

WOODS EDGE

**HAMILTON TOWNSHIP
COUNTY OF ATLANTIC
GENERAL DEVELOPMENT PLAN
BLOCK 1, LOT 1134**

OCTOBER 13, 2009

FILE COPY

Harding Highway, L.L.C.
30 Washington Avenue
Suite B-4
Haddonfield, New Jersey 08033

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WOODS EDGE

This presentation has been prepared to support an application for General Development Plan approval for a proposed community which has been given the name "Woods Edge". A General Development Plan approval is the first step in a three step approval process. It provides the conceptual framework for the design and engineering of the entire community.

Woods Edge will be located at the northeast corner of the intersection of Cologne Avenue and Harding Highway. It will sit on a lightly wooded site that totals over 111 acres and lies within a Pinelands Regional Growth Area.

The site is governed by a Settlement Agreement that was reached between the applicant and the Township. As part of this agreement, a new zoning classification, Planned Village Development (PVD), was created for the site. The zone allows for up to 610 residential units and imposes requirements for affordable housing and the purchase of Pinelands Development Credits. The Settlement Agreement also provides for modifications in the review of all development applications.

We look forward to working with the Planning Board to develop what we believe will be an exciting and innovative addition to the Hamilton Township community.

FILE COPY

October 13, 2009

I. GENERAL LAND USE PLAN

A. PLAN

A plan, entitled "General Land Use Plan" (Sheet 3 in the plan set) has been prepared showing the proposed uses on the site. In accordance with the Municipal Land Use Law, each use may be decreased by up to 15% without affecting the General Development Plan approval. No increase in units is permitted without an amended application to the Planning Board. The flexibility which is inherent in this process provides for increased opportunities for varying lot sizes and locating open space. It should be noted that the original concept plans for this community anticipated a small amount of commercial uses. As a result of Pinelands imposed wetland buffers, there is now no suitable location for the commercial uses.

Following is a summary of the uses and number of units within each section of the proposed community:

<u>AREA</u>	<u>TYPE</u>	<u># UNITS</u>
A	Single Family	48
B	Affordable Flats	67 - 95*
C	Townhouses	190
D	Single Family	142

* The number of affordable flats is dependent upon whether the units will be fee simple (20% of total units are affordable) or will be rental (15% of total units are affordable).

B. ZONING CONSIDERATIONS

Following is an overview of the more salient zoning requirements and a discussion on compliance with each.

- 1) Section XXIV.5.A (1) specifies that no more than 30% of the dwelling units may be two-story apartments over retail space. The site is compliant since there are no units of this type.
- 2) Section XXIV.5.A (2) specifies that at least 20% of the total units shall be market rate, non-age restricted, single family detached units. With 190 single family detached units out of a possible 475 total units, the site has a 40% ratio.
- 3) Section XXIV.5.A (2) also requires that at least 40% of the dwelling units shall be single family detached or single family attached (townhouse). This requirement is met since 380 out of a possible 475 dwelling units will be single family detached or townhouse units (80%).
- 4) Section XXIV.5.A. (3) specifies that no more than 25% of the dwelling units may be age restricted housing in three-story buildings over parking. The site is compliant since there are no units of this type.
- 5) Section XXIV.6.A limits the land that can be used for commercial to 5% for just commercial and 15% for commercial which has a residential component. The site is compliant since there are no proposed commercial uses.
- 6) Section XXIV.8.A limits the gross density to 5.45 dwelling units per gross acre. With a site area of 111.68 acres, this permits a total of 608 units. This section also limits the net density to 6.5 units per net acre. With a net acreage of 93.23 acres, this permits a total of 605 units. The site is compliant since only 475 units are proposed.

C. GENERAL DEVELOPMENT PLAN APPROVAL PROCESS

The property is governed by a Settlement Agreement ("Agreement") that was reached between the applicant and the Township of Hamilton and is dated August 24, 2006. This agreement addresses, in detail, the development of the property and the

procedures that are to be followed. The main body of the Agreement is attached as Appendix I.A.

The Township of Hamilton does not have any specific requirements for the submittal of a General Development Plan (GDP). The Municipal Land Use Law (MLUL) does, however, contain the following language in Section 40:55D-45.1:

“The general development plan shall set forth the permitted number of dwelling units, the amount of nonresidential floor space, the residential density and the nonresidential floor area ratio for the planned development, in its entirety, according to a schedule which sets forth the timing of the various sections of the development.”

In addition, the MLUL, has a list of items that may be included in Section 40:55D-45.2. In summary, these items are as follows:

- a) A general land use plan
- b) A circulation plan
- c) An open space plan
- d) A utility plan
- e) A stormwater management plan
- f) An environmental inventory
- g) A community facility plan
- h) A housing plan
- i) A local service plan
- j) A fiscal report

Certain of the items listed above were specifically waived under the terms of the Settlement Agreement. The Agreement stipulates that separate environmental, fiscal or community impact assessments need not be submitted. In addition, the only traffic studies to be submitted will be those required by the Atlantic County Planning Board.

This submittal includes all of the optional items except for those that were waived. For both the Circulation Plan and the Environmental Inventory, sections have been included to inform the Planning Board as to where the project stands.

APPENDIX I.A

SETTLEMENT AGREEMENT

**HARDING HIGHWAY, L.L.C. – HAMILTON TOWNSHIP
MOUNT LAUREL LITIGATION
SETTLEMENT AGREEMENT**

THIS MOUNT LAUREL SETTLEMENT AGREEMENT ("Settlement Agreement" and/or "Agreement") is entered into on this _____ day of _____, 2006 by and between **HARDING HIGHWAY, L.L.C.**, c/o Parker McCay, P.A., Three Greentree Centre, 7001 Lincoln Drive West, P.O. Box 974, Marlton, New Jersey 08053-0974 ("Plaintiff"); the **TOWNSHIP OF HAMILTON**, a Municipal corporation of the State of New Jersey, with offices at the Hamilton Township Municipal Building, 6101 13th Street, Mays Landing, New Jersey 08330 ("Township" and/or "Hamilton"); and the **HAMILTON TOWNSHIP PLANNING BOARD**, a duly constituted Planning Board as defined by law, with offices at the Hamilton Township Municipal Building, 6101 13th Street, Mays Landing, New Jersey 08330 ("Planning Board" and/or "Board"). The Plaintiff, the Township, and the Planning Board are collectively referred to herein as the "Parties".

BACKGROUND

1. The Plaintiff is the owner of an equitable interest in approximately 111 acres of land in the Township of Hamilton, County of Atlantic and State of New Jersey that is identified on the community's Tax Maps as Block 1134, Lot 1 (the "Parcel", "Tract", or "Property").
2. The Plaintiff desires to produce affordable housing on the Property in accordance with So. Burl. Co. NAACP v. Township of Mount Laurel, 92 N.J. 158 (1983)

["Mount Laurel II"] and the New Jersey Fair Housing Act, N.J.S.A. 52:27D-301, *et seq.* ["FHA"] and filed exclusionary zoning litigation against the Township, the Planning Board, the Hamilton Township Municipal Utilities Authority ("HTMUA"), and the New Jersey Pinelands Commission in the matter captioned Harding Highway, L.L.C. v. Township of Hamilton, et al., Docket No. ATL-L-155-04 (Mount Laurel)[the "Litigation"] which is currently pending before the Superior Court.

3. The litigation resulted in the entry of a Consent Order by the Court on April 4, 2005 whereupon the Township and the Planning Board acknowledged that Hamilton had not satisfied its twelve (12) year cumulative second cycle affordable housing obligation from 1987 to 1999 as assigned by the New Jersey Council on Affordable Housing ("COAH") under Mount Laurel II and the FHA and was thus in violation of its constitutional and statutory mandates entitling the Plaintiff to builder's remedy relief.
4. The Plaintiff's primary challenges against the Pinelands Commission focused on (a) its failure to ensure that municipalities that fall under its regional planning jurisdiction pursuant to the Pinelands Protection Act (such as Hamilton Township) abide by their affordable housing mandates under the Mount Laurel doctrine and the Fair Housing Act ("FHA"), and (b) that the low densities specified in Pinelands "growth areas" under the Comprehensive Management Plan ("CMP") when coupled with the Pinelands Commission's Pinelands Development Credit ("PDC") purchase requirements make it economically infeasible to produce affordable housing.
5. The Court subsequently dismissed the Pinelands Commission from the litigation without prejudice to the Plaintiff's ability to rejoin the Commission.

6. The Parties thereafter engaged in extensive planning discussions with respect to a mutually agreeable site-specific inclusionary development concept for the property that is capable of being endorsed by the Pinelands Commission.
7. These discussions have resulted in an understanding with respect to the Plaintiff's builder's remedy entitlements and the agreed-upon development of the Plaintiff's property by the Township and the Planning Board as documented and memorialized in the within Settlement Agreement which the Parties intend to jointly submit to the Superior Court for review and approval.
8. This Agreement does not address the Plaintiff's sewer and water entitlements with the HTMUA which shall be litigated separately after this Agreement is executed and approved by the Court. The HTMUA is therefore not a party to this Agreement.
9. This Agreement only addresses the Plaintiff's site-specific builder's remedy entitlements and does not represent a position being taken by any parties with respect to the validity or constitutionality of the Pinelands Protection Act or the regulations and policies of the Pinelands Commission with regard to compliance with the Mount Laurel doctrine or the FHA.

NOW, THEREFORE, in consideration of the mutual covenants, promises and agreements contained herein, to which the Parties agree to be legally bound, the Parties agree to settle Plaintiff's builder's remedy litigation as follows:

SECTION I

INCORPORATION OF BACKGROUND

1.1 Incorporation. The "Background" set forth hereinabove is herewith incorporated by reference herein as if set forth herein at length.

SECTION II

THE LAND USE CONCEPT FOR THE INCLUSIONARY DEVELOPMENT OF THE PLAINTIFF'S PROPERTY

1.1 **The Parties' Intent.** The Parties acknowledge that the Plaintiff's property is in a Pinelands Regional Growth Area ("RGA") pursuant to the Comprehensive Management Plan ("CMP") adopted by the New Jersey Pinelands Commission pursuant to the Pinelands Protection Act, N.J.S.A. 13:18A-1, *et seq.* and that they are presented with the unique opportunity to plan for the site-specific development of the property in a responsible fashion to (a) create the realistic opportunity for the prompt provision of affordable and market-rate housing in a mixed-use residential and nonresidential format, and (b) promote sound local, regional and state land use planning objectives.

1.2 **The Land Use Plan.** The intentions of the Parties as expressed above are intended to be implemented by the Township's adoption of an Ordinance establishing a Planned Village Development ("PVD") Zone District and inclusionary zoning standards that shall be applicable to Plaintiff's property that is attached hereto and incorporated by reference herein as Exhibit "A" upon approval of this Agreement by the Superior Court to facilitate the development of the property as generally depicted in the Conceptual ^{Site} ~~Land Use~~ Plan under date of August 1⁵, 2006 that is attached hereto and incorporated by reference herein as Exhibit "B" which the Parties acknowledge has been reviewed and found to be acceptable. The parties acknowledge and confirm that the PVD Ordinance shall not require that Pinelands Development Credits ("PDC") be purchased with

respect to any affordable units or nonresidential uses constructed in the Plaintiff's inclusionary project.

1.3 **Adoption of Amended Master Plan and the PVD Ordinance and Submission of Same to the Pinelands Commission for Review and Certification.** The Planning Board agrees to amend its Master Plan consistent with the intent of this Agreement in accordance with the Municipal Land Use Law, N.J.S.A. 40:55D-1, et seq. ("MLUL") within forty-five (45) days of the date of the Court's approval of the Agreement. Thereafter, the Township shall immediately introduce the PVD Ordinance at first reading and refer same to the Planning Board for a Master Plan consistency review pursuant to N.J.S.A. 40:55D-26(a). The Planning Board shall transmit its Master Plan consistency report to the Township prior to the second reading and public hearing on the Ordinance. The Township shall then adopt the PVD Ordinance at second reading and (a) publish notice of adoption in accordance with law, (b) file a copy of the PVD Ordinance with the County Planning Board in accordance with N.J.S.A. 40:55D-16, and (c) immediately submit the Second Round Compliance Plan and the PVD Ordinance to the Pinelands Commission for review and certification in accordance with the Pinelands Protection Act and the CMP. Thereafter, the parties shall jointly appear at all public hearings and staff meetings conducted by the Pinelands Commission to support its certification of the submittals to facilitate the prompt production of affordable housing as envisioned in this Agreement and the Housing Element and Fair Share Plan (collectively "Compliance Plan") that the Township intends to submit to the Court.

1.4 **Public Notification and Comment.** The adoption of the PVD Ordinance and the Amended Master Plan shall be accomplished in accordance with the

8/24/06

applicable public notification and comment requirements. In the event that the Township, after consideration of the public's concerns, elects to not adopt the PVD Ordinance, and/or the Planning Board, after consideration of the public's concerns, elects not to adopt the Amended Master Plan, the Plaintiff may elect to terminate this Agreement, the parties shall hold each other harmless, the parties shall be restored to the status quo ante, and the Mount Laurel litigation shall resume at the point that it existed as of the date of this Agreement.

SECTION III

MAXIMUM NUMBER OF RESIDENTIAL UNITS AND THE PLAINTIFF'S AFFORDABLE HOUSING OBLIGATION(S)

2.1 **The Total Project.** The Parties agree that the Plaintiff shall be permitted to construct approximately 610 units, not to exceed a gross density of 5.45 units per acre, on the property based upon the tenure type of Plaintiff's choosing in addition to such nonresidential uses as specified and permitted in the PVD Ordinance in Exhibit "A", i.e., up to 15% of the site may be used for nonresidential development in accordance with the Neighborhood Commercial provisions of the zoning ordinance, and that said development project shall be considered a permitted Planned Unit Development ("Project"). No PDCs shall be required with respect to the affordable units or the nonresidential components of the project.

2.2 **The Affordable Housing Component.** Plaintiff agrees that the total number of affordable residential units in the project shall be set-aside pursuant to the PVD Ordinance, and reserved for low and moderate income households as defined in COAH's rules. Affordable units may be located above ground level nonresidential uses subject to the approval of the Court's Master as well as the statutory review and approval of the Planning Board. The Plaintiff, or its successor for any component of the Project, shall be freely permitted to apply for and secure available state and federal subsidies and/or tax credits to defray the cost of construction of the affordable units whereupon the Township shall extend its full and prompt endorsement and support. However, the parties acknowledge that under current rules and guidelines of the New Jersey Department of

Community Affairs ("DCA"), state administered affordable housing subsidies are not typically available to inclusionary developments such as that envisioned in this Agreement. The Plaintiff shall not be relieved of any of its affordable housing obligation by virtue of an inability to secure public funding to subsidize the cost of the affordable units associated with the project. In this regard, the Township shall extend a Payment in Lieu of Taxes ("PILOT") based upon 6.28% of the gross shelter rents should the affordable units be located in one or more rental phases or components of the Project and otherwise comply with all regulations promulgated by the New Jersey Housing Mortgage Finance Agency ("HMFA") in connection with government subsidized affordable rental projects. The term and duration of the PILOT shall be consistent with the term and duration of the HMFA mortgage. The PILOT shall only apply to the affordable rental component of the Project and the rest of the Project shall be subject to standard taxation.

- 2.3 **Compliance with COAH's Rules.** Plaintiff agrees that all affordable units shall comply with COAH's rules including, but not limited to: (a) income qualification, (b) controls on affordability, (c) deed restrictions, (d) bedroom distribution, (e) low-moderate income split, (f) phasing, and (g) affirmative marketing. However, COAH's preference for integration shall not be applicable should the Plaintiff elect to concentrate all affordable units as rental units in one or more phases or components of the

Project or above ground level nonresidential uses. The location and design of the affordable housing units shall be subject to the approval of the Court's Master as well as the statutory review and approval of the Planning Board.

SECTION IV

CONTINUED INTERACTION WITH THE PINELANDS COMMISSION TO SECURE CERTIFICATION OF THE PVD ORDINANCE

- 3.1 Interaction With The Pinelands Commission. The parties acknowledge that they have engaged in extensive discussions with the staff of the Pinelands Commission ("PC") and the Superior Court's Mount Laurel Master since the Plaintiff's litigation was filed to ensure that the site-specific PVD Ordinance and the terms of this Agreement will be favorably supported by the PC in light of the densities and zoning standards in the Ordinance and the fact that the Ordinance exempts all affordable units and nonresidential uses in the Plaintiff's inclusionary project from the PC's PDC purchase requirements to facilitate the production of affordable housing. The parties agree to continue this interaction such that the PVD Ordinance can be formally submitted to the PC for CMP "conformance" review to enable the Plaintiff to pursue development approvals with the Planning Board.
- 3.2 PDC Purchase Requirements for Affordable Units. The parties acknowledge that the PC was originally joined as a defendant and indispensable party to the within proceedings in light of the contention that the PC's PDC purchase requirements in the CMP make it economically infeasible to produce affordable housing. The PC was subsequently dismissed from the litigation without prejudice.
- 3.3 Purchase of PDCs For Market-Rate Units. In order to allow the Plaintiff's inclusionary project to proceed, the Plaintiff agrees to purchase PDCs with respect to

25% of the market-rate residential units in the project on a phased basis. However, the percentage of PDCs that must be purchased is subject to reduction should any of the following events occur:

a. The PC subsequently amends the CMP and its policies to reduce and/or waive PDC purchase requirements for inclusionary developments; and/or

b. The Township's Court approved and PC certified Housing Element and zoning ordinances reduce the level of PDC purchase that is required for inclusionary projects in Hamilton Township.

In such event, the Plaintiff shall be entitled to such reduction for any and all phases in which PDCs have not been redeemed as of the time such event occurs.

This Settlement Agreement is conditioned upon the PC's certification of the PVD Ordinance and a local approvals related to the development of Plaintiff's property as contemplated herein.

4.4 No Admission with Respect to the Pinelands Commission's PDC Purchase Requirements. Nothing in this Agreement shall be construed as an admission that the Pinelands Commission's regulations and policies comply with the Mount Laurel doctrine and the FHA including, but not limited to, the Pinelands PDC purchase requirements for market-rate units in inclusionary projects. All rights are expressly preserved by all parties and other property owners and developers in the Township who commit to produce affordable housing to challenge the Pinelands' regulations and policies as being "exclusionary".

