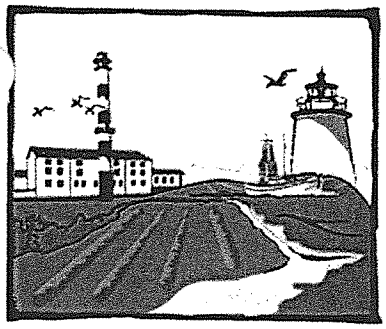


Since 1712

HYDE COUNTY
NORTH CAROLINA

Meeting Date: 1.07.2012

Presenter(s): Kris Cahoon Noble

Title: Planning and Economic Development Director

Agency/Dept.: Office of Planning and Economic Development

Item Title: Memorandum of Agreement (MOA) Between the County of Hyde and the Engelhard Sanitary District

Attachments: MOA and Draft SOC

Description:

The attached Memorandum of Agreement between the County of Hyde and the Engelhard Sanitary District outlines the roles and responsibilities of both parties while cooperating on a joint effort towards the extension of wastewater service and the replacement/repair of the currently failing wastewater treatment system. The Engelhard Sanitary District approved the MOA at their regular meeting in December 2012.

Times Read: Once

Impact on Budget: None.

RECCOMMENDATION: Authorize Board Chair to execute Memorandum of Agreement and authorize staff to move forward with activities as directed in the Memorandum of Agreement.

MOTION MADE BY:	MOTION SECONDED BY:	Vote:	Aye	Nay
____ E. Pugh	____ E. Pugh	E. Pugh	____	____
____ A. Byrd	____ A. Byrd	A. Byrd	____	____
____ J. Fletcher	____ J. Fletcher	J. Fletcher	____	____
____ B. Swindell	____ B. Swindell	B. Swindell	____	____
____ D. Tunnell	____ D. Tunnell	D. Tunnell	____	____

Memorandum of Agreement

Between the County of Hyde and the Engelhard Sanitary District

Extension of Wastewater Service System and Replacement/Repair of Wastewater Treatment System

This Agreement, dated January 7, 2013, between Hyde County, North Carolina (a body politic and corporate of the State of North Carolina), hereinafter called "the County" and the Engelhard Sanitary District, a Sanitary District created under the authority of North Carolina General Statute 130A, hereinafter called "ESD".

Whereas, the County has been awarded a CDBG Contingency Infrastructure grant in the amount of $600,000 by the North Carolina Division of Community Assistance to allow ESD to extend sewer force main and provide on-site STEP pumps to serve approximately 44 households located on US Hwy 64; and,

Whereas, the households proposed for assistance with CDBG funds are suffering septic tank failures and the area proposed for extended sewer service is not suitable for private septic systems, and the proposed CDBG project will alleviate a significant environmental concern for the county and its citizens; and,

Whereas, the NC Division of Community Assistance will not release funds for the CDBG Contingency grant due to the NC Division of Water Quality's objection to the proposed project, stemming from the deteriorated condition of ESD's existing sewage treatment facility; and,

Whereas, the North Carolina Division of Water Quality will not provide the Division of Community Assistance with an advisory that they have no objection to the proposed CDBG project without receipt of a properly reviewed and approved application for a Special Order by Consent ("the SOC") to allow ESD to add the additional customers to its sewage treatment facility ; and,

Whereas, the County has identified additional households that would benefit considerably from provision of public sewer service provided by ESD, and failure of private septic tanks throughout the Engelhard community and adjacent portions of the County is a significant concern for the elected official and citizens of the County; and,

Whereas, ESD will require the County to prepare the SOC application, to apply for grant funds on its behalf, and to provide additional technical assistance in order to meet the timeline for proposed sewage treatment facility improvements outlined in the SOC, and,

Whereas, the County wishes to support ESD in its efforts to extend its service and to improve or replace the existing sewage treatment facility for the reasons outlined above, but requires that ESD agree to certain restrictions and stipulations in order to satisfy the County that the County will not assume legal or fiscal liabilities as a result of its efforts to assist ESD,

NOW, THEREFORE, both Hyde County and the Engelhard Sanitary District agree to the following terms and conditions:

The County will prepare the Special Order by Consent application and coordinate the SOC review and approval process on behalf of ESD with FY10 CDBG funds. ESD will provide technical assistance during preparation and review of the SOC application as requested by the Project Engineer and the County Planning Director and their agents.

ESD will assume sole responsibility for remaining in strict compliance with the terms of the SOC, and any environmental liabilities or fines levied by the Division of Water Quality as a result of ESD's non-compliance with the SOC shall be the sole responsibility of ESD. ESD does hereby agree to indemnify the County against any and all loss, costs, damages, charges, liabilities, or expenses, including court costs and attorney's fees which it may sustain or be put to as a result of assistance to ESD pursuant to this agreement. Hyde County will provide technical support to respond to concerns of the Division of Water Quality in a reasonable manner as requested by ESD, based on staff availability and availability of grant funds managed by the County.

This Agreement provides no guarantee that the County will succeed in obtaining funding for the necessary repairs/replacement outlined in the SOC. ESD assumes sole responsibility for meeting the improvement parameters defined in the SOC. However, the County will assist ESD in obtaining funding for repairs/replacement of the sewage treatment facilities and for subsequent ESD sewer extensions. The County will assume responsibility for preparation of grant applications for County-managed funding sources, including preparation of applications for specific County-managed funding sources outlined in the SOC. The County will assume responsibility for grant management, procurement of engineering and construction services, and supervision of construction/contract administration for County–managed sewer improvements projects in accordance with the appropriate Grant Agreements. The County will also provide technical assistance for preparation of ESD's applications for grant and loan assistance for repairs/replacement of the sewage treatment facilities and for subsequent ESD sewer extensions, and will assist with the management of those projects based upon staff availability and funds available for project management. If the County chooses to provide application and management assistance for grant or loan projects managed by ESD, the assistance will be provided under the terms of individual management contracts executed by both parties.

All engineering and management contracts and construction contracts procured by either party for grant/loan funds related to this Memorandum of Agreement will be procured specifically for each project utilizing procedures outlined in the North Carolina General Statutes and/or the applicable federal procurement standards. The County reserves the right to veto the award of any professional services or construction contract entered into directly by the ESD, and to approve an alternate award or re-bid the work if the County has objections to a proposed contract award recommended by ESD.

ESD will assume sole ownership and maintenance responsibility for the ownership and maintenance of its existing facilities and service lines, as well as for all new or upgraded sewage treatment facilities, new

sewer lines, and lift stations following completion of construction/repairs. ESD will assign no liability for operation or maintenance of these existing facilities or improvements to Hyde County.

ESD will provide the County Manager or County Planning Director with audited financial statements, by-laws, meeting minutes, or other documents and correspondence related to the improvements covered by this Memorandum of Agreement in a reasonable time frame upon request.

Agreed this 7th day of January, 2013

HYDE COUNTY

_____

Chairman

ATTEST:

_____

Averi Simmons, Clerk to the Board
-seal-

ENGELHARD SANITARY DISTRICT

_____

ATTEST:

_____

-seal-

9\\\SERVER02\LSS\LSSDOCS\00029408.000.DOC

Engelhard Sanitary District (ESD)

Hyde County NC

RE: FLOW REDUCTION for planning of new attachments to collection system and discharged to the Engelhard Wastewater Treatment Plant

Engelhard Sewer District owns and operates a collection system built in 1999 with 227 residential and 49 commercial customers. Not all of the customers on record contribute flow to the wastewater collection system but are listed for billing purposes. Those noncontributing homes are either abandoned or are second homes that rarely contribute flow. It is the intent of ESD to add 44 existing homes along US 264 to a new forcemain from STEP pumps and septic tanks. The proposed customers have failing septic systems receiving sanitary sewer flow plus many older homes have surface gray water discharges.

The existing Engelhard Wastewater Treatment facility is a 9 acre facultative treatment pond, chlorine contact chamber, and spray irrigation pumps. The treatment facility was built 2000 with a treatment capacity of 120,000 GPD and an irrigation capacity of 64,000 GPD. The peak flow ever recorded at the plant intake was 43161 GPD and the average flow is calculated as 23383 gpd. The pond was designed and built to extend below grade to an elevation of -2ftMSL. As a result water was permanently present under the liner. Because the soils in the area are deep peat with high organic content, the decomposition of the peat created gaseous decay products and subsequently lifted the liner under the facultative pond. With the liner lifted high winds from hurricanes and northeasters caused the undermining of the berm around the lagoon and the failure of the pond liner. The damage to the liner is extensive and widespread with no reasonable means for repair. To mitigate their failed wastewater facultative treatment pond ESD plans to design and build a new treatment plant that will properly treat their existing flow and the new septic tank and drainage field served homes.

There are potentially 145 homes and sites that could be connected to the ESD collection system within the next 20 years because they already exist. The North Carolina Office of State Budget and Management estimates the population increase for all of Hyde County to increase from the present 5842 to 6012 over the next 20 years for an increase of 170 individuals, seeTable 1. To estimate the increase in population in Engelhard an EIS composed for Marine Fisheries actions in 2006 recorded the population and is shown in Exhibit 001. In that report the 2000 population of the Engelhard community was 1561 out of a county wide population of 5826.
http://www.osbm.state.nc.us/ncosbm/facts_and_figures/socioeconomic_data/population_estimates/demog/grnw9000.html. The ratio of Engelhard to Hyde County population was 26.7%. It is assumed that that ratio is applicable to the current population making the growth rate for the Engelhard community to expand by 45 individuals over the next 20 years.

The low projected population increase implies that the necessary increase in wastewater disposal will be quite small as well over the 20 year period. It is therefore reasonable to assume that there will be negligible population increases that would require expanded wastewater capacity beyond serving the existing community.

Table 1 Population Projections to 2032

County	July 2010	July 2011	July 2012	July 2013	July 2014	July 2015	July 2016	July 2017	July 2018	July 2019
Hyde	5,800	5,815	5,831	5,842	5,851	5,860	5,870	5,879	5,888	5,897
	July 2020	July 2021	July 2022	July 2023	July 2024	July 2025	July 2026	July 2027	July 2028	July 2029
	5,906	5,912	5,922	5,933	5,942	5,951	5,958	5,967	5,976	5,987
	July 2030	July 2031	July 2032							
	5,994	6,004	6,012							

Source:
http://www.osbm.state.nc.us/ncosbm/facts_and_figures/socioeconomic_data/population_estimates/county_projections.shtm

WASTEWATER FLOW MEASURMENTS

The Engelhard Wastewater Treatment Facility is equipped with a single influent flow meter that is read periodically and reported in the monthly DMR reports. This meter indicates the total wastewater flow accumulated by the ESD and reflects sewer contributions and I/I flow on a daily basis. That daily record enables the assessment of average and maximum daily flow. More accurately there exists at each home and business a flow meter that tracks the volume of water sold. Records from these individual meters allow the flow of water to homes and businesses to be assessed for determining water use and hence sewer flow throughout the ESD collection system. See Table 2 for flows of potable water distribution and influent flows to the ESD WWTF. . Reports were generated from the billing data that showed the total water sold to water customers that also had an existing sewer connection and cross referenced with tax data to include the number of bedrooms at each residence, see Exhibit 2 for a water flow per residence report. There exist no sewer customers that do not also have a potable water connection. The water flow to the state prison is supplied by the ESD but is not included in the water flow assessment since they operate their own WW treatment facilities. From those water billing reports, the individual water delivered to residential and business was compiled and was established that business water flow accounts for 39.2% of the water delivered within the water system and residences account for 60.8%. For this wastewater flow assessment all of the potable water supplied to the customers is returned as wastewater. The average wastewater flow to be treated is therefore the supplied average flow of 22824 gpd patitioned between the commercial flow of 8947 gpd and the residential flow of 13877 gpd. Some water delivered to fish processors will not return in the waste stream. It is assumed that commercial flows are consistent and do not vary nor do they have bedrooms.

ESTIMATED FLOW PER HOME

Residential accounts shown in Exhibit 2 indicate that there exist 227 homes attached to the ESD collection system but only 125 homes contribute flow, see Table 3. Only homes adding flow to the collection system are used to determine the contribution per bedroom. Within those 125 homes there are 405 bedrooms. Those 405 bedrooms within the 125 homes make an average bedroom per house count of 3.24 bedrooms per home. The 3.24 bedrooms per house count is assumed to be representative of the homes in the area that would attach to the ESD collection system. If the 405 bedrooms contribute the average flow of 13877 gpd day then the average flow per bedroom is 34.26 gpd. And if there are 3.24 bedrooms per home then each home averages **111** gpd. The average number of days in a month 30.4 days. The average flow from a home would therefore be 3375 g/month. The median flow from all homes in the collection system is 2400 gpd.

The average flow metered at the WWTF is 23472 which differs from the distribution flow of 22824 by only 648 gallons per day.

PEAK FLOW

The maximum flow recorded at the ESD WWTF was measured at 43161 gpd. The peak flow differs from the average WWTF flow by 19680 gpd. I/I flow is known to exist at sealing points in the existing STEP tanks where electrical penetrations enter the tanks and at tank lids. These problems are known and will be addressed to reduce their contribution to the peak flow.

REDUCED FLOW FOR PLANNING PURPOSES

From these records and afore going discussion it is requested to allow the ESD to use the average flow per home to be 111 gpd in sewer expansion calculations for sewer expansion purposes. Since the only disposal method available in the low elevation landscape is spray irrigation a minimum size 30 day storage pond is required for wet weather equalization. The very high water tables require that ponds are shallow and can become disproportionately large and as a result react to the high winds that occur in the area during storm events. To keep the ponds and treatment facilities as small as possible, an accurate assessment of wastewater flow is needed to design treatment facilities and to assess flow allocations. We feel that we have demonstrated with the enclosed records that accurate flow.

Hyde County has an immediate need to add 44 homes along US 264 to the ESD collection system. Using the 111 gpd per home this would constitute an additional flow of 4885 gpd to create an average influent flow of 27709 gpd. In the future, using that same flow per home, the ultimate plausible flow expansion in Engelhard would be to connect an estimated 145 homes in the next 20 years that currently have no sewer service would add an additional 16097 gpd. These two additional flows with the existing total flow would require a treatment facility with a minimum 80% treatment capacity of 43806 gpd, the total capacity of the ultimate treatment facility would be 55,000 gpd. This estimated long term flow is what ESD would make plans for providing with the assumed flow per home assessment of 111 gpd.

Table 2 Engelhard Water Sold, WWTP Monthly Average Influent, WWTP Monthly Maximum Daily Influent

ENGLEHARD WATER AUTHORITY			
RECORDS	NO DATA	SUSPECT	
MONTH	WATER SOLD PER DAY (GPD) COMPILED FROM BILLING RECORDS	DMR WWTP INFLUENT AVEAGE DAILY FLOW	DMR WWTP INFLUENT MAXIMUM DAILY FLOW IN MONTH
Nov/2009	21,637		
Dec/2009	15,068		
Jan/2010	34,145		
Feb/2010	20,296		
Mar/2010	17,687		
Apr/2010	18,707		
May/2010	18,352		
Jun/2010	19,450		
Jul/2010	31,774		
Aug/2010	27,348		
Sep/2010	23,263		
Oct/2010	24,474		
Nov/2010	18,927		
Dec/2010	19,574		
Jan/2011		28,813	43161
Feb/2011	21,889	28,813	43161
Mar/2011	16,716	24,774	38731
Apr/2011	20,597	24,774	38731
May/2011		26,487	42467
Jun/2011	22,287	22,716	29339
Jul/2011	21,719	20,821	24848
Aug/2011	29,652	18,183	19865
Sep/2011	25,813	24,816	28650
Oct/2011	24,545	25,698	29531
Nov/2011	18,693	24,404	31282
Dec/2011	19,029	24,567	29704
Jan/2012	22,648		
Feb/2012	18,721	20,383	22808
Mar/2012	21,719	26,693	37479
Apr/2012	24,843	22,283	26752
May/2012	20,326	20,210	24372
Jun/2012		21,220	26514
Jul/2012	25,813	22,683	26514
Aug/2012	29,190	24,415	27101
Sep/2012	32,550	22,888	23311
Oct/2012	25,742	17,276	27410
Nov/2012			
Dec/2012			
NOV 09 - OCT 12	**22824**	**23472**	**43161**
	AVERAGE	AVERAGE	MAXIMUM

Table 3 Flow Projection and Average Flow per home

FLOW PROJECTIONS - BASED UPON HISTORICAL FLOWS PER CUSTOMER	
Average Commercial Daily Flow (gpd)	8947
Average Residential Daily Flow (gpd)	13877
Total Daily Flow SOLD over period (gpd)	22824
Total Residential Customers	227
Total Residential Customers contributing to WW flow	125
Total # of bedrooms contributing to WW flow	405
Average bedrooms per house in Collection System	3.24
Flow per bedroom from residential customers (gpd)	34.3
(Average Bedroom GPD * Average Number of Bedrooms)	
Reduced Water Supply Flow Per Home (gpd)	**111.0**

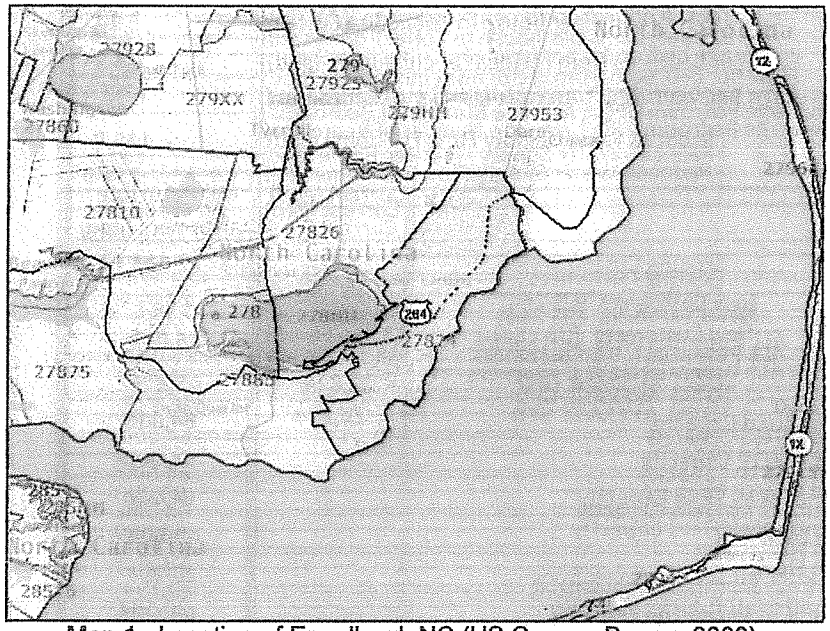
Number of Customers		Current (gpd)	All Plausible Customers (gpd)
125	Existing Customers	22,824	22,824
44	New Customers (US 264)		4,885
145	**ALL Potential NEW Customers**		**16,097**
	TOTAL AVERAGE GPD	**22,824**	**43,806**
Current WWTP Spray Field Capacity			**64,000**
Current & Proposed WWTP Capacity			64,000
Permitted Treatment/Spray Field Capacity			**64,000**
Proposed Plausible Flow			**43,806**
Available Capacity after all future connections			20,194
Projected Flows as a % of Permitted Capacity			**68.45%**

Exhibit 1

ENGELHARD, NC[1]
Community Profile[2]

PEOPLE AND PLACES
Regional orientation

The village of Engelhard (35.51°N, 75.99°W) is surrounded by the Pamlico Sound and the Alligator and Pungo Rivers in the Northeast corner of North Carolina. There are three major National Wildlife Refuges in the area; Alligator River, Lake Mattamskeet, and Swan Quarter Refuges.[3] The village is in Hyde County and the deep waters surrounding Engelhard and its inlets, provide access to large fishing vessels (MapQuest 2007).



Map 1. Location of Engelhard, NC (US Census Bureau 2000)

Historical/Background

Engelhard was founded in 1711 and is home to the state's largest natural lake, Lake Mattamuskeet, and bisected by the Intracoastal Waterway. Englehard was named for Chief Engelhard, a Native American of the area. The village is appropriately known as "the land of many waters". Ocracroke Island, once home to the pirate "Blackbeard", is now a busy tourist center and is only accessible by air or water (Hyde County NC 2007). Engelhard itself is named after the first publisher of a local newspaper, *Wilmington Paper*. Hyde County is one of the

---

[1] These community profiles have been created to serve as port descriptions in Environmental Impact Statements (EISs) for fisheries management actions. They also provide baseline information from which to begin research for Social Impact Assessments (SIAs). Further, they provide information relevant to general community impacts for National Standard 8 of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) and information on minorities and low income populations for Executive Order (E.O.) 12898 on Environmental Justice.

