



GRANVILLE COUNTY ENVIRONMENTAL PROGRAMS

141 WILLIAMSBORO STREET, POST OFFICE BOX 906, OXFORD, NORTH CAROLINA 27565-0906

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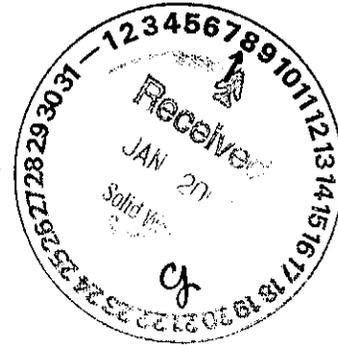
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January 2, 2007

NCDENR
Division of Waste Management
Solid Waste Section Permitting Branch
Toni Wyche Jones
1646 Mail Service Center
Raleigh, NC 27699-1646



Re: Revised Operation Plans for Butner (#39-02)
and Oxford (#39-01) Solid Waste Facilities

Dear Mrs. Jones,

Attached are revised operation manuals for two of our solid waste facilities. These revised plans discuss current and continuing operations at both sites. The document entitled "*Operations Plan Granville County C&D Landfill Granville County, NC December 2006*" should be included within "*Facility Revisions Application Oxford C&D Landfill Vertical Expansion Granville County, North Carolina December 2002*". Operation plans for the facility's type I-yard waste composting area are also included.

Also included within this package are revised operational plans to the "*Granville County (Butner) Transition Plan*" which was approved by the Solid Waste Division in March 1996. Please include the attached document entitled "*Butner Material Operations Manual Composting Facility Type I Yard Waste Composting Granville County, NC December 2006*".

The revised plans detail both current and continuing operations at both facilities. If you have any questions or need additional information, please do not hesitate to call me at (919) 603-1355.

Jason Falls

Dir. of Env. Programs

JF/jf

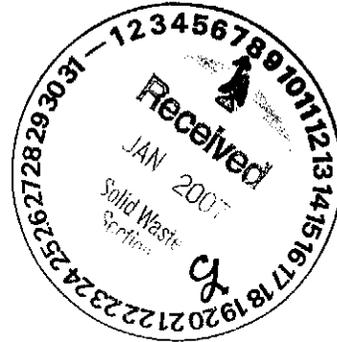
Attachment(s)

xc: Brian Alligood, County Manager
Mary Whaley, Division of Waste Management

Prepared for:

**Granville County
P.O. Box 906
Oxford, NC 27565**

JEI Project No. 660.06.01



**TYPE I COMPOSTING FACILITY (OXFORD)
OPERATIONS PLAN
GRANVILLE COUNTY C&D LANDFILL
GRANVILLE COUNTY, NORTH CAROLINA**

December 2006

Prepared by:



**2211 West Meadowview Road
Suite 101
Greensboro, North Carolina 27407
(336) 323-0092**

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- 2. Process Flow Diagrams**
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SECTION 1.0

INTRODUCTION

1.1 Purpose

The purpose of the following document is to provide the information necessary for the operations of the yard waste composting facility at the Oxford C&D Landfill (Permit Number 39-01). The facility is currently operated by Granville County.

Under the NC Department of Environment and Natural Resources (DENR) regulations, one of the operations at the facility are classified as a yard waste only composting operation (Type 1 facility). Scrap tires, white goods and scrap metals are collected at the site also.

1.2 Location

The facility is located off of 6584 Landfill Road Oxford, NC 27565. The facility is accessed off of Sterl Carrington Road, approximately five miles from the town of Oxford.

1.3 Contact Person

For actions relative to this permit, the following individual is responsible:

Title: Jason Falls/Director of Environmental Programs
Granville County Solid Waste Management

Address for notification: P. O. Box 906
Oxford, NC 27565

Phone: (919) 603-1335
Fax: (919) 690-8610

1.4 Personnel

The facility is be staffed by a facility supervisor, full time scale clerk and full-time equipment operators. The facility supervisor and scale clerk will direct traffic, maintain records, and oversee operations. The heavy equipment operators will operate all equipment and maintain good housekeeping practices.

1.5 Hours of Operation

The facility will operate from 7:30 a.m.-3:00 pm Monday-Friday and 8 a.m.- 12:00 noon on Saturdays.

2.0 TYPE I – Oxford C&D Landfill/Yard Waste Composting Facility

2.1 Waste Quantities

Granville County operates a C&D facility at the above location. White goods, scrap tires, and scrap metal are also collected and stockpiled for recycling. Adjacent to the borrow area is a Type I yard waste composting area that receives pallets, yard waste, scrap tires, white goods, and metal from within the County and the yard waste consists of brush, leaves, and other land clearing debris up to 24" in diameter, small stumps are accepted. Based on the data reported, the facility receives on average 96 tons of pallets, 326 tons of brush/yard waste, 276 tons of tires, 337 tons of white goods/scrap metal per month. Winter months tend to be somewhat lower in tonnage as would be expected.

The facility also processed and sold 100 tons of mulch during this 12 month period. Accurate records of incoming waste should be kept at the scale house. These records should differentiate between loads of brush (including all land clearing debris), clean wood and loads of leaves or grass clippings.

2.2 Design Considerations

2.2.1 Design Capacities and Product Quality

The Type 1 facility currently receives an average of 27 tons per month of yard waste. For evaluating the facility's design, 50 tons per month or 500 tons per year were used. This material is stockpiled until sufficient material is available to produce a windrow. The material is separated prior to composting. Material greater than 1" becomes woodchips and mulch; material smaller than 1" is windrowed for compost. Based on this data, approximately 100% of the yard waste material is turned into mulch products, and 0 % is sold for wood chips.

The following table summarizes the design criteria used to verify adequate space at the facility for the composting operation. As a factor of safety, it was assumed that the density of the product remains the same as the incoming waste stream.

Total waste stream (by weight)	453 tons (annual)
Total waste stream for composting (27%)	125 tons
Density (assumed average)	500 lb./cy
Composting waste stream (by volume)	+/-500 cubic yards
Cross-section windrow 1' (top) x 13' (base) x 8' (ht)	104 square feet
Total length windrow required	200 feet
Windrow: At half in spring and half in fall	feet
At 200' length	5-7 windrows needed
With 13' base and 2' aisle, total acreage required	<5 acres (Maximum)

The facility operates a working area for the Type 1 facility of <5 acres. Sufficient room is available for the operations.