SECTION V

DEVELOPMENT AND BUILDING APPROVALS

- 4.1 General Development Plan Approval. Plaintiff shall be permitted to apply to the Planning Board to secure general development plan ("GDP") approval for its Project with vested rights for a period of twenty (20) years. The submission requirements shall be in accordance with those specified in N.J.S.A. 40:55D-45.1 and the GDP shall be generalized in nature and not require the same detail as that required for preliminary subdivisions and site plans. The Plaintiff shall provide the Planning Board with copies of the Traffic Impact Assessment that has been submitted to the Atlantic County Planning Board when the application for County Planning Board Approval has been filed; the application documents, plans and reports submitted to the Pinelands Commission when the application for a Certificate of Filing has been filed; and the Environmental Assessments for the adjacent DiImperio property upon their receipt by the Plaintiff. However, the Plaintiff shall not be required to submit separate Environmental, Fiscal or Community Impact Assessments in connection with any development applications to the Board. The GDP shall be derived from the Conceptual Site Plan dated August 15, 2006 (Exhibit "B") and shall be reviewed and approved by the Board within (a) forty-five (45) days of submission if the Plan substantially conforms to the unit types and mixes as identified in Exhibit "B" which the Board and the Township has already reviewed and endorsed, and (b) ninety-five (95) days if the GDP varies significantly from Exhibit "B". Any debate or dispute over the significance of any changes or variations between Exhibit

"B" and the submitted GDP shall be resolved by the Court's Master whose decision the Parties agree shall be binding without the necessity of seeking judicial intervention by way of post-judgment relief. Architectural renderings and elevations for the buildings to be constructed in the project shall be submitted at the time of preliminary subdivision and site plan approval. Said renderings and elevations shall not be required in connection with the Plaintiff's GDP submission

4.2 **Site Specific Zoning Measures.** The parties acknowledge the unique and beneficial development opportunity that is presented with respect to the Plaintiff's Property and agree that certain variances and waivers from the proposed PVD Ordinance, as well as relaxation from other local and regional land use ordinances or regulations may be required to allow for the intended site-specific development of the Property as set forth in this Agreement. In order to permit the intended agreed upon development of the Property, the Planning Board shall cooperate with the Plaintiff in granting reasonable waivers or variances that may be necessary to permit the development of the Property that is substantially similar to the Conceptual Site Plan dated August 15, 2006 which the Board and the Township have already reviewed and endorsed.

4.3 **Subsequent Development Approvals and Plaintiff's Subchapter 10 Entitlements.** The Planning Board shall conduct all reviews of the Plaintiff's applications for preliminary and final subdivision, site plan

and/or variance approvals strictly in accordance with the Municipal Land Use Law, N.J.S.A. 40:55D-1, *et seq.* ("MLUL"), COAH's rules, and this Settlement Agreement and Plaintiff shall be afforded all expedition and cost-reduction rights, entitlements and benefits accorded to inclusionary developers in COAH's second cycle Subchapter 10 Rules [N.J.A.C. 5:93-10.1, *et seq.*]. In this regard, the Parties specifically agree that the Planning Board will schedule such Special Meetings as may be necessary to accommodate the "action time periods" in the MLUL and shall provide the Plaintiff with preferential treatment on regular agenda reviews. The Planning Board shall likewise grant reasonable waiver and variance requests including waivers pertaining to the submission of (a) community, fiscal, environmental and traffic impact assessments in connection with all applications, and (b) architectural renderings and elevations at the time of GDP approval. Moreover, the Board agrees to apply the uniform Residential Site Improvement Standards ("RSIS") to the whole Project should the Plaintiff present a residential and nonresidential mixed-use development plan except with regard to streets and roadways in the commercial and/or nonresidential components of the project which the parties agree shall be governed by the Township's commercial street and roadway improvement standards.

4.4 Mount Laurel Cost Reduction Entitlements. As is customary with respect to Mount Laurel projects, the following specific cost reduction entitlements apply to the Plaintiff's Project:

- a. No Planning Board application and escrow fees shall be attributable to the affordable units.

- b. No fees shall be charged for building permits, certificates of occupancy, and engineering inspections for the affordable units.
- c. The entire Project, including the commercial component, is exempt from the payment of affordable housing development fees and any third round growth share obligations.

5.5 Recreational Amenities. The Plaintiff shall provide recreational amenities with an improvement cost (not including any cost attributable to land) equal to \$2,500 per market-rate unit and \$1,250 per affordable unit. If the Plaintiff's approved plans involve on-site recreational amenities with a construction cost less than the unit costs referenced above, then the Plaintiff shall make a monetary contribution to the Township for the difference in cost. Any dispute with respect to the appropriate amount of the cost of constructing the recreational amenities shall be resolved by the Court's Master whose decision the parties agree shall be binding and unappealable.

SECTION VI

ROADWAY REDESIGN

5.1 New York Avenue Extension. The Plaintiff acknowledges that the Township would like to alleviate traffic congestion on Cologne Avenue by having New York Avenue comport in its dimensions with a collector roadway as extended through the Plaintiff's property and lands owned by others over which Plaintiff has no control to intersect with Denmead Drive at its intersection with Cologne Avenue. The Plaintiff agrees to work with the Township to accommodate this objective by constructing the New York Avenue extension if the Plaintiff can secure a roadway deed or easement over and across the intervening triangular property that lies between its property and Harding Highway. If the deed or easement cannot be acquired despite the Plaintiff's best efforts, the Township shall exercise its powers under the law to acquire the deed or easement to accomplish its objectives. The Plaintiff agrees to attempt to acquire the deed or easement from the adjoining property owner within one hundred twenty (120) days of the date of the Court's approval of this Agreement and keep the Township fully apprised of its efforts. If the Plaintiff's efforts have not been successful at the end of this one hundred twenty (120) day period, the Township shall then have ninety (90) days to exercise its powers under the law to acquire the required deed or easement. In the event that the Township exercises these rights, the Plaintiff shall pay the Township for the cost of the deed or easement based upon the property's appraised fair market value. In addition, the Plaintiff shall pay the Township's reasonable Court costs, appraisal fees and

[Handwritten initials: D, MBS, JEC]

attorney's fees in an amount not to exceed \$10,000.00. Said payment shall be made to the Township when the final approved development plans for the first Phase of the project are submitted to the Planning Board Chairman for signature and as a precondition to the filing of the Plat in the County Clerk's Office in accordance with the Map Filing Law. The Plaintiff shall be permitted to pursue and secure development approvals with the Planning Board during the foregoing efforts to secure the roadway deed or easement without the property owner's consent which development plans shall depict the roadway extension. The Planning Board agrees to accept, process and approve the development plans absent the property owner's consent should the plans otherwise meet the Township's development standards.

SECTION VII

COURT APPROVAL OF SETTLEMENT AGREEMENT

7.1 Court Approval Of Agreement Required. The Parties acknowledge that this Settlement Agreement requires Court approval pursuant to applicable Mount Laurel decisional law subsequent to the Court conducting Fairness Hearings upon adequate notice to the protected class and the general public. As such, the Parties shall jointly pursue the scheduling of a Fairness Hearing with the Court at which time the Agreement shall be submitted to the Court for its review and approval. Upon the scheduling of the Hearing date, the Township shall comply with all Notice requirements imposed or directed by the Court and shall fully support and endorse approval of this Agreement at the Hearing. If the Court has not approved this

Settlement Agreement within ninety (90) days of the date on which the documents were submitted to the Court, the Plaintiff and the Township shall have the option of terminating the Agreement and continuing with the litigation.

7.2 **Defense of Agreement and Payment of Costs.** The Parties shall fully cooperate with each other to secure Court approval of this Agreement and to defend said approval against all challenges and/or appeals pursued by third-parties. The Township shall promptly notify the Plaintiff and the Court's Master of all challenges and appeals. Each Party shall be responsible for their own costs and expenses in securing Court approval and defending the Court's Judgment approving this Agreement.

7.3 **Second and Third Round Compliance.** The Plaintiff shall interact and cooperate with the Township and the Court's Master subsequent to the Court's approval of this Agreement with respect to the Township's efforts to prepare and secure Court approval of its cumulative first, second and third round Housing Element and Fair Share Plan (collectively "Compliance Plan") in a continuing effort to vindicate the rights of the protected class.

7.4 **Reservation of Rights with respect to Sewer and Water Issues with the HTMUA.** The parties acknowledge that the Plaintiff has not been able to reach an agreement with the HTMUA with respect to (a) reservation of sewer and water capacity, and (b) the waiver and/or reduction of connection fees for affordable units, and that the Plaintiff is preserving all rights to pursue its Mount Laurel entitlements against the HTMUA after the within Agreement is approved by the Court. Neither the Township nor the Planning Board shall take any action to preclude the Plaintiff from asserting its rights and entitlements against the HTMUA.

SECTION VIII

DEFAULT

8.1 **Violation and Default.** In the event that any Party shall fail to perform any undertaking required to be performed by it pursuant to the terms of this Settlement Agreement,

unless such obligation is waived in writing by the Party or Parties for whose benefit such obligation was intended, such failure to perform shall constitute an event of default under this Settlement Agreement. In the event of default, the non-defaulting Party shall have available any and all rights and remedies that may be provided in law or in equity, including, but not limited to the right of specific performance and/or the right to bring a motion in aid of litigant's rights.

Prior to such proceedings, there shall be an opportunity to cure said alleged default as follows:

(i) the benefited Party shall notify the defaulting Party of such alleged default specifying the nature of the default, (ii) the defaulting Party shall thereafter have ten (10) business days or such reasonable period of time as may be necessary to effect a cure; (iii) the benefited Party shall promptly notify the defaulting party of its acceptance of the proposed cure, or its alternative election to seek judicial remedies.

SECTION IX

NOTICES

9.1 Third-Party Actions. The Parties and their respective counsel agree to immediately provide each other with notice of any lawsuits, actions or governmental proceedings, threatened or pending, which the Parties may reasonably believe could impact Plaintiff's Project.

9.2 Notice by and Among the Parties. All notices required under this Agreement shall be in writing and shall be given by facsimile or by certified mail, return receipt requested, or by recognized overnight personal carriers with certified proof of receipt. All notices shall be deemed received upon the date of delivery which is set forth in the mailing certifications by the mail or delivery services used, and all times for performance based upon such notices, shall be from the date set forth in such proof of delivery. The persons and entities to receive notice shall be as the following or any designated successor:

To the Plaintiff:

Harding Highway, L.L.C.
c/o Camco Management, LLC
30 Washington Avenue, Suite B4
Haddonfield, NJ 08033
Attn: Robert Swartz, Esquire
Telecopier: (856) 857-0700

Ronald C. Morgan, Esquire
Parker McCay, P.A.
Three Greentree Centre
7001 Lincoln Drive West
P.O. Box 974
Marlton, NJ 08053-0974
Telecopier: (856) 552-1427

David N. Kinsey, P.P.
Kinsey & Hand
14 Aiken Avenue
Princeton, NJ 08540
Telecopier: (609) 924-4107

To the Township:

Joan I. Anderson, Clerk
Hamilton Township

8/24/06

6101 13th Street
Mays Landing 08330
Telecopier: (609) 625-9159

Norman L. Zlotnick, Esquire
Mairone, Biel, Zlotnick & Feinberg
3201 Atlantic Avenue
Atlantic City, NJ 08401
Telecopier: (609) 344-5942

To the Planning Board: Howard E. Drucks, Esquire
Cooper, Levenson, April,
Neidelman & Wagenheim
1125 Atlantic Avenue, 3rd Floor
P.O. Box 1125
Atlantic City, NJ 08404-1125
Telecopier: (609) 572-7375 or 344-0939

To the Court's Master: Philip B. Caton, P.P.
Clarke, Caton & Hintz
400 Sullivan Way
Trenton, NJ 08628
Telecopier: (609) 883-4044

SECTION X

MISCELLANEOUS

10.1 Captions. Captions and titles to this Agreement are inserted for the purposes of convenience and reference only, and are in no way to be construed as limiting or modifying the scope and intent of the various purposes and provisions of this Agreement.

10.2 Cooperation. The Parties expressly agree to cooperate with each other in order to effectuate and carry out the purposes of this Agreement in addition to the Mount Laurel doctrine, the FHA, and COAH's Rules.

10.3 Waiver. Each of the Parties waives all rights to challenge the validity and enforceability of this Agreement. Failure to enforce provisions or obligations in this Agreement

by any Party shall not be construed as a waiver of these provisions and obligations.

10.4 **Entire Agreement.** This Agreement and its prefatory statements, background recitals and exhibits constitute the entire Agreement between the Parties. No representative, agent or employee of any Party has been authorized to make any representation and/or promises that are not contained herein or to otherwise modify, amend, vary or alter the terms hereof except as stated herein. No modifications, amendments, variations or alternations shall be binding unless reduced to writing and signed by the Parties.

10.5 **Validity.** In the event that one or more of the provisions of this Agreement shall be held to be invalid, unenforceable or void, the Parties shall within thirty (30) days of such determination, attempt to restructure this Agreement consistent with its underlying intent. If the Parties fail to resolve such a restructuring, any party may seek Court review and a ruling to restructure the Agreement in a legally acceptable manner reflecting the underlying intent of the Parties as expressed herein.

10.6 **Preparation.** The Parties acknowledge that this Agreement has been jointly prepared by the Parties' attorneys as a means of settling Mount Laurel litigation. Therefore, this Agreement shall be construed on a parity among the Parties and any presumption for resolving ambiguities against the drafter shall not apply.

10.7 **Construction.** This Agreement shall be construed, governed and enforced in accordance with the laws of the State of New Jersey and the regulations of COAH. Jurisdiction with respect to any litigation related to this Agreement by way of enforcement or post-judgment relief shall exclusively be in the Superior Court of New Jersey. Service of any Complaint or judgment enforcement proceedings may be effected consistent with the terms hereof for the delivery of notices. The Parties hereby waive formal service of process. Process may be affected by written notice pursuant to the terms hereof for notices. The Parties expressly waive a trial by jury in any such litigation.

10.8 Dispute Resolution. The parties agree to submit any disputes over the interpretation of this Agreement or the development of the Plaintiff's property to implement the objectives of this Agreement in writing to the Court's Master to attempt to resolve the disputes before petitioning the Court for post-judgment relief pursuant to Section 10.7 (above). Unless otherwise provided herein, the Master's determinations and recommendations shall be given serious consideration to resolve the matter at hand to attempt to obviate the need for further judicial involvement. However, the Master's recommendations and determinations shall be non-binding and shall not preclude post-judgment relief.

10.9 Parties Bound and Assignment. The Agreement shall inure to the benefit of and be binding upon the Parties hereto and their respective successors and assigns. The Plaintiff shall expressly be permitted to sell and convey one or more phases or sections of its project to other developers and/or users who shall be entitled to rely upon and enforce this Agreement as to the remaining Parties. Advanced written permission to sell and assign is not intended and shall not be required.

10.10 Holiday and Weekends – Time for Performance. Should any such date, on or before which the performance of any act is required under the terms of the Agreement, fall on a Saturday, Sunday, legal holiday and/or generally recognized religious holiday in the State of New Jersey (such as Christmas, Good Friday, etc.), the date for performance shall be extended to and shall occur on the next succeeding business day. All references to "days" shall be deemed to refer to calendar days unless the context clearly and unequivocally requires otherwise. Except as otherwise set forth herein, any act to be performed on or before a certain day shall be deemed to be required to be performed on or before 5:00 p.m., on the day set forth and, if performed after

5:00 p.m., shall be deemed not to have been performed on said date.

10.11 Counterpart Signature. This Agreement may be executed simultaneously or in one or more counterparts, each of which, when so executed and delivered, shall constitute an original, fully enforceable counterpart for all purposes. Facsimile counterparts shall be accepted and enforceable. Immediately upon the delivery of a facsimile counterpart, the sending Party shall deliver a counterpart with the original execution page.

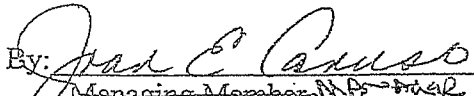
IN WITNESS WHEREOF, the Parties hereto have hereunto set their hands and seals the day and year appearing below their names.

Attest:

HARDING HIGHWAY, L.L.C.,
A Limited Liability Company

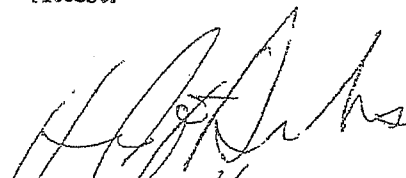


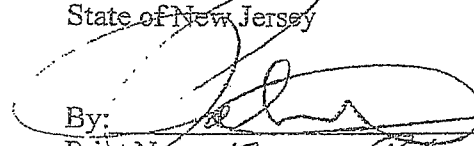
Print Name: Steven D. Madro
9/11/06

By: 
Managing Member - MP - ~~Member~~
Print Name: Joan E. Canuso
Date: 9/11/06

Attest:

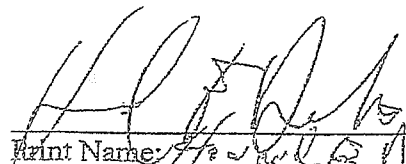
TOWNSHIP OF HAMILTON,
A Municipal Corporation of the
State of New Jersey

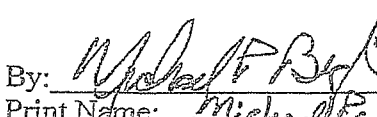

Print Name: Howard E. Drucks Esq.
Aug 31, 2006

By: 
Mayor
Print Name: Thomas Palmentieri
Date: 8/31/06

Attest:

HAMILTON TOWNSHIP
PLANNING BOARD


Print Name: Howard E. Drucks Esq.
Aug 31, 2006

By: 
Chairperson
Print Name: Michael P. Bignol
Date: 8/31/06

II. CIRCULATION

As part of the Settlement Agreement, applicant agreed to work with Township to connect New York Avenue with Denmead Drive. This extension of New York Avenue ("New York Avenue Extension") would run from Harding Highway to Cologne Avenue. This proposed roadway would help alleviate traffic congestion in the area. This new roadway will require approval from NJDOT since Harding Highway is a State Highway and from Atlantic County since Cologne Avenue is a County roadway. We have met with both agencies and each agreed that the connection was desirable.

Approval for the New York Avenue Extension must also be obtained from the Pinelands since there is a small, isolated wetland just north of the New York Avenue/Harding Highway intersection. This wetland lies directly in the path of the proposed road. In addition, there are wetland buffers adjacent to Cologne Avenue which block the access to Cologne Avenue along the entire road frontage. The Pinelands has taken the position that the New York Avenue Extension is not warranted since there are other means of site access that do not involve the disturbance of wetlands. At this point, it is necessary for the Township to take the lead in getting the New York Avenue Extension approved by the Pinelands.

The submitted plan has been designed to accommodate the possible New York Avenue Extension while providing an alternate access point in case the extension is not approved. If the extension is approved, the alternate access would be eliminated.

The Settlement Agreement stipulates, in essence, that no Traffic Impact Assessment need be submitted as part of the GDP. Any such reports would be submitted at the time of preliminary application to the Atlantic County Planning Board. Prior to the preparation of any final traffic report it is imperative that the Township and the Pinelands reach a consensus on the New York Avenue Extension.

