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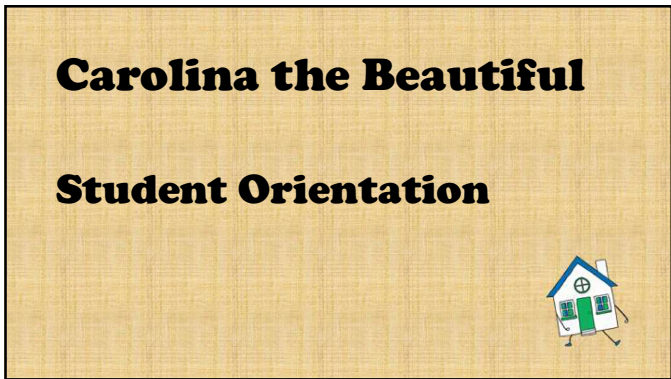
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## Getting Started

To receive credit for **Carolina the Beautiful**, you must be logged on throughout the entirety of the course

Only **ONE** person per computer can receive credit

The information you entered during registration will be used to verify your presence electronically via Zoom

To receive credit, you may only miss a maximum of 20 minutes, and it cannot be the last 20 minutes of the class, we will track this through Zoom

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## Getting Started

To sign up for a free ZOOM account, please go to [www.zoom.com](http://www.zoom.com) and register your email address. Follow the instructions there, or visit our website and watch the video [here](#). All the instructions for creating and using your free ZOOM account are on the class website.

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## Timeline for this Course

**Carolina the Beautiful** is a 4-hour elective divided into 50 minutes of instruction followed by a 10-minute break.

When on break, keep your **video on** and your **microphone muted**.

**Do not log out!**

Return promptly from breaks, remember you can only miss a maximum of 20 minutes of this class and still receive credit.

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## Online Policies

- Be respectful
- Keep your microphone on mute unless you have a question
- Keep your video on
- Be Respectful in the chat
- Use headphones if you are in a noisy area



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## Technical Support

If you are having technical issues, please contact us at

917-STORMIE      917-7867-643

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**Carolina the Beautiful**

**Let's Get Started!**

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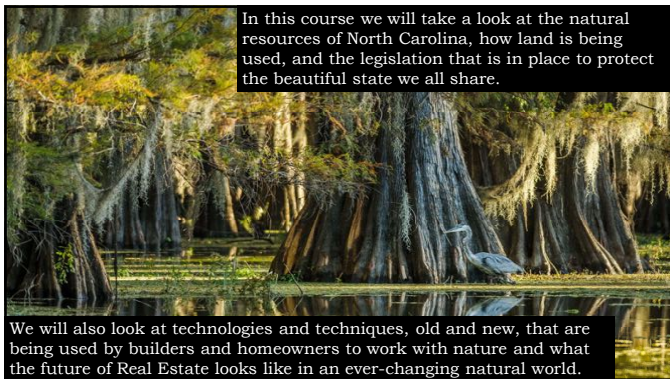
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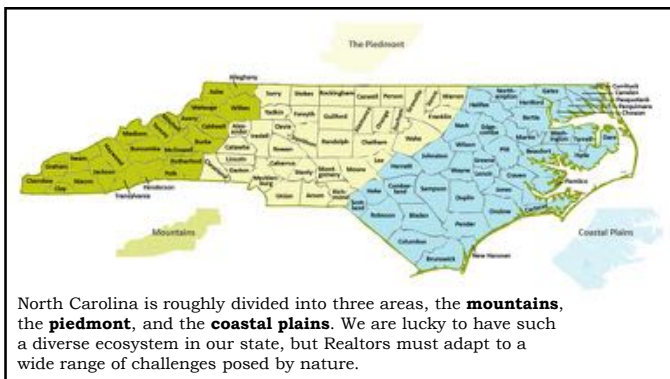
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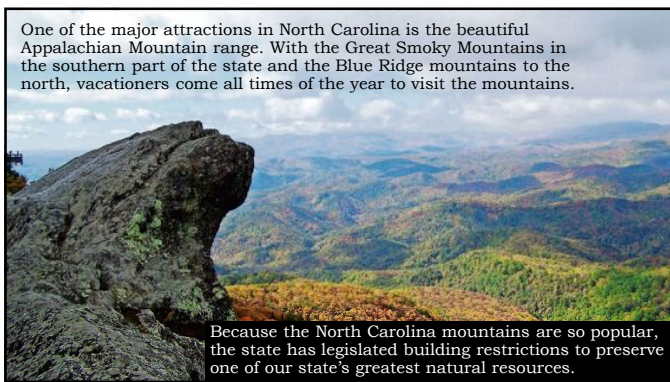
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The mountains also provide the perfect climate for growing apples, berries, and Christmas trees.



Question: Do apples, berries, and Christmas trees convey upon the sale of property?  
Answer in Chapter 2

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Coastal Plain

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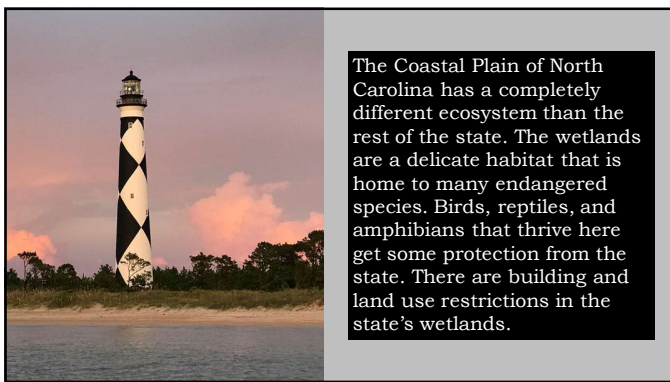
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The Coastal Plain of North Carolina has a completely different ecosystem than the rest of the state. The wetlands are a delicate habitat that is home to many endangered species. Birds, reptiles, and amphibians that thrive here get some protection from the state. There are building and land use restrictions in the state's wetlands.

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### N.C. Coastal Area Management Act

Property development in the coastal areas of North Carolina is subject to the **North Carolina Coastal Area Management Act (CAMA)** and state regulations. Among other things, CAMA requires that a permit be obtained prior to engaging in any "development" of an **"area of environmental concern."**

NORTH CAROLINA REAL ESTATE MANUAL Chapter 7. Land Use Regulation

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Coastal wetlands and marshlands are areas of environmental concern. The term “*development*” is a broad one, encompassing *construction, excavation, dredging, filling, dumping, bulkheading, or the clearing or altering of land as part of construction.*



NORTH CAROLINA REAL ESTATE MANUAL  
Chapter 7, Land Use Regulation

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The North Carolina Supreme Court has described the purpose of **CAMA**, in part, as follows: “...to protect, preserve, manage, and provide for the orderly development of one of North Carolina’s most valuable resources, the coastal estuarine system...,” which is “unique and irreplaceable.”

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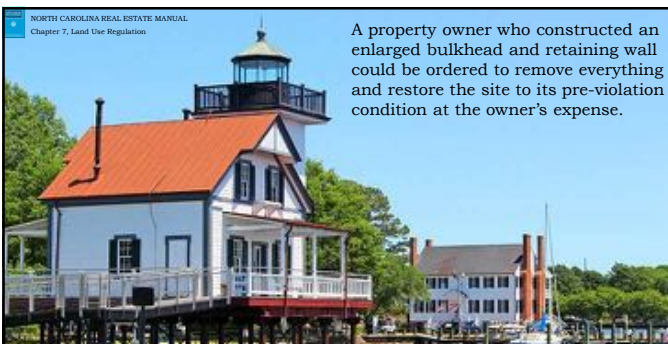
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NORTH CAROLINA REAL ESTATE MANUAL  
Chapter 7, Land Use Regulation

A property owner who constructed an enlarged bulkhead and retaining wall could be ordered to remove everything and restore the site to its pre-violation condition at the owner’s expense.

Property owners who disregard CAMA may find themselves with serious legal problems and a court order requiring them to pay the cost of repairing the damage done to the estuarine system.

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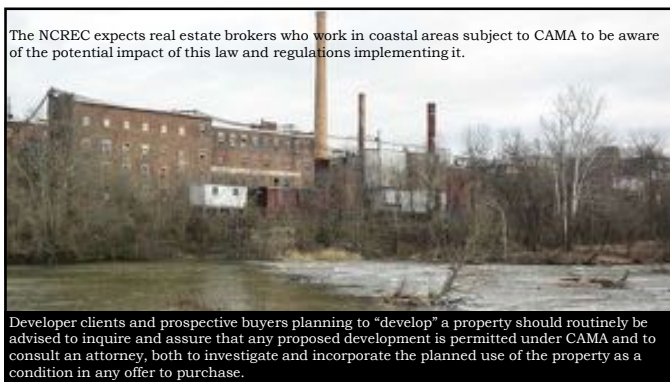
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**FLOOD HAZARD AREA REGULATIONS & INSURANCE**

Real estate located in designated "flood hazard areas" is subject to special federal laws and regulations.<sup>[70]</sup> Flood hazard areas are designated on maps issued by the Federal Emergency Management Agency.

NORTH CAROLINA REAL ESTATE MANUAL  
Chapter 7, Land Use Regulation

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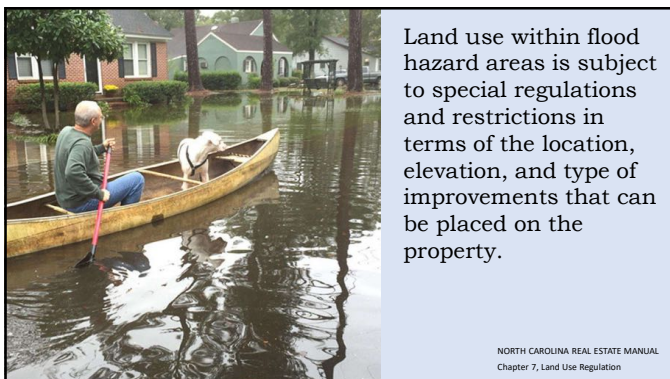
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Example: A couple purchased a vacant lot on the Cape Fear River. The property is located in a flood hazard area. When the couple builds their home, they must construct it in accordance with flood plain regulations that will dictate how close the home can be to the river, and the elevation of finished floors.



If they will need conventional financing, the couple must also obtain a standard flood insurance policy pursuant to the National Flood Insurance Program.

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If a property is in a flood zone, is that a material fact? Yes!



You can look up the flood plain map at FEMA.gov

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### Shifting Sands



Nature is constantly reshaping the coastline of North Carolina. This is a major concern for houses that are built on the water's edge. If the waterline creeps forward enough, the entire property could be compromised.

