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Application to Construct

Type 4 Solid Waste Compost Facility

APPLICANT/OWNER:

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PROPOSED FACILITY:

McGill Environmental Systems
Christian Chapel Church Road
Chatham County, NC

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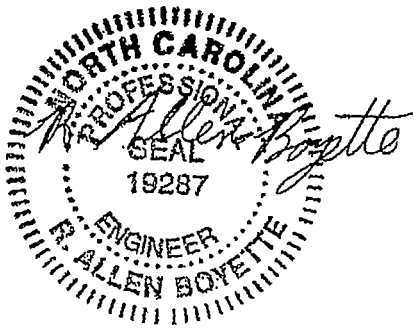
APPROVED
DIVISION OF SOLID WASTE MANAGEMENT
DATE 07/10/01 BY

PROFESSIONAL ENGINEER CERTIFICATION

The information and figures contained in this Application to Construct a Type 4 Solid Waste Compost Facility were prepared under the supervision and direction of the undersigned, whose seal as a registered professional engineer is affixed below.



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1. PROJECT OVERVIEW

McGill Environmental Systems of N.C., Inc., is proposing to construct a compost manufacturing facility on 48.512 acres near the intersection of Old US Hwy. 1 and Christian Chapel Church Road, Cape Fear Township, Chatham County, North Carolina.

Designed for the manufacture of organic products such as compost, landscape mix, and custom blends, the plant will feature approximately 115,000 sq. ft. of office, storage, and processing space in a concrete and metal-clad steel building of standard warehouse design.

The facility will use the static pile, forced aeration processing method on a dual concrete floor system, augmented by electronic process control and an 36,000 sq. ft. open biofilter split between clay and ash pads constructed on both sides of the processing building.

Total design capacity is 100,000 cubic yards (40 dtpd) of finished compost per year derived from 200,000 tons of raw feedstocks and bulking agents (about a 50% reduction) on three acres of production area (plus roadways and parking areas).

Feedstocks will include materials such as sawdust and wood chips; shredded paper, pallets, yard and wood waste; restaurant grease trap waste; food and food processing wastes; engineered wood products; and a variety of non-hazardous by-products from textile, furniture, building products, fertilizer, and other manufacturing processes. Agricultural by-products will include such materials as sweepings, tobacco dust, gin trash waste, etc.

Some of these materials may also be used as bulking agents.

Nutrient sources may include animal manures and bedding materials, as well as municipal and industrial biosolids.

Prior to acceptance at the facility, analytical results from Toxicity Characteristic Leachate Procedure (TCLP) testing, Total Metals, and/or other tests as required by the NCDENR, Division of Solid Waste Management, will be received for post-industrial feedstocks (engineered wood products, ash, etc.) to verify materials are non-toxic and will not impede the composting process.

2. SITING AND DESIGN

SITE DESCRIPTION

Location and zoning. McGill Environmental Systems has purchased 48.512 acres of land near the intersection of Old US Highway 1 and Christian Chapel Church Road in the Merry Oaks community of Moncure, Chatham County, for the site of a compost manufacturing facility.

Attachment: *Deed description*

The parcel has road frontage on Old US 1 and Christian Chapel Church Road, but will be accessed at the southern property line via a 30-ft. deeded access granted by the adjacent landowner, Triangle Brick. The property was rezoned by the Chatham County Board of Commissioners as a Heavy Industrial Conditional Use District in the fall of 2000 to permit this type of manufacturing activity.

Attachment: *Access Agreement*
Attachment: *Zoning Letter from County Commissioners*

Soils and topography. Previously a timber tract, the heavily wooded parcel consists primarily of Masada soils with a fine sandy loam surface on a sandy clay to clay loam subsoil. Depth to groundwater exceeds 40 inches. Topography is smooth and uniform with slopes from two to four percent.

Attachment: *Soil Scientist Report*

Traffic and public access. Traffic will access the property on a gravel drive along the southern boundary by a 30-ft. deeded access, passing through an operator-controlled security gate between the site office and the processing building. Traffic will flow in a circular pattern around the facility and back out the same gate. Parking for office employees and guests will be provided near the front office. Parking for processing employees and McGill fleet vehicles will be near the plant office, located in the processing

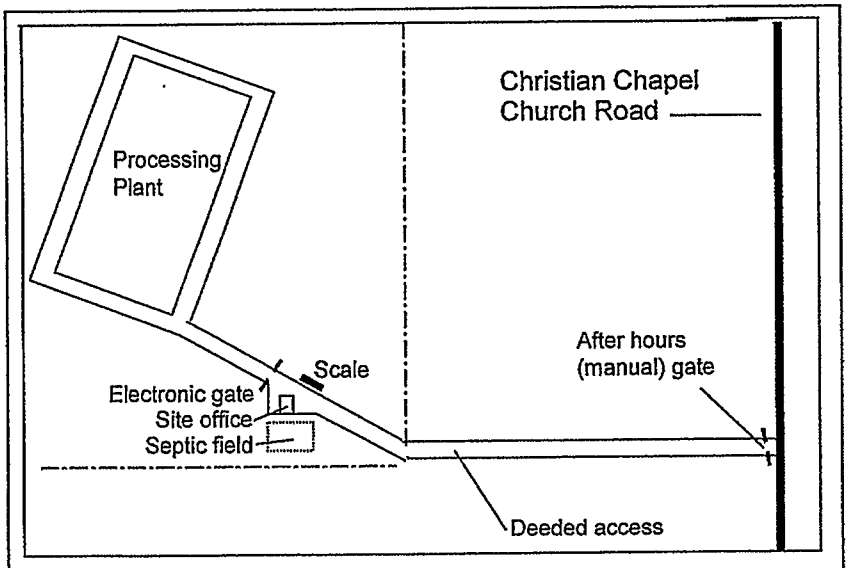

FIGURE 1-1: Traffic pattern

building.

A new intersection of Old US 1 and Christian Chapel Church Road (SR 1912) is under construction by the NC Department of Transportation. The relocation of the entrance to a point 500 feet east of the current intersection means trucks will not directly pass any residential structures as they enter or leave the facility.

There is no public access to the site except by prior approval. The main entry will be gated and locked after hours (McGill drivers will have keys and/or access codes), and a heavily wooded perimeter will be maintained on all four sides of the property.

Flood plain, wells, and watercourses. The property is located outside the 100-year flood plain in Zone X. The area is served by the county water system. However, a windshield survey of the area approximately ¼ mile from the property line identified a number of possible residential/commercial well heads (identified on attached aerial map).

Within the property boundary is an abandoned residential well, which will be permanently grouted and sealed prior to commencement of operations. A new well, which will provide for the facility's drinking and sanitary needs, will be drilled approximately 200 feet from the plant and 600 feet from the septic tank and drain field.

Spring Branch, crossing the property approximately 300 feet from the compost building and flowing southwest along the west property line, crosses the property on the north end 800 feet from the composting buildings. The stream classification is "UT" flowing into Shaddock Creek, classification "WS4."

Several small, unnamed branches enter from the northern sector near the utility lines and Christian Chapel Church Road. No additional perennial streams or rivers, dry runs, wetlands, or other watercourses transverse the parcel.