There is also an issue with pedestrian circulation. The Township's Master Plan calls for sidewalks along Harding Highway and Cologne Avenue. The applicant has no issues with installing these sidewalks. The Pinelands, however, objects to the sidewalks that fall within wetlands or wetland buffers. The Township will have to convince the Pinelands that these sidewalks are necessary as part of a comprehensive pedestrian circulation plan.

III. COMMUNITY FACILITY PLAN

OVERVIEW

Following is a summary of the supporting community facilities for the proposed community:

- 1) **Education** – the Hamilton Township School District provides schooling for Pre-Kindergarten through Eighth Grade students. There are two elementary schools (Hess and Shaner) and one middle school (Davis). For high school students, Hamilton is part of the Greater Egg Harbor Regional School District. This district operates two high schools with Oakcrest High School being the school that would handle students from the proposed project. The project site is across Cologne Avenue from Oakcrest High School.
- 2) **Library** – the Township belongs to the Atlantic County Library system which has ten branches including the main branch at 40 Farragut Avenue in Mays Landing.
- 3) **Hospitals** – the two closest hospitals are the Atlantic Care Regional Center – Mainland Campus located in Pomona (7.5 miles away) and Shore Memorial Hospital located in Somers Point (11.5 miles away).
- 4) **Police Protection** – the Township has a full-time police force consisting of 71 police officers, 8 special officers, 11 dispatchers and 8 clerks. The Police Department is located in the Municipal Building which is approximately four miles from the proposed community.
- 5) **Fire Protection** – there are four fire companies that serve Hamilton Township. They are as follows:
 - a) Cologne Volunteer Fire Company, 2870 Cologne Avenue (3 miles away).
 - b) Mays Landing Fire Department, Reliance Avenue and Mill Street (4 miles away).
 - c) Mizpah Volunteer Fire Company, 6478 Dettirsch Avenue (5 miles away).
 - d) Laureldale Volunteer Fire/Rescue Company, 2657 Route 50 (6 miles away).

IV. ENVIRONMENTAL OVERVIEW

A. WETLANDS

As required by the Pinelands Commission, a wetlands investigation was conducted for the site and all properties within 300' of the site. This work was performed by Junetta N. Dix Consulting, Inc. and resulted in the following findings:

- 1) There are nine isolated wetland pockets within the site boundaries, ranging in size from .02 acres to 2.6 acres. The buffers on these wetlands vary between 50' and 175'. All of these wetlands and buffers are shown on the Existing Conditions Plan (Sheet 2 in the plan set). The project has been designed to avoid any impact on these wetlands and buffers.
- 2) There is an extensive off-site wetland on the west side of Cologne Avenue. Due to the presence of an endangered species (Pine Barrens Reedgrass) within this wetland, the required 300' buffer extends across Cologne Avenue and onto the project site. When combined with the on-site wetlands and wetlands buffers, there is no way to access the project site from Cologne Avenue without impacting a wetlands buffer.
- 3) There is an isolated off-site wetland pocket immediately to the north of the New York Avenue/Harding Highway intersection. This wetland is problematic as it lies in the path of the Township's planned extension of New York Avenue.
- 4) There are three additional off-site wetlands within 300' of the site; all to the south of Harding Highway. Due to reduced buffers, these wetlands will not impact the site as currently designed.

B. ENDANGERED SPECIES

Two studies were required by the Pinelands; one for on-site and one for all properties within 300' of the project site. No endangered species were found on-site which allowed for a reduction in the required buffers. An endangered species was found on an off-site parcel (Block 1027, Lot 2) resulting in a 300' buffer.

Attached as Appendix IV.A are the pertinent parts of the on-site study, prepared by Trident Environmental Consultants and dated January 2008. Included is an introduction which outlines the study and a discussion portion which describes the findings. The entire report is 69 pages and is available upon request.

Attached as Appendix IV.B is the main body of the off-site study, prepared by Trident Environmental Consultants and dated October 2008. The figures and appendix are not included but are available upon request.

APPENDIX IV.A

THREATENED/ENDANGERED SPECIES (ON-SITE)

T1351.001
January 18, 2008

THREATENED/ENDANGERED SPECIES SURVEY & INVENTORY REPORT

PINELANDS APPLICATION #2004-0351.002

BLOCK 1134 * LOT 1
HAMILTON TOWNSHIP,
ATLANTIC COUNTY

PREPARED FOR:

HARDING HIGHWAY, LLC
30 WASHINGTON AVENUE, SUITE B-4
HADDONFIELD, NJ 08033

PREPARED BY:

TRIDENT ENVIRONMENTAL CONSULTANTS
134 SOUTH NEW YORK ROAD
GALLOWAY, NEW JERSEY 08205


ALBERT A. NEWMAN
SR. BIOLOGIST

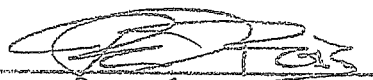

BRYON DUBOIS
SR. BIOLOGIST

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APPENDICES

Appendix A -	Statements of Qualifications
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I. INTRODUCTION

This report summarizes the methodologies, findings, and conclusions of presence/absence surveys for threatened/endangered plant and wildlife species on Block 1134, Lot 1, located within the Township of Hamilton, Atlantic County, New Jersey.

Correspondence from The Pinelands Commission (PC) dated September 14, 2006 states the presence of Pine Snake (*Pituophis m. melanoleucus*), Barred Owl (*Strix varia*), Pine Barrens Treefrog (*Hyla andersonii*), Yellow-fringed Orchid (*Habenaria ciliaris*), Knieskern's Beaked-rush (*Rhynchospora knieskernii*), Resinous Boneset (*Eupatorium resinosum*), Pine Barrens Gentian (*Gentiana autumnalis*), and Pine Barrens Reedgrass (*Calamovilfa brevipilis*) on or in the vicinity of the subject parcel.

Trident Environmental Consultants (TEC) submitted a Threatened/Endangered Species Habitat Suitability Assessment, dated October 10, 2006, to the PC for review and comment. Following PC review, it was determined that presence/absence surveys for Barred Owl, Cooper's Hawk (*Accipiter cooperii*), Northern Pine Snake, Pine Barrens Gentian, Knieskern's beaked-rush, and Yellow-fringed Orchid would be required to maintain consistency with the threatened/endangered species standards of the Pinelands Comprehensive Management Plan (CMP).

A report entitled Threatened/Endangered Species Survey Protocol, dated February 12, 2007, was then submitted to the PC for review and acceptance. Additional information was requested in Pinelands correspondence dated March 27, 2007, and several modifications to the proposed methodologies were outlined in correspondence dated May 15, 2007. TEC responded in correspondence dated June 26, 2007 providing the requested information and stating that the requested modifications to the proposed survey methodologies would be made.

The objective of the study was to establish the presence/absence of the above-referenced State threatened wildlife, as well as assess the site as potential critical habitat for these species, and the presence/absence of the listed plant species identified above. The presence/absence of the concerned snake species is determined through trapping and visual survey efforts, and the presence/absence of the targeted bird species is determined through vocalization and visual survey efforts.

II. SITE CHARACTERISTICS

Location

The site is bound by Harding Highway (a.k.a. U.S. Highway Route 40) to the south and Cologne Avenue (a.k.a. County Route 614) to the northwest within Hamilton Township, Atlantic County (See *Figure 1. Road Map*). There is also a small length of frontage along the southerly side of the Black Horse Pike (a.k.a. U.S. Highway Rt. 322). The parcel is highly irregular in shape and consists of roughly one hundred ten (110) acres.

The project site is found on the U.S.G.S. Mays Landing quadrangle with NAD (1983) state plane coordinates of E(x) - 446206.044, N(y) - 22517.469, at the approximate center of the site (See *Figure 2. U.S.G.S. Mays Landing Quadrangle Map*).

Land Use

Woodlands comprise the majority of the site and surrounding land use is dominantly multi-family residential development; retail shopping centers; schools and associated recreational fields; professional offices; major highway infrastructure; and vacant woodlands (Refer to *Figure 3. Aerial Map*).

The site is located in the Pinelands Regional Growth Management Area (See *Figure 4. Pinelands Management Area Map*).

Vegetation

Woodlands on the subject property contain canopy species of pitch pine (*Pinus rigida*), southern red oak (*Quercus falcata*), white oak (*Quercus alba*) and scarlet oak (*Quercus coccinea*). The understory is composed of black oak (*Quercus velutina*), post oak (*Quercus stellata*), sassafras (*Sassafras albidum*), blackjack oak (*Quercus marilandica*), American holly (*Ilex opaca*), black cherry (*Prunus serotina*), and canopy species. The shrub layer component includes scrub oak (*Quercus ilicifolia*), low blueberry (*Vaccinium vacillans*), greenbrier (*Smilax rotundifolia*), huckleberry (*Gaylussacia* spp.), sheep laurel (*Kalmia angustifolia*), inkberry (*Ilex glabra*), sweet pepperbush (*Clethra alnifolia*), and highbush blueberry (*Vaccinium corymbosum*). The dominant herbaceous woodland species are teaberry (*Gaultheria procumbens*), wintergreen (*Chimaphila maculata*), Pennsylvania sedge (*Carex pensylvanica*), and bracken fern (*Pteridium aquilinum*).

The southwestern-most portion of the site contains pitch pine along with red maple (*Acer rubrum*), blackgum (*Nyssa sylvatica*), sweetbay magnolia (*Magnolia virginiana*), Eastern redcedar (*Juniperus virginiana*), gray birch (*Betula populifolia*), and ebony spleenwort (*Asplenium platyneuron*).

Disturbed areas associated with the expansion of the existing groundwater extraction system contain a variety of successional herbaceous vegetation including panic grasses (*Panicum* spp.), *Polygonum* spp., wool grass (*Scirpus cyperinus*), soft rush (*Juncus effusus*), *Phragmites*, cattail (*Typha latifolia*), sweetfern (*Comptonia peregrina* var. *asplenifolia*), goldenrod (*Solidago* spp.), hairy blazing star (*Liatris graminifolia*), and small-headed beaked rush (*Rhynchospora capitellata*).

Soils Mapping

According to the geographic information systems (GIS) data layer for the most recent soil data available from the U.S. Department of Agriculture, the Soil Survey Geographic Database program (SSURGO), five (5) soil types dominantly underlay

the site (Refer to *Figure 5. County Soil Survey Map*). These soils and corresponding map unit symbols are Downer loamy sand (DocB); Lakehurst sand (LakB); Pits, sand & gravel (PHG); Galloway loamy sand (GamB); and Matawan sandy loam (MbtB). Descriptions of these soil types are given below.

Downer loamy sand (DocB), 0 to 5% slopes

This soil consists of nearly level to sloping, well-drained soils. The plow layer is dark grayish brown loamy sand about ten (10) inches thick. The subsurface layer is yellowish brown loamy sand six (6) inches thick. The subsoil is yellowish brown sandy loam twelve (12) inches thick. The substratum is yellowish brown loamy sand to a depth of sixty (60) inches.

This soil is medium in natural fertility and low to moderate in organic matter content. Permeability is moderately rapid. Surface runoff is slow, and the hazard of erosion is slight. The available water capacity is moderate. This soil is suited to a variety of vegetables and early crops.

Galloway loamy sand (GamB), 0 to 5 % slopes

The Galloway series consists of deep, moderately well drained soil on uplands. They formed in coarse-textured coastal plain sediments. Typically, these soils have a loamy sand surface layer, 9 inches thick, that is grayish brown in the upper part and light brownish-gray in the lower part. The substratum from 9 to 39 inches is olive yellow loamy sand, and from 39 to 47 inches it is light brownish-gray sand. The IIC horizon from 47 to 0 inches is yellowish brown coarse sand. Slopes range from 0 to 5 percent.

Lakehurst sand (LakB), 0 to 5 % slopes

This is a nearly level, moderately well drained and somewhat poorly drained soil in depressional areas and on low divides. Typically the surface layer is ray sand four (4) inches thick and the subsurface layer is light gray sand approximately six (6) inches thick. The subsoil is typically brown loamy sand to a depth of thirteen (13) inches and then mottled, brownish yellow sand up to the depth of twenty-four (24) inches. Twenty-four (24) inches to about thirty-six (36) inches, the soil is mottled, pale brown sand. The substratum, at a depth of sixty (60) inches, is mottled, light brownish gray sand.

Permeability of this soil is rapid in the subsoil and the substratum and the available water capacity is low. The apparent season high water table is at a depth of one and a half (1½) to three and a half (3½) feet from January to April. Organic matter content is low.

Pitch pine is the most common species found on this soil.

Matawan sandy loam (MbtB), 5 to 10 % slopes

The surface layer is dark grayish-brown sandy loam 7 inches thick. The subsurface layer is light yellowish-brown sandy loam 9 inches thick. The subsoil is light yellowish-brown or olive-

yellow sandy loam and clay loam 26 inches thick. The substratum, between depths of 42 and 60 inches, is pale olive, stratified clay loam, sandy clay, and sandy clay loam. It has light-gray mottles.

Included with this soil in mapping are areas of soils that have a surface layer of loamy sand. Also included are areas of Sassafras and Aura soils in slightly higher positions than those of this soil and areas of very poorly drained Pocomoke soils in narrow drainageways. Some areas have been cleared so that fruits and vegetables can be grown, but most areas are wooded.

Pits, Sand & Gravel (PHG)

This unit consists of deep excessively drained to very poorly drained soil material that is dominantly made up of the soil in a burrow pit, gravel pit, or clay pit during mining or after mining has taken place. The soil material in this unit is primarily sandy and is five (5) to thirty-five (35) percent gravel. The material is mostly strongly acidic. Permeability is variable. Available water capacity is low in sandy areas and moderate in clayey areas

Freshwater Wetlands

There are no freshwater wetlands mapped on the subject property (See *Figure 6. Freshwater Wetlands Map*). However, several areas have been delineated in the western portion of the site.

III. TARGET SPECIES

Table 1. Target Species

<u>Common Name</u>	<u>Scientific Name</u>	<u>Approximate Survey Period</u>
Barred Owl	<i>Strix varia</i>	3/1-4/30
Cooper's Hawk	<i>Accipiter cooperii</i>	3/15-4/30
Northern Pine Snake	<i>Pituophis m. melanoleucus</i>	4/15-10/31
Pine Barrens Gentian	<i>Gentiana autumnalis</i>	9/1-10/15
Knieskern's Beaked-rush	<i>Rhynchospora knieskernii</i>	7/20-9/30
Yellow Fringed Orchid	<i>Habenaria ciliaris</i>	7/20-8/31

IV. MATERIALS AND METHODS

Trident Environmental Consultants staff ranged from one (1) to three (3) people on any given day during the 2007 surveys. Additionally, Trident Environmental Consultants Senior Biologist and staff spent five (5) days researching data, literature, analyzing available data, and the writing of this report. Refer to Appendix A for statements of qualifications for TEC staff responsible for performing the survey.

A. Barred Owl

Barred owls were surveyed vocally at a total of three (3) locations on the following dates in 2007: March 9, March 20, March 29, April 10 and April 21. Although four (4) survey dates were proposed, a fifth date was performed to adequately cover the two (2) month survey period since three (3) dates were performed in March due to favorable field conditions (*See Figure 7. Bird Survey Map*). Field survey dates are weather dependant but an effort was made to evenly disperse dates within the March/April survey period.

The calling stations were chosen within the limits of the project site with reference to the evaluation area. The locations are somewhat evenly dispersed and centralized within the evaluation area. Centralization within the context of the evaluation area was done to avoid roadway noise interference with vocalization broadcasts. The stations were selected in an effort to identify the presence/absence of the targeted bird species on and in the vicinity of the site.

A Barred Owl vocalization was mimicked, utilizing a manual Barred Owl caller, for approximately fifteen (15) seconds, followed by approximately forty-five (45) seconds of silence. This process was repeated six (6) times so that three (3) sets of vocalizations were broadcast in each opposing direction. Successive vocalizations were broadcast in opposing directions. This series of broadcasts was followed by fifteen (15) minutes of audio-visual survey time. The roughly twenty (20) minute process was repeated once per survey location per survey date.

Vocalization survey dates were selected when average wind speeds were reported as less than eight (8) mph, visibility reported as greater than one (1) mile, and when precipitation was absent or light and intermittent. Vocalization surveys were conducted after sunset.

Visual

TEC also searched the subject site for potential nesting cavity trees, as well as physical evidence of presence such as white wash and pellets. Nest searches were conducted prior to leaf-out. Please note a portion of the visual survey time was conducted concurrently with the Cooper's hawk visual survey effort.

Data logs for field barred owl survey field events are provided below.

FIELD DATA LOGS: Barred Owl Survey

Date - Time: 10/3/06 - 4 hrs.

Survey Personnel: Al Newman

Survey Activity: Conduct visual survey for any potential nesting cavities.

Weather: not recorded

Target Findings: none

Date - Time: 10/10/06 - 4 hrs.

Survey Personnel: Al Newman
Survey Activity: Conduct visual survey for any potential nesting cavities.
Weather: not recorded
Target Findings: none

Date - Time: 2/20/07 - 8:00am-4:00pm
Survey Personnel: Matt Malhame, Rebecca Holland
Survey Activity: Conduct visual survey for physical evidence of owl presence (e.g. white wash, pellets).
Weather: cloudy, 45 degrees
Target Findings: none

Date - Time: 2/21/07 - 8:00am-4:00pm
Survey Personnel: Matt Malhame, Rebecca Holland
Survey Activity: Conduct visual survey for physical evidence of owl presence (e.g. white wash, pellets).
Weather: sunny, 50 degrees
Target Findings: none

Date - Time: 3/9/07 - 9:30pm-11:00pm
Survey Personnel: Al Newman
Survey Activity: Broadcast con-specific vocalizations with a manual call in an effort to 'call-in' target birds and elicit a vocal response.
Weather: clear, 32 degrees, winds < 4 mph
Target Findings: none

Date - Time: 3/20/07 - 7:30pm-8:45pm
Survey Personnel: Anthony Silva, Ed Morales
Survey Activity: Broadcast con-specific vocalizations with a manual call in an effort to 'call-in' target birds and elicit a vocal response.
Weather: clear, 47 degrees, winds < 7 mph
Target Findings: none

Date - Time: 3/29/07 - 10:00pm-11:30pm
Survey Personnel: Al Newman, Matt Leatherwood
Survey Activity: Broadcast con-specific vocalizations with a manual call in an effort to 'call-in' target birds and elicit a vocal response.
Weather: clear, 35 degrees, 6 mph winds
Target Findings: none

Date - Time: 4/10/07 - 8:00pm-9:30pm
Survey Personnel: Matt Malhame, Rebecca Holland
Survey Activity: Broadcast con-specific vocalizations with a manual call in an effort to 'call-in' target birds and elicit a vocal response.
Weather: clear, 40 degrees, winds < 8 mph
Target Findings: none

Date – Time: 4/21/07 -- 9:30pm-11:00pm

Survey Personnel: Al Newman

Survey Activity: Broadcast con-specific vocalizations with a manual call in an effort to 'call-in' target birds and elicit a vocal response.

