IMPACT
OF
ENERGY RELATED DEVELOPMENTS
IN THE TOWN OF NAVASSA, N.C.

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IMPACT OF ENERGY-RELATED DEVELOPMENTS ON NAVASSA, NORTH CAROLINA

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1.0 INTRODUCTION

1.1 HISTORY OF STUDY

The need for this report grew out of the rapidly expanding demand for energy resources and the realization by local governments that the location of energy production facilities and the transportation networks associated with these facilities can radically alter the social and natural environments of a community. Increasing demand, coupled with political and economic instability of supplying nations, exerted additional pressures not only for production and refining of oil, but for development of alternative energy resources. These pressures resulted in proposals for as many as 12 energy development projects on North Carolina's coast--including oil refineries, a liquified petroleum gas terminal, an aluminum smelter, peat mining, and coal export terminals. However, as quickly as oil prices escalated, conservation efforts and new political developments at the international level temporarily restabilized supplies and prices, resulting in the postponement or abandonment of many of the proposed projects. But practically all economists and political observers agree that rising world population levels will inevitably give rise to renewed demand and, thus, interest in development of energy facilities and supporting transportation networks. In effect, North Carolina state and local governments, caught unaware by the unexpected rush to develop energy facilities, have been granted time to assess potential impacts and develop alternatives and measures to mitigate the effects on communities.

1.2 FOCUS OF STUDY--TOWN OF NAVASSA AND POTENTIAL COAL TRAIN MOVEMENT

While many local governments stand to be the recipients of both the negative and positive impacts of energy development, some will experience mostly the undesirable effects. These local governments will be primarily ones that because of remote location will not benefit from tax base improvements from new construction, nor significantly from new employment and the resulting multiplier effect on the local economy. However, because of the existence of transportation networks (primarily rail), all of the negative impacts associated with transportation of raw or finished products will be felt. To date, this issue has been most clearly focused on coal train movements through

more inland towns to shipping terminals on the coast. This was the apparent case for the City of New Bern, as proposed terminals would have more than doubled the number of trains passing through the city. Possible impacts on historic structures and the local economy were investigated by the North Carolina Department of Transportation and summarized in the report Coal Train Movements Through the City of New Bern--A Preliminary Analysis. The development of this report emphasized the fact that many local governments will be the recipients primarily of the negative effects of energy development and receive no offsetting benefits. As the rush to develop coal terminals for the export of steam coal to European countries began, as many as six sites--three in New Hanover and three in Brunswick County--were proposed for terminal development. As attention was directed to these proposals, it became apparent that the Town of Navassa, as the main switching yard for the Seaboard Coast Line Railroad--the only major rail transport company in this area--could possibly be an area through which virtually all coal train movement in New Hanover and Brunswick Counties would pass. It was this possibility that prompted the Town of Navassa to request funds for the preparation of this report.

1.3 PURPOSE OF REPORT AND METHODOLOGY

This report will seek to accomplish several tasks. First, it will provide a brief overview of the status of energy development activities in North Carolina's coastal area and relate the Town of Navassa to these developments. Second, land use and environmental issues associated with energy development and transport will be defined and potential problems identified. Third, potential adverse or favorable impacts will be analyzed and alternative methods for mitigating unfavorable effects suggested. Finally, ways of implementing mitigation methods will be recommended. These recommendations will include consideration of amendments to the Town's CAMA Land Use Plan, ordinances affecting the speed and timing of coal train movements, possible relocations of tracks or alternative routes, and coordination between local officials and the railroad companies.

2.0 OVERVIEW OF ENERGY FACILITY DEVELOPMENTS AND TRANSPORTATION NEEDS ON THE NORTH CAROLINA COAST

While many of the projects originally proposed on North Carolina's coast have been temporarily or permanently abandoned, it is important to summarize them in retrospect, so that the magnitude of potential future developments can be visualized.

2.1 ENERGY PRODUCTION FACILITIES

The BECO Refinery in Brunswick County - BECO (the Brunswick Energy Corporation) was a joint venture of Crown Central Petroleum, Steuart Petroleum and The Federal Paper Board Corporation to build a 150,000 bbl/day facility on a 1,900 acre site in Brunswick County just west of the confluence of the Brunswick and Cape Fear Rivers. Cost of the facility would have been $750,000,000 and would have employed 3,000 persons during construction and 350 afterwards. An average of three 50,000 DWT tankers per week would have entered the Cape fear River, docking on the east side and transferring oil by pipeline to the refinery. The output of gasolines, fuel oils and propane would have been distributed by water, highway and rail within a 500 mile radius. The following table summarizes the probable distribution modes:

WATER	76%	130 ships/year, 425 barges/year
HIGHWAY	18%	140 trucks/day
RAIL	6%	20 railroad cars/day

While it is speculative how much of the proposed rail traffic would have passed through Navassa, since at least a portion of the traffic would have utilized the U.S. Government rail spur to the Sunny Point Military Ocean Terminal, it is apparent that the construction of a refinery or any other major industry in the southeast Brunswick area could greatly increase rail traffic through the Town.