2.2.2 Process Flow Diagram

(See 2.3 Operations)

2.3 Operations

2.3.1 General Description

Incoming yard waste is weighed and directed to the operational area. The yard waste is stockpiled until a sufficient quantity is accumulated to form a windrow. On average approximately 1 windrow could be formed per month. It should be noted that this is a theoretical maximum as during the operations to date no more than 4 windrows have ever been curing at one time. Grinding creates a product with a particle size of approximately 4" for composting after screening. Once ground, the material is formed into windrows using a front end loader. The windrows are spaced approximately 2 feet apart and each has a geometry: 8 feet high x 13 feet wide at base x 1 foot wide at top.

Once the windrow is formed, it will be turned several times using a front end loader to mix the materials. The turner is capable of handling .5 tons per hour and is more than adequate for the facility. If necessary, water will be added as the windrow is constructed and then periodically during the stabilization process. Granville County would use a fire truck for water addition. The pile will be sprayed as it is turned by the windrow turner on an as needed basis. For optimum composting the moisture should be maintained between 45% and 60%. Drier than 45% and the microbial action is slowed; higher than 60% and the material becomes difficult to handle and difficult to aerate. A copy of the recommended moisture log is contained in Appendix 3.

The temperatures are taken at in each quarter of the windrow (4 separate places) or a minimum of each third (3 separate places). It is suggested that the temperature be controlled by turning (aerating) to assure that the compostable material is maintained at an optimum range for decomposition (between 104°F and 113°F) and -then allowed to elevate to 131°F where it must be maintained for a period of 3 consecutive days as required by Rule .1406(10). When the temperature within the windrow falls below 120 – 130°F during the final stages of composting, the windrow is turned. Windrow construction and turning frequency will be sufficient to maintain aerobic conditions to produce a compost product in the desired time frame. Separate records are kept for each windrow. Once a windrow is constructed, it is assigned an I.D. Number and folder which are used over the lifespan of the windrow. Every time windrow data is taken, it is documented and logged in the folder. The windrows are monitored for temperature at least twice a week and will be aerated as necessary. A log will be kept of all temperature readings, which includes the location of the probes. A copy of the temperature log is contained in Appendix 3.

Tables have been provided in Appendix 4, to assist in the operations. These tables were developed by the Compost Council to assist operators with various calculations and parameter adjustments. The Compost Council's operation manual is incorporated by reference into this operations manual.

A nitrogen source when needed is sometimes added to the yard waste if needed to promote the compost process. Granville County will uses a nitrogen source when necessary. The nitrogen would be spread by equipment and mechanically mixed.

The process from grinding through stabilization was expected to take 24 weeks however, existing operations compost in less than <24 weeks. The final time frame is a function of material density, material type, moisture and operational controls.

Once the windrow begins to cool indicating stabilization, Granville County may screen the material and the larger particles are reused in the process or used as woodchips or mulch. By keeping the coarser materials in the compost, it enables more oxygen to get into the windrows and produces more compost in the finished product. The compost is now stockpiled. Depending on the end use requirements, the compost may be screened again prior to stockpiling if a finer screen is available. The larger particles would be either reused in the process or used as a coarser product.

If the material is free of sharp particles, has no offensive odor, and has minimal pathogens, it may be used in an unrestricted way. Prior to marketing the material to the public, the following testing is recommended by the Compost Council but not required by the State:

- Maximum particle size pH
- C:N ratio
- Total Nitrogen Soluble salts
- Metals as suggested by the Department of Agriculture

Once the compost meets the regulatory requirements for distribution to the public, it can be released for use. As the public obtains the material they must be given the information indicated in Section 2.3.9.C.

2.3.2 Waste Acceptance

Rule .1406 (6)

The Type 1 compost facility will accept only grass, leaves, brush, yard waste, and land clearing debris. No municipal solid waste (MSW), hazardous waste, asbestos containing waste or medical waste shall be accepted at the facility. Granville County accepts yard waste in a non-bagged state or in approved biodegradable bags. Deliveries are monitored at all sites. Granville County anticipates little contamination of the material.

Scrap tires, white goods, and scrap metals are also accepted in designated areas of the landfill. These materials are stockpiled until enough volume has accumulated to warrant a pickup.

2.3.3 Safety Requirements

Rule .1406 (7)

Open burning of solid waste is prohibited. All equipment will be provided with fire extinguishers. The loader will have a fire suppression system. Periodic safety meetings will be held to review safety issues at the site. Personal protective equipment should include steel toe boots, eye and ear protection and dust masks when appropriate. Site personnel will be trained in facility specific safety issues as well as general safety issues. The local fire station would be called should a major fire break out.

2.3.4 Nuisance Control

Rule .1405(10)(B)

Sources of noise will be on-site traffic and the facility equipment such as the front-end loader and grinder. Noise can be controlled by appropriately operating and maintaining equipment.

In addition, the facility is located next to a landfill operation and is buffered from other properties by distance and trees. Employees should wear hearing protection.

Vectors are animals, insects or other organisms that carry pathogens from one host to another like rats, flies, birds and mosquitoes. Vectors will be minimized by good housekeeping practices. The receiving area will be kept clean, water will not be allowed to accumulate and the drainage areas will be cleaned periodically. Material will be stored based on a "first in/first out" basis to prevent long term storage. Turning the windrows will also control vector flies and their larvae. If necessary, a commercial pest control service will be employed.

Dust will be controlled by good housekeeping practices and by dampening loads on the tipping floor as necessary. Moisture is necessary to enhance the composting process and will be monitored. Employees should wear dust masks.

Odors will be minimized by maintaining adequate aeration through turning the windrows.

2.3.5 Monitoring Requirements

Rule .1406 (9)

Once the windrow is constructed, the pH, temperature and moisture content should be measured. It is also suggested that the C:N ratio be determined to evaluate the need for the addition of a nitrogen source. During the composting process pH, O₂ (if equipment available), moisture, and temperature will be monitored periodically. pH should be kept in the range of 5.5 - 8.5. Outside of this range, the biological process is impeded.

Moisture should be kept in the range of 45% - 60%. Water should be added as required to stay within this range. Moisture pH, and O₂ should be monitored at a minimum weekly. Temperature will be monitored at a minimum weekly. To monitor temperature, the probe should be inserted 12" - 24" every 50' along the windrow at a 45° - 90° angle.