Buffers. Minimum distance between compost areas and property lines are north = 900 feet, east = 500 feet, south = 500 feet, west = 300 feet.

Measuring from the corner of the processing building nearest to the neighboring structure, minimum distance between the compost areas and nearby residences and businesses are --

PARCEL NO.	TYPE OF STRUCTURE	FEET TO PROPERTY LINE	FEET TO COMPOSTING AREA
0062399	Church	200	1300
0005516	Residence	600	1500
0005517	Residence	600	1600
0060464	Residence	500	1500
0005520	Residence	700	1500
0005521	Convenience Store	800	1800
0005530/5618	Residence	100	1200

000534	Residence (adjoining)	600	1500
0067261/5535	Residence (adjoining)	400	1300
0005620	No structure (adjoining)	—	—
0005600	No structure (adjoining)	—	—
0005591	Residence	400	700
0005591	Residence	200	1200
0005609	Residence	800	1200
0005610/67661/67663	No structure	200	800
00056121	Industrial (adjoining)	1200	2000

Utility easements and roadways. There are no recorded easements on the property. However, power and phone lines currently intersect the property at the far northern end near Old U.S. Hwy. 1. The railroad right-of-way passes along the northern property boundary, also.

The survey shows an old road bed (Buckhorn Road) dissecting the property from northwest to southeast and a second old road bed along the eastern property line. These are old stagecoach roads unused for almost 100 years. Other than Christian Chapel Church Road and driveways for nearby residences and businesses, no other public or private roadways fall within this area.

Emergency access. No swales or berms will be constructed within 25 feet of buildings, and this zone will remain free of landscaping or other obstructions to provide total access for emergency vehicles on all sides. County law enforcement and fire officials will be provided with keys and access codes for emergency access after hours.

Attachment: *Aerial Map*
Attachment: *Site Plan*

ENVIRONMENTAL ISSUES

Facility design and operations incorporate many features that protect the environment.

Odor control is maintained by a forced aeration composting system, operating procedures developed to assure rapid processing of all incoming feedstocks, and the extraction and treatment of all process air through a biofilter.

Fugitive emissions are minimized or negated by (1) inside off-loading and storage of feedstocks and amendments, (2) paved and graveled roadways and parking areas, (3) mature stands of trees and vegetation surrounding the processing area and throughout the site, (4) electric motors will be used on all equipment except two front end loaders, (5) extensive vegetative buffer at all property boundaries.

Run-off is controlled by (1) enclosing all raw feedstock/amendment storage and processing areas to eliminate contact with rainwater, (2) incorporating two rainwater collection basins for sediment control in the site design with a total capacity of 163,000 gallons to capture run-off from rooftops, driveways, parking areas, and outdoor curing

areas. The run-off filter basin capacity of 22,500 cubic feet is sized to capture the first 1-inch of rainfall from approximately 6 acres of impervious surfaces, including buildings and parking areas.

CALCULATION:

Collection volume required = 6 ac X 43,560 sf/ac x 1/12"/ft = 21,780 cf
Select basin depth of 5 ft; therefore: 21,780 cf/5 ft deep = 4,356 sf
Use a 50' basin width; thus: 4,356 sf/50 ft = 87.12' long
If detention basin is 5' deep x 50 ft. wide x 90 ft. long
Then 5 x 50 x 90 = **22,500 cf** > 21,780 cf

Water levels in the filter basins will be moderated through infiltration, evaporation, and spillways to facilitate sheet drainage of rainwater across the property.

Leachate will not be an issue because (1) any leachate generated is reused in the process, (2) all storage and processing takes place on floor systems that meet or exceed prescribed permeability ratings, (3) all processing takes place on concrete, (4) blended materials are processed on a layer of sawdust or other absorbent media placed on top of the aeration piping, (5) channels are designed so any excess leachate will drain to the main aisle of the composting area for collection and reuse, (6) washwater is reused in the process.

Washwater drains into the concrete storage bunker at the beginning of the process (prior to composting) to verify PFRP achievement.

Noise and vectors are controlled by (1) powering all equipment except front end loaders with electric motors, (2) specifying low-noise motor/blower units located outside the buildings, (3) maintaining extensive, natural vegetative buffers through the property and along its perimeters, (4) storing and processing indoors to control rodent and fly populations, (5) utilizing active vector control measures/devices if needed. All requirements for vector attraction reduction time-temperature relationship will be met.

Attachment: *Manufacturers Performance Data*

FACILITY DESIGN

Overview. The facility features a large, warehouse-type structure, plus an outdoor pad for overflow storage of finished compost, and two biofilters, all sited on the southern half of the property. **(See Figure 2-1)**

The main office, a modular unit, will be sited near the weigh scale at the entry to the processing area. The plant office, bench scale laboratory, and maintenance area will be located in the processing building.

All raw materials storage, processing, and curing will take place indoors independent of weather conditions, enabling a 24/7 operation.

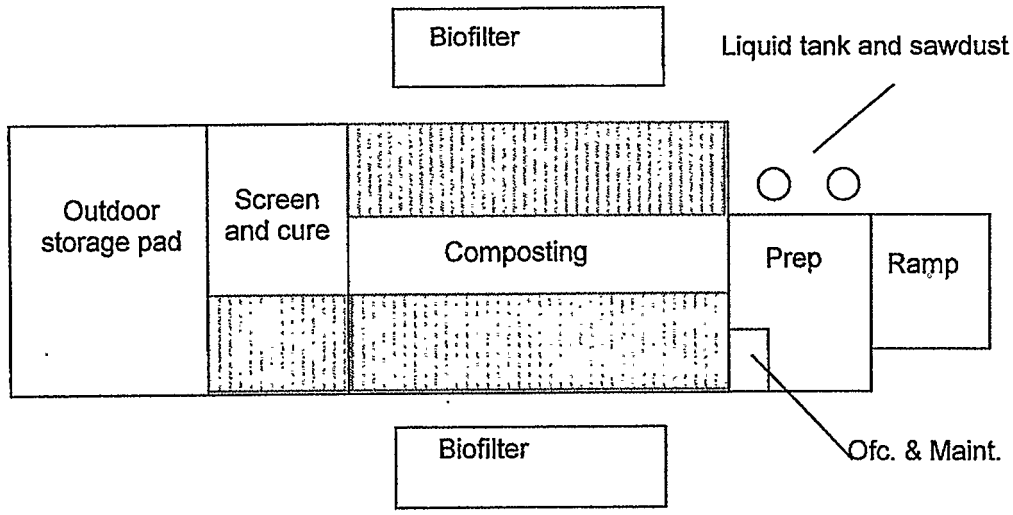

FIGURE 2-1. Processing building layout.

The buildings, floor system, air delivery system, and monitoring system are designed to facilitate static pile, forced aeration processing. With this method, compost piles are not turned as with windrow methods, but air is pushed up through the composting mass by fans to deliver oxygen and remove heat, thereby creating and maintaining an environment more receptive to the specific micro-organisms responsible for biodegradation. The process is highly automated, including temperature monitoring and data recording.

All storage and processing will take place on concrete or clay surfaces with permeability ratings that meet or exceed 1×10^{-7} centimeters per second.

The facility is designed to process about 1,000 cubic yards per day at an average moisture content of about 60 percent.