Weather: clear, 55 degrees, winds < 5 mph

Target Findings: none

B. Cooper's Hawk

Vocalization

Cooper's hawks were surveyed vocally at a total of three (3) locations on the following dates in 2007: March 15, April 3, April 9, April 11, April 18, and May 1. Although selection of field survey dates is weather dependant, an effort was made to evenly disperse the four (4) survey dates within the 1 ½ month survey period (*See Figure 7. Bird Survey Map*). Although four (4) survey dates were proposed, a fifth and sixth date were performed due to the target sighting and to cover the survey period.

The calling stations were chosen within the limits of the project site with reference to the evaluation area. The locations are somewhat evenly dispersed and centralized within the evaluation area. Centralization within the context of the evaluation area was done to avoid roadway noise interference with vocalization broadcasts. The stations were selected in an effort to identify the presence/absence of the targeted bird species on and in the vicinity of the site.

A recorded Cooper's Hawk vocalization was played for approximately fifteen (15) seconds followed by approximately forty-five (45) seconds of silence. During the forty-five (45) seconds of silence the player was rotated 180°. This process was repeated six (6) times so that three (3) sets of vocalizations were broadcast in each opposing direction. This series of broadcasts was followed by fifteen (15) minutes of audio-visual survey time. The roughly twenty (20) minute process was repeated once per survey location per survey date.

Survey dates were selected when average wind speeds were reported, or recorded on-site, as less then eight (8) mph, visibility reported as greater than one (1) mile, and when precipitation was absent or only light and intermittent. Vocalization surveys were initiated at or before sunrise.

Visual

TEC visually searched the site for the presence of any large stick nests, as well as physical evidence of presence in the form of plucking posts and prey remains. The evaluation area was broken down into sectors and inspected. Nest searches were conducted prior to leaf-out. Please note a portion of the visual survey time was conducted concurrently with the barred owl visual survey effort.

Data logs for field Cooper's hawk survey field events are provided below.

FIELD DATA LOGS: Cooper's Hawk Survey

Date - Time: 10/3/06 - 4 hrs.

Survey Personnel: Al Newman

Survey Activity: Conduct visual survey for any existing raptor stick nests.

Weather: not recorded

Target Findings: none

Date - Time: 10/10/06 - 4 hrs.

Survey Personnel: Al Newman

Survey Activity: Conduct visual survey for any existing raptor stick nests.

Weather: not recorded

Target Findings: none

Date - Time: 2/20/07 - 8:00am-4:00pm

Survey Personnel: Matt Malhame, Rebecca Holland

Survey Activity: Conduct visual survey for nests and physical evidence of possible presence (e.g. plucking posts, prey remains).

Weather: cloudy, 45 degrees

Target Findings: none

Date - Time: 2/21/07 - 8:00am-4:00pm

Survey Personnel: Matt Malhame, Rebecca Holland

Survey Activity: Conduct visual survey for nests and physical evidence of possible presence (e.g. plucking posts, prey remains).

Weather: sunny, 50 degrees

Target Findings: Scattered plucked feathers found around avian prey remains.

Date - Time: 3/15/07 - 6:00am-8:00am

Survey Personnel: Al Newman

Survey Activity: Broadcast recorded con-specific vocalizations in an effort to 'call-in' target birds and elicit a vocal response.

Weather: winds < 8 mph

Target Findings: none

Date - Time: 3/19/07 - 9:30am-12:00pm

Survey Personnel: Anthony Silva, Ryan O'keefe, Ian Caldwell

Survey Activity: Conduct visual survey for target individuals, nests, and physical evidence of possible presence (e.g. plucking posts, prey remains).

Weather: sunny, 38 degrees

Target Findings: Cooper's Hawk observed and heard calling in the western portion of the site.

Date - Time: 4/3/07 - 6:15am-11:00am

Survey Personnel: Rebecca Holland

Survey Activity: Broadcast recorded con-specific vocalizations in an effort to 'call-in' target birds and elicit a vocal response. Conduct visual survey for target individuals, nests, and physical evidence of possible presence (e.g. plucking posts, prey remains).

Weather: sunny, 65 degrees, winds < 8 mph

Target Findings: none

Date - Time: 4/9/07 - 6:20am-10:00am

Survey Personnel: Matt Malhame, Rebecca Holland

Survey Activity: Broadcast recorded con-specific vocalizations in an effort to 'call-in' target birds and elicit a vocal response. Conduct visual survey for nests, plucking posts, and prey remains.

Weather: sunny, 48 degrees, winds < 8 mph

Target Findings: Two (2) relatively small stick nests found in the western portion of the site.

Date - Time: 4/11/07 - 6:20am-8:00am

Survey Personnel: Matt Malhame, Rebecca Holland

Survey Activity: Broadcast recorded con-specific vocalizations in an effort to 'call-in' target birds and elicit a vocal response. Conduct visual survey for nests, plucking posts, and prey remains.

Weather: partly cloudy, 35 degrees, winds < 5 mph

Target Findings: Cooper's Hawk responded to call broadcast from survey pt. 1. Bird responded twice to broadcast calls from west (toward Cologne Road), flew-in near the survey point, and then flew-off in a roughly southerly direction.

Date - Time: 4/18/07 - 6:00am-8:00am

Survey Personnel: Al Newman, Rebecca Holland

Survey Activity: Broadcast recorded con-specific vocalizations in an effort to 'call-in' target birds and elicit a vocal response.

Weather: cloudy, 46 degrees, winds generally < 8 mph (few gusts to 12 mph recorded)

Target Findings: None. No target vocalization responses or target individuals observed. Noted turkey vulture perched on one of the trees containing a stick nest.

Date - Time: 5/1/07 - 5:50am-7:45am

Survey Personnel: Matt Malhame, Al Newman

Survey Activity: Broadcast recorded con-specific vocalizations in an effort to 'call-in' target birds and elicit a vocal response.

Weather: cloudy, 54 degrees, winds < 5 mph

Target Findings: None. No target vocalization responses or target individuals observed.

C. Pine Snake

In accordance with Pinelands correspondence for the subject application the directed Pine Snake survey was initiated no later than May 1 through July 15 for the spring survey, and resumed no later than September 1 through October 15 for the fall survey. Specifically,

the spring survey start date was April 20 and the fall survey commencement date was October 31.

Evaluation Area

The evaluation area was selected based on the presence of contiguous woodland habitat with that of the project site (*See Figure 8. Pine Snake Survey Map*). Areas extending off the subject property to the north, east, and south were added to include contiguous woodlands outward to the extent of existing development and roadway infrastructure. The area extending off-site to the west across Cologne Avenue was included due to the presence of upland pine woods with open areas. Off-site areas within the evaluation area were included in the visual survey efforts targeting individual specimens and denning habitat.

Trapping

Trap lines were operational from April 17 to July 13 for the spring survey and from September 1 to October 31 for the fall survey. Traps were checked a minimum of every other day. A primary effort in the field survey was the erection of drift fence and funnel trap arrays (*Refer to Figure 8. Pine Snake Survey Map*). Two (2) five hundred (500) foot arrays were placed in the best possible and most logical locations in order to locate the targeted species. Each fence location was selected based on the presence of favorable habitat characteristics including exposed, sandy soils; scrub pine areas adjacent to open areas; and areas of soils disturbance. Drift fence array 2 is located around a topographical depression, and array 1 near the clay pit identified on the U.S.G.S. quadrangle map. The fence arrays are also somewhat evenly dispersed and centralized within the project site. Both drift fence arrays will be implemented, with funnel traps being placed with openings through the fence, averaging every fifty (50) feet, for a total of 1,000 L.F. of drift fence and twenty (20) traps. Funnel traps were overlaid with branches or other vegetation to provide cover and reduce exposure to sun and rain. Traps were checked a minimum of every other day.

Visual

Target individuals and sheds were sought throughout the evaluation area. Cover objects, such as debris and fallen trees, were overturned in an effort to observe snakes under cover or identify sheds. Visual surveys covering the site were conducted a minimum of once per week.

Road Cruising

Road cruising surveys were conducted along internal roadways.

Hibernacula

Potential hibernacula and summer dens were sought throughout the evaluation area.

Nesting

The area identified on-site as the clay pit on the U.S.G.S. Mays Landing quadrangle was searched for nests, test holes, and tracks during the mid-June to mid-July nesting period.

The survey included:

- The spring trapping survey was conducted from April 17 to July 13, 2007 and the fall survey from September 1 to October 31, 2007.
- The random and opportunistic visual surveys were conducted when daytime air temperatures were 65° or greater and between the hours of 6:00 a.m. to 5:00 p.m.
- The site survey will include one (1) senior biologist and one (1) staff biologist. Locations will be determined and sections will be studied one at a time or until opportunistic conditions prevail.
- Two (2) 500 L.F. drift fences, each with ten (10) funnel traps placed approximately every fifty (50) feet, were constructed in optimal on-site locations.
- Traps were checked every other day while the study was in progress.
- Schematic diagrams of the drift fence arrays will be provided to show precise dimensions.
- Cover objects (debris, log piles, and fallen trees) were overturned in an effort to observe snakes and locate shed skins.
- Any potential hibernacula, summer dens, tracks, and nests were searched in an effort to observe snakes.

Hibernacula Study

An early season hibernacula survey was conducted. Locating potential hibernacula in the study area entailed conducting surveys in suitable areas to search for potential den sites. Searches to locate suitable stumps and potential den sites were conducted throughout the study period.

FIELD DATA LOGS: Northern Pine Snake Survey

Date – Time: 2/20/07 – 8:00am-4:00pm
Survey Personnel: Matt Malhame, Rebecca Holland
Survey Activity: Conduct visual survey for potential denning habitat.
Weather: cloudy, 45 degrees
Target Findings: none

Survey Activity: Conduct visual survey for potential denning habitat.
Weather: sunny, 50 degrees
Target Findings: none

Date – Time: 2/21/07 – 8:00am-4:00pm
Survey Personnel: Matt Malhame, Rebecca Holland

Date – Time: 4/20/07 – 10:30am-12:00pm
Survey Personnel: Becky Holland, Al Newman
Survey Activity: opened traps, visual survey; hibernacula survey
Weather: sunny, 74 degrees

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Target Findings: none

Date - Time: 4/21/07 - 3:15pm-4:45pm

Survey Personnel: Al Newman

Survey Activity: checked traps, visual survey

Weather: clear, sunny, 64 degrees

Findings: one (1) black racer through visual search

Date - Time: 4/23/07 - 3:30pm-4:30pm

Survey Personnel: Becky Holland

Survey Activity: checked traps

Weather: sunny, 65 degrees

Target Findings: One (1) black racer in trap along drift fence array # 1.

Date - Time: 4/26/07 - 1:00pm-3:00pm

Survey Personnel: Becky Holland

Survey Activity: checked traps/ visual survey

Weather: partly cloudy, 49 degrees

Target Findings: One (1) vole in trap along drift fence array # 1. Fowlers toads observed on-site.

Date - Time: 5/1/07 - 1:00pm-2:00pm

Survey Personnel: Becky Holland, Al Newman

Survey Activity: checked traps

Weather: 63 degrees; partly cloudy

Target Findings: none

Date - Time: 5/3/07 - 2:30pm-3:30pm

Survey Personnel: Becky Holland

Survey Activity: checked traps, visual survey

Weather: 69 degrees; sunny

Target Findings: none

Date - Time: 5/5/07 - 12:00pm-1:00pm

Survey Personnel: Becky Holland

Survey Activity: checked traps

Weather: cloudy, 58 degrees

Target Findings: none

Date - Time: 5/7/07 - 12:30pm-1:30pm

Survey Personnel: Becky Holland

Survey Activity: checked traps; repaired existing silt fence of array #2 due to vandalism

Weather: partly cloudy, 56 degrees

Target Findings: none

Date - Time: 5/9/07 - 11:45am-12:45pm

Survey Personnel: Becky Holland

Survey Activity: checked traps

Weather: 73 degrees; partly cloudy

Target Findings: none

Date - Time: 5/11/07 - 1:00pm-2:00pm

Survey Personnel: Becky Holland

Survey Activity: checked traps

Weather: 68 degrees; partly cloudy

Target Findings: none

Date - Time: 5/12/07 - 8:30am-9:30am

Survey Personnel: Becky Holland

Survey Activity: visual survey

Weather: sunny, 67 degrees

Target Findings: none

Date - Time: 5/14/07 - 12:30pm-1:30pm

Survey Personnel: Becky Holland

Survey Activity: checked traps

Weather: partly cloudy, 61 degrees

Target Findings: none

Date - Time: 5/16/07 - 1:00pm-2:00pm

Survey Personnel: Becky Holland

Survey Activity: checked traps

Weather: 76 degrees; sunny

Target Findings: none

Date - Time: 5/18/07 - 1:00pm-2:00pm

Survey Personnel: Becky Holland

Survey Activity: checked traps

Weather: 53 degrees; partly cloudy

Target Findings: none

Date - Time: 5/20/07 - 1:00pm-2:00pm

Survey Personnel: Becky Holland

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Survey Activity: checked traps

Weather: light rain, 64 degrees

Target Findings: none

Date -- Time: 5/21/07-- 3:00pm-4:00pm

Survey Personnel: Becky Holland

Survey Activity: checked traps

Weather: partly cloudy, 66 degrees

Target Findings: none

Date -- Time: 5/23/07 -- 12:00pm-1:00pm

Survey Personnel: Becky Holland

Survey Activity: checked traps

Weather: 71 degrees; sunny

Target Findings: none

Date -- Time: 5/25/07 -- 12:30pm-1:30pm

Survey Personnel: Becky Holland

Survey Activity: checked traps

Weather: 77 degrees; sunny

Target Findings: none

Date -- Time: 5/27/07 -- 1:30pm-2:30pm

Survey Personnel: Becky Holland

Survey Activity: checked traps

Weather: sunny, 83 degrees

Target Findings: none

Date -- Time: 5/29/07-- 1:15pm-2:30pm

Survey Personnel: Becky Holland

Survey Activity: checked traps

Weather: partly cloudy, 49 degrees

Target Findings: none

Date -- Time: 5/30/07 -- 4:00pm-5:00pm

Survey Personnel: Becky Holland, Brian Harmon

Survey Activity: checked traps

Weather: 78 degrees; sunny

Target Findings: none

Date -- Time: 6/1/07 -- 12:15pm-1:00pm

Survey Personnel: Al Newman

Survey Activity: checked traps

Weather: 85 degrees; rain showers

Target Findings: none

Date -- Time: 6/3/07 -- 1:30pm-2:30pm

Survey Personnel: Brian Harmon

Survey Activity: checked traps

Weather: 69 degrees; partly cloudy

Target Findings: Four (4) Fowlers toads found in various traps along drift fence array # 1.

Date -- Time: 6/5/07 -- 12:45pm-1:45pm

Survey Personnel: Becky Holland

Survey Area / Activity: checked traps

Weather: 78 degrees; rain showers

Target Findings: none

Date -- Time: 6/6/07 -- 2:00pm-3:00pm

Survey Personnel: Brian Harmon

Survey Activity: checked traps/ visual survey

Weather: sunny, 74 degrees

Target Findings: none

Date -- Time: 6/8/07-- 2:30pm-3:30pm

Survey Personnel: Becky Holland

Survey Activity: checked traps, repairs to array 2

Weather: partly cloudy, 84 degrees

Target Findings: Two (2) fowlers toads found in traps along drift fence array # 1.

Date -- Time: 6/10/07 -- 3:00pm-4:00pm

Survey Personnel: Brian Harmon

Survey Activity: checked traps

Weather: 73 degrees; partly cloudy

Target Findings: One (1) fowlers toad in trap along drift fence array # 1.

Date -- Time: 6/11/07 -- 2:45pm-3:45pm

Survey Personnel: Becky Holland

Survey Activity: check traps

Weather: 74 degrees; sunny

Target Findings: none

Date -- Time: 6/13/07 -- 2:00pm-3:00pm

Survey Personnel: Brian Harmon

Survey Activity: checked traps

Weather: rain showers, 65 degrees
Target Findings: One (1) fowlers toad found
in trap along drift fence array # 1.

Date - Time: 6/15/07 - 1:00pm-2:00pm
Survey Personnel: Becky Holland
Survey Activity: checked traps, repair fence
& traps along array 1 & 2
Weather: sunny, 71 degrees
Target Findings: none

Date - Time: 6/17/07 - 2:00pm-3:00pm
Survey Personnel: Brian Harmon
Survey Activity: checked traps
Weather: 83 degrees; sunny
Target Findings: One (1) fowlers toad in
trap along drift fence array # 1.

Date - Time: 6/19/07 - 2:30pm-3:30pm
Survey Personnel: Becky Holland
Survey Activity: checked traps
Weather: 84 degrees; sunny
Target Findings: none

Date - Time: 6/20/07 - 1:00pm-2:00pm
Survey Personnel: Becky Holland
Survey Activity: checked traps
Weather: light rain, 82 degrees
Target Findings: none

Date - Time: 6/22/07 - 12:30pm-1:30pm
Survey Personnel: Becky Holland
Survey Activity: checked traps
Weather: sunny, 80 degrees
Target Findings: none

Date - Time: 6/24/07 - 11:15am-12:15pm
Survey Personnel: Brian Harmon
Survey Activity: checked traps
Weather: 77 degrees; sunny
Target Findings: One (1) fowlers toad found
in trap along drift fence array # 1.

Date - Time: 6/26/07 - 1:00pm-2:00pm
Survey Personnel: Becky Holland
Survey Activity: checked traps

Weather: 88 degrees, sunny
Target Findings: Observed red-tailed hawk
near drift fence array # 2.

Date - Time: 6/27/07 - 2:00pm-3:00pm
Survey Personnel: Brian Harmon
Survey Activity: checked traps
Weather: sunny, 83 degrees
Target Findings: One (1) green frog in trap
along drift fence array #2.

Date - Time: 6/29/07 - 1:30pm-2:30pm
Survey Personnel: Brian Harmon
Survey Activity: checked traps, repair fence
Weather: partly cloudy, 89 degrees
Target Findings: One (1) fowlers toad found
in trap along drift fence array # 1.

