

Forsyth County

34-23

Forum 52

Yard Waste Facility

DIN
25066



Permit Application

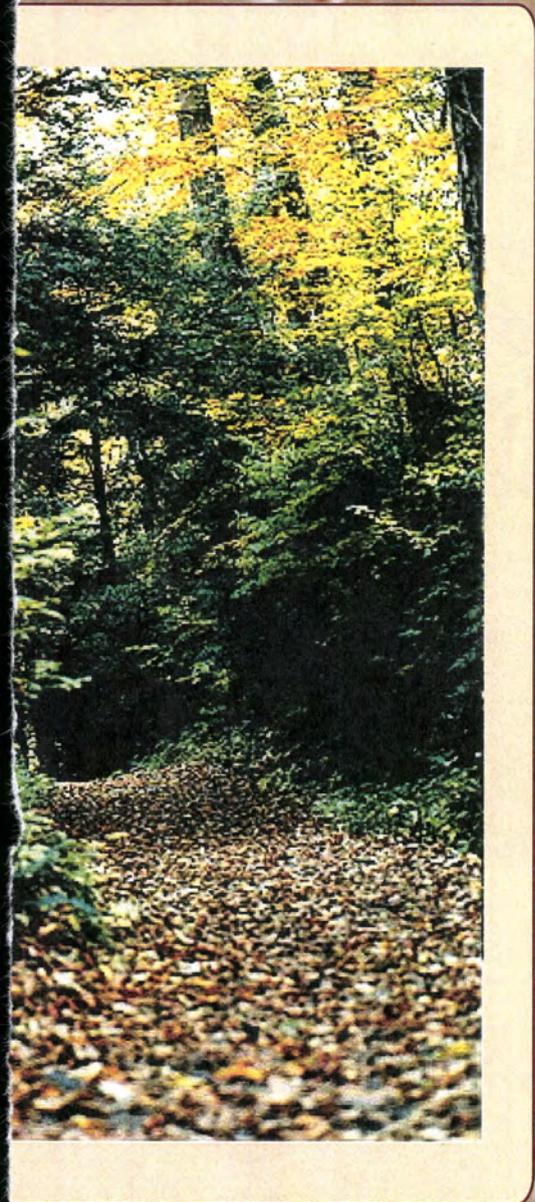
SCANNED
10/2/15



City/County Utility Commission
Winston-Salem, North Carolina

December 2004

HDR



Note:

All large Drawings
at end of File



DIN 25066

North Carolina Department of Environment and Natural Resources

Dexter R. Matthews, Director

Division of Waste Management

Michael F. Easley, Governor
William G. Ross Jr., Secretary

July 26, 2005

Ms. Jan McHargue
Solid Waste Administrator
City of Winston-Salem
P.O. Box 2511
Winston-Salem, North Carolina 27102

Re: City of Winston-Salem – Compost Facility – Permit #SWC-34-23

Dear Ms. McHargue:

Enclosed is your permit to operate a Large, Type I Solid Waste Compost Facility in the City of Winston-Salem, NC on Northstar Drive in Forsyth County, NC. Please carefully review the permit conditions.

Mr. Jason Watkins, Waste Management Specialist in the Winston-Salem Regional Office will be the contact person for facility inspections. Please notify Mr. Watkins when construction will start, Mr. Watkins can be contacted at 336-771-4600. If I can be of further assistance, please call me at 919-508-8508.

Sincerely,

Ted Lyon, Supervisor
Composting & Land Application Branch

cc: Michael Plummer, PE - HDR Engineering, Inc. of the Carolinas
Jason Watkins, Winston-Salem Regional Office

h:da/compost/permits/34-forsy/Winston-Salem/swc34-23-cl_07-05

Forsyth County

#34-23

DIN 25066

STATE OF NORTH CAROLINA
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF WASTE MANAGEMENT
1646 Mail Service Center RALEIGH, N.C. 27699-1646

City of Winston-Salem, NC

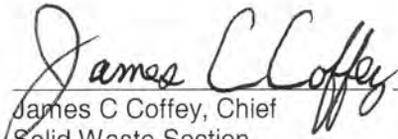
is hereby issued a permit to operate a

LARGE, TYPE 1 SOLID WASTE COMPOST FACILITY

On Northstar Drive

Permit Number SWC-34-23

In accordance with Article 9, Chapter 130A, of the General Statutes of North Carolina and all rules promulgated thereunder and subject to the conditions set forth in this permit.

 07/26/05
James C Coffey, Chief Date
Solid Waste Section

Permit Conditions

1. Operation and maintenance of this facility shall be in accordance with the Solid Waste Compost Rules (15A NCAC 13B, Section .1400), the permit application and the Operation and Maintenance Manual submitted with the permit application. Failure to comply may result in compliance actions or permit revocation.
2. The facility layout shall be maintained in accordance with the approved site plan submitted July 8, 2005.
3. Waste shall not be received at the facility until a pre-operation inspection has been conducted and the facility construction determined to be consistent with the approved application.
4. This facility shall be operated in such a manner that erosion and runoff from the site shall be controlled. Any leachate generated at the facility shall be managed in such a manner that it will not be allowed to adversely impact ground or surface waters.
5. Only materials specifically listed in the permit application may be managed at this facility without adequate testing and prior approval of the Division of Waste Management. Ash shall not be added to the windrows or the finished compost product until tested for total metals and approved by the Division of Waste Management.
6. Engineered wood products received at this facility shall only be distributed as boiler fuel.
7. Wastes with low carbon-nitrogen ratios, such as grass clippings, shall be incorporated into the windrows prior to the waste starting to compost (heat) or generate odors.
8. Odor shall be controlled at the property boundary.
9. Compost produced at the facility shall meet the requirements of Rule .1407 of the Solid Waste Compost Rules and the permit application.
10. Windrows shall be of appropriate size and turned as needed to maintain aerobic conditions.
11. Testing and reporting shall be conducted in accordance with the requirements of Rule .1408 and the permit application. An annual report of facility activities for the fiscal year July 1 to June 30 shall be submitted to the Division by August 1 of each year. This report shall include the amount of materials composted in tons.
12. Groundwater monitoring wells may be required if there is indication of the potential for groundwater contamination.
13. The compost operation and the compost pad shall be operated and maintained with sufficient dust control measures to minimize airborne emissions and to prevent dust from becoming a nuisance or safety hazard.
14. This permit shall expire on August 1, 2010. Changes in ownership, increase in facility capacity, or receiving additional feedstocks shall require a permit modification.



SCANNED
10/21/50

JAMES D. WALL
336-722-7200 DIRECT
JWALL@WEBLLP.COM
WWW.WEBLLP.COM

October 13, 2006



Via Certified Mail

Mr. Ted Lyon, Supervisor
North Carolina Department of Environment and Natural Resources
Composting & Land Application Branch
1646 Mail Service Center
Raleigh, North Carolina 27699-1646

Re: Proposed **Forum 52 Yard Waste Facility** (the "Facility") to be operated by the City of Winston-Salem (the "City")

Dear Mr. Lyon:

This firm represents AKB, LLC ("AKB"), whose principals are Bruce and Andy Brown, in connection with the above matter. AKB owns real property (the "AKB Property") that is one parcel removed from the proposed site of the Facility. For your convenience, we have enclosed a site map on which the AKB Property is marked.

In the early 1990s, AKB purchased property that is currently leased to American Tire Distributors, Inc. On October 21, 1993, AKB and other adjoining property owners entered into a Road Construction Agreement pursuant to which each of the owners agreed to allow the others ingress and regress over their respective parcels. The private road contained within the easement is referred to as "Northstar Drive," and crosses the AKB Property and two adjacent parcels owned by other private parties (collectively as the "Neighboring Parcels"). At the time, there was no intent whatsoever to open this private road to the public, or to endure the intensity and scope of use currently proposed by the City. For years, private funds have been used to maintain, improve, and secure the private road. The road leading to the AKB Property is gated and locked nightly and on the weekends. This has been AKB's practice for a very long time.

It has come to our attention that the City intends to use the private road over the AKB Property as the sole means by which all traffic will access the proposed Facility. Northstar Drive is the only means by which AKB, its tenant, and the owners of the Neighboring Parcels can access their parcels.

We have reviewed the City's application to the NCDENR for a permit to operate the Facility and found it noteworthy that the application makes no reference to several important facts. As noted above, the sole means of access to the Facility will be a private road over an easement crossing three privately owned parcels. Also, the proposed plans of the Facility show

October 13, 2006

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that a waterline is to be constructed within the private road; however, there is no easement for the provision of water service to the Facility. We are concerned that a facility such as the one proposed has no access to water. In addition, we have been unable to locate a signage easement over any of the Neighboring Parcels on which the City could place any of the necessary signs for the Facility described in Section .1406(8) of the City's permit application for the Facility.

Neither the City, Forsyth County nor the NCDENR conducted public hearings or otherwise sought the input of private citizens and neighboring property owners in connection with the planning and permitting of the Facility. In fact, our clients only learned of the proposed Facility by spotting a surveyor on AKB's property despite the fact that the City intends to open AKB's property to intense public traffic. At AKB's request, AKB did have a meeting with David Saunders, the director of the Winston-Salem/Forsyth County City/County Utilities Administration, on September 6, 2006 at which AKB expressed a number of concerns that AKB has with the proposed use of Northstar Drive by the Facility. At the meeting, AKB explained that the traffic on Northstar Drive will increase exponentially once the Facility is fully operational. This traffic will interfere with tractor trailers that use Northstar Drive to access and backup to the loading docks at the businesses located on the Neighboring Parcels. Remember, Northstar Drive is privately owned, and has been used in this manner for nearly 13 years. Those same tractor trailers will likely cause delays for vehicles seeking to access the Facility as they back up to the loading docks. In addition to the expected delays that the increased traffic will cause, there are obvious safety and liability concerns over the use by the public picking up mulch and other materials from the Facility of a small, private access road on which City trucks and commercial tractor trailers are hauling loads and backing up.

At the meeting with Mr. Saunders, AKB discussed a viable alternative to the use of Northstar Drive for access to the Facility over a three acre parcel of land located between the Facility and Forum Parkway. Approximately two hundred feet separate Forum Parkway from the parcel on which the Facility is located. Acquisition of the parcel by the City would also give the City the access it needs to construct a waterline for the Facility and post the necessary signage. AKB is familiar with the owner of that property and offered to discuss any proposals with the owners of that parcel and the Neighboring Parcels in an effort to obtain their cooperation. The City currently intends to expend a significant sum of money repairing and altering Northstar Drive, when this money could instead be used to purchase the parcel and then grade and pave a more suitable and direct means of access to the Facility that would also allow the City to satisfy all waterline and signage requirements for the Facility.

AKB's tenant has already expressed to AKB its concern over the increased traffic and resultant delays and safety/security concerns caused by the Facility and may seek to terminate its lease and vacate the property if the City continues with its current plan to use Northstar Drive. The concerns expressed by the current tenant would be shared by any prospective replacement tenant. As a result, AKB has legitimate worries that use of Northstar Drive as the sole means of

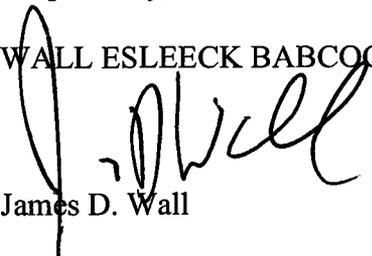
October 13, 2006
Page 3

access to the Facility will significantly damage, if not destroy, the commercial value of the AKB Property.

Please contact me at your earliest convenience to discuss this matter in greater detail. Thank you in advance for giving this matter your prompt attention.

Respectfully,

WALL ESLEECK BABCOCK LLP

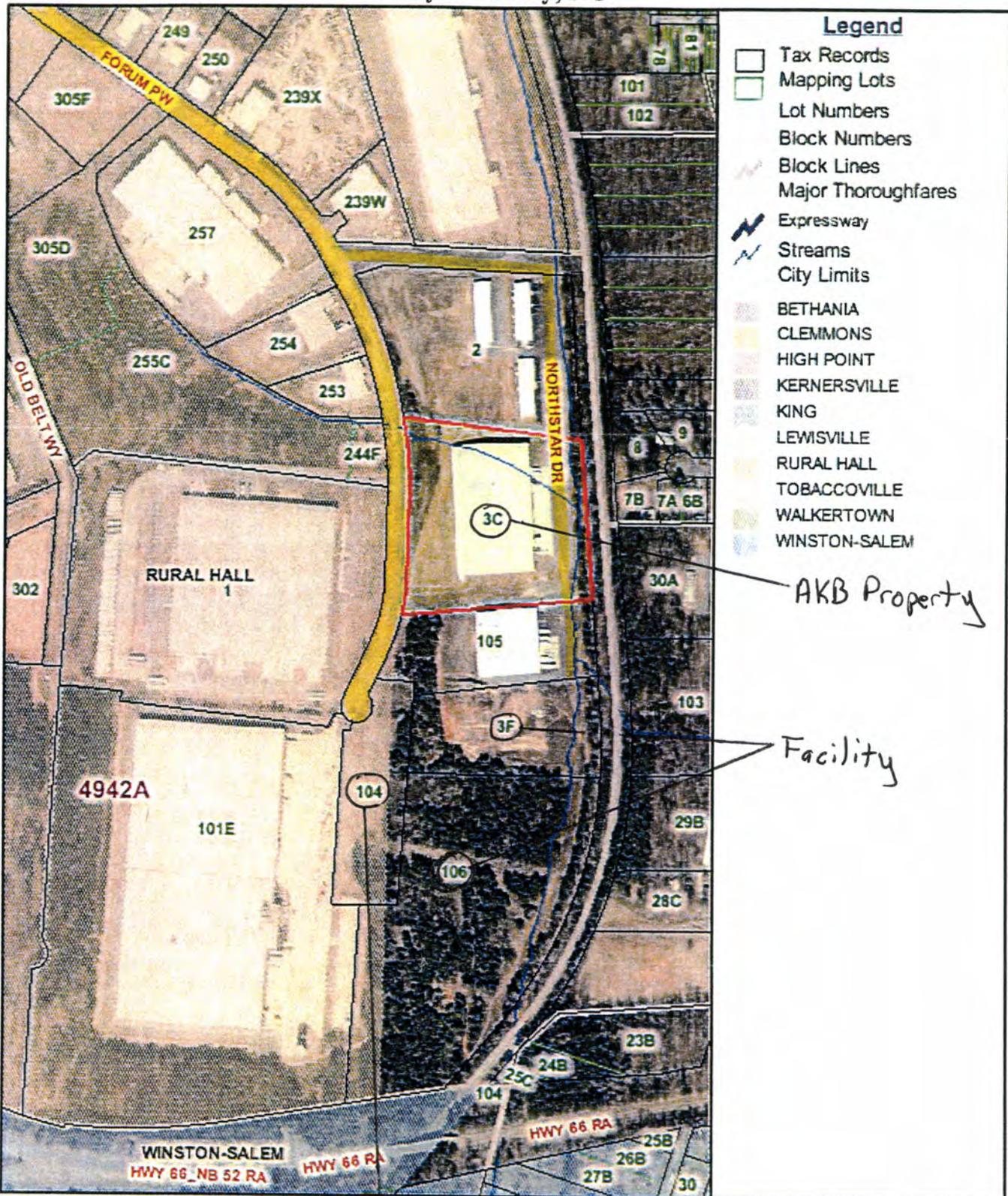

James D. Wall

Enclosure

cc: Mr. David Saunders (via email; w/enclosure)
Mr. Bruce Brown
Mr. Andy Brown

2288

Forsyth County, NC



Disclaimer: Forsyth County cannot guarantee the accuracy of this information, and the County hereby disclaims all warranties, including warranties as to the accuracy of this information.

Potential Access



James D. Wall
336-722-7200 Direct
jwall@webillp.com
www.webillp.com

August 23, 2006



Lee D. Garrity
City Manager, City of Winston-Salem
P.O. Box 2511
Winston-Salem, NC 27102-2511

Re: Proposed **Forum 52 Yard Waste Facility** (the "Facility") to be operated by the City of Winston-Salem (the "City")

Dear Mr. Garrity:

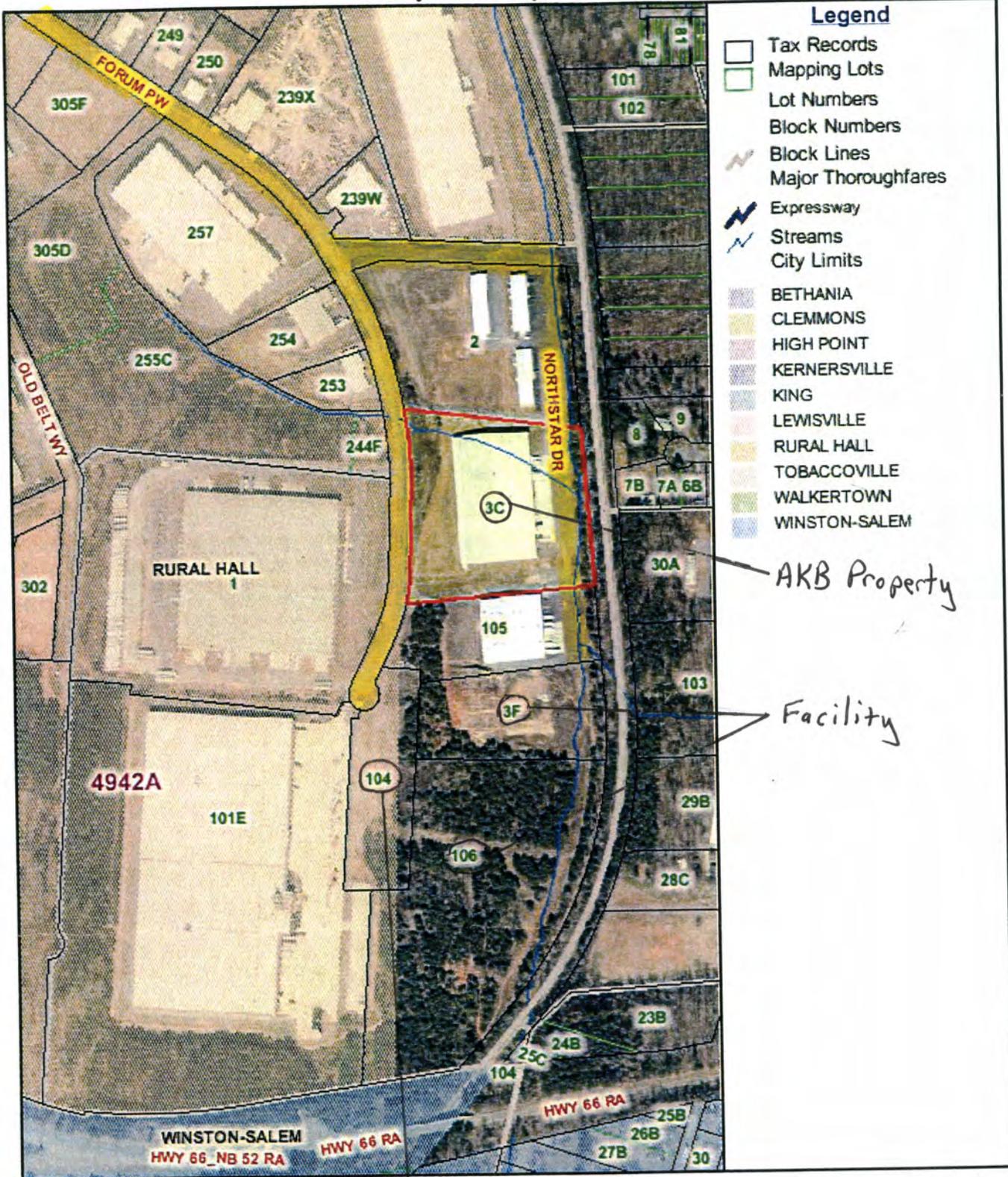
This firm represents AKB, LLC ("AKB"), whose principals are Bruce and Andy Brown, in connection with the above matter. AKB owns real property (the "AKB Property") that is one parcel removed from the proposed site of the Facility, which is to be located in Rural Hall. For your convenience, we have enclosed a site map on which the AKB Property is marked.

In the early 1990s, AKB purchased property that is currently leased to American Tire Distributors, Inc. On October 21, 1993, AKB and other adjoining property owners entered into a Road Construction Agreement pursuant to which each of the owners agreed to allow the others ingress and regress over their respective parcels. The private road contained within the easement is referred to as "Northstar Drive," and crosses the AKB Property and two adjacent parcels owned by other private parties (collectively as the "Neighboring Parcels"). At the time, there was no intent whatsoever to open this private road to the public, or to endure the intensity and scope of use currently proposed by the City. For years, private funds have been used to maintain, improve, and secure the private road. The road leading to the AKB Property is gated and locked nightly and on the weekends. This has been AKB's practice for a very long time.

It is our understanding that the City intends to use the private road over the AKB Property as the sole means by which all traffic will access the proposed Facility. Northstar Drive is the only means by which AKB, its tenant, and the owners of the Neighboring Parcels can gain access their parcels.

We have reviewed the City's application to the NCDENR for a permit to operate the Facility and found it noteworthy that the application made no reference to the fact that the sole means of access to the Facility will be a private road over an easement crossing three privately owned parcels. Because neither the City, Forsyth County nor the NCDENR conducted public hearings or otherwise sought the input of private citizens and neighboring property owners in connection with the planning and permitting of the Facility, AKB has not had the opportunity to express a number of concerns that AKB has with the proposed use of Northstar Drive by the

Forsyth County, NC



Disclaimer: Forsyth County cannot guarantee the accuracy of this information, and the County hereby disclaims all warranties, including warranties as to the accuracy of this information.

Map Scale
1 inch = 464 feet

Potential Access

Permit No. 34-23 Compost

June 24, 2005

Mr. Ted Lyon, Supervisor
North Carolina Department of Environment
and Natural Resources
Composting & Land Application Branch
1646 Mail Service Center
Raleigh, North Carolina 27699-1646

Re: Response to Comments
Forum 52 Yard Waste Facility Application
Forsyth County, North Carolina
HDR Project No. 00162-18088-018



Dear Mr. Lyon:

HDR Engineering, Inc. of the Carolinas (HDR) is hereby submitting, on behalf of the City of Winston-Salem Utilities Division (City), this response to comments made by NCDENR in a letter dated February 8, 2005. Specific responses to all of the comments have been provided in the order they were presented in the review letter. Comments made by NCDENR appear in bold with HDR responses in italics.

1. **A copy of the approval of the Erosion and Sediment Control Plan needs to be included in the application.**

The Erosion and Sediment Control Plan approval letter, dated January 7, 2005, is attached for inclusion in the Permit Application.

2. **A copy of a stormwater or other permit to address runoff from the facility or written documentation from the Division of Water Quality to indicate that a permit is not necessary.**

Attached is a memo detailing a phone conversation with NCDENR DWQ on May 25, 2005 and the email response from DWQ indicating that this facility "does not come under the jurisdiction of the DWQ's NPDES stormwater discharge permitting program, i.e. an NPDES stormwater discharge permit is not required." This decision was based on the agreement that upon completion of construction of the site the sediment traps will be removed and therefore eliminate any point source discharge. An agreement was also made to revise the permit application to disallow the use of fertilizer (i.e. manure, sludge, etc.).

- *Section .1405 Application Requirements for Solid Waste Compost Facilities (a)(7)(C) 2nd paragraph has been deleted from the permit application text.*
- *Section V Facility Operations (E)(1)(f) has been deleted from the Operations Plan.*

3. Actual distances to features addressed in .1404(a)(1)-(5). These distances may be measured off aerial photography where appropriate.

- .1404(a)(1) – 100-year Floodplain – This is shown on Drawing C-02, "Proposed Development Plan"
- .1404(a)(2) and (5) – 50-foot Property line buffer and 50-foot perennial stream/river buffer – These are shown on Drawing C-01, "Existing Site Plan"
- .1404(a)(3) and (4) – 200-foot residence buffer and 100-foot well buffer – The Aerial Map has been revised to show these distances. A replacement copy for the Permit Application is attached.