CRDC Refinery in Morehead City - This is to be a relatively small capacity refinery located on the Newport River near Morehead City. Products will be unleaded gas, no. 2 fuel oil, and kerosene to be distributed locally.

LPG Terminal on Radio Island - This facility is proposed to be a 21 million gallon bulk storage terminal for liquified petroleum gas on the east side of Radio Island outside of Morehead City. About 30 tankers per year would deliver gas to the terminal for delivery north and west by truck or rail.

Aluminum Smelter in Columbus County - While not an energy producer, this smelter could have had a significant impact on energy consumption and the transportation systems in Southeastern North Carolina. The $400 million smelter would have been located on 11,400 acres outside of Tabor City. Plans indicated that 400,000 tons of aluminum and 100,000 tons of petroleum coke would be imported in 40,000 DWT ships, with one ship arriving every four weeks. An average of 16 rail cars per day would be needed for shipment to the plant, and 6 cars a day for return of the finished aluminum products. All of this rail traffic would have been between the State Ports and Columbus County, thus adding as many as 22 or more rail cars per day through the Navassa area.

Peat Projects - Pamilimarle Peninsula - First Colony Farms owns about 372,000 acres of land in coastal North Carolina of which 146,000 acres is fuel-grade peat which, if extracted to 4-6 foot depths, would amount to 203 million moisture-free tons. Peat as an energy source may be used to produce electric power. Because of the bulk of the mined product, any facility using peat as a feedstock would have to be located very close to the source and, thus, would be independent of rail or highway systems.

2.2 COAL EXPORT TERMINALS

Since October 1980, eight companies began development of or proposed to develop coal export facilities in North Carolina. Recent changes in the supply and prices of oil have resulted in abandonment or temporary postponement of almost all of these facilities, but most of the companies indicated that this was a short-term phenomenon and that the long-term outlook for export coal was good. Company estimates of export volumes and an economic profile of the companies are shown on the tables which follow. The following map shows the approximate location of each of these proposed facilities. As can be seen, six of the eight facilities are proposed for the Wilmington area, with three in New Hanover County and two in Brunswick.

COAL EXPORT ESTIMATES FOR NORTH CAROLINA [A]

	MOREHEAD AREA	WILMINGTON AREA	SLURRY	TOTAL
1981-82	3 MT/YR	6 MT/YR	---	9 MT/YR
1985	15	25	12	52
1990	35	37	14	86

ESTIMATED ECONOMICAL PROFILE [A]

FACILITY	INVESTMENTS ($ Million)	EFFECTIVE CAPACITY (MTA)	NUMBER OF WORKERS [B]	ANNUAL PAYROLL ($ Million)	COMPLETION DATE
Alla-Ohio (existing)	5	3	65	1.3	April 1981
Alla-Ohio (Expansion)	C	10-15	C	C	C
Gulf-Interstate	60-80	5-20	85	3.0	January 1984
American Coal	15	3-7	40	.75	October 1982
Cleancoal	10	3	24	.5	September 1982
Williams Terminals	70	10-20	60	C	1st Quarter 1984
Utah International	C	5-7	C	C	1st Quarter 1984
Wheelbrater-Frye	150	12-14	< 100	C	2cd Quarter 1985
Carolina Coal	C	C	C	C	C