[2] For purposes of citation please use the following template: "Community Profile of *Town, ST*. Prepared under the auspices of the National Marine Fisheries Service, Northeast Fisheries Science Center. For further information contact Lisa.L.Colburn@noaa.gov."

[3] Community Review Comments, Frank and Edna Summerlin, Big Trout Marina and Café, 17 Summerlin Drive, Engelhard, NC 27824, September 10, 2007

oldest counties in North Carolina, originally included in Bath County. In 1705, Bath County was divided into three precincts, one of them being "Wickham". In 1711, Wickham was changed to "Hyde", in honor of Edward Hyde, a moneyless cousin of Queen Anne who was made Colonial Governor of North Carolina (Albemarle-nc.com 2007). The timber logging industry introduced the need for a transportation system other than the horse or mule. Now nothing more than an overgrown path, the New Holland, Higginsport and Mt. Vernon Railroad once operated in the county (Albemarle-nc.com 2007).

Demographics[4]

According to Census 2000 data, Engelhard had a total population of 1,561, down 13.9% from the reported population of 1,814 in 1990 (US Census Bureau 1990). Of this 2000 total, 45.4% were males and 54.6 % were female. The median age was 39.2 years and 71.2% of the population was 21 years or older while 19.7% was 62 years or older.

Engelhard's population structure (Figure 1) shows the highest percentage of the population is between 40 and 49 years of age. There is also a dip in the population between the ages of 20 and 29, indicating that many young people may be leaving the community to go to college or in search of jobs. Women outnumber men in every age category with the exception of 30-39, when men and women are nearly equal in number.

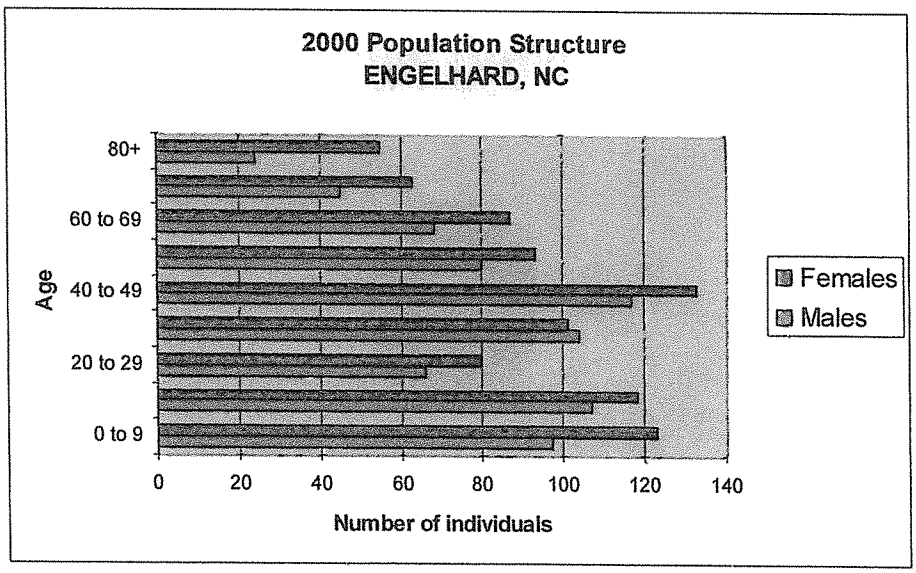


Figure 1. Engelhard's population structure by sex in 2000

The majority of the population was white (51.3%) with 47.3% of residents black or African American, 0.1% Asian, none Native American, and none Pacific Islander or Hawaiian (Figure 2). Only 3.7% of the population identified themselves as Hispanic/Latino (Figure 3). Residents linked their backgrounds to a number of different ancestries including: English (14.8%), Irish (4.6%), and various other ancestries recorded (46.2%). With the regard to region

[4] While mid-term estimates are available for some larger communities, data from the 2000 Census are the only data universally available for the communities being profiled in the Northeast. Thus for cross-comparability we have used 2000 data even though these data may have changed significantly since 2000 for at least some communities.

of birth, 86.1% were born in North Carolina, 13.0% were born in a different state and 0.9% were born outside of the U.S. (all of whom were not United States citizens).

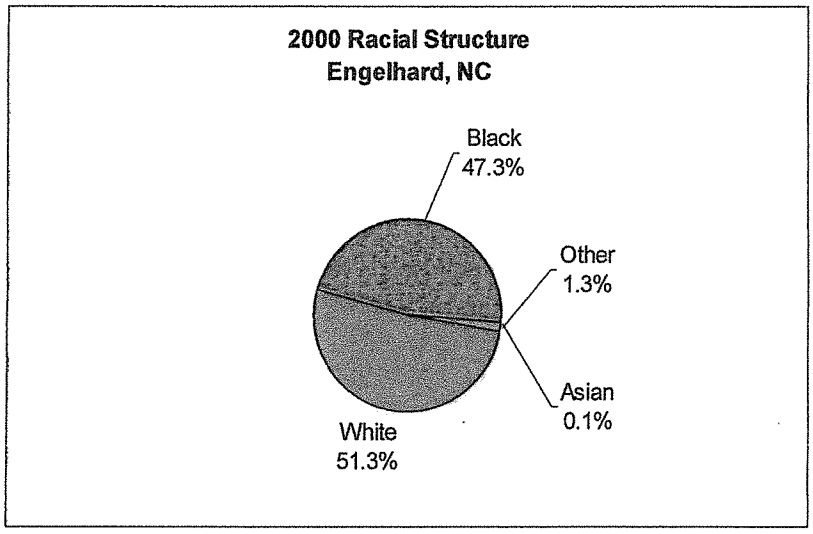


Figure 1. Racial Structure in 2000 (U.S. Census 2000)

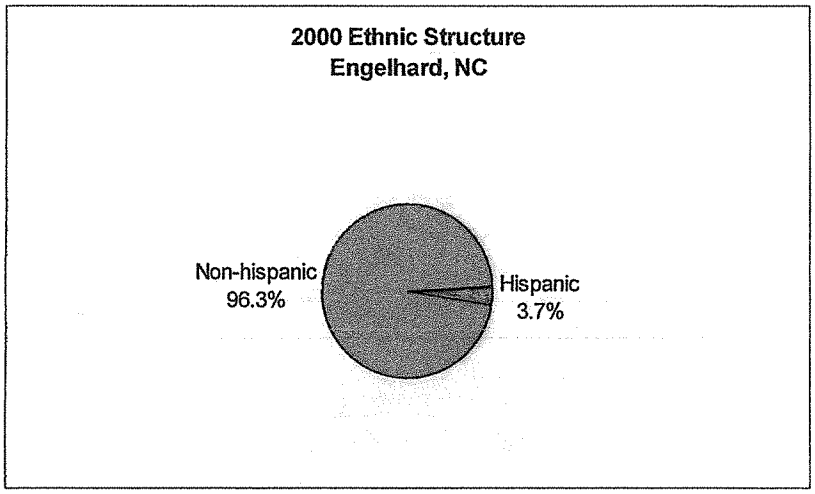


Figure 2. Ethnic Structure in 2000 (U.S. Census 2000)

For 96.3% of the population, only English was spoken at home, leaving 3.7% in homes where a language other than English was spoken, including 0.8% of the population who spoke English less than 'very well' according to the 2000 Census.

Of the population 25 years and over, 64.8 % were high school graduates or higher and 8.7 % had a Bachelor's degree or higher. Again of the population 25 years and over, 13% did not reach ninth grade, 4.5% attended some high school but did not graduate, 36.6% completed high school, 15.3% had some college with no degree, 6.2% received their Associate degree, 7.5% earned their Bachelor's degree, and 3.1% received either their graduate or professional degree.

Although religion percentages are not available through the U.S. Census, according to the Association of Religion Data Archives (ARDA) in 2000, the religion with the highest number of congregations and adherents in Hyde County was United Methodist with 680 adherents. Other

prominent congregations in the county were the Christian Church (3 with 367 adherents) and Churches of Christ (5 with 274 adherents). The total number of adherents to any religion was down 17% from 1990 (ARDA 2000).

Issues/Processes

Shrimp fishermen along the North Carolina coast have suffered because of decreasing prices of shrimp, resulting from an increase of foreign farmed shrimp on the market. North Carolina shrimp fishermen are working to promote their wild-caught shrimp to create a niche market and higher prices for their product (Sea Grant NC 2005). The North Carolina Division of Marine Fisheries was discussing minimum size limits for the shrimp that could be taken by trawlers, noting that foreign imports have cornered the market on small shrimp (Smith 2005).

Crab fishermen along North Carolinas eastern coast have also seen an increase in competition from the global market, with an influx of imported crab meat from around the world. Many local crab processors are unable to compete and are losing profit (Sea Grant NC 2002).

Cultural attributes

The Engelhard Blessing of the Fleet is led by the St. George's Episcopal Church in mid-May. This event is to honor and celebrate the hardships that are associated with commercial fishing. Songs and prayers are offered while fishing families unite along the shore and on their boats where they contemplate the dangers of commercial fishing (Hyde County Chamber of Commerce 2007).

The Engelhard Seafood Festival (May) is sponsored by Engelhard Development Corporation, a non-profit organization whose goal is to better the community of Englehard. In its 18th year (May 2005), the festival featured music, vendors, historic displays and fresh seafood. The yearly festival is a great family outing and begins with a blessing of the fleet. Several titles are determined during the event, including "Little Miss", "Little Mister" and "Miss Engelhard Seafood".

INFRASTRUCTURE

Current Economy

The majority of residents of Engelhard make their living in farming or commercial fishing. There are numerous small businesses established in Engelhard, many of which cater to tourism, such as restaurants, hotels and inns (Albemarle-nc.com 2007).

According to the US Census 2000[5], 40.6% (634 individuals) of the total population 16 years of age or over were in the labor force (Figure 4), of which 2.9% were unemployed, none were in the Armed Forces, and 49.5% were employed.

[5] Again, Census data from 2000 are used because they are universally available and offer cross-comparability among communities. Some statistics, particularly median home price, are likely to have changed significantly since 2000.

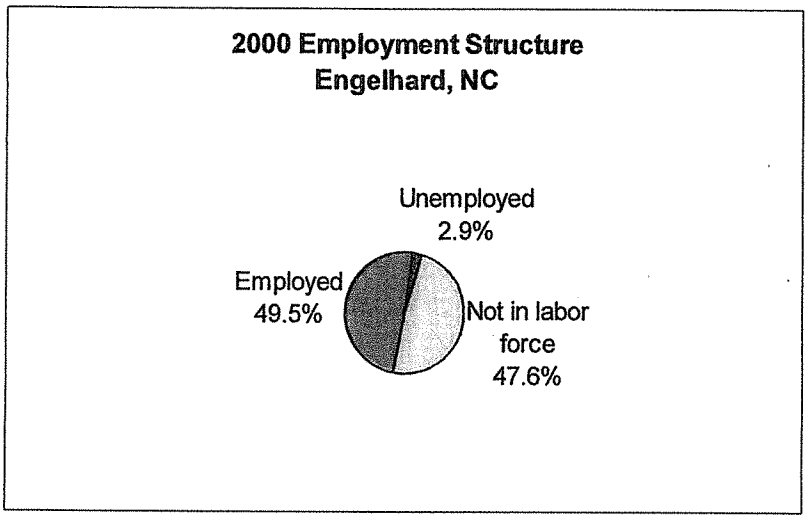


Figure 4. Employment structure in 2000 (US Census Bureau 2000)

According to the census 2000 data, jobs in the census grouping which includes agriculture, fishing, forestry, and hunting, and mining accounted for 82 positions or 13.9% of all jobs. Self employed workers, a category where fishermen might be found, accounted for 17.2% of jobs. Education, health and social services (15.9%), manufacturing (12.4%) construction (12.2%), and retail trade (10.4%) were the primary industries.

Median household income in Engelhard was $22,452 (up 32.7% from $16,919 in 1990 [US Census Bureau 1990]) and median per capita income was $15,062. For full-time year round workers, males made approximately 24.4% more per year than females.

The average family in Engelhard consisted of 3.1 persons. With respect to poverty, 8.7% of families (considerably less than 23.6% in 1990 [US Census Bureau 1990]) earn below the official US Census poverty threshold. This threshold is $8,794 for individuals and ranges from $11,239 through $35,060 for families, depending on number of persons (2-9) (US Census Bureau 2000b). In 2000, 42.3% of all families (of any size) earned less than $35,000 per year.

In 2000, Engelhard had a total of 827 housing units of which 77.1% were occupied and 68.8% were detached one unit homes. Less than one quarter (21.3%) of these homes were built before 1940. Mobile homes accounted for 24.4% of housing units; 89.1% of detached units had between 2 and 9 rooms. In 2000, the median cost for a home in this area was $64,000. Of vacant housing units, 6.4% were used for seasonal, recreational, or occasional use. Of occupied units, 27.1% were renter occupied.

Government

Engelhard and the surrounding area were settled in the early 1700's. Engelhard, itself was incorporated as a village of Hyde County in 1711. The town is overseen by the Hyde County Board of Commissioners. The governing board is made up of 5 members (Hyde County NC 2007).

Fishery involvement in government

Information on fishery involvement in government in Engelhard is unavailable through secondary data collection.

Institutional

Fishing associations

The North Carolina Fisheries Association has been supporting fishing families since 1952, with the goal "to celebrate and preserve commercial fishing families, heritage, and seafood" in North Carolina. This is achieved through lobbying federal, state, and local legislators and through public awareness projects.

Fishing assistance centers

The Trade Adjustment Assistance for Farmers (TAA) program has provided business education to shrimpers in the state to assist them in recent changes in the market of shrimp, and also provided some training to shrimpers to exit the business if they chose (Sea Grant North Carolina 2005).

Other fishing related organizations

The Mattamuskeet Foundation is a nonprofit organization engaged in research and educational activities "to preserve, publish, and otherwise tell the stories of the rich history and ecology of Lake Mattamuskeet and the surrounding areas of eastern North Carolina".

Physical

The village of Engelhard is surrounded by the Pamlico Sound and the Alligator and Pungo Rivers in the Northeast corner of North Carolina. Engelhard is located along one of North Carolina's major highways, Highway 264 and is located just east of Hyde County airport and about 100 miles from the closest train station in Grenville, NC.[6] The nearest airport of Engelhard is the Billy Mitchell Airport, 28.24 miles away. This Northeastern North Carolina village is home to North Carolina's largest natural lake, Lake Mattamuskeet and bisected by the Intracoastal Waterway, appropriately known as "the land of many waters" (Albemarle-nc.com 2007).

Engelhard has some of the best facilities available to cruisers on the upper Pamlico's western shoreline. The village has a well-marked channel with depths of at least seven feet, which has been dredged twice during the last several years (Albemarle-nc.com 2007). Engelhard has numerous private and public piers and boat ramps located throughout the community. There is one main marina located in Engelhard, Big Trout Marina, which offers both gas and diesel pumping stations, and has a number of slips to accommodate both large and small vessels (Albemarle-nc.com 2007).

---

[6] Community Review Comments, Bethany Pugh, Shrimp Festival Organizer, Engelhard, NC, October 26, 2007

INVOLVEMENT IN NORTHEAST FISHERIES[7]

Commercial

Residents of Engelhard have always depended on a diversity of commercial fish species to support their economy. The most valuable species in Engelhard in 2006 was in the "Other" category, followed by summer flounder, scup, and black sea bass. The value of "other" species, which includes both shrimp and crab, was lower in 2006 than the ten year average, but the value of the category which includes summer flounder, scup, and black sea bass had increased (Table 1). The number of vessels home ported in Engelhard ranged between 9-18 vessels, while the number of vessels whose owner's city was Engelhard was smaller and ranged between 4-11 vessels. The home port values generally increased over the ten year time period, while the level of fishing landed port fluctuated (Table 2).

Landings by Species

Table 1. Dollar value by Federally Managed Groups of landings in Engelhard

	Average from 1997-2006	2006 only
Other[8]	2,285,306	1,815,664
Summer Flounder, Scup, Black Sea Bass	760,867	1,390,315
Scallop	65,782	311,182
Dogfish	30,462	0
Bluefish	15,920	12,893
Monkfish	11,990	8,877
Squid, Mackerel, Butterfish	4,155	1,335
Tilefish	710	34
Largemesh Groundfish[9]	104	363
Smallmesh Groundfish[10]	5	0

[7] In reviewing the commercial landings data several factors need to be kept in mind. 1) While both federal and state landings are included, some states provide more detailed data to NMFS than others. For example, shellfish may not be included or data may be reported only by county and not by port. 2) Some communities did not have individual port codes until more recently. Before individual port codes were assigned, landings from those ports were coded at the county level or as an aggregate of two geographically close small ports. Where landings were coded at the county level they cannot be sorted to individual ports for those earlier years, e.g., prior to 2000. 3) Where aggregated codes were used, those aggregate codes may still exist and be in use alongside the new individual codes. Here the landings which are still assigned to the aggregate port code cannot be sorted into the individual ports, so port level data are only those which used the individual port code. 4) Even when individual port codes exist, especially for small ports, landings may be coded at the county level. Here again it is impossible to disaggregate these to a port level, making the port level landings incomplete. 5) In all these cases, the per port data in this profile may under report the total level of landings to the port, though all landings are accounted for in the overall NMFS database.

[8] "Other" species includes any species not accounted for in a federally managed group

[9] Largemesh groundfish: cod, winter flounder, yellowtail flounder, American plaice, sand-dab flounder, haddock, white hake, redfish, and pollock

[10] Smallmesh multi-species: red hake, ocean pout, mixed hake, black whiting, silver hake (whiting)

Vessels by Year[11]

Table 2. All columns represent vessel permits or landings value combined between 1997-2006

Year	# Vessels (home ported)	# Vessels (owner's city)	Level of fishing home port ($)	Level of fishing landed port ($)
1997	10	6	85,663	2,319,011
1998	9	5	194,341	2,662,993
1999	12	8	538,080	4,244,478
2000	18	10	1,266,726	5,380,961
2001	15	6	1,107,953	2,369,213
2002	11	4	1,086,010	3,458,701
2003	12	5	1,222,208	2,576,284
2004	15	7	1,511,966	2,775,047
2005	18	11	2,387,899	2,425,671
2006	14	9	2,267,551	3,540,663

 # Vessels home ported = No. of permitted vessels with location as homeport
 # Vessels (owner's city) = No. of permitted vessels with location as owner residence[12]
Level of fishing home port ($) = Landed value of fisheries associated with home ported vessels
Level of fishing landed port ($) = Landed value of fisheries landed in location

Recreational

Engelhard holds various recreational fishing tournaments and festivals throughout the fishing season. There are numerous businesses in Engelhard listed as charters that provide fishing rental gear. The shores and outer banks of Hyde County are known for its winter surf fishing. Large bluefish, striped bass, red drum, and speckled trout along with other species are available during this time of year. The area's northern beaches are popular spots for striper fishing during the winter months, and the southern beaches offer access to a number of recreationally fished species (NCDENR 2007).

Subsistence

Information on subsistence fishing in Engelhard is either unavailable through secondary data collection or the practice does not exist.

FUTURE

Engelhard continues to grow as a recreational fishing haven and tourist destination. The residents of Engelhard and Hyde County continue to appreciate and respect their deep fishing history and will continue to celebrate it with festivals and fairs for years to come.

REFERENCES

Albemarle-nc.com. 2007. A brief chronological history. Available at: http://www.albemarle-nc.com/hyde/history/

[11] Numbers of vessels by owner's city and homeport are as reported by the permit holder on permit application forms. These may not correspond to the port where a vessel lands or even spends the majority of its time when docked.

[12] The Owner-City from the permit files is technically the address at which the owner receives mail concerning their permitted vessels, which could reflect the actual location of residence, the mailing address as distinct from residence, owner business location, or the address at which a subsidiary receives mail about the permits.

Association of Religion Data Archive (ARDA). 2000. Interactive maps and reports, counties [cited July 2007]. Available at: http://www.thearda.com/

Hyde County Chamber of Commerce. 2007. Calendar. Available at: http://www.hydecounty.org/government/

Hyde County NC. 2007. A brief history. Available at: http://www.hydecounty.org/history/

MapQuest. 2006. Web site [cited Jul 2007]. Available from: http://www.mapquest.com

North Carolina Department of Environment and Natural Resources (NCDENR). 2007. Fishing Guide. Available at: http://www.ncfisheries.net/fishreport/northdist.html

North Carolina Sea Grant (NCSG). 2002. Coastwatch High Season 2002: North Carolina Seafood Processors Go Global. Available at: http://www.ncseagrant.org/

NCSG. 2005. Coastwatch Winter 2005: Shrimp Economics: Coastal Tradition and Global Economy Converge. Available from: http://www.ncseagrant.org/

Smith P. 2005. State unveils its draft plan for shrimp. The Sun Journal. 2005, July 20.