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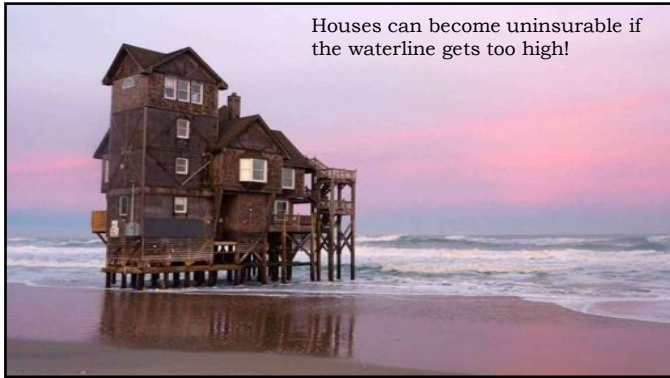
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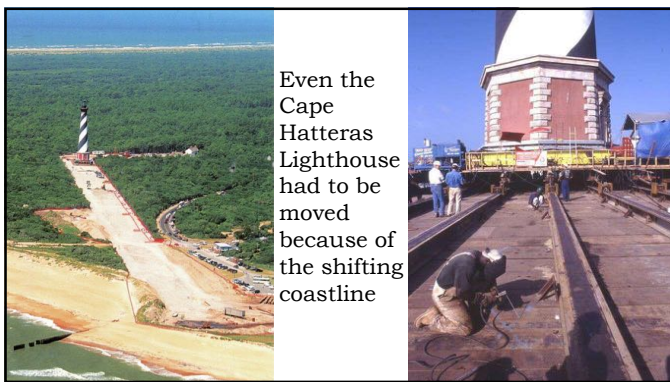
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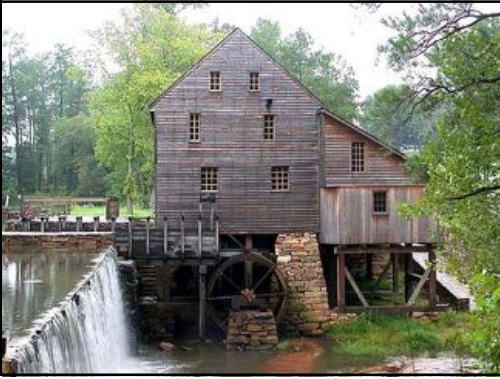
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Chapter 2:  
Using the  
Land of  
North  
Carolina



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Farming in North  
Carolina



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Trivia: Do you  
know the state  
vegetable of  
North  
Carolina?



Sweet Potatoes!

Let's take a look at the farming  
industry in our state!

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## Rules and Regulation for Leasing Land for Agricultural Purposes in North Carolina

One of the most common uses of large tracts of land for property owners in North Carolina is farming. With 8.1 million acres of operational farmland, the state leads the nation in the production of sweet potatoes and tobacco.



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### Can you guess the highest producing crops in North Carolina?

Agricultural Product	Revenue in North Carolina
	\$769 Million
	\$723 Million
	\$638 Million
	\$326 Million
	\$265 Million
	\$76 Million
	\$44 Million
	\$4 Million
Other Crops	\$298 Million

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### Can you guess how many livestock animals are raised in NC?

cows,  
 goats,  
 sheep,  
 hogs,  
 chickens,  
 turkeys,

Milk Industry: \$   
 Egg industry: \$

[www.ncagr.gov](http://www.ncagr.gov)



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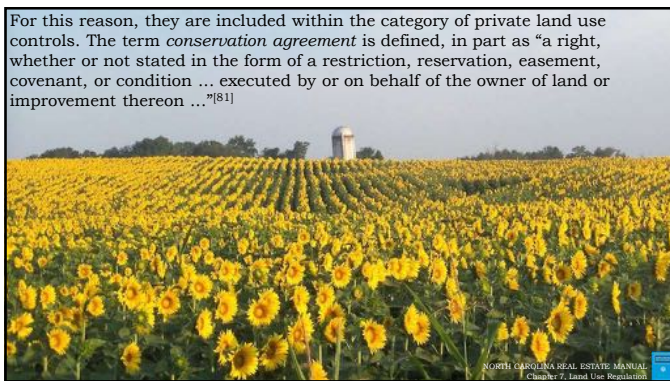
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Often, the document by which the landowner voluntarily restricts the land will be called a "conservation easement." When the preservation of farmland is involved, it is often called an *agricultural conservation easement*.



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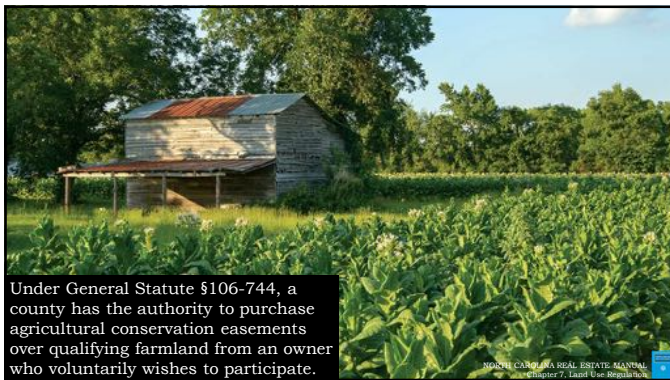
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Under General Statute §106-744, a county has the authority to purchase agricultural conservation easements over qualifying farmland from an owner who voluntarily wishes to participate.

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Although stated to be perpetual in duration, a county may agree to reconvey the easement to the owner of the land after 20 years if the landowner can demonstrate that commercial agriculture is no longer practical on the land in question.



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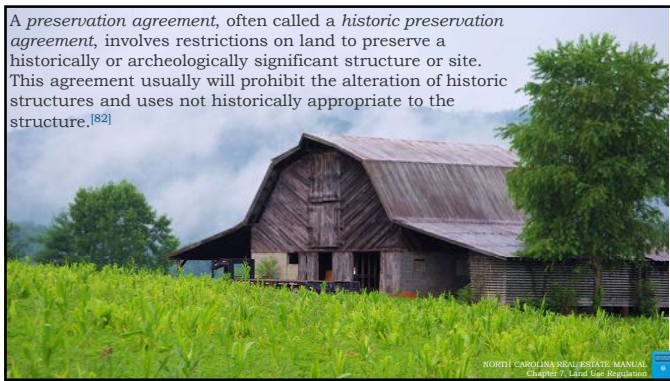
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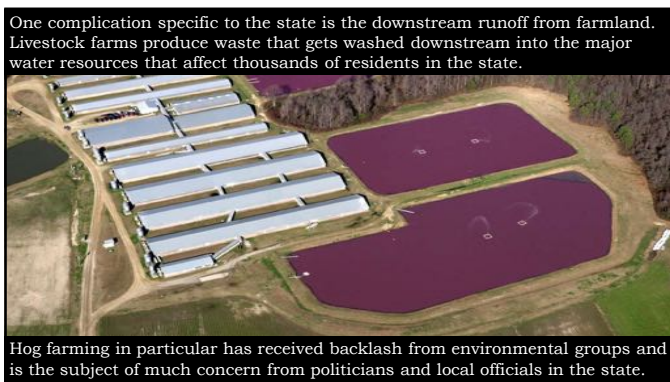
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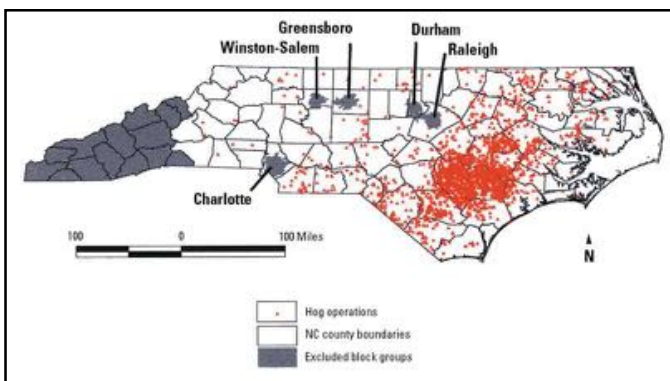
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Farms that produce agricultural products often use fertilizer and pesticides that is also a major environmental concern.



Runoff of chemical products from the agricultural industry can negatively affect wildlife and be a detriment to the state.

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Trivia: Do you know the state tree of North Carolina?

Let's take a look at the timber industry in our state!



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A major agricultural export of North Carolina is timber production and tree nurseries.



Many clients, even those close to city centers, can allocate tracts on their land to grow timber for industrial roundwood products like pulpwood, veneer logs, poles, and logs used for composite board products.

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Many North Carolina residents have allotted space on their residential property to grow timber, and with no overhead and minimal maintenance, this can be an excellent way to generate income from a long-term investment without much risk or downside.



More information can be found at [https://www.ncforestservice.gov/Managing\\_your\\_forest/timber\\_buvers.htm](https://www.ncforestservice.gov/Managing_your_forest/timber_buvers.htm)

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### Timber and Pulp Forests



Planting trees for use in lumber or pulp is not only beneficial to the property owner but also cuts down on deforestation by the logging industry and contributes to the health of the planet. The **Realtors Land Institute** website provides valuable information for how a home-owner can invest in timber forests on their property. [www.riland.com](http://www.riland.com)

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### Timber Deed

A timber deed conveys an interest in all standing timber on a specified tract of land and is subject to the usual rules applicable to all deeds, i.e., the six essential elements.



NORTH CAROLINA REAL ESTATE MANUAL Chapter 5, Transfer of Title to Real Property



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**What should a land owner actually know about a Timber Deed?**

- Buyer and Seller: Who actually owns the timber?
- Length of the Contract
- Clearly State Sale Extent, Location & Legal Description
- Timber Price and Payment Schedule
- Requiring a Performance Bond or Security Payment
- Notification of Start/Start/Completion of Logging
- Maintenance and Condition of Access Roads and Log Decks
- Require Best Management Practices
- Removal of Trees Outside the Sale Area
- Fire and Other Disaster Provisions
- Arbitration and Contract Disagreements
- Indemnity, Insurance, and Safety Regulations

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State stone: Emerald      Trivia: Do you know the state stone and the state mineral of North Carolina?




State mineral: Gold

Let's take a look at Mineral Rights in our state!

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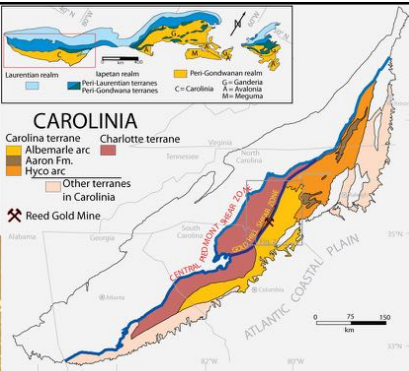
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**Do you want to join the Gold Rush?**

**CAROLINA**

Carolina terrane      Charlotte terrane

Albemarle arc      Aaron Fm.      Hyco arc

Other terranes in Carolina

Reed Gold Mine

ATLANTIC COASTAL PLAIN

Legend: Laurentian realm, Gaptank mafics, Peri-Laurentian terranes, Peri-Gondwanan terranes, Peri-Gondwanan realm, G = Ganderia, A = Avalonia, M = Marguata, C = Carolina

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NC was the home of America's first gold rush at Reed Gold Mine (pictured here). The state is full of gemstones and precious metals. Many miners and landowners have been pleasantly surprised to find hidden riches in their soil.