Work zones. The 500 X 250 ft. processing building consists of three distinct work zones divided by concrete walls. Access between the sections is provided by roll-up garage doors.

ACCESS RAMP

A ramp provides off-loading for all feedstocks and amendment transport vehicles except tanker trucks. (Tankers will be off loaded at the liquids storage tanks.) The ramp rises 10 ft. from ground level, ending at the top of the concrete wall of the prep and blending area. Four roll-up garage doors will provide access to the sawdust hopper, two mixing

hoppers, and storage bunker. The top of the ramp will slope slightly toward the building so wash water from the transport vehicles will drain into the storage bunker and mixing hoppers for use in the composting process.

PREP AND BLENDING AREA

Feedstocks and amendments will be off-loaded into one of two auger-bottom mixing hoppers, into the 50 x 90 concrete storage bunker, or into the sawdust hopper. The concrete bunker will provide temporary storage for materials during peak periods. A loader operator will transfer material from the bunker to a mixing hopper, as needed.

The concrete bunker area has been oversized to allow for longer-term storage, bucket blending, and other activities in the event of equipment failure or other temporary conditions. Surrounded on two sides by 10-ft. high concrete walls, this area will allow for about 1,500 cubic yards of extra storage at a depth of 9 feet. Under normal operating conditions, all material will be transferred out of the bunker and blended by the end of each work day.

The 100 x 60 blending area includes two auger-bottom mixing hoppers, sawdust hopper, amendment hopper, pug mill blender, and associated transfer augers and conveyors. This equipment is operated from an electric control panel by a technician who visually monitors incoming feedstocks and adjusts blending rates and ratios to meet processing requirements. Feed rate and other information is relayed to the main computer and is recorded on a continual basis.

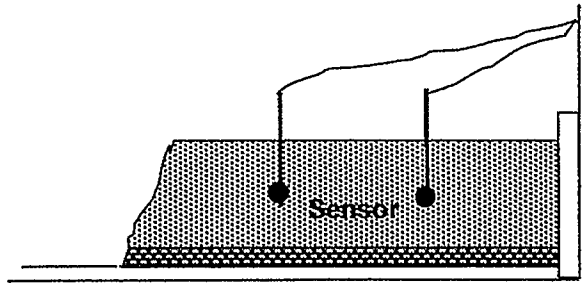

FIGURE 2-2: Sensor placement in compost

Air from the blending area is extracted by two fans through the concrete wall into the adjacent composting area.

A 30 x 50 ft. office and maintenance area, located in one corner of this work zone, contains the electrical control room and process control center.

COMPOSTING AREA

The primary aeration area consists of two aeration floors divided by a 50-ft. wide center access. Perimeter walls are 10-ft high by approximately 10 inches thick.

Each side of the composting area features 10 individually-controlled composting bays, each served by one 7.5 h.p. intake fan under microprocessor control.

Two temperature sensors placed 3-4 ft. deep at 1/3 intervals (from front to back) at the center of the compost pile relay information to the microprocessor, which records data for PFRP verification and controls the aeration rate at prescribed settings.

CURING SHED

The curing shed, open to the ground on one side and open above a 10-ft. wall on a second wall, includes a 100 x 100 aeration floor and screening plant. Compost is removed from the primary aeration area to the curing shed for aging. The aeration floor in this area speeds up the curing process, when needed.

A hood over the screening plant exhausts air into the composting hall, where it is pulled through the exhaust system and biofilter.

An adjacent outdoor pad provides overflow storage for the curing area.

Floor systems. All raw feedstock storage and processing will take place on concrete pads indoors or in storage tanks and silos. Curing/finished compost storage will take place on concrete or clay/ash pads. All floor systems, whether concrete or clay/ash construction, will meet or exceed a permeability rating of 1×10^{-7} centimeters per second. MES will also employ a geotechnical testing service to verify adequate compaction on all building pad subgrade materials.

MATERIALS HANDLING

Storage. Storage for incoming feedstocks and amendments includes:

(1) liquid storage tank

(1) sawdust and amendment storage silo (similar in design to those currently used by the lumber and poultry industries)

(1) open-ended concrete bunker (similar to design currently in use at the McGill Delway facility) for incoming feedstocks -- all concrete meets or exceeds permeability rating of 1×10^{-7} centimeters per second -- water stop at base of containment walls in bunker area - provides for temporary storage of incoming materials during peak periods of the day or during equipment breakdown

(2) Watertight auger-bottom hoppers for feedstock mixing (type used extensively in rendering industry)

Solids and semi-solids are off-loaded directly into the hoppers or concrete bunker, all indoors. Sawdust also is off-loaded into an indoor hopper and then transferred to the storage silo by covered conveyor.

Plant design also includes a 35 cubic yard drag chain amendment hopper in the preparation area (similar to the hopper currently in use at the McGill Delway facility).

From these storage units, the various ingredients will be conveyed to a 200 cyd/hr pug mill blender (McLanahan, or similar) for mixing.

Blending. Covered augers and conveyors will feed material from the hoppers into the blender. Liquids and sawdust will be piped from their respective storage units. Feed rate will be controlled with variable speed drives on the hoppers and a pump for the liquid material linked to an electronic control panel. A process operator will visually monitor what's coming off the conveyor belt and adjust flow rates for amendments according to prescribed ratios to achieve a C:N ratio of approximately 30:1 on all blends.

The blended admixture will discharge from the blending unit onto a transfer conveyor and into a concrete bunker where a front end loader will pick up the blended material for placement on the aeration floor.

The blending system is heavy-duty and oversized to insure that all blending can be performed within a typical work shift. Should any of the automated blending mechanisms fail, numerous backup options are in place.

If any of the automated feeding systems fail, the materials can be tipped into the concrete bunker, crudely bucket blended, and then fed into the amendment hopper, which will take it to the blender. If all the blending mechanisms fail, all materials can be tipped directly into the bunker and blended in the concrete bunker using wheel loaders and moved by loader to the processing bay.

Designing a system that will allow all incoming (wet) materials to be processed within 24-hours of receipt minimizes the potential for odor generation.

Composting and curing. Using a front-end loader, an operator will remove material from the transfer bunker and place it in the composting bay.

A bay is loaded in the following manner:

- A 6-inch layer of wood chips (or other dry, highly porous material) is placed on top of the aeration channels to facilitate even air distribution throughout the composting mass, absorb excess moisture, and prevent clogging of the aeration pipes.

- Typically, blended admixture is placed on top of the wood chips to a height of 8-10 feet.

Material typically will remain in the composting bay 15-21 days. When conditions

dictate, the material in a bay may be "turned" by front end loader during the processing period by either removing the material to another composting bay or simply taking it out and putting it back in the same area. This additional handling is warranted when temperature monitoring indicates the process has "slumped" and the pile is not achieving desired temperature ranges. If this does not solve the problem, the material is returned to the prep area for reprocessing.

When processing is complete – as indicated by monitoring data and visual observation – the loader operator will transport material to a hopper adjacent the screening area in the curing shed where a 200 cyd/hr star screening plant will separate fines from overs.

Material will be removed by front-end loader to the adjacent aeration pad or to the curing area, where material may be turned one time with a front-end loader during the 40 to 60-day curing phase. Temperatures will be monitored in the curing area as needed.