At the end of the process and prior to marketing the materials to the public, it is recommended that the following tests be run:

- pH;
- C:N;
- Total Nitrogen;
- Metals (as suggested by the Department of Agriculture);
- Soluble Salts; and
- Moisture.

These tests are recommended by the Compost Council but not required by the State. Granville County may also utilize the "Hand Test" Method. The test is performed by taking a hand-full of compost material representative of the windrow and squeezing it. After you open you hand, if the material quickly breaks up, then the windrow is too dry. If you can squeeze the material and water is extracted, then the material is too wet. If squeezed and the material remains cohesive, then it is good; otherwise, the proper measures should be taken.

2.3.6 Temperature Parameters

Rule .1406 (10)

For Type I facilities, the compost process must be maintained at or above 55°C (131°F) for 3 consecutive days and aerated to maintain elevated temperatures. Temperature will be monitored weekly.

2.3.7 Addition of Nitrogen Bearing Materials Rule .1406 (13)

Nitrogen compounds may be added as necessary to adjust the nutrient balance for optimum product development. Only approved waste materials (i.e. grass clippings, leaves) or chemical compounds may be added. Nitrogen rich materials can decompose rapidly and cause odor problems. Materials such as grass clippings must be incorporated into the process as soon as possible.

To determine if nitrogen is necessary, the carbon to nitrogen ratio should be calculated. For proper composting, this ratio should be greater than 25:1, but less than 40:1 at the start of composting. Incoming materials have the following estimated ratios:

Grass clippings	12 - 15:1
Dry leaves	40:1
Paper and wood	200:1
Sawdust	200 - 500:1

Thus, adjustment may be necessary after grinding, screening and blending the feedstock materials.

2.3.8 Contingency Plans

Rule .1405 (c) (1)

- A. **Equipment:** The two major pieces of equipment that are required for operations include a dump truck and the front-end loader. These shall be maintained in accordance with the manufacturers' recommendations. If the front-end loader breaks down, one will be rented from a local contractor.
- B. **Air Pollution:** Dust and odor are the two primary air pollutants. Dust will be controlled through proper moisture control and odor will be controlled through proper aeration.
- C. **Nonconforming Waste:** Nonconforming waste shall be taken to the landfill assuming no hazardous materials or asbestos-bearing materials are present.
- D. **Spills:** Spills are not expected. Potential spills would include maintenance fluids for equipment, and fuel. Appropriate precautions will be taken to assure that equipment is serviced correctly to minimize spills or discharges. Should oil or gas spill onto the area, it shall be absorbed immediately and the absorbent disposed of appropriately.

Major equipment maintenance and repairs are handled in the on-site maintenance garage. Off-spec product, incomplete compost, or compost which might spill off the curing pad will be collected and returned to the appropriate location.

- E. Fires, noise, vectors, odors are discussed under Section 2.3.4. Unusual traffic conditions shall be controlled by on-site personnel and the Granville County Sheriffs Department if necessary.
- F. Adverse weather conditions: The primary adverse weather conditions facing the Granville County facility include wind and rain. During periods of heavy wind, grinding and windrow turning will not be conducted and the top of the windrow will be kept moist to prevent blowing material. During periods of heavy rain, compost grinding and screening operations are not carried out in the rain. The operator monitors the site frequently to assure that stormwater controls are adequate and maintains the site as possible. During mild rainfalls, the operator may want to turn the windrow to incorporate moisture into the materials.

2.3.9 Classification/Distribution of MSW Compost Products Rule .1407

A. Requirements

For unrestricted use, the finished Type I compost must meet the following criteria:

- Minimal pathogenic organisms
- Free from offensive odors
- Containing no sharp particles

If these criteria are met then the finished compost material will be marketed to local landscape firms and to residents of Granville County, or used by the County itself.

B. Sampling

Prior to marketing the material to the public, a composite sample of the material should be obtained and the tested for the parameters outlined under Section 2.3.5. It is recommended that a copy of the test results and recommendations from the Department of Agriculture, Agronomic Division be provided to each individual using the material.

A composite sample is obtained by taking 3 evenly distributed samples along the windrow and compositing them into an airtight container or bag. Each sample should be approximately 1-2 cups each and taken from a hole dug into the windrow starting approximately 4' up and angling at 45° into the pile. More samples may be warranted per windrow if there is evidence of an inconsistent product (based on temperature or pH readings.)

A sketch indicating the location of each sample and a description of the sampling technique should be kept on each composite. Accurate record keeping is critical. Label each composite sample with the following information:

- Date sampled
- Time sampled
- Windrow identification
- Source of Sample
- Name of person taking sample
- Sample Preservation Technique
- Temperature of Sample
- pH of Sample

All information should be recorded in a sample log book along with the following:

- Sample preparation
- Shipment record
- Tests to be conducted
- Laboratory to conduct tests

C. Labeling

When the Type 1 compost material is to be marketed to the public, sufficient information should be provided to the public to:

- Inform users of the benefits of using compost
- Advise users on suggested uses of product
- Inform users of cautions in using product
- Inform users of composition of the material including nutrients and contaminants
- Inform users of source of feedstock

It is also recommended that a copy of the test results (if available) be provided to the end user.

2.4 Recordkeeping

2.4.1 Record Keeping Requirements

Separate records will be maintained for each section of the facility as described below. Records shall be made and maintained for a minimum of five (5) years. Records shall be kept on a monthly basis. 2.4.2 Operating Records.

2.4.2 Operating Records

Weekly operating records shall include the following information (at a minimum):

- The quantity, type and source of waste received. It is important to track the type of material closely.
- The quantity and type of waste processed.
- The quantity and type of compost produced by product classification.

- The quantity and type of compost removed for use or disposal, by product classification and the market or permitted disposal facility.
- All operational information including date and number of times windrow(s) turned; date, type, quantity and method of addition of any amendments.
- Temperature data. Temperature data shall indicate the location of readings in the windrow and the length of the composting period. (Sample logs are contained in Appendix 3)
- Moisture testing including data, location of test and weather conditions at time of sampling. (Sample logs are contained in Appendix 3)
- All analytical results from compost testing described above.