It is important for a broker and clients to understand who owns the rights to any resources under the land during a sale or purchase. Active brokers should be familiar with both MOG and a Mineral Deed.

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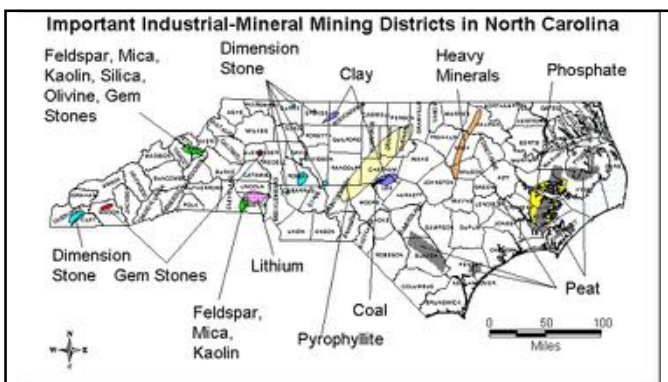
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### Natural Resources

By definition, Real Property includes "minerals and water beneath the surface of the soil"  
NORTH CAROLINA REAL ESTATE MANUAL, Chapter 1, Property Ownership

Because of this, it can be very lucrative for your clients to lease out land that sits upon natural resources.

Note that there will be environmental considerations to any endeavor that extracts minerals from the soil.

#### LIKE-KIND REAL ESTATE OPTIONS

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 **STATE OF NORTH CAROLINA**  
**MINERAL AND OIL AND GAS RIGHTS MANDATORY DISCLOSURE STATEMENT**

**Instructions to Property Owners**

1. The Residential Property Disclosure Act (G.S. 47E) ("Disclosure Act") requires owners of certain residential real estate such as single-family homes, individual condominiums, townhouses, and the like, and buildings with up to four dwelling units, to furnish purchasers a Mineral and Oil and Gas Rights Disclosure Statement ("Disclosure Statement"). This form is the only one approved for this purpose.
2. A disclosure statement is not required for some transactions. For a complete list of exemptions, see G.S. 47E-2(a). **A DISCLOSURE STATEMENT IS REQUIRED FOR THE TRANSFERS IDENTIFIED IN G.S. 47E-2(b)**, including transfers involving the first sale of a dwelling never inhabited, lease with option to purchase contracts where the lessee occupies or intends to occupy the dwelling, and transfers between parties when both parties agree not to provide the Residential Property and Owner's Association Disclosure Statement.
3. You must respond to each of the following by placing a check  in the appropriate box.

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**MINERAL AND OIL AND GAS RIGHTS DISCLOSURE**

Mineral rights and/or oil and gas rights can be severed from the title to real property by conveyance (deed) of the mineral rights and/or oil and gas rights from the owner or by reservation of the mineral rights and/or oil and gas rights by the owner. If mineral rights and/or oil and gas rights are or will be severed from the property, the owner of those rights may have the perpetual right to drill, mine, explore, and remove any of the subsurface mineral and/or oil or gas resources on or from the property either directly from the surface of the property or from a nearby location. With regard to the severance of mineral rights and/or oil and gas rights, Seller makes the following disclosures:

	Yes	No	No Representation
Buyer Initials _____ 1. Mineral rights were severed from the property by a previous owner.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Buyer Initials _____ 2. Seller has severed the mineral rights from the property.	<input type="checkbox"/>	<input type="checkbox"/>	
Buyer Initials _____ 3. Seller intends to sever the mineral rights from the property prior to transfer of title to the Buyer.	<input type="checkbox"/>	<input type="checkbox"/>	
Buyer Initials _____ 4. Oil and gas rights were severed from the property by a previous owner.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Buyer Initials _____ 5. Seller has severed the oil and gas rights from the property.	<input type="checkbox"/>	<input type="checkbox"/>	
Buyer Initials _____ 6. Seller intends to sever the oil and gas rights from the property prior to transfer of title to Buyer.	<input type="checkbox"/>	<input type="checkbox"/>	

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**Note to Purchasers**

If the owner does not give you a Mineral and Oil and Gas Rights Disclosure Statement by the time you make your offer to purchase the property, or exercise its option to purchase the property pursuant to a lease with an option to purchase, you may under certain conditions cancel any resulting contract without penalty to you as the purchaser. To cancel the contract, you must personally deliver or mail written notice of your decision to cancel to the owner or the owner's agent within three calendar days following your receipt of this Disclosure Statement, or three calendar days following the date of the contract, whichever occurs first. However, in no event does the Disclosure Act permit you to cancel a contract after settlement of the transaction or (in the case of a sale or exchange) after you have occupied the property, whichever occurs first.

Property Address: \_\_\_\_\_  
 Owner's Name(s): \_\_\_\_\_  
 Owner's Signature: \_\_\_\_\_ Date: \_\_\_\_\_  
 Owner's Signature: \_\_\_\_\_ Date: \_\_\_\_\_  
 Purchaser's Signature: \_\_\_\_\_ Date: \_\_\_\_\_  
 Purchaser's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

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### Mineral Deed

- Title to real property traditionally includes title to the surface, certain rights to useable space above the surface, and rights to the subsurface, including mineral rights.
- When these subsurface mineral rights are severed from surface ownership, a mineral deed is often used.
- General mineral rights or the right to exploit and remove specified minerals or substances may be conveyed by deed without conveying the surface land itself.



NORTH CAROLINA REAL ESTATE MANUAL  
Chapter 5. Transfer of Title to Real Property



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### Fracking in North Carolina

Hydraulic fracturing is a method of oil and natural gas extraction that involves injecting fluid into subterranean rock formations at high pressure.

Although highly lucrative, there has been much debate on the legality of fracking in North Carolina because of its environmental impact. More information on the legal issues in north Carolina can be found at [https://ballotpedia.org/Fracking\\_in\\_North\\_Carolina](https://ballotpedia.org/Fracking_in_North_Carolina)



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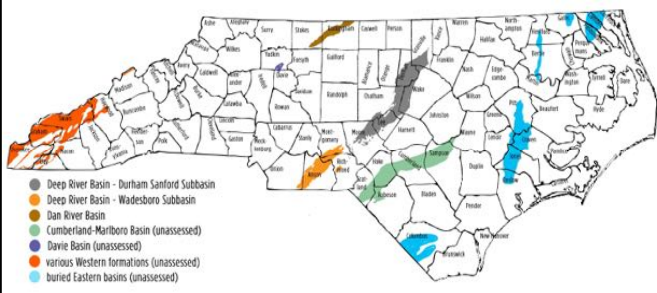
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### NC Geologic Formations with Potential Natural Gas



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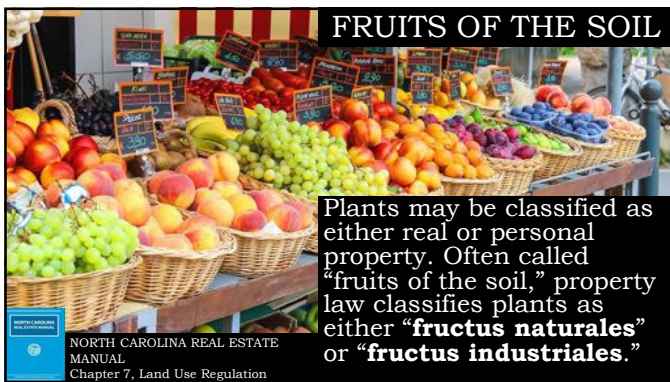
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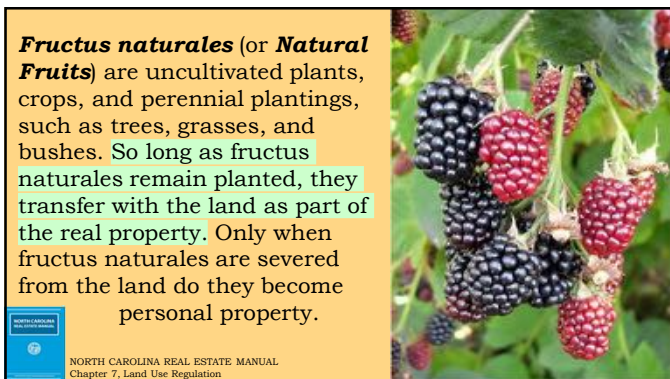
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In contrast, **fructus industrials** (or **fruits of industry**) are products or benefits produced by the labor or industry of a person, rather than nature. Also known as **emblems**, *cultivated* crops and vegetable products are examples of fructus industriales and are generally considered personal property. A broker representing a seller or purchaser of a farm with growing crops should clarify the legal status of crops that will not be harvested prior to closing.

NORTH CAROLINA REAL ESTATE MANUAL  
Chapter 7, Land Use Regulation

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Question: Do apples, berries, and Christmas trees convey upon the sale of property?

Did you change your answer?

How would you advise a client who is purchasing a farm or vineyard?



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Trivia: Do you know the state fruit of North Carolina?

Let's take a look at the wine industry in our state!



Scuppernong Grapes!

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In all three major regions of North Carolina, the mountains, piedmont, and the coastal plain, wine production has become a burgeoning industry producing over 1.1 million cases of wine each year, placing the state eleventh overall in wine production in the country.

North Carolina is home to 186 wineries, more than 525 individually owned vineyards, and utilizes 2,300 acres of land.

The wine and grape industry in North Carolina boasts just under \$2 billion supporting more than 10,000 jobs.

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Common wine grapes like *Vitis Vinifera* are readily grown in the state and are used in the production of Cabernet Sauvignon, Chardonnay, Merlot, and Syrah. However, many native grapes are also utilized in the production of wines with a distinctly North Carolinian profile. *Scuppernon* and *Muscadine* grapes grow natively throughout the state and produce a decidedly North Carolina wine that is sought after all over the country. More information about the wine industry in North Carolina is available at <https://www.ncwine.org>

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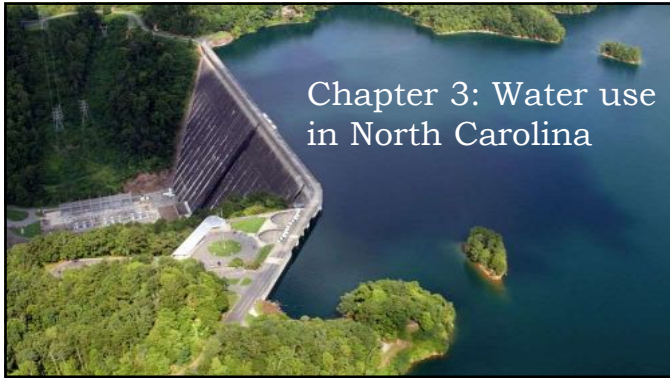
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**Where does the water come from?**

A **river basin** is the portion of land drained by a river and its tributaries. It encompasses all of the land surface dissected and drained by many streams and creeks that flow downhill into one another, and eventually into a river.