During those times when processing rates may exceed the storage capacity (10,000) of the curing building, overflow will be diverted to a 20,000 cyd outdoor storage pad. Total average through-put for material from intake to finished product is 70-90 days. Material may be stockpiled on-site for up to one year prior to distribution.

Composts may be rescreened, blended with other products, and/or bagged prior to distribution.

Air systems. Air will be provided to the composting mass by 20 blower units encased in a 24 x 30 inch concrete tunnel located along the outside wall of the processing area. Ductwork through the concrete wall will deliver air to perforated piping set in a channeled floor.

Fresh air will also enter the composting hall from six supply fans in the roof, each delivering ambient air at a rate of 20,000 cubic feet per minute.

Six 44-inch extraction fans (three on each side) will remove process air from the composting bays, blending area, and curing shed for biofiltration. The extraction fans will feed air to the manifold at the biofilter through underground ductwork.

CONDENSATE COLLECTION

Condensate will be collected from the extraction ductwork and drained to a 1,000 gallon tank adjacent to each biofilter. The water will be used to maintain adequate moisture levels in the biofilter and/or reused in the composting process.

BIOFILTER SIZING

A typical loading rate design for biofilter sizing is 5 cubic feet per minute of air per

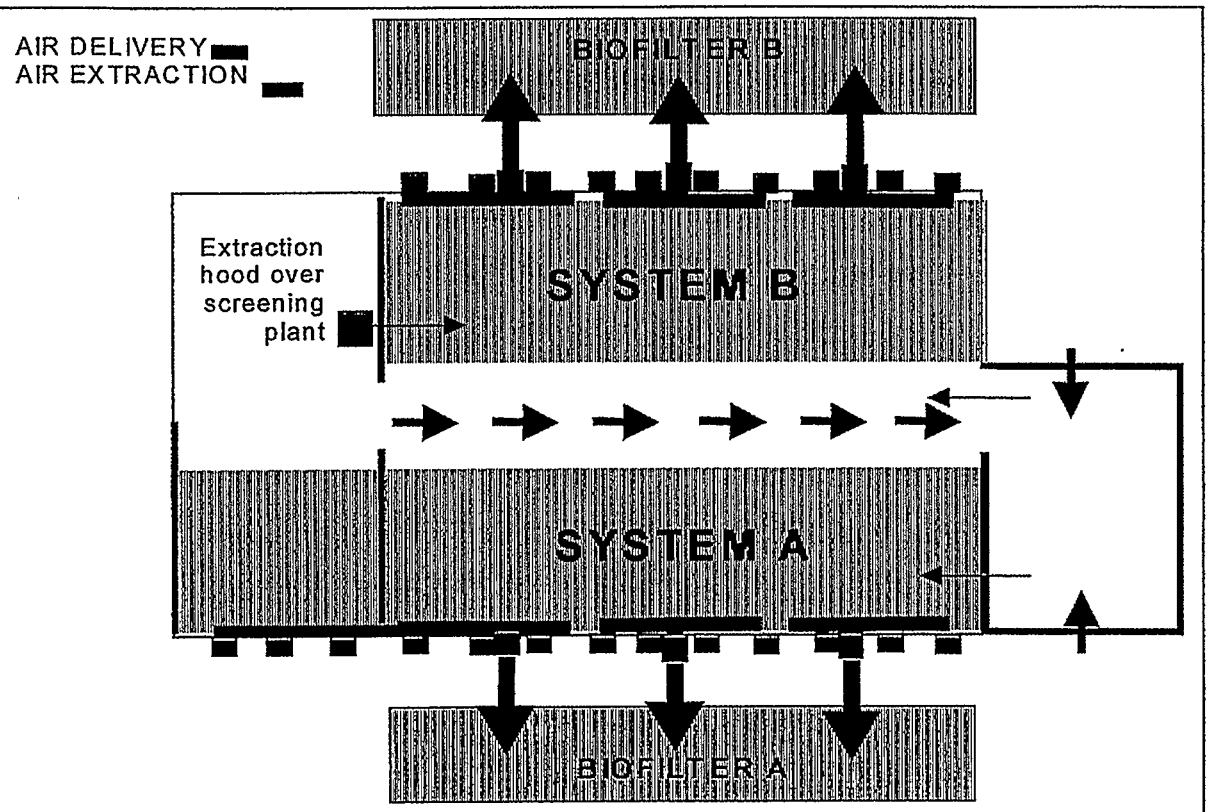

FIGURE 2-3: Air delivery and extraction

square foot of biofilter.

Calculations indicate this exhaust system will move about 180,000 cubic feet per minute in eight air exchanges per hour. The design allows for 18,000 square feet of biofilter on each side of the building measuring 60 x 300 feet.

The biofilters will be constructed with perforated piping placed on top of clay pads. The biofilter material will be placed on the pad to a height of four to six feet. Spent biofilter material will be processed for beneficial end use, as needed.

Process control. Composting and air handling at McGill facilities is controlled by a proprietary software program capable of handling the monitoring and control needs in the processing area. A monitoring station located in the plant office is linked to the main panel, which monitors all electric motors in the plant, temperatures within each composting bay, and flow rates at each end of all conveyors, augers, and liquid feed system. Data from all monitoring points is continuously recorded.

Two sensors placed in each composting bay relays temperature data to the control center. This system automatically turns motor/blower units on and off to maintain desired temperatures within the composting mass and permits operator control of all

feed points along the main feed belt to the blender from a central panel located in the blending area.

This same system monitors all motors, feed belts, and pumps in the plant through links to the main control panels in the blending and screening areas. However, operators in both the blending and screening areas have full control over the equipment in their respective work zones.

3. OPERATIONS

OVERVIEW

Operating protocols at McGill facilities are designed to guarantee processing of all materials in an efficient and timely manner, protect the environment, minimize nuisance factors, and meet regulatory requirements. As an indoor operation, the plant is able to run 24 hours a day, 7 days a week, irrespective of weather conditions.

Normal Hours of Operation: 7 a.m. – 7 p.m. Monday-Friday
Saturday 7 a.m. – 1 p.m.

Responsible for Operations: Currently, M. Noel Lyons, general manager, is responsible for operations at McGill facilities. However, when construction is initiated on the Chatham facility, a corporate operations manager will be hired to oversee operations at both Delway and Chatham, assisted by a plant superintendent at each facility. It is expected that the operations manager will serve as acting superintendent at the Chatham plant through the first year of operation.

Contact: M. Noel Lyons, General Manager
P.O. Box 61, Harrells, NC 28444
TEL: 910-532-2539

PERSONNEL

Positions and Responsibilities. The Chatham facility will be operated by individuals in the following positions:

PLANT SUPERINTENDENT – This individual will receive training at one of the country's best compost operators training schools (i.e., University of Maine or University of Maryland). This person will have extensive management experience in a critical processing environment. The individual will most likely be hired from outside the composting industry and will come with experience in regulatory compliance and maintaining critical process equipment with a low tolerance for equipment down time (such as the food process or pulp and paper industries).