US Census Bureau. 1990. 1990 Decennial Census SF1, Table DP 1 [cited June 2006]. Available from: http://factfinder.census.gov

US Census Bureau. 2000a. Engelhard. Demographic Profile Highlights. [cited July 2007] Available from: http://factfinder.census.gov

US Census Bureau: 2000b. Poverty Threshold. [cited July 2007] Available from: http://www.census.gov/hhes/www/poverty/threshld/thresh00.html

US Geological Survey (USGS). 2008. US Board on Geographic Names: Geographic Names Information System (GNIS) [cited Feb 2007]. Available at: http://geonames.usgs.gov/pls/gnispublic/

STATE OF NORTH CAROLINA
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF WATER QUALITY

APPLICATION FOR A SPECIAL ORDER BY CONSENT (SOC)

I. PERMIT RELATED INFORMATION:

1. Applicant (corporation, individual, or other): _Engelhard Sanitary District_____

2. Print or Type Owner's or Signing Official's Name and Title:

_____Tommy Ethridge__(Sanitary District Chairman)_____

3. Facility Name (as shown on Permit): _Engelhard Sanitary District Wastewater Surface Irrigation

4. Owner Phone: _____ *(or)* _____

5. Owner Email: _____

4. Application Date: ____1/7/2013_____

5. NPDES Permit No. (if applicable):__WQ0017625_____

6. Name of the specific wastewater treatment facility (*if different from I.3. above*):

_____

II. PRE-APPLICATION MEETING:

Prior to submitting this completed application form, applicants must meet with the appropriate regional office staff to discuss whether or not an SOC is appropriate for this situation. Please note the date this meeting occurred and who represented the permittee: Representative:_____ Date: Nov 18, 2011 .
See section II following

III. ADDITIONAL FLOW OR FLOW REALLOCATION:

In accordance with NCGS 143-215.67(b), only facilities owned by a unit of government may request additional flow.

Additional flow may be allowed under an SOC only in specific circumstances. These circumstances may include eliminating discharges that are not compliant with an NPDES or Non-discharge permit. These circumstances do not include failure to perform proper maintenance of treatment systems, collection systems or disposal systems. When requesting additional flow, the facility must include its justification and supporting documentation.

If the requested additional flow is **non-domestic**, the facility must be able to demonstrate the ability to effectively treat the waste and dispose of residuals. The applicant must provide a detailed analysis of the constituents in the proposed non-domestic wastewater.

The total domestic additional flow requested: ___4885_____ gallons per day.

The total non-domestic additional flow requested: _____ gallons per day.

The total additional flow (*sum of the above*): ___4885_____ gallons per day.

Please attach a detailed description or project listing of the proposed allocation for additional flow, with an explanation of how flow quantities were estimated. Further, any additional flow requested must be justified by a complete analysis, by the permittee, that additional flow will not adversely impact wastewater collection/treatment facilities or surface waters.

See Section III following

IV. NECESSITY NARRATIVE:

Please attach a narrative providing a detailed explanation of the circumstances regarding the necessity of the proposed SOC. Include the following issues:

- Existing and/or unavoidable future violations(s) of permit conditions or limits(s),
- The existing treatment process and any process modifications that have been made to date to ensure optimum performance of existing facilities,
- Collection system rehabilitation work completed or scheduled (including dates),
- Coordination with industrial users regarding their discharges or pretreatment facilities. Identify any non-compliant significant industrial users and measure(s) proposed or already taken to bring the pretreatment facilities back into compliance. If any industrial facilities are currently under consent agreements, please attach these agreements,
- Date and outcome of last Industrial Waste Survey,
- Whether or not the facility is acting as a regional facility receiving wastewater from other municipalities having independent pretreatment programs.

See Section IV following

V. CERTIFICATION:

The applicant must submit a report prepared by an independent professional with expertise in wastewater treatment. This report must address the following:

- An evaluation of existing treatment units, operational procedures and recommendations as to how the efficiencies of these facilities can be maximized. The person in charge of such evaluation must sign this document.
- A certification that these facilities could not be operated in a manner that would achieve compliance with final permit limits. The person making such determination must sign this certification.
- The effluent limits that the facility could be expected to meet if operated at their maximum efficiency during the term of the requested SOC (be sure to consider interim construction phases).
- Any other actions taken to correct problems prior to requesting the SOC.

See Section V following

VI. PREDICTED COMPLIANCE SCHEDULE:

The applicant must submit a detailed listing of activities along with time frames that are necessary to bring the facility into compliance. This schedule should include milestone dates for beginning construction, ending construction, and achieving final compliance at a minimum. In determining the milestone dates, the following should be considered:

- Time for submitting plans, specifications and appropriate engineering reports to DWQ for review and approval.
- Occurrence of major construction activities that are likely to affect facility performance (units out of service, diversion of flows, etc.) to include a plan of action to minimize impacts to surface waters.
- Infiltration/Inflow work, if necessary.
- Industrial users achieving compliance with their pretreatment permits if applicable.
- Toxicity Reduction Evaluations (TRE), if necessary.

See Section VI following

VII. FUNDING SOURCES IDENTIFICATION:

The applicant must list the sources of funds utilized to complete the work needed to bring the facility into compliance. Possible funding sources include but are not limited to loan commitments, bonds, letters of credit, block grants and cash reserves. The applicant must show that the funds are available, or can be secured in time to meet the schedule outlined as part of this application.

If funding is not available at the beginning of the SOC process, the permittee must submit a copy of all funding applications to ensure that all efforts are being made to secure such funds.

Note: A copy of the application should be sufficient to demonstrate timeliness unless regional office has reason to request all information associated with securing funding.

THE DIVISION OF WATER QUALITY WILL NOT ACCEPT THIS APPLICATION PACKAGE UNLESS ALL OF THE APPLICABLE ITEMS ARE INCLUDED WITH THE SUBMITTAL.

Required Items:

a. One original and two copies of the completed and appropriately executed application form, along with all required attachments.

   - If the SOC is for a City / Town, the person signing the SOC must be a ranking elected official or other duly authorized employee.
   - If the SOC is for a Corporation / Company / Industry / Other, the person signing the SOC must be a principal executive officer of at least the level of vice-president, or his duly authorized representative.
   - If the SOC is for a School District, the person signing the SOC must be the Superintendent of Schools or other duly authorized employee.

Note: Reference to signatory requirements in SOCs may be found in the North Carolina Administrative Code [T15A NCAC 2H .1206(a)(3)].

b. The non-refundable Special Order by Consent (SOC) processing fee of $400.00. A check must be made payable to The Department of Environment and Natural Resources.
c. An evaluation report prepared by an independent consultant with expertise in wastewater. (in triplicate)

APPLICANT'S CERTIFICATION:
(NO MODIFICATION TO THIS CERTIFICATION IS ACCEPTABLE)

I, _____, attest this application for a Special Order by Consent (SOC) has been reviewed by me and is accurate and complete to the best of my knowledge. I understand if all required parts of this application are not completed and if all required supporting information and attachments are not included, this application package may be returned as incomplete. *(Please be advised that the return of this application does not prevent DWQ from collecting all outstanding penalties upon request).* **Furthermore, I attest by my signature that I fully understand that an upfront penalty, which may satisfy as a full settlement of outstanding violations, may be imposed.** {Note: Reference to upfront penalties in Special Orders by Consent may be found in the North Carolina Administrative Code [T15A NCAC 2H .1206(c)(3)].}

_____ Date _____
Signature of Signing Official

_____
Printed Name of Signing Official

THE COMPLETED APPLICATION PACKAGE, INCLUDING THE ORIGINAL AND TWO COPIES OF ALL SUPPORTING INFORMATION AND MATERIALS, SHOULD BE SENT TO THE FOLLOWING ADDRESS:

NORTH CAROLINA DIVISION OF WATER QUALITY
POINT SOURCE BRANCH
1617 MAIL SERVICE CENTER
RALEIGH, NORTH CAROLINA 27699-1617

IF THIS APPLICATION IS FOR A NON-DISCHARGE SYSTEM, THEN SEND TO:

NORTH CAROLINA DIVISION OF WATER QUALITY
AQUIFER PROTECTION SECTION
1636 MAIL SERVICE CENTER
RALEIGH, NORTH CAROLINA 27699-1636

APPENDIX 5

SOC Pre-Application Certification

Special Order by Consent Pre-Application Certification:

On November 18, 2011 (pre-application meeting date), DWQ regional office staff met with Englehard Sanitary District / WQ0017825 (facility name / permit number) to discuss the needs and merits of applying for a Special Order by Consent (SOC). Based on the information presented during this meeting and the facility's non-compliant status with permit conditions and/or other state rules and regulations, I support this facility's SOC application submittal.

David May
Signature of Regional Office Supervisor

Date November 18, 2011

Washington
DWQ Regional Office

THIS COMPLETED FORM MUST ACCOMPANY THE SOC APPLICATION PACKAGE. FAILURE TO DO SO COULD DELAY THE SOC APPLICATION PROCESS, AND MAY RESULT IN THE SOC APPLICATION BEING RETURNED TO THE APPLICANT AS INCOMPLETE.

Engelhard Sanitary District (ESD)

Hyde County NC

RE: Flow Allocation for 44 Additional Homes

Hyde County has an immediate need to add 44 homes along US 264 to the ESD collection system. Engelhard Sanitary District is applying, parallel to this SOC application, for a flow reduction for planning and sewer allocation to new connections (See exhibit 001 for the flow reduction request and analysis). The flow reduction analysis showed that the average home in the ESD collection system contributes 111 gpd. There is no reason to doubt that the 44 homes along US 264 highway would contribute amounts different from this typical per home flow. The resulting increased flow to be added immediately would be 4885 gpd.

The tasks specified within this SOC application will distinctly improve the situation within the ESD which is currently in a poor state of operation for wastewater treatment and disposal. The addition of the 44 homes will not adversely impact the current treatment facility or the collection system serving the 44 homes. Conversely the need to attach the new flows will precipitate actions to implement a permanent solution to the long term problem of the damaged WWTP. In the interim between the time the additional flow is allocated/added and the construction of the new treatment facility, the chlorine contact chamber and irrigation pumps will be restored to operation and the water level in the lagoon maintained below the liner damage. This action alone will vastly improve the quality of treatment at the plant and irrigation fields. The facultative lagoon has a surface area of 9 acres which is enough oxygen transfer to treat 120,000 gpd. The increased flow to the lagoon will total an estimated 27709 gpd. This flow is 23% of the design capacity of the lagoon. If the volume of the lagoon is reduced by 50% the oxygen transfer will remain approximately the same which will both oxidized the influent BOD and NH3 while avoiding overtopping the damaged liner.

The failing septic systems and grey water surface discharges from the 44 homes have the funding opportunity to be properly collected and conveyed to the ESD land irrigation facility with the completion of this SOC. It would be in the best interest of the environment and public health to stop those discharges.

Engelhard Sanitary District (ESD)

Hyde County NC

RE: SECTION IV-NECESSITY NARRATIVE permit # WQ0017625

BACKGROUND

Hyde County operates the Engelhard Sanitary District to serve the public by collecting, treating, and disposing of wastewater from 227 residential and 49 commercial customers. There are no industrial contributors to the ESD collection system. The collection system was largely installed in 1999 and is considered to be in good working condition. The ESD was issued multiple NOV beginning in May, 2005 for various failures at the treatment facility but was largely motivated by the failure of the facultative pond liner (See Exhibit 002 Lagoon Liner Damage).

The WWTP for the District is composed of a 9 acre facultative lagoon, chlorine contact chamber, land application pump station, and 23.5 acres of spray irrigation fields with pump dewatering drainage ditches. The treatment lagoon was designed for a capacity of 120,000 GPD while the installed, forested irrigation fields may receive flow from 64,000 GPD; both are permitted through permit # WQ0017625

The facultative lagoon was originally constructed abiding by design guidelines with an approved 36 mil, fiber reinforced liner and adequate volume to treat and store 120,000 GPD with 64 days of retention. However, the lagoon pond was excavated below the water table to an elevation of -2 ft MSL which is below the local average water table. As a result ground water could fill in below the liner. Further the lagoon was built on deep peat soils with a high organic component. The organic materials in the soil are forever submerged and experience anaerobic conditions with the products of decomposition being gaseous, both CO2 and methane. The gas flows to the surface and typically escapes into the atmosphere. However under the lagoon liner the gas forms gas pockets or bubbles. The pockets lift the liner off the soil bottom and become mobile. High winds from storm events produce waves in the 1000 foot long pond that are transmitted to the water and gas bubbles under the liner. The water movement under the liner washed out the containment berm from underneath the liner and caused the banks to fail. Once the soil under the liner berm was gone the weight from the water within the lagoon easily pulled the liner apart causing water from inside the lagoon to readily flow below the liner and into the soil.

The lagoon liner is damaged extensively in many locations with the soil from berms washed under the liner. The renovation of the lagoon would require it to be taken out of service completely and is not a feasible alternative. The flow of water around the liner is reason for further violations since the treatment process is circumvented.

To bring the existing lagoon back into compliance, the lagoon would have to be drained, the liner removed, the berm repaired, the pond filled with soil above the water table with drainage beneath the liner to make certain the water could not accumulate again. Simultaneously the raw incoming

wastewater flow would have to be hauled to another receiving facility at an average rate of approximately 23,000 GPD for several months while the pond is repaired. Additionally there would need to be constructed an equalization basin to catch the daily flow to be hauled, otherwise a pump, truck, and operator would be employed around the clock on site to ensure no overflows of the influent pump station occurred. The estimated budget for repairing the lagoon is $1.25M and would require approximately 180 days to drain to a dry enough state to use equipment on and then place and shape the required materials and drainage structures

Because of the length of the lagoon, the open fetch of the surrounding landscape, and the likelihood of high wind events occurring in the area, there still would exist a possibility of waves in the lagoon causing yet another failure. For this reason it is not recommended that the existing pond be repaired but rather abandoned and a new, more reasonably sized treatment works constructed adjacent to the existing pond with a much reduced wet weather storage pond.

It is recommended that the Engelhard Sanitary District make use of the existing influent pump station/flow meter and spray irrigation fields of the existing treatment facility and to build a new package WWTP and required irrigation storage pond. Further the required size to the plant and pond should be assessed for reasonable influent flows based on existing metered flows, documented proposed new attachments to the collection system, and anticipated growth based on historical population trends.

ANTICIPATED FLOW

To accurately gauge the necessary treatment capacity to design for, an evaluation of the WW flow in the collection system was compiled from records of; water consumption, number of residences and businesses attached to and contributing to the collection system, number of bedrooms in each residence, and the existing flows to the lagoon treatment works. The records were compiled to calculate the volume of water contributed daily per bedroom. The resulting characteristics of the homes attached to the collection system are the basis for requesting a flow reduction as described in the state 02T rules for the addition of new customers. It was found through that analysis that a flow of 111 gpd per home is characteristic of all residential customers within the ESD collection system. This flow is sourced from many older homes that were built long before the invention of reduced flow toilets and water fixtures and will likely represent a conservative flow for new attachments.

Hyde County has an immediate need to add 44 homes along US 264 to the ESD collection system. The resulting flow to the Engelhard Sanitary District Wastewater Surface Irrigation Facility would, as a result, average 27709 gpd.

NEW FACITIES

To ultimately conform to requirements of their existing permit the ESD will need to replace the failed facultative lagoon. The original 9 acres lagoon capable of 120,000 gpd was excessive for the wastewater loads it has experienced in the past or the loads anticipated in the future. The maximum expected

average flow to be treated within the next 20 years is estimated at 43806 gpd. If that flow is 80% of the plant capacity then a 55,000 gpd treatment facility is needed.

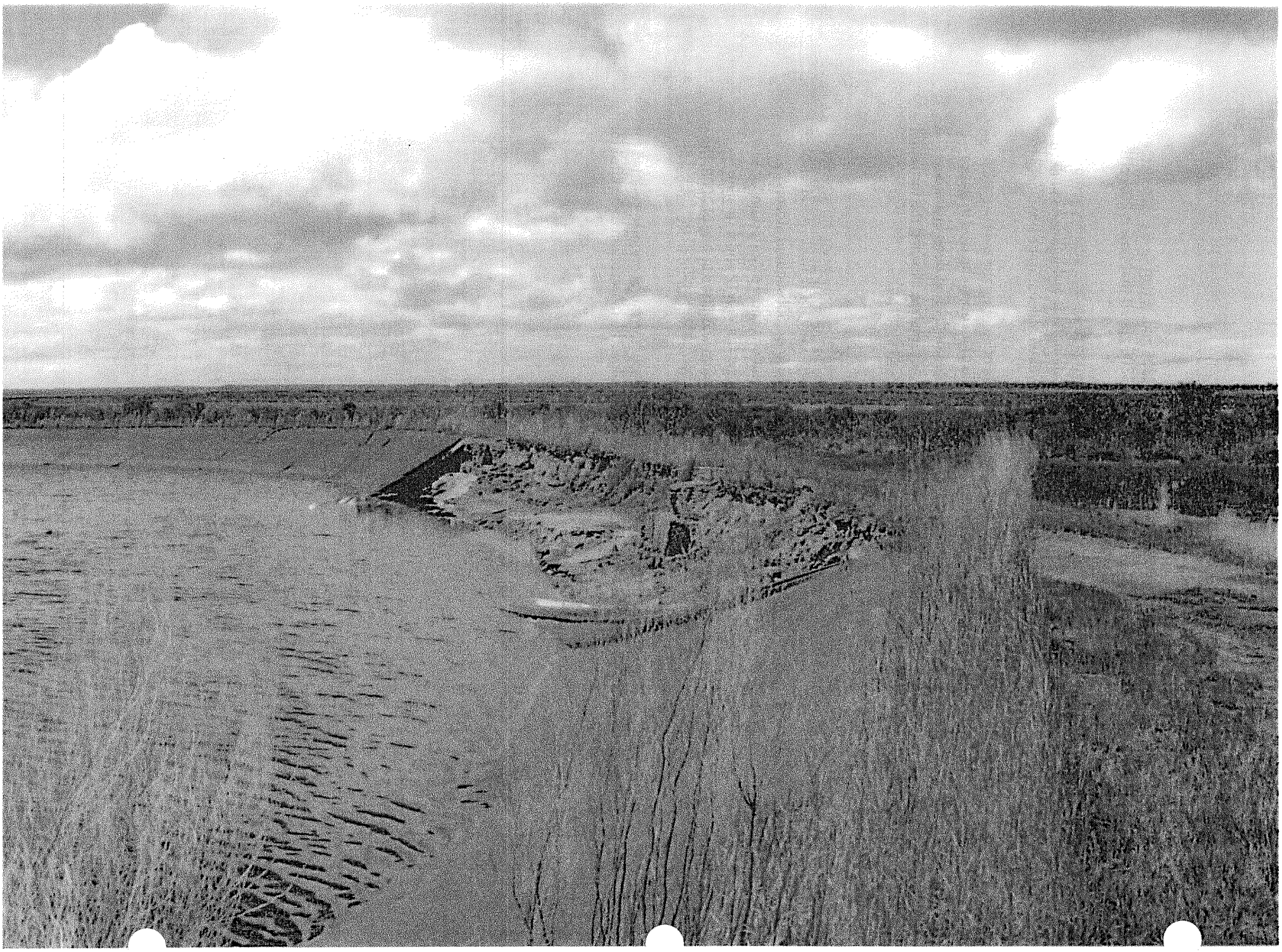
The new WWTP has the advantage of using the 64000 gpd spray irrigation fields and influent pump station. Between these two and new 55,000 gpd WWTP and 30 day wet weather storage pond need to be constructed.

The treatment works will consist of a package treatment plant capable of meeting the land irrigation requirements rated at 55,000 gpd and a 1.26 acre wet weather storage pond 4 feet deep built above the local water table with under-liner drainage to ensure water does not accumulate allowing the formation of gas bubbles (See section V Certification for discussion of the proposed WWTP).

