PASQUOTANK RIVER BASIN REGIONAL COUNCIL

Vernon James Research Center
Hwy. 64E
Plymouth, NC

June 1, 1998
3:00 pm

AGENDA

3:00pm	Call to Order and Welcome	Erie Haste, Jr., Chairman
3:05	Introductions	All
3:15	Acceptance of Minutes-February 5, 1998	Erie Haste, Jr.
3:20	Discussion Items: Herring Spawning Introduction of Exotic Species Water Quality Monitoring	All
5:30	New Business	
6:00	Adjourn	

Carl Parrott - excused 6/1

Guy.

Copy Resignation letters + return to Yates + Erie.

Put BL in all folders

PASQUOTANK REGIONAL COUNCIL

Vernon James Center
Plymouth, NC
June 1, 1998

MINUTES

The question of whether a quorum was present was raised. The group delayed conducting business for a few minutes until an additional member arrived and a quorum was attained. See Attachment A - Attendance Listing. Chairman Haste called the meeting to order at 3:15pm.

Self-introductions were made. Mike Doxey (Currituck Co.) attended for Paul O'Neal and Chairman Haste reported that Clarence Skinner (Dare Co.) submitted his resignation from the Council, effective immediately. Chairman Haste then requested a motion to accept the minutes from the previous meeting (Feb. 5, 1998). Mike Duncan made the motion and Lloyd Griffin seconded. Motion carried.

The agenda for this meeting was dedicated principally to discussion items. The first topic of discussion was Herring Spawning. Yates Barber explained that in the Albemarle sound herring stocks are affected to some extent by heaving fishing and some land-use practices. Discussion centered around the question of whether we (humans) have destroyed the habitat for these fish and, if so, the need to correct it, because herring are an important part of the food chain. Discussion ensued centering around the possible causes of such destruction (urban run-off, low flow in canals and ditches where herring spawning occurs, introduction of substances from agricultural run-off, etc.) Ultimately the group decided to invite Harrell Johnson (Div. of Marine Fishers - Elizabeth City) to make a presentation on herring and the destruction of herring habitat at the next meeting.

The next discussion topic was that of the introduction of exotic species. Yates Barber reported that hydrilla (a foreign plant) has been sighted in the Roanoke and Chowan rivers. Exotic species are often introduced through discharge of ballast from foreign ships and make their way into our rivers and streams in that manner. They attract silt and thereby close channels. After considerable conversation and expressed interest on the subject, it was decided that David Dumont (Div. of Water Resources) should be invited to speak at a future meeting.

Water quality monitoring was the next topic to be discussed. Mike Duncan referred to the LAW Engineering report (mailed to Pasquotank River Regional Council members on May 26, 1998) entitled *Nitrate Source Investigation Study - Selected Wells in Sampson County, NC* which was commissioned by the North Carolina Pork Council. This study reached four major conclusions:

* The laboratory analyses from this study indicated concentrations of nitrate-nitrogen similar to the results of the DENR program.

* The wells sampled by LAW are shallow and the majority are of poor construction. Of the

30 wells, 28 are less than 50 feet in depth and the depth of two wells is not known. Observations made during this study confirm the findings of previous studies: that well construction and depth does appear to play a role in nitrate contaminated wells identified in Sampson County.

* The majority of the nitrate-contaminated wells identified in the study areas of Sampson County appear to have resulted from more than one source of nitrate. Based upon topographical considerations alone, most of the wells had at least three potential cross gradient or up gradient sources of nitrate.

* LAW correlated the results from the site reconnaissance and laboratory tests with the stable isotope results obtained by Dr. William Showers (NCSU) to develop an opinion of the most likely source of nitrate at each well location. Synthetic fertilizer, septic systems, and naturally occurring soil organic nitrogen were identified as the primary sources of nitrate in all 30 wells. LAW and NCSU did not note stable nitrogen isotope ratios that are indicative of a clear correlation with animal waste (poultry, swine, or cattle). Rather, animal waste may contribute very minor to minor secondary sources of nitrate in six wells. One nitrate-contaminated well identified with a potentially very minor contribution of animal waste is located topographically down gradient of a swine spray field. In general, the potential nitrate sources identified by NCSU from he stable isotope ratios agree with the potential sources identified by LAW during our on-site inventory of potential nitrate sources.