4. Portions of the application and the operation manual should be modified to indicate that engineered wood products will not be received at this facility.

The City intends to maintain the same operation as their Overdale site which includes the receipt of engineered wood products for processing and distribution as boiler fuel only. Please refer to page 6 of the Operations Plan, Section VI Process Narrative, 4th paragraph which describes the separate processing of engineered wood products and states "This material will become "Pallet Mulch" which will be distributed to area businesses as boiler fuel only."

5. More specific and consistent information should be provided in the application and in the operational manual as to the amount of time before high nitrogen wastes, such as grass clippings, are incorporated into windrows. "Within a reasonable amount of time" leaves too much room for interpretation that could lead to odor creation.

Based on the low volume of waste anticipated at this site and the fact that initially the Contractor will need to mobilize the grinder to the site each time it is used, the City will grind the grass clippings within one week of receipt on-site. Should odors become a problem the City will amend the operating procedure.

The permit application text Section .1405 Application Requirements for Solid Waste Compost Facilities (a)(7)(C) 1st paragraph has been edited to read "Grass must be ground within a week from the receipt on-site." In addition, the Operations Plan text has been edited to read "Grass clippings will be ground within a week from receipt on-site."

6. The proposed windrow size is generally considered too large and could result in spontaneous combustion problems.

When managed properly, the larger windrows are as safe as smaller windrows as evidenced by the City's successful operations at Reynolds Park Road and Overdale sites for years. In addition, the larger windrows allow the City to maximize the use of limited areas.

7. More detailed information should be provided on how windrows will be turned to provide maximum aeration.

Should the windrows need to be turned, a front-end loader will be available to scoop up the leaves and redeposit them in the windrow thereby creating adequate aeration.

- 8. Portions of the application indicate that temperatures will be measured daily at times. This should be modified unless temperatures are to be monitored on weekends.**

The text has been modified in Section .1405 Application Requirements for Solid Waste Compost Facilities (a)(7)(D) 2nd paragraph to read "The compost material should be monitored each business day....."

*The text has been modified in Section V Facility Operations (G)(1) and (2) to read "Internal temperature of the windrow will be taken and recorded approximately every two weeks after completion of the windrow at approximately 50 foot intervals along each windrow and increased to daily readings **during business hours** and recorded once internal temperatures near 131 °F."*

- 9. Procedures and frequency for inspecting runoff control structures should be explained in the operation manual.**

The sediment traps are temporary for construction only. Once all surfaces have been stabilized these structures will be removed and therefore will not require monitoring.

- 10. Information on the Proposed Development Plan indicating location of windrows, wastes, and products should be located on the Site Plan.**

The Site Plan has already been approved by NCDENR as part of the Erosion and Sedimentation Control Plan and is included in the Permit Application documents for reference purposes only.

If you have any questions or comments concerning the information summarized in this letter or on the enclosures, please do not hesitate to contact me at (704) 338-6700.

Sincerely,

HDR Engineering, Inc. of the Carolinas



Michael D. Plummer, PE
Project Manager

MDP/jvd

Enclosures

cc: Edward L. Gibson, City of Winston-Salem w/enclosures (2)
Mike Cooke, Wrico Equipment Corporation w/enclosures

North Carolina
Department of Environment and Natural

Michael F. Easley, Governor
William G. Ross, Secretary

James D. Simons, P.G., P.E., Director
And State Geologist



WINSTON-SALEM REGIONAL OFFICE
DIVISION OF LAND RESOURCES
LAND QUALITY SECTION

January 7, 2005

LETTER OF APPROVAL WITH MODIFICATIONS

City of Winston Salem
Forsyth County Utilities Commission
P.O. Box 2511
Winston Salem, NC 27102



Dear Sir or Madam:

This office has reviewed the subject erosion and sedimentation control plan and hereby issues this letter of approval with modifications. A list of the modifications is attached. This plan approval shall expire three (3) years following the date of approval, if no land-disturbing activity has been undertaken, as is required by Title 15A NCAC 4B .0029. Should the plan not perform adequately, a revised plan will be required (G.S. 113A-54.1 (b)).

Please be advised that Title 15 NCAC 4B.0018 (a) requires that a copy of the approved erosion control plan be on file at the job site. Also, you should consider this letter to give the notice required by GS 113A-61.1 (a) of our right of periodic inspection to insure compliance with the approved plan.

North Carolinas Sedimentation Pollution Control Program is performance-oriented, requiring protection of existing natural resources and adjoining properties. If, following the commencement of this project, it is determined that the erosion and sedimentation control plan is inadequate to meet the requirements of the Sedimentation and Pollution Control Act of 1973 (North Carolina General Statute 113A-51 through 66), this office may require revisions to the plan and implementation of the revisions to insure compliance with the Act.

Acceptance and approval of this plan is conditioned upon your compliance with Federal and State water quality laws, regulations, and rules. In addition, local city or county ordinances or rules may also apply to this land-disturbing activity. This approval does not supersede any other permit or approval.

585 Waughtown Street, Winston-Salem, North Carolina 27107-2241

Phone: 336-771-4600 \ FAX: 336-771-4631 \ Internet: www.enr.state.nc.us/ENR/

AN EQUAL OPPORTUNITY \ AFFIRMATIVE ACTION EMPLOYER - 50% RECYCLED / 10% POST CONSUMER PAPER

LETTER OF APPROVAL WITH MODIFICATIONS – Forum 52 Yard Waste Facility

January 7, 2005

Page 2

Please note that all land disturbing activities over one acre in size are covered by the enclosed general stormwater permit NCGO1000 (Construction Activities). You should first become familiar with all of the requirements for compliance with the enclosed general permit.

Please note that this approval is based in part on the accuracy of the information provided in the Financial Responsibility Form, which you have provided. You are requested to file an amended form if there is any change in the information included on the form. In addition, it would be helpful if you notify this office of the proposed starting date for this project. Please notify us if you plan to have a preconstruction conference, and we will plan to attend.

Your cooperation is appreciated, and we look forward to working with you on this project.

Sincerely,



Brooks Cole, C.P.E.S.C.
Assistant Regional Engineer

BC/lb

Enc: Certificate of Approval With Modifications
NPDES

cc: HDR Engineering
Water Quality – Daryl Lamb
WSRO File

LETTER OF APPROVAL WITH MODIFICATIONS – Forum 52 Yard Waste Facility

January 7, 2005

Page 3

PROJECT NAME:	Forum 52 Yard Waste Facility
COUNTY:	Forsyth
RIVER BASIN:	Yadkin
WATER CLASSIFICATION:	Other
FACILITY NUMBER:	Forsy 2005-025
SUBMITTED BY:	HDR Engineering
RECEIVED BY L.Q.S.:	December 13, 2004

NEW SUBMITTAL (X)

MODIFICATIONS

This plan is approved with the following modifications:

1. All silt fencing and limits of disturbance must be installed such that a minimum 15' undisturbed buffer is maintained between all measures and the top of the bank for grassey creek closest to the project.

CERTIFICATE OF PLAN APPROVAL



The posting of this certificate certifies that an erosion and sedimentation control plan has been approved for this project by the North Carolina Department of Environment and Natural Resources in accordance with North Carolina General Statute 113A - 57 (4) and 113A - 54 (d) and North Carolina Administrative Code, Title 15A, Chapter 4B.0107 (c). This certificate must be posted at the primary entrance of the job site before construction begins and until establishment of permanent groundcover as required by North Carolina Administrative Code, Title 15A, Chapter 4B.0127 (b).

Forum 52 Yardwaste Facility

Project Name and Location

Forsy - 2005 - 025

Dwight Cole

1-7-05

Date of Plan Approval

w/mods.



Assist.

Regional Engineer

Plummer, Michael

From: Ken Pickle [ken.pickle@ncmail.net]
Sent: Thursday, May 26, 2005 9:11 AM
To: Plummer, Michael
Cc: Rose Pruitt; Bradley Bennett; Bethany Georgoulas
Subject: Re: Forum 52 Yardwaste

Mike,

Thanks for providing written notes on our discussion about Winston-Salem's proposed mulching and composting facility on Forum Parkway.

Based on my review of the reduced site plan you sent me, and based on your description of site conditions over the phone, and based on the final removal of the sediment traps once construction is complete and final regrading to remove the two sediment trap outlets, and based on your description of spreading the flow from the 24"RCP, I concur that it appears that upon completion of construction your site will not have a point source discharge of stormwater. If there will be no point source discharge as you assert in your 5/25/05 memo to me, then the facility does not come under the jurisdiction of the DWQ's NPDES stormwater discharge permitting program, i.e. an NPDES stormwater discharge permit is not required.

Please note that if at any time after construction a point source discharge of stormwater occurs, the facility would be in violation of the Clean Water Act by discharging without a valid permit. The facility would be subject to enforcement action and significant monetary penalties.

Please contact me with any additional questions.

Ken Pickle
Stormwater Permitting Unit, DWQ
(919) 733-5083 x 584

Plummer, Michael wrote:

> Ken,
>
> Attached is a memo documenting our phone conversation today. Please
> let me know if you want to see any changes.
>
> In response to your voicemail about the wetlands; we met with both DWQ
> and the Corp to delineate the wetlands. We based our design to avoid
> impacting the wetlands and therefore were told that we didn't need to
> permit anything. I can get you contact names if you need them.
>
> Thanks for your assistance,
>
> Mike
>
> <<20050525 MDP Memo to Ken Pickle.doc>>
>

To: Ken Pickle w/ NCDENR	
From: Mike Plummer	Project: Forum 52 Yardwaste Facility
CC: Ed Gibson w/ City of Winston-Salem	
Date: 5-25-05	Job No:

RE: Forum 52 Stormwater Permitting Phone Conversation

This memo is to document our telephone conversation on May 25, 2005 about the proposed Winston-Salem Forum 52 Yardwaste Facility. We discussed the three main topics listed below:

1. **Point Source Discharge** – As discussed the temporary sediment traps shown on drawing C-02 “Proposed Development Plan”, are strictly for sediment and erosion control during construction. Once the site has been stabilized via grass, stone, or pavement these features will be removed and regraded to the original contours thus eliminating a point source discharge. In addition, the 24-inch drainage pipe in the center of the property will have an oversized outlet apron to aid in the dispersion of flow.
2. **Removal of Trees** – We discussed the impact to runoff from clearing the wooded area. It was agreed that the potential for greater runoff is possible although the existing conditions are on very steep slopes and by creating large flat areas we will interrupt the direct flow and provide some minor retention thereby lessening any impacts.
3. **Composting Process** – Mr. Pickle asked about the use of fertilizer (i.e. manure, sludge, etc.) in the composting process as well as the wetting process. The City of Winston-Salem currently has two yardwaste facilities in operation in which they have never used fertilizer and they will modify the Permit Application for this facility to not allow the use of fertilizer. There will be a fire hydrant onsite for wetting the compost pile although in the experience with the other two facilities this will happen infrequently and in most instances is for dust control.

FORUM 52 YARD WASTE FACILITY

PERMIT APPLICATION

CITY/COUNTY UTILITY COMMISSION
WINSTON-SALEM, NORTH CAROLINA



APPROVED
DIVISION OF WASTE MANAGEMENT
SOLID WASTE SECTION
DATE 7/26/05 BY JL

PREPARED BY:

HDR ENGINEERING, INC. OF THE CAROLINAS
128 S. TRYON STREET, SUITE 1400
CHARLOTTE, NORTH CAROLINA 28202

HDR Project No. 0162-18088-018

HDR

December 2004



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Appendices

- A. Related Correspondence
 - Letter from Lanny Gough, Zoning Code Enforcement Supervisor
 - Deed for Tax Block 4942A, Tax Lot 102C and a portion of 101C
 - Erosion and Sedimentation Control Plan
 - Wetland Delineation
 - Hand Auger Letter report
 - DWQ letter from Beth Morton

- B. Operations Plan
 - Operations Plan
 - Emergency Action Plan
 - Compost Monitoring Report Form
 - Handout for the Product

- C. Drawings
 - Aerial Map
 - Existing Site Plan
 - Proposed Development Plan
 - Yard Waste Flow Diagram
 - Leaf Processing Area Flow Diagram

Background

This Permit Application was prepared by HDR Engineering, Inc. of the Carolinas (HDR) on behalf of the City/County Utility Commission of Winston-Salem, North Carolina (City), for the Forum 52 Yard Waste Facility (Facility) located on Northstar Drive in Forsyth County, NC.

The City is proposing to open a yard waste facility on the northern side of Winston-Salem to allow better management of their yard waste collection services. The existing yard waste facility on Overdale Road will remain in operation. This new facility is intended to serve areas of the City scheduled for annexation in July 2005.

This Permit Application was prepared in accordance with North Carolina Solid Waste Rule 15A NCAC 13B Section .1400.

In accordance with Rule .1402 (f)(i), this Facility will receive only yard waste, silviculture waste, untreated and unpainted wood waste, or any combination thereof. Therefore, the Facility will be designated as a Type 1 Facility.

General

The waste stream for this Facility will come primarily from City curbside pickup, landscaping companies, local industry, and private citizens. The facility is sized to handle 40,000 tons per year of yard waste, pallets and woody waste, and grass clippings in addition to 21,000 cubic yards of leaves. Some of the waste stream will originate from newly annexed areas of Winston-Salem and some will be diverted from the existing facility on the south side of the City. That facility processed approximately 30,000 tons of yard waste in fiscal year 2003-2004.

The operation and management of this facility may be contracted to an independent company. The City will maintain personnel to operate the scale onsite. The anticipated operating schedule for this Facility will be open from 7:00 a.m. to 5:00 p.m. Monday through Friday, and 8:00 a.m. to 4:00 p.m. on Saturday, however, this schedule may change to meet the City's needs. The site will accept yard waste, limbs, brush, leaves, grass clippings, and other similar debris. Tree stumps are not expected to be processed at this facility due to the contamination that the soil within the stump would cause to the final product. Untreated and unpainted wood, such as shipping pallets, will also be accepted.

Finished products will include mulch and compost, soil amendment (composted leaves and grass clippings), and boiler fuel (pallets and woody waste). The public will be able to acquire the mulch and compost products during hours of operation on a per cubic yard basis. The untreated, unpainted product will be processed and delivered to several industrial plants to be used as fuel.

Process Narrative

The purpose of this narrative is to provide additional operational details of the Facility. Refer to the Proposed Development Plan and Process Flow Diagrams in Appendix C.

Incoming waste managed at the Facility will include curbside collected yard waste from the City, materials dropped off by the general public, yard waste, pallets, and materials such as untreated, unpainted wood waste from processing plants disposed by private companies, and storm debris. A City staff person will manage the scale area where the material is weighed. The scale attendant will confirm the material make-up of the load and direct the customer to one of three locations. Yard waste and other woody waste will be dumped in the waste receiving area. Pallets and other untreated, unpainted wood will be maintained in a separate pile in the waste receiving area. Leaves and grass clippings will be received in the leaf processing area near the grinder/shredder.

The yard waste, pallets, woody waste, and other untreated, unpainted wood will be processed through the hammermill. Yard waste will generally be processed separately from the other materials. As the yard waste is processed through the hammermill, a radial stacker (conveyor) will be operated to create a stockpile area for the mulch. The mulch product will be managed in bulk piles and then offered to the general public (who will pick up the material on-site).

The pallets, woody waste (such as large tree limbs), and unpainted, untreated wood will be processed separately through the hammermill. Again, the radial stacker will be used to develop a stockpile of processed material. The "pallet mulch" will then be hauled to area businesses for use as a boiler fuel.

When the hammermill is in operation, the loader operators will visually screen the material for contaminants. Contaminants include materials which are not accepted at the facility but were not discovered by the scale attendant, or materials which would harm the equipment. Unacceptable waste includes material such as construction demolition waste, painted wood, metal, and large stumps from land-clearing operations. The "reject" material will be stockpiled in the waste receiving area and hauled to the City's landfill.

Leaves and grass clippings which arrive on-site will be processed through a grinder located in the leaf processing area. Sometimes a small quantity of yard waste may be mixed with the leaves and grass clippings to avoid jamming the tub grinder with the finer materials. Processed material from the grinder has two potential end uses. It may be taken from the grinder/shredder and sold as a soil amendment to a local business or it may be composted. If composted, the compost windrows will be turned. After the compost process has been completed, the finished compost product will be made available to the public or delivered to area customers.

Application Format

This application has been prepared in accordance with Section .1400 of the North Carolina Solid Waste Management Rules. In order to facilitate review of this application, the format precisely follows the structure of the Section .1400 Rules. The following subsections of Section .1400 are restated in their entirety:

- .1404 Siting/Design Requirements for Solid Waste Compost Facilities.
- .1405 Application Requirements for Solid Waste Compost Facilities.
- .1406 Operational Requirements for Solid Waste Compost Facilities.

Responses to each item are shown in *Italics*.

.1404 Siting/Design Requirements for Solid Waste Compost Facilities

- (a) A site shall meet the following requirements at the time of initial permitting and shall continue to meet these requirements throughout the life of the permit only on the property owned or controlled by the applicant or by the landowner(s) at the time of permitting:

- (1) A site located in a floodplain shall not restrict the flow of the 100-year flood; reduce the temporary storage capacity of the floodplain; or result in washout of solid waste so as to pose a hazard to human life, wildlife, land or water resources;

The site operations are not located within the 100-year floodplain. This was determined by looking at the FEMA Map dated February 29, 1996, for Forsyth County, North Carolina.

- (2) A 100-foot minimum buffer is required between all property lines and compost areas for Type 3 and 4 facilities, 50-foot for Type 1 or 2 facilities;

The Facility will maintain more than the 50-foot buffer between all property lines and compost areas as required for Type 1 facilities. Please refer to the Proposed Development Plan in Appendix C.

- (3) A 500-foot minimum buffer is required between compost areas and residences or dwellings not owned and occupied by the permittee, except that Type 1 and Small Type 2 and 3 facilities shall have a 200-foot minimum buffer;

There are no dwellings or residences within 200 feet of the Facility.

- (4) A 100-foot minimum is required between all wells and compost areas, except monitoring wells;

There are no wells within 100 feet of the Facility.

- (5) A 50-foot minimum buffer is required between perennial streams/rivers and compost areas;

There are no streams within 50 feet of the Facility. Please refer to the Existing Site Plan in Appendix C.

- (6) A compost facility shall be located in accordance with 15A NCAC 2B .0200, Classification and Water Quality Standards Applicable to Surface Waters in North Carolina;

According to the NCDENR Water Quality Division in Winston-Salem, NC, the Facility is located within a Class C watershed, which is a non-critical watershed. This site drains to Grassy Creek.

- (7) All portions of any compost facility located over a closed-out disposal area shall be designed with a pad adequate to protect the disposal area cap from being disturbed, as defined in Part (a)(10)(E) of this Rule, and there shall be no runoff from the pad onto the cap or side slopes of the closed-out area;

The compost area will not be located over a closed-out disposal area.

- (8) A 25-foot minimum distance is required between compost areas and swales or berms to allow for adequate access of firefighting equipment;

A 25-foot buffer will be maintained around the windrows to allow adequate access for fire fighting equipment. Please refer to the Proposed Development Plan in Appendix C.

- (9) A site shall meet the following surface water requirements:

- (A) A site shall not cause a discharge of materials or fill materials into waters or wetlands of the state that is in violation of Section 404 of the Clean Water Act;

HDR personnel have delineated wetland areas across this property. The site plan identified wetland locations agreed upon with the Corp of Engineers and the North Carolina Department of Water Quality (DWQ) in an onsite meeting on November 16, 2004. HDR is currently working through a process with the North Carolina 401 Water Quality Certification Unit to permit the minor impact shown on the Existing Site Plan. Approximately 24 feet of isolated stream channel will be impacted by the leaf processing area.

In addition, HDR has submitted an Erosion and Sedimentation Control Plan to the North Carolina Department of Environment and Natural Resources (NCDENR) Land Quality Division for approval. The erosion and sedimentation control plan was designed to prevent the discharge of materials or fill materials into waters or wetlands of the State.

- (B) A site shall not cause a discharge of pollutants into waters of the state that is in violation of the requirements of the National Pollutant Discharge Elimination System (NPDES), under Section 402 of the Clean Water Act; and

The Facility will not directly discharge runoff by pipes, ditches, or channels, nor will the site generate additional water for the processing of

the waste. According to the DWQ in Winston-Salem, NC, NPDES permits are required for manufacturing operations and operations that have a conveyance to waters of the state. DWQ ruled that Winston-Salem's Overdale Yard Waste Facility operation is not defined as a manufacturing operation nor does it have conveyance to waters of the state. Therefore, that site does not meet the definitions required to obtain an NPDES permit and does not violate any NPDES requirement. Since the Forum 52 facility is the same in design and operation as the Overdale Facility, HDR would expect the same ruling to apply.

Please refer to Appendix A for correspondence with DWQ dated December 9, 1998.

- (C) A site shall not cause non-point source pollution of waters of the state that violates assigned water quality standards;

The Facility generally drains to the east side of the site into two temporary sediment traps which is considered a Best Management Practice (BMP). The Facility should not cause non-point pollution.

- (10) A site shall meet the following groundwater requirements:

- (A) A site shall not contravene groundwater standards as established under 15A NCAC 2L;

No specific information regarding groundwater quality exists for the site (there are no groundwater monitoring wells). However, based on the materials to be managed at the site, no groundwater impacts are expected. Additionally, the mulch and boiler fuel processing areas will be paved.

- (B) Portions of a site used for waste receipt and storage, active composting, and curing shall have a soil texture finer than loamy sand and the depth to the seasonal high water table shall be maintained at least 12 inches for a Type 1 or 2 facility and 24 inches for a Type 3 facility, unless pad is provided;

The waste receiving area and load-out area will be paved. The leaf processing area shall have a soil texture finer than loamy sand. Based on site topography, depth to seasonal high groundwater exceeds 12 inches. Please refer to Appendix A for a field hand auger report to verify groundwater on site and geology.

- (C) A pad shall be provided for portions of a Type 4 facility used for waste receiving and storage, active composting, and curing;

Not required for a Type 1 Facility.

- (D) A pad is not required for storage of finished product that is dried so as to pass the Paint Filter Liquids Test (EPA Method 9095), and for which the storage area is prepared in such a manner that water does not collect around the base of the stored material, and where the depth to the seasonal high water table is maintained at least 12 inches; and

Not required for a Type 1 facility.

- (E) The liner coefficient of permeability of pads required in accordance with this Rule shall not be greater than 1×10^{-7} centimeters per second. If natural soils are used, the liner must be at least 18 inches thick.

Not required for a Type 1 facility.

- (b) For Subparagraphs (a)(2) through (a)(4) and Part (a)(10)(B) of this Rule (dependent upon waste type, facility design, and regional topography), alternative minimum buffers or requirements may be increased if deemed necessary by DWQ in order to protect public health and the environment or to prevent the creation of a nuisance.

- (c) A site shall meet the following design requirements;

- (1) A site shall not allow uncontrolled public access;

There will be a gated entrance into the site, which will be locked when the Facility is closed each day.

- (2) A site shall meet the requirements of the Sedimentation Pollution Control Law (15A NCAC 4);

The site will be operated in accordance with NCDENR Sedimentation Pollution Control Laws.

- (3) A site shall meet the requirements of the Air Pollution Control Requirements (15A NCAC 2D) to minimize fugitive emissions and odors; and

When processing dry waste, water can be added at the hammermill processing area to reduce fugitive dust.

- (4) A site shall be designed to minimize odors at the property boundary.

Static piles and windrows will be turned in an effort to minimize odors.

.1405 Application Requirements for Solid Waste Compost Facilities

- (a) The following information is required for an application for a permit to construct and operate a proposed Type 1 or a Small Type 2 or 3 solid waste compost facility, unless the permitting requirements are exempted by Paragraph (g) of Rule. 1402 of this Section;

This Facility will receive yard, untreated, and unpainted wood waste and any combination thereof. Therefore this application addresses a Type 1 Solid Waste Compost facility.

