RALPH E. GOMETZ
9 LEADA WOODS ROAD
OLD SAYBROOK, CT 06475

PLANNING COMMISSION EXHIBIT 99

Old Saybrook Planning Commission
302 Main Street
Old Saybrook, CT 06475

Re: The Preserve

Dear Mr. McIntyre and Commissioners:

I am an abutter to the property known as "The Preserve" and like many in the community, I am interested in all proposals and applications for any use of the this property. Recently, I have taken note of articles in the local press concerning an application for a modification to the special permit issued for the development of 221 building sites by your commission. I have been contacted by several residents from my neighborhood inquiring as to my opinion of the preserve application and also about a flyer that was circulated around in our mailboxes from the organization called "Alliance for Sound Area Planning" or ASaP. After reading the various articles, speaking with many concerned members of our community and reviewing the flyer from ASaP, I find there is no clear understanding as to exactly what the current application actually seeks to achieve.

In an attempt to determine for myself what is proposed by the applicant, River Sound Development, I contacted its attorney, David Royston, and asked him to provide me with a copy of the plan that was submitted along with the application. I also visited the Land Use Office to review the file, and obtained copies of all expert and staff comments and reports submitted to the Commission.

Although the flyer from ASaP claims the application before you is for a 226 unit residential development, a private 18 hole golf course and one of the largest community septic systems ever constructed in the state, the actual plan and application is for a modification to an existing and valid permit issued several years ago by the Planning Commission.

The modification sought by the applicant requests permission to develop 34 building lots to accommodate residential housing on three "pods" on three different streets far from each other to be served by individual conventional engineered septic systems to be located on each lot, and in conformance with the public health code and of the same type as used throughout the state of Connecticut to accommodate similar residential homes. Documents of interest to me in the file were a notice of intervention and two letters from the Connecticut Fund for the Environment or CFE, two reports from George Logan and Sigrun Gadwa from REMA, a consulting firm hired by CFE to facilitate the denial of the development of The Preserve property. Being that the issue of the day among environmental activists and others opposed to development seems to be nitrates, I took particular interest in the letter from REMA dated January 19, 2011 and the comments in paragraph 2.2, pages 8, 9, 10 and 11 titled adverse nutrient impacts. Although virtually all of the comments of Mr. Logan and Ms. Gadwa are true, the Commission should note that the comments generally describe what nitrates and other nutrients can possibly cause, but avoid actually claiming that this specific site is threatened with adverse impacts caused by the proposed development of the property.

In the past, during an application by me for the development of a Conservation Development, the nitrate discharge from proposed septic systems became a predominant battle cry from opponents of my application and in an effort to determine the actual effects on certain wetlands from nitrates discharged into the soils up gradient from a wetlands, I requested a study by Dr. Harvey Luce and was surprised by the outcome of his study. Please see attached report dated June 3, 2002.

As it seems REMA's conclusions were an overreach, I have requested Dr. Luce to review the plans and various reports and letters and to determine on my behalf the accuracy of the REMA report and to give me his professional opinion if the application for modification with depicted house and septic system locations would cause an adverse impact to the wetlands adjacent to the area of development. Attached you will find Mr. Luce's findings.

As a side note, there is an issue that is extremely troubling to me. That is the right of a property owner to use, develop or sell his property without encountering unwarranted interference from others who may not agree with the property owner's intent. The Preserve property was not a single parcel of land, but several parcels combined together by current and former owners. As an example the Pianta property on Bokum Road was purchased a short time ago by the predecessor to the current applicant. Opponents of The Preserve and the requested modification seem to believe that any land added to The Preserve property holdings somehow become one of the most environmentally significant parcels in Connecticut. Yet several years ago this Commission approved an application for the subdivision of land on Bokum Road belonging to Carl Pointkowski but no such scrutiny and oversight was afforded that application.

As with the Lyons property, now a portion of The Preserve, the Pianta property could have been purchased by any organization or municipality believing in its environmental significance. Once again the opportunity was passed up by short-sighted politicians and environmental activists who now seem to believe that landowners are non-profit organizations existing for the sole benefit of opponents of development.

No person is entitled to or should expect to achieve every desire, be it the developer, the State DEP, ASaP or the towns of Essex or Westbrook. Working with instead of against the current property owners could very well result in the preservation of a large portion of The Preserve property.