Discussion ensued ranging from what other areas have been studied relative to the issue of contaminated groundwater; to what monitoring is being done to determine contamination and its sources; to the Div. of Water Quality's ambient monitoring stations and the Citizens' Water Quality Monitoring Program supported by the Albemarle-Pamlico Sounds National Estuary Program (APES). It was decided to have a spokesperson (DWQ), dealing with groundwater, make a presentation at the meeting after next. It was also decided to have Patrick Stanforth, coordinator of the Citizens' Water Quality Monitoring Program make a presentation to the group.

NEW BUSINESS

Chairman Haste noted that because of Clarence Skinner's resignation, a replacement representative to the Coordinating Council needed to be named. He charged Yates Barber with the responsibility of identifying a fellow Regional Council member to fill the void.

Joan Giordano stated that she would include the report from the Program of Work workshops with the next mailing.

Mike Doxey stated that the 1st and 3rd Monday of the month were meetings times that conflicted with most County Commission meetings. He requested (for Paul O'Neal) that those dates be avoided so more local government members could attend.

The date, time and place of the next meeting was not decided, but members will be notified by mail when a decision is made. There being no further business the meeting was adjourned.

NCDENR
North Carolina Department of Environment and Natural Resources

Washington Regional Office
943 Washington Square Mall
Washington, N. C. 27889

919-946-6481
919-975-3716 - FAX

TO: Greg / Alex

FAX #: 919-715-5637

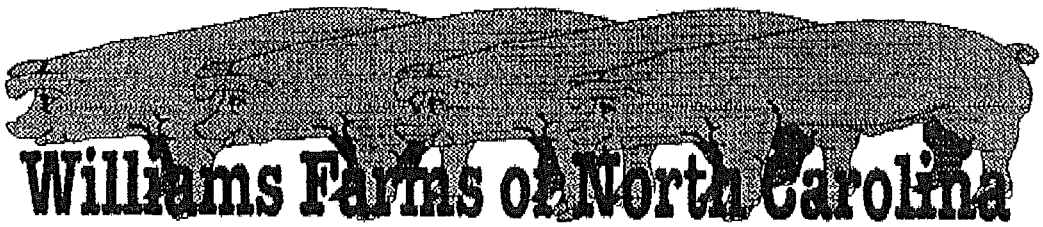
FROM: Jean

DATE: 5/26/98

PAGES (including cover page): 5

MESSAGE: Per my e-mail to give both!

Jean



Williams Farms of North Carolina
Post Office Box 416 - Moyock, North Carolina 27958
919-435-6930 (office) - 919-435-2387 (fax)

Date May 26, 1998
Time
Number of Pages 5
(including cover page)

FAXED TO: NC Dept. of Environment + Nat. Res.

ATTENTION: Joan Giordano

FAX PHONE NUMBER: 252-975-3716

COMMENTS: Please call Mike Duncan with any questions - Mobile 919-333-0417 Pager - 919-334-0216 or leave message in the office shown above.

LAW
ENGINEERING AND ENVIRONMENTAL SERVICES, INC.

NITRATE SOURCE INVESTIGATION STUDY
SELECTED WELLS IN SAMPSON COUNTY, NORTH CAROLINA

Prepared For:

NORTH CAROLINA PORK COUNCIL
156 Mine Lake Court
Raleigh, North Carolina 27615

Prepared By:

Law Engineering and Environmental Services, Inc.
3301 Atlantic Avenue
Raleigh, North Carolina 27604

April 15, 1997

Law Engineering Job No. 30742-5-1073, Phase 11

EXECUTIVE SUMMARY

This study was initiated and funded by the North Carolina Pork Council (NCPC) for the purpose of sampling and testing nitrate-contaminated water supply wells in Sampson County. The wells are located in areas of intensive agricultural land usage and consist of wells sampled previously by the North Carolina Division of Water Quality (DWQ), Department of Environment, Health and Natural Resources (DEHNR), during a state-wide free well water testing program sponsored by the Governor's Office. Data from the DEHNR well sampling and testing program indicated 47 wells in Sampson County and 89 wells state-wide had nitrate-nitrogen (nitrate) concentrations in excess of the North Carolina groundwater standard of 10 milligrams per liter. Sampson County had the most nitrate contaminated wells of the 50 counties that participated in the DEHNR program.