- (1) An aerial photograph or scaled drawing, where 1 inch is less than or equal to 400 feet, accurately showing the area within 1/4 mile of the proposed site's boundaries with the following specifically identified:

Refer to the Aerial Photograph in Appendix C.

- (A) Entire property owned or leased by the person proposing the Facility;

Refer to the map of the entire property owned by the City of Winston-Salem in Appendix C.

- (B) Location of all homes, wells, industrial buildings, public or private utilities, roads, watercourses, dry runs, and other applicable information regarding the general topography within 500 feet of the proposed facility; and

Refer to the Aerial Photograph map in Appendix C.

- (C) Land use zoning of the proposed site.

Refer to the zoning map in Appendix A.

- (2) A letter from the unit of government having zoning jurisdiction over the site which states that the proposed use is allowed within the existing zoning, if any, and that any necessary zoning approval or permit has been obtained.

Refer to the letter (located in Appendix A) from the City of Winston-Salem Inspections Division stating that the property is zoned General Industrial (GI), and that the land use is consistent with the zoning.

- (3) An explanation of how the site complies with siting and design standards in Rule .1404 of this Section.

Refer to Section .1404 responses above.

- (4) A detail report indicating the following:
- (A) Waste type(s), source and estimated quantity of the solid waste to be composted, including the source and expected quantity of any bulking agent or amendment (if applicable), any expected recycle of bulking agent or compost, and any seasonal variations in the solid waste type or quantity; and

The types of waste that enter the Facility will include yard waste, leaves, grass clippings, tree parts, shipping pallets, and some unpainted, untreated wood such as scraps from building truss fabrications.

The amount of yard waste, pallets, and woody waste that can be processed through the site is based on the City's experience with their Overdale Yard Waste Facility which is very similar in size to Forum 52. Under normal operating conditions the facility is estimated to process approximately 40,000 tons per year of yard waste, pallets and woody waste, and grass clippings in addition to approximately 21,000 cubic yards of leaves per year.

This total is broken up into the following categories:

*Tree parts/yard waste (curbside brush)
Shipping pallets and unpainted/untreated wood
Grass clippings
Leaves*

The yard waste will come to the site primarily from curb-side pickup, landscape companies, and private citizens. Unpainted, untreated wood waste (such as pallets) will come from local industry.

No specific bulking agents are expected to be used.

Typical seasonal variations are expected to be experienced at the site for leaves, grass, clippings, etc.

- (B) For facilities that utilize natural soils as a pad, a soil evaluation of the site conducted by a soil scientist down to a depth of 4 feet, or to bedrock or evidence of a seasonal high water table, to evaluate all chemical and physical soil properties and depth of the seasonal high water table.

HDR conducted a hand auger survey by a licensed geologist to evaluate the soil properties and groundwater elevation onsite. Based on a visual classification, a red brown clayey silt was encountered across the site to a depth of 4 to 7 feet. Based on the hand auger results being dry and the majority of the composting area being on structural fill, HDR would anticipate the depth to the estimated seasonal high water table shall be greater than one (1) foot.

- (5) Site plan at a scale where 1 inch is less than or equal to 100 feet to the inch that delineates the following:

- (A) Existing and proposed contours, at intervals appropriate to the topography;

Please refer to the Existing Site Plan in Appendix C.

Please refer to .1405 (a)(5)(B) for site drainage patterns.

- (B) Location and elevations of dikes, trenches, and other water control devices and structures for the diversion and controlled removal of surface water;

Please refer to the Erosion and Sedimentation Control Plan in Appendix A.

- (C) Designated setbacks and property lines;

Please refer to the site map found in Appendix C.

- (D) Proposed utilities and structures; and

Please refer to the site map found in Appendix C.

- (E) Areas for unloading, processing, active composting, curing, and storing of material.

Please refer to the site map found in Appendix C.

- (6) A description of the operation of the Facility, which must include at a minimum:

- (A) Name, address and phone number for the person responsible for the operation of the Facility;

Physical address of the site:

*0 Northstar Drive
Forsyth County, NC 27045*

Property Owner and City Contact:

*Ms. Jan McHargue
Solid Waste Administrator
City of Winston-Salem
Public Works Department
P.O. Box 2511
Winston-Salem, NC 27102
(336) 747-7310*

(B) List of personnel required and the responsibilities of each position;

The following is a list of required personnel and their responsibilities:

<u>Personnel</u>	<u>Responsibility</u>
<i>Operations Manager</i>	<i>Operation of the Facility</i>
<i>Scale House Attendant</i>	<i>Inspect incoming waste and record incoming waste weight (City employee)</i>
<i>Loader Operators (2-4)</i>	<i>Oversee waste processing and load shredded waste in public vehicles</i>
<i>Truck Driver (1)</i>	<i>Deliver shredded waste to industry</i>

(C) Operation plan for the Facility;

The Operations Plan for the Facility can be found in Appendix B.

(D) Special precautions or procedures for operating during wind, heavy rain, snow, freezing, or other adverse conditions;

Refer to the Operations Plan in Appendix B.

(E) A description of actions to be taken to minimize noise, vectors, air borne particulates, and odors; and

The site is located within a lightly developed industrial area. The noise generated at the site from equipment engines and electric motors will be typical of other neighboring industries. No residential communities adjoin the property. The Facility will operate during daylight hours, which will further minimize noise complaints.

The windrows should be placed with the slope to allow free drainage between the windrows and to maintain proper moisture content. Please refer to the site map on page 5 for an approximate layout of the windrows. In the event odor becomes a problem with the compost, several measures could be taken to minimize the odor. The windrows could be turned or ground leaves could be incorporated into the windrows. The windrows would be turned using the on-site front-end loader. Another method to control odor would be to cover the compost with more mature compost that would act as a biofilter.

There is little, if any, odor associated with mulch. In the event odor does become a problem with the mulch, the mulch should be turned using the front-end loader.

In order to minimize airborne particulates of either the compost or mulch, the material can be sprayed with water at the grinder or at the Hammermill. In addition, an effort will be made to minimize grinding during windy conditions.

- (F) A description of the ultimate use for the finished compost, method for removal from the site, and a contingency plan for disposal or alternative usage of residues or finished compost that cannot be used in the expected manner due to poor quality or change in market conditions.

Leaves and grass clippings will be composted to give away, sell, or use in-house by the City. In addition, uncomposted leaves may be diverted to other permitted compost facilities.

Yard waste, pallets, and woody waste will be ground into Fine and Coarse mulch to be given away, sold or used by the City.

The City will have the ability to direct wastes to other City owned facilities to manage the operation of this facility.

- (7) A report on the design of the Facility, including:

- (A) Design capacity of the Facility;

Under normal operating conditions, this facility will process approximately 40,000 tons per year of yard waste, pallets, woody waste and grass clippings and approximately 21,000 cubic yards of leaves.

In addition, the Facility will operate the electrical machines on off-peak power usage time. To accommodate occurrences of above normal waste and product levels, operating hours will be extended until the level of

waste and product are returned to normal. The capacities of the major equipment used are listed below:

*Hammermill – 50-70 tons/hr
Horizontal grinder – 50 tons/hr*

- (B) A process flow diagram of the entire Facility, including the type, size, and location of all major equipment, and feedstock flow streams. The flow streams shall indicate the quantity of materials on a wet weight and volumetric basis;

Incoming material will be separated into four categories, grass, leaves, tree parts, and pallets. Each category will be recorded on a tonnage basis with the exception of leaves which will be recorded on a per cubic yard basis. Outgoing material will be sold on a weight basis for mulch and compost and on a volume basis for boiler fuel. The annual outgoing tonnage for each material type is to be reported to NCDENR.

Refer to the process flow diagrams found in Appendix C. The Yard Waste Flow Diagram depicts the flow of yardwaste, pallets, woody waste, and grass clippings. The Leaf Processing Flow Diagram depicts the flow of the leaves.

- (C) The means for measuring, shredding, mixing, and proportioning input materials;

Grass must be ground within a week from receipt on-site. Should odors from the grass clippings become a problem, the grass will be ground immediately. If enough material is available, leaves and grass will be ground together at a ratio of approximately 3 lbs. of leaves to 1 lb. of grass.

- (D) Anticipated process duration, including receiving, preparation, composting, curing, and distribution;

From the time the material arrives on-site to the time it leaves will be generally short, except for the compost material. In the event of an ice or windstorm, unprocessed material may remain for up to two months.

When composting is initially performed at this Facility, the compost material should be turned so that the internal temperature remains at or

above 55 degrees Celsius (131 degrees F) for three days. The compost material should be monitored each business day throughout the composting process in order to ensure that the temperature requirement is being fulfilled and to establish a timeline for the process. After the temperature requirement is met, the temperature of the material does not need to be monitored. Once the timeline is determined, the monitoring can be performed less frequently.

- (E) A description of the location of all temperature, air, and any other type of monitoring points, and the frequency of monitoring;

When composting is initially performed at this site, monitoring should be performed as stated in .1405(a)(7)(D). Temperature should be checked at every 50 feet of compost windrow. Once it is determined that the temperature requirement is being met, the temperature can be monitored less frequently. Monitoring should be recorded using the form (or similar) found in Appendix A.

Temperature of the mulch and boiler fuel will not be monitored or recorded at this Facility. If the material is not completely removed in a short amount of time, a staff member will visually inspect and estimate the temperature of the material. If the mulch is hot or steam is coming from the pile, the mulch will be turned using the on-site front-end loader. If the mulch or boiler fuel is not heating up, there is no need for it to be turned.

- (F) A description of how the temperature control and monitoring equipment will demonstrate that the Facility meets the requirements in Rule .1406 Items (10), (11), or (12) of this Section, as appropriate for the feedstock;

Please refer to .1405(7)(E).

- (G) The method of aeration provided and the capacity of aeration equipment; and

When composting is performed at this Facility, the windrows will be turned using equipment such as a front-end loader.

- (H) A description of the method to control surface water run-on and run-off; and the method to control, collect, treat, and dispose of leachate generated.

The surface water flows generally from the west side of the site to the east toward Grassy Creek.

- (8) A description of the label or other information source that meets the requirements of Rule .1407(k) of this Section.

This is a Type 1 facility and we expect it to produce a product suitable for public distribution. The product may be distributed to the public in an unlimited and unrestricted manner provided the product is free from offensive odor and does not contain sharp particles that would cause injury to those handling the product. A handout will be made available to the public at the scale house. The handout will contain the information as required in .1407(g). Please refer to Appendix B for the handout.

- (9) Plans and specifications for the Facility, including manufacturer's performance data for all equipment selected.

The following is an example list of the equipment used at this type of facility:

*7' x 36' chain conveyor
20' x 7' vibrating feeder
Arasmith 50" x 86" horizontal salvage hog
West-Salem 40" x 64" Hammermill
Radial stacker conveyor
84" x 36" stacking belt conveyor
Barlo 160D double boom loader
JD 644G wheel loader with 10 cy bucket
Kenworth truck-tractor
(1) 44' open top trailers
(1) 45' walking floor trailers
International dump truck, 24 cy body
CB1 4000 HZ portable grinder/shredder
Ford 445C wheel loader
Innovator 7221 trommel screen
Wildcat 750 windrow turner
(2) 624H John Deere wheel loaders (1 with bush forks, and 1 with a loadout bucket)*

- (10) A detailed operation and maintenance manual outlining:
- (A) A quality assurance plan for the process and final product which lists the procedures used in inspecting incoming material, monitoring, sampling and analyzing the compost process and final product, test schedule, and record keeping requirements;
 - (B) Contingency plans detailing corrective or remedial action to be taken in the event of equipment breakdown; non-conforming waste delivered to the Facility; spills, and undesirable conditions such as fires, vectors and odors; and

- (C) An explanation of how the Facility will comply with operational requirements as outlined in Rule .1406 of this section, detailed operational information and instruction, an outline of reports to be submitted in compliance with this section, and safety instructions.

Please refer to Appendix B for the Operations Plan.

- (11) As-built drawings where applicable.

Not available for this site.

.1406 Operational Requirements for Solid Waste Compost Facilities

Any person who maintains or operates a solid waste compost facility shall maintain and operate the site to conform with the following practices:

(1) Plan and Permit Requirements:

- (A) Construction plans and conditions of permit shall be followed; and

The construction plans and the conditions of the permit shall be followed.

- (B) A copy of the permit, plans, and operational reports shall be maintained on-site at all times.

A copy of this approved permit, plans, and operational reports will be maintained on-site at all times.

- (2) Adequate erosion control measures shall be practiced to prevent on-site erosion and to control the movement of soil or contaminants from the site.

The facility will adhere to the NCDENR approved erosion and sedimentation control plan.

- (3) Surface water shall be diverted from the operational, compost curing, and storage areas.

Diversion berms on channels will be located at the top of sloped to prevent run-on into the working area. Storm water that traverses disturbed areas will be directed to the erosion control features.

- (4) Leachate shall be contained on-site and treated to meet the standards of the off-site disposal method.

There is no leachate produced by the waste.

(5) Access and Security Requirements:

- (A) Large sites shall be secured by means of gates, chains, berms, fences, or other security measures demonstrated to provide equivalent protection approved by the Division, to prevent unauthorized entry.

The Facility will only be accessible by one gate that will be locked when the Facility is closed.

- (B) An operator shall be on duty at the site at all times while the Facility is open for public use to ensure compliance with operational requirements, and access to such facilities shall be controlled.

When the Facility is open, there will be a scale house attendant on site.

- (C) The access road to the site shall be of all-weather construction and maintained in good condition.

The access road into the facility is paved.

- (6) A site shall only accept those solid wastes that it is permitted to receive.

The site will only accept those materials within this permit. The waste will be visually inspected at the scale house by the scale house attendant. Any waste that does not meet acceptable criteria will be rejected. Further visual screening will be performed by the operators.

- (7) Safety Requirements:

- (A) Open burning of solid waste is prohibited.

No open burning will occur on-site.

- (B) Equipment shall be provided to control accidental fires and arrangements made with the local fire protection agency to immediately provide fire-fighting services when needed.

Fire control will be managed by the operations personnel. A fire station is located within 4 miles of the site.

- (C) Personnel training shall be provided to ensure that all employees are trained in site-specific safety, remedial and corrective action procedures.

Training of City personnel will be provided to ensure that all employees are trained in site-specific safety, remedial and corrective action procedures.

- (8) Sign Requirements:

- (A) Signs providing information on waste that can be received, dumping procedures, the hours during which the site is open for public use, the permit number, and other pertinent information shall be posted at the site entrance.

Signs designating the types of waste that can be received, hours of operation, and permit number will be displayed at the site entrance and at the scale house.

- (B) Traffic signs/markers shall be provided as necessary to promote an orderly traffic pattern to and from the discharge area and to maintain efficient operating conditions.

The site will be signed as necessary.

- (C) Signs shall be posted stating that no hazardous waste, asbestos containing waste, or medical waste can be received at the site.

Signs with these statements will be prepared and installed by the City.

(9) Monitoring Requirements:

- (A) Specified monitoring and reporting requirements shall be met.
- (B) The temperature of all compost produced shall be monitored sufficiently to ensure that the pathogen reduction criterion is met.

Please refer to .1405(a)(7)(D).

- (10) Compost process at Type 1 facilities shall be maintained at or above 55 degrees Celsius (131 degrees F) three days and aerated to maintain elevated temperatures.

Please refer to .1406(9) above.

- (11) Types 2, 3, and 4 facilities shall maintain the compost process at a temperature above 40 degrees Celsius (104 degrees F) for 14 days or longer and the average temperature for that time shall be higher than 45 degrees Celsius (13 degrees F), or Types 2, 3, and 4 facilities shall meet the vector attraction reduction requirements in 40 CFR 503.33(b)(4) or (7). Requirements of 40 CFR 503.33(b)(4) and (7) are hereby incorporated by reference, including any subsequent amendments or additions.

This is a Type 1 facility; therefore, this rule does not apply.

- (12) The composting process shall qualify as a process to further reduce pathogens for all Types 3 and 4 facilities. The following are acceptable methods:

- (A) The windrow composting method, in which the following requirements apply: Aerobic conditions shall be maintained during the compost process. A temperature of 131 degrees F (55 degrees Celsius) or greater shall be maintained in the windrow for at least 15 days. During the high temperature period, the windrow shall be turned at least five times.

Does not apply to this site.

- (B) The static aerated pile composting method, in which the following requirements apply: Aerobic conditions shall be maintained during the compost process. The temperature of the compost pile shall be maintained at 131 degrees F (55 degrees Celsius) or greater for at least three days.

Does not apply to this site.

- (C) The within-vessel composting method, in which the temperature in the compost piles shall be maintained at a minimal temperature of 131 degrees F (55 degrees Celsius) for at least three days.

Does not apply to this site.

- (13) Nitrogen bearing wastes shall be incorporated as necessary to minimize odor and the migration of nutrients.

Does not apply to this site.

- (14) Miscellaneous Requirements:

- (A) The finished compost shall meet the classification and distribution requirements outlined in Rule .1407 of this Section.

The compost and mulch provided at the Facility, based on the materials processed, will meet the criteria outlined in .1407 (d)(3) (minimal pathogenic organisms, free of offensive odor, and no known sharp particles). Therefore, the mulch and compost will be managed with "unrestricted application and distribution."

- (B) The quality of the final product shall determine the allowable uses as outlined in Rule .1407 of this Section.

See (14)(A) above.

- (C) The final product shall be approved by the Solid Waste Section as outlined in Rule .1407 Subparagraph (6)(b) of this Section.

- (i) Non-compostable solid waste and unacceptable compost shall be disposed in a solid waste management facility permitted to receive the particular type of waste under 15A NCAC 13B.

Unacceptable waste and process reject waste will be disposed of at the City's construction and demolition debris landfill or the Hanes Mill Road Landfill.

- (ii) The amount of compost stored at the Facility shall not exceed the designed storage capacity.

The stored compost will not exceed the site capacity of approximately 21,000 cubic yards.

Appendix A

Plummer, Michael

From: Ken Pickle [ken.pickle@ncmail.net]
Sent: Thursday, May 26, 2005 9:11 AM
To: Plummer, Michael
Cc: Rose Pruitt; Bradley Bennett; Bethany Georgoulas
Subject: Re: Forum 52 Yardwaste

Mike,

Thanks for providing written notes on our discussion about Winston-Salem's proposed mulching and composting facility on Forum Parkway.

Based on my review of the reduced site plan you sent me, and based on your description of site conditions over the phone, and based on the final removal of the sediment traps once construction is complete and final regrading to remove the two sediment trap outlets, and based on your description of spreading the flow from the 24"RCP, I concur that it appears that upon completion of construction your site will not have a point source discharge of stormwater. If there will be no point source discharge as you assert in your 5/25/05 memo to me, then the facility does not come under the jurisdiction of the DWQ's NPDES stormwater discharge permitting program, i.e. an NPDES stormwater discharge permit is not required.

Please note that if at any time after construction a point source discharge of stormwater occurs, the facility would be in violation of the Clean Water Act by discharging without a valid permit. The facility would be subject to enforcement action and significant monetary penalties.

Please contact me with any additional questions.

Ken Pickle
Stormwater Permitting Unit, DWQ
(919) 733-5083 x 584

Plummer, Michael wrote:

> Ken,
>
> Attached is a memo documenting our phone conversation today. Please
> let me know if you want to see any changes.
>
> In response to your voicemail about the wetlands; we met with both DWQ
> and the Corp to delineate the wetlands. We based our design to avoid
> impacting the wetlands and therefore were told that we didn't need to
> permit anything. I can get you contact names if you need them.
>
> Thanks for your assistance,
>
> Mike
>
> <<20050525 MDP Memo to Ken Pickle.doc>>
>

To: Ken Pickle w/ NCDENR	
From: Mike Plummer	Project: Forum 52 Yardwaste Facility
CC: Ed Gibson w/ City of Winston-Salem	
Date: 5-25-05	Job No:

RE: Forum 52 Stormwater Permitting Phone Conversation

This memo is to document our telephone conversation on May 25, 2005 about the proposed Winston-Salem Forum 52 Yardwaste Facility. We discussed the three main topics listed below:

1. **Point Source Discharge** – As discussed the temporary sediment traps shown on drawing C-02 "Proposed Development Plan", are strictly for sediment and erosion control during construction. Once the site has been stabilized via grass, stone, or pavement these features will be removed and regraded to the original contours thus eliminating a point source discharge. In addition, the 24-inch drainage pipe in the center of the property will have an oversized outlet apron to aid in the dispersion of flow.
2. **Removal of Trees** – We discussed the impact to runoff from clearing the wooded area. It was agreed that the potential for greater runoff is possible although the existing conditions are on very steep slopes and by creating large flat areas we will interrupt the direct flow and provide some minor retention thereby lessening any impacts.
3. **Composting Process** – Mr. Pickle asked about the use of fertilizer (i.e. manure, sludge, etc.) in the composting process as well as the wetting process. The City of Winston-Salem currently has two yardwaste facilities in operation in which they have never used fertilizer and they will modify the Permit Application for this facility to not allow the use of fertilizer. There will be a fire hydrant onsite for wetting the compost pile although in the experience with the other two facilities this will happen infrequently and in most instances is for dust control.

WINSTON-SALEM-FORSYTH COUNTY
CITY-COUNTY UTILITIES
HANES MILL ROAD LANDFILL
325 HANES MILL ROAD
WINSTON-SALEM, NC 27105

November 17, 2004

Mr. Lanny Gough
Zoning/Inspections Department
City of Winston-Salem
P.O. Box 2511
Winston-Salem, NC 27102

Re: Verification of land use

Dear Lanny:

Please consider this a request for verification that the below mentioned proposed facility is a permitted use within the facility boundary.

BACKGROUND INFORMATION

The City-County Utility Commission is planning to design, permit, construct, and operate a facility that would be located on the following Lot-Blocks, the facility boundary:

- Tax Lot 3F, Block 4942A, containing approximately 3.95 acres
- Tax Lot 106, Block 4942A, containing approximately 12.98 acres

The present zoning designation for both parcels mentioned above is *GI*. The above lots are presently unused lots belonging to the Forum 52 Industrial subdivision. See attached map delineating the project property lines.

The proposed use under this project would be the following: a public facility whereby residential and commercial customers would be able to transport their yard waste, leaves, grass, and other wood waste such as wood pallets for processing. This facility would then process this waste: stockpiling, mixing, grinding, chipping, composting. Once processed, the final product would be removed from the site, i.e. either sold or given away. Planned buildings include a scale house w/scales and appropriate roadways. The facility entrance is planned through the north side of Lot 3F, via Northstar Drive.