In closing, it certainly seems realistic and reasonable to permit the modification of The Preserve application as requested. The objectives of the Connecticut Fund for the Environment and others to the requested modifications seem only to be some type of prior restraint in anticipation of a supposed possible future breach of the performance required by the applicants existing special permit. It seems to me that by allowing the property owners the opportunity to lessen their costs by recouping some of their investment, it could possibly open the door for those desiring the preservation of The Preserve property as open space to pool their resources and negotiate an acceptable purchase and sale of the 800 or so acres most worthy of protection.

Respectfully yours,

Ralph Gometz 2/14/11

Ralph Gometz

February 14, 2011

Harvey Luce, Ph. D., CPSS/SC
528 Bassetts Bridge Road
Mansfield Center, CT 06250

Town of Old Saybrook
Planning Commission and Staff
302 Main Street
Old Saybrook, Connecticut 06475

At the request of Ralph Gometz, I have reviewed a report dated January 19, 2011 which was submitted to you by REMA Ecological Services, LLC. In this report, REMA makes certain assertions regarding the potential for nutrients from septic systems proposed as part of a preliminary open space subdivision plan modification of the Preserve. While each of these assertions may be true in principle, they do not apply to this proposed subdivision.

For instance, it is true that nutrient enrichment of a wetland can result in algal proliferation and all of the adverse effects described by REMA but, given the proposed density and location of the septic systems shown in this proposal, measurable algal proliferation will not, in my opinion, occur. It is also true that certain floristically distinctive wetland plant communities with existing low nutrient levels are adversely affected by nutrient inputs. The biological survey conducted by Environmental Planning Services describes the down gradient wetlands. They are not low nutrient wetlands that are highly sensitive to nutrient inputs. In fact, based on the descriptions given by Environmental Planning Services, it is my interpretation that these wetlands have a fairly high capacity to remove nutrients via denitrification and plant uptake without the floristic composition of the wetlands being changed. REMA asserts that the adjacent wetlands and watercourses have low dilution capacities. I do not agree with this assertion. The only reason given for the assertion of low dilution capacity of the adjacent wetlands and water courses ir that they are headwater wetlands. I do not agree that all headwater wetlands have low dilution capacities.

In general, REMA grossly overstates the negative aspects of this proposed development. A more objective review is presented in the report submitted by Environmental Planning Services.

Respectively submitted,

Harvey Luce, Ph. D.
Professional Soil Scientist and Soil Classifier

RESUME

Harvey D. Luce, Ph. D, Certified Soil Scientist, Certified Soil Classifier

Educations:

B. S., University of Kentucky, 1966, Agronomy (Soils)
M.S. Iowa State University, 1973, Soil Genesis and Classification
Ph.D., Virginia Polytechnic Institute and State University, 1975, Soil Science

Employment Record:

2004-2011, Private Consultant, Environmental Soil Science, 528 Bassetts Bridge Road, Mansfield Center, CT

1976-2004, Assistant Professor of Soil Science, Department of Plant Science, University of Connecticut, Storrs, Connecticut

1975-1976, Assistant Professor, Department of Agriculture and Natural Resources, Florida A & M University, Tallahassee, Florida

1971-1974, Graduate Research and Teaching Assistant, Virginia Polytechnic Institute and State University, Blacksburg, Virginia

1968-1971, Research Assistant, Iowa State University, Ames, Iowa

1966-1968, Area Extension Agronomist, University of Kentucky Cooperative Extension Service, Maysville and West Liberty, Kentucky

Professional Societies:

Soil Science Society of America
Soil Science Society of Southern New England
American Society of Agronomy
Soil and Water Conservation Society of America

Professional Activities

Member of the Council of Soil Science Examiners, Soil Science Society of America
Member of Accredation Committee, Soil Science Society of Southern New England
Member of Scholarship Committee, Soil Science Society of Southern New England

Honorary Societies:

Alpha Zeta
Gamma Sigma Delta
Phi Sigma

Selected Publications and Presentations:

