treatment facility complies with applicable standards. If any future problems with effluent quality occur, the MADEP may become involved under an enforcement action, but the responsibility is primarily on the operator to assure full compliance with all GWDP limits and conditions. It is this limited review by MADEP that typically is done that warrants the ZBA asking for additional information of the Applicant in this project.

The project shows both a primary and reserve subsurface absorption system for the discharge beds. Available test pits and percolation tests indicate the soils to be generally suitable for subsurface disposal. The available disposal area appears suitable for this purpose, but should be confirmed through completion of the hydrogeologic evaluation and review of eth results by the ZBA.

The Board should request of the Applicant that a copy of its Hydrogeologic Report be provided to the Board for review. This is necessary given the extensive resource areas that occur on and surrounding the Site, particularly the First Herring Brook waterway and its associated BVW, as well as the nearby residential abutters as well as onsite residents.

Landscaping Plan (LP-1)

The applicant has provided a landscape plan. Woodard & Curran offers the following comments in regards to the landscaping plan.

The applicant should strive to incorporate native plantings to the extent practicable, especially in buffer areas closest to existing Riverfront Area.

The "existing tree to remain" located at the entrance to the site is in an area to be filled showing five feet of fill material to be added. The appropriate measures to maintain the longevity of the tree, both during the construction phase and after, should be proposed, if necessary.

The mature height of the proposed plantings should be provided in order to be evaluate the visual site lines for traffic circulation, aesthetics and view shed issues.



The “mowed path to trail system” does not appear to connect to the proposed development.

Open Space Plan (OS-1)

The applicant has provided an Open Space Plan. The plan depicts the areas for land transfer and conservation restriction that the Applicant proposes to offer to the Town. Woodard & Curran offers the following comments in regards to the open space plan.

It is unclear whether the “Salt Marsh Area” will be transferred to the town or will remain in control of the development.

The applicant should clarify if the proposed footbridge is included in the development plans as currently proposed. If it is, the plans should address what additional permitting by either local, state or federal agencies may be required for this structure in a resource area.