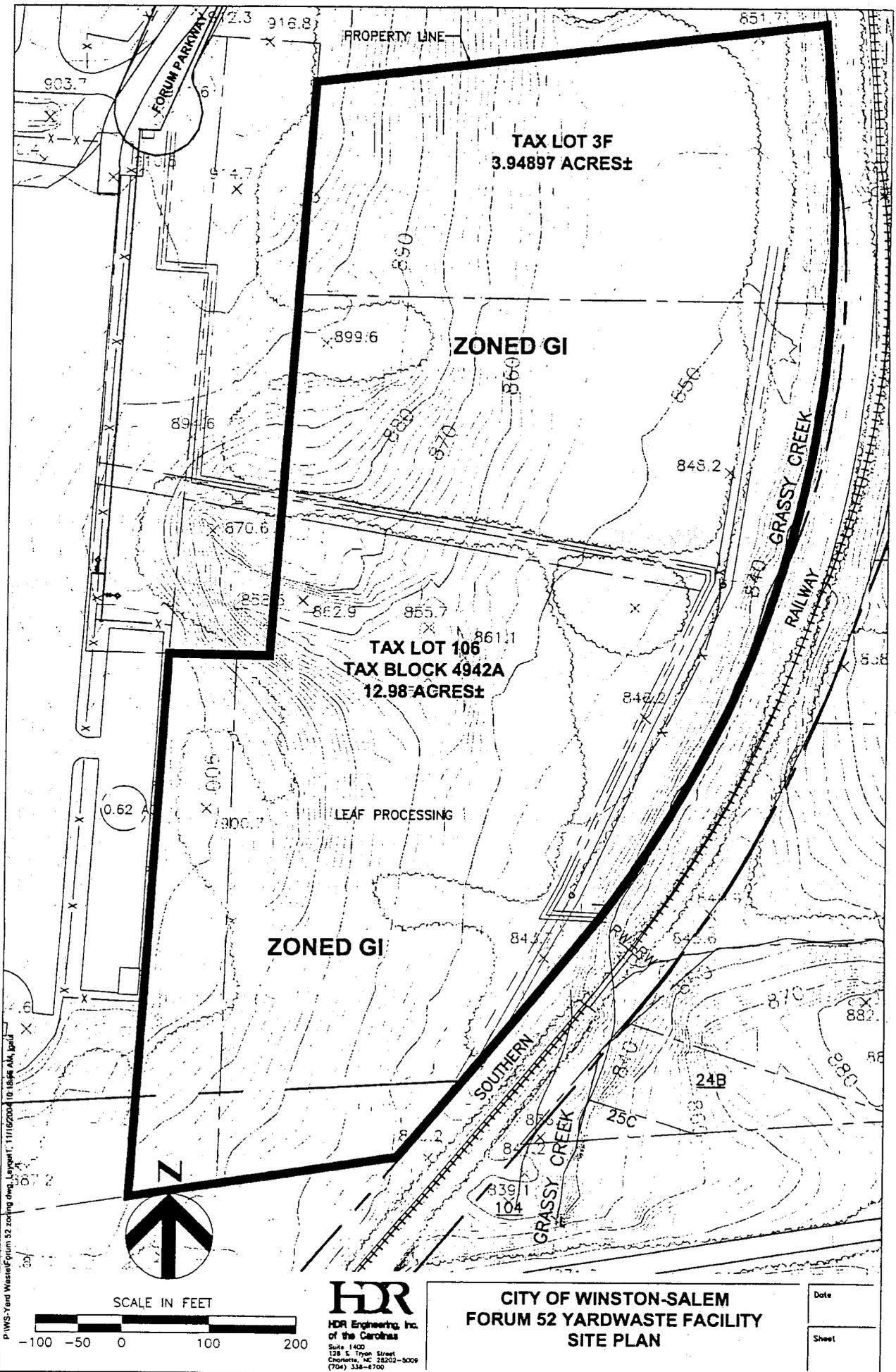
REQUEST

In order to begin the construction of this proposed facility, one of the major approvals we would need is a permit from the North Carolina Department of Environment and Natural Resources (NCDENR). The permit application to NCDENR requires that we supply evidence that we would be operating on parcels that allow the proposed use. The City-County Utilities Administration understands that since these parcels have a *GI* designation, a change in zoning is not necessary for the proposed facility and that no new special use permits are necessary. We are requesting that your department provide written documentation of such. If you need further information please do not hesitate to call me at 399-5051.

Sincerely,



Edward Gibson, P.E.
Solid Waste Engineer



TAX LOT 3F
3.94897 ACRES±

ZONED GI

TAX LOT 106
TAX BLOCK 4942A
12.98 ACRES±

ZONED GI

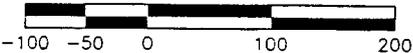
LEAF PROCESSING

SOUTHERN
RAILWAY

GRASSY CREEK

GRASSY CREEK

SCALE IN FEET



HDR
HDR Engineering, Inc.
of the Carolinas
Suite 1400
128 S. Tryon Street
Charlotte, NC 28202-3009
(704) 338-6700

**CITY OF WINSTON-SALEM
FORUM 52 YARDWASTE FACILITY
SITE PLAN**

Date
Sheet

P:\WS-Yard Waste\Forum 52 zoning.dwg, Layout1, 11/15/2004 10:16:46 AM, igul



ADMINISTRATIVE LETTER # 22034

ZONING LETTER

100 East First Street
Winston-Salem, NC 27101
(336) 727-2628

Property Address: 00 NORTHSTAR DR
RURAL HALL, NC

Tax Block: 4942A
Tax Lot: 003F; 106

Zoning District: GI

Map Page: 618894

<p><u>Owner:</u> Same as Contractor</p>

<p><u>Applicant:</u> CITY OF WINSTON-SALEM UTILITIES ADMIN P.O. BOX 2511 WINSTON-SALEM, NC 27101</p>
--

To Whom It May Concern:

The property in question per your letter dated November 17, 2004, known as Tax Block 4942A; Lots 3F & 106 is zoned General Industrial(GI). The proposed use as you describe in this letter is classified as a Recycling Plant per the Unified Development Ordinance and is a permitted use within this zoning district. A building/zoning permit will be required prior to use of this property and plans must be submitted to the Inspections Division for approval. Since this property is not contiguous to a public street right of way, proof of access must be established prior to a permit being approved. The minimum width of an access easement is 25 feet.

Should you have any question feel free to contact Lanny Gough at 727-2626.

This document is provided by the Winston-Salem/Forsyth County Inspections Division in response to your request regarding the above described property, and serves as official confirmation of the information stated above, as of the date shown.

LANNY GOUGH

Processed By

Issue Date: 11/23/2004

AUTOSTAGE

Issued By

Authorized Signature



Subject to easements, restrictions and rights of way of record, utility lines in existence over and under the above described property.

IN WITNESS WHEREOF, the Grantors have hereunto set their hands and seals, the day and year first above written.

R. J. REYNOLDS TOBACCO COMPANY

By: Ronald H. Morgan
Vice President *[Signature]* 1/29/04

STATE OF NORTH CAROLINA)
COUNTY OF FORSYTH)

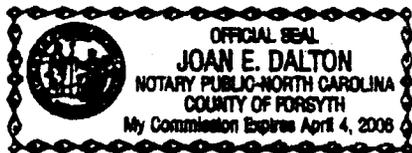
I, Joan E Dalton, notary public of the County and State aforesaid, certify that Ronald H. Morgan personally came before me this day and acknowledged that he (or she) is _____ Vice President of R. J. REYNOLDS TOBACCO COMPANY, a New Jersey corporation, and that he/she, as _____ Vice President, being authorized to do so, executed the foregoing on behalf of the corporation.

WITNESS my hand and official stamp or seal, this the 30th day of January, 2004.

My Commission Expires: _____

Joan E Dalton
Notary Public

[Notarial Stamp/Seal]



STATE OF NC - FORSYTH CO

The foregoing certificate(s) of:

Joan E. Dalton

is certified to be correct as the date of recordation shown on the first page thereof.

Dickie C. Wood, Register of Deeds by: [Signature] Deputy/Trust

EXHIBIT "A"

Lying and being in Bethania and Rural Hall Townships of Forsyth County, North Carolina and being all of Tax Lot 102C, Tax Block 4942A, and a portion of Tax Lot 101C, Tax Block 4942A.

Beginning at a Concrete Right-of-Way Monument found at the Southeast corner of said Lot 102C, said Monument being located North $16^{\circ} 31' 56''$ West 151.81 feet from an NCGS Monument titled "For 29", said Monument being located on the Western right-of-way line for the Southern Railroad (100-foot width) and Northern right-of-way line of SR 1840, said Concrete Monument being the Point and Place of Beginning.

Running thence with the South lines of Lot 102C and Lot 101C, South $81^{\circ} 04' 23''$ West 320.37 feet to an iron placed, said iron placed being located at the Northern right-of-way of SR 1840; thence leaving the Northern right-of-way of said SR 1840, North $03^{\circ} 55' 41''$ East 667.52 feet to an iron placed in the South line of Lot 104; thence with the South line of Lot 104, South $85^{\circ} 57' 45''$ East 122.78 feet to an iron found, the Southeast corner of Tax Lot 104; thence with the East line of Lot 104, North $04^{\circ} 03' 47''$ East 423.24 feet to an iron found, the Southwest corner of Tax Lot 3F; thence with the South line of Lot 3F, South $85^{\circ} 56' 23''$ East 561.61 feet to an iron found; thence along same line South $85^{\circ} 56' 23''$ East 52.37 feet to a point, said point being the common corner of Tax Lots 3F and 102C, said point being located 50' from the center of the 100-foot Southern Railroad right-of-way; thence along the Western 100-foot railroad right-of-way the following calls, South $06^{\circ} 31' 52''$ West 96.44 feet to a point, thence South $10^{\circ} 39' 12''$ West 96.44 feet to a point, thence South $14^{\circ} 30' 27''$ West 96.56 feet, thence South $18^{\circ} 32' 04''$ West 96.54 feet to a point, thence South $22^{\circ} 11' 13''$ West 96.50 feet to a point, thence South $27^{\circ} 06' 36''$ West 96.45 feet to a point, thence South $30^{\circ} 44' 17''$ West 96.32 feet to a point, thence South $34^{\circ} 07' 48''$ West 96.50 feet to a point, thence South $38^{\circ} 23' 15''$ West 97.44 feet to a point, thence South $39^{\circ} 54' 08''$ West 99.73 feet to a point, thence South $40^{\circ} 30' 12''$ West 157.62 feet to the Point and Place of Beginning.

Together with a permanent non-exclusive 30-foot access easement providing access to Northstar Drive, which is also known as N.C. State Road 4007. The access easement is shown on Plat Book 36, Page 191, in the Forsyth County Registry. The access easement crosses over Tax Lots 002, 003C, 105, and 003F of Tax Block 4942A.

The above-described parcel was found to contain 565,736 SF (12.98 acres) calculated by the coordinate method. The above described parcel is known as Tax Lot 102C, of Tax Block 4942A, and a portion of Tax Lot 101C, of Tax Block 4942A. This legal description is based upon a map prepared by Kale Engineering for R.J. Reynolds Tobacco Company with a Job Number of 2003102.



North Carolina
Department of Environment and Natural

Michael F. Easley, Governor
William G. Ross, Secretary

James D. Simons, P.G., P.E., Director
And State Geologist



WINSTON-SALEM REGIONAL OFFICE
DIVISION OF LAND RESOURCES
LAND QUALITY SECTION

January 7, 2005

LETTER OF APPROVAL WITH MODIFICATIONS

City of Winston Salem
Forsyth County Utilities Commission
P.O. Box 2511
Winston Salem, NC 27102

Dear Sir or Madam:

This office has reviewed the subject erosion and sedimentation control plan and hereby issues this letter of approval with modifications. A list of the modifications is attached. This plan approval shall expire three (3) years following the date of approval, if no land-disturbing activity has been undertaken, as is required by Title 15A NCAC 4B .0029. Should the plan not perform adequately, a revised plan will be required (G.S. 113A-54.1 (b)).

Please be advised that Title 15 NCAC 4B.0018 (a) requires that a copy of the approved erosion control plan be on file at the job site. Also, you should consider this letter to give the notice required by GS 113A-61.1 (a) of our right of periodic inspection to insure compliance with the approved plan.

North Carolinas Sedimentation Pollution Control Program is performance-oriented, requiring protection of existing natural resources and adjoining properties. If, following the commencement of this project, it is determined that the erosion and sedimentation control plan is inadequate to meet the requirements of the Sedimentation and Pollution Control Act of 1973 (North Carolina General Statute 113A-51 through 66), this office may require revisions to the plan and implementation of the revisions to insure compliance with the Act.

Acceptance and approval of this plan is conditioned upon your compliance with Federal and State water quality laws, regulations, and rules. In addition, local city or county ordinances or rules may also apply to this land-disturbing activity. This approval does not supersede any other permit or approval.

585 Waughtown Street, Winston-Salem, North Carolina 27107-2241

Phone: 336-771-4600 \ FAX: 336-771-4631 \ Internet: www.enr.state.nc.us/ENR/
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LETTER OF APPROVAL WITH MODIFICATIONS – Forum 52 Yard Waste Facility

January 7, 2005

Page 2

Please note that all land disturbing activities over one acre in size are covered by the enclosed general stormwater permit NCGO1000 (Construction Activities). You should first become familiar with all of the requirements for compliance with the enclosed general permit.

Please note that this approval is based in part on the accuracy of the information provided in the Financial Responsibility Form, which you have provided. You are requested to file an amended form if there is any change in the information included on the form. In addition, it would be helpful if you notify this office of the proposed starting date for this project. Please notify us if you plan to have a preconstruction conference, and we will plan to attend.

Your cooperation is appreciated, and we look forward to working with you on this project.

Sincerely,



Brooks Cole, C.P.E.S.C.
Assistant Regional Engineer

BC/lc

Enc: Certificate of Approval With Modifications
NPDES

cc: HDR Engineering
Water Quality – Daryl Lamb
WSRO File

PROJECT NAME:	Forum 52 Yard Waste Facility
COUNTY:	Forsyth
RIVER BASIN:	Yadkin
WATER CLASSIFICATION:	Other
FACILITY NUMBER:	Forsy 2005-025
SUBMITTED BY:	HDR Engineering
RECEIVED BY L.Q.S.:	December 13, 2004

NEW SUBMITTAL (X)

MODIFICATIONS

This plan is approved with the following modifications:

1. All silt fencing and limits of disturbance must be installed such that a minimum 15' undisturbed buffer is maintained between all measures and the top of the bank for grassey creek closest to the project.

CERTIFICATE OF PLAN APPROVAL



The posting of this certificate certifies that an erosion and sedimentation control plan has been approved for this project by the North Carolina Department of Environment and Natural Resources in accordance with North Carolina General Statute 113A - 57 (4) and 113A - 54 (d) (4) and North Carolina Administrative Code, Title 15A, Chapter 4B.0107 (c). This certificate must be posted at the primary entrance of the job site before construction begins and until establishment of permanent groundcover as required by North Carolina Administrative Code, Title 15A, Chapter 4B.0127 (b).

Forum 52 Yardwaste Facility

Project Name and Location

Forsy - 2005 - 025

1-7-05

Date of Plan Approval

w/mods.



Assist.

Regional Engineer

Burwell

North Carolina
Department of Environment and Natural

Michael F. Easley, Governor
William G. Ross, Secretary

James D. Simons, P.G., P.E., Director
And State Geologist



WINSTON-SALEM REGIONAL OFFICE
DIVISION OF LAND RESOURCES
LAND QUALITY SECTION

December 22, 2004

LETTER OF RECEIPT OF EROSION CONTROL PLAN

City of Winston Salem
Forsyth County Utilities Commission
P.O. Box 2511
Winston Salem, NC 27102

Dear Sir or Madam:

This office has received a soil erosion and sediment control plan for the project listed below which was submitted as required by the North Carolina Sedimentation Pollution Control Act (G.S. 113A-57 (4)).

The Act requires that all persons disturbing an area of one or more acres of land must obtain approval of a soil erosion control plan prior to the commencement of the land-disturbing activity (G.S. 113A-54 (d) (4)). The Act further states that this plan must be filed a minimum of 30 days prior to the activity and the approving authority must approve or disapprove the submitted plan within 30 days of receipt. Failure of the approving authority to approve or disapprove the submitted plan within the 30-day period will be deemed approval of the plan if the submitted plan is complete. Commencement or continuation of a land disturbing activity under the jurisdiction of this Act prior to the approval of an erosion and sediment control plan is a violation of the Act.

The approval of an erosion and sediment control plan is conditioned on the applicant's compliance with Federal and State water quality laws, regulations and rules.

585 Waightown Street, Winston-Salem, North Carolina 27107-2241

Phone: 336-771-4600 \ FAX: 336-771-4631 \ Internet: www.enr.state.nc.us/ENR/
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Letter of Receipt – Forum 52 Yard Waste Facility

December 22, 2004

Page 2

If you have questions please do not hesitate to contact this office. Your cooperation in this matter is appreciated and we look forward to working with you on this project.

Sincerely,



Brooks Cole, C.P.E.S.C.
Assistant Regional Engineer

BC/lr

cc: HDR Engineering
WSRO File

PROJECT NAME:	Forum 52 Yard Waste Facility
COUNTY:	Forsyth
RIVER BASIN:	Yadkin
WATER CLASSIFICATION:	Other
FACILITY NUMBER:	Forsy 2005
SUBMITTED BY:	HDR Engineering
DATE RECEIVED BY L.Q.S.:	December 13, 2004

NEW SUBMITTAL (X)

EROSION AND SEDIMENT CONTROL PLAN
FOR THE
FORUM 52 YARD WASTE FACILITY

WINSTON-SALEM, NORTH CAROLINA

Prepared for:

**City/County Utility Commission
City of Winston-Salem
P.O. Box 2511
Winston-Salem, NC 27102**

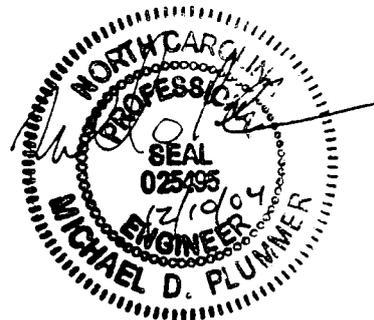
Prepared by:

**HDR Engineering, Inc. of the Carolinas
128 S. Tryon Street, Suite 1400
Charlotte, NC 28202-5001
HDR Project #0162-18088-018**

HDR

HDR Engineering, Inc.
of the Carolinas

December 2004



December 10, 2004

Mr. Brooks Cole, CPESC
Assistant Regional Engineer
North Carolina Department of Environment
and Natural Resources
Land Quality Section
585 Woughtown Street
Winston-Salem, NC 27107

Re: Forum 52 Yard Waste Facility
Erosion and Sediment Control Plan
Winston-Salem, NC
HDR Project No. 00162-18088-018

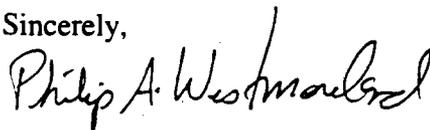
Dear Mr. Cole:

On behalf of the City of Winston-Salem (City), enclosed is one copy of the Erosion and Sediment Control Plan (Plan) submittal for the above-referenced project. This Plan addresses the proposed land disturbance of approximately 12 acres located at the end of Northstar Drive in Winston-Salem, NC.

The City will forward a check in the amount of \$600 for the 12 acres of disturbance, along with an executed Financial Responsibility and Ownership Form, under separate cover.

If you have any questions regarding this submittal, please contact me.

Sincerely,



Philip A. Westmoreland, EI
Project Engineer

PAW/

Enclosure

cc: Jan McHargue, (City of Winston-Salem) w/o enclosures
Ed Gibson, (City of Winston-Salem) w/o enclosures
Joe Reading, (HDR) w/o enclosures

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2.0 BACKGROUND	1
3.0 CONTACT INFORMATION.....	1
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5.0 EXISTING CONDITIONS	2
6.0 DESIGN GUIDELINES AND PROCEDURES	2
7.0 EROSION AND SEDIMENTATION CONTROL MEASURES.....	2
7.1 SEDIMENT TRAPS.....	3
7.2 TEMPORARY DIVERSION BASINS	3
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APPENDICES

APPENDIX A – CALCULATIONS

TEMPORARY SEDIMENT TRAPS

APPENDIX B – TECHNICAL SPECIFICATIONS

02110	SITE CLEARING
02220	EARTH WORK
02270	SOIL AND EROSION CONTROL
02271	STONE REVETMENT (RIP RAP)
02485	SEEDING
02511	AGGREGATE COURSE
02720	EROSION CONTROL BLANKETS
02900	GEOTEXTILE

APPENDIX C – DRAWINGS

C-01	EXISTING CONDITIONS
C-02	EROSION AND SEDIMENT CONTROL PLAN
C-03	GRADING PLAN
C-04	EROSION CONTROL DETAILS

1.0 PURPOSE

The purpose of this Erosion and Sediment Control Plan (Plan) is to obtain a Certificate of Plan Approval from the North Carolina Department of Environment and Natural Resources (NCDENR) to construct the Forum 52 Yard Waste Facility. This Plan describes the erosion and sedimentation control features for the development of this site. This Plan addresses disturbance for approximately 12 acres and has been prepared in accordance with the *North Carolina Erosion and Sediment Control Planning and Design Manual Guidelines*.

2.0 BACKGROUND

The City of Winston-Salem, North Carolina (City) owns the property located on Northstar Drive. The site is comprised of approximately 17 acres in Forsyth County (County).

3.0 CONTACT INFORMATION

Owner: The owner of the site and the person to contact should sediment control issues arise during the land-disturbing activity is as follows:

City/County Utilities Commission
Attn.: Edward Gibson, P.E., Solid Waste Administrator
City of Winston-Salem
100 East First Street, Suite 131
Winston-Salem, NC 27102
Telephone: (336) 61-4900 Fax: (336) 661-4905

Engineer: For questions regarding this Plan, please contact the following:

HDR Engineering, Inc. of the Carolinas
Attn.: Michael D. Plummer, P.E.
128 South Tryon Street, Suite 1400
Charlotte, NC 28202-5001
Telephone: (704) 338-6700 Fax: (704) 338-6760

4.0 PROJECT DESCRIPTION

The City plans to expand its current yard waste operations to this new facility in order to handle disposal from the northern half of the County. The site will consist of a leaf processing area where grass clippings and leaves will be brought to be composted. In addition, there will be a waste receiving area where bulky wood products (i.e. pallets, engineered wood products, etc.) will be ground for mulch. The site will include infrastructures (i.e. scales, scalehouse, roads, etc.) necessary to operate the facility. The total disturbed area within the clearing limits is 12 acres. The work consists of clearing and grubbing, installing erosion and sediment control features, construction of the roadways, and excavation of soils.

5.0 EXISTING CONDITIONS

The site is currently a wooded forest. A portion of the site near the entrance was cleared and grubbed by the previous land owner. Grassy Creek borders the site on the east, Highway 52 on the south, an industrial warehouse on the west and north. Existing ground surface elevations on the site vary from Elevation 910 (feet) at the top of the hill to Elevation 848(feet) along Grassy Creek

6.0 DESIGN GUIDELINES AND PROCEDURES

This Plan for was conducted based on guidelines and procedures as set forth in the *North Carolina Erosion and Sediment Control Planning and Design Manual* and *Elements of Urban Stormwater Design* by H. Rooney Malcom, P.E. Design calculations are provided as an attachment to this Plan.

Stormwater runoff flows were calculated using the Rational Method based on the maximum rate of runoff from a 25-year storm event for the sediment basins and drainage channels. Runoff coefficients for various groundcover conditions are referenced in the above-mentioned documents. Drainage areas were determined using a planimeter and/or AutoCAD on topographic sheets of the project area.

7.0 EROSION AND SEDIMENTATION CONTROL MEASURES

The following erosion and sedimentation control measures are to be used in construction of the site: Temporary Sediment Traps, Temporary Diversion Channels, Silt Fence, and Seeding. Attachments A, B, and C to this Plan include technical specifications, calculations, plans, and details for each of these measures.

7.1 SEDIMENT TRAPS

There are two proposed temporary sediment traps (TST #1 and TST #2), which will serve the site throughout construction. Temporary sediment trap design is subject to several requirements. The temporary sediment trap must provide a basin volume of 1,800 ft³/acre of disturbed area and a minimum surface area of 1 percent (1%) of the peak flow runoff. The top of the dam is set 1.5 feet above the weir. The design of these temporary sediment traps was performed in accordance with criteria from the *North Carolina Design Manual*.

7.2 TEMPORARY DIVERSION BERMS

Temporary diversion berms are to be installed above cut slopes to prevent runoff from flowing over the slope. The temporary diversion berms will divert stormwater runoff away from the disturbed area. Diversion berm capacity, velocity, and ridge design were designed in accordance the *North Carolina Design Manual*, Section 6.20.

7.3 VEGETATIVE STABILIZATION

Vegetative stabilization will be in accordance with the seeding schedule in the project specifications and on the plans. The seeding schedule was prepared with reference to the *North Carolina Design Manual*, Sections 6.10 and 6.11, and seeding regimes used in the geographic location.