2.4.3 Annual Reporting Requirements

Rule .1408 (3)

An annual report shall be submitted to the Solid Waste Division of DENR. The fiscal year shall be July 1 - June 30. The annual report will include the following:

- Facility name, address, and permit number.
- Year covered.
- Total quantity and type of waste in tons received at the facility during the year covered including tons of waste received by local government of origin.
- Total quantity and type of waste in tons, processed into compost during the year covered.
- Total quantity in tons and type of compost produced at the facility, by product classification, during the year covered.
- Total quantity in tons and type of compost removed for use or disposal from the facility, by product classification, along with a general description of the market for use during the year covered.
- Total quantity in tons, and the type of waste removed from the facility and disposed of.
- Condensed monthly temperature monitoring to support Rule .1406 (9) (c).
- Summary of all testing completed on the compost as required by the Division.
- Condensed yearly totals of solid waste received and composted shall be reported back to the local government of origin for respective annual recycling reporting.

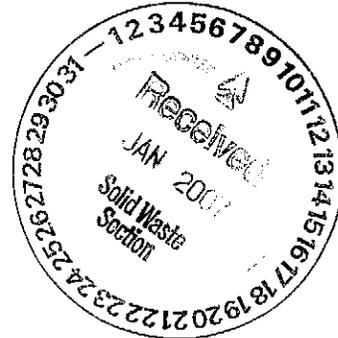
2.5 All Required Permits

A copy of all required local, state and federal permits/approvals are included in the permit application. The permit application should be kept on site at all times.

2.6 Equipment Specifications and Maintenance Requirements

The two major pieces of equipment in use at the composting facility are a dump truck and a Front-end Loader.

Granville County
P.O. Box 906
Oxford, NC 27565



**OPERATIONS PLAN
GRANVILLE COUNTY C&D LANDFILL
GRANVILLE COUNTY, NORTH CAROLINA**

December 2006

Prepared by:



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Suite 101
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OPERATION PLAN

1. General Operating Conditions

1.1 Facility Contact

The owner and operator of the site is:

Granville County
P.O. Box 906
Oxford, NC 27565

Phone Number: (919)-603-1335

Fax Number: (919)-690-8610

1.2 Hours of Operation

The landfill is expected to be open to private waste haulers and the public from 7:30 a.m – 3:00 p.m. Monday through Friday. The facility is open on Saturdays from 8:00 a.m-12:00 noon. The facility will be closed on most major holidays.

1.3 Site Access and Safety

Access to the facility is controlled through a single access road. A metal gate prevents access after operating hours. A sign containing the information required in Rule .0566 (16) is posted at the facility entrance. Traffic moves from the entrance gate to the landfill via a gravel haul road that extends approximately .25 mile from the facility entrance. The entrance is planned to remain at its present location. The gravel haul roads may be rerouted as needed to access the proposed C&D expansion area.

1.4 Waste Acceptance

Only construction/demolition and land clearing/inert debris is proposed for disposal at the landfill in their respective permitted areas. Construction and demolition debris is defined in NC General Statutes as waste or debris resulting solely from construction, remodeling, repair, or the demolition of pavement, buildings, or other structures. Land clearing and inert debris includes waste such as stumps, trees, limbs, leaves, brush, grass, brick, block and untreated wood. Yard waste, pallets are accepted and stockpiled in the yard waste recovery area.

1.5 Prohibited Waste

In accordance with Rule .0505(11)(b) no hazardous or liquid waste may be accepted for disposal. The C&D landfill will not accept:

- municipal solid waste, including household, commercial and industrial waste;

- hazardous waste as defined within 15A NCAC 13A, including hazardous waste from conditionally exempt small quantity generators;
- polychlorinated biphenyl (PCB) wastes as defined in 40 CFR 761;
- barrels and drums (except fiber drums containing asbestos), unless they are empty and sufficiently perforated;
- yard trash defined as solid waste consisting solely of vegetative matter resulting from landscaping maintenance;
- other wastes specifically banned from landfill disposal by rule or statute, such as lead acid batteries, whole tires, used oil, or aluminum cans.

Granville County will notify the NC Division of Waste Management within 24 hours of attempted disposal of hazardous waste and other waste the landfill is not permitted to receive. The waste-screening program is described later in Section 2.0

1.6 Litter Control

Windblown litter is not anticipated to be a significant problem at the C&D landfill due to the heavy, bulky nature of this waste type. Prompt compaction of the waste at the working face will be conducted to minimize litter. Temporary fences may be constructed if needed to contain windblown material during operations. Also, landfill personnel will pick up windblown litter as needed along the access road and in the vicinity of the disposal area.

1.7 Air Quality

Open burning of waste, including yard waste and brush, is prohibited at the landfill. However, under state's of emergency, the Division of Air Quality has allowed the landfill to burn yard wastes and land clearing debris. This will only be done if granted by the state.

1.8 Dust, Odor, Fire and Vector Control

Dusty road surfaces will be sprayed with water as needed during windy, dry weather.

Significant odors and disease vectors are not anticipated at the C&D landfill. The waste will be covered weekly.

Site operators will observe incoming waste loads for evidence of fire such as flames, smoke, or the odor of burning material. If evidence of fire exists, the landfill operator will evaluate the situation to determine whether the fire can be extinguished using fire extinguishers and/or other equipment at the site, or if off-site equipment is needed. If necessary, the local fire department will be called to render assistance in extinguishing the fire. Fires that occur at the landfill will be

reported verbally to the NC Division of Waste Management within 24 hours, and in writing within 15 days.

If a fire occurs at the waste disposal area, the waste will be removed or segregated from other waste in the disposal area if possible. Following segregation, the situation will be reevaluated to determine whether emergency personnel should be notified. If necessary, the local Fire Departments will be called to render assistance and provide support in fighting any fires that occur at this site. Water in sedimentation ponds and nearby creeks can be used by firefighters to extinguish larger fires. See Appendix III for written notification from local fire departments.

Fire extinguishers will be carried on each piece of landfill equipment on site, and will be used for small, localized fires. Equipment operators will be trained in the use of these extinguishers. A small stockpile of soil will be maintained near the working face to be used for extinguishing small surface fires that are too large to control with the fire extinguishers carried on the landfill equipment.