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Connecticut State Police Forensic Laboratory, Meridan, Connecticut
U.S. Federal Bureau of Investigation
Robbins Island Preservation Corp, New Suffolk, NY 11956
HRP Engineers, Geologists, and Scientists, Plainville, CT and Albany, NY
Robinson and Cole, Attorneys at Law, Hartford, CT
Megson and Heagle, Consulting Engineers, Glastonbury, CT
TRC Environmental Corporation, Windsor, CT
Marin Environmental, Higganum, CT.
Inland Wetlans Commission &Planning and Zoning Commission, Town of Sherman
Sherman, CT
Inland Wetlands Commission, Town of North Stonington, CT
Town of Middlefield, CT
Office of the Building Inspector, Town of Preston, Preston, Ct

Inland Wetlands Commission, Town of Westport, Westport, CT
Fuss and O' Neill, Ino., Manchester, CT

POTENTIAL IMPACTS OF DEVELOPMENT OF PETTICOAT LANDING SUBDIVISION ON DOWN GRADIENT WETLANDS

Harvey Luce, Ph.D.
Certified Soil Scientist
Certified Soil Classifier

528 Bassetts Bridge Road
Mansfield Center, Connecticut 06250

June 3, 2002

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POTENTIAL IMPACTS OF DEVELOPMENT OF PETTICOAT LANDING SUBDIVISION ON DOWN GRADIENT WETLANDS

Harvey Luce, Ph.D. 9/18/01
Certified Soil Scientist
Certified Soil Classifier

Introduction

This report is focused on certain specific environmental impacts of the development of a 22-lot subdivision on a 77-acre parcel in East Haddam, Connecticut. Eighteen of these lots will front on a street to be constructed off Petticoat Landing near its intersection with Shanaghan Road. Three lots are proposed to front on Bogue Lane. One lot fronts on both Bogue Lane and Shanaghan Road.

Development of Petticoat Landing will involve no direct impacts on wetlands or watercourses. Indirect impacts are limited to the discharge of storm waters from the proposed construction of a street that will serve 18 of the 22 houses. Possible or potential indirect impacts include discharges of sediment during the construction phase, on-site leaching systems, and runoff from lawns.

Erosion and Sediment Control

Construction of the proposed street, driveways, on-site septic systems, and houses will all involve soil disturbance creating the potential for erosion and subsequent sediment transport. All construction activities will take place some distance from wetlands. At its closest point, the detention/retention basin is about 75 feet from the larger of the two wetlands, the level spreader is about 80 feet away, and the septic system on Lot 20 is about 75 feet from the wetlands. Other activities vary from 100 to several hundred feet from any wetland boundary. Erosion and sediment control is the key to assuring that there are no adverse impacts on the wetland during the construction phase. If no soil or sediment reaches the wetland, there is no impact. The proposed erosion and sediment control plan for Petticoat Landing is more than adequate to protect the wetlands and downstream open waters, if, and only if, they are carefully followed.

The goal of erosion and sedimentation control plans is to insure zero sedimentation and there is no reason that this should not be achieved for Petticoat Landing. While there <u>should</u> be no deposition of sediment in the wetland from construction activities, deposition of small amounts of sediments into these particular wetlands would have little if any adverse effects. Most wetlands including those of Petticoat Landing are well buffered against modest inputs of sediments and plant nutrients such as nitrogen and phosphorus which are often transported by sediments.

Storm Water

Storm water from the proposed street will be directed into two different discharge structures located upslope from the larger wetland. Street drainage from the east end of the proposed street will first be directed into a catch basin and then into a double-chambered sediment structure, a.k.a., oil and grit separators. Upon leaving the sediment structure, storm water is directed into a plunge pool and then into a detention/retention structure via a riprap channel located on Lot 6. Street drainage from the west end of the proposed street will be sequentially directed into a catch basin, a sediment structure, a plunge pool and a detention/retention structure located at the rear of Lot 14.

Properly maintained catch basins and sediment structures are quite effective in removing the coarser portion of the sediments in storm water and also removing some of the finer material. They are designed to remove free oils, floating debris, and suspended sediments from runoff. With proper maintenance they can remove 60 percent of sediments on a mass basis, total suspended solids and lead by 10 to 25 percent and phosphorus, nitrogen and zinc by 5 to 10 percent (Aronson, et al., 1983). By removing the larger sediments these structures prolong the life of detention/retention basins. Sediment structures lose their effectiveness, if they are not cleaned out on a regular basis.