Law Engineering and Environmental Services, Inc. (LAW) was retained by the NCPC after media reports linked the nitrate-contaminated wells in Sampson County to the swine industry. LAW was retained by the NCPC to objectively review the DEHNR well testing data and to identify potential sources of nitrate in the vicinity of contaminated wells. The study efforts focused on well sites in four areas located near the community of Keener where more than 60 percent of the nitrate contaminated wells identified by DEHNR were located. At least 18 swine farms, 22 poultry farms, and numerous cultivated fields were identified in the study areas.

LAW completed a detailed reconnaissance at 30 well locations to identify potential sources of nitrates. Most of the wells are located within 500 feet of land used for row-crop agriculture or pasture. Synthetic fertilizers and/or poultry litter are periodically applied to many of the cultivated fields, which are used to grow corn, wheat, cotton, tobacco, soybeans, fresh produce and rye grass. Domestic septic systems were identified topographically cross-gradient or upgradient of 14 of the 30 wells. Other potential sources of nitrate included domestic sources such as gardens, family cemeteries and dog pens; and agricultural sources such as sprayfields, poultry houses, swine houses, swine waste lagoons, drainage ditches and fertilizer mixing areas.

The majority of the wells were less than 30 feet in depth. Based upon above-ground evidence and interviews with the well owners, over half of the wells were improperly constructed with no grout or bentonite seals and below-ground wellheads. Several of the wells were installed by the well owners topographically downgradient of septic systems and adjacent to ditches.

The 30 wells were sampled and tested to determine selected chemical properties which could be used to evaluate water quality. Stable isotope testing was also conducted on 29 of the 30 samples by the Stable Isotope Laboratory of North Carolina State University. Stable isotopic geochemistry is a well established methodology used to help identify and differentiate sources of nitrate-nitrogen.

Test results indicated nitrate concentrations in the 30 wells ranged from about 1 to 24 mg/L with isotopic ratio values of +1 to +10‰ (‰ = parts per million). According to Dr. William Showers, the Director of the NCSU Stable Isotope Laboratory, the stable isotope results suggest that elevated nitrate concentrations in the groundwater samples are associated primarily with nitrate from synthetic fertilizer, septic field; and soil organic nitrogen with possible minor influence from animal waste nitrate in several wells. Minor amounts of nitrate from animal waste could have contributed to isotopic ratio values obtained from six of the contaminated wells, however this cannot be substantiated because nitrate contributions from human waste (septic drain fields, cemeteries) could give similar values. An additional tracer test could be useful to differentiate isotopic values obtained from fertilizer and septic systems.

The study reached four major conclusions:

- The laboratory analyses from this study indicated concentrations of nitrate-nitrogen similar to the results of the DEHNR program.
- The wells sampled by LAW are shallow and the majority are of poor construction. Of the 30 wells, 28 are less than 50 feet in depth and the depth of two wells is not known. Observations made during this study confirm the findings of previous studies: that well construction and depth does appear to play a role in nitrate contaminated wells identified in Sampson County.
- The majority of the nitrate-contaminated wells identified in the study areas of Sampson County appear to have resulted from more than one source of nitrate. Based upon topographical considerations alone, most of the wells had at least three potential cross-

gradient or upgradient sources of nitrate.

- LAW correlated the results from the site reconnaissance and laboratory tests with the stable isotope results obtained by Dr. Showers to develop an opinion of the most likely source of nitrate at each well location. Synthetic fertilizer, septic systems, and naturally occurring soil organic nitrogen were identified as the primary sources of nitrate in all 30 wells. LAW and NCSU did not note stable nitrogen isotope ratios that are indicative of a clear correlation with animal waste (poultry, swine, or cattle). Rather, animal waste may contribute very minor to minor secondary sources of nitrate in six wells. One nitrate-contaminated well identified with a potentially very minor contribution of animal waste is located topographically downgradient of a swine sprayfield. In general, the potential nitrate sources identified by NCSU from the stable isotope ratios agree with the potential sources identified by LAW during our on-site inventory of potential nitrate sources.

More detailed discussion about our findings and conclusions are contained in this report.