Responsible for managing all day-to-day activities at the plant including production, process control, monitoring and record-keeping, transportation, regulatory compliance, billing, human resources (including operator training), and customer service. The plant superintendent will be supported and assisted by the following positions:

INDUSTRIAL MECHANIC (1) – routine maintenance of motor/blower units, transport vehicles, blending and screening units, loaders, tools, and other equipment; replacing blowers and probes; painting and minor structural repairs.

PROCESSING OPERATORS (2) – monitor all incoming loads to assure off-loading to designated hoppers and bunkers, control and monitor blending rates of raw materials to assure a proper mixture according to prescribed, place blended admixture to appropriate composting bay, clean aeration channels. These employees are also loader operators.

LOADER OPERATORS (3) – daily equipment checklist, place blended admixture in composting bay, place temperature probes, adjust manual dampers on air circulation system (if necessary), remove probes when processing is complete, remove processed material to screening area, clean air channels, screen material and move to curing building, turn curing compost, remove finished compost to stockpile, load transport vehicles, scrape yard, wash down loader at the end of the day.

DRIVERS (8) – transport material to and from the facility according to D.O.T. and facility regulations, verify and carry proper documentation and obtain Chain of Custody signatures for all incoming loads, verify and carry appropriate bill of lading documents (including end use instructions) for outgoing loads, obtain customer signatures at the drop-off location, provide copies of properly executed documents to the site office, wash trucks and trailers after dropping off each incoming load in the designated wash area.

FLEET COORDINATOR (1) – scheduling and monitoring all McGill and contractor vehicles in and out of the facility; scheduling and training drivers; scheduling vehicle repair and maintenance; scheduling sampling and analytical activities; mobilization of personnel and equipment for new projects; D.O.T. compliance and insurance verification; weigh master duties including project documentation, client and contractor communications.

ADMINISTRATIVE COORDINATOR (1) – general correspondence, file maintenance, data entry, record-keeping and regulatory compliance reports, corporate liaison for accounts payables/receivables, human resource activities (payroll records, wage and hour, workman's comp, insurance, etc.), assistant weigh master.

Training. All processing employees will be cross-trained on equipment operation and task management procedures. In addition, training will be provided to both processing employees and drivers to insure transportation and Chain of Custody documents will be properly executed in the absence of office personnel.

Additional training will include sampling and analyses procedures, troubleshooting air delivery and monitoring systems, and other duties related to the processing function. Monthly safety and operations training meetings, conducted by McGill personnel and/or outside specialists, will reinforce established procedures.

Staffing requirements. During regular business hours, there will be a minimum of three processing employees on site – one running the blending unit, one building compost piles and screening, one turning curing pile and loading trucks with finished product. These individuals will be supported by at least one person in the office controlling the access gate and weigh scale, and verifying documents. Staffing will be adjusted as required to meet processing needs of incoming materials.

DAILY ACTIVITIES

Start-up. Prior to the initiation of daily operations, the plant superintendent will perform the following –

- Inspect the air delivery system through the central monitor and confirm operational status of all blower units.
- Inspect the temperature charts for unusual activity.
- Verify capacity for the day's incoming feedstocks/amendments in the appropriate storage containers and establish the daily blending schedule to maintain adequate storage capacity.

When the plant superintendent is not on site, the most senior processing employee assumes responsibility for these tasks.

In addition, the blender, loader, and screening plant operators will perform daily equipment checks as per manufacturers' instructions. (Other routine maintenance on equipment will be performed, as needed, by the maintenance technician.)

Shutdown. Prior to leaving at the end of the workday, the plant superintendent (or most senior processing employee) will repeat a.m. air delivery, monitoring system, and capacity inspections (for anticipated after-hours incoming loads), troubleshooting as needed.

Blending, loader, and screening plant operators will wash down respective equipment and tidy the processing area.

The gate at the main entrance will be locked by the last employee to leave the site. McGill and contract drivers entering after hours have keys for the main gate and entry codes for the access gate.

PROCESS MANAGEMENT AND ODOR CONTROL

The entire operating system of a McGill facility is designed to minimize odors.

1. Transportation schedules are designed to remove incoming materials from the generation point as soon as possible to preclude the formation of odorous compounds.

2. All incoming materials are blended upon delivery (maximum holding time of 24-hours on weekdays and 48 hours on the weekend) to minimize odors already present in the raw material. Moving material quickly through blending and to an aeration pad rapidly neutralizes inherent odors and prevents further generation/emissions. Raw feedstocks that are not blended before the end of the workday are covered with an insulating blanket of previously composted material to reduce odorous emissions.

3. Continuous monitoring of air delivery systems assures that oxygen is delivered in sufficient quantities and rates to preclude the proliferation of anaerobic microbes responsible for odors. Biofilter media is also monitored and changed, as needed.

These operating procedures, combined with a natural buffer of trees and undergrowth to be maintained on all four property boundaries (ranging from 50 to 150 ft. deep), will negate odors beyond the property boundary.

TROUBLESHOOTING

PROBLEM	**SOLUTION**
Composting mass does not reach or cannot maintain desired temperatures	(A) Verify blowers are working properly. If not, replace blower or blower part from inventory. (B) Verify probe is working properly. If not, replace from inventory. (C) Turn compost. (D) Move compost to another bay and clean the channels. (E) Remove compost from bay and reprocess.
Temporary monitoring system failure	If the monitoring system is expected to be off-line for repair or maintenance for more than 24-hours, temperatures will be recorded manually at least once a day to verify PFRP/Vector Reduction compliance.
Processing failure resulting in regulatory non-compliance for PFRP/vector reduction	Remove from composting bay and reprocess.
Monitoring system failure resulting in loss of monitoring data and/or records	Remove from composting bay and reprocess.
Anticipated incoming volumes are expected to exceed blending/storage capacity	(A) Increase blending rates. (B) Delay or reschedule incoming loads. (C) Store in concrete bunker.
Blending equipment is off-line for repair or maintenance	(A) Mix with a front-end loader. (B) Bring in portable blending unit. (C) Delay or reschedule incoming loads.
Front-end loader is down for repair or maintenance	(A) Plant work shifts may be extended to allow one loader to process the same daily volume as

	two loaders. (B) Another loader will be leased for the duration of the maintenance period.
Screening plant is down for repair or maintenance	(A) Move compost directly to curing pad and screen prior to transport. (B) Lease another screening plant for the duration of the maintenance period.
Random TCLP analyses reveal a waste stream does not meet minimum Class A standards	(A) Suspend transportation of material until problem can be identified and resolved. (B) Send notification of non-compliance to generator and arrange for transportation/disposal by approved method

MONITORING, TESTING, AND RECORD-KEEPING

Once a compost bay is constructed, the operator will place two temperature probes linked to a customized microprocessor control system that will *continuously* monitor and record temperatures, turning blower units on and off in response to pre-set processing requirements based on ambient temperatures and temperature of the composting mass.

These monitoring points have been selected because they are most representative of what is going on in the full bay. Two sensors per bay will be adequate for routine processing because uniform blending and a permanent floor aeration system assures homogeneous mix throughout the entire pile.

Throughout the day, the plant superintendent will check the data records to verify operating status and troubleshoot, as needed.

The process will be electronically monitored and controlled to meet or exceed the following standards:

1. Temperatures of the compost process shall be maintained above 104° F for 14 days or longer with the average temperature for that time higher than 113° F.