Date - Time: 7/1/07 - 3:30pm-4:30pm
Survey Personnel: Brian Harmon
Survey Activity: checked traps, visual
survey
Weather: 76 degrees; sunny
Target Findings: green frog

Date - Time: 7/3/07 - 1:00pm-2:00pm
Survey Personnel: Becky Holland
Survey Activity: checked traps
Weather: sunny, 78 degrees
Target Findings: none

Date - Time: 7/5/07 - 2:00pm-3:00pm
Survey Personnel: Becky Holland
Survey Activity: checked traps, visual
survey
Weather: 81 degrees; rain showers
Target Findings: none

Date - Time: 7/7/07 - 2:45pm-3:45pm
Survey Personnel: Brian Harmon
Survey Activity: checked traps
Weather: 91 degrees; sunny
Target Findings: none

Date - Time: 7/8/07 - 1:00pm-2:00pm
Survey Personnel: Becky Holland

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Survey Activity: checked traps

Weather: sunny, 92 degrees

Target Findings: none

Date -- Time: 7/9/07 - 1:15pm-2:15pm

Survey Personnel: Brian Harmon

Survey Activity: checked traps

Weather: sunny, 95 degrees

Target Findings: none

Date -- Time: 7/11/07 - 2:30pm-3:30pm

Survey Personnel: Brian Harmon

Survey Activity: checked traps

Weather: 84 degrees; sunny

Target Findings: none

Date -- Time: 7/13/07 - 8:00am-10:00am

Survey Personnel: Becky Holland

Survey Activity: checked and closed traps, visual survey

Weather: 87 degrees; sunny

Target Findings: none

Date -- Time: 9/1/07 - 8:00am-8:45am

Survey Personnel: Becky Holland

Survey Activity: open traps

Weather: 68 degrees

Target Findings: none

Date -- Time: 9/3/07 - 11:00am-12:00pm

Survey Personnel: Becky Holland, Ryan

O'keefe

Survey Activity: check traps. Repairs made to smashed traps and fence on array #, traps #4 and #2.

Weather: 85 degrees, mostly sunny

Target Findings: none

Date -- Time: 9/4/07 - 12:00pm-3:00pm

Survey Personnel: Al Newman, Becky Holland

Survey Activity: check traps, visual survey

Weather: 79 degrees

Target Findings: none

Date -- Time: 9/6/07 - 8:00am-9:30am

Survey Personnel: Becky Holland, Ian Caldwell

Survey Activity: check traps, visual survey

Weather: 65 degrees, some clouds

Target Findings: none

Date -- Time: 9/8/07 - 12:00pm-1:00pm

Survey Personnel: Becky Holland

Survey Activity: check traps, visual survey

Weather: 87 degrees, sunny

Target Findings: none

Date -- Time: 9/10/07 - 8:00am-9:00am

Survey Personnel: Rory Wavershak, Ryan O'keefe

Survey Activity: check traps; repair fence at both arrays; repair/replace traps along array #2

Weather: overcast, 85 degrees

Target Findings: green frog in trap on array #1.

Date -- Time: 9/12/07 - 8:00am-9:30am

Survey Personnel: Rory Wavershak

Survey Activity: check traps, visual survey

Repairs made to sections of fence on drift fence array # 2. No traps damaged however fence was repaired in between trap # 3 through trap # 6 on drift fence array # 1.

Weather: 64 degrees

Target Findings: none

Date -- Time: 9/14/07 - 12:00pm-1:00pm

Survey Personnel: Rory Wavershak

Survey Activity: check traps, visual survey

Weather: 79 degrees

Target Findings: garter snake in trap on array #1

Date -- Time: 9/15/07 - 8:00am-9:00am

Survey Personnel: Becky Holland

Survey Activity: check traps, visual survey

Weather: cloudy, 62 degrees

Target Findings: none

Date -- Time: 9/17/07 - 8:00am-9:00am

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Survey Personnel: Katie Kinsella
Survey Activity: check traps
Weather: 65 degrees, partly cloudy
Target Findings: none

Date -- Time: 9/19/07 -- 12:00pm-2:00pm
Survey Personnel: Becky Holland
Survey Activity: check traps, visual survey
Weather: 77 degrees, mostly sunny
Target Findings: fence lizards

Date -- Time: 9/21/07 -- 8:00am-9:00am
Survey Personnel: Becky Holland
Survey Activity: check traps
Weather: 67 degrees
Target Findings: box turtle in trap on array #1

Date -- Time: 9/22/07 -- 12:00pm-1:00pm
Survey Personnel: Becky Holland, Ryan O'keefe
Survey Activity: check traps, visual survey
New fence installed to replace damaged fence from traps #3 to trap #7 on drift fence array #1.
Weather: cloudy, 85 degrees
Target Findings: none

Date -- Time: 9/24/07 -- 8:00am-9:00am
Survey Personnel: Rory Wavershak
Survey Activity: check traps
Weather: sunny, 74 degrees
Target Findings: none

Date -- Time: 9/26/07 -- 12:00pm-1:00pm
Survey Personnel: Rory Wavershak
Survey Activity: check traps, visual survey
Weather: sunny, 90 degrees
Target Findings: none

Date -- Time: 9/28/07 -- 8:00am-11:00am
Survey Personnel: Becky Holland
Survey Activity: check traps, visual survey
Weather: 72 degrees
Target Findings: none

Date -- Time: 9/29/07 -- 8:00am-10:00am
Survey Personnel: Becky Holland
Survey Activity: check traps, visual survey
Weather: 72 degrees
Target Findings: none

Date -- Time: 10/1/07 -- 9:00am-10:00am
Survey Personnel: Rory Wavershak
Survey Activity: check traps
Weather: sunny, 69 degrees
Target Findings: none

Date -- Time: 10/3/07 -- 12:00pm-1:45pm
Survey Personnel: Rory Wavershak
Survey Activity: check traps, visual survey
Weather: sunny, 79 degrees
Target Findings: none

Date -- Time: 10/5/07 -- 8:00am-9:00am
Survey Personnel: Rebecca Holland
Survey Activity: check traps
Weather: 73 degrees, few clouds
Target Findings: none

Date -- Time: 10/6/07 -- 8:00am-9:30am
Survey Personnel: Becky Holland
Survey Activity: check traps, visual survey
Repair fence and trap by trap # 10 on drift array # 1.
Weather: overcast, 63 degrees
Target Findings: none

Date -- Time: 10/8/07 -- 8:00am-9:00am
Survey Personnel:
Survey Activity: check traps
Weather: sunny, 70 degrees
Target Findings: none

Date -- Time: 10/10/07 -- 12:00pm-1:00pm
Survey Personnel: Rory Wavershak
Survey Activity: check traps, visual survey
Weather: partly cloudy, 82 degrees
Target Findings: none

Date -- Time: 10/12/07 -- 8:30am-9:15am
Survey Personnel: Becky Holland

Survey Activity: check traps
Weather: 56 degrees
Target Findings: none

Date - Time: 10/13/07 - 8:00am-9:00am
Survey Personnel: Becky Holland
Survey Activity: check traps, visual survey
Weather: 43 degrees, cloudy
Target Findings: none

Date - Time: 10/15/07 - 9:00am-10:00am
Survey Personnel: Rory Wavershak
Survey Activity: check traps
Weather: partly cloudy, 70 degrees
Target Findings: none

Date - Time: 10/17/07 - 12:00pm-1:00pm
Survey Personnel: Rory Wavershak
Survey Activity: check traps, visual survey
Weather: 75 degrees
Target Findings: none

Date - Time: 10/19/07 - 8:00am-11:00am
Survey Personnel: Becky Holland
Survey Activity: check traps, visual survey
Weather: rain, 69 degrees
Target Findings: none

Date - Time: 10/21/07 - 8:00am-9:30am
Survey Personnel: Becky Holland
Survey Activity: check traps, visual survey
Weather: 67 degrees
Target Findings: none

Date - Time: 10/23/07 - 8:00am-9:00am
Survey Personnel: Rory Wavershak

Survey Activity: check traps
Weather: 76 degrees
Target Findings: none

Date - Time: 10/24/07 - 12:00pm-2:45pm
Survey Personnel: Ryan O'keefe
Survey Activity: check traps, visual survey
Replace traps 1 through 3 on drift fence
array #1. Repair damage to fence in same
area.
Weather: 77 degrees, rain
Target Findings: none

Date - Time: 10/26/07 - 8:00am-9:00am
Survey Personnel: Becky Holland
Survey Activity: check traps
Weather: 56 degrees, rain
Target Findings: none

Date - Time: 10/28/07 - 8:00am-9:00am
Survey Personnel: Becky Holland
Survey Activity: check traps, visual survey
Weather: rain, 63 degrees
Target Findings: none

Date - Time: 10/29/07 - 8:00am-9:00am
Survey Personnel: Rory Wavershak
Survey Activity: check traps
Weather: partly cloudy, 42 degrees
Target Findings: none

Date - Time: 10/31/07 - 9:00am-1:00pm
Survey Personnel: Al Newman
Survey Activity: check & pull traps
Weather: sunny, 57 degrees
Target Findings: none

D. Plant Species

Areas of suitable habitat for the concerned species located on the site are mainly associated with the disturbance resulting from construction of the existing groundwater extraction expansion (See *Figure 13. Plant Survey Map*). The survey areas for each target plant species were designed to adequately cover all areas of suitable habitat for each particular species. Additional areas versus that identified in the protocol were added per verbal communication with PC review staff. The extent of the survey area for each species was inspected in its entirety on each survey date targeting that particular species

Pine Barrens Gentian

There are no nearby populations known to TEC, however control populations in both Burlington and Cape May Counties were monitored to confirm flowering during the survey period.

Yellow Fringed Orchid

There are no nearby populations known to TEC.

Knieskern's Beaked Rush

There are no nearby populations known to TEC, however control populations in Cape May County were monitored to confirm blooming/fruiting during the survey period so achenes would be mature.

FIELD DATA LOGS: Threatened/Endangered Plant Survey

Date -- Time: 5/24/07 -- 10:00am-11:00am

Survey Personnel: Al Newman

Survey Activity: Conduct visual survey for additional target plant species habitat.

Target Findings: none

Date -- Time: 7/14/07 -- 3:00pm-4:00pm

Survey Personnel: Al Newman, John Parke

Survey Activity: Conduct visual survey for Yellow-fringed Orchid.

Target Findings: none

Date -- Time: 7/31/07 -- 8:00am-9:00am

Survey Personnel: Al Newman, Becky Holland

Survey Activity: Conduct visual survey for Yellow-fringed Orchid.

Target Findings: none

Date -- Time: 8/4/07 -- 2:30pm-3:30pm

Survey Personnel: Al Newman

Survey Activity: Conduct visual survey for Yellow-fringed Orchid.

Target Findings: none

Date -- Time: 8/22/07 -- 5:30pm-6:30pm

Survey Personnel: Al Newman

Survey Activity: Conduct visual survey for Yellow-fringed Orchid and Knieskern's Beaked-rush.

Target Findings: none

Date -- Time: 9/4/07 -- 1:00pm-1:45pm

Survey Personnel: Al Newman
Survey Activity: Conduct visual survey for Knieskern's Beaked-rush.
Target Findings: none

Date -- Time: 9/26/07 -- 1:30pm-2:30pm
Survey Personnel: Al Newman, Katie Kinsella, Becky Holland
Survey Activity: Conduct visual survey for Pine Barrens Gentian and Knieskern's Beaked-rush.
Target Findings: none

Date -- Time: 9/28/07 -- 11:15am-12:15pm
Survey Personnel: Al Newman, Ryan O'keefe
Survey Activity: Conduct visual survey for Pine Barrens Gentian.
Target Findings: none

Date -- Time: 10/2/07 -- 8:00am-9:00am
Survey Personnel: Al Newman, Anthony Silva
Survey Activity: Conduct visual survey for Pine Barrens Gentian and Knieskern's Beaked-rush.
Target Findings: none

Date -- Time: 10/12/07 -- 3:30pm-4:30pm
Survey Personnel: Al Newman
Survey Activity: Conduct visual survey for Pine Barrens Gentian and Knieskern's Beaked-rush.
Target Findings: none

V. RESULTS

A. Barred Owl

Traffic noise and barking dogs were the dominant noises noted on each vocalization survey night.

Vocalization Survey

There were no return calls heard during the vocalization broadcasts conducted during the March-April 2007 survey.

Visual Survey

There were no cavity nests or physical evidence of owl presence found during the visual survey efforts.

Table 1. Bird species observed and/or heard during the 2007 survey.

Common Name	Scientific Name
American Crow	<i>Corvus brachyrhynchos</i>

American Robin	<i>Turdus migratorius</i>
American Woodcock	<i>Scolopax minor</i>
Carolina Chickadee	<i>Parus carolinensis</i>
Blue Jay	<i>Cyanocitta cristata</i>
Brown Creeper	<i>Certhia americana</i>
Common Grackle	<i>Quiscalus quiscula</i>
Cooper's Hawk	<i>Accipiter cooperii</i>
European Starling	<i>Sturnus vulgaris</i>
Gray Catbird	<i>Dumetella carolinensis</i>
Gull	<i>Larus sp.</i>
House Finch	<i>Carpodacus mexicanus</i>
House Sparrow	<i>Passer domesticus</i>
Mourning Dove	<i>Zenaidura macroura</i>
Northern Cardinal	<i>Cardinalis cardinalis</i>
Red-bellied Woodpecker	<i>Melanerpes carolinus</i>
Red-tailed Hawk	<i>Buteo jamaicensis</i>
Turkey Vulture	<i>Cathartes aura</i>
White-breasted Nuthatch	<i>Sitta canadensis</i>

B. Cooper's Hawk

A Cooper's Hawk was observed on-site on two (2) occasions during the 2007 survey. The first was on March 19 where the bird was both observed and heard during visual survey efforts, and the second was on April 11 during the vocalization survey.

Vocalization Survey

During the April 11 vocalization survey date there was a positive vocal response from a target individual from survey pt. 1. The bird responded several times to the broadcast call; flew-in to near the broadcast location allowing a positive visual identification; and then flew-off to the south. There were no other target sightings during the vocalization survey.

Visual Survey

Visual survey efforts produced a target sighting where a Cooper's Hawk was observed and heard calling in the western portion of the site (See Figure 7. Bird Survey Map). Also, the remains of a possible avian prey with feathers scattered around was discovered further toward the westernmost corner of the subject property. The possible prey remains were discovered on February 20. Two (2) stick nests were identified on-site; however they did not possess adequate size characteristics typical of that of a successful Cooper's Hawk nest (See Figure 7. Bird Survey Map).

C. Pine Snake

Hibernacula Survey

There were no potential Northern Pine Snake hibernacula identified within the evaluation area. The early season survey, conducted prior to emergence and egress, aimed specifically at locating land features that could serve as potentially suitable hibernacula did not produce any favorable findings. The two (2) small pit-like areas on-site: one mapped as Pits, sand & gravel and shown on the U.S.G.S. quad as a topographical depression and the other shown on the U.S.G.S. quad as a 'claypit' and mapped as Downer loamy sand. The 'claypit' contains eroded, south-facing banks for a potential hibernacula and a small area of bare soil for possible nesting habitat.

Random Opportunistic Sampling & Time Constrained

Target snake species were sought during random searches on site, and our office found several species of snakes. Non-target snake species were found basking along open areas adjacent to dense woodlands and under debris piles within the study area. Reptile activity was found to be fair during warm days during the survey period and higher during the early mornings of mid June and July.

Trapping

Traps captured non-target snakes such as northern black racer, black rat, and eastern garter snakes in addition to other reptilian species like northern fence lizard, eastern box turtle, five-lined skink, and northern fence lizard. Amphibian captures include many Fowler's toads during the spring survey in addition to bullfrog and green frog.

There were no target captures made of Northern Pine Snake.

Table 2. Reptiles/amphibians species observed and/or captured during the 2007 survey.

<u>Common Name</u>	<u>Scientific Name</u>
Eastern Garter Snake	<i>Thamnophis s. sirtalis</i>
Fowler's Toad	<i>Bufo woodhouseii fowlerii</i>
Northern Black Racer	<i>Coluber c. constrictor</i>
Northern Fence Lizard	<i>Sceloporus hyacinthinus</i>
Five-lined Skink	<i>Eumeces fasciatus</i>
Eastern Box Turtle	<i>Terrapene c. carolina</i>
Green Frog	<i>Rana clamitans melanota</i>

D. Plant Species

There were no individuals or colonies of the three (3) targeted species, nor any other threatened/endangered plants species, observed during the 2007 survey. Presented below is a table of plants observed.

Table 3. Plant species observed during the 2007 survey.

<u>Common Name</u>	<u>Scientific Name</u>
Pitch Pine	<i>Pinus rigida</i>
Eastern Redcedar	<i>Juniperus virginiana</i>
Scrub Oak	<i>Quercus illicifolia</i>
Sassafras	<i>Sassafras albidum</i>
Scarlet Oak	<i>Quercus coccinea</i>
White Oak	<i>Quercus alba</i>
Black Oak	<i>Quercus velutina</i>
Sheep Laurel	<i>Kalmia angustifolia</i>
Red Maple	<i>Acer rubrum</i>
Pennsylvania sedge	<i>Carex pensylvanica</i>
American Holly	<i>Ilex opaca</i>
Sweetgum	<i>Liquidambar styraciflua</i>
Green Ash	<i>Fraxinus pennsylvanica</i>
Black Cherry	<i>Prunus serotina</i>
Black Gum	<i>Nyssa sylvatica</i>
Winged Sumac	<i>Rhus copallina</i>
Gray Birch	<i>Betula populifolia</i>
Highbush blueberry	<i>Vaccinium corymbosum</i>
Mountain Laurel	<i>Kalmia latifolia</i>
Lowbush blueberry	<i>Vaccinium vacillans</i>
Southern Arrowwood	<i>Viburnum dentatum</i>
Multiflora Rose	<i>Rosa multiflora</i>
Black huckleberry	<i>Gaylussacia baccata</i>
Greenbrier	<i>Smilax rotundifolia</i>
Inkberry	<i>Ilex glabra</i>
Sweet pepperbush	<i>Clethra alnifolia</i>
Poison Ivy	<i>Rhus radicans</i>
Common dandelion	<i>Taraxacum</i> spp.
Common Reed	<i>Phragmites australis</i>
Lance-leaved violet	<i>Viola lanceolata</i>
False Indigo	<i>Baptisia australis</i>
Oxeye daisy	<i>Leucanthemum vulgare</i>
Switchgrass	<i>Panicum virgatum</i>
Soft Rush	<i>Juncus effusus</i>

Teaberry	<i>Gaultheria procumbens</i>
Sweetfern	<i>Comptonia peregrina</i>
Virginia Creeper	<i>Parthenocissus quinquefolia</i>
Goldenrod*	<i>Solidago</i> spp.
Spotted Knapweed	<i>Centaurea maculosa</i>
Hairy Hawkweed	<i>Heiracium gronovii</i>
English Plantain	<i>Plantago lanceolata</i>
Daisy Fleabane	<i>Erigeron annuus</i>
Whorled loosestrife	<i>Lysimachia quadrifolia</i>
Goat's rue	<i>Tephrosia virginiana</i>
Round-leaved boneset	<i>Eupatorium rotundifolium</i>
Partridge pea	<i>Chamaecrista fasciculata</i>
Wand-like bush clover	<i>Lespedeza intermedia</i>
Fragrant Goldenrod	<i>Solidago odora</i>
Mugwort	<i>Artemisia vulgaris</i>
Cudweed	<i>Pseudognaphalium maccouni</i>
Toothed white top aster	<i>Aster paternus</i>
Beggar ticks	<i>Bidens</i> spp.
Green spike-rush	<i>Eleocharis olivacea</i>
Rabbit foot clover	<i>Trifolium arvense</i>
Bracted plantain	<i>Plantago aristata</i>
Hyssop-leaved boneset	<i>Eupatorium hyssopifolium</i>
Path rush	<i>Juncus tenuis</i>
Grape	<i>Vitis</i> spp.
Heal-all	<i>Prunella vulgaris</i>
Twig rush	<i>Cladium mariscoides</i>
Butterfly weed	<i>Asclepias tuberosa</i>
Hairy bush clover	<i>Lespedeza hirta</i>
Bayberry	<i>Myrica pensylvanica</i>
Strawberry	<i>Fragaria virginiana</i>
Common reed	<i>Phragmites communis</i>
Broad-leaved cattail	<i>Typha latifolia</i>
Wood sorrel	<i>Oxalis acetosella</i>
Little bluestem	<i>Schizachyrium scoparium</i>
Smooth Crabgrass	<i>Digitaria ischameum</i>
Pokeweed	<i>Phytolacca americana</i>
Winged Sumac	<i>Rhus copallina</i>
Common Milkweed	<i>Asclepias syriaca</i>
Ailanthus	<i>Ailanthus altissima</i>
Small-headed beaked rush	<i>Rhynchospora capitellata</i>
Blazing star	<i>Liatris graminifolia</i>

*not wand-like goldenrod (*Solidago stricta*)

VIII. DISCUSSION

With the exception of Cooper's Hawk, TEC determined an absence of the targeted threatened/endangered flora and fauna on the site.