As a bathtub catches all the water that falls within its sides, a river basin sends all the water falling on the surrounding land into one of North Carolina's rivers

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In North Carolina, the five western basins drain to the Gulf of Mexico (Hiwassee, Little Tennessee, French Broad, Watauga and New). The other 12 basins flow to the Atlantic Ocean. Only four basins are contained entirely within the state (Cape Fear, Neuse, White Oak and Tar-Pamlico).

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# Trivia: Do you know the state fish of North Carolina?

Freshwater

Saltwater



Southern Appalachian Brook Trout



Channel Bass (Red Drum)

82

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North Carolina freshwaters support an impressive array of aquatic species with at least 240 fish, 125 mollusk and 45 crayfish.



Unfortunately, nearly 12 percent of our fish and 59 percent of our mussel species are currently imperiled.

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**The North Carolina Sediment Pollution Control Act** deals with the problem of sedimentation of state waters. "Sedimentation" occurs from the erosion or depositing of soil or other materials into waters caused by activities such as land development, manufacturing, farming, and mining.



The environmental problem with sedimentation is its adverse impact on the waters of the state, including fish and plants located in them.

NORTH CAROLINA REAL ESTATE MANUAL Chapter 7, Land Use Regulation

84

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Any person engaging in activity that disturbs land by altering the natural vegetation or topography in a way that creates sedimentation is subject to the Act.

Land-disturbing activities are regulated by the North Carolina Department of Environmental Quality.



NORTH CAROLINA REAL ESTATE MANUAL Chapter 7, Land Use Regulation

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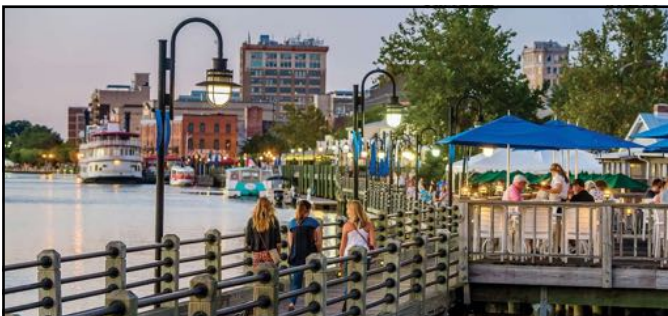
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Example: A new shopping center is under construction. The Sediment Pollution Control Act and state regulations require that the construction include both a sedimentation and erosion control plan and devices. A natural buffer zone between the project and nearby waters must also be maintained. Numerous other sedimentation and erosion controls may be required.

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### Clean Water Acts

The federal and state Clean Water Acts make the depositing of dredged or fill materials into wetlands and other waters of the United States or North Carolina illegal unless a permit is obtained in advance. **“Wetlands”** are areas periodically inundated or saturated to the extent that they can or do support vegetation adapted to aquatic conditions.



The Venus Fly Trap occurs naturally only along the coastal plain of North and South Carolina in the U.S, with all known current sites within 90 km of Wilmington, North Carolina  
-Wikipedia



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The federal dredge and fill permit program is administered by the U.S. Army Corps of Engineers, and the Environmental Protection Agency. The *North Carolina Dredge and Fill Act* requires that a permit – issued by the Coastal Resources Commission – be obtained before any dredging or filling is done in North Carolina waters or marshlands.



NORTH CAROLINA REAL ESTATE MANUAL, Chapter 7, Land Use Regulation

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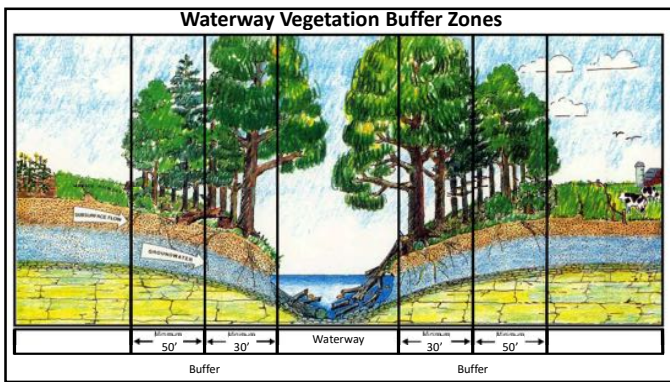
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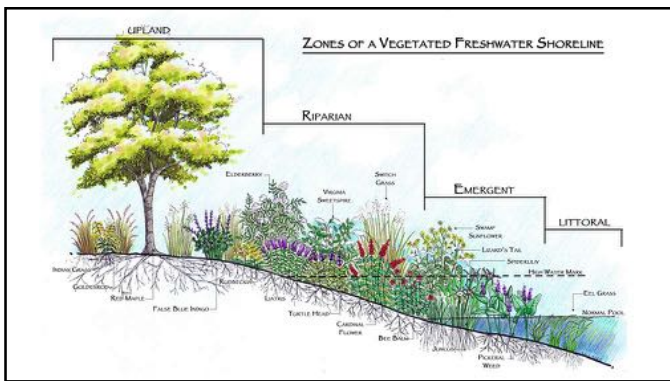
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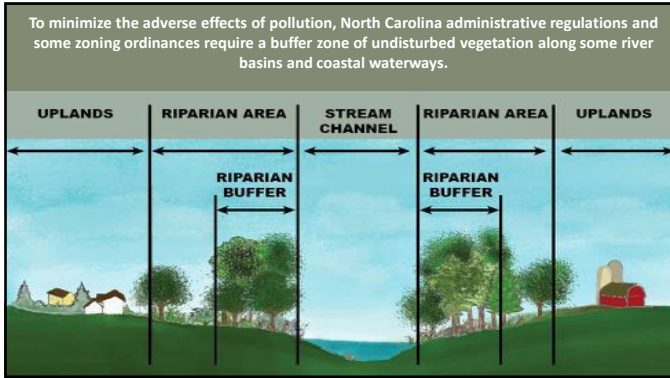
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Zoning and land use ordinances in certain areas require more extensive buffer zones. The undisturbed vegetation zone runs from 30 to 50 feet from the water's edge, depending upon the location and nature of the waterway.

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The image contains two parts. On the left is a photograph of a green sign that reads 'THE NEUSE RIVER BASIN' with a picture of a river and a bridge. On the right is a map of North Carolina with the Neuse River Basin highlighted in green. The map shows the river flowing from the interior towards the coast.

Brokers dealing with land in the Neuse River Basin or in coastal areas should familiarize themselves with environmental regulations and ordinances having a direct impact on land development. Coastal areas are governed by the North Carolina Coastal Resources Commission.

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**Example:** In a federal court decision involving a buyer of timber rights that included land in an environmental buffer zone created by an ordinance of the Town of Garner, a timber company made a claim against a title insurance company because the timber on 179 out of more than 700 acres was within a waterway buffer zone and could not be harvested.



A town ordinance created a buffer zone of 500 feet from the center of Swift Creek, or the 100-year floodplain plus 50 feet. The timber company estimated its loss by valuating the timber that could not be harvested at **\$374,769.00**

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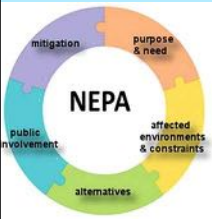
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### National Environmental Policy Act



The **National Environmental Policy Act (NEPA)** mandates that all federal agencies fully weigh the environmental effects of federal programs. NEPA requires federal agencies to prepare **environmental impact statements** describing in detail the effect of proposed projects on the environment. North Carolina requires environmental impact statements of state agencies for certain projects under the North Carolina Environmental Policy Act.

NORTH CAROLINA REAL ESTATE MANUAL  
Chapter 7, Land Use Regulation

97

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### Drawbacks of farming in North Carolina

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### Rules and Regulation for Renting Land for Agricultural Purposes in North Carolina

Both the **Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)** and state law require owners, operators, and "responsible parties" to notify the Inactive Hazardous Waste Sites Branch of the NC Division of Waste Management within 90 days of discovering any inactive hazardous substance or waste disposal site.



NORTH CAROLINA REAL ESTATE MANUAL  
Chapter 7, Land Use Regulation

99

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### Rules and Regulation for Renting Land for Agricultural Purposes in North Carolina

If a broker is aware of a prior use that may have caused environmental issues, the broker must disclose that prior use to all parties, including lenders.



NORTH CAROLINA REAL ESTATE MANUAL Chapter 7, Land Use Regulation

100

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### Rules and Regulation for Renting Land for Agricultural Purposes in North Carolina

Disclosure should include the existence of underground storage tanks in which hazardous substances have been stored, any history of hazardous waste disposal or the storage of hazardous substances on the property, and other environmental danger signals, such as the existence of a former sanitary landfill on the property.



NORTH CAROLINA REAL ESTATE MANUAL Chapter 7, Land Use Regulation

101

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Congress enacted the **Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)** in 1980 to address the liability, compensation, cleanup, and emergency response to hazardous substances released into the environment.

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 Chapter 7, Land Use Regulation

102

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CERCLA authorizes both the federal and state governments to institute actions for the containment, cleanup, and removal of **hazardous wastes** on property.



**Air Pollution**      **Water Pollution**

**Soil Pollution**      **Toxins**

NORTH CAROLINA REAL ESTATE MANUAL Chapter 7, Land Use Regulation

103

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**CERCLA** 

At the federal level, CERCLA is enforced by the Environmental Protection Agency (EPA).

The North Carolina Department of Environmental Quality (DEQ) enforces CERCLA at the state level. CERCLA authorizes actions for damages, including actions by private parties, to recover the necessary costs of an environmental cleanup.

NORTH CAROLINA REAL ESTATE MANUAL Chapter 7, Land Use Regulation

104

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The federal government might fund a cleanup with what is known as "Superfund" money. The "Superfund" is a fund financed jointly by the industry and the federal government.

North Carolina also has a "Superfund" program, and a list of reported waste sites may be found on the NC DEQ's Division of Waste Management website. If the government funds the cleanup, it will seek to recover the cost from the "responsible parties" for the environmental damage.