A--Company Interview

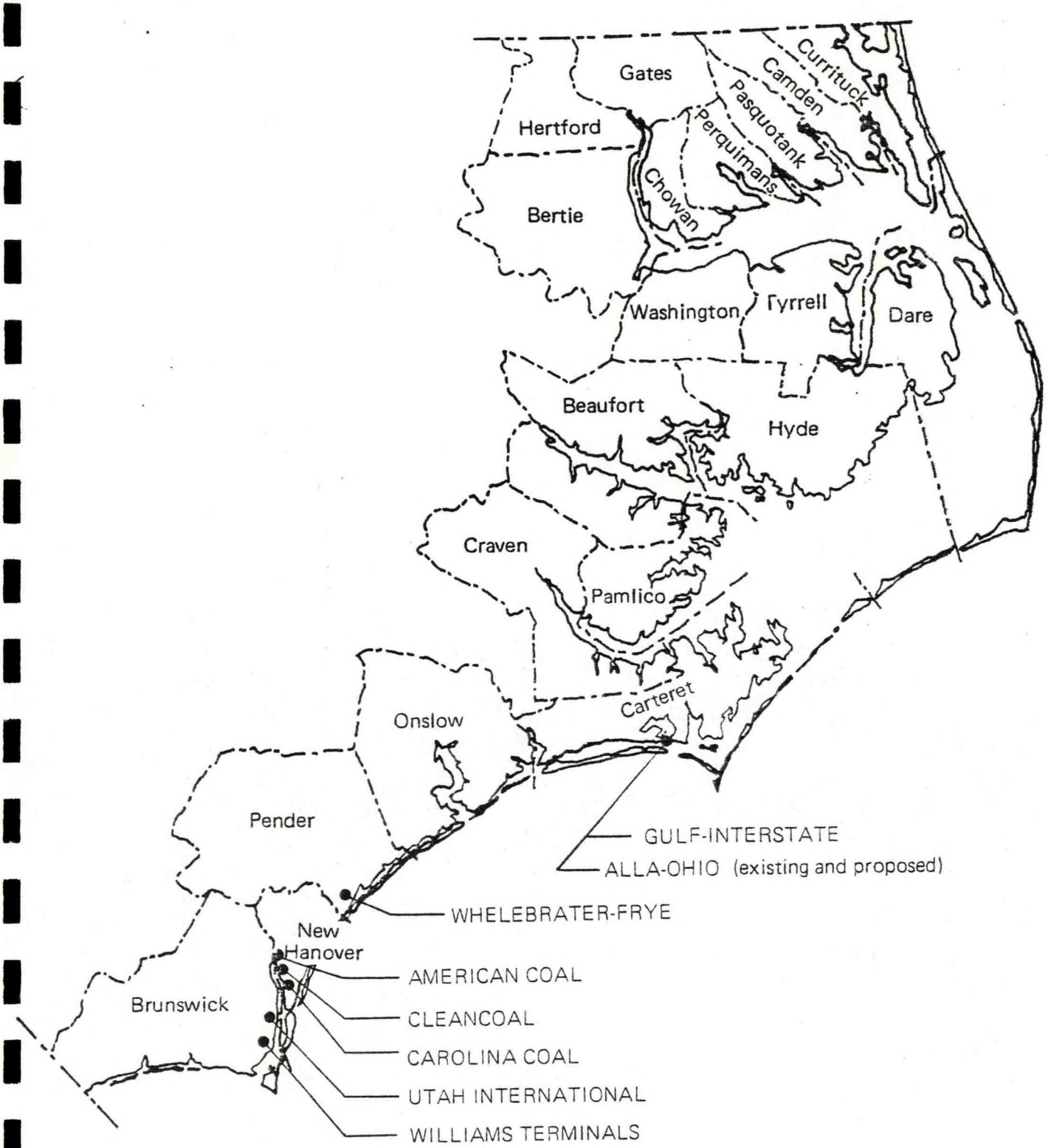
B--At Effective Capacity

C--Information Unavailable

WILMINGTON AREA PROJECTED TRANSPORTATION VOLUMES

YEAR	COAL VOLUME (MT/YR)	DAILY TRAIN MOVEMENTS [A]	WEEKLY SHIP MOVEMENTS [B]	ANNUAL SHIP TRAFFIC
1982	6	4	4	109
1985	25	18	18	455
1990	37	27	26	673

A--Unit train of 75 cars and 100 each to and from site.
B--Ship carrying 55,000 tons to and from site.



PROPOSED COAL EXPORT FACILITIES IN N.C.

Cleancoal Terminals

Cleancoal is to be a 3 million ton/year facility located on a 20 acre tract in the northern part of Downtown Wilmington. Transport would be via rail through the northeastern section of Wilmington. The future of this site is in doubt because of a referendum scheduled for June 1 of this year which will allow citizens the opportunity to vote on a zoning amendment that would prohibit use of the site as a coal terminal.

Williams Terminal Company

This would have been a 10 to 20 million ton/year facility located on a 400 acre tract just north of Southport, adjacent to Pfizer Chemical and CP&L's Brunswick Plant. Transport to the site would have been by rail through Seaboard Coast Line and to the site on the U.S. Sunny Point Military Ocean Terminal rail. The company has recently abandoned plans for this site and sold the land, but maintains it is looking for additional sites on the east coast, including the Cape Fear River.

Carolina Coal Company

This company would use the State Port Terminal to export 4 to 9 million tons/year, with transport via rail through the City of Wilmington. Because of the significant potential impact of this facility, as well as the Cleancoal Terminal, at grade crossings and on neighborhoods, a consultant has been hired by the City of Wilmington to study these effects and make recommendations for mitigation measures.

Utah International

This facility would have been located about 10 miles south of Wilmington in Brunswick County and had an initial proposed capacity of 5 to 7 million tons per year, with possible expansion to 15 to 20 million tons per year. This company, citing economic conditions in the oil market, has also temporarily abandoned plans for development.

While the issues relating to coal export and transport have become largely academic at this point, they do provide an excellent benchmark for indicating the magnitude of the levels of future activity. The following table summarizes projected transportation volumes through 1990 in the Wilmington area. The essential portion of this traffic that would pass through the Town of Navassa is discussed in sections that follow.

3.0 SURVEY OF EXISTING CONDITIONS - TOWN OF NAVASSA

3.1 POPULATION AND ECONOMY

According to the first count of the 1980 Census, there are 438 persons living in Navassa, a 2% increase since 1977. These 438 persons live in 148 houses, for an occupancy ratio of 2.9 persons per household. The population is almost entirely low to moderate income blacks; and a serious housing condition exists in the Town, as only 12% of the units are in sound condition.

3.2 EXISTING LAND USE

The most significant characteristic about Navassa's land use distribution is that 82% of the Town's 1,533 acres (or 1,310 acres) is undeveloped. Industrial uses, consisting of fertilizer plants, the Seaboard Coast Line switching station, and a lumber yard, occupy the next largest area, with 11% of the total or 171 acres. Only 2% of the Town (37 acres) is developed for residential purposes. Virtually all of the residential development is concentrated in the southwestern portion of the Town, between NC 132 and NC 135. Under the Town's current land use plan and zoning ordinance, it is unlikely this pattern will change. A further incentive to maintaining growth in the existing residential area is the recent installation of a central water system in this area.