VIOLATIONS

Beginning in 2005, NOV were issued for the liner failure and operation of the spray fields. An attempt was made to build back the washed out berm and repair the damaged liner. Subsequent storms continued to damage the lagoon and other NOVs were issued for violations and a moratorium for new connections was instated. In 2008 a design was completed for replacing the WWTP and a smaller storage lagoon. With the new plant planned and funded the moratorium was lifted in July of 2008. The decision was made not to pursue the new WWTP and the moratorium was reinstated in November of 2011 (See NOV and correspondences below)

This application for SOC hopes to put forth a commitment that will allow the moratorium to be lifted for future flow addition.



Michael F. Easley, Governor

William G. Ross Jr., Secretary
North Carolina Department of Environment and Natural Resources

Alan W. Klimek, P.E. Director
Division of Water Quality

Aquifer Protection Section
February 13, 2006

CERTIFIED MAIL 7003 3110 0002 0608 6153
RETURN RECEIPT REQUESTED

Mr. Tommy J. Etheridge
Engelhard Sanitary District
Post Office Box 579
Engelhard, North Carolina 27824

Subject: **NOTICE OF VIOLATION / NOTICE OF INTENT TO ENFORCE**
Engelhard Sanitary District WWTP
Permit No. WQ0017625
Hyde County
NOV 2006-PC-0049

Dear Mr. Etheridge:

On February 9, 2006, Division of Water Quality staff performed a follow-up inspection of the subject facility to determine if needed repairs, as originally referenced in the NOV dated May 6, 2005 had been performed. The 36 mil polypropylene geomembrane liner in the facultative lagoon continues to fail to operate as it was designed. The follow-up inspection revealed that the liner remains fallen down into the lagoon in places, which is contributing to other structural problems. Failure of the liner results in the potential for the lagoon to function as a conduit for wastewater to impact groundwater quality. Large areas of the berm surface lack protective vegetative cover, resulting in erosional problems. The "Daily Rate into Treatment System" flows on your Non Discharge Wastewater Monitoring Report have not been reported due to absence of meter.

Engelhard is hereby notified of the following specific violations:

- Operation of the facultative lagoon without the proper installation of the liner, collapsing of the lagoon walls, and the presence of large gas bubbles under the liner are violations of Engelhard Sanitary District's Permit No. WQ0017625 Conditions I.1 and II.1.

- Engelhard's failure to maintain protective vegetative cover over the berm is a violation of Condition II.14.

- Engelhard's failure to install and maintain an influent flow measurement device and to report daily flow is a violation of Condition III.2.

North Carolina Division of Water Quality
943 Washington Square Mall
Washington, NC 27889

Internet: h2o.enr.state.nc.us
Phone: 252-946-6481
FAX 252-975-3716

- Engelhard has failed to take immediate corrective action to correct problems associated with the lagoon as directed by this office, which is a violation of Condition I.1.

Engelhard is advised that "a civil penalty, in accordance with the maximums established by N.C.G.S. 143-215.6(a)(2), may be assessed against a person who is required but fails to apply for or to secure a permit required by G.S. 143-215.1, or who violates or fails to act in accordance with the terms, conditions, or requirements of such permit." NCGS 143-215.6 further provides that "if any action or failure to act is continuous, the Commission may assess a penalty for as long as the violation continues."

Thank you for your prompt attention to this matter. The referenced problems are considered to be severe as they jeopardize the structural integrity of the lagoon. Please note that continued enforcement actions may continue to be taken until the necessary corrections have been completed. Please provide a response within 10 days that includes how you prepare to resolve this issue or have resolved this issue. If you have any questions regarding this Notice or need additional information, you may contact Robert Tankard with this office at (252) 948-3921.

Sincerely,

David L. May
Aquifer Protection Regional Supervisor
Washington Regional Office

Cc: WaRO File
DWQ APS LAPCU
CENTRAL FILES
Hyde County Health Department

PERMITS

Michael F. Easley, Governor

William G. Ross Jr., Secretary
North Carolina Department of Environment and Natural Resources

Coleen H. Sullins, Director
Division of Water Quality

DIVISION OF WATER QUALITY
Aquifer Protection Section
July 24, 2008

Mr. Tommy Etheridge
Engelhard Sanitary District
Post Office Box 579
Engelhard, North Carolina 27824

RE: Removal of Moratorium
Engelhard Sanitary District
Wastewater Surface Irrigation System
Non-Discharge Permit WQ0017625
Hyde County, NC

Dear Mr. Etheridge:

On May 16, 2007 a Notification of Sewer Moratorium was issued to Engelhard Sanitary District Wastewater Surface Irrigation System. The Aquifer Protection Section of the Washington Regional Office has received Engelhard Sanitary District's request to remove the moratorium. Based on actions taken to correct previously identified operational problems, we are pleased to remove the moratorium, effective as of the date of this letter.

Please be reminded that Engelhard Sanitary District Wastewater Surface Irrigation System remains subject to complying with all conditions of Non Discharge Permit WQ0017625. Should you have any questions concerning this matter or require additional information, please do not hesitate to contact me, or Will Hart, at the Washington Regional Office.

Sincerely,

David May

David May, Supervisor
Aquifer Protection Section
Washington Regional Office

cc: Mr. Carl Classen, County Manager, County of Hyde
Hobbs, Upchurch, and Associates
WaRO

North Carolina Division of Water Quality
943 Washington Square Mall
Washington, NC 27889

Internet: www.ncwaterquality.org
Phone (252) 946-6481
Fax (252) 975-3716

NORTH CAROLINA

ENVIRONMENTAL MANAGEMENT COMMISSION

DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

RALEIGH

SURFACE IRRIGATION SYSTEM PERMIT

In accordance with the provisions of Article 21 of Chapter 143, General Statutes of North Carolina as amended, and other applicable Laws, Rules, and Regulations

PERMISSION IS HEREBY GRANTED TO

Engelhard Sanitary District
Hyde County

FOR THE

continued operation of a 64,000 GPD surface irrigation treatment and disposal facility consisting of the following:

a wastewater treatment facility, consisting of an ultra-sonic influent flow meter, a nine-acre facultative treatment and storage lagoon with a design capacity of 120,000 GPD, with 36 mil polypropylene geomembrane liner, chlorine contact tank with chlorine gas storage unit and feeder system, an effluent flowmeter, an effluent irrigation pump station with two 426 GPM pumps, all associated piping and appurtenances;

distribution piping for spray irrigation of 64,000 GPD onto 23.5 acres, which consists of 2,292 linear feet of 8-inch force main, 9,328 linear feet of 6-inch laterals and 132 sprinkler nozzles, all associated appurtenances; and

approximately 15,000 linear feet of maintained drainage ditches, which drains to a dewatering pump station with two 4,000 GPM pumps with associated 70 linear feet of 18-inch force main and 54 linear feet of 12-inch force main

to serve Engelhard Sanitary District, with no discharge of wastes to the surface waters, pursuant to the application received May 9, 2005, and subsequent additional information received by the Division, and in conformity with the project plan, specifications, and other supporting data subsequently filed and approved by the Department of Environment and Natural Resources and considered a part of this permit.

This permit shall be effective from the date of issuance until January 31, 2010, shall void Permit No. WQ0017625 issued February 16, 2005, and shall be subject to the following specified conditions and limitations:

I. PERFORMANCE STANDARDS

1. The surface irrigation facilities shall be effectively maintained and operated at all times so that there is no discharge to the surface waters, nor any contamination of ground waters which will render them unsatisfactory for normal use. In the event that the facilities fail to perform satisfactorily, including the creation of nuisance conditions or failure of the irrigation area to adequately assimilate the wastewater, the Permittee shall take immediate corrective actions including those actions that may be required by the Division of Water Quality (Division), such as the construction of additional or replacement wastewater treatment and disposal facilities.

2. The issuance of this permit shall not relieve the Permittee of the responsibility for damages to surface or groundwaters resulting from the operation of this facility.

3. The residuals generated from these treatment facilities must be disposed in accordance with General Statute 143-215.1 and in a manner approved by the Division.

4. Diversion or bypassing of the untreated wastewater from the treatment facilities is prohibited.

5. The following buffers shall be maintained:

a) 400 feet between wetted area and any residence or places of public assembly under separate ownership,
b) 150 feet between wetted area and property lines,
c) 100 feet between wetted area and wells,
d) 100 feet between wetted area and drainage ways or surface water bodies,
e) 50 feet between wetted area and public right of ways,
f) 100 feet between treatment/storage units and any wells, and
g) 50 feet between treatment units and property lines.

Some of the buffers specified above may not have been included in previous permits for this waste treatment and disposal system. These buffers are not intended to prohibit or prevent modifications, which are required by the Division, to improve performance of the existing treatment facility. These buffers do, however, apply to modifications of the treatment and disposal facilities that are for the purpose of increasing the flow that is tributary to the facility. These buffers do apply to any expansion or modification of the irrigation areas and apply in instances in which the sale of property would cause any of the buffers now complied with, for the treatment and disposal facilities, to be violated. The applicant is advised that any modifications to the existing facilities will require a permit modification.

II. OPERATION AND MAINTENANCE REQUIREMENTS

1. The facilities shall be properly maintained and operated at all times.

2. Upon classification of the wastewater treatment and irrigation facilities by the Water Pollution Control System Operators Certification Commission (WPCSOCC), the Permittee shall designate and employ a certified operator to be in responsible charge (ORC) and one or more certified operator(s) to be back-up ORC(s) of the facilities in accordance with 15A NCAC 8G .0201. The ORC shall visit the facilities in accordance with 15A NCAC 8G .0204 or as specified in this permit and shall comply with all other conditions specified in these rules.

3. A suitable year round vegetative cover over the spray irrigation fields of Sweet Gum and Sycamore trees shall be maintained.

4. Irrigation shall not be performed during inclement weather or when the ground is in a condition that will cause runoff.

5. Adequate measures shall be taken to prevent wastewater runoff from the irrigation field.

6. The facilities shall be effectively maintained and operated as a non-discharge system to prevent the discharge of any wastewater resulting from the operation of this facility.

7. The application rate shall not exceed a cumulative loading of 36.4 inches over any twelve (12) month period. Wastewater shall be applied to the following fields and shall not exceed the maximum irrigation rates indicated:

Field #	Acreage (acres)	Maximum Annual Average (in/year)	Maximum Instantaneous Loading (in/hour)
1	5.75	36.4	0.25
2	6.03	36.4	0.25
3	6.10	36.4	0.25
4	5.65	36.4	0.25
	Total = 23.53		

8. The system of drainage ditches and canals which surrounds the spray fields and the corresponding dewatering pump station shall be effectively maintained at all times, to include regular maintenance of the ditch/canal side slopes and maintaining the ditch/canal bottom elevation as established in the design. If ditch/canal erosion or siltation becomes problematic, geotextiles or similar may be required for stabilization purposes.

9. No type of wastewater other than that from Engelhard Sanitary District shall be irrigated onto the irrigation area.

10. No traffic or equipment shall be allowed on the disposal area except while installation occurs or while normal maintenance is being performed.

11. Public access to the land application sites shall be controlled during active site use. Such controls may include the posting of signs showing the activities being conducted at each site.

12. Freeboard in the facultative lagoon shall not be less than two feet at any time.

13. If not already installed, a waste-level gauge, to monitor waste levels in the storage pond, shall be installed within 60 days of issuance of this permit. This gauge shall have readily visible permanent markings indicating the maximum liquid level at the top of the temporary liquid storage volume, minimum liquid level at the bottom of the temporary liquid storage volume, and top of the dam elevations. Caution must be taken not to damage the integrity of the liner when installing the gauge.

14. A protective vegetative cover shall be established and maintained on all earthen basin embankments (outside toe of embankment to maximum pumping elevation), berms, pipe runs, erosion control areas, and surface water diversions. Trees, shrubs, and other woody vegetation shall not be allowed to grow on the earthen basin dikes or embankments. Earthen basin embankment areas shall be kept mowed or otherwise controlled and accessible.

III. MONITORING AND REPORTING REQUIREMENTS

1. Any monitoring (including groundwater, surface water, soil or plant tissue analyses) deemed necessary by the Division to insure surface and ground water protection will be established and an acceptable sampling reporting schedule shall be followed.

2. Influent flow shall be continuously monitored and daily flow values shall be reported on Form NDMR.

The Permittee shall install an appropriate flow measurement device consistent with approved engineering and scientific practices to ensure the accuracy and reliability of influent flow measurement. Flow measurement devices selected shall be capable of measuring flows with a maximum deviation of less than 10 percent from true flow, accurately calibrated at a minimum of once per year, and maintained to ensure that the accuracy of the measurements is consistent with the accepted capability of that type of device. Records of flow measurement device calibration shall be kept on file by the Permittee for a period of at least three years. At a minimum, data to be included in this documentation shall be:

a. Date of flow measurement device calibration
b. Name of person performing calibration
c. Percent from true flow

3. The effluent from the subject facilities shall be monitored by the Permittee at the point prior to irrigation for the following parameters:

Parameter	Sampling Frequency	Type of Sample
BOD_5 (5 day, 20 C)	2/Month	Composite
NH_3 as N	2/Month	Composite
TSS	2/Month	Composite
Fecal Coliform	2/Month	Composite
NO_3 as N	Monthly	Grab
TKN	Monthly	Grab
TDS	Monthly	Grab
TOC	Monthly	Grab
Chloride	Monthly	Grab
Settleable Matter	Daily	Grab
Residual Chlorine	Daily	Grab
pH	Daily	Grab

The effluent pH shall not be less than 6.0 standard units nor greater than 9.0 standard units.

If Groundwater sampling indicates or predicts problems with compliance with the Groundwater Standards, this permit may be modified to include additional and/or more restrictive limitations.

4. Adequate records shall be maintained by the Permittee tracking the amount of wastewater disposed. These records shall include, but are not necessarily limited to, the following information:

a. date of irrigation,
b. volume of wastewater irrigated,
c. field irrigated,
d. length of time field is irrigated,
e. continuous weekly, monthly, and year-to-date hydraulic (inches/acre) loadings for each field,
f. weather conditions, and
g. maintenance of cover crops.

5. Freeboard in the facultative lagoon shall be recorded weekly.

6. Three (3) copies of all monitoring data (as specified in condition III 2 and III 3) on Form NDMR-1 and three (3) copies of all operation and disposal records (as specified in condition III 4, and III 5) on Form NDAR-1 shall be submitted monthly on or before the last day of the following month. All information shall be submitted to the following address:

NC Division of Water Quality
Information Processing Unit
1617 Mail Service Center
Raleigh, North Carolina 27699-1617

7. A representative annual soils analysis (Standard Soil Fertility Analysis) shall be conducted on each irrigation field and the results maintained on file by the Permittee for a minimum of five years. The Standard Soil Fertility Analysis shall include, but is not necessarily limited to, the following parameters:

Acidity	Manganese	Potassium
Calcium	Percent Humic Matter	Sodium
Copper	pH	Zinc
Magnesium	Exchangeable Sodium Percentage	Phosphorus
Cation Exchange Capacity	Base Saturation (by calculation)	

8. Drainage channel surface water (sampling points SW-1 and SW-2) shall be sampled every March, July and November for the parameters listed below. The results of the sampling and analysis must be received on Form NDMR on or before the last working day of the month following the sampling month. Prior to sampling the parameters, the measurement of water levels must be taken. The depth to water shall be measured as the depth of the water surface in the channel below the surveyed top of stake mark, as established by a permanent stake in the channel. The measuring points (top of stake) of all surface water sampling points shall be surveyed to provide the relative elevation of the measuring point for each surface water sampling point.

pH	Chloride
Fecal Coliform	Total Ammonia (as N)
Nitrate (NO_3-N)	Total Dissolved Solids (TDS)
Total Organic Carbon (TOC)	

9. A record shall be maintained of all residuals removed from this facility. The record shall include the name of the hauler, the permit authorizing the disposal or a letter from a municipality agreeing to accept the residuals, the date the residuals were hauled, and the volume of residuals removed.

10. Noncompliance Notification:

The Permittee shall report by telephone to the Washington Regional Office, telephone number (252) 946-6481, as soon as possible, but in no case more than 24 hours or on the next working day following the occurrence or first knowledge of the occurrence of any of the following:

a. Any occurrence at the wastewater treatment facility which results in the treatment of significant amounts of wastes which are abnormal in quantity or characteristic, such as the dumping of the contents of a sludge digester; the known passage of a slug of hazardous substance through the facility; or any other unusual circumstances.

b. Any process unit failure, due to known or unknown reasons, that render the facility incapable of adequate wastewater treatment such as mechanical or electrical failures of pumps, aerators, compressors, etc.

c. Any failure of a pumping station, sewer line, or treatment facility resulting in a by-pass directly to receiving waters without treatment of all or any portion of the influent to such station or facility.

d. Any time that self-monitoring information indicates that the facility has gone out of compliance with its permit limitations.

Occurrences outside normal business hours may also be reported to the Division's Emergency Response personnel at telephone number (800) 662-7956, (800) 858-0368, or (919) 733-3300. Persons reporting such occurrences by telephone shall also file a written report in letter form within five (5) days following first knowledge of the occurrence. This report must outline the actions taken or proposed to be taken to ensure that the problem does not recur.

IV. GROUNDWATER REQUIREMENTS

1. Well Construction / Abandonment Criteria:

a. Within sixty (60) days of permit issuance, research monitor wells MW-2, MW-3, MW-4, MW-5, MW-6, MW-8, MW-9, and MW-10 shall be permanently abandoned. Within thirty (30) days of abandonment, a Well Abandonment Record (GW-30 form) shall be completed for each well abandoned and mailed to the address listed in the "Reporting / Documentation" section of the Groundwater Requirements. The wells must be abandoned by a North Carolina Certified Well Contractor according to the North Carolina Well Construction Standards (15A NCAC 2C .0113) and local county rules.

2. Sampling Criteria:

a. Research monitor wells* (MW-1 and MW-7) shall be sampled every March, July and November for the parameters listed below. Prior to sampling the parameters, the measurement of water levels must be taken. The depth to water in each well shall be measured from the surveyed point on the top of the casing. The measuring points (top of well casing) of all monitoring wells shall be surveyed relative to a common datum.

pH	Chloride
Fecal Coliform	Total Ammonia (as N)
Nitrate (NO_3-N)	Total Dissolved Solids (TDS)
Total Organic Carbon (TOC)	

* The research monitor wells are inside the 2L compliance and review boundaries and are not to be used for compliance purposes.

b. Compliance monitor wells (MW-11 and MW-12) shall be sampled every March, July and November for the parameters listed below. Prior to sampling the parameters, the measurement of water levels must be taken. The depth to water in each well shall be measured from the surveyed point on the top of the casing. The measuring points (top of well casing) of all monitoring wells shall be surveyed relative to a common datum.

pH
Fecal Coliform
Nitrate (NO_3-N)
Total Organic Carbon (TOC)
Chlorides
Total Ammonia (as N)
Total Dissolved Solids (TDS)
Volatile Organic Compounds (VOC) – November only

The effluent stream shall be sampled every November for the parameters listed below.

Volatile Organic Compounds
Total Organic Carbon (TOC)
Dissolved Organic Carbon (0.45 um filter followed by TOC analysis)
Residual Chlorine

c. For Total Organic Carbon (TOC), if concentrations greater than 10 mg/l are detected in any down-gradient monitoring well, additional sampling and analysis must be conducted to identify the individual constituents comprising this TOC concentration. If the TOC concentration as measured in the background monitor well exceeds 10 mg/l, this concentration will be taken to represent the naturally occurring TOC concentration. Any exceedances of this naturally occurring TOC concentration in the down-gradient wells shall be subject to the additional sampling and analysis as described above.

d. For Volatile Organic Compounds (VOCs) sampled in November, use only one of the following methods:

1) Standard Method 6230D, Practical Quantitation Limit (PQL) at 0.5 ug/L or less
2) Standard Method 6210, PQL at 0.5 ug/L or less
3) EPA Method 8021, Low Concentration, PQL at 0.5 ug/L or less
4) EPA Method 8260, Low Concentration, PQL at 0.5 ug/L or less
5) Another method with prior approval by the Groundwater Section Chief.

Any of the referenced methods used for VOCs must at a minimum, include all the constituents listed in Table VIII of Standard Method 6230D. Any method used must provide a PQL of 0.5 ug/L or less, which must be supported by laboratory proficiency studies as required by the DWQ Laboratory Certification Unit. Any constituents detected above the Method Detection Limit (MDL) but below the PQL of 0.5 ug/L must be qualified (estimated) and reported.

e. Any laboratory selected to analyze parameters must be Division of Water Quality (DWQ) certified for those parameters required.