NORTH CAROLINA REAL ESTATE MANUAL Chapter 7, Land Use Regulation

105

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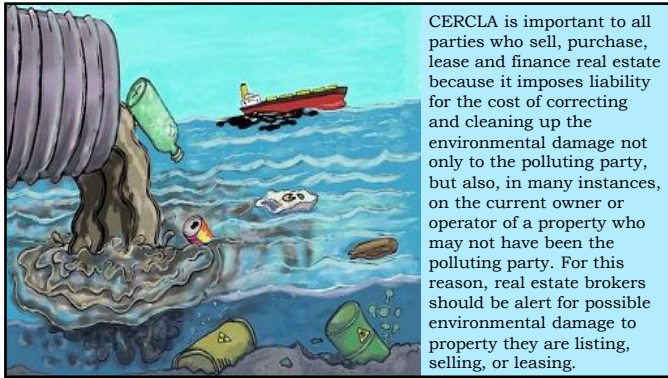
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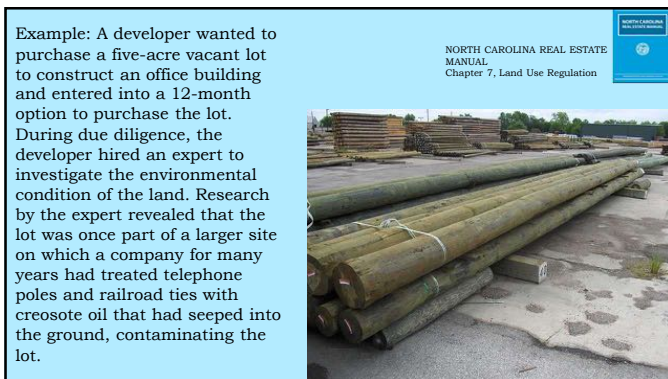
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Amendments to CERCLA offer a defense to innocent landowners who conscientiously perform due diligence, undertaking all appropriate inquiries, but who had no actual or constructive knowledge of a hazardous substance



Landowners who purchased without exercising due diligence remain liable with prior owners for site cleanup even though they did not cause the hazardous substance pollution.

NORTH CAROLINA REAL ESTATE MANUAL  
Chapter 7, Land Use Regulation



109

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**Example:** An investor finds a lot located in a commercial zone near a busy intersection that has been vacant for decades. The seller knew that an ancestor had operated an electronic transformer repair company on the lot, but the seller never mentioned this to his listing broker or to the investor.



The investor was in such a rush to get title to this bargain lot that he did not perform any due diligence investigation of the property. Several years after the real estate closing, the investor discovers that the lot is contaminated with PCP (polychlorinated biphenyl) from the earlier operation of the electronic transformer repair company.

**Who is responsible for the cost of clean up?**

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The investor is jointly and severally liable for cleaning up the lot along with prior owners.



Too often, however, these other parties are bankrupt, deceased, or a company no longer exists, leaving the burden of cleanup on the current owner.

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**Example:** A real estate broker familiar with a rural area recalls that an old abandoned paint factory that operated throughout World War II is located only one block away from a one-acre parcel of land that is for sale and zoned for multifamily residential purposes.

**What should the broker do?**



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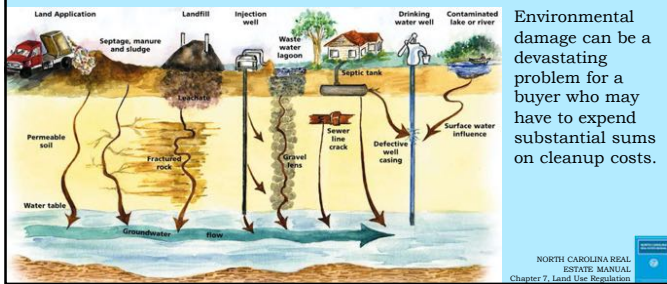
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Prospective buyers must be informed of the possibility of adverse environmental consequences, such as lead contamination of the ground-water.



Environmental damage can be a devastating problem for a buyer who may have to expend substantial sums on cleanup costs.

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One of the most recent examples of an environmental disaster that violated the EPA was the coal ash spill in Western North Carolina in 2014.

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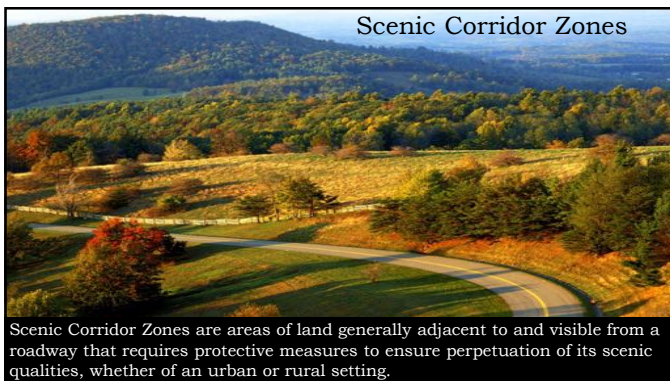
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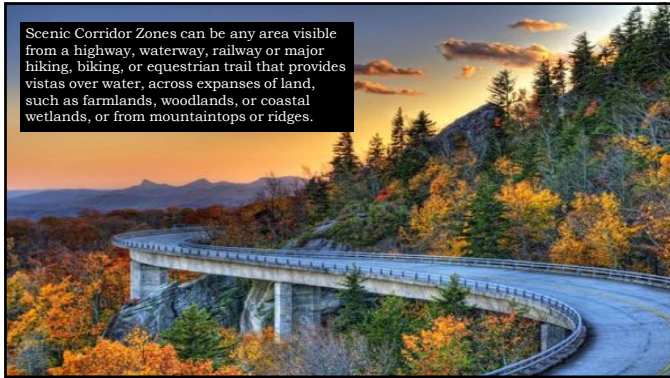
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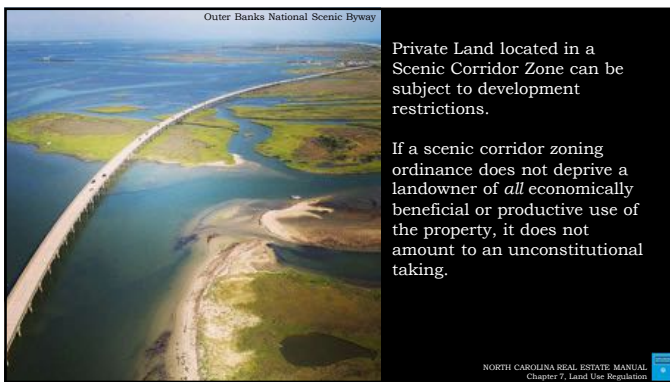
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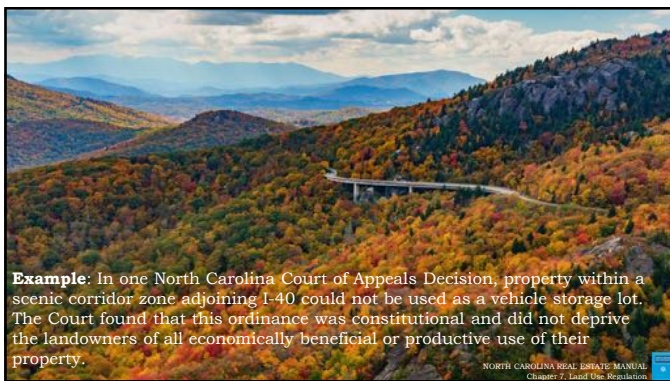
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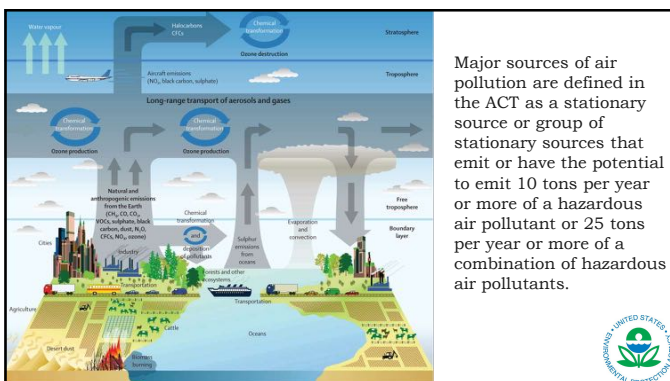
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Major sources of air pollution are defined in the ACT as a stationary source or group of stationary sources that emit or have the potential to emit 10 tons per year or more of a hazardous air pollutant or 25 tons per year or more of a combination of hazardous air pollutants.



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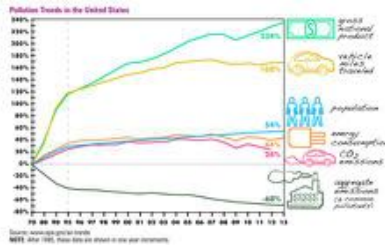
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National and state air pollution controls that went into effect in the early 1990s coincide with decreasing death rates from emphysema, asthma and pneumonia among people in North Carolina, according to a study led by Duke University researchers.

"This research tends to show that environmental policies work, if the goal of those policies is not only to improve the environment, but also to improve health," said H. Kim Lyster, M.D., professor of surgery, associate professor of pathology and assistant professor of immunology at Duke. Lyster is senior author of the study published online June 23, 2014, in the International Journal of COPD.



Air Pollution Controls Linked to Lower Death Rates in North Carolina  
Published June 23, 2014 | Updated January 20, 2016

124

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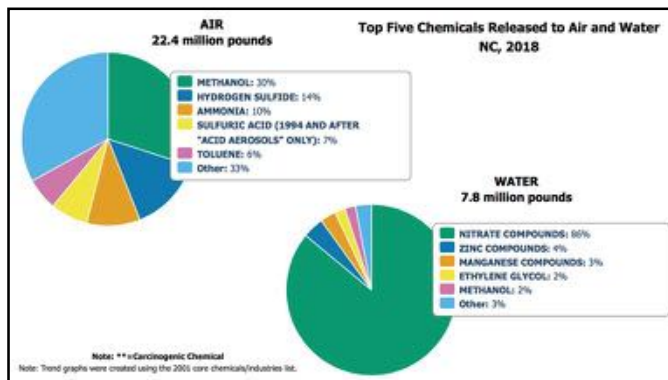
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COUNTY	NO OF FACILITIES	POUNDS MANAGED	LARGEST POLLUTION SOURCE	POUNDS DISPOSED/RELEASED ON-SITE/OFF-SITE BY LARGEST POLLUTION SOURCE
1. CATAWBA	26	23,300,000	DUKE ENERGY MARSHALL	2,291,146
2. PERSON	7	16,800,000	CPI USA	2,301,448
3. FORSYTH	25	16,100,000	ARDAGH METAL BEVERAGE	611,188
4. CRAVEN	7	12,200,000	INTERNATIONAL PAPER NEW BERN MILL	678,361
5. HALIFAX	6	11,000,000	KAPSTONE KRAFT PAPER	1,060,739
5. STOKES	2	10,500,000	DUKE ENERGY BELEWS CREEK	598,228
7. MECKLENBURG	60	9,400,000	CHARLOTTE PIPE AND FOUNDRY	620,309
8. BERTIE	3	7,100,000	LEWISTON PROCESSING	2,213,456
9. DURHAM	12	6,400,000	CREP	27,944
10. BURKE	11	6,000,000	HEXION	148,808
11. WAKE	24	5,800,000	KELLOG'S SNACKS	153,732
12. ROWAN	21	5,700,000	SOUTHERN CO ROWAN POWER PLANT	78,010
13. BLADEN	8	5,100,000	SMITHFIELD TAR HEEL	2,952,011
14. GASTON	23	5,100,000	DUKE ENERGY ALLEN	148,454
15. IREDELL	25	5,100,000	TYSON FARMS	53,438

Toxics Release Inventory, 2018

126

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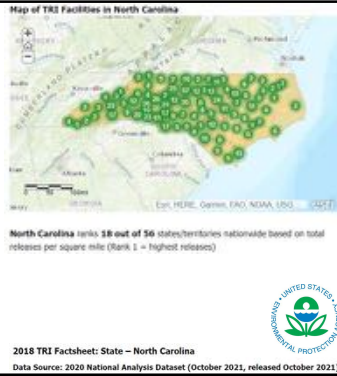
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The **Toxics Release Inventory (TRI)** tracks the management of certain toxic chemicals that may pose a threat to human health and the environment. Certain industrial facilities in the U.S. must report annually how much of each chemical is recycled, combusted for energy recovery, treated for destruction, and disposed of or otherwise released on- and off-site. This information is collectively referred to as production-related waste managed.