3.3 TRANSPORTATION NETWORK

While the Town is bounded by water on the east, west and south, only the eastern boundary has any potential future usefulness for navigation. The easternmost boundary is contiguous with the Cape Fear and Brunswick Rivers, both of which, although navigable for barge traffic, are too shallow to accomodate deep draft vessels for coal loading.

Rail service is provided through the Town by Seaboard Coast Line Railroad which has two distribution lines, one originating in Charlotte and traveling through southeastern North Carolina roughly parallel to US 74 to Lumberton, and then straight to Wilmington. The second line originates in Florence, South Carolina, and services Marion, South Carolina, and most towns along US 76 to Wilmington. Both lines converge at the Navassa switching yard, then cross the

the Cape Fear River on the Hilton Bridge and proceed to Wilmington. Thus, it is highly likely that most west or south bound rail traffic will pass through Navassa.

In addition to SR 1435 and 1432, the Town is serviced by SR 1430. All of these state roads function as collectors for US 74-76 and as arteries for the industries located in Navassa and the surrounding area. It is significant to note that transportation's efficiency on the portions of these arteries located within the Town may be heavily affected by convenient alternative routes, specifically SR 1426 which provides a connector between DuPont and US 74-76.

4.0 IMPACTS OF COAL TERMINALS AND COAL TRAIN MOVEMENT

4.1 COAL TERMINALS - IMPACTS

While the Town of Navassa had no sites proposed for development within its Town limits, the availability of rail access and navigable water frontage make the possibility of this development worth considering. For this reason, a brief description of coal export terminal impacts will be given and recommendations made for steps the Town can take to mitigate the effects should a future site be proposed for development.

Water Pollution - Usually the biggest problem associated with a coal storage pile is pollution of both surface and ground water. The latter could pose most serious problems for the Town of Navassa, since the Town's water supply is from wells. The problem arises because the pile is exposed to atmospheric moisture and rain and, since most coal contains metal sulfides, continual contact with moisture and oxygen results in oxidation of metal sulfides to sulfates, which in turn form sulfuric acid. As the sulfuric acid soaks into the pile, many of the chemicals become water soluble and are washed out by rain creating significant polluted runoff. The runoff from coal piles contains high concentrations of suspended solids, metallic elements, chlorides, sulfates, phosphorus and ammonia. It is also generally at a low pH. Obviously, the existence of a coal pile means water pollution or water treatment; and to determine if one is occurring and the other is needed, an estimate of the impact of the runoff in terms of pollutant concentrations is necessary. Models such as the "Low Flow" and "Single Rainfall Event Model" can be used to provide this information.

Groundwater - The extent to which pollutants from coal pile runoff reach underground aquifers is heavily dependent on location of the aquifer relative to the coal pile and on the structure of intervening geologic formations. Some soils may have limited filtering capacity, thus reducing the level of suspended solids in flow; others (e.g., clay) are impervious and can serve as a protective barrier to the aquifer. The importance of coal pile runoff to subsurface aquifers is that pollutant levels in the runoff are not altered significantly

while flowing through the ground, but the extent to which the nature of the subsurface materials retards or promotes the flow into the aquifer will determine the degree of its impact. This impact can be monitored by core samples or monitoring wells in the area of the coal pile to determine the nature of the subsurface materials and the direction and volume of underground flow.

Air - Air pollution problems of coal piles occur mainly in the form of fugitive dust created by the action of wind and rain on the coal during handling and movement during loading and unloading, pile reclaiming, and transfer to the boiler. In addition to dust, fugitive coal emissions may contain trace metals.

Noise - Coal piles require heavy machinery and constant activity to maintain them. After coal is delivered to a site, it is unloaded at a receiving hopper and transferred by conveyors to the pile. Bulldozers are then used to shape the pile and assist in transferring it for future shipment or consumption. At 50 feet, typical sound pressure from these operations is:

Equipment	dBA
Coal pile reclaimer	80
Bulldozer	85
Switch engine	90

Fires and safety - Fires occur in coal piles because of (1) sparks thrown by contact between coal and steel machinery, such as blades or scoops; (2) sparks thrown by other operations, such as welders or boilers; and (3) spontaneous combustion. Of these three, by far the most serious is spontaneous combustion. Because of the oxidation of metal sulfides, heat is produced which, under certain conditions, can reach the ignition point. Moisture, lack of circulation and mass of the pile will affect the process.

Esthetics - Because of the mass, shape and color of coal piles, many think they are esthetically unpleasing. While this is largely a subjective judgment, certain measures can be taken to reduce the visual impacts.

4.2 COAL TERMINALS - IMPACT MITIGATION MEASURES

Both water and surface pollution result from exposure of the pile to rainfall and subsequent drainage of the runoff. Two obvious solutions are to keep the rain off the pile with a covering or to control the runoff after it flows through the pile. Because the second approach is the most practical, the first is not discussed. The easiest way to contain runoff is to line the storage area with an impervious lining and chanel the runoff to a collection pond for treatment and disposal. Manmade liners, such as vinyl, or natural materials, such as clay, may be used. While lining is the first step, it does not eliminate the problem, since the runoff must be properly collected and adequately treated.