7.4 SILT FENCE

Silt fence will be installed at or outside the clearing limits as shown on the plans prior to land-disturbing activity. Silt fence is an adequate runoff control measure provided that less than one-fourth an acre per 100 linear feet drains to it according to the North Carolina Design Manual Section 6.62.1.

8.0 MAINTENANCE AND SEDIMENT DISPOSAL

All erosion and sedimentation control devices will be inspected at regular intervals and immediately following any major storm event. Repairs will be made as needed and accumulated sediment removed when one half of the holding capacity is depleted.

All sediments which are removed from erosion and sedimentation control measures will be disposed of in a manner such that further erosion and sedimentation will not occur.

9.0 CONSTRUCTION SEQUENCE

The Construction Sequence can be found on the drawings.

Appendix A

CALCULATIONS

Project:	Forum 52 yard Wate Facility	Computed: PAW	Date: 12/10/04
Subject:	Storm Water Drainage	Checked:	Date:
Task:	Temporary Sediment Trap	TST #1	Sheet Of

Objective Design a temporary sediment trap near the proposed scalehouse

References

1. North Carolina Erosion and Sediment Control Planning and Design Manual.

Calculate Peak Flow

$Q=CIA$

C=	0.4	smooth, bare packed soil (0.30 - 0.60)	Ref 1, p. 8.03.2
I (in/hr)=	7.2	25-yr, 5-min storm	Ref 1, 8.03.6, figure 8.03d Greensboro
A (Ac.) =	4.40	Drainage Area (Existing Condition)	
A (Ac.) =	5.00	Drainage Area (Post Condition)	
A (Ac.) =	5.00	Drainage Area (used in calculations)	
Q ₁₀ (cfs)=	14.4		

Sediment Storage

Minimum Storage Required (cf / Ac) 1,800 Ref 1, p 6.60.2

Sediment Storage (cf) 9,000 min required storage volume

Surface Area

A (SF) = 0.01*Q₁₀* 43,560 Ref 1, p 6.60.2

A (SF) = 6,273 min required surface area for 75% efficiency

Trap Design

Elevation (ft)	stage (ft)	area (sf)	volume (cf)	cum. vol. (cf)	
848	0	2,516	0	0	
850	2	11,501	12,931	12,931	
851.5	3.5	18,230	22,105	35,036	Adequate Sed Storage Vol & Surface Area @ min of 3.5'

Conclusion:

The minimum requirements are met.

Project:	Forum 52 yard Wate Facility	Computed: PAW	Date: 12/10/04
Subject:	Storm Water Drainage	Checked:	Date:
Task:	Temporary Sediment Trap TST #2	Sheet	Of

Objective Design a temporary sediment trap near the southern end of the leaf processing area

References

1. North Carolina Erosion and Sediment Control Planning and Design Manual.

Calculate Peak Flow

$Q=CIA$

C=	0.4	smooth, bare packed soil (0.30 - 0.60)	Ref 1, p. 8.03.2
I (in/hr)=	7.2	25-yr, 5-min storm	Ref 1, 8.03.6, figure 8.03d Greensboro
A (Ac.) =	1.70	Drainage Area (Existing Condition)	
A (Ac.) =	4.60	Drainage Area (Post Condition)	
A (Ac.) =	5.00	Drainage Area (used in calculations)	
Q ₁₀ (cfs)=	14.4		

Sediment Storage

Minimum Storage Required (cf / Ac) 1,800 Ref 1, p 6.60.2

Sediment Storage (cf) 9,000 min required storage volume

Surface Area

A (SF) = 0.01*Q₁₀* 43,560 Ref 1, p 6.60.2

A (SF) = 6,273 min required surface area for 75% efficiency

Trap Design

Elevation (ft)	stage (ft)	area (sf)	volume (cf)	cum. vol. (cf)	
844	0	3,634	0	0	
846	2	5,450	9,023	9,023	
847.5	3.5	6,598	9,022	18,045	Adequate Sed Storage Vol & Surface Area @ min of 3.5'

Conclusion:

The minimum requirements are met.

Appendix B

TECHNICAL SPECIFICATIONS

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**SECTION 02110
SITE CLEARING**

4

PART 1 - GENERAL

5

1.1 SUMMARY

6

A. Section Includes:

7

- 1. Site clearing, tree protection, stripping topsoil and demolition.

8

B. Related Sections include but are not necessarily limited to:

9

- 1. Division 0 - Bidding Requirements, Contract Forms, and Conditions of the Contract.

10

- 2. Division 1 - General Requirements.

11

- 3. Section 02220 - Sitework.

12

- 4. Section 02270 - Soil Erosion and Sediment Control.

13

1.2 QUALITY ASSURANCE

14

- A. North Carolina Erosion and Sediment Control Planning and Design Manual, Current Edition.

15

PART 2 - PRODUCTS - (NOT APPLICABLE TO THIS SECTION)

16

PART 3 - EXECUTION

17

3.1 PREPARATION

18

A. Protect existing trees and other vegetation to remain outside limits of construction (shown on drawing) against damage.

19

- 1. Do not smother trees by stockpiling construction materials or excavated materials within drip line.

20

- 2. Avoid foot or vehicular traffic or parking of vehicles within drip line.

21

- 3. Provide temporary protection as required.

22

23

B. Repair or replace trees and vegetation outside clearing limits damaged by construction operations.

24

- 1. Repair to be performed by a qualified tree surgeon.

25

- 2. Remove trees which cannot be repaired and restore to full-growth status.

26

- 3. Replace with new trees of minimum 4 IN caliper.

27

28

29

3.2 SITE CLEARING

30

A. Clearing and Grubbing:

31

- 1. Clear from within limits of construction.

32

- a. Include shrubs, brush, downed timber, rotten wood, heavy growth of grass and weeds, vines, rubbish, structures and debris.

33

- 2. Grub (remove) from within limits of construction all stumps, roots, root mats, logs and debris encountered.

34

35

36

B. Disposal of Waste Materials (Non-Saleable Material):

37

- 1. Do not burn combustible materials on site.

38

- 2. Do not bury organic matter on site.

39

- 3. All waste materials shall be ground and removed from the site.

1 **3.3 ACCEPTANCE**

- 2 A. Upon completion of the site clearing, obtain Engineer's acceptance of the extent of clearing,
3 depth of stripping and rough grade.

4 **END OF SECTION**

1
2

SECTION 02220
SITWORK

3 **PART 1 - GENERAL**

4 **1.1 SUMMARY**

- 5 A. Section Includes:
- 6 1. Earthwork.
- 7 B. Related Sections include but are not necessarily limited to:
- 8 1. Division 0 – Bid Requirements, Contract Forms, and Conditions of the Contract.
- 9 2. Division 1 - General Requirements.

10 **1.2 QUALITY ASSURANCE**

- 11 A. Referenced Standards:
- 12 1. American Society for Testing and Materials (ASTM):
- 13 a. D698, Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort
- 14 (12,400 ft-lb/ft³).
- 15 b. D1557, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort
- 16 (56,000 ft-lb/ft³ (2,700 kN-m/m)).
- 17 c. D2487, Standard Classification of Soils for Engineering Purposes (Unified Soil Classification
- 18 System.
- 19 d. D4253, Standard Test Methods for Maximum Index Density of Soils Using a Vibratory Table.
- 20 e. D4254, Test Methods for Minimum Index Density of Soils and Calculation of Relative Density.
- 21 2. North Carolina Erosion and Sediment Control Planning and Design Manual, current edition.
- 22 3. North Carolina Department of Transportation Standard Specification for Roads and Structures,
- 23 current edition.

24 **1.3 SUBMITTALS**

- 25 A. Shop Drawings:
- 26 1. As-built survey of subgrade grading plans.
- 27 2. Test reports:
- 28 a. Soils inspection and testing results.

29 **1.4 SOILS/GEOTECHNICAL**

- 30 A. The Owner will provide for the on-site services of a Soils Engineer to monitor compliance with the
- 31 requirements of these Specifications.
- 32 B. The Contractor will afford these representatives access to the job site for the performance of their duties
- 33 as described in the Contract Documents.
- 34 C. General Duties and Responsibilities of the Soils Engineer:
- 35 1. Approve materials proposed for incorporation into the work as proposed by the soils Engineer.
- 36 2. Review subgrades and excavations and approve suitability of materials encountered as proposed by
- 37 the contract. Approve extent of any overexcavation required to remove unsuitable materials under
- 38 roadways, structures, or other areas of construction, as proposed by the Engineer.
- 39 3. Observe placement of fill materials and testing by Contractor for compliance with these
- 40 specifications.
- 41 4. Review/approve the suitability of existing on-site materials for use in construction of embankments
- 42 and fills.
- 43 5. Review construction operations and monitor for compliance with Contract Documents.
- 44 6. Review/approve Contractor quantity of unsuitable materials for payment on a unit price basis under
- 45 contract provisions for authorized overexcavation and backfill.

1 D. Available Subsurface Information: Where provided, data on subsurface soil conditions are not intended
2 as representations or warranties of the continuity of such conditions between borings or indicated
3 sampling locations. It shall be expressly understood that neither the Owner nor the Engineer will be
4 responsible for any interpretation or conclusion drawn therefrom by the Contractor. Data is made
5 available for the convenience of the Contractor.

6 E. Additional or supplementary soil borings or other exploratory operations may be made by the Contractor
7 at no additional cost to the Owner. The Contractor shall provide the Owner with a copy of any data
8 obtained/developed during such work. Such additional work shall be performed in a timely manner in
9 accordance with and not impacting or changing the project schedule set forth in the Contract Documents.

10 1.5 TOLERANCES

11 A. Grading shall be to a tolerance of + 0.2 FT unless otherwise noted in the construction documents and then
12 the stricter criteria shall be used.

13 PART 2 - PRODUCTS

14 2.1 MATERIALS

15 A. Fill and Backfill: Selected material approved by Soils Engineer and Owner from site excavation or from
16 site stockpile.

17 B. The Contractor shall conduct his own quantity and quality investigations and testing to determine
18 availability and suitability of (on-site) borrow materials, as allowed by the Owner.

19 C. All earth materials proposed for use in the Work shall be adequately characterized prior to the Work by
20 the Contractor.

21 PART 3 - EXECUTION

22 3.1 PROTECTION

23 A. Protect existing surface and subsurface features on-site and adjacent to site as follows:

24 1. Provide barricades, coverings, or other types of protection necessary to prevent damage to existing
25 items indicated to remain in place.

26 2. Protect and maintain benchmarks, monitoring wells, existing structures, monuments, or other
27 established reference points and property corners. If disturbed or destroyed, replace at own expense
28 to full satisfaction of Owner and controlling agency.

29 3. Verify location of utilities. Omission or inclusion of utility items does not constitute non-existence or
30 definite location. Secure and examine local utility records for location data.

31 a. Take necessary precautions to protect existing utilities from damage due to any construction
32 activity.

33 b. Repair damages to utility items at own expense.

34 c. In case of damage, notify Engineer at once so required protective measures may be taken.

35 4. Any item known or unknown or not properly located that is inadvertently damaged shall be repaired
36 to original condition. All repairs to be made and paid for by Contractor.

37 5. Provide full access to public and private premises, fire hydrants, street crossings, sidewalks, and
38 other points as designated by Owner to prevent serious interruption of travel.

39 6. Maintain stockpiles and excavations in such a manner to prevent inconvenience or damage to
40 structures on-site or on adjoining property.

41 7. Avoid surcharge or excavation procedures which can result in heaving, caving, or slides.

42 8. Conduct operation with minimum interference to daily landfill operations.

43 B. Construction erosion and sedimentation controls prior to beginning earthwork.

44 C. Dispose of waste materials, legally, off site. Burning, as a means of waste disposal, is not permitted.

1 3.2 SITE EXCAVATION AND GRADING

- 2 A. The Work includes all operations in connection with excavation, borrow, construction of fills and
3 embankments, rough grading, and stockpiling of excess materials in connection with the preparation of
4 the site(s) for construction of the proposed facilities.
- 5 B. Excavation and Grading: Perform as required by the Contract Drawings.
6 1. Contract Drawings may indicate both existing grade and finished grade required for construction of
7 Project. Stake all units, structures, piping, and roads and establish their elevations. Perform other
8 layout work required. Replace property corner markers to original location if disturbed or destroyed.
9 2. Preparation of ground surface for embankments or fills: Before fill is started, scarify to a minimum
10 depth of 6 IN in all proposed embankment and fill areas. Where ground surface is steeper than one
11 vertical to four horizontal, plow surface in a manner to bench and break up surface so that fill
12 material will bind with existing surface.
13 3. Protection of finish grade: During construction, shape and drain embankment and excavations.
14 Maintain ditches and drains to provide drainage at all times. Protect graded areas against action of
15 elements prior to acceptance of work. Re-establish grade where settlement or erosion occurs.
- 16 C. Construct embankments and fills as required by the Contract Drawings:
17 1. Construct embankments and fills at locations and to lines of grade indicated. Completed fill shall
18 correspond to shape of typical cross section or contour indicated regardless of method used to show
19 shape, size, and extent of line and grade of completed work.
20 2. Provide approved fill material which is free from roots, organic matter, trash, frozen material, and
21 stones having maximum dimension greater than 6 IN. Ensure that stones larger than 4 IN are not
22 placed in upper 6 IN of fill or embankment. Do not place material in layers greater than 8 IN loose
23 thickness. Place layers horizontally and compact each layer prior to placing additional fill.
24 3. Compact by sheepsfoot, pneumatic rollers, vibrators, or by other equipment as required to obtain
25 specified density. Control moisture for each layer necessary to meet requirements of compaction.
- 26 D. Upon reaching subgrade elevations shown, proofroll subgrade soils and obtain the Engineer's approval.
27 If unsuitable materials are encountered at the subgrade elevation, repair as directed by the Engineer to
28 remove unsuitable materials. Excavation of 1 cy or greater should be preapproved by the Engineer.
- 29 E. Proofrolling shall be conducted with a pneumatic-tired vehicle of at least 20 tons GVW, approved by the
30 Engineer. An alternate approved by the Engineer may be used in constricted areas.
- 31 F. Where subgrade materials are determined to be unsuitable, such materials shall be removed to the lengths,
32 widths, and depths directed by the Engineer, and backfilled with suitable material unless further
33 excavation or earthwork is required. No additional payment will be made for such excavation and
34 backfill 6 IN or less than the finished subgrade. Payment for unsuitable material excavation greater than
35 6 IN beneath the finished subgrade shall be negotiated.
- 36 G. The subgrade of areas to receive fill shall be smooth and free of all vegetation, sticks, roots, rocks, and
37 debris.
- 38 H. Do not place fill when the subgrade is frozen, wet, loose, or soft.
- 39 I. Moisture control:
40 1. Moisture content of materials prior to, and during compaction, shall be uniform throughout each
41 layer of material.
42 2. Granular materials shall be thoroughly wetted during or immediately prior to compaction.
43 3. Supplementary water shall be added as required to materials by sprinkling and mixing uniformly
44 throughout layer.
45 4. Materials too wet for placing shall be temporarily spread or aerated until moisture content is
46 acceptable. If these materials cannot be processed in time to use, the Contractor shall find
47 alternatives acceptable to the Engineer.

1 **3.3 ROCK EXCAVATION**

- 2 A. Rock is defined as natural material that cannot be moved or ripped with a D-9 equipped with a single
3 tooth ripper or approved equal. A demonstration is required. The Contractor shall not remove rock until
4 authorized by the Engineer.
- 5 B. All rock excavation shall be under one classification. This classification shall include solid ledge rock in
6 its natural location that requires systematic quarrying, drilling, and/or blasting for its removal and also
7 boulders that exceed 2 CY in volume.
- 8 C. When rock is encountered, strip free of earth. Employ an independent surveyor to determine rock
9 quantities before removal operation begins. In computing the volumetric content of rock excavation for
10 payment, the pay lines shall be taken from rock surface to below proposed subgrade and 10 FT outside
11 the construction baseline for the landfill phase.
- 12 D. The use of explosives shall be limited to the magnitude and location of the charge that will not cause
13 damage to adjacent existing construction and utilities through shock vibrations or other stress loadings.
14 Provide adequate blanket protection to ensure that there will not be fragments of rock or other debris
15 flying through the air when discharging explosives. Any damage to existing construction or other
16 features caused by blasting operations to be repaired and paid for by Contractor.
 - 17 1. Explosive permits shall be obtained from the appropriate local authorities.
 - 18 2. The Contract unit price for rock excavation shall include all equipment and materials and other work
19 necessary for excavation and hauling the rock from the site, and for furnishing and placing suitable
20 replacement material as specified in its place.
- 21 E. Where explosives and blasting are used, comply with all laws and ordinances of municipal, state and
22 Federal agencies relating to the use of explosives. Use qualified personnel for blasting and take proper
23 precautions to protect persons, property or the work from damage or injury from blast or explosion.
24 Conduct preblast survey in the company of the Engineer to aid in determining any damage caused by
25 blasting.

26 **3.4 FIELD QUALITY CONTROL**

- 27 A. Moisture density relations, to be established by the Soils Engineer are required for all materials to be
28 compacted.
- 29 B. Extent of compaction testing will be as necessary to assure compliance with Specifications.
- 30 C. Give minimum of 24 HR advance notice to Soils Engineer when ready for compaction or subgrade
31 testing and inspection.
- 32 D. Should any compaction density test or subgrade inspection fail to meet Specification requirements,
33 perform corrective work as necessary.
- 34 E. Pay for all costs associated with corrective work and retesting resulting from failing compaction density
35 tests.

36 **3.5 COMPACTION DENSITY REQUIREMENTS**

- 37 A. Obtain approval from Soils Engineer with regard to suitability of soils and acceptable subgrade prior to
38 subsequent operations.
- 39 B. Provide dewatering system necessary to successfully complete compaction and construction
40 requirements.
- 41 C. Remove frozen, loose, wet, or soft, material and replace with approved material as directed by Soils
42 Engineer.
- 43 D. Stabilize subgrade with well graded granular materials as directed by Soils Engineer.
- 44 E. Assure by results of testing that compaction densities comply with the following requirements:
 - 45 1. Sitework:
 - 46

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LOCATION	COMPACTION DENSITY
UNDER PIPING/PAVED ROADS	
Cohesive Soils	95 percent, ASTM D698
Cohesionless Soils	75 percent relative density per ASTM D4253 and D4254
UNPAVED AREAS	
Cohesive Soils	85 percent, ASTM D698
Cohesionless Soils	60 percent relative density per ASTM D4253 and D4254

2. Perform testing at a minimum frequency of 1 test per lift per 10,000 square feet.

3.6 SPECIAL REQUIREMENTS

A. Erosion Control: Conduct work to minimize erosion of site. Construct stilling areas to settle and detain eroded material. Remove eroded material washed off site. Clean streets daily of any spillage of dirt, rocks, or debris from equipment entering or leaving site.

END OF SECTION

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SECTION 02270
SOIL EROSION AND SEDIMENT CONTROL

3 **PART 1 - GENERAL**

4 **1.1 SUMMARY**

5 A. Section Includes:

- 6 1. Soil erosion and sediment control.

7 B. Related Sections include but are not necessarily limited to:

- 8 1. Division 0 - Bid Requirements, Contract Forms, and Conditions of the Contract.
9 2. Division 1 - General Requirements.
10 3. Division 2 - Section 02220, Earthwork.
11 4. Division 2 - Section 02485, Seeding.
12 5. Division 2 - Section 02720, Erosion Control Blankets.
13 6. Division 3 - Section 03002, Concrete.

14 **1.2 QUALITY ASSURANCE**

15 A. Referenced Standards:

- 16 1. North Carolina Erosion and Sediment Control Planning and Design Manual, current edition.
17 2. North Carolina State Department of Transportation Standard Specifications for Roads and Structures
18 Construction, current edition.

19 **1.3 SUBMITTALS**

- 20 A. Pipe riser and barrel assembly. Submittal should include but not limited to Section 2.1 of this
21 specification.
22 B. All appurtenances necessary to completely install erosion and sediment control features.

23 **PART 2 - PRODUCTS**

24 **2.1 MATERIALS**

- 25 A. Stone: NCDOT #57, NCDOT Class B Rip Rap.
26 B. Grass Seed: Refer to Section 02485, Seeding.
27 C. Silt Fence: Premanufactured or constructed on site.
28 D. Erosion Control Blankets: Refer to Section 02720.

29 **PART 3 - EXECUTION**

30 **3.1 PREPARATION**

31 A. Prior to General Stripping Topsoil, Tree Clearing, and Excavating:

- 32 1. Install silt fence, ditches, and channels.
33 2. Excavate and shape sediment basins and traps.
34 3. Construct spillways and install stone filter where required.
35 4. Machine compact all berms, dikes, and embankments for basins and traps in accordance with Section
36 02220.
37 5. Refer to the construction sequence on the plans for further detail.

- 38 B. Temporarily seed all disturbed slopes and stockpiles:

- 1 1. Refer to Section 2485, Seeding, for application rates.
- 2 2. Reseed as required until good stand of grass is achieved.

3 **3.2 DURING CONSTRUCTION PERIOD**

- 4 A. Maintain Basins, Dikes, Traps, Stone Filters, Straw Bales, Etc.:
 - 5 1. Inspect regularly especially after rainstorms.
 - 6 2. Repair or replace damaged or missing items.
- 7 B. After rough grading, sow temporary grass cover over all exposed earth areas not draining into sediment
- 8 basin or trap.
- 9 C. Construct inlets as soon as possible.
 - 10 1. Excavate and tightly secure silt fence completely around inlets as detailed on Drawings.
- 11 D. Provide necessary swales and dikes to direct all water towards and into sediment basins and traps.
- 12 E. Do not disturb existing vegetation (grass and trees).
- 13 F. Excavate sediment out of basins and traps when capacity has been reduced by 50 percent.
 - 14 1. Remove sediment from siltfence to prevent overtopping.
- 15 G. Topsoil and Fine Grade Slopes and Swales, Etc.:
 - 16 1. Seed and mulch as soon as areas become ready.
- 17 H. The erosion control features shown on the plans are performance based. If the feature does not
- 18 adequately control erosion and sediment control to the satisfaction of the project manager, the contractor
- 19 will be required to install additional erosion and sediment control features. The project manager will
- 20 work with the contractor to determine the extent of the additional measures.

21 **3.3 NEAR COMPLETION OF CONSTRUCTION**

- 22 A. Grade to finished or existing grades.
- 23 B. Fine grade all remaining earth areas, then seed and mulch in accordance with Section 02485, Seeding.

24 **END OF SECTION**

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SECTION 02271
STONE REVETMENT (RIP RAP)

3 **PART 1 - GENERAL**

4 **1.1 DESCRIPTION**

5 A. General:

- 6 1. Furnish all labor, materials, tools, equipment and services for all stone revetment (rip rap) for
7 protection of earthen slopes against erosion as indicated, in accord with provisions of Contract
8 Documents.
9 2. Completely coordinate with work of all other trades.
10 3. Although such work is not specifically indicated, furnish and install all supplementary or
11 miscellaneous items, appurtenances and devices incidental to or necessary for a sound, secure,
12 complete and compatible installation.
13 4. See Division 1 for General Requirements.

14 B. Work required in project includes but is not necessarily limited to:

- 15 1. Drainage Channels.
16 2. Erosion and Sediment Control Features.
17 3. Other areas indicated.

18 C. Related Sections.

- 19 1. Division 0 - Bidding Requirements, Contract Forms, and Conditions of the Contract.
20 2. Division 1 - General Requirements.
21 3. Division 2 - Section 02220, Earthwork.
22 4. Division 2 - Section 02900, Geotextile.

23 **1.2 QUALITY STANDARDS**

24 A. Perform all tests under supervision of Owner at an approved independent laboratory at no cost to Owner.
25 Obtain samples in conformance with Corps of Engineers Specification CRD C 100-64 or other approved
26 method.