A. Barred Owl

Barred Owl (*Strix varia*). State Threatened

Barred Owls are forest dwellers which rarely stray from forested swamps, or other mature old growth woodlands. Nesting habitat for this species requires extensive contiguous forests containing large, mature trees and snags for suitable cavity nests. Tree specimens with a DBH of twenty (20) inches or greater are considered to be indicative of suitable nesting habitat. Nest sites are usually at a minimum of twenty-five (25) feet above the ground and may be a cavity, broken tree top, crotch of a tree, or an abandoned raptor, crow or squirrel nest. Foraging usually occurs in and along open areas where prey can be easily seen, but because of the ability to pounce on prey rather than swoop, Barred Owls are able to forage in dense Pine Barrens habitats. During the breeding season (typically early March through April), this species is highly territorial to intraspecific competitors. Home range size is highly variable according to location and habitat type. In eastern North America home range sizes of two hundred thirteen (213) to nine hundred fourteen (914) acres have been documented (Johnsgard 1988), and it has been suggested that southern New Jersey home ranges are relatively larger due to low productivity of the habitat.

The following factors should be considered when evaluating a property for potentially critical Barred Owl habitat:

- Locational factors, such as proximity to development, density of development, other human factors, and agricultural lands
- Forest block size and community
- Vegetative factors such as forest age, canopy height, species composition, stem density
- Competitor influences

The project site is vacant and consists of woodland habitat. Woodland habitat on-site lacks mature stands to provide potential nesting cavities. The landscape in the immediate area of the subject property is significantly developed with multi-family housing; commercial development; school facilities; and road and utility infrastructure resulting in forest fragmentation. Such forest fragmentation and overall degradation ultimately results in an inability to viably support species requiring a relatively large home range of contiguous forest habitat such as Barred Owl. Although the property is surrounded by heavily traveled roadways and is situated within a significantly developed landscape containing many human disturbance factors, the surrounding landscape does contain extensive tracts of forest containing core forested wetland habitat. Consequently, TEC

determined that there was minimal potential for Barred Owls to forage on the site. Significant noise disturbances produced by vehicular traffic, air traffic, and barking dogs from the adjacent development were noted during night vocalization surveys.

Based upon the absence results of the directed vocalization and visual surveys, combined with the above habitat suitability comments, critical habitat for any local Barred Owl population is not present on the subject property.

B. Cooper's Hawk

Cooper's Hawk (*Accipiter cooperii*), State Threatened

Cooper's Hawks prefer deciduous or mixed deciduous woodlands, especially those with greater ecotone area. Farm woodlots, coniferous forest, and coastal dunes also have been reported. Spring migration north usually occurs from late February through March with migrants arriving in the breeding habitat in March. Platform nests of sticks and twigs are usually constructed in the crotch of a deciduous or coniferous tree at a minimum of twenty (20) feet above the ground. This species, which is historically known to prefer extensive forest tracts, primarily feeds on other birds. Residential bird feeders, where avian prey congregate, have become common sighting locations for this species.

Due to the success of the rebounding population as a result of their ability to adapt to and cope with growing development and human activity, Cooper's Hawk has been recommended for delisting by the New Jersey Department of Environmental Protection (NJDEP) Endangered and Non-Game Species (ENSP) Advisory Committee. The primary reason for delisting, which is likely to take effect later this year, is the fact that this raptor has shown the ability to not only adapt to, but thrive in, a fragmented landscape and the population appears to have been consistently growing in size in recent years.

There were two (2) on-site Cooper's Hawk sightings during the survey, where on each occasion the individual was positively identified both vocally and visually. There were also two (2) relatively small stick nest structures found in roughly the western portion of the site. However, they were not of a size consistent with that of a successful Cooper's Hawk nest. And although the western portion of the site was the location of the on-site observations, no Cooper's Hawks were actually observed on either of the nest trees.

The possible avian prey remains were found during the early part of the spring migration period. This may have been prey taken by an adult moving to higher latitude or possibly a sedentary bird. The lack of further prey findings, plucking posts, and additional target sightings does not suggest the foraging habitat on-site is critical to the survival of any local population.

The 2007 survey concluded an absence of any habitat critical to the survival of any local Cooper's Hawk population, whether it be foraging or nesting. Consequently, the project is consistent with the CMP standards with respect to this species.

C. Pine Snake

Northern Pine Snake (*Pituophis m. melanoleucus*), State Threatened

Northern Pine Snakes are a fossorial species limited to sandy soil habitats of the New Jersey Pine Barrens. Sandy, infertile soil provides areas with limited vegetation and is a necessary medium for potential nesting sites. Dry, sandy, pine-oak to oak-pine woodlands with open canopy areas are indicative of potential foraging habitat for the species. In mid spring, usually April in New Jersey, Pine Snakes begin emerging from their hibernacula. Dens may be dug at the bases of old decaying stumps, in abandoned mammal burrows, or other suitable refugia. Later in the spring and even into early summer, males may actively seek out females laying pheromone trails and attempt to mate with them. During the months of June and early July, gravid female Pine Snakes find sunny open areas where they proceed to dig roughly meter-long horizontal tunnels ending in a chamber. The female lays three (3) to sixteen (16) eggs in this chamber and then leaves the nest. During early fall, Pine Snakes may follow scent trails back to their original overwintering sites or seek out another suitable hibernaculum. Cold weather in mid October or early November will promote the descent of the snakes into the hibernacula, where they will remain until spring emergence.

Throughout its range, Pine Snakes are nearly always associated with dry upland forests, most often with pine woods (Connant 1975, Woodward & Barthakrus 1992). Adequate Pine Snake habitat is primarily found within dry pine-oak forest types growing on very infertile sandy soils such as Lakehurst or Lakewood sands (Burger and Zappalorti 1988, 1989). A recent study conducted by the New Jersey Fish and Wildlife, which focused on habitat components of forest cover and soils mapping, identified approximately 2.54% of the total land area represented by Ocean, Cumberland, Cape May, Atlantic, and Burlington Counties as potential Northern Pine Snake habitat.

Features of suitable habitat are present on-site for Pine Snake. There are two (2) small pit-like areas on-site: one mapped as Pits, sand & gravel and shown on the U.S.G.S. quad as a topographical depression and the other shown on the U.S.G.S. quad as a 'claypit' and mapped as Downer loamy sand. Foraging habitat is present within debris piles, and roadways and other open-canopy areas provide basking habitat. Although suitable habitat features are present on the subject property, TEC concluded in its original habitat suitability assessment that it would be highly unlikely that a population of Pine Snakes would be present on, or utilize, the site. Home ranges for Pine Snakes typically exceed the area of woodlands on-site with contiguous habitat. The contiguous woodland habitat associated with that on-site is surrounded by U.S. Rt. 40, U.S. Rt. 322 with concrete divider, and Cologne Avenue which serves as a connector between the previous two. This essentially creates a barrier to viable snake movement and would produce dead-on-road specimens.

PC suggests directed Pine Snake surveys be initiated no later than May 1 and continue through July 15 for the spring survey, and then resume no later than September 1 and

continue through October 15 for the fall portion of the survey. It should be noted that TEC initiated the spring survey on April 17, and extended the fall survey to October 31. Warm and favorable weather conditions, including nightly low temperatures, persisted through almost exactly to the end of October. Also, the spring survey ended on July 13 due to extreme heat (note: extremely hot weather typically initiates around this time of year and traps are sometimes closed very near the July 15 end date if weather detrimental to trapped herpetile species). These actual survey periods provide a total of twenty seven (27) more days (11 spring, 16 fall) than the minimum suggested by the PC. Due to the juxtaposition of the site to townhouse communities; a major retail shopping area; and schools vandalism to the silt fence trap arrays occurred during the spring and fall surveys. Portions of array TEC maintained, through repair and replacement of materials, the integrity of the trap lines as vigorously as possible to ensure the quality of the survey. Portions of array #2 fencing were noted down and traps vandalized on May 7. Fence and trap repairs were made that date and two (2) traps were replaced May 12. Varying portions of array 2 was vandalized periodically through June, where fence and trap repairs and trap replacement was necessary. Array 1 required minor fence maintenance during June. On September 6 PC noted a 'significant' portion of array 1 was down, and array 2 had a small portion of fence down with two (2) traps missing. TEC repaired and replaced fence and/or traps on September 10 to bring both lines fully operational. The two (2) 500 L.F. drift fences were placed in the most optimal locations to intercept any snake movement on the site. The survey retained its quality and did produce an inventory of herpetile species in the evaluation area of four (4) reptile species, including two (2) snake species, and two (2) amphibian species. For all of these reasons, the snake survey remains valid in its goal in identifying the presence/absence of Pine Snakes and critical Pine Snake habitat in the evaluation area, despite the vandalism.

Based upon the absence results of the directed survey, the site location and its physical characteristics, Pine Snakes are not present on, or utilizing, the subject property and evaluation area. As a result, critical habitat for any local Pine Snake population is not present on the subject property.

D. Plant Species

With the exception of Yellow-fringed Orchid, control populations of the targeted plant species were monitored during the period of directed survey work conducted on-site.

Pine Barrens Gentian (*Gentiana autumnalis*), Pinelands Listed

Pine Barrens Gentian has a slender stem that is simple, or occasionally branched, and reaches approximately six (6) to eighteen (18) inches in height. The narrow, linear leaves are opposite and reach two (2) inches in length. The flowers may be solitary, or two (2) to three (3), and are found at the tops of the stems or branches. The flowers are large with five (5) widely spreading lobes from a deep, tube-like corolla. The outside of the corolla is a vivid, light blue and brown speckled within. Pine Barrens Gentian blooms from roughly September through early October and is usually found in moist, open sandy barrens and in bogs.

Yellow-fringed Orchid (*Habenaria ciliaris*), Pinelands Listed

Yellow-fringed Orchid is found in sandy, peaty bogs and swales. A relatively large golden to orange-yellow spike of flowers blooms from roughly late July to August. The slender spur, about one (1) inch or greater, exceeds the fringed lip of the flower. This species grows to approximately twelve (12) to thirty (30) inches.

Knieskern's Beaked Rush (*Rhynchospora knieskernii*)

Knieskern's Beaked-rush is a grass-like plant, generally considered an annual species, but is currently suspected to be a short-lived perennial where habitat conditions remain stable enough to allow for uninterrupted growth season after season. This plant grows from six-tenths (0.6) of an inch to twenty-four (24) inches, it has slender stems branching from the base, and short, narrow linear leaves. It has numerous small flower clusters that occur at distant intervals along the stem. Knieskern's Beaked-rush is found on naturally occurring early successional habitats and disturbed areas such as burn areas, gravel and clay pits, road cuts, right-of-ways, cleared home sites, eroded areas, cleared edges of Atlantic white-cedar swamps, wheel ruts, muddy swales, etc. Periodic disturbance, natural or human, which helps maintain a damp/wet early successional condition, may be necessary for success of the species. The majority of known existing populations occur on early successional sites created by such human activities as mining, borrow pit excavation, construction of cranberry bogs, and construction of roads, utility lines, and ditches through wetland areas. Fruiting usually occurs from July to September. Blooming and fruiting occurs late July to September. The species is known to occur in Atlantic, Burlington, Camden, Monmouth, and Ocean County, New Jersey.

There were no specimens or colonies of the targeted threatened/endangered plant species identified during the 2007 survey. Consequently, the application is consistent with the CMP threatened/endangered species standards with respect to plants.

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APPENDIX IV.B

THREATENED/ENDANGERED SPECIES (OFF-SITE)

T1351.001
October 27, 2008

OFF-SITE PLANT SPECIES SURVEY REPORT

PINELANDS APPLICATION #2004-0351.002

BLOCK 1134 * LOT 1
HAMILTON TOWNSHIP,
ATLANTIC COUNTY

PREPARED FOR:

HARDING HIGHWAY, LLC
30 WASHINGTON AVENUE, SUITE B-4
HADDONFIELD, NJ 08033

PREPARED BY:

TRIDENT ENVIRONMENTAL CONSULTANTS
134 SOUTH NEW YORK ROAD
GALLOWAY, NEW JERSEY 08205


ALBERT J. NEWMAN
SR. BIOLOGIST

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I. INTRODUCTION

This report summarizes the methodologies, findings, and conclusions of off-site presence/absence surveys for Pine Barrens Reedgrass (*Calamovilfa brevipilis*) and Pine Barrens Gentian (*Gentiana autumnalis*) within the Township of Hamilton, Atlantic County, New Jersey. Both of these species are listed threatened/endangered under the Pinelands Comprehensive Management Plan (CMP).

Correspondence from The Pinelands Commission (PC) dated October 9, 2008 states the need for the surveys at specified off-site wetlands locations (Refer to Appendix A for a copy of the Pinelands review letter). These are off-site wetland locations where development is proposed within three hundred (300) feet.

Trident Environmental Consultants (TEC) reviewed the plan set entitled "Woods Edge General Development Plan", prepared by Taylor, Wiseman & Taylor, sheets 1 through 8, originally dated August 10, 2007.

II. PERSPECTIVE AND SCOPE

Project Site Location

The site is bound by Harding Highway (a.k.a. U.S. Highway Route 40) to the south and Cologne Avenue (a.k.a. County Route 614) to the northwest within Hamilton Township, Atlantic County (See *Figure 1. Project Site Road Map*). There is also a small length of frontage along the southerly side of the Black Horse Pike (a.k.a. U.S. Highway Rt. 322). The parcel is highly irregular in shape and consists of roughly one hundred ten (110) acres.

The project site is found on the U.S.G.S. Mays Landing quadrangle with NAD (1983) state plane coordinates of E(x) – 446206.044, N(y) – 22517.469, at the approximate center of the site (See *Figure 2. Project Site U.S.G.S. Quadrangle Map*).

Off-site Plant Survey Locations

Pine Barrens Reedgrass and Pine Barrens Gentian were sought within areas of potential habitat located across Cologne Avenue from the project site (Refer to *Figure 3. Plant Survey Map 1*). Open to semi-open areas with herbaceous vegetation were included in the survey. This included the Cologne Avenue roadside; herbaceous areas; maintained path and periphery; and other areas. Wooded areas outside of these limits where the herbaceous component becomes absent and mainly needle-litter is present were not included in the survey.

Pine Barrens Reedgrass was also sought within the "depressional area" located across Rt. 40 from the southeastern corner of the project site (Refer to *Figure 4. Plant Survey Map 2*). The limits of this area well-defined by steeply sloping topography.

Soils Mapping

According to the geographic information systems (GIS) data layer for the most recent soil data available from the U.S. Department of Agriculture, the Soil Survey Geographic Database program (SSURGO), four (4) soil types underlay the survey area across Cologne Avenue from the project site (Refer to *Figure 3. Soil Survey Map*). These soils and corresponding map unit symbols are Downer loamy sand (DocB); Galloway loamy sand (GamB); and Matawan sandy loam (MbtB); and Mullica sandy loam (MumA).

Pits, sand & gravel (PHG) is the only soil type associated with the depressional feature.

Downer loamy sand (DocB), 0 to 5% slopes

This soil consists of nearly level to sloping, well-drained soils. The plow layer is dark grayish brown loamy sand about ten (10) inches thick. The subsurface layer is yellowish brown loamy sand six (6) inches thick. The subsoil is yellowish brown sandy loam twelve (12) inches thick. The substratum is yellowish brown loamy sand to a depth of sixty (60) inches.

This soil is medium in natural fertility and low to moderate in organic matter content. Permeability is moderately rapid. Surface runoff is slow, and the hazard of erosion is slight. The available water capacity is moderate. This soil is suited to a variety of vegetables and early crops.

Galloway loamy sand (GamB), 0 to 5 % slopes

The Galloway series consists of deep, moderately well drained soil on uplands. They formed in coarse-textured coastal plain sediments. Typically, these soils have a loamy sand surface layer, 9 inches thick, that is grayish brown in the upper part and light brownish-gray in the lower part. The substratum from 9 to 39 inches is olive yellow loamy sand, and from 39 to 47 inches it is light brownish-gray sand. The 11C horizon from 47 to 0 inches is yellowish brown coarse sand. Slopes range from 0 to 5 percent.

Matawan sandy loam (MbtB), 5 to 10 % slopes

The surface layer is dark grayish-brown sandy loam 7 inches thick. The subsurface layer is light yellowish-brown sandy loam 9 inches thick. The subsoil is light yellowish-brown or olive-yellow sandy loam and clay loam 26 inches thick. The substratum, between depths of 42 and 60 inches, is pale olive, stratified clay loam, sandy clay, and sandy clay loam. It has light-gray mottles.

Included with this soil in mapping are areas of soils that have a surface layer of loamy sand. Also included are areas of Sassafras and Aura soils in slightly higher positions than those of this

soil and areas of very poorly drained Pocomoke soils in narrow drainageways. Some areas have been cleared so that fruits and vegetables can be grown, but most areas are wooded.

Mullica sandy loam (MumA)

This nearly level, very poorly drained soil is in depressional areas and on broad flats. The areas are irregular in shape and range from about fifteen (15) to one hundred and fifty (150) acres.

Typically, the surface layer is black sandy loam about twelve (12) inches thick. The subsoil is thirteen (13) inches of grayish brown and light brownish gray sandy loam and has light olive brown mottles in the lower part. The substratum extends to a depth of sixty (60) inches or more. It is light brownish gray loamy sand to a depth of thirty-six (36) inches and light brownish gray sand at a depth of more than thirty-six (36) inches.