Fugitive dust emissions may be reduced by spraying a surfactant over the coal pile. Some of these surfactants are also effective in reducing the likelihood of spontaneous combustion since they shield the coal from contact with oxygen.

Visual impacts may be reduced through construction of a barrier, such as vegetation, fencing or a berm. Another method is to locate the pile at an acceptable distance from populations that may be affected. Each of these methods may also be effective in reducing noise levels, but the important factor in reducing noise is the level of sound which reaches areas that are inhabited or otherwise used by people.

Spontaneous combustion may be reduced by: (1) limiting the depth of the coal pile, so that no point in the interior is greater than 10 to 12 feet; (2) providing for ample circulation of air through and around the pile to dissipate heat before it can build up;
(3) move the coal periodically to disrupt "hot spots" where heat may be building;
(4) use a mineral oil ignition-retardant spray to reduce the degree of oxidation of the coal.

4.3 COAL TRAIN MOVEMENTS - IMPACT

The movement of coal trains through a community can result in two types of impacts--environmental and impacts at grade crossings. The relative severity of these impacts on a particular community will largely reflect the community members' values and perceptions of impacts. For instance, a community that perceives the movement of coal trains as necessary to the economic well-being of the area may complain very little. In an area characterized by wealthy

residents not dependent on coal trains, the opposite may be true. This simply reflects that environmental decisions are value decisions and that mitigation measures should be designed to reflect the values represented by each community.

4.3.1 ENVIRONMENTAL IMPACTS

Environmental impacts from coal train movements are of four types: noise, vibrations, esthetics, and air pollution.

Noise - Of all of the impacts, it appears that noise is the most objectionable to community residents. Noise is a function of train volume and, thus, the higher the train traffic and population density exposed to it, the greater will be the number of complaints. Sources of noise in a moving diesel electric locomotive are listed as follows in descending order of noise intensity:

- horn
- diesel exhaust muffler
- cooling fans
- wheel/rail interaction
- electrical generators
- vibration in empty cars

In an electric locomotive, noise sources, in descending order, are:

- horn
- cooling blowers
- wheel/rail interaction
- electric traction motors

Other than periods of high braking, which produces considerable noise in the electric locomotive, this form of engine is considerably quieter than the diesel. The following table illustrates relative noise levels for moving trains. As the table shows, trains may cause the noise level to rise to nearly 200 times that for a typical quiet urban day.

Air pollution - Air pollution from coal trains may arise from two sources: atmospheric emissions from the unit trains and fugitive coal dust. Loss of particulates in transit will vary with the type of coal shipped, condition of the cars, moisture and fines content of the coal, speed of the train and wind speed. Estimates of losses have ranged from negligible to 1% of the coal shipped. Other reports indicate losses of up to 5 tons per car during a

Comparative Noise Levels

Noise	Noise Level (dBA)	Relative Magnitude*
Threshold of pain	140	31,000
Train warning whistle	120	3,100
Jet fly-over (1,000 ft.)	105	556
EPA standards (maximum at 50 ft.)		
Pre-1980 trains		
Moving	96	197
Stationary	93	141
Idling	73	13
Post-1980 trains		
Moving	90	100
Stationary	87	69
Idling	70	9
Diesel tractor or truck (50 ft.)	80	31
Noisy urban day	80	31
Commercial area	65	6
Quiet urban day	50	1.
Normal background	45	.31
Quiet rural night	25	.06
Threshold of hearing	5	.006

*Times louder than a quiet urban day

300 mile trip. While these reports vary, best estimates indicate losses probably in the 0.05 to 1.0 percent range. Possible effects of windblown coal are covering of leaves of nearby vegetation, with consequent loss in photosynthesis; possible toxic effects on wildlife, pets or humans; clogging of soil, resulting in restriction in movement of precipitation.

Vibration - Although often mentioned, this effect is poorly documented. The effect on nearby structures or persons will be a function of the train weight and speed, as well as the condition and construction of the affected structures. Additional factors such as rail bed conditions and soil types may also affect the impact of vibrations. In a recent study of coal train movements through the City of New Bern, the North Carolina Department of Transportation reached similar conclusions concerning the effect of the trains on historic structures. In other research, it is suggested that a person's abdominal organs may be vibrated, creating not only physical discomfort but psychological feelings of apprehension. Clearly, this is one area requiring additional research before demand revives and train movements increase.

Esthetics - As with coal terminals, this is the most subjective of the impacts and also the most difficult to mitigate, since rail right-of-ways represent a permanent committment of the land.

4.3.2 COAL TRAIN MOVEMENTS - IMPACT MITIGATION MEASURES

Air pollution - Fugitive coal dust will probably present less of a problem to coastal communities, since it will already have traveled several hundred miles and loose dust will already have been blown away. However, there are several methods that may be used to reduce wind losses. The most common and effective method is spraying with oil or water during loading. Calcium chloride has also been used. Other measures used include wind guards, sealing the surface with a latex-polymer or asphalt emulsion and application of removable tarpaulins. The only effective method of reducing emissions from diesel locomotives is railroad electrification which, although effective in reducing pollutants, may present insurmountable costs.