The detention/retention provide two primary functions: (1) the reduction of the velocity of stormwater runoff in order to reduce flooding and (2) the improvement of the quality of the storm water that leaves the property. In the case of smaller storms the basins will acts as retention basins. Retention basins are highly effective in removing virtual all, if not all, of the potential pollutants in storm water. The water will be storied in the basin until it infiltrates the soil and percolates downward into the groundwater, providing groundwater recharge. This is desirable for a number of reasons. The soil will tend to filter the storm water. Recharging the groundwater will not only reduce flooding but will tend to increase the volume of water available to feed into surface water bodies during periods of low flow.

In the case of larger storms water leaving the structure (now acting as a detention basin) will flow through a grass-lined spillway and then sheet flow through a gently-sloping, vegetated upland before entering the wetland. The combination of the basins, now acting as detention basis and vegetated filter strips will effectively remove from storm waters a high percentage of the total suspended solids, organic matter (biological oxygen demand or BOD), total phosphorus, soluble phosphorus, organic nitrogen, inorganic nitrogen (primally nitrates), hydrocarbons and heavy metals such as lead and cadmium. Given the concentrations of the potential pollutants listed above, likely to occur in storm water generated by Petticoat Landing, storm waters will not have an adverse effect on this wetland and renovation or "polishing" of the storm water will continue in the wetlands until open water is reached which will not happen for hundreds of feet.

The structures proposed for Petticoat Landing are designed to retain all of certain smaller storms and the first portion of larger storms. A disproportionate amount of pollutants tend to occur within the "first flush" of storm events. These "first flushes" will be retained by these structures.

Not only will storm waters not have an adverse effect on the wetlands, but renovation or "polishing" of the storm water will continue in the wetlands.

On-Site Sewage Systems

These 22 homes will be serviced by wells and on-site septic systems. The distance of leaching systems from the wetlands exceeds 100 feet in all cases. In my communications with wetland commissioners throughout the state, I have been concerned to learn that there is a relative widespread assumption that on-site septic systems pose a serious danger to the quality of all wetland systems and that it is always desirable to place leaching fields as far as possible from wetlands. While a modest separation distance (about 50 feet) is always desirable, more distant placement is often counter productive from an environmental point of view.

Close placements of septic systems to open water bodies (streams, lakes, and ponds) and certain nutrient impoverished wetlands such as hanging bogs are a legitimate concern. Such wetlands are usually poorly buffered against substantial increases in plant nutrients such as nitrogen (N) and phosphorus (P). Placement of leaching systems near poorly buffered low nutrient wetlands or water bodies could result in the delivery of nitrates to the wetland or water body which could result in an alteration of the species composition of a low nutrient wetland or the eutrophication of a water body, assuming that phosphorus or another nutrient is not more limiting than nitrogen. Failure of leaching systems near low nutrient wetlands or water bodies could result in the delivery of nitrates, phosphates, and organic matter (biological oxygen demand) to the wetland or water body. The large riparian wetland that lies down gradient of the 22 lots of Petticoat Landing is not a poorly buffered low nutrient wetland. In contrast, it can be characterized as a well-buffered moderate to high nutrient wetlands.

In most fresh water wetlands in Connecticut, normally functioning or even failing septic systems pose little potential for adverse impacts to wetland quality. This is true, in part because of the effectiveness of on-site septic systems in treating the pollutants found in residential sewage but is equally due to the high capacity of most wetlands to purify septic system leachate especially after the pathogens and phosphorus has been removed by the actions of well-aerated upland soils. Wetland soils have the capacity to remove certain pollutants that are not as readily removed by upland soils.

The success of on-site septic systems is based on the fact that those pollutants that are not removed by septic systems normally occur in sufficiently low concentration to allow them to be diluted to drinking water standards by other groundwater. Nonetheless as a solution, pollution removal is preferable to dilution. Placements of an on-site septic system in a well-drained soil that is a good filter sufficiently close to a wetland such as to allow the flow lines of the leaching system to pass into the biologically active portion of the wetland will allow the treatment of the water from the leaching system to continue, resulting in the removal of those pollutants that tend not to be completely removed by upland soils. The flow of water from on-site septic system that is far removed any wetland tends to be to groundwater that is well below the soil surface. Such groundwater tends to be free of the anaerobic bacteria capable of denitrification. Nitrates entering such groundwater remain as nitrates and may be discharged directly to surface water bodies. Thus, placing septic systems relatively near and upslope from wetlands is almost always an environmentally sound practice.