The permeability of this soil is moderate in the subsoil and moderately rapid in the substratum. If the soil is drained, available water capacity is moderate, but water is available to plants from the water table. The seasonal high water table is at the surface from November to June. Some areas have water ponded on the surface. In summer, the water table generally is at a depth of two (2) to three (3) feet, but is as deep as five (5) feet in places during extended dry periods. Areas adjacent to perennial streams are subject to occasional flooding. Organic matter content of the soil is high, and natural fertility is medium. Runoff is very slow, tilth is good, and the soil is easily worked when drained.

This soil is suitable for pasture if drainage, proper seeding, proper stocking, and pasture rotation are used. It is also suited to trees. Common species are blackgum, sweetgum, red maple, bay magnolia, pin oak, willow oak, pitch pine, swamp white oak, Atlantic white-cedar, southern red oak, and holly.

Pits, Sand & Gravel (PHG)

This unit consists of deep excessively drained to very poorly drained soil material that is dominantly made up of the soil in a burrow pit, gravel pit, or clay pit during mining or after mining has taken place. The soil material in this unit is primarily sandy and is five (5) to thirty-five (35) percent gravel. The material is mostly strongly acidic. Permeability is variable. Available water capacity is low in sandy areas and moderate in clayey areas

III. TARGET SPECIES

Table 1, below identifies the targeted plant species surveyed at the off-site locations specified in Pinelands Commission correspondence dated October 9, 2008. General descriptions of typical habitat for each species follow the table.

Table 1. Target Species

<u>Common Name</u>	<u>Scientific Name</u>
Pine Barrens Reedgrass	<i>Calamovilfa brevipilis</i>
Pine Barrens Gentian	<i>Gentiana autumnalis</i>

Pine Barrens Reedgrass (*Calamovilfa brevipilis*), Pinelands Listed

Pine Barrens Reedgrass, also known as Pine Barrens Sandreed, is roughly two (2) to four (4) feet tall perennial with a slender, erect stem rising from short, thick rhizomes. It is found within bogs, swamps, and pitch pine lowlands of the Pine Barrens. Flowering typically occurs from early July to late August with one-flowered spikelets (less than ¼" long) arranged in a somewhat open, purple-colored panicle reaching up to ten (10) inches long. Leaf blades are relatively long and linear.

Pine Barrens Gentian (*Gentiana autumnalis*), Pinelands Listed

Pine Barrens Gentian has a slender stem that is simple, or occasionally branched, and reaches approximately six (6) to eighteen (18) inches in height. The narrow, linear leaves are opposite and reach two (2) inches in length. The flowers may be solitary, or two (2) to three (3), and are found at the tops of the stems or branches. The flowers are large with five (5) widely spreading lobes from a deep, tube-like corolla. The outside of the corolla is a vivid, light blue and brown speckled within. Pine Barrens Gentian blooms from roughly September through early October and is usually found in moist, open sandy barrens and in bogs.

IV. MATERIALS AND METHODS

Trident Environmental Consultants staff ranged from one (1) to two (2) people on any given day during the 2008 survey. Three (3) days were spent in the field for a total of twenty (20) person-hours expended conducting the off-site surveys (this hourly total does not include checking control populations). Refer to Appendix B for statements of qualifications for TEC staff responsible for performing the survey.

Field data logs are provided below.

FIELD DATA LOGS: Threatened/Endangered Plant Survey

Date – Time: 10/17/08 – 6 person-hrs.

Survey Personnel: Al Newman

Survey Activity: Check control populations of both target species to verify identifiability in the field. Conduct visual survey for Pine Barrens Reedgrass at the off-site depressional wetland area located across Rt. 40. Conduct visual survey for Pine Barrens Reedgrass and Pine Barrens Gentian in areas across Cologne Avenue from the project site.

Target Findings: none

Date – Time: 10/21/08 – 10 person-hrs.

Survey Personnel: Al Newman, Katie Kinsella

Survey Activity: Conduct visual survey for Pine Barrens Reedgrass at the off-site depressional wetland area located across Rt. 40. Conduct visual survey for Pine Barrens Reedgrass and Pine Barrens Gentian in areas across Cologne Avenue from the project site.

Target Findings: Pine Barrens Reedgrass found across Cologne Avenue from the project site within a small open area. Several clumps were observed here between wetland delineation points O-15 and O-16.

Date – Time: 10/23/08 – 4 person-hrs.

Survey Personnel: Al Newman

Survey Activity: Conduct visual survey for Pine Barrens Reedgrass at the off-site depressional wetland area located across Rt. 40. Conduct visual survey for Pine Barrens Reedgrass and Pine Barrens Gentian in areas across Cologne Avenue from the project site.

Target Findings: No additional findings.

A. Pine Barrens Reedgrass

A control population located in Maurice River Township, Cumberland County was visited to confirm the species was identifiable in the field during the survey period (Refer to Appendix C for Survey Photographs).

B. Pine Barrens Gentian

A control population located in Upper Township, Cape May County was visited to confirm the species was identifiable in the field during the survey period. Pine Barrens Gentian was visible in both bloom and bud at this control population on October 17, 2008 (Refer to Appendix C for Survey Photographs). A population in Egg Harbor Township, Atlantic County was also confirmed to still be in bloom during the October survey period.

V. RESULTS

A. Pine Barrens Reedgrass

There were no clumps or colonies of Pine Barrens Reedgrass (*Calamovilfa brevipilis*) observed within the off-site depressional wetland survey area across Rt. 40 from the southeastern corner of the project site.

However, Pine Barrens Reedgrass was determined present in the survey area across Cologne Avenue. In a small patch of herbaceous vegetation located between wetland delineation points O-15 and O-16 several clumps of Pine Barrens Reedgrass were found (Refer to Appendix C for Survey Photographs).

B. Pine Barrens Gentian

There were no individuals or colonies of Pine Barrens Gentian (*Gentiana autumnalis*) observed within the off-site survey area across Cologne Avenue during the 2008 survey.

VIII. DISCUSSION

A. Pine Barrens Reedgrass

The Pinelands Commission requested a survey for Pine Barrens Reedgrass (*Calamovilfa brevipilis*) at two (2) locations off-site locations to the subject property of the application known as Block 1134, Lot 1, Hamilton Township, Atlantic County.

TEC visited a control population in Maurice River Township, Cumberland County where Pine Barrens Reedgrass (*Calamovilfa brevipilis*) was observed. Since the species was identifiable vegetatively in the field, TEC initiated surveys at the two (2) locations specified by the Pinelands Commission in correspondence dated October 9, 2008.

B. Pine Barrens Gentian

The Pinelands Commission requested a survey for Pine Barrens Gentian (*Gentiana autumnalis*) across Cologne Avenue from the project site known as Block 1134, Lot 1, Hamilton Township, Atlantic County.

TEC visited a control population in Upper Township, Cape May County where Pine Barrens Gentian was observed in both bloom and bud. Blooming was also confirmed at a population in Egg Harbor Township, Atlantic County. Since the species was still identifiable in the field, TEC initiated surveys at the location specified by the Pinelands Commission in correspondence dated October 9, 2008.

There were no individuals or colonies of Pine Barrens Gentian (*Gentiana autumnalis*) observed during the off-site 2008 survey across Cologne Avenue.

C. Summary

The 2008 survey resulted in an absence determination for Pine Barrens Reedgrass (*Calamovilfa brevipilis*) within the isolated freshwater wetlands area located within the confines of the depressional feature located across Harding Highway (a.k.a. Rt. 40) from the southeastern corner of the project site was determined. Based on the absence of a local population, the proposed one hundred seventy five (175) feet buffer to this wetland is consistent with the Pinelands CMP.

The presence of a local Pine Barrens Reedgrass (*Calamovilfa brevipilis*) population was confirmed, however, within the survey area located across Cologne Avenue from the project site. Specifically, several clumps were found between wetland delineation points O-15 and O-16. Based on the plan entitled "General Land Use Plan", prepared by Taylor, Wiseman & Taylor, dated August 10, 2007 and last revised August 13, 2008, the proposed development appears to be approximately four hundred (400) feet from the Pine Barrens Reedgrass (*Calamovilfa brevipilis*) location. Although located greater than the maximum imposed wetland buffer of three hundred (300) feet from the proposed development, the Pine Barrens Reedgrass (*Calamovilfa brevipilis*) is located within contiguous wetlands where a one hundred seventy five (175) buffer is proposed. Consequently, it appears a three hundred feet (300) wetland buffer here will be required by the Pinelands Commission to maintain consistency with the CMP.

Pine Barrens Gentian (*Gentiana autumnalis*) was also targeted within this survey area but no individuals were observed.

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V. HOUSING PLAN

A. UNIT SUMMARY

<u>AREA (S)</u>	<u>TYPE</u>	<u># OF UNITS</u>
A, D	Single Family	190
B	Affordable Flats	67 – 95*
C	Townhouses	190
Total		447 - 475

* The number of affordable units is dependent upon whether the units will be fee simple or rental.

B. HOUSING OBLIGATION

Section XXIV.5.B of the Township Code provides two options regarding the amount of affordable units. The required set aside is 20% if the affordable units are offered for sale and 15% if they are offered for rent.

At this time, a decision has not been reached regarding which option will be utilized. Based upon the proposed number of 380 market-rate units, the required number of affordable units is 95 for the for-sale option and 67 for the rental option.

Area B has been designed to accommodate the maximum number of 95 affordable units. The actual number to be constructed could be less if the rental options pursued or if the number of market-rate units declines from the proposed total of 380.

VI. LOCAL SERVICE PLAN

SEVICE PROVIDERS

Following is a summary of those public services, which will be provided to the residents of the proposed community;

- 1) Water Service: To be provided by Hamilton Township MUA.
- 2) Sewer Service: To be provided by Hamilton Township MUA.
- 3) Electric Service: To be provided by Conectiv/Atlantic City Electric.
- 4) Gas Service: To be provided by South Jersey Gas.
- 5) Solid Waste Disposal and Recycling: To be provided by Hamilton Township Public Works through curbside pick-up.
- 6) Cable TV: To be provided by Comcast or Verizon.
- 7) Location of Utilities: All utilities will be installed underground in accordance with Township ordinance requirements.

VII. OPEN SPACE PLAN

A. ORDINANCE REQUIREMENTS – OPEN SPACE

Section XXIV.7.A. of the Township Code requires a minimum open space area equal to 40% of the site. For the purpose of this calculation, total open space consists of all areas not covered by buildings or impervious surfaces.

The amount of open space can only be approximated at this point in the process. To determine this approximate amount, the non-open space areas were calculated. For each type of residential unit, assumptions were made regarding the coverage of the unit itself, the driveway, a patio and service walks. For commercial areas, the amount of building coverage, parking and sidewalks were calculated. In addition, the paving within all of the rights-of-way was calculated. These calculations follow this section as Appendix VII.A.

The calculations show a non-open space area of 36.36 acres on the 111.68 site. This results in an open space area of 75.32 acres which is 67.4 % of the site, far exceeding the 40% requirement.

B. ORDINANCE REQUIREMENTS – RECREATION

Section XXIV.7 of the Township Code sets forth the recreation requirements for the proposed project. The project has been designed to provide a series of parks and open spaces to service the residents of the community. The actual facilities have not been determined at this time but, the cost of these facilities will exceed \$1,033,750 if the affordable units are rentals or \$1,068,750 if the affordable units are for sale. These amounts are based upon \$2,500 for each of 380 market-rate units and \$1,250 for each affordable unit.

APPENDIX VII.A
CALCULATION OF NON-OPEN SPACE AREAS

A. RESIDENTIAL

1) Single Family

House Footprint (42' x 50')	2,100 sf
Driveway (18' x 25')	450 sf
Service Walks	100 sf
Patios/Decks	<u>300 sf</u>
	2,950 sf

190 Units @ 2,950 sf = 560,500 sf = 12.87 acres

2) Townhouse

Unit Footprint (20' x 60')	1,200 sf
Driveway (18' x 25')	400 sf
Service Walks	100 sf
Patios/Decks	<u>300 sf</u>
	2,000 sf

190 units @ 2,000 sf = 380,000 sf = 8.72 acres

3) Flat Buildings

Buildings (80' x 150') = 12,000 x 4 buildings =	48,000 sf
Parking - 180 spaces @ 300 sf/each =	54,000 sf
Sidewalks, etc. =	<u>10,000 sf</u>
	122,000 sf

112,000 sf = 2.57 acres

B. OTHER USES

1) Recreational

Hardscaped facilities are assumed to total 1.00 acre in area.

2) Roadways

12,200 LF roadway at 40' (30' cartway & sidewalks)	488,000 sf
---	------------

488,000 sf = 11.20 acres

C. SUMMARY

<u>Residential</u>	<u>Acres</u>
Single Family	12.87
Townhouse	8.72
Flats	<u>2.57</u>
Total - Residential	24.16
<u>Other Uses</u>	
Recreational	1.00
Roadways	<u>11.20</u>
Total - Other	12.20
Total Non-Open Space Area	36.36
Total Site Area	111.68
Total Open Space Area	75.32
Open Space Percentage	67.4 %

VIII. STORMWATER MANAGEMENT

A. OVERVIEW

There are three primary drainage areas on the site. All drain, generally, from north to south and the drainage from each area is directed to its own stormwater management basin. Basin A handles the western portion of the site and discharges to the west across Cologne Avenue. Basin B is the largest of the basins since it handles nearly 60% of the site. It handles the central portion of the site. The flow from this basin eventually heads south along New York Avenue. Basin C handles the eastern portion of the site. The flow from this basin joins the flow from Basin B and heads south along New York Avenue.

B. REPORT

Attached as Appendix VIII.A is the first section of a Stormwater Management Report prepared by Taylor, Wiseman and Taylor and dated August 15, 2009. The complete report, which contains over 100 pages of computer printouts, has been supplied to the Planning Board Engineer and the Planning Board Secretary.

APPENDIX VIII.A

STORMWATER MANAGEMENT REPORT

Stormwater Management Report

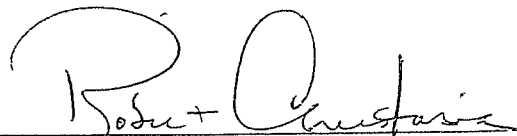
Woods Edge
Block 1134, Lot 1
Hamilton Township
Atlantic County, New Jersey

PREPARED FOR:

Harding Highway, LLC.
30 Washington Avenue
Haddonfield, NJ 08033

PREPARED BY:

Taylor Wiseman & Taylor
124 Gaither Drive, Suite 150
Mount Laurel, NJ 08054



Robert Anastasia
NJ Professional Engineer # 24GE03030600
NJ Certificate of Authorization # 24GA28032900

Job #02988

August 15, 2007

Revised: 2/6/08 - Revised pre- and post-develop drainage calculations per layout changes.
4/4/08 - Revised pre- and post-develop drainage calculations per layout changes.
6/3/08 - Updated boring logs.
7/9/08 - Revised pre- and post-development drainage calculations per layout changes.
6/1/09 - Revised pre- and post-development drainage calculations per Pinelands comments.

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Discussion

Discussion

Site Summary

The subject parcel is a 111.5 acre site located north of Harding Highway (U.S. Route 40), southeast of Cologne Avenue (County Route 614) and southwest of the Black Horse Pike (U.S. Route 322) in Hamilton Township, Atlantic County, New Jersey. The majority of the proposed development area is woods, with some meadows and brush covered areas. The site consists of soils from the hydrological soil groups (HSG) "A", "B", and "C".

There are three primary drainage areas on the site. These drainage areas represent the portion of the site that currently drains to the proposed discharge location for each stormwater management facility. These pre-development drainage areas were used in determining allowable outflows for each discharge location. Existing drainage area A is 13.7 acres in size and drains to wetland areas located along the western portion of the site. Existing drainage area B is 43.3 acres in size and drains to wetland areas located along the southern portion of the site. Existing drainage area C is 9.8 acres in size and drains to the same location as drainage area B.

Infiltration/Detention Basin A proposes to collect and detain runoff from 16.4 acres.
Infiltration/Detention Basin B proposes to collect and detain runoff from 61.5 acres.
Infiltration/Detention Basin C proposes to collect and detain runoff from 13.6 acres.

Pre and Post Development Drainage Areas

All hydrologic analyses were performed using USDA Natural Resource Conservation Service (NRCS) methodology. The analyses included application of the DelMarVa unit hydrograph as well as 24-hour rainfall totals taken from the NOAA National Weather Service Hydrometeorological Design Studies Center Precipitation Frequency Data Server (PFDS) also known as Atlas 14 Volume 2 (as provided by the New Jersey office of the NRCS). The NRCS Type III 24-hour rainfall distribution was used for all computations. The NRCS curve number (CN) and time of concentration (T_c) were computed using the methods detailed in NRCS Technical Release No. 55 (TR-55), *Urban Hydrology for Small Watersheds*, June 1986, as implemented in the *WinTR-55 Small Watershed Hydrology*, version 1.00.08 computer software released by the NRCS. Detailed computations supporting selected CN and T_c values can be found elsewhere in this report. All hydrograph computations, basin/pond outlet structure hydraulic computations, and routing analyses were performed using *PondPack* version 10.00.026.00 computer software by Bentley Systems Inc.

The pre-developed watershed graphical peak discharges and post-development outflow hydrographs generated by the basin routing of the detained areas, for the 2-, 10-, and 100-year storm events, were generated using the following data:

Table 1 - Pre-Development Drainage Areas

Drainage Area ID	Area (acres)	CN	Tc (hours)
Area A	16.39	58	0.66
Area B	61.47	58	0.92
Area C	13.56	68	0.75

The 2-, 10-, and 100-year storm events were routed through existing sump areas on the project site in order to simulate the effect of storage in these areas. These routings were performed using the standard Modified Puls (a.k.a. Storage Indication) method.

Table 2 - Post-Development Drainage Areas

Drainage Area ID	Area (acres)	CN	Tc (hours)
Basin A Impervious	9.60	98	0.22
Basin A Grass	9.49	66	0.22
Basin B Impervious	28.36	98	0.22
Basin B Grass	33.11	62	0.22
Basin C Impervious	7.34	98	0.22
Basin C Grass	6.22	71	0.22

Stormwater Quantity

The 2-, 10- and 100-year storm events were routed through the basins to demonstrate that they comply with both the Pinelands Comprehensive Management Plan (N.J.A.C. 7:50-1.1 et seq.) and with the New Jersey Stormwater Management Rules (N.J.A.C. 7:8-1.1 et seq.) requirements for peak design outflow. The section in the Stormwater Management Rules (N.J.A.C. 7:8-5.4(a)3.iii.) that addresses runoff quantity impacts states that the design engineer shall:

“...Design stormwater measures so that the post-construction peak runoff rates for the 2-, 10-, and 100-year storm events are 50, 75, and 80 percent, respectively, of the pre-construction peak runoff rates. The percentages apply only to the post-construction stormwater runoff that is attributable to the portion of the site on which the proposed development or project is to be constructed....”