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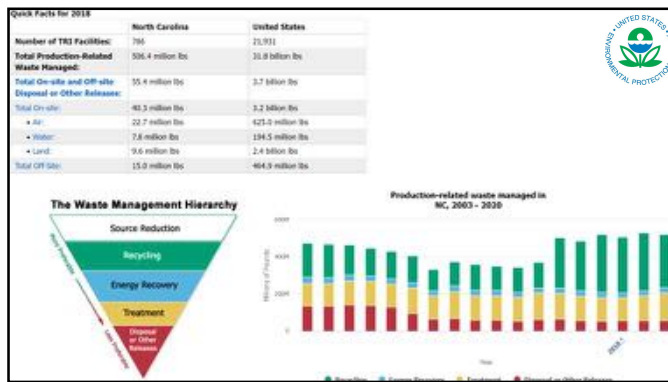
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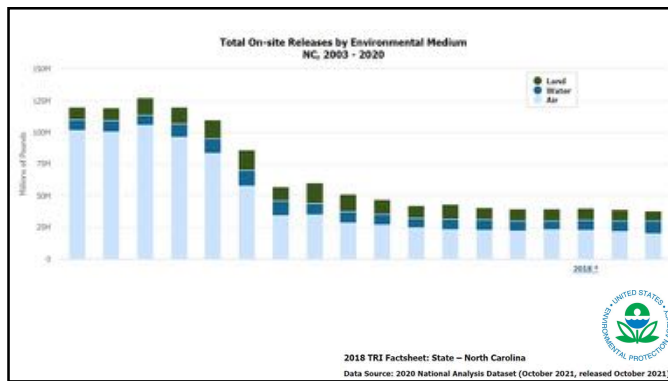
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**The Clean Smokestacks Act**, officially titled the *Air Quality/Electric Utilities Act (SB 1078)*, requires significant actual emissions reductions from coal-fired power plants in North Carolina.



The act differs from federal rules, which allow utilities to buy pollution credits from other states instead of cutting air pollution from power plants in state.



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**Emissions reductions:** Under the act, North Carolina's utilities must reduce actual emissions of:

nitrogen oxides (NOx) from 245,000 tons in 1998 to 56,000 tons by 2009 (77% reduction).

sulfur dioxide (SO2) emissions from 489,000 tons in 1998 to 250,000 tons by 2009 (49% reduction) and 130,000 tons by 2013 (73% reduction).

This represents about a one-third reduction of the total NOx emissions and a one-half reduction of the total SO2 emissions from all sources in North Carolina.

131

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**Health benefits:** The emission reductions will have health benefits for citizens of North Carolina and other states by significantly reducing pollution events that can trigger asthma and other respiratory problems.



The cuts in both SO2 and NOx emissions will reduce acid rain and serve as a significant step toward meeting the new fine particle and ozone standards throughout North Carolina.



132

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**How did NC do? Did our state meet the requirements of the Clean Smokestack Act?**

The end of 2013 marked the last milestone in SO<sub>2</sub> related emissions reductions, when Duke Energy and Progress Energy had to further reduce calendar year SO<sub>2</sub> emissions to 80,000 tons and 50,000 tons, respectively. The combined SO<sub>2</sub> emissions limitation for 2013 was reduced to 130,000 tons, while the NO<sub>x</sub> emissions limits remained unchanged in 2013. In this year's compliance reports, both utilities reported that they have continued to meet their respective limits. The DENR/DAQ has verified compliance with all emissions limits.



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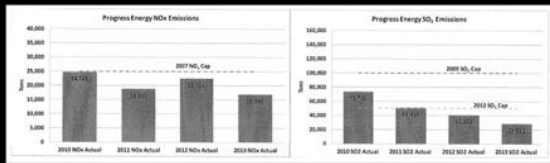
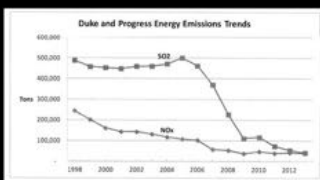
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A Report to the Environmental Review Commission and the Joint Legislative Commission on Governmental Operations

Submitted by the North Carolina Department of Environment and Natural Resources and the North Carolina Utilities Commission



134

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*Then...*  
**1998**  
9 mile Visual Range  
33 deciviews

*Now...*  
**2015**  
35 mile Visual Range  
19 deciviews

**Visibility:** Air pollution has reduced visibility in the Smoky Mountains from 93 miles to between 24 and 36 miles (National Park Service report, "Clearing the Air at Great Smoky Mountains National Park", September 1999). The act is helping North Carolina reach its goal of improving visibility in the mountains and from other scenic vistas in North Carolina by reducing pollution from North Carolina sources that contribute to the problem.

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The **Resource Conservation and Recovery Act (RCRA)** gives EPA the authority to control hazardous waste from cradle to grave. This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA also set forth a framework for the management of non-hazardous solid wastes. The 1986 amendments to RCRA enabled EPA to address environmental problems that could result from underground tanks storing petroleum and other hazardous substances.

**Resource Conservation and Recovery Act  
RCRA**

Generate    Dispose  
Transport    Treat    Store

136

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**HSWA - the Federal Hazardous and Solid Waste Amendments** - are the 1984 amendments to RCRA that focused on waste minimization and phasing out land disposal of hazardous waste as well as corrective action for releases.

**RCRA  
8 METALS**

Metal	Hazardous Waste Code	Regulation Level
Ba (Barium)	112,207	100 PPM
Cd (Cadmium)	112,411	1 PPM
As (Arsenic)	74,20110	5 PPM
Pb (Lead)	207,2	5 PPM
Hg (Mercury)	200,95	1 PPM
Cr (Chromium)	61,9961	5 PPM
Se (Selenium)	78,36	5 PPM
Ag (Silver)	107,888	5 PPM

IDR Environmental Services  
100 S. Ironside Avenue, Azusa, CA 91702 • Phone: 1.866.437.3664 • idrenvironmental.com

137

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**Chapter 5: Environmental Issues and Due Diligence**

Although the substance and requirements of these various laws go well beyond what a real estate broker must know, a broker should be aware of the need for an environmental inspection prior to the purchase or leasing of commercial, industrial, office, and other nonresidential property.

NORTH CAROLINA REAL ESTATE MANUAL  
Chapter 7, Land Use Regulation

138

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ESAs are conducted by environmental experts who investigate the property to assess environmental issues based on technical standards.

### Environmental Site Assessments (ESAs)



The assessment includes a history of past use of the property, an inspection of public records that might reveal environmental issues, and an evaluation of suitability for the current or proposed use.

NORTH CAROLINA REAL ESTATE MANUAL  
Chapter 7, Land Use Regulation

139

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An ESA is highly advisable for a purchaser of suspect land, since real property owners in North Carolina generally are not compelled to disclose potential environmental problems or a history of environmental problems on the property being transferred, in part because North Carolina is a caveat emptor state.



NORTH CAROLINA REAL ESTATE MANUAL  
Chapter 7, Land Use Regulation

140

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Both **CERCLA** and state law require owners, operators, and "responsible parties" to notify the Inactive Hazardous Waste Sites Branch of the NC Division of Waste Management within 90 days of discovering any inactive hazardous substance or waste disposal site.



NORTH CAROLINA REAL ESTATE MANUAL  
Chapter 7, Land Use Regulation

141

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If a broker is aware of a prior use that may have caused environmental issues, the broker must disclose that prior use to all parties, including lenders.

Disclosure should include the existence of underground storage tanks in which hazardous substances have been stored, any history of hazardous waste disposal or the storage of hazardous substances on the property, and other environmental danger signals, such as the existence of a former sanitary landfill on the property.

Hopefully, an expert conducting an ESA would discover these prior uses through his/her research.

NORTH CAROLINA REAL ESTATE MANUAL  
Chapter 7. Land Use Regulation



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142

Environmental issues can complicate any real estate transaction, whether residential or commercial, because of the owner/purchaser's potential liability to clean up any contamination even if they did not cause it.

A real estate broker who knows or has reasonable cause to believe that a prior use may have had adverse environmental effects on the property must disclose what s/he knows and should strongly recommend that any prospective buyer or lessee fully use their due diligence to conduct any and all inspections, investigations, or inquiries they wish.

NORTH CAROLINA REAL ESTATE MANUAL  
Chapter 7. Land Use Regulation



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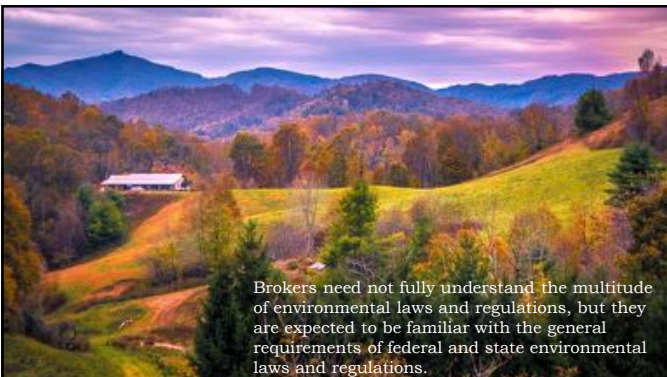
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Brokers need not fully understand the multitude of environmental laws and regulations, but they are expected to be familiar with the general requirements of federal and state environmental laws and regulations.