3. **Reporting / Documentation:**

a. All reports and documentation (GW-1, GW-30, GW-59) shall be mailed to the following address:

NC Division of Water Quality
Information Processing Unit
1617 Mail Service Center
Raleigh, North Carolina 27699-1617

Updated blank forms (GW-1, GW-30, GW-59) may be downloaded from the Groundwater Section's website at http://gw.ehnr.state.nc.us/ or requested from the address mentioned above.

b. The results of the sampling and analysis must be received on Form GW-59 (Groundwater Quality Monitoring: Compliance Report Form) by the Groundwater Section (address listed in the "Reporting / Documentation" section of the Groundwater Requirements), on or before the last working day of the month following the sampling month. The data of all groundwater sampling

analyses required by the permit conditions must be reported using the most recent GW-59 fo. along with attached copies of the laboratory analyses.

4. Vertical Separation Requirements:

   a. Waste shall not be applied or discharged onto or below the land surface when the vertical separation between the waste and the seasonal high water table is less than one (1) foot.

5. Applicable Boundaries:

   a. The COMPLIANCE BOUNDARY for the disposal system is specified by regulations in 15A NCAC 2L, Groundwater Classifications and Standards. The Compliance Boundary for the disposal system individually permitted on or after December 30, 1983 is established at either 250 feet from the waste disposal area, or 50 feet within the property boundary, whichever is closest to the waste disposal area. An exceedance of Groundwater Quality Standards at or beyond the Compliance Boundary is subject to remediation action according to 15A NCAC 2L .0106(d)(2).

   b. The REVIEW BOUNDARY is established around the disposal systems midway between the Compliance Boundary and the perimeter of the waste disposal area. Any exceedance of standards at the Review Boundary shall require action in accordance with 15A NCAC 2L .0106(d)(1).

6. Additional Requirements:

   a. Any additional groundwater quality monitoring, as deemed necessary by the Division, shall be provided.

V. INSPECTIONS

1. Adequate inspection, maintenance, and cleaning shall be provided by the Permittee to insure proper operation of the subject facilities.

2. The Permittee or his designee shall inspect the wastewater treatment and disposal facilities to prevent malfunctions and deterioration, operator errors and discharges which may cause or lead to the release of wastes to the environment, a threat to human health, or a nuisance. The Permittee shall keep an inspection log or summary including at least the date and time of inspection, observations made, and any maintenance, repairs, or corrective actions taken by the Permittee. This log of inspections shall be maintained by the Permittee for a period of three years from the date of the inspection and shall be made available upon request to the Division or other permitting authority.

3. Any duly authorized officer, employee, or representative of the Division may, upon presentation of credentials, enter and inspect any property, premises or place on or related to the disposal site or facility at any reasonable time for the purpose of determining compliance with this permit; may inspect or copy any records that must be maintained under the terms and conditions of this permit, and may obtain samples of groundwater, surface water, or leachate.

VI. GENERAL CONDITIONS

1. This permit shall become voidable unless the facilities are constructed in accordance with the conditions of this permit, the approved plans and specifications, and other supporting data.

2. This permit is effective only with respect to the nature and volume of wastes described in the application and other supporting data.

3. This permit is not transferable. In the event there is a desire for the facilities to change ownership, or there is a name change of the Permittee, a formal permit request must be submitted to the Division accompanied by an application fee, documentation from the parties involved, and other supporting materials as may be appropriate. The approval of this request will be considered on its merits and may or may not be approved.

4. Failure to abide by the conditions and limitations contained in this permit may subject the Permittee to an enforcement action by the Division in accordance with North Carolina General Statute 143-215.6A to 143-215.6C.

5. The issuance of this permit does not exempt the Permittee from complying with any and all statutes, rules, regulations, or ordinances which may be imposed by other government agencies (local, state, and federal) which have jurisdiction, including but not limited to applicable river buffer rules in 15A NCAC 2B .0200, erosion and sedimentation control requirements in 15A NCAC Chapter 4 and under the Division's General Permit NCG010000, and any requirements pertaining to wetlands under 15A NCAC 2B .0200 and 2H .0500.

6. A set of approved plans and specifications for the subject project must be retained by the Permittee for the life of the project.

7. The annual administering and compliance fee must be paid by the Permittee within thirty (30) days after being billed by the Division. Failure to pay the fee accordingly may cause the Division to initiate action to revoke this permit as specified by 15A NCAC 2H .0205 (c)(4).

8. The Permittee, at least six (6) months prior to the expiration of this permit, shall request its extension. Upon receipt of the request, the Commission will review the adequacy of the facilities described therein, and if warranted, will extend the permit for such period of time and under such conditions and limitations as it may deem appropriate.

9. The subject wastewater treatment and disposal facilities shall be connected to an operational publicly owned wastewater collection system within 180 days of its availability to the subject facilities, if the subject wastewater treatment or disposal facilities are in noncompliance with the terms and conditions of this non-discharge permit or the governing statutes or regulations. Prior to the initiation of these connection activities, appropriate approval must be received from this Division.

Permit issued this the 23rd day of August, 2005

NORTH CAROLINA ENVIRONMENTAL MANAGEMENT COMMISSION

Alan W. Klimek, P.E., Director
Division of Water Quality
By Authority of the Environmental Management Commission

Permit Number WQ0017625

COPY TO: MAZIE

North Carolina Department of Environment and Natural Resources
Division of Water Quality

Beverly Eaves Perdue
Governor

Coleen H. Sullins
Director

Dee Freeman
Secretary

Aquifer Protection Section
October 26, 2011

CERTIFIED MAIL
RETURN RECEIPT REQUESTED RECEIPT
7011 0110 0000 9947 5810

Mr. Tommy Etheridge
Engelhard Sanitary District
Post Office Box 579
Engelhard, North Carolina 27824

Subject: **Notice of Violation and Recommendation of Enforcement**
NOV-2011-PC-0577
Permit No. WQ0017625
Engelhard Sanitary District
Hyde County

Dear Mr. Etheridge:

On October 10, 2011 the NC Division of Water Quality (DWQ), Aquifer Protection Section (APS) received notification of noncompliance with Permit WQ0017625. On October 21, 2011 staff of the Washington Regional Office (WaRO) inspected the subject wastewater treatment and disposal system. We wish to thank Mr. Allen Bliven who was present and assisted during the inspection.

The following items specify permit conditions and limitations that were in violation during the time of the inspection. Also please refer to the attached inspection report

I. PERFORMANCE STANDARDS

North Carolina Division of Water Quality
943 Washington Square Mall
Washington, NC 27889

Internet: www.ncwaterquality.org
Phone: 252-946-6481
FAX 252-946-9215

1. Condition I. 1. requires that the spray irrigation facilities shall be effectively maintained and operated at all times so that there is no discharge to the surface waters. In the event that the facilities fail to perform satisfactorily, including the creation of nuisance conditions due to improper operation and maintenance, or failure of the irrigation area to adequately assimilate the wastewater, the Permittee shall take immediate corrective actions. On the date of the inspection, the liner of the wastewater lagoon contained numerous small holes near the upper part of the dike wall and several larger holes in the vicinity of the southwest corner. In the southeast corner of the lagoon, the liner appeared to be "piled up" on itself or possibly floating on top of wastewater/groundwater. Also in this area a seam in the liner appeared to have been breached.

II. OPERATION AND MAINTENANCE REQUIREMENTS

1. Condition II. 1. requires the facilities to be properly operated and maintained at all times. The liner also displayed many signs of distress where holes were not present. The liner appeared tattered and thin at numerous locations around the lagoon.

III. INSPECTIONS

1. Condition V. 1. requires adequate inspection, maintenance, and cleaning by the Permittee to insure proper operation of the subject facilities. Given the overall condition of the lagoon liner the WaRO is concerned that wastewater may be leaking into the subsurface, effectively functioning as an infiltration basin.

You are required to provide a written response to this Notice within fifteen (15) days of receipt of this Notice. Please include in your response all corrective actions already taken and a schedule for completion of any corrective actions not addressed. The schedule for future corrective actions should include an adequate assessment of groundwater at the facility in order to determine the integrity of the liner, and the severity of any wastewater contamination of groundwater if present.

As a result of the violations described in this Notice, this office is considering a recommendation for a civil penalty assessment to the Director of the Division. If you wish to present an explanation for the violations cited, or if you believe there are other factors, which should be considered, please send such information to me in writing within fifteen (15) days following receipt of this letter. Your response will be reviewed, and, if an enforcement action is still deemed appropriate, it will be forwarded to the Director and included for consideration.

Aquifer Protection Section
October 26, 2011

CERTIFIED MAIL
RETURN RECEIPT REQUESTED RECEIPT
7011 0110 0000 9947 5810

Mr. Tommy Etheridge
Engelhard Sanitary District
Post Office Box 579
Engelhard, North Carolina 27824

Subject: **Notice of Violation and Recommendation of Enforcement**
NOV-2011-PC-0577
Permit No. WQ0017625
Engelhard Sanitary District
Hyde County

Dear Mr. Etheridge:

On October 10, 2011 the NC Division of Water Quality (DWQ), Aquifer Protection Section (APS) received notification of noncompliance with Permit WQ0017625. On October 21, 2011 staff of the Washington Regional Office (WaRO) inspected the subject wastewater treatment and disposal system. We wish to thank Mr. Allen Bliven who was present and assisted during the inspection.

The following items specify permit conditions and limitations that were in violation during the time of the inspection. Also please refer to the attached inspection report

I. PERFORMANCE STANDARDS

1. Condition I. 1. requires that the spray irrigation facilities shall be effectively maintained and operated at all times so that there is no discharge to the surface waters. In the event that the facilities fail to perform satisfactorily, including the creation of nuisance conditions due to improper operation and maintenance, or failure of the irrigation area to adequately assimilate the wastewater, the Permittee shall take immediate corrective actions. On the date of the inspection, the liner of the wastewater lagoon contained numerous small holes near the upper part of the dike wall and several larger holes in the vicinity of the southwest corner. In the southeast corner of the lagoon, the liner appeared to be "piled up" on itself or possibly floating on top of wastewater/groundwater. Also in this area a seam in the liner appeared to have been breached.

II. OPERATION AND MAINTENANCE REQUIREMENTS

1. Condition II. 1. requires the facilities to be properly operated and maintained at all times. The liner also displayed many signs of distress where holes were not present. The liner appeared tattered and thin at numerous locations around the lagoon.

III. INSPECTIONS

1. Condition V. 1. requires adequate inspection, maintenance, and cleaning by the Permittee to insure proper operation of the subject facilities. Given the overall condition of the lagoon liner the WaRO is concerned that wastewater may be leaking into the subsurface, effectively functioning as an infiltration basin.

You are required to provide a written response to this Notice within fifteen (15) days of receipt of this Notice. Please include in your response all corrective actions already taken and a schedule for completion of any corrective actions not addressed. The schedule for future corrective actions should include an adequate assessment of groundwater at the facility in order to determine the integrity of the liner, and the severity of any wastewater contamination of groundwater if present.

As a result of the violations described in this Notice, this office is considering a recommendation for a civil penalty assessment to the Director of the Division. If you wish to present an explanation for the violations cited, or if you believe there are other factors, which should be considered, please send such information to me in writing within fifteen (15) days following receipt of this letter. Your response will be reviewed, and, if an enforcement action is still deemed appropriate, it will be forwarded to the Director and included for consideration.

Failure to comply with conditions in a permit may result in a recommendation of enforcement action, to the Director of the Division of Water Quality who may issue a civil penalty assessment of not more that twenty-five thousand ($25,000) dollars against any "person" who violates or fails to act in accordance with the terms, conditions, or requirements of a permit under authority of G.S. 143-215.6A. Please note that each day a violation continues may be considered a separate violation, subject to additional civil penalties. If you have any questions concerning this Notice, please contact Will Hart at 252-948-3911 or me at 252-948-3939.

Sincerely,

David May
Aquifer Protection Section Supervisor
Washington Regional Office

attachments: Inspection Report

cc: Enviro-Tech PO Box 69, Harbinger, NC 27941-0069
Hyde County Environmental Health Department
WaRO-APS Files
Aquifer Protection Section Central Files

Failure to comply with conditions in a permit may result in a recommendation of enforcement action, to the Director of the Division of Water Quality who may issue a civil penalty assessment of not more that twenty-five thousand ($25,000) dollars against any "person" who violates or fails to act in accordance with the terms, conditions, or requirements of a permit under authority of G.S. 143-215.6A. Please note that each day a violation continues may be considered a separate violation, subject to additional civil penalties. If you have any questions concerning this Notice, please contact Will Hart at 252-948-3911 or me at 252-948-3939.

Sincerely,

David May
Aquifer Protection Section Supervisor
Washington Regional Office

attachments: Inspection Report

cc: Enviro-Tech PO Box 69, Harbinger, NC 27941-0069
Hyde County Environmental Health Department
WaRO-APS Files
Aquifer Protection Section Central Files

Compliance Inspection Report

Permit: WQ0017625 **Effective:** 08/23/05 **Expiration:** 01/31/14 **Owner:** Engelhard Sd

SOC: **Effective:** **Expiration:** **Facility:** Engelhard Sanitary District

County: Hyde PO Box 579

Region: Washington

Engelhard NC 27824

Contact Person: Tommy J Etheridge **Title:** **Phone:** 252-925-4301

Directions to Facility:

Facility is located east/northeast of Engelhard, NC on US Highway 264 - immediately south of the Hyde County Airport.

System Classifications: SI,

Primary ORC: James Keith Bliven **Certification:** 28243 **Phone:** 252-491-5277

Secondary ORC(s):

On-Site Representative(s):

Related Permits:

Inspection Date: 10/21/2011 **Entry Time:** 10:00 AM **Exit Time:** 11:15 AM

Primary Inspector: Will T Hart **Phone:**

Secondary Inspector(s):

Reason for Inspection: Other **Inspection Type:** Compliance Evaluation

Permit Inspection Type: Surface Irrigation

Facility Status: ☐ Compliant ■ Not Compliant

Question Areas:

■ Miscellaneous Questions ■ Treatment Lagoons

(See attachment summary)

Permit: WQ0017625 **Owner - Facility:** Engelhard Sd

Inspection Date: 10/21/2011 **Inspection Type:** Compliance Evaluation **Reason for Visit:** Other

Inspection Summary:

On October 10, 2011 Mr. Jimmy Bliven, ORC for the Engelhard Sanitary District, telephoned the Washington Regional Office to report holes in the lagoon liner at the facility. On October 21, 2011 I (Will Hart) arrived at the facility at 10:00 am and met Mr. Allen Bliven, Back-Up ORC, at the facility. Mr. Bliven and I conducted a visual inspection of the liner and found many small holes (< 1 inch) at/near the top of the lagoon wall. The liner in the southern end of the lagoon appears to be in very bad condition, exhibiting several holes of 6 - 8 sq. ft. near the southwest corner, areas of extreme wear (stretched and tattered in appearance), one or more seams that appear to have been compromised, and what appears to be "excess" liner material either piled up or floating in the southeast corner.
Due to the fact that the liner is in horrible condition and irrigation has not taken place at the facility in quite some time, the WaRO is concerned that the lagoon may be leaking into the ground beneath the liner, essentially allowing the lagoon to operate as an infiltration basin. The WaRO will likely issue a Notice of Violation with Notice of Intent to Enforce, and also likely place Engelhard SD on a Moratorium. WaRO will be in touch with the Engelhard SD to discuss options and provide assistance in much needed repairs and/or upgrades to the facility.

Type	Yes	No	NA	NE
Infiltration System	☐			
Reuse (Quality)	☐			
Activated Sludge Drip, LR	☐			
Activated Sludge Spray, HR	☐			
Activated Sludge Spray, LR	☐			
Single Family Spray, LR	☐			
Single Family Drip	☐			
Recycle/Reuse	☐			
Lagoon Spray, LR	■			

WaRO-APS

North Carolina Department of Environment and Natural Resources
Division of Water Quality

Beverly Eaves Perdue
Governor

Coleen H. Sullins
Director

Dee Freeman
Secretary

November 18, 2011

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
7011 0110 0000 9947 5841

Mr. Tommy Etheridge
Engelhard Sanitary District
Post Office Box 579
Engelhard, North Carolina 27824

Subject: **Notification of Sewer Moratorium**
Engelhard Sanitary District Wastewater Surface Irrigation
Permit Number WQ0017625
Hyde County

Dear Mr. Etheridge:

The Division of Water Quality has determined that Engelhard Sanitary District Wastewater Surface Irrigation System is unable to adequately collect and treat waste tributary to its wastewater treatment facility. The determination is based on the deterioration of the wastewater lagoon liner and the overall condition of the lagoon.

North Carolina General Statute 143-215.67(a) states in part, that no person subject to the provision of NCGS 143-215.1, 143-215.108 or 143-214.109 shall cause or allow the discharge of any wastes to a waste-disposal system in excess of the capacity of the disposal system or of any wastes which the disposal system cannot adequately treat. Should these terms be violated, 143-215.67 (c) states a moratorium may be imposed "on the addition of waste to a treatment works" if the treatment works is not capable of adequately treating additional waste.

During several site visits, the liner was observed to be in a general state of disrepair. During a facility inspection conducted October 21, 2011 the liner was observed to contain many holes of various sizes. Based on the Aquifer Protection Section's October 21, 2011 findings the lagoon is considered to be unable to adequately impound wastewater as designed. Therefore, the Engelhard Sanitary District Wastewater Surface Irrigation System is hereby placed on a sewer moratorium (with no new sewer taps, sewer extensions or additional flow) at its wastewater treatment plant effective January 4, 2012. This moratorium will remain in effect until the Engelhard Sanitary District has

North Carolina Division of Water Quality
943 Washington Square Mall
Washington, NC 27889

Internet: www.ncwaterquality.org
Phone: 252-946-6481
FAX 252-946-9215

sufficiently demonstrated that it can adequately treat its waste and has obtained written permission from the Division of Water Quality suspending the moratorium.

As required by NCGS 143-215.67(d), the Town shall give public notice that a moratorium will be placed on the discharge of additional waste to the Engelhard Sanitary District Wastewater Surface Irrigation System's treatment works within 15 days of receipt of this letter. The Town shall give public notice of the moratorium by publication of the notice one time in a newspaper having general circulation in the county in which the treatment works is located. The notice shall be as provided in the attached public notice.

The Engelhard Sanitary District shall provide an affidavit of publication and a copy of the public notice to this office on or by December 8, 2011. Failure to place the public notice as directed may subject the Engelhard Sanitary District to enforcement as required by NCGS 143-215.67(d). The Sanitary District shall give actions and in no way absolves the Engelhard Sanitary District from past or future violation(s) of North Carolina General Statutes.

Correspondence pertaining to this moratorium should be sent to the letterhead address. If you have any questions about this letter, please contact David May at 252-948-3939.

Sincerely,

David May

David May
Aquifer Protection Supervisor
Washington Regional Office

Attachment

cc: Coleen H. Sullins, Director, DWQ
Ted Bush, Aquifer Protection Section Chief
WaRO -APS
Ed Hardee, LAPCU
WaRO-SW
Hyde County Health Department
Enviro-Tech, Inc. PO Box 69, Harbinger, NC 27941-0069

North Carolina Department of Environment and Natural Resources
Division of Water Quality

Beverly Eaves Perdue
Governor

Charles Wakild, P.E.
Director

Dee Freeman
Secretary

Aquifer Protection Section
March 15, 2012

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
7011 0110 0000 9947 5926

Mr. Tommy Etheridge
Engelhard Sanitary District
Post Office Box 579
Engelhard, North Carolina 27824

Subject: **Notice of Violation and Recommendation of Enforcement Action**
NOV-2012-PC-0086
Permit No. WQ0017625
Engelhard Sanitary District
Hyde County

Dear Mr. Etheridge:

On February 3, 2012, staff of the NC Division of Water Quality (DWQ), Aquifer Protection Section (APS), inspected the subject wastewater treatment and disposal system. We wish to thank Messr's James and Allen Bliven, who were present and assisted during the inspection.

The following items specify permit conditions and limitations that were in violation during the time of the inspection:

I. OPERATION AND MAINTENANCE REQUIREMENTS

1. Condition II.6. requires the facility to be effectively maintained and operated as a non-discharge system to prevent the discharge of any wastewater resulting from the operation of this facility. During the inspection Washington Regional Office APS staff observed no less than two large holes in the liner that intersect the liquid level in the wastewater lagoon.

You are required to take any necessary action to correct the above violation immediately and to provide a written response to this Notice by April 2, 2012. Please include in your response all corrective actions already taken and a schedule for completion of any corrective actions not addressed.