2. Random Waste Screening Program

2.1 Authority

In order to prevent the acceptance of prohibited wastes, a random waste screening program is proposed in accordance with the North Carolina's Solid Waste Management Regulations, Rule .1626(1)(f). Key elements of this rule are as follows:

No hazardous or liquid wastes as defined in 15A NCAC 13A, municipal solid waste, or materials offering an undue hazard to landfill personnel or the landfill operations shall be accepted at the C&D landfill except as specifically authorized by the facility permit or by the Division. The owner or operator shall implement an inspection program to detect and prevent disposal of non-permitted wastes, hazardous and liquid wastes, and polychlorinated biphenyls (PCB). This program shall include, at a minimum:

- Random inspections of incoming loads, unless the owner or operator takes other steps to prohibit incoming loads containing municipal solid waste, regulated hazardous or liquid wastes, or PCB wastes;
- Records of any inspections;
- Training of facility personnel to recognize municipal solid waste, regulated hazardous or liquid wastes, or PCB wastes; and
- Development of a contingency/action plan to properly manage non-permitted or hazardous and/or liquid wastes that are identified.

2.2 Random Selection

Random selection of vehicles to be inspected will be made on a regular basis. At least one vehicle per week will be randomly selected, at the working face, by the personnel conducting the

inspection. A random truck number and time will be selected. Every 200th customer will be inspected

2.3 Record Keeping

Appropriate forms indicating the results of each inspection will be completed. All reports and resulting correspondence will be maintained at the facility office for the life of the landfill and during the post-closure period.

2.4 Training

Inspections will be supervised by the operator or by support personnel trained to identify and manage municipal solid waste, and hazardous and liquid waste.

2.5 Location

Inspections will be conducted in or near the working face of the landfill.

2.6 Contingency/Action Plan

The following contingency/action plan details the procedure for the facility for conducting random waste inspections:

- 1) Upon weigh-in, drivers are asked about the contents of their load and sign an invoice stating that they are not discharging hazardous materials, liquid wastes or any other unacceptable materials into the landfill. Although all loads are visually inspected upon weigh-in, the complete contents of a load cannot be determined until the load is discharged by the driver and pushed back by Granville County.
- 2) The dumped material is examined for safety hazards and waste excluded by the operating permit which include:
 - Municipal solid waste (MSW);
 - Containers labeled hazardous;
 - Excessive or unusual moisture;
 - Biomedical (red bag) waste;
 - Powders, dusts, smoke, vapors, or chemical odors;
 - Sludges, pastes, slurries, or bright colors (such as dyes); and
 - Unauthorized waste
 - Tires.

Loads that include large closed containers will be handled carefully to avoid possible rupturing of the containers.

- 3) Take the following action as appropriate:

- Incorporate acceptable waste into working face.
- Haul MSW to a transfer facility or to a MSW landfill for disposal.
- If necessary, hold suspected unauthorized waste for identification by on-site personnel and confirmation by others, such as a contract laboratory or regulator.
- Interview driver and hauler to identify the source of waste in the load.
- Hold rejected hazardous or liquid waste for generator, or
- Arrange for hazardous or liquid waste collection by licensed collector.

5) Document Actions:

- a) Record Inspection.
- b) Retain Reports.
- c) Report hazardous liquid, or PCB wastes to Solid Waste Section - NCDENR.

6) Should any materials be discharged into the landfills that are unacceptable, Granville County may impose a clean-up fee to cover the cost of properly disposing of the unacceptable waste.

7) Should the unacceptable materials pose an immediate threat to the health and safety of individuals, the area will be secured. The material/wastes shall be handled by a licensed handler of hazardous waste and disposed of at a facility licensed to accept that material. The appropriate officials will be notified.

3. Waste Compaction And Equipment

3.1 Filling Operation

The area method of filling will be used in accordance with the approved filling sequence. Each lift shall be approximately 10 feet thick, including an allowance for weekly cover. The proposed waste to soil volume ratio is 9:1. The debris shall be spread and compacted by a self-propelled landfill compactor. The compactor, prior to the placement of a subsequent layer of debris, shall make at least 4 to 6 passes in orthogonal directions.

3.2 Landfill Equipment

Granville County proposes to operate the following equipment at the C&D landfill:

- Front End Track Loaders ()
- Grapple Track Hoe ()
- Bucket Track Hoe ()
- Compactor ()
- Pans ()
- Rubber Tire Backhoe()
- Road Tractor ()
- Off Road Truck ()

Additional equipment may be added, depending on the actual quantity of waste accepted.

3.3 Cover Material

At the end of each week's operation, the compacted waste in the current lift shall be covered with cover soil (proposed waste to soil volume ratio of 9:1). At least 2 to 3 passes of heavy equipment will be made over the area to compact the soil. Whenever a subsequent lift of waste will not be placed for at least 12 months, additional soil shall be placed over the cover material already in place to provide a minimum 12 inches of intermediate cover. Provisions for a vegetative ground cover to restrain erosion shall be accomplished within 120 calendar days upon completion of each phase of development.

4. Erosion and Sediment Control

As required, the operator shall not cause a discharge of pollutants into waters of the United States, including wetlands, that violates any requirements of the Clean Water Act, including, but not limited to, the National Pollutant Discharge Elimination System (NPDES) requirements, pursuant to Section 402, or cause the discharge of a nonpoint source of pollution to waters of the United States, including wetlands, that violates any requirement of an area-wide or State-wide water quality management plan that has been approved under Section 208 or 319 of the Clean Water Act, as amended. Surface water shall be diverted from the operational area and shall not be impounded over or in waste.

Embankment slopes will be regularly inspected for erosion. The vegetation on these slopes will be mowed at least once a year. These slopes will be maintained with reseeded, fertilizer, and other means, as necessary, to promote a healthy stand of vegetation. All vegetative and structural erosion and sediment control devices will be maintained according to the North Carolina Erosion and Sediment Control Planning and Design Manual (NCESCPDM). Channels and basins shall be kept free of debris and sediment.

In-place erosion and sediment control measures, including stormwater conveyance channels and a sediment basin, will continue to serve the existing C&D landfill.