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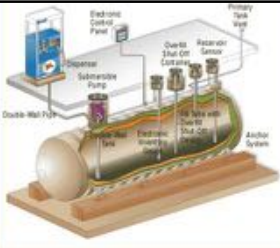
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**The North Carolina Leaking Petroleum Underground Storage Tank Cleanup Act** regulates the unauthorized discharge of oil or other hazardous chemicals and substances from underground petroleum storage tanks.



Under this environmental law, the owner of polluted property may have the heavy burden of cleanup costs even though the owner had nothing to do with the discharge of the hazardous substance. Leaking underground storage tanks are a common environmental issue.

NORTH CAROLINA REAL ESTATE MANUAL  
Chapter 7, Land Use Regulation

145

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**Example:** An investor purchased a commercial lot not knowing that a former owner had operated a small country gasoline station on the property. The building was demolished and the lot graded when the former owner died a decade earlier, but the underground storage tank with fuel was never removed.



**Who is responsible for the cleanup?**

After purchasing the property without conducting an environmental assessment, the investor discovered the underground tank and that it had been slowly leaking for years.

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Chapter 7, Land Use Regulation

146

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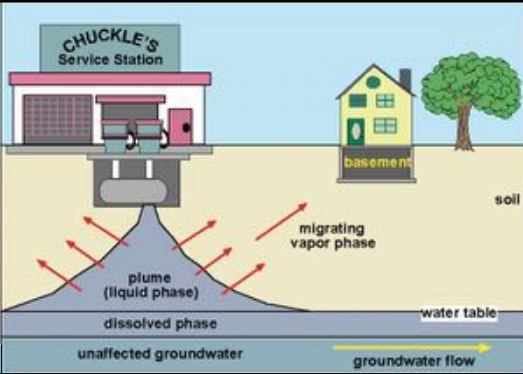
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The investor is now liable for substantial environmental cleanup costs.

(Past owners who caused the problem are also liable, but they may be deceased, unable to be found, or insolvent.)



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Chapter 7, Land Use Regulation

147

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**Commercial USTs** have been regulated at the federal level since 1974 following the enactment of the Resource Conservation and Recovery Act (RCRA).



Unfortunately, discovering whether a *noncommercial underground fuel storage tank* was ever installed on a property may not be easy.

NORTH CAROLINA REAL ESTATE MANUAL  
Chapter 7, Land Use Regulation

148

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It does not appear that there have ever been any regulatory or permitting requirements for **noncommercial** USTs at either the federal or state level.

Even today, a property owner apparently can install a noncommercial UST without notifying any authority or obtaining any permit.

NORTH CAROLINA REAL ESTATE MANUAL  
Chapter 7, Land Use Regulation

149

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A current owner may not know if a prior owner installed a UST, particularly where the present heat source is nonfuel. As part of the discovery process, a reasonable prudent broker should consider factors such as:

- \*the age of the structure,
- \*its location when built (e.g., urban, suburban, rural),
- \*previous uses of the property,
- \*the presence of radiators in the dwelling,
- \*pipes sticking out of the ground, and
- \*how long the current owner has owned the property.



NORTH CAROLINA REAL ESTATE MANUAL  
Chapter 7, Land Use Regulation

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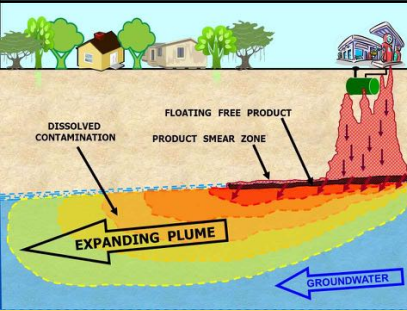
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A structure built decades ago in what was then a rural environment that has always been used for residential purposes raises the question: what was the original heat source?

What inquiries might a reasonable prudent broker make to discover whether an underground storage tank could be on the property?

The broker might contact NCDEQ's UST Division and ask whether they have any records of any USTs being removed from the property



151

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Any broker who knows that there is or was a UST on the property **must disclose** its presence to all prospective purchasers or tenants, and if acting as a buyer agent, should **strongly encourage** the buyer to hire an expert to inspect the tank and conduct a soil contamination test to determine whether the buyer is purchasing a major liability.



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Property owner liability for USTs has become even more important since the General Assembly passed legislation in September 2015 that eliminated a state trust fund administered by the Underground Storage Tank Section of the NC Department of Environmental Quality that helped defray remediation expenses related to noncommercial USTs. (Session Law 2015-241.)

Owners who first learned of a problem with a noncommercial UST after July 1, 2015, are not eligible for any state reimbursement funds nor is there any federal program for noncommercial USTs. If, however, an owner discovers that a **commercial UST** was installed sometime earlier on his/her property, the owner *may be eligible for contribution from federal funds* administered by the NCDEQ, UST Section.



153

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**Wastewater Systems**

Directly related to environmental health is the treatment and disposal of wastewater, which is governed both by statute and administrative rules.



The rules state that "any person owning or controlling a residence, place of business, or place of public assembly containing water-using fixtures connected to a water-supply source shall discharge all wastewater directly to an approved wastewater system permitted for that specific use."

NORTH CAROLINA REAL ESTATE MANUAL  
Chapter 7, Land Use Regulation

154

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"Residence" includes a private home, dwelling unit in a multiple family structure, hotel, motel, summer camp, labor work camp, manufactured home, institution, or any other place where people reside.



Wastewater includes water from sinks, showers, or washing machine drains (often referred to as "grey water"), sewage (sometimes called "black water"), and industrial process wastewater.

NORTH CAROLINA REAL ESTATE MANUAL  
Chapter 7, Land Use Regulation

155

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All wastewater must be treated either through a septic system or sewage treatment plant. Despite state law, some properties still employ "straight-piping" where wastewater is discharged directly into streams or onto land.



**This is illegal.** A straight-pipe system is a material fact that brokers must disclose to all parties involved in the transaction.

NORTH CAROLINA REAL ESTATE MANUAL  
Chapter 7, Land Use Regulation

156

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### Waste Water Systems approved by the EPA

Septic system design and size can vary widely, from within your neighborhood to across the country, due to a combination of factors.

These factors include:

- household size,
- soil type,
- site slope,
- lot size,
- proximity to sensitive water bodies,
- weather conditions,
- local regulations.

Below are ten of the most common types of septic systems used. The list is not all-inclusive; there are many other types of septic systems.



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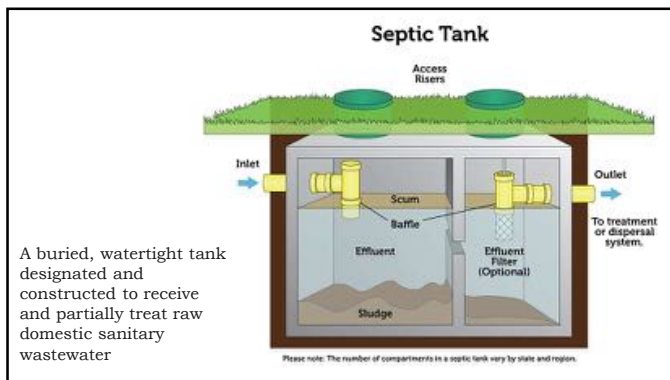
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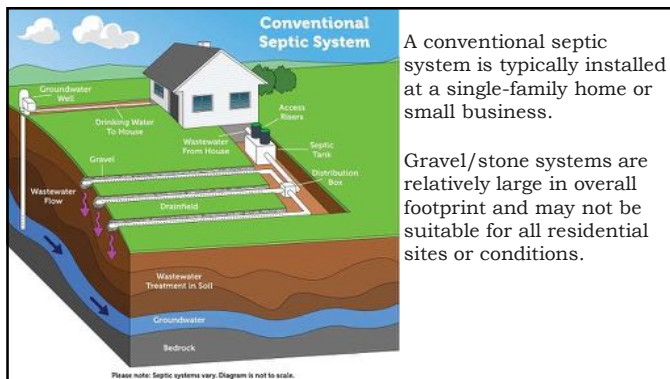
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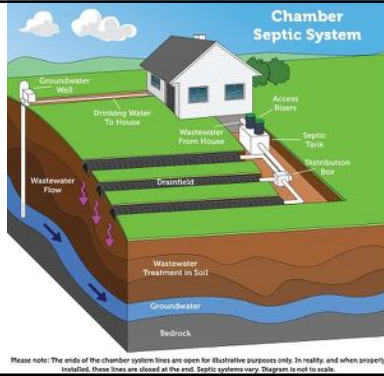
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The chamber system serves as an alternative design to the gravel/stone system. The primary advantage of the chamber system is increased ease of delivery and construction.

They are also well suited to areas with high groundwater tables, where the volume of influent to the septic system is variable (e.g., at a vacation home or seasonal inn), in an area where gravel is scarce, or in areas where other technologies such as plastic chambers are readily available.



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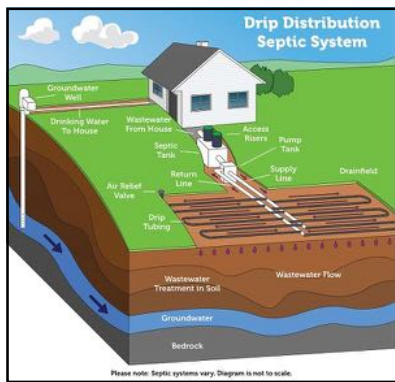
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The main advantage of the drip distribution system is that no large mound of soil is needed as the drip laterals are inserted into the top 6 to 12 inches of soil.

The disadvantage of the drip distribution system is that it requires a large dose tank after the septic tank to accommodate the timed dose delivery of wastewater to the drip absorption area.

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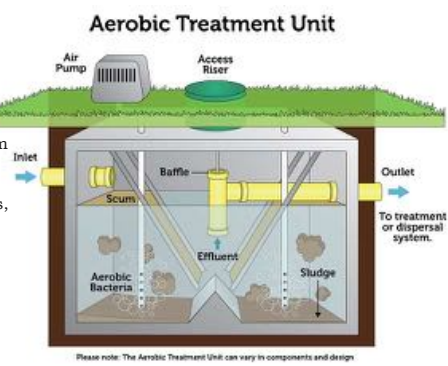
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Aerobic Treatment Units (ATUs) use many of the same processes as a municipal sewage plant, but on a smaller scale.

The benefits of this system are that it can be used in homes with smaller lots, inadequate soil conditions, in areas where the water table is too high, or for homes close to a surface water body sensitive to contamination by nutrients contained in wastewater effluent.