The following tables compare the pre- and post-development peak discharges for the site. Pre- and post-development drainage areas B and C, as well as outflow from basins B and C, have been combined because they have the same discharge location. The post-developed peak discharges are taken from the basin outflow hydrographs.

Table 3 - Infiltration/Detention Basin A

Frequency Event (years)	Pre-development Peak Discharge (cfs)	Allowable Peak Discharge (cfs)	Post-development Peak Discharge (cfs)
2	1.48	0.74	0.00
10	7.34	5.51	0.00
100	24.68	19.74	5.60

Table 4 - Infiltration/Detention Basins B & C

Frequency Event (years)	Pre-development Peak Discharge (cfs)	Allowable Peak Discharge (cfs)	Post-development Peak Discharge (cfs)
2	1.98	0.99	0.00
10	16.41	12.31	3.41
100	67.00	53.60	31.12

Groundwater Recharge

In addition to the rate reduction requirements for the 2-, 10- and 100-year storm events, the *Pinelands Comprehensive Management Plan* includes surface water runoff standards that include this groundwater recharge criteria which can be found in N.J.A.C. 7:50-6.84(a)6.iii.(1):

“For all major developments, the total runoff volume generated from the net increase in impervious surfaces by a ten (10) year, twenty-four (24) hour storm shall be retained and infiltrated onsite.”

In response to a discussion with representatives of the New Jersey Pinelands Commission, the applicant's design will provide sufficient groundwater recharge capability to retain and infiltrate the net increase in stormwater runoff associated with the 100-year 24-hour storm event. Infiltration/Detention Basins A, B, and C have been designed to retain and infiltrate any additional runoff associated with development of the project site up to and including the 100-year storm event. The pre- and post-development volumes of stormwater runoff generated from the project site have been calculated using NRCS methodology, as shown in the example below:

Post-development runoff from Drainage Area A (example):

Grass ("B" soils, good condition):

$$Q = \frac{(P - 0.2 S)^2}{(P + 0.8 S)} = \frac{[8.9 - (0.2)(0.20)]^2}{[8.9 + (0.8)(0.20)]} = 4.14 \text{ inches}$$

where: Q = Stormwater runoff (in inches)
 P = 100-year storm precipitation (in inches) = 8.9 inches
 S = potential maximum retention after runoff begins
 $= \frac{1000}{CN} - 10 = 6.393$ inches
 CN = NRCS curve number = 61

Grass ("C" soils, good condition):

$$Q = \frac{(P - 0.2 S)^2}{(P + 0.8 S)} = \frac{[8.9 - (0.2)(0.20)]^2}{[8.9 + (0.8)(0.20)]} = 5.74 \text{ inches}$$

where: Q = Stormwater runoff (in inches)
 P = 100-year storm precipitation (in inches) = 8.9 inches
 S = potential maximum retention after runoff begins
 $= \frac{1000}{CN} - 10 = 3.514$ inches
 CN = NRCS curve number = 74

Impervious Area:

$$Q = \frac{(P - 0.2 S)^2}{(P + 0.8 S)} = \frac{[8.9 - (0.2)(0.20)]^2}{[8.9 + (0.8)(0.20)]} = 8.66 \text{ inches}$$

where: Q = Stormwater runoff (in inches)
 P = 100-year storm precipitation (in inches) = 8.9 inches
 S = potential maximum retention after runoff begins
 $= \frac{1000}{CN} - 10 = 0.204$ inches
 CN = NRCS curve number = 98

$$\text{Volume} = \sum \text{Drainage Area} \times Q$$

$$\begin{aligned} \text{Grass (CN = 61)} &= (5.78 \text{ acres}) \times 4.14 \text{ inches} \times \frac{43,560 \text{ ft}^2}{1 \text{ acre}} \times \frac{1 \text{ foot}}{12 \text{ inches}} \\ &= 86,958 \text{ feet}^3 \end{aligned}$$

$$\begin{aligned} \text{Grass (CN = 74)} &= (3.71 \text{ acres}) \times 5.74 \text{ inches} \times \frac{43,560 \text{ ft}^2}{1 \text{ acre}} \times \frac{1 \text{ foot}}{12 \text{ inches}} \\ &= 77,274 \text{ feet}^3 \end{aligned}$$

$$\begin{aligned} \text{Impervious Area} &= (6.90 \text{ acres}) \times 8.66 \text{ inches} \times \frac{43,560 \text{ ft}^2}{1 \text{ acre}} \times \frac{1 \text{ foot}}{12 \text{ inches}} \\ &= 216,899 \text{ feet}^3 \end{aligned}$$

$$\begin{aligned} \therefore \text{Total volume of runoff} &= 86,958 + 77,274 + 216,899 \\ &= 381,131 \text{ feet}^3 \end{aligned}$$

The infiltration volume provided by infiltration/detention basin A is the storage volume in the basin up to the invert elevation of the lowest opening in the proposed outlet structure. The lowest opening in the structure, a 3.0' wide \times 0.5' high rectangular orifice, will be set at an invert elevation of 58.5 ft-NAVD. From the *Pond E-V-Q Table* for infiltration/detention basin A, included in the Pondpack output elsewhere in this report, the storage volume at elevation 58.5 ft-NAVD will be 189,702 ft³.

The infiltration volume provided by infiltration/detention basin B is the storage volume in the basin up to the invert elevation of the lowest opening in the proposed outlet structure. The lowest opening in the structure, a 2.5' wide \times 0.75' high rectangular orifice, will be set at an invert elevation of 60.7 ft-NAVD. From the *Pond E-V-Q Table* for infiltration/detention basin B, included in the Pondpack output elsewhere in this report, the storage volume at elevation 60.7 ft-NAVD will be 524,826 ft³.

The infiltration volume provided by infiltration/detention basin C is the storage volume in the basin up to the invert elevation of the lowest opening in the proposed outlet structure. The lowest openings in the structure, a pair of 4.0' wide \times 1.0' high rectangular orifices, will be set at an invert elevation of 70.6 ft-NAVD. From the *Pond E-V-Q Table* for infiltration/detention basin C, included in the Pondpack output elsewhere in this report, the storage volume at elevation 70.6 ft-NAVD will be 121,262 ft³.

The table below provides a summary of all pre- and post-development runoff volume computations performed for the project site:

Table 5 - 100 Year Storm Runoff Volumes and Basin Infiltration Volumes

Drainage Area ID	Pre-development Runoff Volume (cubic feet)	Post-development Runoff Volume (cubic feet)	Basin Infiltration Volume (cubic feet)
A	224,846	381,131	189,702
B	842,453	1,407,329	524,826
C	246,189	352,014	121,262
Total	1,313,488	2,140,474	835,790

Detailed infiltration/detention basin elevation vs. storage volume data can be found in the PondPack output included elsewhere in this report. Subtracting the basin infiltration volume from the post-development runoff volume produces a total 100-year storm event runoff volume of 1,304,684 cubic feet leaving the project site under proposed conditions. This total is 8,804 cubic feet less than the pre-development 100-year runoff volume of 1,313,488 cubic feet shown above. Therefore, the design complies with the infiltration requirement agreed upon.

Basin Design Summary

Basin A will function both as infiltration basin and an extended detention basin. Basin A will receive runoff from both pervious and impervious surfaces. The infiltration basin will feature a six inch layer of K4 sand, with a minimum of permeability rate of 6 inches/hour and a maximum permeability rate of 20 inches/hour. The invert of the infiltration basin will be at elevation 55.8 ft-NAVD, with a six (6) foot wide berm set at elevation 61.5 ft-NAVD. The infiltration basin design will included a 100 foot wide emergency spillway set at an elevation of 60.0 ft-NAVD. All side slopes of the basin will be a minimum of three (3) to one (1), with exposed slopes planted with water tolerant grasses.

Basin A will discharge through a concrete box riser with a 3.0' wide \times 0.5' high rectangular orifice set at an elevation of 58.5 ft-NAVD. The riser will have an open top of box, protected by a trash rack, set an elevation of 59.5 ft-NAVD. Additionally, the outlet structure will feature a plugged three (3) inch diameter orifice set at an elevation of 55.8 ft-NAVD to accommodate potential basin maintenance needs.

Basin B will function both as infiltration basin and an extended detention basin. Basin B will receive runoff from both pervious and impervious surfaces. The infiltration basin will feature a six inch layer of K4 sand, with a minimum of permeability rate of 6 inches/hour and a maximum permeability rate of 20 inches/hour. The invert of the infiltration basin will be at elevation 58.0 ft-NAVD, with a six (6) foot wide berm set at elevation 65.5 ft-NAVD. The infiltration basin design will included a 100 foot wide emergency spillway set at an elevation of 63.5 ft-NAVD. All side slopes of the basin will be a minimum of three (3) to one (1), with exposed slopes planted with water tolerant grasses.

Basin B will discharge through a concrete box riser with a 2.5' wide × 0.75' high rectangular orifice set at an elevation of 60.7 ft-NAVD. The riser will have an open top of box, protected by a trash rack, set an elevation of 63.2 ft-NAVD. Additionally, the outlet structure will feature a plugged three (3) inch diameter orifice set at an elevation of 58.0 ft-NAVD to accommodate potential basin maintenance needs.

Basin C will function both as infiltration basin and an extended detention basin. Infiltration Basin C will receive runoff from both pervious and impervious surfaces. The infiltration basin will feature a six inch layer of K4 sand, with a minimum of permeability rate of 6 inches/hour and a maximum permeability rate of 20 inches/hour. The invert of the infiltration basin will be at elevation 68.6 ft-NAVD, with a six (6) foot wide berm set at elevation 73.5 ft-NAVD. The infiltration basin design will included a 344 foot wide emergency spillway set at an elevation of 72.0 ft-NAVD. All side slopes of the basin will be a minimum of three (3) to one (1), with exposed slopes planted with water tolerant grasses.

Basin C will discharge through a concrete box riser with two (2) 4.0' wide × 1.0' high rectangular orifices set at an elevation of 70.6 ft-NAVD. The riser will have an open top of box, protected by a trash rack, set an elevation of 71.7 ft-NAVD. Additionally, the outlet structure will feature a plugged three (3) inch diameter orifice set at an elevation of 68.6 ft-NAVD to accommodate potential basin maintenance needs.

Emergency Spillway Calculations

Flows through the spillways have been calculated using the weir equation as follows:

$$Q = C L H^{3/2}$$

where: Q = rate of flow (in cfs)
 C = 2.9 = broad crested weir coefficient
 L = length of weir (in feet)
 H = head above weir crest (in feet)

Table 6 - Emergency Spillway Freeboard Calculations

Basin	Peak 100-yr Q (cfs)	Spillway Length (feet)	Weir Coefficient (C)	Max. Head Above Spillway Crest (feet)	Top of Berm Elevation (ft-NAVD)	Spillway Crest Elevation (ft-NAVD)	Freeboard (feet)
A	65.4	65	2.9	0.49	61.5	60.0	1.01
B	238.5	85	2.9	0.98	65.5	63.5	1.02
C	59.9	60	2.9	0.49	73.5	72.0	1.01

Table 7 - Emergency Spillway Maximum Discharge Velocity

Basin	Peak 100-Yr Q (cfs)	Spillway Length (feet)	Max. Head Above Spillway Crest (feet)	Flow Area (feet ²)	Velocity (feet/sec)
A	65.4	65	0.49	31.9	2.05
B	238.5	85	0.98	83.3	2.86
C	59.9	60	0.49	29.4	2.04

Stormwater Quality: Total Suspended Solids (TSS) Removal

Stormwater quality will be provided in accordance with N.J.A.C. 7:8-5.5, which states that following:

"Stormwater management measures shall be designed to reduce post-development load of total suspended solids (TSS) in stormwater runoff generated from the water quality design storm by 80% of the anticipated load from the developed site..."

With consideration to the agreed upon Pinelands Commission design requirements, the site design will include the ability to retain and infiltrate the difference between the pre- and post-development 100-year storm volume runoff. Because of this, the basins will also have the ability to retain and infiltrate the water quality storm event. Therefore the adopted infiltration basin TSS removal rate of 80% is achieved.

Groundwater Recharge Standards

For all major developments, the New Jersey Stormwater Management Rules require one of the two following options be implemented in order to be in compliance with required volume of groundwater recharge:

- "1. Demonstrate through hydrologic and hydraulic analysis that the post developed project site maintains 100 percent of the site's pre-developed average annual groundwater recharge volume; or
2. Demonstrate through hydrologic and hydraulic analysis that any increase in the project site's stormwater runoff volume for the two (2) year, twenty (24) hour storm from pre-developed to post-developed conditions is infiltrated onsite."

The Pineland's Stormwater Ordinance requires that the increase of impervious runoff volume from the ten (10) year storm event be retained and infiltrated on site, and it has been agreed that the design will retain and infiltrate the difference in runoff between the 100-year pre- and post-development storms. Therefore, option number two (2) above will be able to be achieved onsite.

Infiltration Basin Permeability Testing

New Jersey Stormwater Best Management Practices Manual requires all surface infiltration basins to have a minimum of permeability rate of 0.5 inches per hour, the table below, provides a summary for the testing location and permeability rate for each infiltration basin. Additionally, there is a two and a half (2.5) foot separation between the seasonal high groundwater elevation and invert of the basin (the half foot increment is for the K4 sand layer placed over the infiltration basin bottom). See boring logs for complete testing location for soil details, included in the following section.

Table 8 - Infiltration Basin Permeability Testing

Basin	Test Location ID #	Minimum Perk Rate (in/hr)	Test Perk Rate (in/hr)	Factor of Safety Design Rate (in/hr)
A	10	0.5	21.4	10.70
	4	0.5	28.6	
B	5	0.5	16.5	8.25
	6	0.5	17.3	
C	7	0.5	15.3	5.95
	8	0.5	11.9	

Table 9 - Infiltration Basin Depth to Seasonal High Water

Basin	Test Location ID #	Ground Elevation (ft-NAVD)	Seasonal High Water Elevation (ft-NAVD)	Invert of Basin (ft-NAVD)	Separation (ft)
A	11	57.03	53.03	55.8	2.53
	12	56.27	53.27		
B	4	60.00	55.50	58.0	2.50
	5	57.75	53.75		
	6	59.00	54.00		
C	7	72.00	66.00	68.6	2.52
	8	71.25	66.08		

Table 10 - Infiltration Basin Drain Down Time

Basin	Design Perk Rate (in/hr)	Basin Invert Elevation (ft-NAVD)	Lowest Orifice Elevation (ft-NAVD)	Drain Down Time (hours)
A	10.70	55.8	58.5	3.03
B	8.25	58.0	60.7	3.93
C	5.95	68.6	70.6	4.03

IX. UTILITY PLAN

A. OVERVIEW

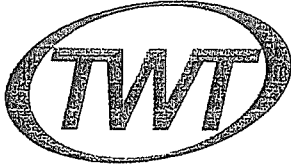
Water and sanitary sewer service for the site will be provided by the Hamilton Township Municipal Utility Authority. The site will connect to an existing 24 inch sanitary sewer main that runs along Cologne Avenue. The entire site will flow to this point without the need for pumping stations. The site will also connect to two 12 inch water lines, one running along Harding Highway and the other running along Cologne Avenue. The existing and proposed utilities are shown on Sheet 5 of the plan set.

B. FLOWS

Attached as Appendix IX.A is a calculation of the expected sanitary sewer flow and the expected water demands.

APPENDIX IX.A

SANITARY SEWER AND WATER FLOWS



Taylor Wiseman & Taylor

ENGINEERS / SURVEYORS / SCIENTISTS

124 Gaither Drive, Suite 150, Mt. Laurel, NJ 08054

856-235-7200 phone 856-722-9250 fax

www.taylorwiseman.com

October 8, 2009

02988

Re : Woods Edge
Block 1134, Lot 1
Cologne Ave and Harding Highway
Hamilton Township
Atlantic County, NJ

Mr. Robert Bower
30 Washington Avenue
Suite B-4
Haddonfield, NJ 08033

Dear Mr. Bower,

As requested, attached is an estimate of the average daily sanitary demands and water demands of the project. Based on the proposed unit count, the estimated sanitary flow is 130,875 gallons per day (gpd) and the estimated water demand is 132,330 gpd.

If you have any questions, or require additional information, please call.

Sincerely,

Edward P. Brady, P.E.
Project Manager

w/ attachment

WOODS EDGE

PROPOSED UNITS

ESTIMATED SANITARY DEMANDS

Residential	No. of Units	Sanitary flow per NJDEP criteria	Estimated Sanitary Flow
Single Family (4-br)	190 du	300 gpd/du	57,000 gpd
Townhouse (2-br)	60 du	225 gpd/du	13,500 gpd
Townhouse (3-br)	63 du	300 gpd/du	18,900 gpd
Townhouse (4-br)	67 du	300 gpd/du	20,100 gpd
Apartments (2-br)	95 du	225 gpd/du	21,375 gpd
	475 du		

Total Flow - Sewer

130,875 gpd

ESTIMATED WATER DEMANDS

Residential	No. of Units	Water Demand per NJDEP/RSIS criteria	Estimated Water Demand
Single Family (4-br)	190 du	395 gpd/du	75,050 gpd
Townhouse (2-br)	60 du	150 gpd/du	9,000 gpd
Townhouse (3-br)	63 du	210 gpd/du	13,230 gpd
Townhouse (4-br)	67 du	275 gpd/du	18,425 gpd
Apartments (2-br)	95 du	175 gpd/du	16,625 gpd
	475 du		

Total Flow - Water

132,330 gpd

Sanitary flow calculated in accordance with NJDEP Chapter 7:14A-23.3

Water demands calculated in accordance with RSIS, Title 5, Chapter 21 and NJAC 7:10 for commercial demands

X. TIMING SCHEDULE

A. RESIDENTIAL CONSTRUCTION

- 1) There are two residential product types planned for the proposed community plus the required affordable housing. It is expected that both product types will begin in the first year. The following chart shows, based upon an anticipated sales pace, the duration of each product type:

<u>UNIT TYPE</u>	<u># OF UNITS</u>	<u>SALES PER MONTH</u>	<u>DURATION</u>
Single Family	190	3.0	5 years, 4 months
Townhouse	190	4.0	4 years, 0 months

- 2) The affordable housing will be phased in accordance with COAH requirements.

B. SITE IMPROVEMENTS

- 1) Due to access considerations, it is expected that the New York Avenue extension, if approved, will be part of the first phase.
- 2) At all times, the cumulative site improvements will be in compliance with the New Jersey Residential Site Improvement Standards.
- 3) The timing of the recreational facilities will be established in conjunction with the first preliminary approval for the project. The timing will be based upon the nature and type of facilities.

