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**PLANNING
COMMISSION
EXHIBIT #44**

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THE PRESERVE

**PESTICIDES AND FERTILIZERS - - METHODS
AND PRELIMINARY RESULTS: RISK
ASSESSMENT, RISK MANAGEMENT,
AND WATER QUALITY MONITORING**

SUBMITTED TO:

**OLD SAYBROOK PLANNING COMMISSION
APPLICATION FOR SPECIAL EXCEPTION USE
OPEN SPACE SUBDIVISION**

by

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on behalf of

River Sound Development, LLC

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I. INTRODUCTION AND PURPOSE

The Preserve is a proposed housing and golf development. A minimum of 50% of the lands would be set aside as passive open space, not including the golf course.

A previous development team obtained an inland wetlands approval for the golf course (2000). Its submission included an “Integrated Turf and Pest Management Plan,” which addressed turf management, pesticide risks to humans and fish, surface water monitoring, and ground water monitoring. This work applied only to the golf course.

More recently, the current team intensively studied the site and reevaluated the approved golf course layout as it relates to the reassessed environmental constraints. The most substantial difference between the current work and the past permitting package is the current intensive focus on the vernal pool habitats and the rich populations of amphibians and reptiles. Our full report to be submitted in connection with actual permit applications provides cutting edge toxicity and risk assessment for potential amphibian and reptile exposure to pesticides and fertilizers. In addition, we are aware of the expressed concern in the previous application hearings for a more “organic” golf turf management focus.

Thus the goal of our work is to update the previous work with a greater focus on amphibian and reptile protection, “organic” golf turf management and environmentally sound lawn care management for the residential component of the project. This was done in the following manner:

II. RISK ASSESSMENT

- Maximum Allowable Concentrations (MACs) for pesticide and nitrate exposure to amphibians were calculated and used to inform the risk assessment. (An MAC is the upper limit of a chemical concentration that can be reached without causing a toxic effect.) This was done in a two-step toxicological process that we developed (Reid et al., 2002).

- The regulatory status and toxicology database of the previously approved list of 42 pesticides was reviewed. This was done by evaluating the scientific and regulatory determinations performed by the U.S. EPA as part of the intensive pesticide registration/regulation process.
- Conservative screening-level models, SCI-GROW and GENEEC, have been run to estimate potential contaminant leachate and runoff, respectively, consistent with methods used in the previous report.

III. RISK MANAGEMENT

- Partly on the basis of these activities, 11 organic/biorational products were added, and 14 new conventional pesticides were added, replacing 15 of the original 42 pesticides. A key component of these actions also was a careful agronomic evaluation.
- Additional restrictions were added to the pesticide program to further address concerns of pesticide and nitrate impacts on vernal pools, dermal exposure to amphibians migrating across golf playing surfaces to terrestrial upland habitats, and herbicide drift to State-listed plants. This was done in a hole-by-hole, pool-by-pool analysis.
- Specific limitations are recommended for quick release, water soluble nitrogen fertilizer when applied within 200 ft of vernal pools and watercourses.
- Use of all herbicides in specified sensitive areas (e.g. the 7th tees) are restricted to granular products, hand-held application of liquid products, or application of liquid products with a tractor boom equipped with a spray shroud.
- Specific limitations are recommended on applications of natural organic fertilizers in the same areas.
- The surface water and ground water monitoring protocols were updated and expanded . This is described in more detail below.
- Finally, a two-part lawn care management program was developed that will govern turf management for private homes. One plan is very comprehensive in scope, is user friendly, and targets homeowners. The second plan is brief, technical, and is for

professional lawn care firms that would be hired to work on home lawns. Both plans are based on the risk assessment for the proposed golf course (see below).

These programs are each a component of a comprehensive master plan that has, as a primary focus, the creation of an environmentally sound development.

IV. WATER QUALITY MONITORING

A. Surface Water

The previously approved protocol is being updated and expanded. (A protocol is a technical document that described all relevant sampling, study design, quality controls, and detection response procedures.) Following are the preliminary, key components of the program:

- surface water sampling stations plus one sediment sampling point (sampling to include vernal pools);
- storm flow and base flow sampling for four phases of monitoring at various frequencies;
- This improved program expands the pesticide list for monitoring.
- This version also adds a background water quality monitoring station and a sediment sampling point, which will provide more scientific evaluations of the golf course impacts on the environment.
- remedial response thresholds.

B. Ground Water

- on-site monitoring wells;
- inclusion of private residential wells;
- sampling of on-site wells during the operational phase (spring and fall), with varying frequencies in prior phases;
- sampling for private residential wells, depending on the location;
- remedial response thresholds;

- expanded monitoring in the event of significant detections

V. LAWN TURF MANAGEMENT

Two lawn care management plans are being prepared for the private homes at The Preserve. They benefit from the intensive studies that have been done associated with the project in general and the golf course in particular. One plan is designed for the private, 'do-it-yourself' homeowners, and the other is designed for professional firms that may be hired by the homeowners.

The basic philosophy is that one minimizes the need for pesticides by growing-in the turf quickly and keeping it healthy. In addition, goals need to be established to ensure that the turf is not over managed. All residential turf management will be approved by the Homeowners Association.

REFERENCES

Reid, S.S., S.Z. Cohen, J. Julian, S. Julian, J. Ferrigan, and J. Howard, "Risk Assessments for Golf Course Pesticides: 2. New Methodologies to Estimate Amphibian Toxicity of Turfgrass Chemicals", poster presented at the 10th IUPAC International Congress on the Chemistry of Crop Protection, Basel, Switzerland, August, 2002.