Noise - The greatest disturbance in terms of sound pressure, but also the least frequent noise emanating from coal trains, is the horn. Reduction of

noise from this source is not only unsafe, as it would reduce its effectiveness as a warning signal, but does not represent a serious problem because of infrequency. The other two most aggravating noise sources are engine noise and wheel/rail interaction. Both can be reduced significantly, but costs will vary. Mufflers on the exhaust system can greatly reduce noise from diesel locomotives, and modified casings with acoustical absorbent material around the engine can significantly reduce engine noise. Several methods for reducing wheel/rail interaction have been suggested, including resilient wheels, rubber rail heads and rubber tires. By far the most successful approach so far has been the continuous welded rail, which can achieve noise reductions greater than 5 decibels. Incorporating this type of rail on routes passing through urban centers or residential neighborhoods is an alternative to welding all tracks. Proper maintenance of the rail and bed will also help to keep noise levels low. Buffering with vegetation will also aid in establishing a noise barrier.

Vibration and esthetics - Most of the mitigation measures used to reduce noise will reduce negative impacts from vibration and poor esthetics. Because of the lack of research and complexity of vibration measurement, each area must be handled on a case-by-case basis. In lieu of relocation, the most effective mitigation measure, screening with vegetation is the most effective method of improving esthetic quality. However, vegetation is often controlled along right-of-ways to improve visibility, reduce fire hazards, and improve safety conditions for crews. Leaching may occur, which may pose a threat to non-target vegetation and groundwater. Thus, attention should be given to using selective chemicals which will not destroy the buffering effects of vegetation and which are non-toxic and non-persistent.

4.3.3. IMPACTS AT GRADE CROSSINGS

Grade crossing impacts generally fall into 5 categories: highway traffic delay, emergency vehicle delay, decreased safety, severance of community services, and lowered economic growth. All of these impacts are a function of the length of the unit train. A typical example is a 100 car train (about 50 feet per car) traveling 5 miles per hour, which would result in about 5 minutes of delay at a grade crossing. Assuming a return train with cars empty, an additional 5 minutes of delay would occur, or 10 minutes per day per train. Delays at grade crossings can result in increased travel time to work,

school, shopping or other destinations. While these delays may seem relatively insignificant, delays in travel times for emergency service vehicles of 5 minutes may be critical. The effectiveness of fire and ambulance vehicles is particularly dependent on short response times, generally considered to be between 5 and 7 minutes. Response times could be doubled given the length and speed of the hypothetical train described above. Grade crossing delays may also sever access to community services and facilities, depending on land use patterns. While possible effects on economic vitality may in actuality be more perceived than real, the result is the same if shoppers and residents begin to avoid an isolated area due to negative perceptions.

4.3.4 MITIGATION MEASURES

Mitigating grade crossing impacts entirely requires either cessation of all train movement, or rerouting, relocation of rail lines, or construction of overpass bridges. Each of these may involve substantial expense or delay and may be infeasible for this reason. The relative impacts associated with each particular case and the surrounding land use patterns must be evaluated individually to determine the feasibility of any of these alternatives. Other alternatives involve timing of train movements and establishing communication channels between emergency vehicle services and inbound trains. Train movements can be scheduled around rush hours and school bus movements and radio communications established so that train movement can be delayed or slowed at crossings needed by emergency vehicles in route.

5.0 POTENTIAL TRAIN MOVEMENTS THROUGH NAVASSA

At the present time, existing train movement through the Town of Navassa is moderate. The following table generally describes weekly movement in and out of the Town during a typical week.

Tues., Thurs., Sat. - New Bern to Navassa to Lumberton
20-30 car train with mixed commodities

Mon., Wed., Fri. - 6:00 AM Navassa to New Bern
25-30 cars, mixed commodity and bulk

Mon. - Sun. - 8:30 AM Navassa to State Port via
Wilmington beltline, return 6:00 PM
25-40 cars, mixed commodity and bulk

However, the purpose of this study is to estimate the impacts from potential coal train movements and the volumes that would have been expected if all proposed development had been completed as scheduled. Based on earlier projected volumes, possible annual exporting capacities in the Wilmington area would be as follows:

New Hanover County	Annual Export Tonnage - millions tons	
American Coal	3 to 7	
Clean Coal	3 to 3	
Carolina Coal	4 to 6	
Totals	10 to 16	
Brunswick County		
Williams Terminal	10 to 20	
Utah International	5 to 7	
Totals	15 to 27	
Totals both counties		25 to 43

According to Seaboard Coast Line officials, all inbound coal train traffic would use the northernmost line from Lumberton. Trains destined for New Hanover County would continue directly across the Hilton Bridge, while trains destined for Brunswick terminals would use a "Y" track at the Davis Yard to reroute the cars to the Malmo Leland line parallel to SR 1432 which would

then travel to the Sunny Point spur line. Thus, all coal train traffic destined for the Wilmington area would pass through Navassa, and the majority of that would be rerouted past residential areas in the Town. Based on a unit train of 75 cars, each with 100 tons per car, traveling to and from the site, the following estimates of potential train movements through Navassa can be made.