3.5 Record Keeping Requirements

The following records will be maintained in the Operating Record at the landfill office:

- The landfill's operating permit and pertinent correspondence;
- Operation Plan;
- Inspection records, waste determination records, and waste screening programs;
- Amounts by weight of construction/demolition debris received at the facility, including the source of generation;
- Water Quality Monitoring Plan and any demonstration, certification, finding, monitoring, testing, or analytical data required by the approved water quality monitoring program at the

site;



REFUSED/ACCEPTED WASTE FORM

WASTE DESCRIPTION/TYPE: _____

WASTE: REJECTED ACCEPTED

NOTIFIED: WASTE SOURCE HAULING MANAGEMENT

LOCAL AUTHORITY DEQ EPA

OTHER: _____

Refused Waste Transporter: _____

Address: _____

Destination: _____

Address: _____

Accepted Waste: _____

Contained Area: _____

Secured By: _____

Additional Comments: _____

Signature: _____ Date & Time: _____



RANDOM WASTE INSPECTION FORM

Facility Name: Granville County C&D Landfill

Inspector(s): _____

Transporter Name: _____

Address: _____

Phone Number: _____

Vehicle Type: _____

Vehicle License Number: _____

Driver's Name: _____

Generator/Source: _____

Types of Waste Observed: _____

Actions Taken (If unauthorized waste is discovered, complete Refused/Accepted Waste Form):

Additional Comments: _____

Inspector's Signature: _____

Date: _____ Time: _____



Granville County
P. O. Box 906
Oxford, NC 27565

BUTNER MATERIAL OPERATIONS MANUAL COMPOSTING FACILITY

TYPE 1 – Yard Waste Composting

GRANVILLE COUNTY, NORTH CAROLINA

DECEMBER 2006

Prepared by:



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SECTION 1.0

INTRODUCTION

1.1 Purpose

The purpose of the following document is to provide the information necessary for the operations of the yard waste composting facility at the Oxford C&D Landfill (Permit Number 39-01). The facility is currently operated by Granville County.

Under the NC Department of Environment and Natural Resources (DENR) regulations, one of the operations at the facility are classified as a yard waste only composting operation (Type 1 facility). Scrap tires, white goods and scrap metals are collected at the site also.

1.2 Location

The facility is located off of 2796 Old Route Highway 75 Butner, NC 27509. The facility is accessed off of Interstate 85, approximately five miles from the town of Butner.

1.3 Contact Person

For actions relative to this permit, the following individual is responsible:

Title:	Director of Environmental Programs
Address for notification:	Jason Falls Granville County Solid Waste Management P. O. Box 906 Oxford, NC 27565
Phone:	(919) 603-1335
Fax:	(919) 690-8610

1.4 Personnel

The facility is be staffed by a full time scale clerk and part-time equipment operators. The scale clerk will direct traffic, maintain records, and oversee operations. The heavy equipment operators will operate all equipment and maintain good housekeeping practices.

1.5 Hours of Operation

The facility will operate from 7:30 a.m.-3:00 pm Monday-Friday and 8 a.m.- 3:00 noon on Saturdays.

2.0 TYPE I – Oxford C&D Landfill/Yard Waste Composting Facility

2.1 Waste Quantities

Granville County receives yard waste, scrap tires, white goods, and metal from within the County and the yard waste consists of brush, leaves, and other land clearing debris up to 24" in diameter, small stumps are accepted. Pallets are also accepted. Appendix 1 summarizes waste data available for the facility from Dec. 05 – Nov. 06. Based on the data reported, the facility receives on average 75 tons of brush/yard waste, 36 tons of tires, 42 tons of white goods/scrap metal per month. Winter months tend to be somewhat lower in tonnage as would be expected.

The facility also processed and sold 683 tons of mulch during this 12 month period. Accurate records of incoming waste should be kept at the scale house. These records should differentiate between loads of brush (including all land clearing debris), clean wood and loads of leaves or grass clippings.

2.2 Design Considerations

2.2.1 Design Capacities and Product Quality

The Type 1 facility currently receives an average of 75 tons per month of yard waste. For evaluating the facility's design, 100 tons per month or 1000 tons per year were used. This material is stockpiled until sufficient material is available to produce a windrow. The material is separated prior to composting. Material greater than 1" becomes woodchips and mulch; material smaller than 1" is windrowed for compost. The Appendix 1 summarizes all available tonnage data for the facility. Based on this data, approximately 100% of the yard waste material is turned into mulch products, and 0 % is sold for wood chips.

The following table summarizes the design criteria used to verify adequate space at the facility for the composting operation. As a factor of safety, it was assumed that the density of the product remains the same as the incoming waste stream.

Total waste stream (by weight)	3803 tons (annual)
Total waste stream for composting (___%)	900 tons
Density (assumed average)	500 lb./cy
Composting waste stream (by volume)	0 cubic yards
Cross-section windrow 1' (top) x 13' (base) x 8' (ht)	104 square feet
Total length windrow required	200 feet
Windrow: At half in spring and half in fall	feet
At 200' length	5-7 windrows needed
With 13' base and 2' aisle, total acreage required	<5 acres (Maximum)

The facility operates a working area for the Type 1 facility of <5 acres. Sufficient room is available for the operations.

2.2.2 Process Flow Diagram

Appendix 2 contains the updated Process Flow Diagram, which illustrates the complete operation including the type and size of equipment, feedstock flow streams, recommended operational parameters, monitoring requirements, and final product requirements. The facility must record all data on the incoming and outgoing materials in tonnage. To provide volumetric

information as required by DENR, the operator should determine a bulk density for brush, leaves, grass and final product periodically.

2.3 Operations

2.3.1 General Description

Incoming yard waste is weighed and directed to the operational area. The yard waste is stockpiled until a sufficient quantity is accumulated to form a windrow. On average approximately .25 windrow could be formed per month. It should be noted that this is a theoretical maximum as during the operations to date no more than 4 windrows have ever been curing at one time. Grinding creates a product with a particle size of approximately 4" for composting after screening. Once ground, the material is formed into windrows using a front end loader. The windrows are spaced approximately 2 feet apart and each has a geometry: 8 feet high x 13 feet wide at base x 1 feet wide at top.

Once the windrow is formed, it will be turned several times using a front end loader to mix the materials. The turner is capable of handling .5 tons per hour and is more than adequate for the facility. If necessary, water will be added as the windrow is constructed and then periodically during the stabilization process. Granville County would use a fire truck for water addition. The pile will be sprayed as it is turned by the windrow turner on an as needed basis. For optimum composting the moisture should be maintained between 45% and 60%. Drier than 45% and the microbial action is slowed; higher than 60% and the material becomes difficult to handle and difficult to aerate. A copy of the recommended moisture log is contained in Appendix 3.