2. The temperature of the composting process shall be maintained at 131° F for at least three days.

Data will be recorded for monitoring and reporting purposes.

A composite sample of finished compost will be analyzed every six months or every 20,000 tons, whichever comes first, for percent foreign matter, arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, zinc, pathogens, and Kjeldahl nitrogen.

McGill facilities require (at minimum) a waste analysis and TCLP/Total Metals testing (industrial sources only) for each waste stream prior to initial acceptance, and annually thereafter. TCLPs are repeated at a random interval at least once a year to verify continued compliance. Additional testing may be required depending on source of feedstocks.

To assure a quality compost product, incoming materials must meet or exceed EPA Class A standards for total metals before they are accepted as a feedstock.

COMPOST DISTRIBUTION

It is anticipated that distribution of finished product generated at this facility will not begin until mid-2002 to allow stockpiles to build to levels required for marketing purposes.

Stable composts and/or inerts will be used as soil amendments and fertilizers or as ingredients in enriched topsoils, mulches, potting mixes, and other custom blends produced by McGill Environmental Systems and others.

Composts failing to meet quality standards (for any reason) will be reprocessed.

A compost sales manager has been hired to assume responsibility for sales of finished compost products from both the Chatham and Delway facilities. Increasing demand for existing product, combined with the allocation of resources and energies to compost sales, is expected to result in product demand that meets or exceeds production volumes within 12-24 months.

However, should these markets not materialize, McGill will designate excess production volumes for agricultural use.

PLAN FOR NON-COMPOSTABLES

From time to time, non-compostables are found in raw feedstocks. Typically, these items are manually separated from the organic fraction prior to blending or mechanically separated from the finished compost when screened. Metals are stored in a roll-off container and recycled. Other materials (wood, plastics, glass, etc.) may also be recycled; but, as quantities are small, these materials are usually bagged and disposed of as office trash at the local landfill.

Entire loads of non-conforming wastes will be rejected and returned to the generator or disposed of at an appropriate facility at generator's expense.

Leprechaun

Soil Builder

The first step in creating a healthy growing environment, compost turns dirt into soil. Use to establish and maintain the long-term vigor of lawns and gardens.

FLOWER AND VEGETABLE GARDENS -- Work 2-3 inches of compost into the top 6 inches of soil. Promotes root development and increases plant resistance to stress.

MULCH -- Spread 1-3 inches around plants to prevent erosion, control weed growth, and conserve water. Extend mulch at least 6 inches beyond the drip line of all trees and shrubs.

ESTABLISH TURF GRASS -- Work 2-3 inches of compost into the top 6 inches of soil prior to sodding or seeding. Compost can degrade commonly applied turf pesticides and suppress specific soil borne diseases and nematodes.

SOIL BUILDER CALCULATOR

1/2 inch layer = 1.5 cyds/1000 sq. ft.
1 inch layer = 4.5 cyds/1000 sq. ft.
2 inch layer = 6.0 cyds/1000 sq. ft.
3 inch layer = 9.0 cyds/1000 sq. ft.

Leprechaun

Landscape Mix

A blend of screened bark, compost, and topsoil. The preferred growing medium for shrubs, trees, and garden plants.

TREES AND SHRUBS -- Use as backfill to encourage establishment and survivability.

FOUNDATION WORK -- Replace compacted and contaminated fill along building foundations.

RAISED BEDS AND PLANTERS -- *Landscape Mix* is the perfect growing medium for perennials and annual plants.

TOP SOIL REPLACEMENT -- *Landscape Mix* is a weed free growing medium used to establish lawns and ground covers where native soils are unsuitable.

LANDSCAPE MIX CALCULATOR

Square feet to be covered x depth to be filled (in inches) x 0.0031 = cyds of *Landscape Mix* needed

www.mcgillcompost.com

Leprechaun products are manufactured by McGill Environmental Systems, Harrells, North Carolina, USA

FIGURE 3-1: Front and Back of Compost Information Handout

CP&L
A Progress Energy Company

Carolina Power & Light Company
1025 Frazier Dr
Sanford, NC 27330

June 5, 2001

Mr. Steve Cockman
McGill Environmental
PO Box 734
Pittsboro, NC 27312

Re: Availability of Electric Service
McGill Environmental Systems
Christian Chapel Church Rd
Merry Oaks, NC

In response to your request concerning availability of electric service to the proposed site for McGill Environmental Systems in Merry Oaks, NC, Carolina Power & Light Company will be pleased to supply electric service. Service will be provided in accordance with our applicable rate schedules and service regulations, provided suitable right of way on customer property can be secured for extending distribution facilities. Please feel free to contact me at 919-774-2632 if you have any questions regarding your electric service arrangements.

We look forward to serving this project.

Yours very truly,

Kendall A. Cumbee

Kendall A. Cumbee
Service Coordinator

P.O Box 1551
Raleigh, NC 27602

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INVOICE

16242

CHATHAM COUNTY
HEALTH DEPARTMENT
Environmental Health Division
P.O. Box 130   80 East Street
PITTSBORO, NORTH CAROLINA 27312
(919) 542-8208

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]
5-22-01	wrf	—	ck #2604

Cashman, Steve
PO Box ~~[illegible]~~ 151
Pittsboro, NC 27312

QUANTITY	DESCRIPTION	[illegible]	AMOUNT
1	Well Permit		100.00
1	Const. Authorization		100.00
	Compost Mfg.		
	pd 200.00 ck. 2604 wrf		

Thank You

Permit No. AS03215

CHATHAM COUNTY HEALTH DEPARTMENT
ENVIRONMENTAL HEALTH DIVISION

80 E. Street
P. O. Box 130
Pittsboro, NC 27312-0130
(919) 542-8208 Phone
(919) 542-8288 Fax

1000 S. 10th Avenue
Siler City, NC 27344
Phone (919) 742-4911
Fax (919) 542-1442

IMPROVEMENT PERMIT FOR WASTEWATER SYSTEMS

ARTICLE II-CHAPTER 130A OF THE NC GENERAL STATUTES

An Improvement Permit is issued to STAUB COCKMAN / J.E. HAHN for a 43.5± acre site located OFF CHRISTIAN CHAPEL RD in Chatham County. It is specifically issued for the following facility:

Facility: Residence ( ) Business (X)

No. Bedrooms NA No. Residents/Employees 12

Type Wastewater: Residential (X) Commercial ( )

Type System: Shallow Conventional (X) LPP ( )

Other _____

Design Flow 300 EGPD Application Rate .2 GPD/ft²

Size Tank(s) w/Risers and Effluent Filter ST 1200 Gal PT _____ Gal

Nitrification Line (Length/Width/Max Depth) 500'X3'X20"

(On contour in surveyed septic area; solid earth dams every 50' for shallow conventional systems using Schedule 40)

Type Repair LPP

Special Conditions INSTALL INITIAL SYSTEM IN FLAGGED AREA ON LOWER END. NO HEAVY EQUIP ON SEPTIC AREA.

A plat with site plan showing specific location of the facility, the site for the proposed wastewater system, existing buildings, property lines, water supplies, surface waters, the conditions for any site modifications; and any other information required by the department must be attached to be valid.