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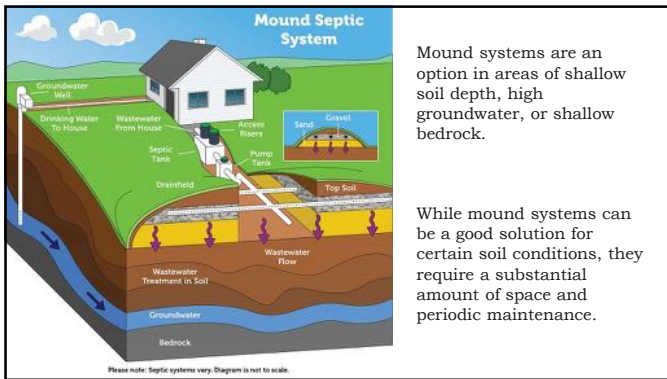
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Mound systems are an option in areas of shallow soil depth, high groundwater, or shallow bedrock.

While mound systems can be a good solution for certain soil conditions, they require a substantial amount of space and periodic maintenance.

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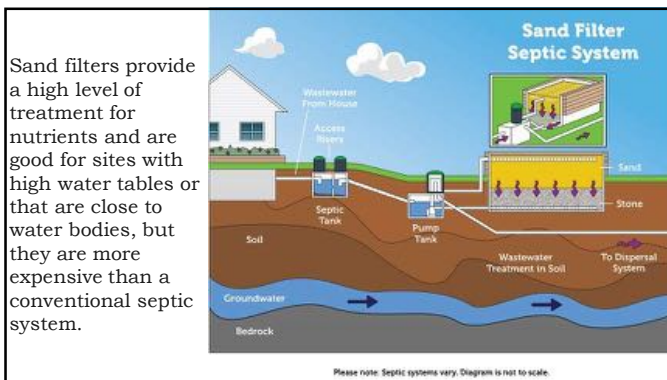
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Sand filters provide a high level of treatment for nutrients and are good for sites with high water tables or that are close to water bodies, but they are more expensive than a conventional septic system.

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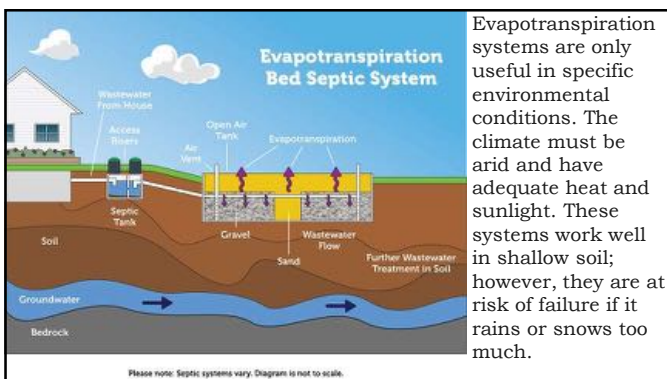
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Evapotranspiration systems are only useful in specific environmental conditions. The climate must be arid and have adequate heat and sunlight. These systems work well in shallow soil; however, they are at risk of failure if it rains or snows too much.

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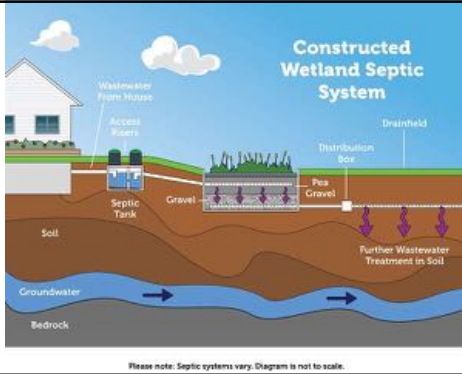
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165

A constructed wetland mimics the treatment processes that occur in natural wetlands.

As wastewater flows through the wetland, it may exit the wetland and flow into a drainfield for further wastewater treatment into the soil.



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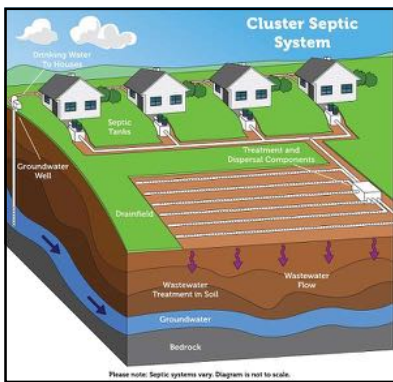
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A decentralized wastewater treatment system under some form of common ownership that collects wastewater from two or more dwellings or buildings and conveys it to a treatment and dispersal system located on a suitable site near the dwellings or buildings. It is common to find cluster systems in places like rural subdivisions.

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Chapter 6: Sustainable Technology for Realtors



168

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**Weatherizing a home is not only good for your wallet, it helps the environment.**

Here we will explore some new technologies that help the energy efficiency of homes in North Carolina.

**MECHANICAL MEASURES**

- Clean, tune, repair or replace heating and cooling systems.
- Insulate duct and heating pipe insulation.
- Install programmable thermostats and other HVAC controls.
- Repair/replace water heaters.
- Install water heater tank insulation.
- Insulate water heating pipes.
- Install solar water heating systems.
- Install water heat recovery devices.

**HEALTH & SAFETY MEASURES**

- Complete combustion appliance safety testing.
- Repair/replace vent systems to ensure combustion gas does not enter building.
- Install mechanical ventilation to ensure adequate indoor air quality.
- Assess fire hazards, install smoke and carbon monoxide alarms.
- Eliminate mold/moisture hazards.
- Perform incidental safety inspection/repair.

**BUILDING SHELL MEASURES**

- Install wall, floor, ceiling, attic, and/or foundation insulation.
- Complete Storm Door Sealing.
- Perform air sealing.
- Repair/replace primary windows/doors.
- Install storm windows/doors.
- Insulate window frames/door casings/porches/benches and porches.
- Repair minor roof and wall leaks prior to attic or wall insulation.

**ELECTRIC BASELOAD MEASURES**

- Install motor controls.
- Install efficient light sources.
- Replace old appliances and fixtures with energy efficient models.

169

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One of the easiest upgrades to make on a home is high efficiency windows that are designed to keep sunlight out during the hot summer and keep warm air in during the cold winter. These windows are becoming commonplace in modern homes and can be retrofitted to older houses.

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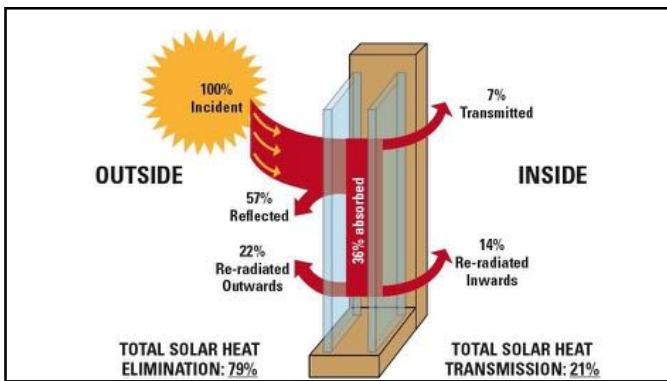
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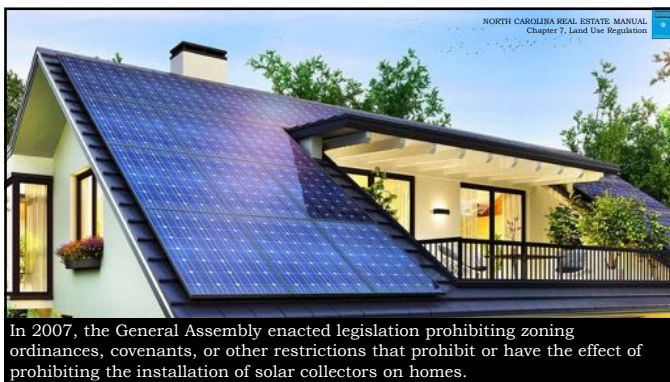
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Community Solar Program from the North Carolina Department of Environmental Quality



The DEQ State Energy Office is partnering with North Carolina utilities and electric cooperatives to bring renewable solar energy to eligible low-income residents across the state!



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To further NC DEQ's mission to provide science-based environmental stewardship for the health and prosperity of ALL North Carolinians, the NC Weatherization Program ("WAP") will fund qualified low-to-moderate income (LMI) households' participation in utility community solar programs statewide.

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Applicants for the NC WAP Community Solar Partnership program must meet the following requirements\*:

- Applicant must be within the participating utility's service range
- Electric utility bills must be in the applicant's name
- Households must be single-family dwellings, stick-built, or mobile homes
- Applicants can be homeowners or renters

For more information, visit <https://deq.nc.gov>




177

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The **Weatherization Assistance Program** helps low-income North Carolinians save energy, reduce their utility bills, and stay safe in their homes. Its mission is to keep North Carolina citizens warm in the winter, cool in the summer, and safe all year long while educating the public about energy efficiency and household safety.

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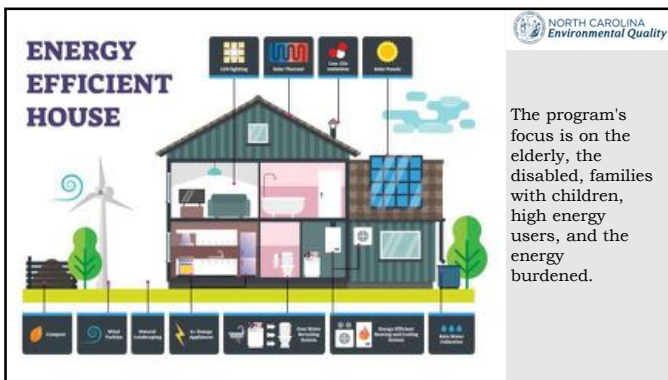
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The program's focus is on the elderly, the disabled, families with children, high energy users, and the energy burdened.

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The N.C. Department of Environmental Quality administers the Weatherization Assistance Program with annual funding from the U.S. Department of Energy.



In 2015, \$23 million in federal grants allowed more than 1,600 homes to be weatherized and over 1,200 heating and air units in homes to be repaired or replaced throughout the state.

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The program also creates job opportunities in communities where weatherization services are offered because it relies on plumbers, electricians, HVAC repairmen and general contractors, among others.



In addition, the program provided smoke detectors and carbon monoxide detectors, assistance with roof repairs, and help replace major appliances.

For more information, visit <https://deq.nc.gov>

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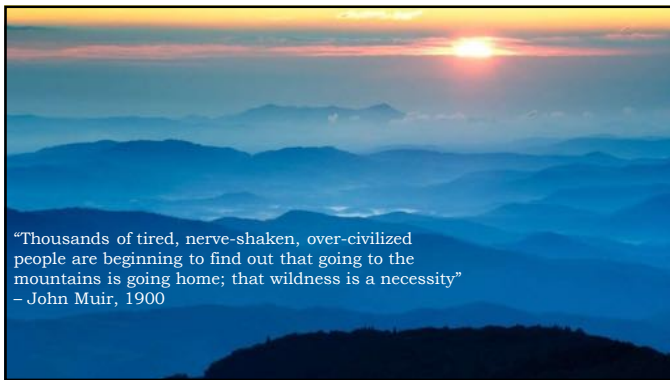
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