27 B. Source Tests: Supply certified tests and service records to determine acceptability and application of
28 stone materials. In event suitable test reports or a service record that is satisfactory are not available, as in
29 case of newly operated sources, subject material to tests necessary to determine its acceptability for use.
30 Tests to which materials may be subjected include but are not necessarily limited to:

- 31 1. Petrographic analysis.
32 2. Specific gravity.
33 3. Abrasion.
34 4. Absorption.
35 5. Wetting and drying.
36 6. Soundness in magnesium sulfate.
37 7. Freezing.
38 8. Thawing.
39 9. Such other tests as may be considered necessary to demonstrate satisfactorily that materials are
40 acceptable.

41 C. Material acceptability tests:

- 42 1. Initial test: On material from each ledge sampled, prior to start of construction:
43 a. Bulk specific gravity.
44 b. Soundness in magnesium sulfate solution.
45 c. Soundness in freezing and thawing.

1 2. Control tests: Perform control tests including one specific gravity, one soundness in magnesium
2 sulfate solution test, and one soundness in freezing and thawing test for each type of stone protection
3 material for every 1,000 tons of material.

4 D. Specific gravity test: ASTM C127.

5 1. Not less than 2.40 min.

6 E. Soundness in magnesium sulfate solution test: ASTM C88, except maintain samples immersed in solution
7 at a temperature of 80 degF (26 degC) plus or minus 2 deg.

8 1. Loss at 5 cycles: Not more than 12 percent.

9 F. Soundness of aggregates in freezing and thawing test:

10 1. Ensure loss at 12 cycles of not more than 10 percent.

11 2. Modify and use AASHTO Designation T 103 Method.

12 3. Maintain temperature of cold liquid in range of -5 to 0 degF (-20 to -18 degC).

13 4. Maintain thaw fluid temperature in range of 45 to 50 degF (7 to 10 degC).

14 5. Permit length of freezing and of thawing cycles of two hours with one hour of freezing following by
15 one hour of thawing.

16 6. Perform thawing by circulating thaw fluid around pan containing stone immersed in a depth of 1/4
17 IN (6 mm) rather than by total immersion.

18 1.3 SUBMITTALS

19 A. See Section 01300.

20 B. Supplier's certification of all materials.

21 C. Submit all tests and certification in a single coordinated submittal. Partial submittals will not be accepted.

22 D. Description of location for use.

23 E. Geotextile fabric (if used) in accordance with Section 02900.

24 PART 2 - PRODUCTS

25 2.1 MATERIALS

26 A. Stone: Approved durable broken stone quarry run.

27 1. Durable and of such quality that it will disintegrate on exposure to water or weathering and free
28 from structural fractures and defects.

29 2. Not containing shale, unsound sandstone, or other material which will readily disintegrate.

30 3. Graded within limits specified.

31 4. Neither breadth nor thickness of any stone less than one-third of its length.

32 5. Ensure that dirt and fines accumulated from interledge layers or from blasting or handling operation
33 is less than 5 percent by weight.

34 6. The gradation of the material shall be well-graded from small to large of the sizes as indicated on the
35 plans or as directed by the Engineer. The rock shall be sized so as to permit its interlocking.

36 B. Geotextile: In accordance with Section 02900, Geotextile.

37 PART 3 - EXECUTION

38 3.1 PREPARATION

39 A. Trim and dress all areas to conform to the Plans as indicated with tolerance of ± 0.1 FT from theoretical
40 slope lines and grades.

41 B. Bring areas that are below allowable minus tolerance limit to grade by filling with embankment material
42 similar to adjacent material.

- 1 C. Machine compact in accordance with Section 02220.
- 2 D. Do not place any stone material on prepared base prior to inspection and approval to proceed.
- 3 E. Lay geotextile fabric prior to placing rip rap.
- 4 **3.2 PLACING RIP RAP**
- 5 A. Place dumped riprap on prepared foundation within limits indicated.
- 6 B. Place on prepared base to produce a well-graded mass of rock with minimum practicable percentage of
- 7 voids, to required thickness and grades.
- 8 C. Place to full thickness in a single operation to avoid displacing the underlying material.
- 9 D. Distribute larger stones and entire mass in final position, roughly graded to conform to approximate
- 10 gradation specified.
- 11 E. Keep finished rip rap free from objectionable pockets of small stones or clusters of larger stone.
- 12 1. Hand place and rearrange individual stones as necessary to obtain a reasonably well-graded
- 13 distribution.
- 14 F. Ensure a final tolerance of within 3 IN (75 mm) from indicated grade lines.
- 15 1. Neither tolerance extreme continuous over an area greater than 200 SQ/FT (20 SM).
- 16 G. Distribute stones throughout mass either by selective loading at quarry or by controlled dumping of
- 17 successive loads during final placing or by a combination of these methods.
- 18 1. Do not place stone by dumping into chutes or by similar method likely to cause segregation.
- 19 H. Place stone revetment (rip rap) in conjunction with embankment construction at toe of revetment as
- 20 necessary to prevent mixture of embankment and stone protection materials.
- 21 1. Maintain stone revetment until accepted.
- 22 2. Replace any displaced material to lines and grades shown.

END OF SECTION

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SECTION 02485
SEEDING

3 **PART 1 - GENERAL**

4 **1.1 DESCRIPTION**

5 A. General:

- 6 1. Furnish all labor, materials, tools, equipment and services for seeding in accordance with provisions
7 of Contract Documents.
8 2. Completely coordinate with work of all other trades.
9 3. See Division 1 for General Requirements.

10 B. Related work specified elsewhere:

- 11 1. Section 02220 - Earthwork.
12 2. Section 02221 - Trenching, Backfilling, and Compacting.
13 3. Section 02270 - Soil Erosion and Sediment Control.
14 4. Section 02720 - Erosion Control Blankets.

15 C. Location of work: All disturbed areas, exclusive of lined landfill area.

16 **1.2 QUALITY ASSURANCE**

17 A. Fertilizer testing: Current methods of Association of Official Agricultural Chemists.

- 18 1. Testing will be conducted at discretion of Engineer.

19 **1.3 SUBMITTALS**

20 A. See Section 01300.

21 B. Certificates for each grass seed mixture, stating botanical and common name, percentage by weight, and
22 percentages of purity, germination, and weed seed.

23 C. Copies of fertilizer invoices, showing grade furnished and total quantity applied.

24 D. Grass seed mix that will be used for the project and application rate.

25 **PART 2 - PRODUCTS**

26 **2.1 MATERIALS**

27 A. Establish a smooth, healthy, uniform, close strand of grass from specified seed.

28 B. Grass seed: Fresh, clean, latest available crop.

- 29 1. Seeds shall meet state seed requirements and those of the Federal Seed Act.
30 2. Species, proportions and minimum percentage of purity, germination, and maximum percentage of
31 weed seed, as specified.
32 a. Minimum percent purity 96%.
33 b. Minimum percent germination 80%.
34 c. Maximum percent weed seed 1%.
35 3. All seed used shall comply with state noxious weed seed requirements.

36 C. Mulch: Clean, seed-free, threshed straw of oats, wheat, barley, rye, beans, or other locally available mulch
37 material.

- 38 1. Do not use mulch containing a quantity of matured noxious weed seeds or other species that will be
39 detrimental to seeding, or provide a menace to surrounding land.
40 2. Do not use mulch material which is fresh or excessively brittle, or which is decomposed and will
41 smother or retard growth of grass.

- 1 D. Fertilizer: Commercial grade fertilizer meeting applicable requirements of State and Federal law.
- 2 1. Do not use cyanamic compounds of hydrated lime.
- 3 E. Limestone: agricultural grade ground limestone containing not less than 85 percent of combined calcium
- 4 and magnesium carbonates.
- 5 1. 50 percent passing 100 mesh sieve.
- 6 2. 90 percent passing 20 mesh sieve.
- 7 F. Asphalt binder: Emulsified asphalt per State Specifications.
- 8 G. Water: Potable, free of substances harmful to growth.
- 9 H. Erosion Control Matting: Refer to Section 02720, Erosion Control Blankets. Contractor shall provide
- 10 erosion control matting as required on slopes and ditchlines to obtain suitable vegetative cover.

11 2.2 DELIVERY, STORAGE AND HANDLING

- 12 A. Deliver seed in standard sealed containers labeled with producer's name and seed analysis, and in accord
- 13 with US Department of Agriculture Rules and Regulations under Federal Seed Act.
- 14 B. Deliver fertilizer in original containers labeled with content analysis.

15 PART 3 - EXECUTION

16 3.1 JOB CONDITIONS

- 17 A. This project shall comply with the planting regime for the Piedmont Region.
- 18 B. Perform spring seeding between March 1 and May 15, and fall seeding between September 1 and
- 19 November 1, or upon approval of the Engineer.
- 20 C. Permanent Seeding Regime
- 21 1. Spring (March 1 – April 30) and Fall (September 1 – November 15)
- 22 a. Kentucky-31: 175 lbs/ac.
- 23 b. Unhulled sercia lespedeza: 50 lbs/ac.
- 24 c. Rye grain: 1 bushel/ac.
- 25 2. Winter (November 16 – February 28)
- 26 a. Kentucky-31: 200 lbs/ac.
- 27 b. Unhulled sercia lespedeza: 50 lbs/ac.
- 28 c. Rye Grain: 3 bushels/ac.
- 29 3. Summer (May 1 – August 31)
- 30 a. Kentucky-31: 50 lbs/ac.
- 31 b. Unhulled sercia lespedeza: 50 lbs/ac.
- 32 c. Korean or kobe lespedeza: 50 lbs/ac.
- 33 d. Weeping love grass: 5 lbs/ac.
- 34 e. Bermuda grass: 10 lbs/ac.
- 35 f. Millet: 1 bushel/ac.
- 36 D. Temporary Seeding
- 37 1. Establish temporary or intermediate seeding within 15 working days or 90 calendar days (whichever
- 38 is shorter) if construction has ceased for more than 15 working days or 90 calendar days.
- 39 2. Temporary Seeding Regime
- 40 a. Spring (March 1 – April 30) and Winter (November 16-February 28)
- 41 1) Rye: 120 lbs/ac.
- 42 2) Sercia Lespedeza: 50 lbs/ac
- 43 b. Summer (May 1 – August 31)
- 44 1) German Millet: 40 lbs/ac
- 45 c. Fall (September 1 – November 15)
- 46 1) Rye: 120 lbs/ac

1 E. Seeding is a performance based construction activity. Refer to paragraph 3.4 Maintenance.

2 **3.2 SOIL PREPARATION**

3 A. Project manager to approve area after the surface is prepared and prior to seeding.

4 B. Limit preparation to areas which will be planted soon after preparation.

5 C. Loosen surface to minimum depth of four (4) IN.

6 D. Remove stones over one IN in any dimension, sticks, roots, rubbish and other extraneous matter.

7 E. Test soil pH using test kits approved by USDA NRCS. Use test results to determine rate of lime
8 application needed to make soil circumneutral. Provide application rate to Engineer for approval prior to
9 its application.

10 F. Spread lime uniformly over designated areas at rate determined by soil testing.

11 G. After application of lime, prior to applying fertilizer, loosen areas to be seeded with double disc or other
12 suitable device if soil has become hard or compacted. Correct any surface irregularities in order to
13 prevent pocket or low areas which will allow water to stand.

14 H. Test soil fertility according to USDA NRCS approved methods. Use test results to determine rate of
15 fertilizer application. Engineer will approve fertilizer application rate prior to application.

16 I. Distribute fertilizer uniformly over areas to be seeded at a rate determined by soil testing.

17 1. Use suitable distributor.

18 2. Incorporate fertilizer into soil to depth of at least two (2) IN.

19 3. Remove stones or other substances which will interfere with turf development or subsequent
20 mowing.

21 J. Grade seeded areas to smooth, even surface with loose, uniformly fine texture.

22 1. Roll and rake, remove ridges and fill depressions, as required to meet finish grades.

23 2. Fine grade just prior to planting.

24 K. Restore seeded areas to specified condition if eroded or otherwise disturbed between fine grading and
25 planting.

26 L. If fertilizer application rate is determined (by invoices submitted) to be less than that specified, apply
27 additional fertilizer.

28 M. Cover seeded areas with mulch.

29 **3.3 SEEDING**

30 A. Do not use seed which is wet, moldy, or otherwise damaged.

31 B. Use approved mechanical power driven drills or seeders, or mechanical hand seeders, or other approved
32 equipment.

33 C. Distribute seed evenly over entire area at not less than 7LB/1000 SF, 50 percent sown in one direction,
34 remainder at right angles to first sowing.

35 D. Stop work when work extends beyond most favorable planting season for species designated, or when
36 satisfactory results cannot be obtained because of drought, high winds, excessive moisture, or other
37 factors.

38 E. Resume work only when favorable condition develops.

39 F. Lightly rake seed into soil followed by light rolling or Culti-packing.

40 G. Immediately protect seeded areas against erosion by mulching or placing netting.

41 1. Spread mulch in a continuous blanket using 1-1/2 TON/ACRE to depth of 4 or 5 straws.

42 2. Immediately following spreading mulch, secure with evenly distributed emulsified asphalt at rate of
43 200 gal/acre.

- 1 3. Protect all seeded slopes greater than 3:1 (horizontal to vertical) and ditches against erosion with
2 approved erosion control netting or mats.
- 3 H. Immediately after planting, water to a reasonable depth.
- 4 I. Clean-up: Remove any soil or similar material from paved areas within same working day. Upon
5 completion of seeding, remove all excess soil, stones, and other debris from site or dispose as directed by
6 Owner. Repair all damages to existing construction caused by lawn operations to the satisfaction of
7 Engineer and Owner at no additional cost to Owner

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SECTION 02511
AGGREGATE COURSE

3 **PART 1 - GENERAL**

4 **1.1 WORK INCLUDED**

- 5 A. Crushed stone paving course, compacted.

6 **1.2 RELATED WORK**

- 7 A. Section 01300 - Submittals
8 B. Section 02220 - Earthwork

9 **1.3 REFERENCES**

- 10 A. North Carolina Department of Transportation Standard Specifications for Roads and Structures, current
11 edition.

12 **1.4 TEST**

- 13 A. Contractor to supply to Engineer certificate from supplier that material meets specifications.
14 B. Contractor to supply to Soils Engineer sample of material for determination of optimum moisture and
15 density determination.

16 **PART 2 - PRODUCTS**

17 **2.1 MATERIAL**

- 18 A. Material shall be ABC stone as provided in accordance with Section 1010 of the North Carolina
19 Department of Transportation Standard Specifications for Roads and Structures.

20 **PART 3 - EXECUTION**

21 **3.1 CONSTRUCTION**

- 22 A. Construct aggregate course to grade, thickness, and typical section as indicated on drawings. Existing
23 subgrade upon which aggregate course is to be placed shall be compacted in accordance with Section
24 02220.
25 B. Aggregate course shall be constructed in accordance with Section 520 of the North Carolina Department
26 of Transportation Standard Specifications for Roads and Structures, unless indicated otherwise on plans
27 or specifications.

28 **3.2 COMPACTION**

- 29 A. Compact by vibrating or other approved methods to 95 percent maximum dry density as determined by
30 ASTM D1557.
31 B. Any irregularities in the surface shall be corrected by scarifying, remixing, reshaping and recompacting
32 until a smooth surface is secure.
33 C. The crushed stone will be tested for depth and density.

34 **END OF SECTION**

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SECTION 02720
EROSION CONTROL BLANKETS

3 **PART 1 - GENERAL**

4 **1.1 SECTION INCLUDES**

- 5 A. The erosion control blankets are for the purpose of erosion control and revegetation as described herein.
- 6 B. This work shall consist of furnishing and installation of the erosion control blankets, including fine
7 grading, blanketing, stapling, and miscellaneous related work, in accordance with these standard
8 specifications and at the location(s) identified on Drawings or designated by Engineer. This work shall
9 include all necessary materials, labor, supervision and equipment for installation of a complete system.
- 10 C. All work of this Section shall be performed in accordance with the Conditions and Requirements of the
11 Contract Documents.
- 12 D. The erosion control blankets shall be used where surface erosion is not desirable. The blankets shall be
13 suitable for the following applications:
14 1. Channel and ditch linings.
15 2. Slope protection.

16 **1.2 RELATED SECTIONS**

- 17 A. Section 1300 - Submittals.
- 18 B. Section 02220 - Earthwork.
- 19 C. Section 02485 - Seeding.

20 **1.3 PERFORMANCE REQUIREMENTS**

- 21 A. Erosion control blankets shall provide a temporary, biodegradable cover material to reduce erosion and
22 enhance revegetation.

23 **1.4 SUBMITTALS**

- 24 A. Submit product data on materials for erosion control blankets in accordance with Section 01300.
- 25 B. Any alternative system submitted for approval shall include complete design data, including test evidence
26 of compliance to the essential design parameters of Project and reference installations similar in size and
27 scope to that specified for Project.

28 **1.5 SAMPLES**

- 29 A. Submit product samples in accordance with Section 01300.

30 **1.6 DELIVERY, STORAGE AND HANDLING**

- 31 A. Erosion control blankets shall be furnished in rolls and wrapped with suitable material to protect against
32 moisture and extended ultraviolet exposure prior to placement. Each roll shall be labeled to provide
33 identification sufficient for inventory and quality control purposes.
- 34 B. Erosion control blankets shall be free of defects that would interfere with the proper installation or impair
35 the performance.
- 36 C. Erosion control blankets shall be stored by Contractor in a manner which protects them from damage by
37 construction traffic.

1 **PART 2 - PRODUCTS**

2 **2.1 EROSION CONTROL BLANKETS**

3 A. Material shall be Curlex II Excelsior as manufactured by American Excelsior, or approved equal.

4 **PART 3 - EXECUTION**

5 **3.1 SITE PREPARATION**

6 A. Before placing erosion control blanket, the subgrade shall be inspected by Contractor to insure that it has
7 been properly compacted; has been graded smooth; has no depressed, void, soft or uncompacted areas; is
8 free from obstructions, such as tree roots, projecting stones or other foreign matter; and has been seeded.
9 Contractor shall not proceed until all unsatisfactory conditions have been remedied. By beginning
10 construction, Contractor signifies his approval of preceding work.

11 B. Contractor shall fine grade the subgrade by hand dressing where necessary to remove local deviations.

12 C. No vehicular traffic shall be permitted directly on the blankets.

13 **3.2 CHANNEL INSTALLATION**

14 A. Erosion control blankets shall be installed as directed by the Engineer in accordance with manufacturer's
15 instructions. The extent of erosion control blankets shall be as shown on Drawings.

16 B. Erosion control blankets shall be installed parallel to the flow of water. The first roll shall be centered
17 longitudinally in mid-channel and anchored. Subsequent rolls shall follow from channel center outward.

18 C. Successive lengths of erosion control blankets shall be overlapped ("shingled") sufficiently for a common
19 row of connections with the upstream end on top. Connect the overlap across the end of each of the
20 overlapping lengths.

21 D. A trench shall be located at the upstream termination. Erosion control blanket shall be connected to the
22 bottom of the trench. Backfill and compact the trench.

23 **3.3 SLOPE INSTALLATION**

24 A. Before placing erosion control blanket, the subgrade shall be inspected by Contractor to insure that it has
25 been properly compacted; has been graded smooth; has no depressed, void, soft or uncompacted areas; is
26 free from obstructions, such as tree roots, projecting stones or other foreign matter; and has been seeded.
27 Contractor shall not proceed until all unsatisfactory conditions have been remedied. By beginning
28 construction, Contractor signifies his approval of preceding work.

29 B. Place on all slopes within limits of construction on slopes greater than or equal to 2H:1V.

30 **3.4 QUALITY ASSURANCE**

31 A. Erosion control blankets shall not be defective or damaged. Any such problems shall be corrected by
32 Contractor at no cost to Owner and to the satisfaction of Engineer.

33 **3.5 CLEAN-UP**

34 A. At the completion of this scope of work, Contractor shall remove from the job site and properly dispose
35 of all remaining debris, waste materials, excess materials, and equipment required of or created by
36 Contractor. Disposal of waste materials shall be solely the responsibility of Contractor and shall be done
37 in accordance with applicable waste disposal regulations.

38 **END OF SECTION**

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SECTION 02900
GEOTEXTILE FABRIC

3 **PART 1 - GENERAL**

4 **1.1 SUMMARY**

5 A. Section Includes:

- 6 1. Geotextile fabric for all uses as shown in Drawings including but not limited to:
7 a. Cushion geotextile to protect geomembrane from leachate collection layer.
8 b. Separator geotextile between leachate collection system and operational cover.

9 B. Related Sections include but are not necessarily limited to:

- 10 1. Section 02220 - Earthwork.

11 **1.2 QUALITY STANDARDS**

12 A. Reference Standards:

- 13 1. American Society for Testing and Materials (ASTM):
14 a. D1987, Biological Clogging of Geotextile or Soil/Geotextile Filters.
15 b. D3776, Test Method for Mass Per Unit Area of Woven Fabric.
16 c. D4354, Practice for Sampling of Geosynthetics for Testing.
17 d. D4355, Test Method for Deterioration of Geotextiles from Exposure to Ultraviolet Light and
18 Water.
19 e. D4491, Test Method for Water Permeability of Geotextiles by Permittivity.
20 f. D4595, Tensile Properties of Geotextiles by the Wide-Width Strip Method.
21 g. D4632, Test Method for Grab Breaking Load and Elongation.
22 h. D4751, Determining Apparent Opening Size of a Geotextile.
23 i. D4833, Test Method for Index Puncture Resistance of Geotextiles, Geomembrane, and Related
24 Products.
25 j. D4873, Guide for Identification, Storage, and Handling of Geotextiles.
26 k. D5261, Measuring Mass Per Unit Acre of Geotextiles.

27 **1.3 SUBMITTALS**

28 A. Shop Drawings:

- 29 1. See Sections 01300 and 01340.
30 2. Product technical data.
31 3. Manufacturer's delivery, storage, handling, and installation instructions.

32 **PART 2 - PRODUCTS**

33 **2.1 ACCEPTABLE MANUFACTURERS**

34 A. Subject to compliance with the Contract Documents, the following Manufacturers are acceptable:

- 35 1. Geotextiles:
36 a. Amoco Fabrics and Fibers Co.
37 b. Advanced Drainage Systems Inc.
38 c. Nicolon Mirafi Group.
39 d. Synthetic Industries, Inc.
40 e. Or approved equal.

41 **2.2 FABRICATION**

- 42 A. Geotextile: Non-woven, needle punched; polyester or polypropylene; continuous filament or staple fibers;
43 conforming to the following properties:

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<u>Property</u>	<u>Test Method</u>	<u>Minimum Required Value</u>
Unit Weight	ASTM D5261	8 oz/sy
Grab Tensile Strength	ASTM D4632	210 lb
Elongation	ASTM D4632	50%
Puncture Strength	ASTM D4833	95 lb
Maximum Apparent Opening Size	ASTM D4751	#70 US Sieve
Permittivity	ASTM D4491	0.5 sec-1

B. Roadbed Geotextile Fabric: The geotextile shall be composed of synthetic fibers formed into a woven fabric. Fibers used in the manufacture of the geotextile shall be polyolefins, polyesters or polyamides and conform to the following properties.

<u>Property</u>	<u>Test Method</u>	<u>Minimum Required Value</u>
Grab Tensile	ASTM D4632	200 lbs
Grab Elongation	ASTM D4632	15 %
Puncture Strength	ASTM D4833	100 lbs
Trapezoidal Tear	ASTM D4533	75
UV Resistance	ASTM D4355	90 %

PART 3 - EXECUTION

3.1 INSTALLATION

A. General Handling and Layout

1. General storage and handling of geotextiles must meet requirements of ASTM D4873.
2. Exercise care when installing to prevent damage to geotextile.
3. Lay out geotextile smooth and free of wrinkles, but loose enough that placement of overlying materials will not stretch or tear the fabric.
4. Repair or replace geotextile that is torn or punctured. Repair by placing a geotextile patch over the damaged area, overlapping the existing geotextile by 12 IN (minimum) from any part of the damaged area. Repair or replace at no extra cost to Owner.
5. No equipment may operate directly on geotextiles. A minimum vertical separation of 9 IN must be maintained between all geotextiles and equipment tracks or wheels.