The temperatures are taken at in each quarter of the windrow (4 separate places) or a minimum of each third (3 separate places). It is suggested that the temperature be controlled by turning (aerating) to assure that the compostable material is maintained at an optimum range for decomposition (between 104°F and 113°F) and -then allowed to elevate to 131°F where it must be maintained for a period of 3 consecutive days as required by Rule .1406(10). When the temperature within the windrow falls below 120 – 130°F during the final stages of composting, the windrow is turned. Windrow construction and turning frequency will be sufficient to maintain aerobic conditions to produce a compost product in the desired time frame. Separate records are kept for each windrow. Once a windrow is constructed, it is assigned an I.D. Number and folder which are used over the lifespan of the windrow. Every time windrow data is taken, it is documented and logged in the folder. The windrows are monitored for temperature at least twice a week and will be aerated as necessary. A log will be kept of all temperature readings, which includes the location of the probes. A copy of the temperature log is contained in Appendix 3.

Tables have been provided in Appendix 4, to assist in the operations. These tables were developed by the Compost Council to assist operators with various calculations and parameter adjustments. The Compost Council's operation manual is incorporated by reference into this operations manual.

A nitrogen source when needed is sometimes added to the yard waste if needed to promote the compost process. Granville County uses a nitrogen source when necessary. The nitrogen is spread by equipment and mechanically mixed.

The process from grinding through stabilization was expected to take 24 weeks however, existing operations compost in less than <24 weeks weeks. The final time frame is a function of material density, material type, moisture and operational controls.

Once the windrow begins to cool indicating stabilization, Granville County may screen the material and the larger particles are reused in the process or used as woodchips or mulch. By keeping the coarser materials in the compost, it enables more oxygen to get into the windrows and produces more compost in the finished product. The compost is now stockpiled. Depending on the end use requirements, the compost may be screened again prior to stockpiling if a finer screen is available. The larger particles would be either reused in the process or used as a coarser product.

If the material is free of sharp particles, has no offensive odor, and has minimal pathogens, it may be used in an unrestricted way. Prior to marketing the material to the public, the following testing is recommended by the Compost Council but not required by the State:

- Maximum particle size
- pH
- C:N ratio
- Total Nitrogen
- Soluble salts
- Metals as suggested by the Department of Agriculture

Once the compost meets the regulatory requirements for distribution to the public, it can be released for use. As the public obtains the material they must be given the information indicated in Section 2.3.9.C.

2.3.2 Waste Acceptance

Rule .1406 (6)

The Type 1 compost facility will accept only grass, leaves, brush, yard waste, and land clearing debris. No municipal solid waste (MSW), hazardous waste, asbestos containing waste or medical waste shall be accepted at the facility. Granville County accepts yard waste in a non-bagged state or in approved biodegradable bags. Deliveries are monitored at all sites. Granville County anticipates little contamination of the material.

Scrap tires, white goods, and scrap metals are also accepted. These materials are stockpiled until enough volume has accumulated to warrant a pickup.

2.3.3 Safety Requirements

Rule .1406 (7)

Open burning of solid waste is prohibited. All equipment will be provided with fire extinguishers. The loader will have a fire suppression system. Periodic safety meetings will be held to review safety issues at the site. Personal protective equipment should include steel toe boots, eye and ear protection and dust masks when appropriate. Site personnel will be trained in facility specific safety issues as well as general safety issues. The local fire station would be called should a major fire break out.

2.3.4 Nuisance Control

Rule .1405(10)(B)

Sources of noise will be on-site traffic and the facility equipment such as the front-end loader and grinder. Noise can be controlled by appropriately operating and maintaining equipment. In addition, the facility is located next to a landfill operation and is buffered from other properties by distance and trees. Employees should wear hearing protection.

Vectors are animals, insects or other organisms that carry pathogens from one host to another like rats, flies, birds and mosquitoes. Vectors will be minimized by good housekeeping practices. The receiving area will be kept clean, water will not be allowed to accumulate and the drainage areas will be cleaned periodically. Material will be stored based on a "first in/first out" basis to prevent long term storage. Turning the windrows will also control vector flies and their larvae. If necessary, a commercial pest control service will be employed.

Dust will be controlled by good housekeeping practices and by dampening loads on the tipping floor as necessary. Moisture is necessary to enhance the composting process and will be monitored. Employees should wear dust masks.

Odors will be minimized by maintaining adequate aeration through turning the windrows.

2.3.5 Monitoring Requirements

Rule .1406 (9)

Once the windrow is constructed, the pH, temperature and moisture content should be measured. It is also suggested that the C:N ratio be determined to evaluate the need for the addition of a nitrogen source. During the composting process pH, O₂ (if equipment available), moisture, and temperature will be monitored periodically. pH should be kept in the range of 5.5 - 8.5. Outside of this range, the biological process is impeded.

Moisture should be kept in the range of 45% - 60%. Water should be added as required to stay within this range. Moisture pH, and O₂ should be monitored at a minimum weekly. Temperature will be monitored at a minimum weekly. To monitor temperature, the probe should be inserted 12"- 24" every 50' along the windrow at a 45° - 90° angle.

At the end of the process and prior to marketing the materials to the public, it is recommended that the following tests be run:

- pH;
- C:N;
- Total Nitrogen;
- Metals (as suggested by the Department of Agriculture);
- Soluble Salts; and
- Moisture.

These tests are recommended by the Compost Council but not required by the State. Granville County may also utilize the "Hand Test" Method. The test is performed by taking a hand-full of compost material representative of the windrow and squeezing it. After you open your hand, if the material quickly breaks up, then the windrow is too dry. If you can squeeze the material and

water is extracted, then the material is too wet. If squeezed and the material remains cohesive, then it is good; otherwise, the proper measures should be taken.

2.3.6 Temperature Parameters

Rule .1406 (10)

For Type I facilities, the compost process must be maintained at or above 55°C (131°F) for 3 consecutive days and aerated to maintain elevated temperatures. Temperature will be monitored weekly.

2.3.7 Addition of Nitrogen Bearing Materials Rule .1406 (13)

Nitrogen compounds may be added as necessary to adjust the nutrient balance for optimum product development. Only approved waste materials (i.e. grass clippings, leaves) or chemical compounds may be added. Nitrogen rich materials can decompose rapidly and cause odor problems. Materials such as grass clippings must be incorporated into the process as soon as possible.