North Carolina Division of Water Quality
943 Washington Square Mall
Washington, NC 27889

Internet: www.ncwaterquality.org
Phone: 252-946-6481
FAX 252-946-9215

As a result of the violations described in this Notice, this office is considering a recommendation for a civil penalty assessment to the Director of the Division. If you wish to present an explanation for the violations cited, or if you believe there are other factors, which should be considered, please send such information to me in writing within ten (10) days following receipt of this letter. Your response will be reviewed, and, if an enforcement action is still deemed appropriate, it will be forwarded to the Director and included for consideration.

Failure to comply with conditions in a permit may result in a recommendation of enforcement action, to the Director of the Division of Water Quality who may issue a civil penalty assessment of not more that twenty-five thousand ($25,000) dollars against any "person" who violates or fails to act in accordance with the terms, conditions, or requirements of a permit under authority of G.S. 143-215.6A. Please note that each day a violation continues may be considered a separate violation, subject to additional civil penalties. If you have any questions concerning this Notice, please contact Will Hart at 252-948-3911 or me at 252-948-3939.

Sincerely,

David May

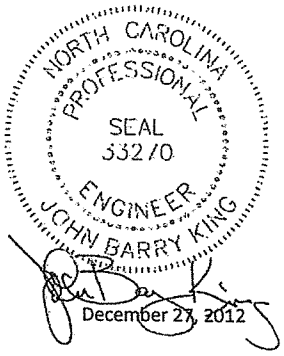
David May
Aquifer Protection Section
Washington Regional Office Supervisor

cc: Enviro-Tech PO Box 69, Harbinger, NC 27941-0069
Ms. Kris Noble, Hyde County Grants Administrator
Hyde County Environmental Health Department
WaRO-APS Files
Aquifer Protection Section Central Files

Engelhard Sanitary District (ESD)

Hyde County NC

RE: SECTION V-CERTIFICATION # WQ0017625



CURRENT SITUATION

Much of this discussion is included in Section IV under Narrative.

The WWTP for the District is composed of a 9 acre facultative lagoon, chlorine contact chamber, land application pump station, and 23.5 acres of spray irrigation fields with pump dewatering drainage ditches. The treatment lagoon was designed for a capacity of 120,000 GPD while the installed, forested irrigation fields may receive flow from 64,000 GPD; both are permitted through permit # WQ0017625

The facultative lagoon was originally constructed abiding by design guidelines with an approved 36 mil, fiber reinforced liner and adequate volume to treat and store 120,000 GPD with 64 days of retention. However, the lagoon pond was excavated below the water table to an elevation of -2 ft MSL which is below the local average water table. As a result ground water could fill in below the liner. Further the lagoon was built on deep peat soils with a high organic component. The organic materials in the soil are forever submerged and experience anaerobic conditions with the products of decomposition being gaseous, both CO2 and methane. The gas flows to the surface and typically escapes into the atmosphere. However under the lagoon liner filled with water the gas forms gas pockets or bubbles since the water prohibits the gas from escaping. The pockets lift the liner off the soil bottom and become mobile. High winds from storm events produce waves in the 1000 foot long pond that are transmitted to the water and gas bubbles under the liner. The water movement under the liner washed out the containment berm from underneath the liner and caused the banks to fail. Once the soil under the liner berm was gone the weight from the water within the lagoon easily pulled the liner apart causing water from inside the lagoon to readily flow below the liner and into the soil.

The lagoon liner is damaged extensively in many locations with the soil from berms washed under the liner. The renovation of the lagoon would require it to be taken out of service completely and is not a feasible alternative. The flow of water around the liner is reason for further violations since the treatment process is circumvented.

To bring the existing lagoon back into compliance, the lagoon would have to be drained, the liner removed, the berm repaired, the pond filled with soil above the water table with drainage beneath the liner to make certain the water could not accumulate again. Simultaneously the raw incoming wastewater flow would have to be hauled to another receiving facility at an average rate of approximately 23,000 GPD for several months while the pond is repaired. Additionally there would need to be constructed an equalization basin to catch the daily flow to be hauled, otherwise a pump, truck, and operator would be employed around the clock on site to ensure no overflows of the influent pump station occurred. The estimated budget for repairing the lagoon is $1.25M and would require

approximately 180 days to drain to a dry enough state to use equipment on and then place and shape the required materials and drainage structures

Because of the length of the lagoon, the open fetch of the surrounding landscape, and the likelihood of high wind events occurring in the area, there still would exist a possibility of waves in the lagoon causing yet another failure. For this reason it is not recommended that the existing pond be repaired but rather abandoned and a new, more reasonably sized treatment works constructed adjacent to the existing pond with a much reduced wet weather storage pond.

It is recommended that the Engelhard Sanitary District make use of the existing influent pump station/flow meter and spray irrigation fields of the existing treatment facility and to build a new package WWTP and required irrigation storage pond. Further the required size to the plant and pond should be assessed for reasonable influent flows based on existing metered flows, documented proposed new attachments to the collection system, and anticipated growth based on historical population trends.

ANTICIPATED FLOW

To accurately gauge the necessary treatment capacity to design for, an evaluation of the WW flow in the collection system was compiled from records of; water consumption, number of residences and businesses attached to and contributing to the collection system, number of bedrooms in each residence, and the existing flows to the lagoon treatment works. The records were compiled to calculate the volume of water contributed daily per bedroom. The resulting characteristics of the homes attached to the collection system are the basis for requesting a flow reduction as described in the state 02T rules for the addition of new customers. It was found through that analysis that a flow of 111 gpd per home is characteristic of all residential customers within the ESD collection system. This flow is sourced from many older homes that were built long before the invention of reduced flow toilets and water fixtures and will likely represent a conservative flow for new attachments.

Hyde County has an immediate need to add 44 homes along US 264 to the ESD collection system. The resulting flow to the Engelhard Sanitary District Wastewater Surface Irrigation Facility would, as a result, average 27709 gpd.

NEW FACITIES and INTERIM OPERATIONS

To ultimately conform to requirements of their existing permit the ESD will need to replace the failed facultative lagoon. The original 9 acres lagoon capable of 120,000 gpd was excessive for the wastewater loads it has experienced in the past or the loads anticipated in the future. The maximum expected average flow to be treated within the next 20 years is estimated at 43806 gpd. If that flow is 80% of the plant capacity then a 55,000 gpd treatment facility is needed.

The new WWTP has the advantage of using the 64000 gpd spray irrigation fields and influent pump station. Between these two and new 55,000 gpd WWTP and 30 day wet weather storage pond (1.65 MG) need to be constructed.

To treat the existing flow while the new plant is being planned and built, First, the existing Chlorine contact chamber will have to return to service to disinfect the lagoon water that will be applied to the spray irrigation fields. Second, the spray irrigation pumps need to be returned to the spray pump station to begin drawing down the lagoon below the damaged sections of the liner and stop the wastewater flow around the liner. Third, an operator needs to visit the site every day and perform maintenance or operation procedures to be certain that the lagoon level stays below the damaged liner breaks. If the existing lagoon is operated at half of its existing volume then it should not have a significant problem either adequately treating the waste stream or flowing behind the liner.

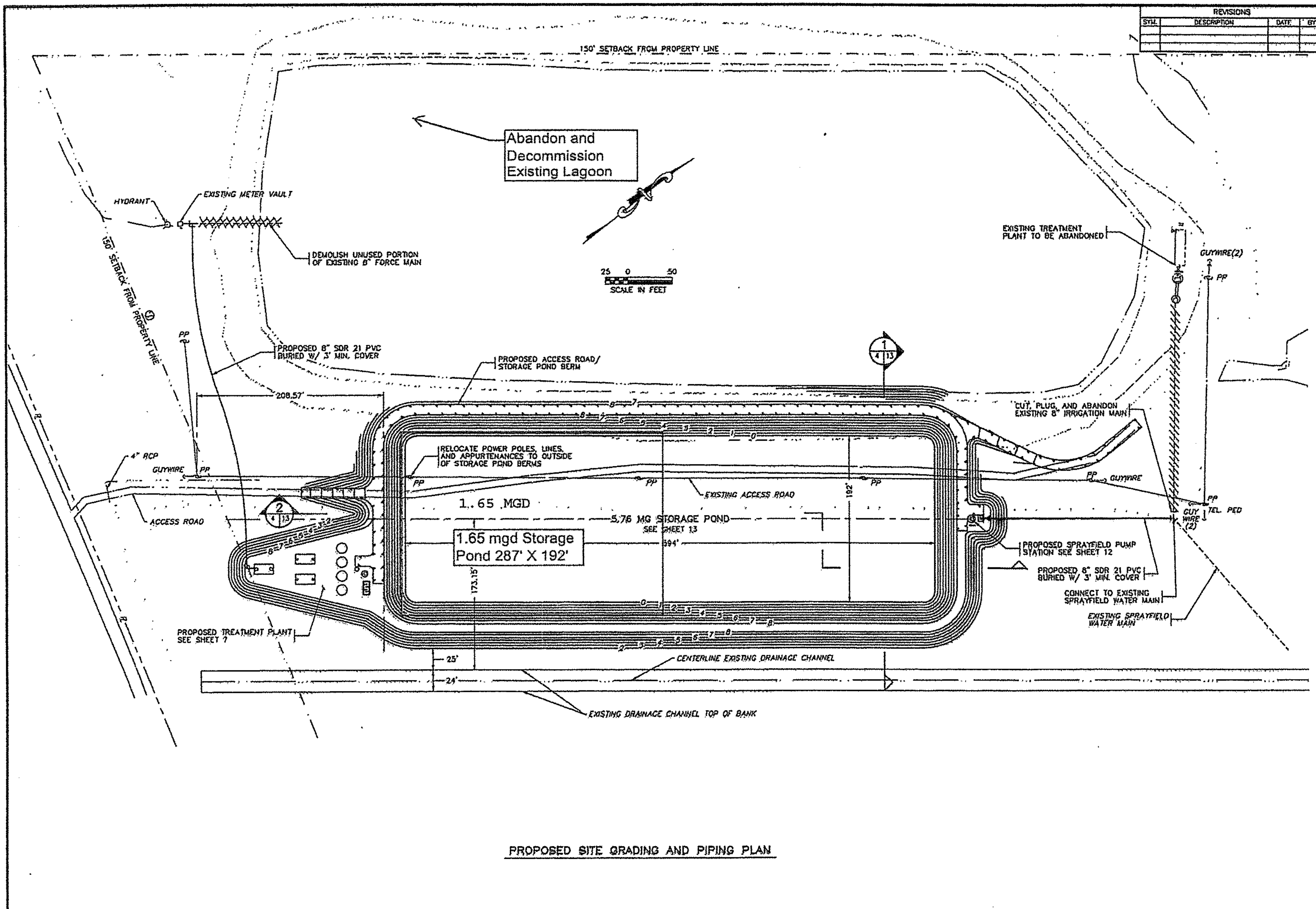
The new treatment works will consist of a package treatment plant capable of meeting the land irrigation requirements rated at 55,000 gpd and a 1.26 acre wet weather storage pond 4 feet deep built above the local water table with under-liner drainage to ensure water does not accumulate allowing the formation of gas bubbles.

Exhibit 5 shows the Replacement WWTP and Storage Lagoon and how the 2008 WWTP design will be modified. Detailed engineering of the 2012 replacement plant will use the 2008 design as a basis for the new smaller design.

Exhibit 6 shows the calculated storage requirements for the wet weather pond. Using the original soil studies from 1998 from Triangle Wetland Consultants, the reduced wastewater flow applied to the 23.5 acres requires a storage pond of 0 gallons. The rules guiding spray irrigation require a minimum of 30 days storage and as a result the storage pond must have a volume of 55,000 gpd * 30 days for 1.65 MG.

Exhibit 7 shows a good alternative for a wastewater treatment plant to serve ESD. The plant shown is a FAS plant (Fixed Film Activated Sludge). The tanks are precast and are able to be trucked in and set in place and stabilized. They can be installed above or at grade. The tank capacity can be modified with the addition of moving media inside the tank chambers. Moving media bioreactors offer excellent treatment capacity per cubic foot of volume.

Exhibit 08 shows the budget planning estimate for both constructing the new WWTP and storage pond and to repair the existing facility to operate for approximately one year until the new plant can accept flow.



PROPOSED SITE GRADING AND PIPING PLAN

REVISIONS			
SYM.	DESCRIPTION	DATE	BY

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 8803 FREDERICK M. HOBBS

Hobbs, Upchurch & Associates, P.A.
Consulting Engineers, Surveyors & Land Planners
Southern Pines, North Carolina 28387
300 S.W. Broad Street, Southern Pines, North Carolina 28387
Phone: (910) 692-5616 – Fax: (910) 692-7342

PROPOSED SITE GRADING AND PIPING PLAN

ENGELHARD SANITARY DISTRICT
WASTEWATER TREATMENT PLANT UPGRADE
HYDE COUNTY, NORTH CAROLINA

DATE:	SEPTEMBER, 2008
DESIGNER:	TAG
DRAWN:	HCP
CHECKED:	DTU
SCALE:	AS SHOWN
SHEET NO.	4

D3 Site Plans.dwg, Layout2

A Spray Irrigation Water Balance for

Permit No: WQ0017625

Permittee Name: Engelhard Sanitary District

Facility Engelhard Sanitary District Wastewater Surface Irrigation

Soil Scientist: Douglas A. Freese, Soil Scientist (1998)

Engineer: Barry King, PE

Water Budget Prepared By:

Barry King, PE, Hobbs Upchurch, and Associates P.A.

Enter Data ===>

Precipitation Worksheet

FYI

Calculate the precipitation for an 80th percentile "wet" year, based on long term data (approx. 30 years or greater).

Click on each step box

Precipitation Data

Step 1 | Step 2

Month	Mean Monthly Precipitation	Percent of Mean Annual Precipitation	80th Percentile Monthly Precipitation
	inches	percent	inches
January	4.83	9.43	5.47
February	3.01	5.88	3.41
March	4.18	8.16	4.73
April	2.79	5.45	3.16
May	3.59	7.01	4.07
June	4.34	8.47	4.91
July	5.41	10.56	6.13
August	7.33	14.31	8.30
September	5.16	10.07	5.84
October	4.48	8.75	5.07
November	3.62	7.07	4.10
December	2.48	4.84	2.81
TOTALS =	51.22	100.00	58.00
		Calculations	Calculations

Values shown in yellow cells are linked to other locations within the Water Balance Program

Step 3 - Precipitation Data Soucre

Location of Precipitation Data:

Staring Year of Data Record:

Ending Year of Data Record:

Period of Record (Years) = 0

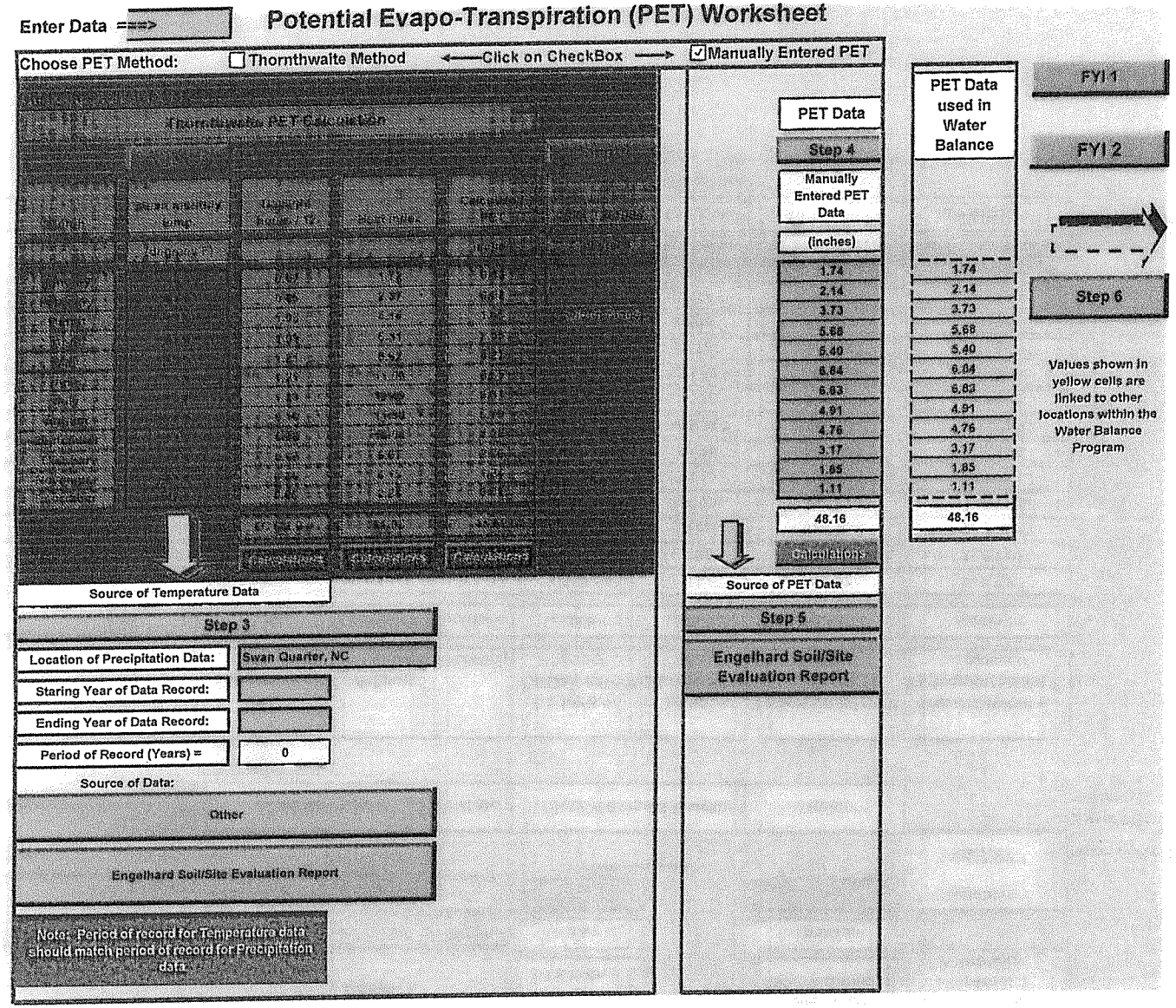
Step 4

Source of Data:

Other (List Below)

Engelhard Soil/Site Evaluation Report

Important Note: Period of record for precipitation data should match period of record for temperature data


Enter Data ===>
Potential Evapo-Transpiration (PET) Worksheet
Choose PET Method:
Thornthwaite Method
<---Click on CheckBox --->
Manually Entered PET
Thornthwaite PET Calculation
Source of Temperature Data
Step 3
Location of Precipitation Data:
Swan Quarter, NC
Staring Year of Data Record:
Ending Year of Data Record:
Period of Record (Years) =
0
Source of Data:
Other
Engelhard Soil/Site Evaluation Report
Note: Period of record for Temperature data should match period of record for Precipitation data.
PET Data
Step 4
Manually Entered PET Data
(inches)
1.74
2.14
3.73
5.68
5.40
6.84
6.83
4.91
4.76
3.17
1.85
1.11
48.16
Calculations
Source of PET Data
Step 5
Engelhard Soil/Site Evaluation Report
PET Data used in Water Balance
1.74
2.14
3.73
5.68
5.40
6.84
6.83
4.91
4.76
3.17
1.85
1.11
48.16
FYI 1
FYI 2
Step 6
Values shown in yellow cells are linked to other locations within the Water Balance Program

Influent, Lagoon Storage, and Zone Setup Worksheet

Calculate the adjusted influent loading by including the gains and losses from the Storage Lagoon, and set up the Spray Zones areas and individual Zone flowrates.