B. Seaming and Joining

1. Cushion: Join sheets without sewing but with a minimum of 4 IN longitudinal overlap.
2. Separator: Join sheets as specified below.
 - a. With Sewing: Overlap adjacent panels a minimum of 4 IN. Use Type SSa (prayer) seam and a Type 401 stitch having a minimum distance from the edge of the geotextile to the stitch line of 2.0 IN or follow recommendations of geotextile manufacturer.
 - b. With Heat Bonding: Overlap adjacent panels a minimum of 4 IN. Heat bond seam must develop a minimum of 60% of the tensile strength of the parent geotextile as measured in ASTM D4632.

C. Geotextile

1. Place fabric directly on a relatively smooth subgrade, free of obstructions, abrupt depressions or humps, debris, or deposits of loose or soft soil.
2. Care must be taken to avoid damaging the geotextile during placement of the soil over the geotextile. This may require use of a thicker loose lift or a smooth drum roller to limit damage due to penetration of compactor feet.

1 D. Roadbed Geotextile Fabric: Woven

- 2 1. Place woven geotextile directly on a relatively smooth subgrade, free of obstructions, abrupt
3 depressions or humps, debris, or deposits of loose or soft soil.
4 2. If required, the geotextile may be held in place with staples.
5 3. Geotextile shall be overlapped in the direction of the subbase placement.

6 **3.2 CQC TESTING**

- 7 A. The CQC Consultant shall confirm that the identification, storage, and handling of geotextiles is in
8 accordance with ASTM D4873. Any deviation from this requirement will be reported to the Engineer.
9 B. The CQC Consultant will examine all manufacturer's certifications to ensure that the property values
10 listed on the certifications meet or exceed these specifications. Any deviations will be reported to the
11 Engineer.
12 C. The CQC Consultant will observe placement of the geotextiles to confirm that the panel overlaps and
13 seams are in accordance with these specifications. Any deviations will be reported to the Engineer.

14 **END OF SECTION**

Appendix C
DRAWINGS



TO: Mike Plummer, PE
FROM: John Jamison
DATE: Tuesday, October 26, 2004
SUBJECT: Proposed Forum 52 Yardwaste Facility



*HDR Engineering, Inc.
of the Carolinas*

MEMORANDUM

This memorandum is to summarize the findings of my site visit conducted October 15, 2004 at the proposed City of Winston-Salem Forum 52 Yardwaste Facility off Forum Parkway, herein referred to as the Site. The Site is located southeast of the cul-de-sac of Forum Parkway in Forsyth County, North Carolina. The site visit was conducted to delineate and flag the extent of Waters of the United States within the property limits; the review did not include a survey of the Site.

Surface waters and wetlands are considered "Waters of the United States," as defined in Section 33 of Code of Federal Regulations (CFR) Part 328.3. Any action that proposes to dredge or place fill material into surface waters or wetlands falls under the jurisdiction of the United States Army Corps of Engineers (USACE) through Section 404 of the Clean Water Act (33 U.S.C. 1344). Surface waters include all standing or flowing waters that have commercial or recreational value to the public. Wetlands are identified based on the presence of hydric soils, hydrophytic vegetation, and wetland hydrology, as described in the 1987 USACE Wetland Delineation Manual.

The site is partially forested with significant areas impacted by land disturbing activities. Disturbed areas on site appear to be as a result of grading (on the northern ¼ of the Site) and utility right-of-way maintenance (natural gas and sewer). A berm or spoil pile bounds the east/southeast property limits along Grassy Creek, likely as a result of stream dredging activities in the first half of the 20th century. The forested portion of the site appears to have been impacted multiple times over the past 50 years and is now regenerating in a mixed pine/hardwood early-successional forest.

The Site generally slopes downward from west to east toward Grassy Creek, with a drainage feature near the center of the site. Grassy Creek is an entrenched stream that flows south along the eastern Site boundary toward Highway 52.

An intermittent stream and associated small riparian wetland were observed on-site and are situated immediately south of the natural gas easement that crosses through the center of the property. The stream channel dissipates into the wetland area. The wetland may have been historically created by the construction of an impoundment feature (possibly a road crossing or dam). The pipe that runs under this feature is filled in and thus not passing any significant flows. The intermittent stream channel continues below the feature for approximately 100 feet. The channel then becomes indiscernible as the flow enters an area that appears to have been cleared or graded in the past 10-15 years. This over-land flow eventually makes it way to a low area along the Grassy Creek berm. An

emergent wetland is present at this low point near the southeastern property limit (adjacent to the berm along Grassy Creek) and is generally contained within the existing utility right-of-way.

The aforementioned wetland areas exhibit field indicators of all three required wetland criteria: hydrophytic vegetation, wetland hydrology, and hydric soils. However, the hydric soil indicators were weak in most spots. Additional areas adjacent to those described above exhibited hydrophytic vegetation and wetland hydrology but did not appear to have hydric soils, and thus were not flagged during the delineation. Verification that these areas are not jurisdictional wetlands will be determined by the USACE site visit.

USACE jurisdiction of the wetlands and stream has not yet been determined. Based on the approximate size and location of these areas, in conjunction with the preliminary site design, the following conclusions may be reached:

- The most significant constraint to site development will be the intermittent stream and wetland located in the center of the site.
- The larger wetland area adjacent to Grassy Creek is contained primarily within the sanitary sewer right-of-way, which is not significantly impacted by the preliminary site design.
- Development of the site is feasible, although minor impacts to jurisdictional wetlands and streams are likely to occur.
 - These impacts, based on the brief field review, could potentially be permitted under a Nationwide Permit, which has a maximum 45- to 60-day review period.
 - Mitigation may be required for unavoidable impacts to wetlands and streams within the property. This can only be determined through a formal survey of the verified jurisdictional areas.
 - All effort should be made to avoid and minimize wetland and stream impacts during the site design process – this will be a major factor in determining the pace of a USACE permit approval.
 - A formal USACE wetland verification of the site should be performed, followed by a survey by a professional land surveyor.



To: Mike Plummer	
From: Chris Randazzo	Project: Winston-Salem Forum 52 Yardwaste Site
CC:	
Date: 10/27/2004	Job No: 00162-18088-018-001

RE: The results of the hand augering site visit conducted on October 15, 2004 are as follows:

Location B-1:

Surface above soil: vegetation

0'-5': Red, brown, clayey SILT, little fine grained sand, sparse mica, medium stiff, dry, will not stay inside auger beyond 5'

Location B-2:

Surface above soil: sparse vegetation

0'-5': Red, brown, clayey SILT, little fine grained sand, micaceous, loose, dry, will not stay inside auger beyond 5'

Location B-3:

Surface above soil: organic, leaf litter, mossy

0'-7': Red, brown, clayey SILT, little fine grained sand, highly micaceous, very loose, dry, will not stay inside auger beyond 7'

Location B-4:

Surface above soil: organic, leaf litter, mossy

0'-5': Brown, fine grained sandy, clayey, SILT, highly micaceous, very loose, dry, will not stay inside auger beyond 5'

Location B-5:

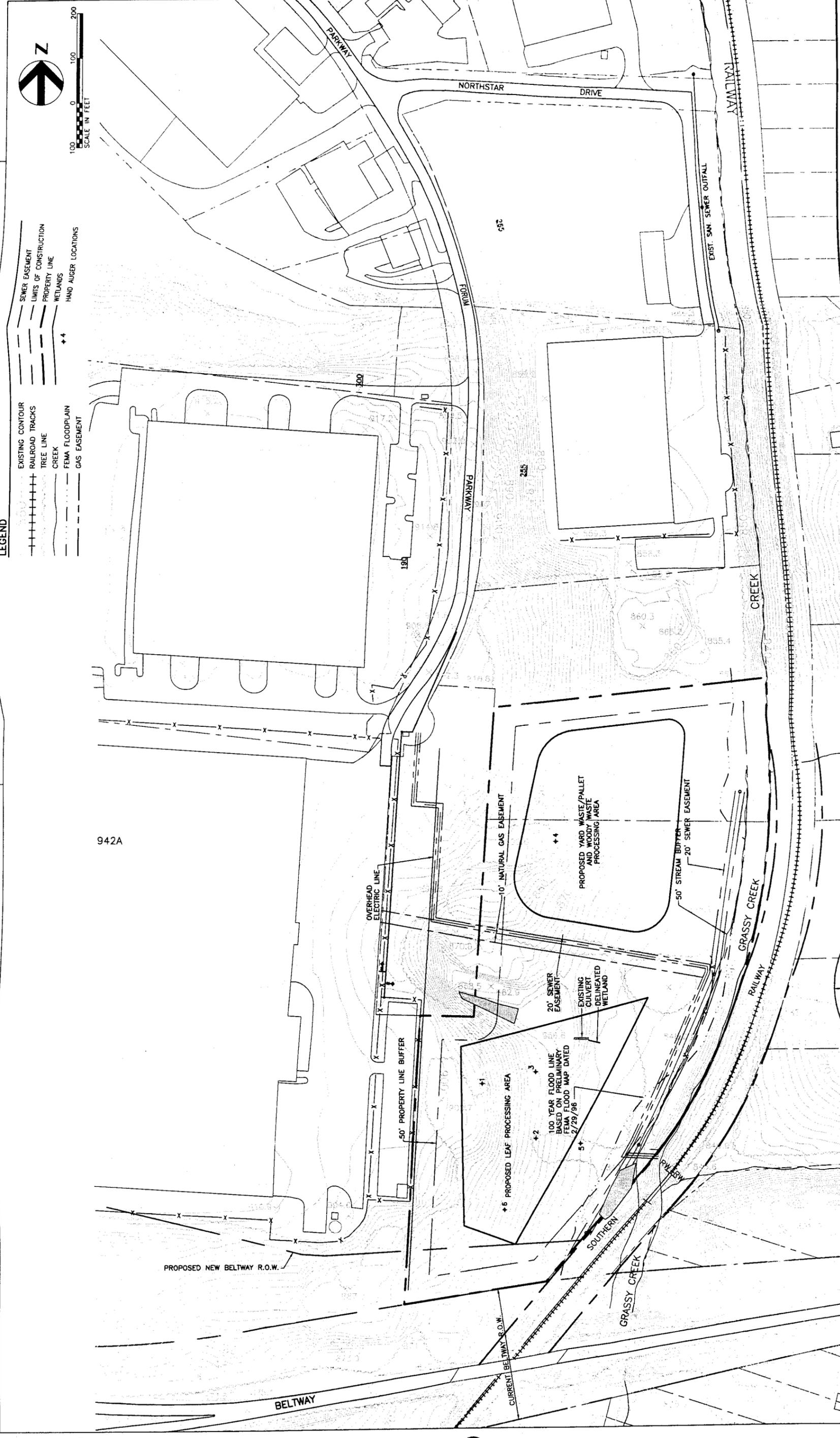
Surface above soil: vegetation

0'-4': Red, brown, tan, clayey, SILT, little fine grained sand, micaceous, hard augering, stiff, more tan with depth, dry, will not stay inside auger beyond 4'

Location B-6:

Surface above soil: organic, leaf litter

0'-4': Red, brown, clayey, SILT, little fine grained sand, slightly micaceous, hard augering, stiff, dry, will not stay inside auger beyond 4'



PROJECT MANAGER	M. D. PLUMMER, P.E.
	P. WESTMORELAND
	J. GAUL
PROJECT NUMBER	00009095.018

ISSUE	DATE	DESCRIPTION
A	12/04	

HDR
HDR Engineering, Inc.



NORTH CAROLINA DEPARTMENT OF
ENVIRONMENT AND NATURAL RESOURCES
WINSTON-SALEM REGIONAL OFFICE
DIVISION OF WATER QUALITY
December 9, 1998

DEC 10 1998



JAMES B. HUNT JR.
GOVERNOR

WAYNE MCDEVITT
SECRETARY

Mr. Philip Westmoreland, E.I.T.
HDR Engineering, Inc. of the Carolinas
Suite 1400
128 S. Tryon Street
Charlotte, NC 28202-5001

**Subject: Overdale Yard Waste Facility
Winston-Salem, NC
HDR Project No. 00162-000-018**

Dear Mr. Westmoreland:

This letter is in response to your request to comment on the compliance status of the subject facility. You specifically questioned that I comment on whether the site is in compliance with NPDES permitting and if the site is causing non-point source pollution in violation of the assigned water quality standards.

From your information submitted, I determined that the site drainage is into an unnamed tributary to South Fork Muddy Creek, which is classified as "C" waters of the state. Attached are the assigned water quality standards for these waters.

NPDES permits for stormwater runoff are required by the U.S. E.P.A. for listed industrial operations which manufacturer products and have a conveyance to waters of the state. North Carolina has the delegation to issue these Stormwater NPDES Permits. Since this operation is not defined as "manufacturing" and has no conveyance, the site does not meet the definitions to require it to obtain a NPDES permit from North Carolina. Thus, the site does not violate any NPDES requirement.

To answer the question regarding whether non-point source pollution is occurring from the site which violates the water quality standards we would need the applicant to provide sampling data from the receiving waters for each of the parameters attached. Our office does not monitor this particular unnamed tributary as part of our monitoring program. You may want to check with Crystal Couch with the City of Winston-Salem Stormwater Department to see if the receiving waters are sampled

December 9, 1998

Page 2

by the City as part of the requirements of the City of Winston-Salem's NPDES Stormwater Permit issued by the state.

It appears from the map that adequate best management practices are in place to address non-point source stormwater pollution from the site. The densely vegetated buffer in the direction of the majority of the stormwater drainage should be adequate to control non-point source pollution. One would not expect the site to violate the attached water quality standards since good management practices are employed.

Should you have any questions regarding these comments, please contact Beth Morton at (336)771-4600.

Sincerely,



Beth Morton
Environmental Engineer

cc: WSRO File
Central File

Water Quality Standards For Freshwater Classifications

October 1, 1998

Parameters (less noted)	Standards for All Freshwater ¹		Standards to Support Additional Uses		
	Aquatic Life	Human Health ¹	WS Classes ²	Trout Waters	HOW
	50		1000		
Barium		71.4	1.19		
Benzene	6.5	0.117	0.0068		
Beryllium	2.0			0.4	
Cadmium		4.42	0.254		
Carbon tetrachloride	230000 (AL)		250000		
Chloride			488 (N)		
Chlorinated benzenes				17	
Chlorine, total residual	17 (AL)			15 (N)	
Chlorophyll a, corrected	40 (N)				
Chromium, total	50				
Coliform, total (MFTCC/100ml) ³			50 (N) ⁴		
Coliform, fecal (MFFCC/100ml) ³		200 (N)			
Copper, total	7 (AL)			5.0	
Cyanide	5.0				
Dioxin		0.00000014	0.00000013		
Dissolved gases	(N)				
Dissolved oxygen (mg/l)	5.0 ⁵			6.0	(N) ⁶
Fluoride	1800				
Hardness, total (mg/l)			100		
Hexachlorobutadiene		49.7	0.445		
Iron (mg/l)	1 (AL)				
Lead	25 (N)				
Manganese			200		
MBAS (Methylene-Blue-Active-Substances)	500				
Mercury	0.012				
Nickel	88		25		
Nitrate nitrogen			10,000		
Pesticides					
Aldrin	0.002	0.000136	0.000127		
Chlordane	0.004	0.000588	0.000575		
DDT	0.001	0.000591	0.000588		
Demeton	0.1				
Dieldrin	0.002	0.000144	0.000135		
Endosulfan	0.05				
Endrin	0.002				
Guthion	0.01				
Heptachlor	0.004	0.000214	0.000208		
Lindane	0.01				
Methoxychlor	0.03				
Mirex	0.001				
Parathion	0.013				
Toxaphene	0.0002				
2,4-D			100		
2,4,5-TP (Silvex)			10		
Polycyclic aromatic hydrocarbons ⁷	6.0-9.0	(N)	1.0 (N)		(N) ⁸
Polychlorinated biphenyls ⁷	0.001	0.000079	0.0028		
Polynuclear aromatic hydrocarbons ⁸		0.0311			
Radioactive substances		(N)			
Selenium	5				
Silver	0.06 (AL)				
Solids, total dissolved (mg/l)			500		
Solids, total suspended (mg/l)					10 Tr, 20 other
Solids, settleable	(N)				
Sulfates			250000		
Temperature	(N)				
Tetrachloroethane (1,1,2,2)		10.8	0.172		
Tetrachlorethylene			0.8		
Toluene	11			0.36	
Toxic substances	(N)				(N)
Trialkylin	0.008				
Trichloroethylene		92.4	3.08		
Turbidity (NTU)	50; 25 (N)			10 (N)	
Vinyl chloride		525	2.0		
Zinc	50 (AL)				

* These standards apply to all freshwater classifications. For the protection of WS and supplemental classifications, standards listed under Standards to Support Additional Uses should be used unless standards for aquatic life or human health are listed and are more stringent.

(AL) Values represent action levels as specified in 2B .0211. WS Classes - Water Supply Classifications, same standards for all WS Classes.

(N) See 2B .0211 for narrative description of limits. HQW - High Quality Waters, standards for HQW areas only. Tr - Trout Waters.

1 Human health standards are based on consumption of fish only unless dermal contact studies available. See 2B .0208 for equation.

2 Water Supply standards are based on consumption of fish and water. See 2B .0208 for equation.

3 MFTCC/100ml means membrane filter total coliform count per 100 ml of sample. MFFCC/100ml means membrane filter fecal coliform count per 100 ml of sample.

4 Applies only to unfiltered water supplies.

5 An instantaneous reading may be as low as 4.0 mg/l, but the daily average must be 5.0 mg/l or more.

6 Designated swamp waters may have a dissolved oxygen less than 5.0 mg/l and a pH as low as 4.3, if due to natural conditions.

7 Applies to total PCBs present and includes PCB 1242, 1254, 1221, 1232, 1248, 1260, and 1016. See 2B .0208 & .0211.

8 Applies to total PAHs present and includes benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene. See 2B .0208, .0212, .0214, .0215, .0216, & .0218.

dmr/Old WQ Standards Table:5/1/97 9:15 AM

Appendix B

FORUM 52 YARD WASTE FACILITY

OPERATIONS PLAN

**CITY/COUNTY UTILITY COMMISSION
WINSTON-SALEM, NORTH CAROLINA**

PREPARED BY:

**HDR ENGINEERING, INC. OF THE CAROLINAS
128 S. TRYON STREET, SUITE 1400
CHARLOTTE, NORTH CAROLINA 28202**

HDR Project No. 0162-18088-018



December 2004

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I. INTRODUCTION

The purpose of this document is to identify protocols for the overall operation and maintenance of the Forum 52 Yard Waste Facility (Facility). This site is owned by the City of Winston-Salem (City). The site encompasses approximately 17 acres located on Northstar Drive on the eastern side of US Hwy 52 in the northern portion of the City. The plan provides details of the procedures and policies, which shall be implemented throughout operation of the Facility.

II. STANDARD OPERATING PROCEDURES

A. Hours and Days of Operation

It is anticipated that the Facility will be open for operation between the hours of 7:00 a.m. and 5:00 p.m. Monday through Friday, and from 8:00 a.m. to 4:00 p.m. on Saturday. The City may adjust the hours of operation as warranted.

Special notices will be posted at the scalehouse advising users of observed holidays.

Activity may occur at the site other than the stated hours to allow off-hour delivery of wastes by City Sanitation crews; to conduct facility maintenance or processing; or to extend distribution hours for the finished product.

III. FACILITY ACCESS AND SECURITY MEASURES

A. Access

The site will be accessed through an entrance on Northstar Drive by a 20 foot wide all weather surface road. All waste deliveries and distribution of finished compost will occur via this entrance.

B. Security

Security for the compost site shall be maintained through a gate at the access road. The gate will remain locked when the Facility is not occupied.

IV. FACILITY SIGNAGE

Signage at the site will address the location of the waste receiving areas, the compost area and proper covering required on all loads leaving the site.

V. FACILITY OPERATIONS

A. Weighing Procedures

1. Incoming Material

All vehicles entering the Facility will be required to stop at the scalehouse, which will be located at the entrance to the Facility. All refuse transportation vehicles will be weighed on scales and the content of the load will be assessed. In addition records for the City's yard waste and leaf collection services will be kept on a per cubic yard basis.

The weighmaster will request from the driver of the vehicle a description of the waste it is carrying to ensure that unacceptable waste is not being brought into the Facility. The weighmaster will then collect the payment and visually check the vehicle as it crosses the scale. Please refer to Section VIII of the Operations Plan for record keeping instructions of incoming material.

2. Outgoing Material

Outgoing material will be recorded on a tonnage basis and compost will be converted to a cubic yard quantity. Please refer to Section VIII of the Operations Plan for record keeping instructions of outgoing material.

B. Wastes Accepted

This Facility will be approved to receive only the following waste: Yard trash (as defined in G.S. 130 A-290), pallets, woody waste, engineered wood products and other untreated, unpainted wood, leaves, and grass clippings.

C. Unacceptable Waste

The following wastes will be prohibited by the yard waste facility:

- *Whole scrap tires
- *Used oil
- *Municipal solid waste
- *Land clearing debris (stumps, etc.)
- *Construction and demolition waste (C&D)
- *White goods
- *Lead acid batteries
- *Hazardous waste
- *Asbestos containing waste
- *Medical wastes

D. Mulching Process

After final inspection, the waste will be loaded into the yard waste and pallet processing unit (horizontal salvage hog and hammermill). The radial stacker will be used to stockpile the processed material. Please refer to the Monitoring and Testing Section for instructions on monitoring and testing of the mulch.

E. Composting Process

1. Material Preparation

- a. Leaves shall be immediately unloaded in predesignated windrow locations and formed into windrows with the loader the same day if possible, but no longer than three days from receipt. Each windrow shall be approximately 30 feet wide and 15 feet high, with the lengths of each windrow varying on location of the windrow on the site.
- b. Grass clippings will be ground within a week from receipt on-site. Should odors become a problem, the grass clippings will be ground immediately.
- c. The ground material will then be removed from the processing area and placed into windrows as a compost amendment in approximate ratios of one part clippings to three parts leaves.
- d. Upon placement of material into windrows, moisture requirements will be determined.
- e. Moisture will be added by using a water truck or turning the windrows in the rain.

2. Composting Process

- a. Refer to the Monitoring and Testing section for instructions on monitoring and testing of the compost.
- b. The windrows should be placed with the slope to allow free drainage between the windrows and to maintain proper moisture content. Please refer the Proposed Development Plan for an approximate layout of the windrows. If odor becomes a problem, the windrows should be turned or ground leaves could be incorporated into the windrows. Another method to control odor would be to cover the compost with more mature compost, which would act as a biofilter.

3. Final Product

- a. If the temperature requirement has been met as stated in the Monitoring and Testing section of the Operations Plan, the material may be screened to

remove any nonconforming waste (overs) that may have been missed during the original screening.

- b. The material passing the screen can be placed in a curing pile or distributed immediately.
- c. The material not passing the screen (overs) may be sold as mulch, boiler fuel, or landfilled.
- d. Monitoring and testing records will be maintained until the product is ready for distribution.

F. Contingency Plan

1. Equipment Breakdown

In the event of equipment downtime, the operating Contractor on site will be responsible for arranging to have other equipment brought to the site.

2. Non-Conforming Waste

All waste will be screened both at the scalehouse and in the receiving area. If nonconforming waste is discovered at the scalehouse, it will be rejected immediately. If nonconforming waste is found in the receiving area, it will be sent to a separate area which has been dedicated for such material. The reject/non-conforming waste pile shall be hauled to the proper landfill when the area is full. Municipal Solid Waste (MSW) will be sent directly to the Hanes Mill Road Landfill and Construction & Demolition (C&D) like material will be sent to the OSR C&D Landfill.