This permit is valid [ ] **without expiration** [X] **for five years** but is subject to revocation if the site is altered, soil disturbed, set-backs violated, or the plans of intended use are changed.

THIS IS NOT AUTHORIZATION TO INSTALL. An authorization for Wastewater Construction must be obtained from this department before installation.

Environmental Health Specialist _____

Reg. No. 1341 Date 8-9-00

Name COCKMAN, STEVE 911 Address 11315 US 64 E CHAR. RD.

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

April 30, 2001

Chatham County County Driveway Permit File Number 52-509

Subject: Commercial Driveway Permit Application with Entrance onto SR 1912

Mr. Steve Cockman
McGill Environmental System
P.O. Box 734
Pittsboro, N.C. 27312

Dear Mr. Cockman:

A review of the permit Applications has been conducted by personnel assigned to this office and approval is granted subject to the following stipulations:

1. The entrance onto SR 1912 is to be constructed in accordance with the attached detail sheet.

2. The entrance onto SR 1912 shall be paved to at least the end of radii.

3. The driveway entrance on SR 1912 shall require 56' of 15" pipe as shown on plans (either reinforced concrete pipe or corrugated metal pipe is recommended). The driveway pipe is to be furnished by the owner/developers, not the N.C. Department of Transportation.

4. The entrance onto SR 1912 shall require radii on each side of the driveways as shown on the attached drawing.

5. No parking or outdoor advertising (signs) shall be allowed inside the right of way of SR 1912.

6. Any areas inside the right of way disturbed during construction shall be seeded and mulched immediately upon completion of construction.

Attached to this correspondence please find an approved copy of TEB Form 65-04 (Driveway Permit Application - N. C. Department of Transportation). Upon completion of the driveway entrance construction please notify the Chatham County Maintenance Department (Phone 919-742-3431) so a final inspection of the entrance can be made.

Yours very truly,

DCW

J. L. Picklesimer, P.E., P.L.S.
District Engineer

DCW:
Attachment

cc: Mr. W. F. Rosser, P.E. Division Engineer
Mr. B.F. Sloan, County Maintenance Engineer

P.O. BOX 1164, ASHEBORO, NORTH CAROLINA 27204
PHONE (336) 629-1423 FAX (336) 629-7228

LOCATION OF PROPERTY:

County Chatham Access to Route No. SR 1912

Exact Distance .60 ☒ Miles ☐ Feet N ☐ S ☒ E ☐ W ☐

From the Intersection of Route No. SR 1912 and Route No. SR 1911 Toward SR 1924

N. C. DEPARTMENT OF TRANSPORTATION
STREET AND DRIVEWAY ACCESS PERMIT APPLICATION

PROPERTY WILL BE USED FOR: ☐ Special Commercial ☒ Regular Commercial ☐ Residential/Subdivision ☐ Other

PROPERTY ☐ is ☒ is not within City Zoning Area.

PROPERTY IS LOCATED IN: ☒ Rural ☐ Urban Development Classification

AGREEMENT

I, the undersigned property owner, request access and permission to construct driveway(s) or street(s) on public right-of-way at the above location.

I agree to construct and maintain driveway(s) or street entrance(s) in absolute conformance with the current "Policy on Street and Driveway Access to North Carolina Highways" as adopted by the North Carolina Department of Transportation.

I agree that no signs or objects will be placed on or over the public right-of-way.

I agree that the driveway(s) or street(s) will be constructed as shown on the sketch on (the reverse side) (the attached plans).

I agree that driveway(s) or street(s) as used in this agreement include any approach tapers, storage lanes or speed change lanes as deemed necessary.

I agree that if any future improvements to the roadway become necessary, the portion of driveway(s) or street(s) located on public right-of-way will be considered the property of the North Carolina Department of Transportation, and I will not be entitled to reimbursement or have any claim for present expenditures for driveway or street construction.

I agree that this permit becomes void if construction of driveway(s) or street(s) is not completed within the time specified by the "Policy on Street and Driveway Access to North Carolina Highways".

I agree to pay an installation fee for pipe installed by the Division of Highways or pay a $50 inspection fee for installation by others. Make checks payable to NCDOT. The inspection fee will be reimbursed if application is denied.

I agree to construct and maintain the driveway(s) or street(s) in a safe manner so as not to interfere with or endanger the public travel.

I agree to provide during construction proper signs, signal lights, flagers and other warning devices for the protection of traffic in conformance with the current "Manual on Uniform Traffic Control Devices for Streets and Highways" and Amendments or Supplements thereto. Information as to the above rules and regulations may be obtained from the Division Engineer.

I agree to indemnify and save harmless the North Carolina Department of Transportation from all damages and claims for damage that may arise by reason of this construction.

I agree that the North Carolina Department of Transportation will assume no responsibility for any damages that may be caused to such facilities, within the highway right-of-way limits, in carrying out its construction.

I agree to provide a Performance Bond in the amount specified by the Division of Highways for any construction proposed on the State Highway system.

I AGREE TO NOTIFY THE DISTRICT ENGINEER WHEN THE PROPOSED WORK BEGINS AND WHEN IT IS COMPLETED.

INSTALLATION BY: ( ) NCDOT (X) OTHERS

Entrance Width(s)	Pipe Size	Pipe Length	Pipe Installation Costs	Inspection Satisfactory (Yes/No)	AMOUNT RECEIVED
1. 20	15"	56'	$		Fifty & 00/100 Dollars $ $50.00
2.			$		
3.			$		

1. Damon C. Webb (SIGNATURE) TTIV (TITLE) 5/9/01 (DATE)

INSPECTION BY NCDOT

(SIGNATURE) (TITLE) (DATE)

PROPERTY OWNER

NAME McGill Environmental Systems

SIGNATURE Steve Cochrane

ADDRESS P.O. Box 734

Pittsboro NC 27312 Phone No. 919-542-8903

WITNESS

NAME Damon C. Webb

SIGNATURE Damon C. Webb

ADDRESS P. O. Box 1164

Asheboro, NC 27204

APPLICANT

NAME SAME

SIGNATURE

ADDRESS

Phone No.

WITNESS

NAME

SIGNATURE

ADDRESS

10-1-86 *NOTE: Submit Four Copies of Application to Local District Engineer, N.C. Department of Transportation* TEB 86-04

61-03419

APPROVALS

APPROVAL BY: Local Governmental Authority (when required)

SIGNATURE	TITLE	DATE

APPLICATION RECEIVED BY DISTRICT ENGINEER		APPLICATION APPROVED BY DISTRICT ENGINEER	
SIGNATURE	DATE	SIGNATURE	DATE
[signature]	5/10/01	[signature]	5/10/01

COMMENTS:

County Driveway Permit File Number 52-509.