Click on each step box

Enter Data ==>

Pan Evap. Data | Precip | Lagoon Gains & Losses | Influent

Step 1 | Step 2 | Step 3

Area of Lagoon: acres: 1.26

Design Daily Flow (Influent): gals/day: 54,000

Total Flow to be Disposed (Annual Averaged): gals/day: 56,277

should be equal

Step 4: Total Flow to All Zones: gals/day: 56,277

Zone 1: Daily Flow to Zone 1: gals/day: 54,000 | Wetted Acreage: acres: 23.50

Irr. Rate (in/wk) = 0.59

Month	Days per month	Pan Evaporation Data	Adjusted Pan Data	Precip	Lagoon Gains from Precip.	Lagoon Losses from Evap.	Design Influent Volume per Month	Total: Influent + Lagoon Gains & Losses	Zone 1 Volume to be Disposed	Zone 1 Design Irrigation per month
		inches	inches	inches	gallons	gallons	gallons	gallons	gallons	inches
January	31	1.74	1.22	5.47	187,115	41,670	1,674,000	1,819,445	1,674,000	2.62
February	28	2.14	1.50	3.41	116,608	51,249	1,512,000	1,577,359	1,512,000	2.37
March	31	3.73	2.61	4.73	161,934	89,326	1,674,000	1,746,607	1,674,000	2.62
April	30	5.68	3.98	3.16	108,085	136,025	1,620,000	1,592,060	1,620,000	2.54
May	31	5.40	3.78	4.07	139,077	129,320	1,674,000	1,683,757	1,674,000	2.62
June	30	6.84	4.79	4.91	168,132	163,805	1,620,000	1,624,327	1,620,000	2.54
July	31	6.83	4.78	6.13	209,584	163,565	1,674,000	1,720,019	1,674,000	2.62
August	31	4.91	3.44	8.30	283,965	117,585	1,674,000	1,840,380	1,674,000	2.62
September	30	4.76	3.33	5.84	199,899	113,993	1,620,000	1,705,906	1,620,000	2.54
October	31	3.17	2.22	5.07	173,556	75,915	1,674,000	1,771,640	1,674,000	2.62
November	30	1.85	1.30	4.10	140,239	44,304	1,620,000	1,715,935	1,620,000	2.54
December	31	1.11	0.78	2.81	96,075	26,582	1,674,000	1,743,493	1,674,000	2.62
			Calcs.		Calcs.	Calcs.	Calcs.	Calcs.	Calcs.	Calcs.
Totals:	365	48.16	33.71	58.00	1,984,268	1,153,339	19,710,000	20,540,929	19,710,000	30.89

Soils and Water Balance for Zone 1

Zone 1 Description: 23.5 Acres at Engelhard

Calculate Soil Drainage

Step 1		Step 2	f x Ksat
In-situ saturated vertical hydraulic conductivity (Ksat)		Drainage factor (f)	Soil Drainage Rate
in/hr	in/day	percent	in/day
0.22	5.28	0.050	0.26

Soils Series Information for Zone 1

Series Name	Drainage class	Water table depth (BLS)	risk of perching	Is bedrock < 60" BLS ?
		Potential site limitations		
Ponzer	v poorly	LS- <1.5	high	no

BLS = below land surface

Published soil permeability rates by series or textural class are not acceptable. Actual in-situ soils Ks:t data is required.

Copied from Influent & Zones Setup Sheet:		
Daily Flow =	54,000	gals/day
Zone 1 Area =	23.50	acres

Click the "CALCULATE" button after making changes.

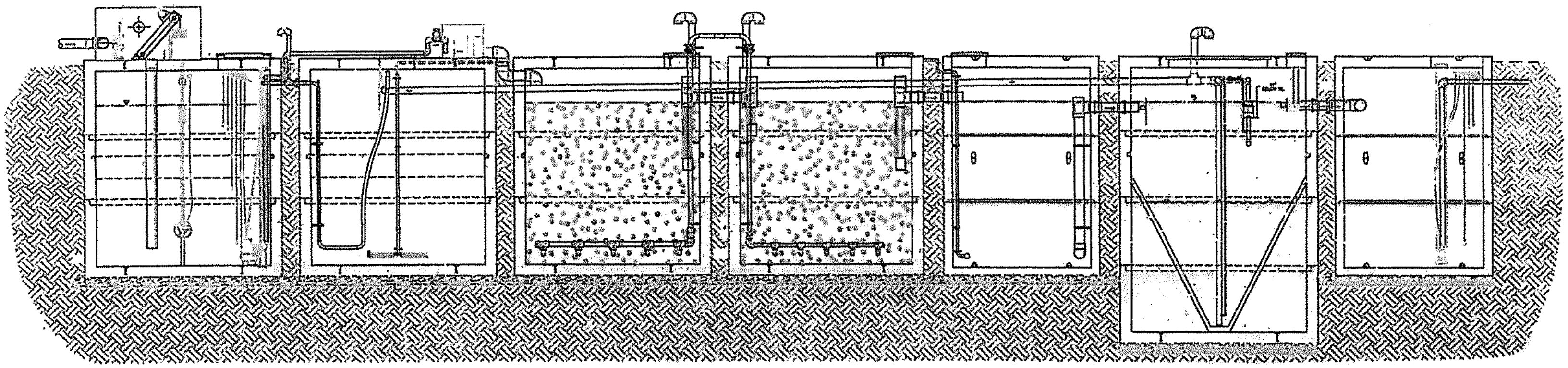
HELP

Month	Days per month	PET	Zone 1 Soil Drainage	Zone 1 Total Loss	Precip	Calculated Maximum Allowable Irrigation	Manual Override Maximum Allowable Irrigation	Actual Used Maximum Allowable Irrigation	Design Irrigation per Month	Monthly Excess	Zone 1 Cummulative Storage Required for Irrigation	Zone 1 Actual Monthly Irrigation Rate
		inches	inches	inches	inches	inches	inches	inches	inches	inches	inches	inches
January	31	1.74	8.18	9.92	5.47	4.45		4.45	2.62	1.83	0.00	2.62
February	28	2.14	7.39	9.53	3.41	6.12		6.12	2.37	3.75	0.00	2.37
March	31	3.73	8.18	11.91	4.73	7.18		7.18	2.62	4.56	0.00	2.62
April	30	5.68	7.92	13.60	3.16	10.44		10.44	2.54	7.90	0.00	2.54
May	31	5.40	8.18	13.58	4.07	9.52		9.52	2.62	6.90	0.00	2.62
June	30	6.84	7.92	14.76	4.91	9.85		9.85	2.54	7.31	0.00	2.54
July	31	6.83	8.18	15.01	6.13	8.89		8.89	2.62	6.26	0.00	2.62
August	31	4.91	8.18	13.09	8.30	4.79		4.79	2.62	2.17	0.00	2.62
September	30	4.76	7.92	12.68	5.84	6.84		6.84	2.54	4.30	0.00	2.54
October	31	3.17	8.18	11.35	5.07	6.28		6.28	2.62	3.66	0.00	2.62
November	30	1.85	7.92	9.77	4.10	5.67		5.67	2.54	3.13	0.00	2.54
December	31	1.11	8.18	9.29	2.81	6.49		6.49	2.62	3.86	0.00	2.62
			Calcs.	Calcs.		Calc. M.A.I.	Manual M.A.I.	M.A.I. Used		Calcs.		
Totals:	365	48.16	96.36	144.52	58.00	86.52		86.52	30.89			30.89

FYI

Maximum Monthly Storage Required for the Irrigation of Zone 1:

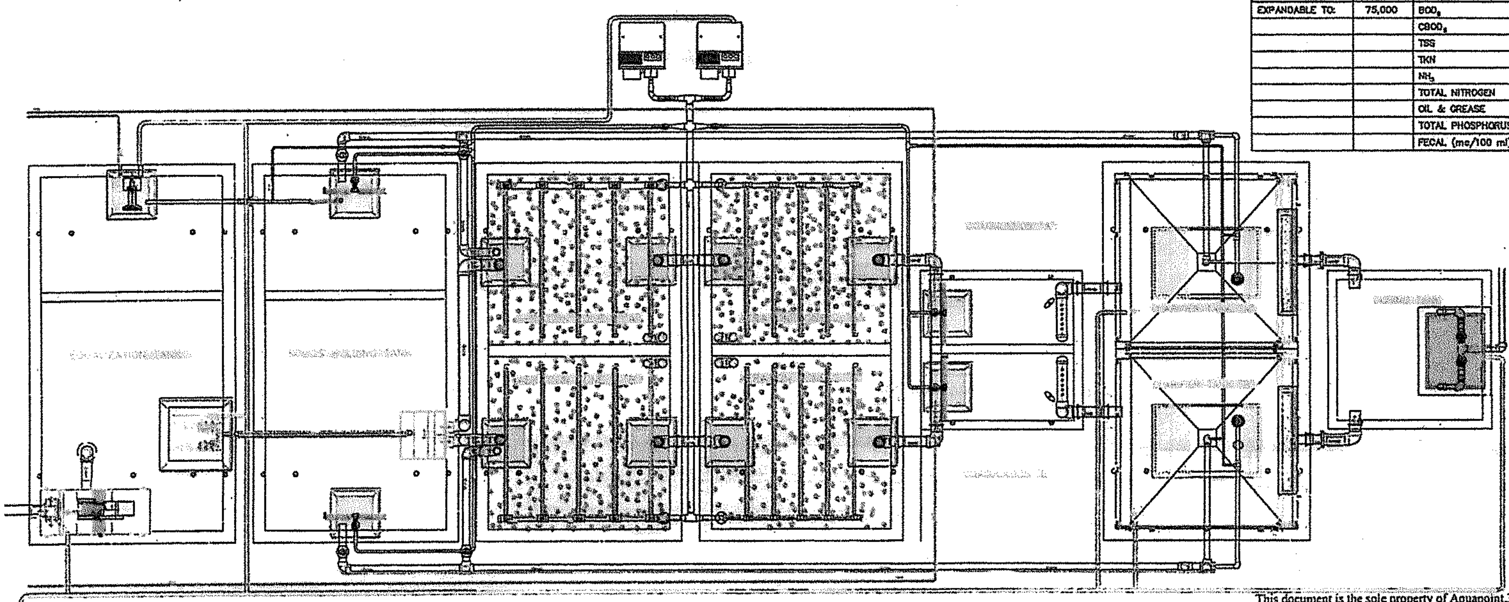
inches		acres		gallons
0.00	over	23.50	=	0



SYSTEM PROFILE

5/16"= 1'

FLOW (EACH TRAIN)	Q (GPD)		INFLUENT (MG/L)	EFFLUENT (MG/L)
DESIGN	50,000	PH	6.5 – 8.5	6.5 – 8.5
		TEMPERATURE (DEGREES)	MIN. 10C	
EXPANDABLE TO:	75,000	BOD_5	250	<10
		$CBOD_5$	–	–
		TSS	250	<10
		TKN	50	–
		NH_3	40	1
		TOTAL NITROGEN	–	–
		OIL & GREASE	–	–
		TOTAL PHOSPHORUS	8–12	1
		FECAL (mo/100 ml)	–	–



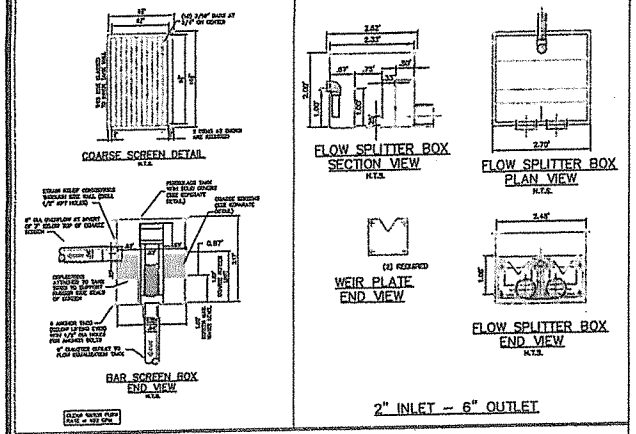
PRELIMINARY
NOT FOR CONSTRUCTION

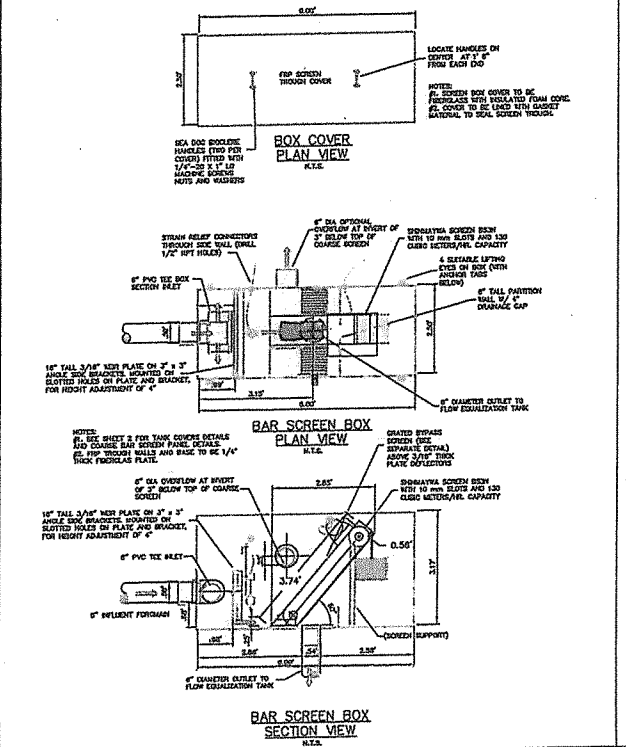
SYSTEM PLAN VIEW

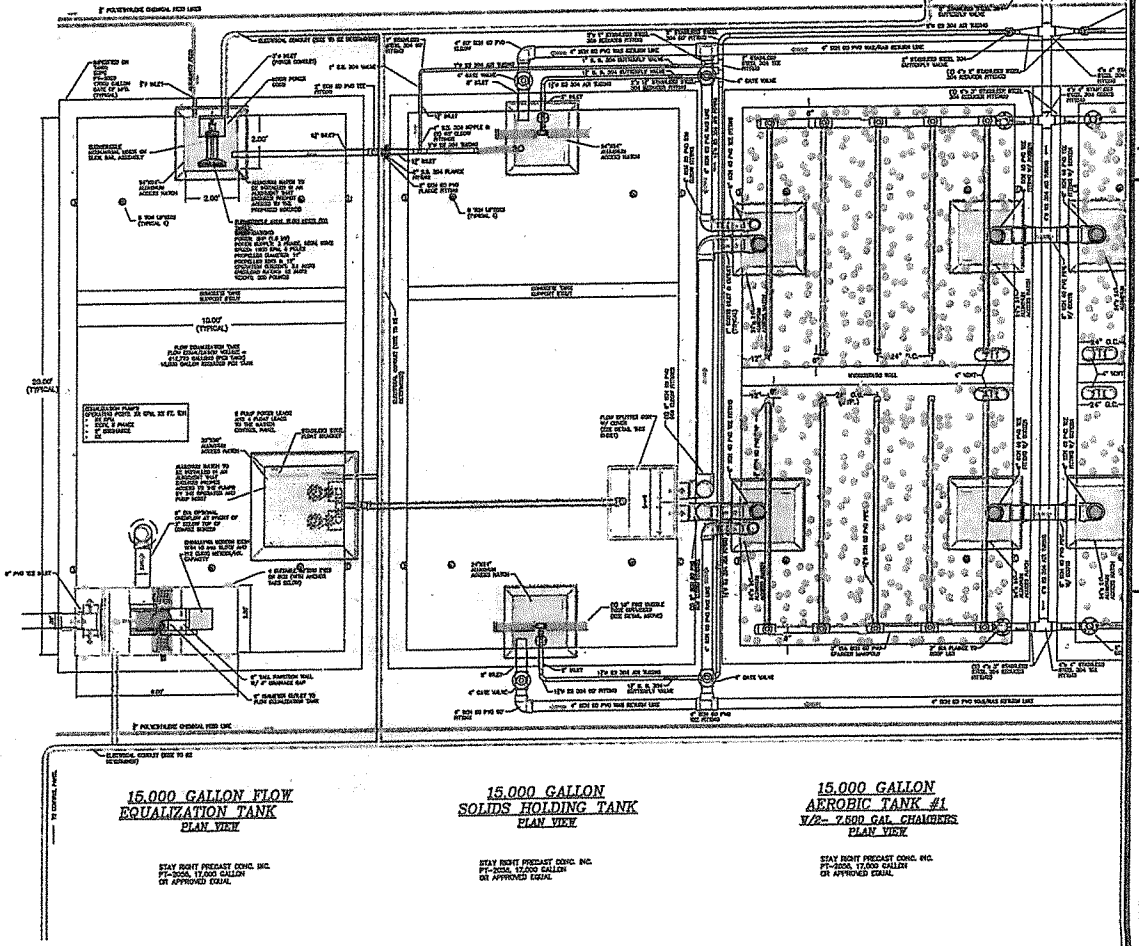
5/16"= 1'

AQUAPOINT
AN OESH COMPANY
39 TARKILN PLACE
NEW BEDFORD, MA. 02745
TELEPHONE: (508) 985-9050 – FAX (508) 985-9072

50,000 GPD (INITIAL DESIGN)
WASTEWATER TREATMENT PLANT
FOR
PARK POINT
NEW PALTZ, NY.







15,000 GALLON FLOW EQUALIZATION TANK
PLAN VIEW

STAY RIGHT PRECAST CONC. INC.
PT-3000, 17,000 GALLON
OR APPROVED EQUAL

15,000 GALLON SOLIDS HOLDING TANK
PLAN VIEW

STAY RIGHT PRECAST CONC. INC.
PT-3000, 17,000 GALLON
OR APPROVED EQUAL

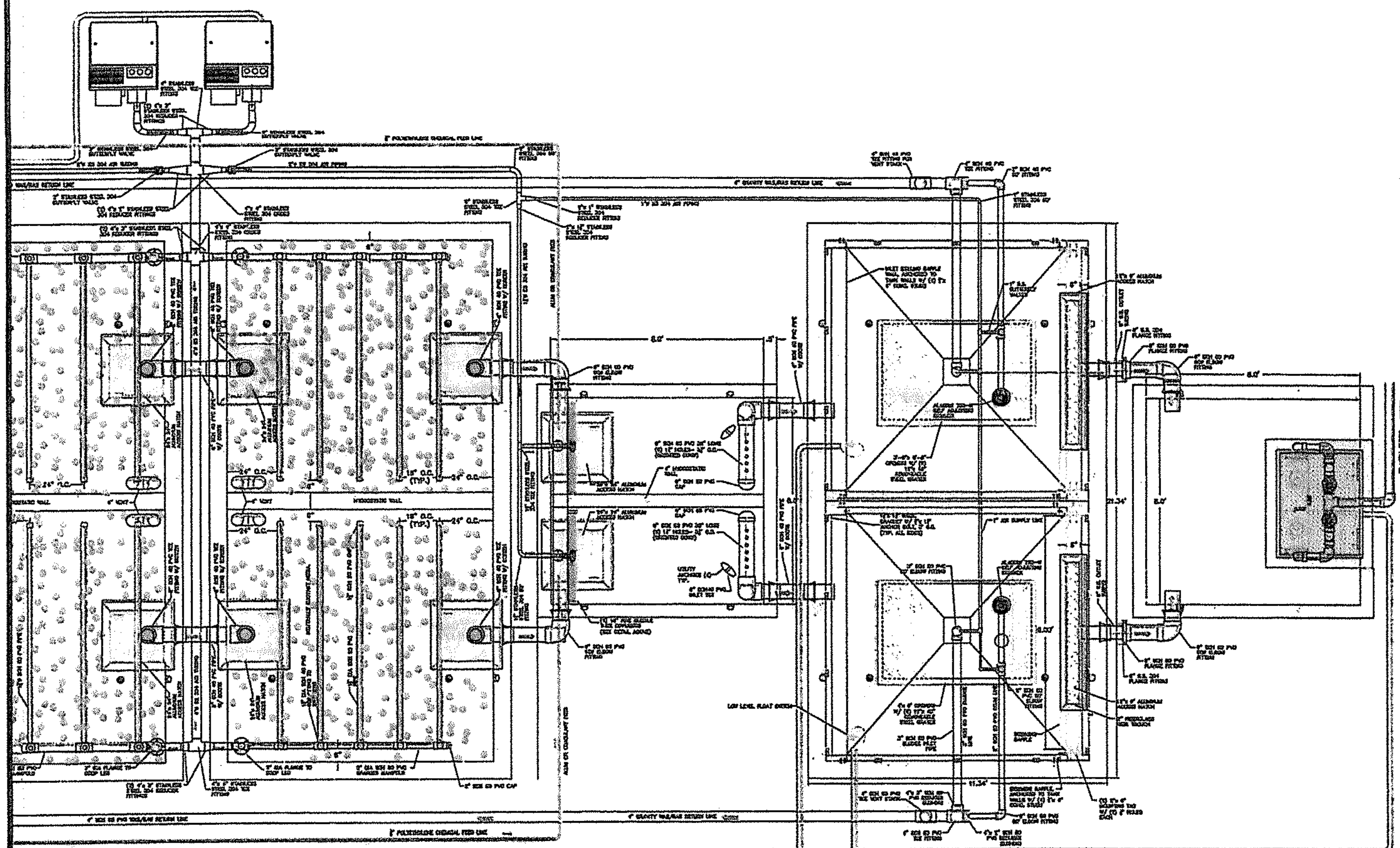
15,000 GALLON AEROBIC TANK #1
W/2– 7,500 GAL. CHAMBERS
PLAN VIEW

STAY RIGHT PRECAST CONC. INC.
PT-3000, 17,000 GALLON
OR APPROVED EQUAL

AQUAPOINT
AN OSEN COMPANY
39 TARKILN PLACE
NEW BEDFORD, MA. 02745
TELEPHONE: (508) 985-9000 – FAX (508) 985-9072

Date: 11/02/12
Drawn By: RK

50,000 GPD (INITIAL DESIGN)
WASTEWATER TREATMENT PLANT
FOR
PARK POINT
NEW PALTZ, NY.