The following is a review of the effectiveness of soils in treating septic waste and the potential role of wetland soils in this regard.

The general subject of the effectiveness of soils in "purifying" septic tank effluent has been reviewed by Pettry and Reneau (1974) and by Tyler et al. (1977). Pollutants of primary concern from residential on-site septic systems include pathogens, phosphorus, organic matter (biological oxygen demand), nitrogen, and detergents. In addition, there is the potential that various toxic substances that should not be poured into household drains will in fact be so disposed. Examples include pesticides, petroleum products, oven cleaners, photographic chemicals, drain cleaners, and even materials alleged to benefit the septic system.

Many studies, including those previously cited, have shown properly functioning septic systems to be quite effective in removing pathogens, phosphorus, detergents, and organic matter (BOD). With rare exception, complete removal is affected either in the leaching system or within a few feet of the systems (Luce and Welling, 1983; Reneau, 1977; Reneau, 1979; Reneau and Pettry, 1976).

The situation relative to nitrogen is less straightforward. Leachate, as it leaves the septic tank, contains about 40 milligrams per liter (mg/L) of nitrogen in the forms of both ammoniacal nitrogen and organic nitrogen. The organic nitrogen is converted into ammoniacal nitrogen either within the leaching system or after entering the soil. While the soil immediately adjacent to the leaching system is usually saturated and anaerobic, a properly functioning septic system requires the presence of a zone of unsaturated and oxidized soil which separates the leaching system from the water table. Reduced soils will remove pathogens and phosphorus from leachate but oxidized soil is more efficient in this regard. In addition, unsaturated soil is simply more efficient in adsorbing effluent than saturated soil. (Connecticut's state health code requires that the water table be at least 18 inches below the bottom of the trenches or galleys.) Thus pathogens and phosphates that are not removed in the leaching trenches will be removed in the soil surrounding the trench.

However, this is not true for the nitrogen. Within the oxidized and unsaturated soil zone the ammoniacal nitrogen is converted to the nitrate form of nitrogen. Being an anion the nitrate nitrogen is not adsorbed by most soils and therefore tends to leach into the groundwater. This is not to say that no nitrogen is removed by leaching systems. Denitrification (conversion of nitrates to gaseous forms of nitrogen) occurs in some but not in most leaching systems. Some nitrogen is removed by uptake by plants and by microbes. Some ammoniacal nitrogen, a cation, is adsorbed by soils. Because of the variability of systems in removing nitrogen, it is usually assumed in environmental assessments that on-site leaching systems remove very little nitrogen. Septic systems are designed so that the contribution of nitrates by the system will be diluted by other groundwater to acceptable levels (<10 mg/L) before reaching drinking water wells.

Unlike upland soils, wetland soils are highly effective in removing nitrate nitrogen via a biochemical process known as denitrification. Denitrification refers to the conversion of nitrate nitrogen (NO_3) to gaseous forms of nitrogen (N_2O, NO, and N_2) by anaerobic bacteria. In addition, nitrates may be attenuated by wetlands via plant uptake. Research in Virginia (Reneau, 1977) and in Connecticut (Luce and Welling, 1983) have shown poorly drained soils located down gradient from septic systems to be highly effective in removing nitrates from leachate. In both of these studies, denitrification was assumed to be the primary mechanism. Plant uptake by wetland vegetation may have also been a contributing factor.

In addition to removing nitrates, wetland soils have the potential to remove many other pollutants from leachate that are not removed in conventional septic systems or by oxidized soils. These include certain specific pesticides, petroleum products, degreasers, chemical cleaners, paint thinners, and photographic chemicals. A number of potential pollutants, not removed by septic systems or well-oxidized soils, are removed by wetlands. Because wetland soils tend to be higher in organic matter and finer in texture than upland soils, they tend to be much higher in their capacity to adsorb toxic substances. Organic matter and sediment accumulate in many wetlands over time. Such wetlands can be though of as permanent sinks for organic matter and sediments. Thus they are also permanent sinks for those pollutants that are attached to either the organic matter or the sediments. Finally, a different set of chemical reactions occurs in reduced wetlands than occurs in oxidized uplands. Denitrification is an example of a reaction that occurs exclusively in reducing environments. Simply put, certain things are removed from groundwater as it passes through wetlands soils that are not removed as it percolates through upland soils.