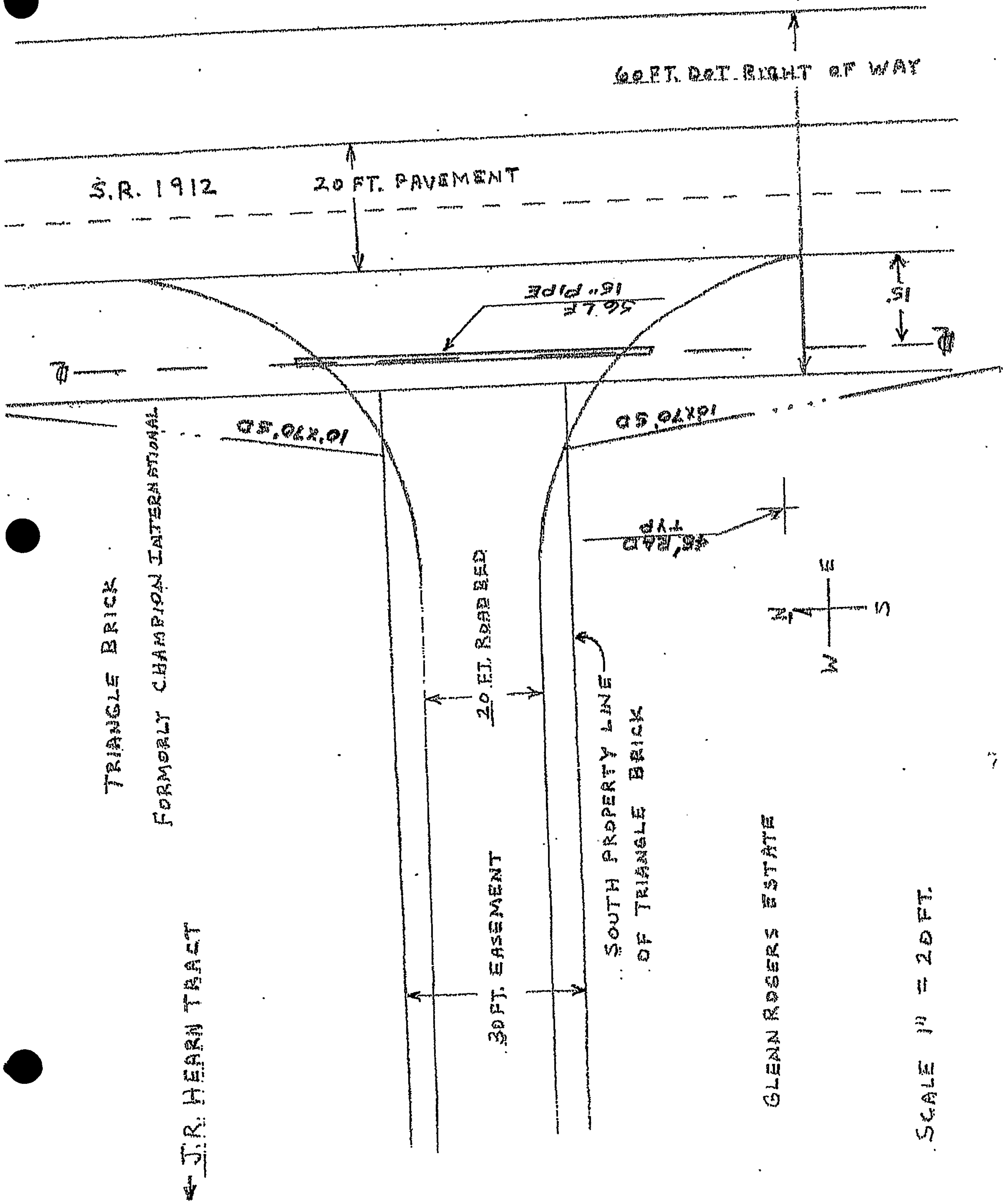
SHOW:

1. LOCATION OF DRIVEWAYS
2. DETAILS OF WORK, INCLUDING PIPES
3. EXISTING BUILDING, WALL, ETC.
4. PROPOSED BUILDING, WALL, ETC.
5. HIGHWAY FEATURES

PROPOSED PLANS

DRAW OR SKETCH BELOW, OR ATTACH CONSTRUCTION PLANS FOR STREETS OR DRIVEWAYS.

INDICATE NORTH


60 FT. DOT RIGHT OF WAY
S.R. 1912
20 FT. PAVEMENT
16" PIPE
56 L.F.
15'
10'x70' SD
10'x70' SD
46' RAD TYP
TRIANGLE BRICK
FORMORLY CHAMPION INTERNATIONAL
20 FT. ROAD BED
SOUTH PROPERTY LINE
OF TRIANGLE BRICK
N
E
S
W
J.R. HEARN TRACT
30 FT. EASEMENT
GLENN ROGERS ESTATE
SCALE 1" = 20 FT.

Page Break

a. Aeration and Extraction System –
   1) Aeration fans have been equipped with VFDs (see above)
   2) Recycle piping has been installed on (Bays 1,4,5,8,13,14,20,21) (see above)
   3) Seven (7) Roof Fans – all seven roof fans have been closed up with plywood covers and disconnected from the electrical supply to reduce potential for off-site odors.

b. Odor Control –
   1) The Global Odor Control Technologies ultra vapor unit LF2 has been disconnected from the now-inactive roof fans
   2) **An irrigation system has been installed on the biofilter that is capable of delivering odor-neutralizing products on an as needed basis.**

c. The remaining aspects of Equipment Specifications remain the same as in the original permit application.

1.5 Compliance Issues

a. Erosion and Surface Water Runoff –Two sediment ponds have been equipped with permenant 15" riser pipes. This is shown on the attached As-Built Site Plan.

b. Odor Minimization – the procedures detailed in the original permit application are largely unmodified. In addition, the following additional steps are now in place to minimize odors:
   1) A meteorological station has been installed at the office trailer to monitor wind speed and direction. This data is recorded every 20 minutes and hard copy of the daily report is collected and filed for reference. This station is used to minimize operational activities that might create odorous conditions during times of unfavorable wind speed and direction.
   2) All wastes received are analyzed using a C:N ratio computer model to ensure that the final mix C:N ratio is at or above 20:1 (see attached copy). In addition, this model is used to analyze potential incoming feedstocks to determine what effect they might have on mix C:N ratio. This model is discussed below in Section 2 Operating Procedures.
   3) We have reduced the amount of gypsum wall board coming into the plant to reduce the potential for hydrogen sulfide formation.
   4) We have begun accepting water treatment plant residuals (alum sludges and ferric hydroxide sludges) to dilute the high volatile solids content of incoming biosolids.

c. Quality Assurance
   1) Pre-Acceptance evaluation – in addition to the existing procedures, all new feedstocks are analyzed with a C:N ratio computer model to ensure no adverse effect on C:N ratios.

d. Advisory Panel
   1) McGill will form an Advisory Panel to address such issues as off-site odors, traffic, noise and dust. The panel will consist of one or more McGill representatives, one local neighborhood representative, one county government representative and one

state government representative. Initially this panel will meet on a regular basis. The main focus of the initial meetings will be on evaluating the use of an olfactometer as a mechanism to measure and clarify odors.

e. The remaining aspects of Compliance Issues remain the same as in the original permit application.

Section 2 – Operating Procedures

The Operations Plan for the Merry Oaks Plant has recently been revised. A copy of the Plan is attached.

2.8 Compost Distribution

No change from original permit application submitted in March, 2003.

2.9 Sampling and Analysis

No change from original permit application submitted in March, 2003.

2.10 RecordKeeping and Reporting

No change from original permit application submitted in March, 2003.

2.11 Personnel

No change from original permit application submitted in March, 2003.