	Export Tons (millions)	Number of Trains
New Hanover County	10 to 16	7 to 11
Brunswick County	25 to 39	11 to 20
TOTALS	35 to 55	18 to 31

Assuming a length of about 5,000 feet per train and a speed of 5 MPH, delays at grade crossings could be as follows:

New Hanover County trains	35 to 55 minutes
Brunswick County trains	55 to 100 minutes
Total if both trains use same crossing	90 to 155 minutes

Thus, total potential delays during a day at a crossing used by all trains entering Navassa could be anywhere from an hour and a half to 3 hours. Increased train speed or shortened train loads from use of greater tonnage cars to receive more favorable tariff rates would shorten the times.

6.0 IMPACTS IN THE NAVASSA AREA

6.1 GRADE CROSSINGS

The following map shows the routes and potential train volumes and the 1981 average daily traffic volumes at selected points. Also illustrated are emergency vehicle service routes that would be affected. Traffic delays would be significant at several intersections, with the most serious being at the Eastbrook intersection on SR 1426 about 2 miles north of its intersection with US 74-76. SR 1426 is a major collector for DuPont traffic, the major employer in the area, and average daily traffic at this point is 4,300 cars. This is also the only crossing which would be crossed by all trains entering the Wilmington area and would, thus, have possible delays ranging between 1 1/2 to 3 hours per day. Four other crossings could experience significant impacts. Three are along the Leland-Malmo line providing service to Brunswick County. The first is the crossing of 1426 about 1/2 a mile south of US 74-76. Average daily traffic at this point is 2,200 vehicles. Traffic along this route is destined for 74-76 or DuPont. The second crossing is on SR 1472 about 1/4 of a mile west of Leland, and the third is at Leland on SR 1486. Both of the crossings provide both short-trip residential service and through-trip service for DuPont and other employment centers. ADT's are 2,300 and 1,800 respectively. The fourth crossing significantly affected would be the crossing of SR 1430 in the Town of Navassa. At this point, traffic is generally destined for DuPont, US Steel, Royster or Swift Chemical. SR 1435 is also used as an artery between the Town's population and employment centers, as well as for residents along SR 1430 traveling to Wilmington.

The map also illustrates alternative emergency service vehicle routes. Service is provided chiefly by the Leland Rescue Squad and the Leland Volunteer Fire Department, both located in the Woodburn area off of SR 1472. In addition to possible delays at any one crossing, it is possible that double delays could be encountered at both the Eastwood crossing and one of the Leland area crossings. This could occur if a Brunswick County bound train had been routed along the Malmo-Leland line and another train were encountered at the Eastwood crossing a few minutes later. While this possibility would be unlikely, the results could be serious in an emergency situation. Virtually all school bus traffic will be affected at all intersections for any buses transporting students north

INTERSECTIONS WITH POTENTIAL FOR SIGNIFICANT TRAFFIC AND EMERGENCY VEHICLE SERVICE DELAY

AVERAGE DAILY TRAFFIC VOLUME 1981

ALTERNATIVE EVS ROUTES

AFFECTED INTERSECTIONS

N

1" = ½ mile

1200
4300
200
700
1800
1550
400
700
2000
2300
3900
2200
5700
3050
1500
1700
3000

NAVASSA
POP. 410

WILMINGTON
POP. 46,169

EAGLE ISLAND

BELVILLE
POP. 70

of SR 1432, since Leland High and Leland Elementary are located south of the Malmo-Leland line, which must be crossed to reach the schools.

6.2 ENVIRONMENTAL IMPACTS

The most seriously affected area in the Town will be the residential area in the triangular areas lying between SR 1432 and SR 1434. It is this area that will be most significantly affected by the movement of trains destined for Brunswick County terminals. Within this area, there are 25 parcels of land, 10 residences and 2 churches. Total appraised value for assessment purposes is estimated to be $200,000. However, a more accurate picture of the affected residences and property is shown on the following map which relates the number of houses within 100 foot intervals of the track. These are shown as follows:

Distance from Track	Number of Residences
50'	0
100'	0
200'	2
300'	2
400'	7
500'	4
600'	7
700'	5
800'	7
900'	5
1,000'	4
	43

The 43 residences represent 32% of the Town's housing stock. Within 600 feet are 22 houses, but there are no houses within 100 feet and only 2 houses within 200 feet. Further, even the closest houses have SR 1432 as a physical and psychological buffer. Although the direct impact on residential areas may appear minimal due to relatively low density within less than 1,000 feet of the tracks, the cumulative impact of the potential train volumes may magnify these effects. Further, as was discussed in earlier sections, if previously planned industrial development had taken place (the BECO refinery and the aluminum smelter in Columbus County), considerably more train traffic than predicted for coal terminal development could develop.