0 GALLON
IC TANK #1
0 GAL. CHAMBERS
LAN VIEW

T PRECAST CONC. INC.
17,000 GALLON
ED EQUAL

15,000 GALLON
AEROBIC TANK #2
W/2- 7,500 GAL. CHAMBERS
PLAN VIEW

STAY RIGHT PRECAST CONC. INC.
PT-2052, 17,000 GALLON
OR APPROVED EQUAL

5,000 GALLON
COAGULATION TANK
PLAN VIEW

STAY RIGHT PRECAST CONC. INC.
8' (L)x 8' (W)x 12' (D)
OR APPROVED EQUAL

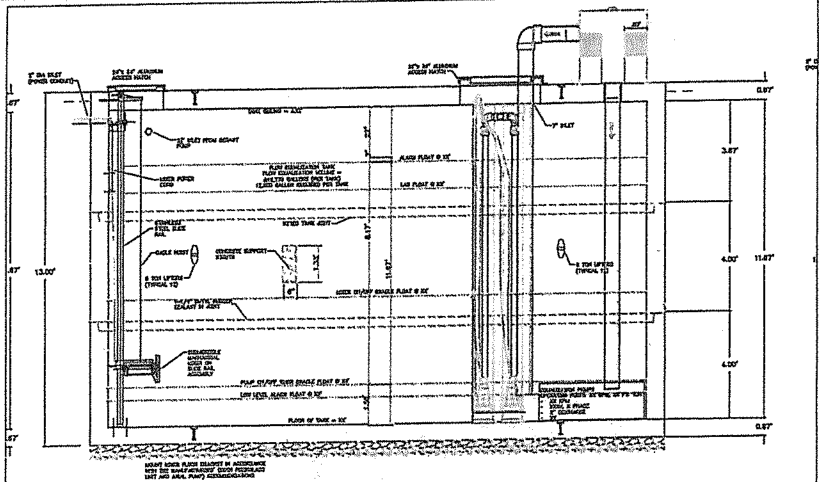
23,000 GALLON
CLARIFIER TANK
PLAN VIEW

STAY RIGHT PRECAST CONC. INC.
PT-2056, 17,000 GALLON W/ 4' SECTION ADDED
OR APPROVED EQUAL

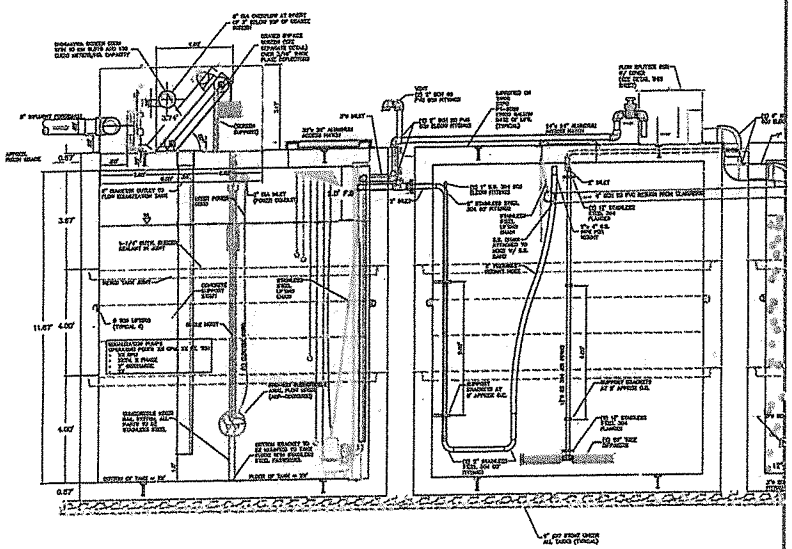
AQUAPOINT
AN OBSI COMPANY
30 TARKLIN PLACE
NEW BEDFORD, MA. 02745
TELEPHONE: (508) 985-9050 ~ FAX (508) 985-9072

50,000 GPD (INITIAL DESIGN)
WASTEWATER TREATMENT PLANT
FOR
PARK POINT
NEW PALTZ, NY.

SHEET 3 OF 6

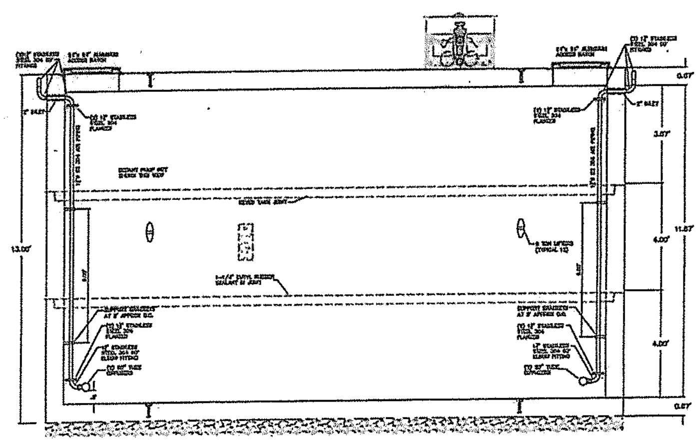


15,000 GALLON FLOW
EQUALIZATION TANK
SECTION VIEW



15,000 GALLON FLOW
EQUALIZATION TANK
PROFILE

15,000 GALLON
SOLIDS HOLDING TANK
PROFILE



15,000 GALLON
SOLIDS HOLDING TANK
SECTION VIEW

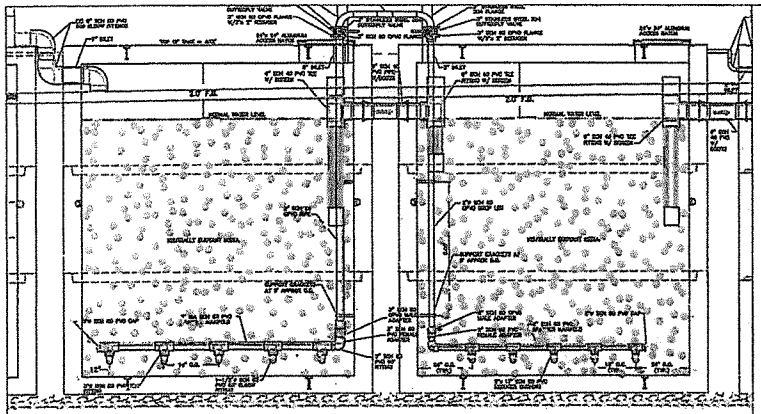
AQUAPOINT
AN OBEH COMPANY
39 TARKILN PLACE
NEW BEDFORD, MA. 02745
TELEPHONE: (508) 985-9050 - FAX (508) 985-9072

Drwn By: RJL

Date: 11/21/12

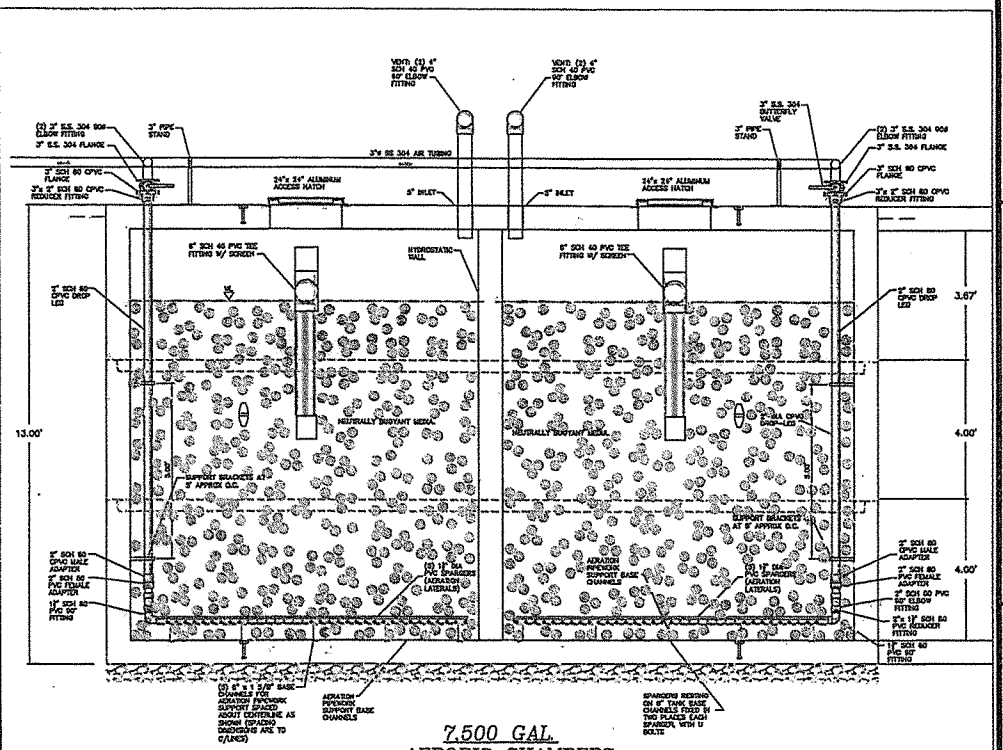
50,000 GPD (INITIAL DESIGN)
WASTEWATER TREATMENT PLANT
FOR
PARK POINT
NEW PALTZ, NY.

SHEET 4 OF 6



7,500 GAL.
AEROBIC TANK #1
PROFILE

7,500 GAL.
AEROBIC TANK #2
PROFILE

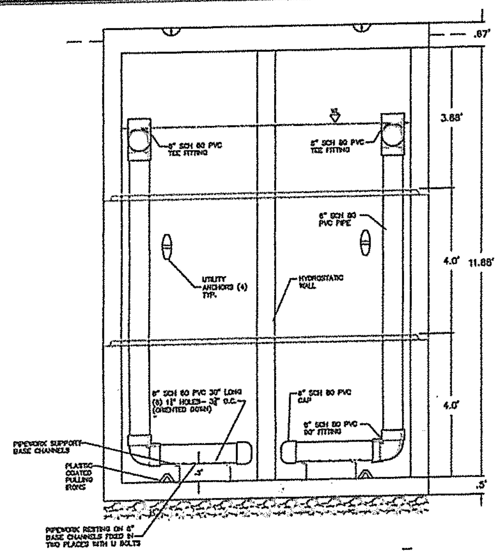


7,500 GAL.
AEROBIC CHAMBERS
SECTION VIEW

AQUAPOINT
AN OWSS COMPANY
30 TARKLIN PLACE
NEW BEDFORD, MA. 02745
TELEPHONE: (508) 985-0050 - FAX (508) 985-0072

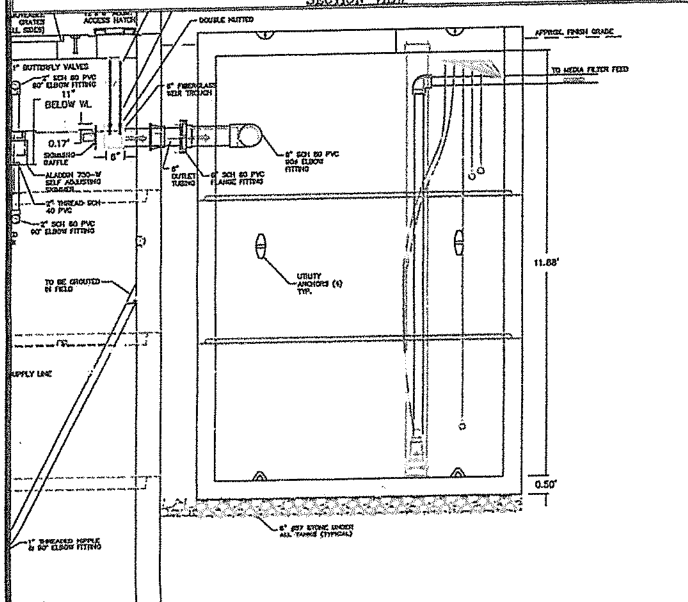
Date: 11/9/12
Drawn By: BE

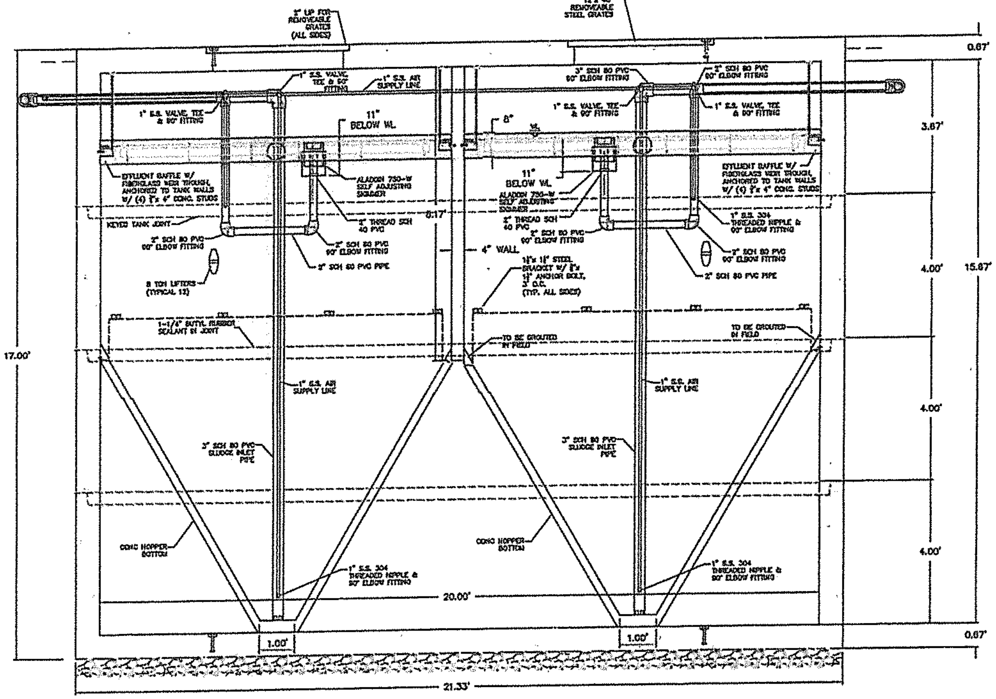
50,000 GPD (INITIAL DESIGN)
WASTEWATER TREATMENT PLANT
FOR
PARK POINT
NEW PALTZ, NY.



5,000 GALLON COAGULATION TANK

SECTION VIEW





CLARIFIER TANK

SECTION VIEW

This document is the sole property of Aquapoint, LLC. Its use for any purpose in whole or in part other than the approved by Aquapoint, LLC will be viewed as theft of intellectual property and will be punished to the full extent of the law.

50,000 GPD (INITIAL DESIGN)
WASTEWATER TREATMENT PLANT
FOR
PARK POINT
NEW PALTZ, NY.

AQUAPOINT
AN OBEH COMPANY
39 TARKLIN PLACE
NEW BEDFORD, MA. 02745
TELEPHONE: (508) 985-9050 - FAX (508) 985-9072

SHEET 6 OF 6

Engelhart Sanitary District Project Cost Estimate	
Wastewater Treament Plant 55,000 GPD (installed w/ electrical)	$790,000.00
30 Day storage pond at 55,000 gpd	$620,000.00
Spray Field Pump Station	$165,000.00
Piping to Existing Sprayfield Distribution	$17,000.00
Repair the Chlorine Contact Chamber for interim use	$11,000.00
Repair ditch dewatering pumps	$2,500.00
Repair existing spray field irrigation pumps for interim drawdown	$6,000.00
TOTAL CONSTRUCTION	**$1,611,500.00**
Contingencies	$161,150.00
Engineering	
Modify Existing Plant Design	$64,460.00
Geotechnical - Design	$56,402.50
Construction Administration	
Civil	$96,690.00
Geotechnical - QA/QC	$112,805.00
TOTAL PROJECT COSTS	**$2,103,007.50**

Engelhard Sanitary District (ESD)

Hyde County NC

RE: SECTION VI-ESTIMATED TIMELINE FOR COMPLETION

ESTIMATED TIME LINE

The time line shown here is the number of days to implement the corrective actions from the notice to proceed. The interim repairs can be initiated immediately since they only involve repairs to the Chlorine contact chamber chlorine dispenser and putting the irrigation pumps back into the irrigation pump station and to begin pumping down the facultative lagoon. An advantage that this plant design has is that it is for less than 100,000 GPD and as a result does not require an environmental assessment by the state. If funding agencies require an EA or PER then this time requirement will added to the front end.

Engineering, Permitting, and Construction Time to completion of the New WWTP		
TASK	DAYS FOR TASK	TOTAL DAYS IN SEQUENCE
Notice to Proceed with Plant	0	0
Design and Prepare Drawings and specifications for the modification of the 2008 design	60	60
Prepare and Submit Application and calculations to NCDENR for ATC	30	90
Receive comments from NCDENR on ATC application	30	120
Return comments to NCDENR	15	135
NCDENR reviews comments and issues ATC	30	165
Prepare bid documents and advertise for bids	45	210
Review BIDs and BIDS	15	225
Construct Lagoon and elevated area for the WWTP	140	365
Construct WWTP	120	485
Complete punch list and get plant certification	45	530
Begin to accept flow	0	530

Since 1712

HYDE COUNTY
NORTH CAROLINA

Meeting Date: 1.7.2013

Presenter(s): Tammy Blake

Title: HR Director

Agency/Dept.: Human Resources

Item Title: Personnel Policy Amendment

Attachments: Yes

Description: **Amend** Article VII: Section 4. **Holidays: Compensation When Work is Required/Shift Work** and strike "~~If a holiday falls on a regularly scheduled off-duty day for shift personnel, the employee shall receive pay for the proportionately equivalent holiday leave hours.~~"

Clarification: This will clarify for Shift Work employees that sick leave is the only additional compensation rewarded for holidays.

Times Read: First

Impact on Budget: Does not increase the budget.

RECCOMMENDATION: Discuss and take action.

MOTION MADE BY:	MOTION SECONDED BY:	Vote:	Aye	Nay
_____ E. Pugh	_____ E. Pugh	E. Pugh	_____	_____
_____ A. Byrd	_____ A. Byrd	A. Byrd	_____	_____
_____ J. Fletcher	_____ J. Fletcher	J. Fletcher	_____	_____
_____ B. Swindell	_____ B. Swindell	B. Swindell	_____	_____
_____ D. Tunnell	_____ D. Tunnell	D. Tunnell	_____	_____

ARTICLE VII. HOLIDAYS AND LEAVES OF ABSENCE

Section 1. Policy

The policy of the County is to provide vacation leave, sick leave, and holiday leave to all full-time and part-time employees in a regular position with County and to provide proportionally equivalent amounts to employees having average work weeks of different lengths. Leave balances should accrue with each payroll at a pro-rated amount when employees work or are on a paid leave status. Leave balances should be printed on payroll checks or provided to employees with each paycheck, including net accrued sick leave, vacation, holiday leave, and compensatory leave.

Section 2. Holidays

The policy of the County is to follow the holiday schedule as published by the State of North Carolina each year. The schedule for the calendar year will be published by December 1 of the previous calendar year for distribution to County employees. Any additional holidays must be approved by the Hyde County Board of Commissioners.

Amended by the Hyde County Board of Commissioners on November 1, 2010.

The number of holiday hours earned by employees shall be determined in accordance with the formula set forth in Section 15 of this article.

Departments which have staff working during holidays may designate which days of the week are to be observed using the actual legal holidays when appropriate.

Section 3. Holidays: Effect on Other Types of Leave

Regular holidays which occur during a vacation, sick or other leave period of any employee shall not be considered as vacation, sick, or other leave. ***This does not apply to shift work employees who are regularly scheduled on holidays.***

Amended by the Hyde County Board of Commissioners on January 19, 2010,

Section 4. Holidays: Compensation When Work is Required/Shift Work

Employees required to work on regularly scheduled holidays shall receive 8 hours of sick leave for the holiday.

Amended by the Hyde County Board of Commissioners on January 17, 2012.

~~If a holiday falls on a regularly scheduled off-duty day for shift personnel, the employee shall receive pay for the proportionately equivalent holiday leave hours.~~