Recent studies have attempted to quantify the nitrates removed by wetlands. In a study of riparian wetlands located downslope from an unsewered subdivision in Rhode Island, wetlands removed up to 35 pounds of nitrate-nitrogen from groundwater per acre of wetlands (Hanson, et al., 1992). The primary controlling factor in the rate or magnitude of nitrate removal was nitrate loading, i.e., the wetlands could have removed more than 35 pounds per acre. Concentrations of nitrate nitrogen in the groundwater decreased from eight parts per million immediately down gradient of the subdivision to an average of 0.5 ppm in the very poorly drained soils of the wetland. (This 1950's vintage subdivision had an average lot size of 0.25 acres.) The authors of this study concluded that "wetlands potentially remove a high percentage of the groundwater-borne nitrate that moves from upland environments before it reaches streams." It is also interesting to note that the authors found substantial removal of nitrates in the moderately well drained and somewhat poorly drained soils that occur in the transition between the uplands and the wetlands. Up to 50 percent of the nitrates were removed in this zone and actually never reached the wetlands.

In a study of a riparian wetland located down gradient of Maryland corn fields, Jordan et al. found nitrate-nitrogen to decrease from 8 ppm at the edge of the wetlands to less than 0.4 ppm halfway through the wetlands. They estimated a nitrate nitrogen removal rate of 53 pounds per acre per year of wetlands.

Numerous other studies have reported on the effectiveness of wetlands in cleansing nitrates from groundwater (Fustec, et al., 1991; Groffman, P.M. et al., 1991; Lowrance, R.R., et al., 1984; Pettjohn and Correll, 1980; Pinay, G., and DeCamps, 1988; Reddy and Patrick, 1984.)

The average person served by an on-site sewage treatment system produces about 60 gallons or 228 liters of sewage effluent per day. On average, each liter of this effluent contains about 40 mg/l of nitrate nitrogen. Of this about 40% is removed in on-site leaching systems resulting in effluent with a concentration of about 24 mg/l being delivered to the soil beneath the system (Healy and May, 1982).

Based on the above assumptions one person would potentially deliver to the soil environment down gradient of the leaching system, about 4.5 lbs. of nitrates per year. If we assume that, on average, four people will live in each of the 22 houses on Petticoat Landing each household would produce 18 pounds of nitrate-nitrogen and the 22 houses would produce 396 pounds of nitrate-nitrogen per year. The 22 houses proposed for Petticoat Landing Subdivision drain into a nine-acre wetland. On average each acre of wetland will receive about 44 pounds of nitrate-nitrogen. As previously stated a typical acre of wetlands is capable of removing 35 to 50 pounds of nitrogen per year. While it is unlikely that the mass of nitrates removed by this nine-acre wetland will completely remove all of the nitrates that are produced by the people living in this subdivision, it will remove most of the nitrates produced.

The location of these houses up gradient from this wetland is fortuitous. Most leaching systems are not so well buffered from open water or deep ground water. The separating distance between septic systems and open water, considered alone, is of little relevance to protecting N sensitive aquatic systems from N inputs. The N will continue moving with the groundwater toward open water bodies unless it is removed by denitrification, plant uptake or microbial immobilization.

Runoff from Lawns

A conservation easement will separate the portion of the lawn that may be seeded, fertilized and otherwise cultivated from the wetland. This easement is at least 50 feet in all areas. This easement should adequately protect the wetlands from any adverse impacts of lawn runoff which might include fertilizers or pesticides. As previously stated, the wetlands on this site are well buffered against inputs of N and P. The same would be true for typical lawn pesticides in the concentrations likely to be found in runoff from lawns.

Summary and Conclusions

It is my opinion that the development of 22 houses on Petticoat Landing, according to plans entitled "Petticoat Landing" prepared by Richard F. Mihok, P.E., and last revised on March 11, 2001, will have no significant or substantial adverse impacts on the wetlands that lie immediately down gradient. In addition, the approximately nine-acre wetlands will effectively buffer down stream watercourses from the adverse effects that are inherent in housing developments of this type.

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