To determine if nitrogen is necessary, the carbon to nitrogen ratio should be calculated. For proper composting, this ratio should be greater than 25:1, but less than 40:1 at the start of composting. Incoming materials have the following estimated ratios:

Grass clippings	12 - 15:1
Dry leaves	40:1
Paper and wood	200:1
Sawdust	200 - 500:1

Thus, adjustment may be necessary after grinding, screening and blending the feedstock materials.

2.3.8 Contingency Plans

Rule .1405 (c) (1)

- A. **Equipment:** The two major pieces of equipment that are required for operations include a dump truck and the front-end loader. These shall be maintained in accordance with the manufacturers' recommendations. If the front-end loader breaks down, one will be rented from a local contractor.
- B. **Air Pollution:** Dust and odor are the two primary air pollutants. Dust will be controlled through proper moisture control and odor will be controlled through proper aeration.
- C. **Nonconforming Waste:** Nonconforming waste shall be taken to the landfill assuming no hazardous materials or asbestos-bearing materials are present.

- D. Spills: Spills are not expected. Potential spills would include maintenance fluids for equipment, and fuel. Appropriate precautions will be taken to assure that equipment is serviced correctly to minimize spills or discharges. Should oil or gas spill onto the area, it shall be absorbed immediately and the absorbent disposed of appropriately. Major equipment maintenance and repairs are handled in the on-site maintenance garage. Off-spec product, incomplete compost, or compost which might spill off the curing pad will be collected and returned to the appropriate location.
- E. Fires, noise, vectors, odors are discussed under Section 2.3.4. Unusual traffic conditions shall be controlled by on-site personnel and the Granville County Sheriffs Department if necessary.
- F. Adverse weather conditions: The primary adverse weather conditions facing the Granville County facility include wind and rain. During periods of heavy wind, grinding and windrow turning will not be conducted and the top of the windrow will be kept moist to prevent blowing material. During periods of heavy rain, compost grinding and screening operations are not carried out in the rain. The operator monitors the site frequently to assure that stormwater controls are adequate and maintains the site as possible. During mild rainfalls, the operator may want to turn the windrow to incorporate moisture into the materials.

2.3.9 Classification/Distribution of MSW Compost Products Rule .1407

A. Requirements

For unrestricted use, the finished Type I compost must meet the following criteria:

- Minimal pathogenic organisms
- Free from offensive odors
- Containing no sharp particles

If these criteria are met then the finished compost material will be marketed to local landscape firms and to residents of Granville County, or used by the County itself.

B. Sampling

Prior to marketing the material to the public, a composite sample of the material should be obtained and the tested for the parameters outlined under Section 2.3.5. It is recommended that a copy of the test results and recommendations from the Department of Agriculture, Agronomic Division be provided to each individual using the material.

A composite sample is obtained by taking 3 evenly distributed samples along the windrow and compositing them into an airtight container or bag. Each sample should be approximately 1-2 cups each and taken from a hole dug into the windrow starting approximately 4' up and angling at 45° into the pile. More samples may be warranted per windrow if there is evidence of an inconsistent product (based on temperature or pH readings.)

A sketch indicating the location of each sample and a description of the sampling technique should be kept on each composite. Accurate record keeping is critical. Label each composite sample with the following information:

- Date sampled
- Time sampled
- Windrow identification
- Source of Sample
- Name of person taking sample
- Sample Preservation Technique
- Temperature of Sample
- pH of Sample

All information should be recorded in a sample log book along with the following:

- Sample preparation
- Shipment record
- Tests to be conducted
- Laboratory to conduct tests

C. Labeling

When the Type 1 compost material is to be marketed to the public, sufficient information should be provided to the public to:

- Inform users of the benefits of using compost
- Advise users on suggested uses of product
- Inform users of cautions in using product
- Inform users of composition of the material including nutrients and contaminants
- Inform users of source of feedstock

It is also recommended that a copy of the test results (if available) be provided to the end user.

2.4 Recordkeeping

2.4.1 Record Keeping Requirements

Separate records will be maintained for each section of the facility as described below. Records shall be made and maintained for a minimum of five (5) years. Records shall be kept on a monthly basis. 2.4.2 Operating Records.

2.4.2 Operating Records

Weekly operating records shall include the following information (at a minimum):

- The quantity, type and source of waste received. It is important to track the type of material closely.
- The quantity and type of waste processed.
- The quantity and type of compost produced by product classification.
- The quantity and type of compost removed for use or disposal, by product classification and the market or permitted disposal facility.
- All operational information including date and number of times windrow(s) turned; date, type, quantity and method of addition of any amendments.
- Temperature data. Temperature data shall indicate the location of readings in the windrow and the length of the composting period. (Sample logs are contained in Appendix 3)
- Moisture testing including data, location of test and weather conditions at time of sampling. (Sample logs are contained in Appendix 3)
- All analytical results from compost testing described above.

2.4.3 Annual Reporting Requirements

Rule .1408 (3)

An annual report shall be submitted to the Solid Waste Division of DENR. The fiscal year shall be July 1 - June 30. The annual report will include the following:

- Facility name, address, and permit number.
- Year covered.
- Total quantity and type of waste in tons received at the facility during the year covered including tons of waste received by local government of origin.
- Total quantity and type of waste in tons, processed into compost during the year covered.
- Total quantity in tons and type of compost produced at the facility, by product classification, during the year covered.
- Total quantity in tons and type of compost removed for use or disposal from the facility, by product classification, along with a general description of the market for use during the year covered.
- Total quantity in tons, and the type of waste removed from the facility and disposed of.
- Condensed monthly temperature monitoring to support Rule .1406 (9) (c).
- Summary of all testing completed on the compost as required by the Division.
- Condensed yearly totals of solid waste received and composted shall be reported back to the local government of origin for respective annual recycling reporting.

2.5 All Required Permits

A copy of all required local, state and federal permits/approvals are included in the permit application. The permit application should be kept on site at all times.

2.6 Equipment Specifications and Maintenance Requirements

The two major pieces of equipment in use at the composting facility are a dump truck and a Front-end Loader. Equipment specifications are enclosed in Appendix 5.