SEABOARD COASTLINE

NORTH

1"=400'

TO WILMINGTON

100'
200'
300'
400'
500'
600'
700'
800'
900'
1000'

DISTANCE OF RESIDENCES
FROM LELAND-MALMO LINE
IN 100' INTERVALS

Several other factors could accelerate traffic even further. Among these are: expanded operations at the State Ports, increased military shipments from Sunny Point, and new industrial development anywhere within Southeastern North Carolina. In addition to the negative environmental impacts associated with the movement of train traffic, even more serious problems could occur through accidents or derailments of hazardous materials. There have been previous accidents which have been generally contained through quick action of state officials. However, because of the location of the Town's well fields within 200 yards of the tracks, the possibility of contamination of the Town's water supply exists. There are numerous recorded cases of explosions of flammable materials and of release of toxic gases in urban areas due to rail accidents. Because of the number of disabled and elderly persons and their lack of transportation, evacuation could present a serious problem. Finally, while the extent of munitions shipments to the loading terminal at Sunny Point is unknown, if such shipments are passing through the Town, an additional and even more serious hazard is presented.

7.0 CONCLUSIONS AND RECOMMENDATIONS

The Town of Navassa was incorporated in 1976 and, while small in population and area, it contains a significant tax base due to the location of several large industries in the Town. Its proximity to Wilmington, US 74-76-17 and the Cape Fear River, as well as other major industries makes further growth inevitable. Town officials have consistently indicated their desire that future industrial growth not detract from the clean and quiet rural nature of the residential portion of the Town and have adopted a land use plan and regulatory ordinances to insure this result. While current levels of train movement and the effects of these movements do not currently pose a serious threat to this goal, discussions contained in previous sections of this report should adequately demonstrate the probability of considerable increases in economic development in the area in the near to intermediate term. As this occurs and train traffic accelerates, all of the potential hazards and effects discussed in the previous section could arise.

RECOMMENDATIONS

(1) The Town should begin negotiations with the Seaboard Coast Line Railroad and the North Carolina Department of Transportation to study the feasibility of constructing a by-pass from the northernmost Lumberton line that would connect to, or in close proximity to, the Sunny Point line. The by-pass should be located entirely west of SR 1479. This would serve to eliminate all Brunswick County bound coal trains from residential area in Navassa, as well as in the Leland community. Possible modifications to the overpass at the intersection of US 74-76 and SR 1438 would permit accomodation of a rail line. Based on estimates of by-pass routes for the City of New Bern, costs of constructing such a by-pass would be about $1.5 million without a highway overpass, and $2.0 to $2.5 million with a highway overpass or modification to the US 74-76/SR 1438 overpass. Such a by-pass would not only significantly reduce coal train traffic, but would reduce the exposure of residential areas in Navassa and Leland to hazardous or explosive materials shipped along this portion of the rail line. Further, the potentially most seriously affected grade crossing at Eastbrook would be improved for traffic and emergency service vehicles. The potential for time savings, reduced congestion

at the Davis switching station, and reduced potential liability should spills or explosions occur in residential areas could make this an attractive solution for both the Seaboard Coast Line Railroad and Town and area residents.

(2) In the event a by-pass route cannot be constructed, Town and County officials should work with Seaboard officials to develop methods of coordinating train movements that will minimize disruptions at grade crossings and through residential areas. Such methods would include:

(a) Possible rerouting of train traffic in-bound on the Lumberton line to the Florence-Malmo-Leland line.

(b) Scheduling of train movements to avoid morning and afternoon rush hours of major employers or school buses. Morning and afternoon shift changes for DuPont are at 8:00 AM and 4:00 PM. School buses run approximately between 6:30 and 8:30 AM and 3:30 and 4:30 PM. Reduced scheduling between 6:30 and 8:30 in the morning and 3:30 and 4:30 in the afternoon would minimize grade crossing delays at the most seriously affected crossings.

(c) The Leland Volunteer Fire Department and Rescue Squad should begin establishing a system of radio contact with the Davis Switchyard and trains approaching the affected grade crossings. The system should not only provide for train stoppage or slowing to allow passage of emergency vehicles in their initial response route, but provide for continuous contact during rescue operations, so that return routes to hospitals are unobstructed.

(d) An evacuation plan should be prepared by the Town in the event of a toxic or flammable material spill. The plan should be similar to civil defense plans for beach communities, in that elderly or disabled persons with transportation problems should be identified for assistance with evacuation. State Civil Defense officials should be contacted for assistance with developing and coordinating the plan with Town and County officials. Sunny Point officials should also be contacted to provide information on movements of explosives and munitions through the area.

(e) The Town should begin discussions with Seaboard Coast Line officials to establish a plan for mitigation of impacts associated with coal train, or other train, movements. This plan should include:

- Installation of continuous weld track at all points parallel to SR 1432 and SR 1472.

- Installation of mufflers and modified engine casings on diesel engines.

- Insuring that steps are taken to reduce fugitive coal dust prior to entering the Navassa area.

- Vegetation maintenance procedures along SR 1432 and SR 1472 that will maintain vegetation at its maximum buffering capacity without endangering railroad crews, but without using toxic or persistent chemicals.

- Continuous maintenance of rails and rail beds to reduce noise and prevent accidents.

(f) Vibration testing should begin simultaneously with any increased train movement to determine the effects on neighboring structures.

(g) The Town should amend its Land Use Plan and zoning ordinance to establish performance and location standards for the operation of coal terminals.

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