3. Fire Contingency

The local fire department, located within four (4) miles of the Facility, will be informed of the operation of the Facility. The threat of fire will be minimized by the short life span of the material on-site.

4. Vectors and Odors

To minimize the threat of vectors, the yard waste will be ground within 48 hours of receipt. To minimize potential odors, particularly odors from the compost, grass clippings will be incorporated into the windrows or turning of the windrows. In the event the windrow turner is inoperable, other equipment will be brought to the site.

G. Monitoring and Testing

1. Compost

Internal temperature of the windrow will be taken and recorded approximately every two weeks after completion of the windrow at approximately 50 foot intervals along each windrow and increased to daily readings during business hours and recorded once internal temperatures near 131°F. Once internal temperatures reach 131°F for 3 consecutive days, composting will have met pathogen reduction requirements and windrows will be allowed to cure on site. Prior to distribution, the windrows meeting the required temperature will be shredded, placed back into windrows, and monitored to ensure temperatures reach 131°F for three consecutive days again.

The on-site operator will inspect the integrity of all windrows periodically, especially following severe weather, and maintain as necessary. The operator will monitor the windrows for temperature to ensure an aerobic condition. If the temperature exceeds 160°F the windrows will be aerated. The temperature will be measured by inserting a four-foot long probe into the windrow approximately 6-feet above the ground surface to ensure the temperature is taken in the center of the windrow.

2. Grass Clippings

Grass clippings will be utilized as a compost amendment in approximate ratios of one part grass, three parts shredded leaves. The operator will shred the grass clippings as necessary and deposit the materials in the windrows using the loader as necessary to prevent odors and before composting begins in the grass clippings. The windrows shall be of sufficient size to allow a front end loader to mix the grass with the composting leaves.

Internal temperature of the windrow shall be taken and recorded approximately every two weeks after completion of the windrow at approximately 50 foot intervals along each windrow and increased to daily readings during business hours and recorded once internal temperatures near 131°F. Once internal temperatures reach 131°F for 3 consecutive days, composting will have met pathogen reduction requirements and windrows will be allowed to cure on site.

The Compost Monitoring Form included in this plan, or a similar form, can be used for maintaining records of the composting process.

3. Mulch and Boiler Fuel

Temperature monitoring of the woody mulch will be necessary in the event all of the mulch is not removed within a short period of time. To monitor this, a staff member will visually inspect and estimate the temperature of the mulch. If the mulch is hot or steam is coming from the pile, the mulch will be turned using the site front-end loader.

VI. PROCESS NARRATIVE

This narrative is provided to give additional operational details of the Forum 52 Yard Waste Facility. Refer to the Proposed Development Plan and Process Flow Diagrams included in Appendix C of this application.

Incoming waste to be managed at the Facility primarily includes curbside collected yard waste from Forsyth County, materials dropped off by the general public, private companies disposing of yard waste, pallets and materials such as untreated, unpainted wood waste from processing plants, and storm debris. A city staff person will manage the scale area where the material is weighed. The scale attendant will confirm the material make-up of the load and direct the customer to one of three locations. Yard waste and other woody waste will be dumped in the waste receiving area. Pallets and other untreated, unpainted wood will be maintained in a separate pile in the waste receiving area. Leaves and grass clippings will be received in the leaf processing area near the grinder. Some uncomposted leaves collected by the City may be diverted to permitted compost facilities.

The yard waste, pallets, woody waste, and other untreated, unpainted wood will be processed through the hammermill. Yard waste will generally be processed separately from the other materials. As the yard waste is processed through the hammermill, a radial stacker (conveyor) will be operated to create a stockpile area for the mulch. The mulch product will be managed in bulk piles and then offered to the general public (who will pick up the material on-site) or will be delivered to private customers. The mulch may be distributed as Coarse Mulch or sent through a portable grinder and distributed as Fine Mulch.

The pallets, woody waste (such as large tree limbs), engineered wood products (such as plywood and particleboard) and unpainted, untreated wood will be processed separately through the hammermill. Again, the radial stacker will be used to develop a stockpile of processed material. This material will become "Pallet Mulch" which will be distributed to area businesses as boiler fuel only.

When the hammermill is being operated, the loader operator will visually screen the material for contaminants. Contaminants include materials which are not accepted at the Facility but were not discovered by the scale attendant, or materials which would harm the equipment. Unacceptable waste includes material such as construction demolition waste, painted wood, metal, and large stumps from land-clearing operations. The "reject" material will be stockpiled in the reject/non-conforming area and be back-hauled by staff to the City's construction and demolition debris landfill or the Hanes Mill Road Landfill.

Yard trash as defined in GS 130A-290(45), typically leaves and grass clippings, that arrive on-site will be processed through a grinder located in the leaf processing area. Sometimes a small quantity of yard waste may be mixed with the leaves and grass clippings to avoid jamming the grinder with the finer materials. Processed material from the grinder has two potential end uses. It may be taken from the grinder and distributed as a soil amendment to a local business, or it may be composted onsite. The finished compost product will be available to the public for on site pickup or will be delivered to area customers. The compost will not be distributed unless the temperature requirements have been met.

VII. WORKER SAFETY AND TRAINING

All operating personnel shall receive training, safety equipment, and supervision necessary to carry out their assigned duties. Refer to the Emergency Action Plan regarding emergency protocols.

VIII. RECORD KEEPING

A. Daily Record Keeping

Records shall be maintained for a minimum of five years. Records shall be available for inspection by North Carolina Department of Environment and Natural Resources (NCDENR) Solid Waste Section personnel during normal business hours and shall be sent to NCDENR upon request:

- a. Daily operational records must be maintained, which include, at a minimum, temperature data (length of the composting period) and quantity of material processed.
- b. The quantity of waste received.
- c. The quantity and type of waste processed into compost.
- d. The quantity and type of compost produced by product classification.
- e. The quantity and type of compost removed for use or disposal, by product classification, and the market or permitted disposal facility.

B. Annual Reporting

Annual Reporting: An annual report for the period July 1 to June 30 shall be submitted to the NCDENR by in accordance with the Permit, which is typically August 1, and shall contain:

- a. The Facility name, address, and permit number.
- b. The total quantity in tons, of waste received at the Facility during the year.
- c. The total quantity in tons and type of compost produced at the Facility, by product classification, during the year covered by the report.
- d. The 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 if for use during the year covered by the report.

IX. EMERGENCIES

Please refer to the Emergency Action Plan.



FORUM 52 YARD WASTE FACILITY

EMERGENCY ACTION PLAN

**CITY/COUNTY UTILITY COMMISSION
WINSTON-SALEM, NORTH CAROLINA**

PREPARED BY:

**HDR ENGINEERING, INC. OF THE CAROLINAS
128 S. TRYON STREET, SUITE 1400
CHARLOTTE, NORTH CAROLINA 28202**

HDR Project No. 0162-18088-018



December 2004

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APPENDIX A

A. PURPOSE

The Forum 52 Yard Waste Facility Emergency Action Plan (Plan) is to provide all City employees with the proper information to protect themselves, co-workers, and the public in the event of an emergency. This Plan is designed to meet the requirements of the Occupational Safety and Health Administration (OSHA) 1910.38(a) and 1910.120 and is updated as needed.

B. DEFINITIONS

1. Emergencies shall include such events as fire and explosion, tornado and hurricane, bomb threat, or chemical spills. This Plan will detail the appropriate emergency action for each.
2. Severe fires shall be any fire which is not extinguishable by a portable fire extinguisher, or a fire within a confined space which would require entering the space to extinguish it, or a fire involving explosive or toxic materials.
3. The assembly point shall be the area in which all employees gather in the event of an emergency.

C. RESPONSIBLE PERSONS and EMERGENCY NUMBERS

The following people are responsible for implementing and training City employees on the Plan. If employees have questions, they should contact the supervisor listed below.

Solid Waste Engineer – Edward Gibson
(336) 399-5051

See Appendix A at the end of this section for other emergency numbers.

In the case of emergency evacuation, each section supervisor is responsible for accountability of his/her employees and all visitors. Every employee is responsible for his/her safety and for preventing job-related accidents or injuries by complying with all work place safety policies and related procedures.

This Plan shall be issued to the contractor for his training purposes.

D. TYPES OF EMERGENCIES

1. Fire and Explosion
 - a) In the event of a fire or explosion, all personnel shall evacuate the area with caution. Listed below are the assembly areas for each potential area in question:

- 1) Front gate at Facility entrance.
- 2) Scalehouse.

2. Tornado and Hurricane

- a) In the event of a tornado or hurricane with sufficient warning, all landfill personnel shall move with caution to Fire Station #14 located at 5754 Shattalon Drive. In the event of a tornado without warning, personnel should temporarily retreat to the scalehouse.

3. Bomb Threat

- a) In the event of a bomb threat, the highest ranking supervisor shall be responsible for making sure the site has been evacuated and the site secured (doors locked, access to site/or building prohibited, contractors notified, and proper warning signs posted).

To alert other personnel away from the main building the highest-ranking person shall notify them not to return to the Facility. They should be instructed to meet at the appointed safe area.

- b) The procedures listed in the policy should be followed with the exception of the safe area and method of notifying employees. The location listed below is a safe area in case of a bomb threat:

Forum 52 Yard Waste Facility - Evacuate to Fire Station #14 at 5754 Shattalon Drive.

4. Chemical Spills

- a) In the event of a spill, the highest ranking supervisor shall notify and instruct employees and staff members to meet at the appointed safe area. Under no circumstances shall an employee or staff member remain in a hazardous area to operate equipment. The highest ranking supervisor shall promptly notify proper authorities.

E. EMERGENCY PROCEDURES

1. Under no circumstances shall an employee remain in a hazardous area to operate equipment. Evacuation is mandatory.
2. Employee Accounting:

In the event of an emergency, the site supervisor(s) or, in his/her absence, the senior person will take charge at the assembly point and account for all persons at the landfill.

The highest ranking supervisor(s) at the assembly point will be responsible for accounting for all persons on-site. Once everyone has been accounted for, no one may leave the assembly point without the assembly point supervisor's permission.

All persons should reach the Assembly Point within minutes of the alarm. All persons unaccounted for after this time will be assumed to be down and their names and last known location will be provided to the fire/rescue personnel by the assembly point supervisor.

3. Assigned Responsibilities:

In the event of an emergency evacuation, the following personnel shall have these responsibilities:

Person discovering the emergency condition:

- Report the situation to 911 or radio 902.
- Take first aid kit to the assembly point site supervisor(s) or senior person.
- Report to the assembly point and begin accounting for persons on-site.
- Coordinate actions with emergency response personnel; report all missing persons.

4. Employees are not required to administer medical attention but may offer first aid normally given to any accident victim. Only properly trained personnel shall attempt rescue of an employee in a hazardous atmosphere.

5. The preferred means of reporting an emergency is by telephone (i.e., call 911). The next preferred method of reporting is by radio (i.e., call 902). The least preferred method of reporting is by word of mouth. In all cases be sure to give emergency personnel an address, phone number, injuries, if any are known, and type of emergency.

F. TRAINING

The supervisory employees shall be responsible to make sure all employees receive initial training on this policy. They also shall ensure that employees are retrained whenever sections of this policy are changed or updated.

APPENDIX A

Emergency Response Telephone Numbers

EMERGENCY (FIRE/POLICE)	911
WS/FC Hazmat	(336) 727-8053
Emergency Management (Local)	(336) 727-2200
Emergency Management (State)	(800) 858-0368
Risk Management (Local)	(336) 727-2296
Emergency Medical Service (Local)	(336) 727-2404
Division of Environmental Management Winston-Salem Regional Office	(336) 771-4600
EPA National Response Center	(800) 424-8802
N.C. Emergency Management	(919) 733-3867
Chemtrac	(800) 424-9300
State Emergency Number (After Hours)	(800) 662-7956
Poison Control Center	(800) 848-6946
(Chlorine) PB&S Chemical	(800) 777-9281
(Caustic) Holtra Chemical	(800) 343-6470
Winston-Salem City Yard Emergency	(336) 727-2345
Winston-Salem City Yard Emergency "Radio"	902
NC Pesticide Control	(919) 733-3556
Winston-Salem Fire Department Engine Co. Fourteen.....	(336) 661-4907

*If possible, consult your supervisor before using the number listed.





FORUM 52 YARD WASTE FACILITY

[ADDRESS]

[phone]

Owned by: City of Winston-Salem

Operated by: *Contractor to be named*

MULCH

Description of Mulch Material: This coarse material consists of chipped tree branches and tree trunks.

Recommended Uses: This material may be used in landscaping applications.

Application Rates: Unrestricted. (Please read the planting instructions that accompany the plant before applying.)

COMPOST

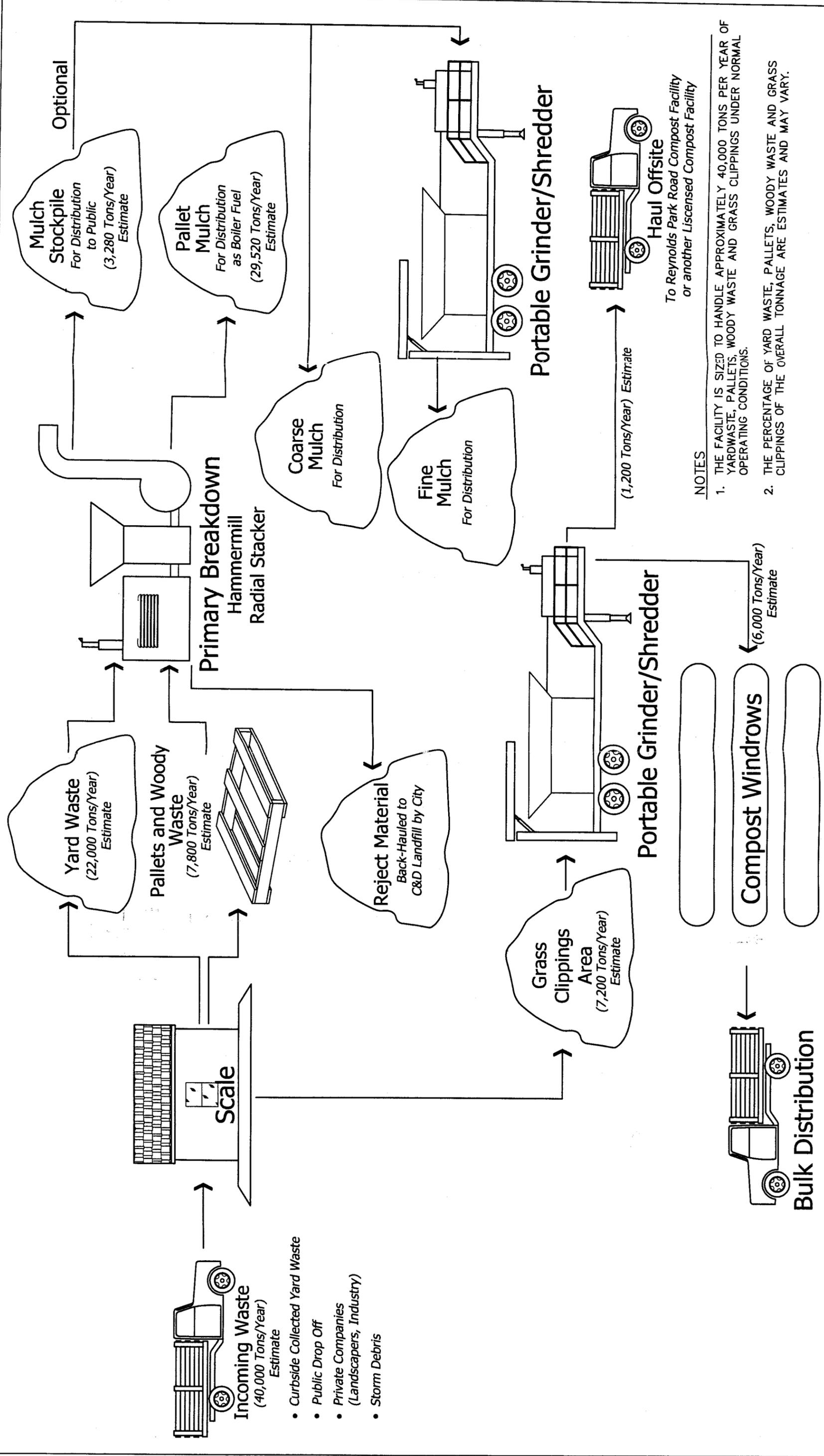
Description of Compost Material: This fine material consists of chipped tree branches, tree trunks, leaves, and grass clippings.

Material Class: Grade A, unlimited and unrestricted distribution as defined by North Carolina Solid Waste Management Rules and Law, Administrative Code Title 15A, Chapter 13, Subchapter 13B, Section .1407(d)(3).

Recommended Uses: This material may be used in landscaping or gardening applications.

Application Rates: Unrestricted. (Please read the planting instructions that accompany the plant before applying.)

Appendix C

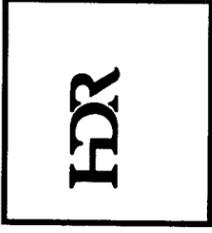


- Curbside Collected Yard Waste
- Public Drop Off
- Private Companies (Landscapers, Industry)
- Storm Debris

NOTES

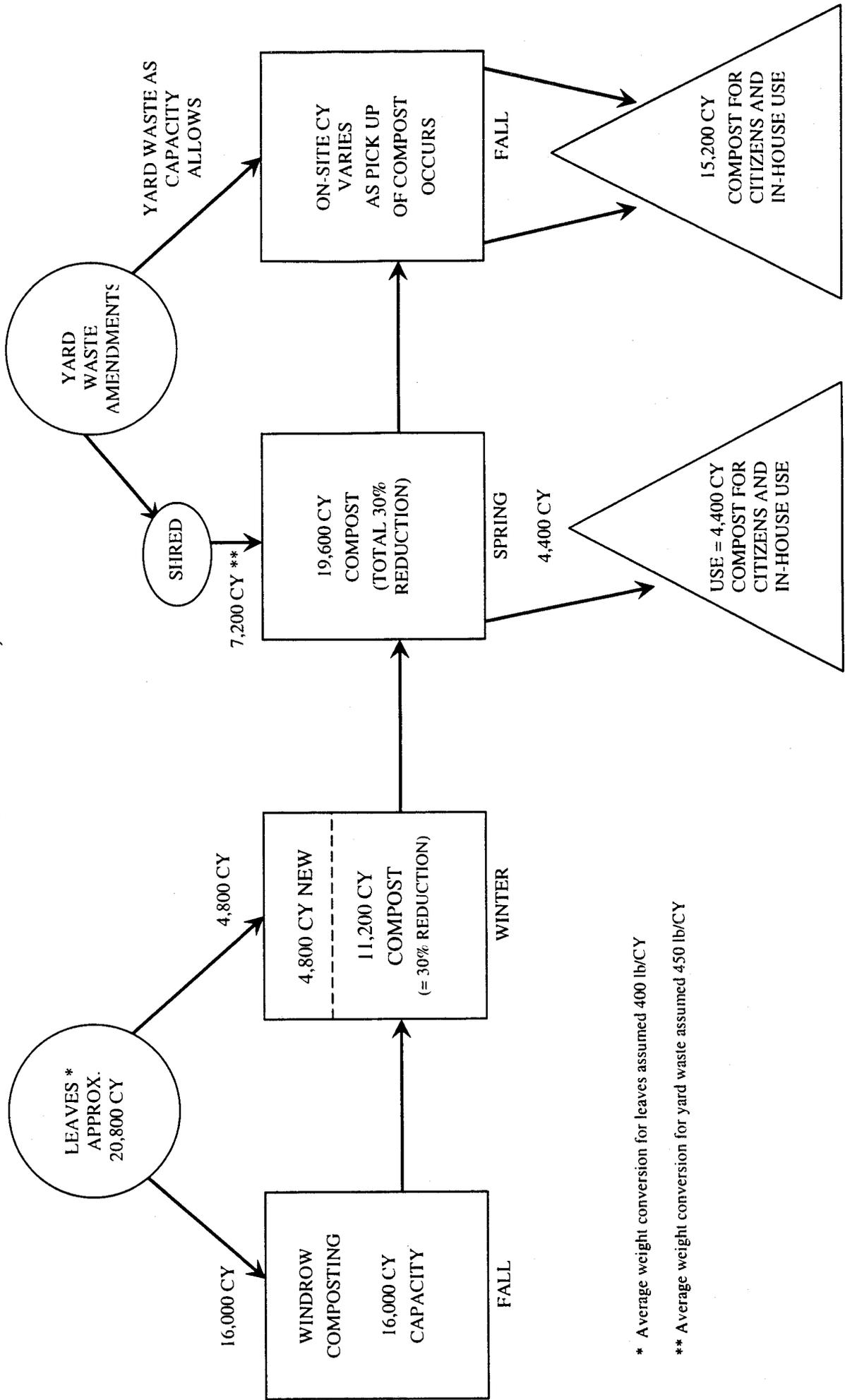
1. THE FACILITY IS SIZED TO HANDLE APPROXIMATELY 40,000 TONS PER YEAR OF YARDWASTE, PALLETS, WOODY WASTE AND GRASS CLIPPINGS UNDER NORMAL OPERATING CONDITIONS.
2. THE PERCENTAGE OF YARD WASTE, PALLETS, WOODY WASTE AND GRASS CLIPPINGS OF THE OVERALL TONNAGE ARE ESTIMATES AND MAY VARY.

**FORUM 52 YARD WASTE FACILITY
YARD WASTE PROCESS FLOW DIAGRAM**



DATE	12/04
FIGURE	1

**FLOW DIAGRAM FOR LEAF PROCESSING AREA
FORUM 52 YARD WASTE FACILITY
WINSTON-SALEM, NC**

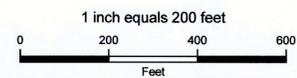


* Average weight conversion for leaves assumed 400 lb/CY

** Average weight conversion for yard waste assumed 450 lb/CY



Source: Forsyth County Geographic Information Systems



Legend

- ▭ Site Property Boundary
- 1/4 Mile Radius
- ▭ Stream
- ▭ Waterbody

Zoning

- ▭ GB, HB, HB-S, LB
- ▭ GI, GI-S, LI
- ▭ RM12, RM18, RM18-S, RM8, RM8-S
- ▭ RS20, RS30, RS9

rev. June 2005 per NC DENR comments

FORM 52 YARD WASTE FACILITY

Winston-Salem, NC

Date December 2004 Project No. 000162-18088-018

File Location G:\G_Temp\DanC\WS\Form52\map_docs\arcmap

Figure: 1.0



NOTES

1. TOPOGRAPHY PROVIDED BY THE CITY OF WINSTON-SALEM WITH UNKNOWN DATA.
2. THE CONTRACTOR SHALL OBTAIN ALL REQUIRED PERMITS AND APPROVALS PRIOR TO COMMENCING WORK. THE OWNER HAS APPLIED FOR THE FOLLOWING PERMITS: EROSION AND SEDIMENT CONTROL. REFER TO TECHNICAL SPECIFICATIONS.
3. THE CONTRACTOR SHALL RESTORE TO THE OWNERS SATISFACTION ALL AREAS DISTURBED BY CONSTRUCTION, INCLUDING ROADWAY SURFACES, ROADWAY SHOULDERS AND DITCHES, DRAINAGE STRUCTURES, UTILITIES AND OTHER EXISTING FEATURES.
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VICINITY MAP
NOT TO SCALE



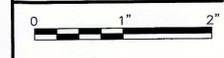
ISSUE	DATE	DESCRIPTION
A	12/04	ISSUED FOR NCDENR LAND QUALITY APPROVAL

PROJECT MANAGER	M.D. PLUMMER, P.E.
	P. WESTMORELAND
	J. GAUL
PROJECT NUMBER	00009095.018

**Forum 52 Yard Waste Facility
Erosion and Sediment
Control Plans**

WINSTON-SALEM NORTH CAROLINA

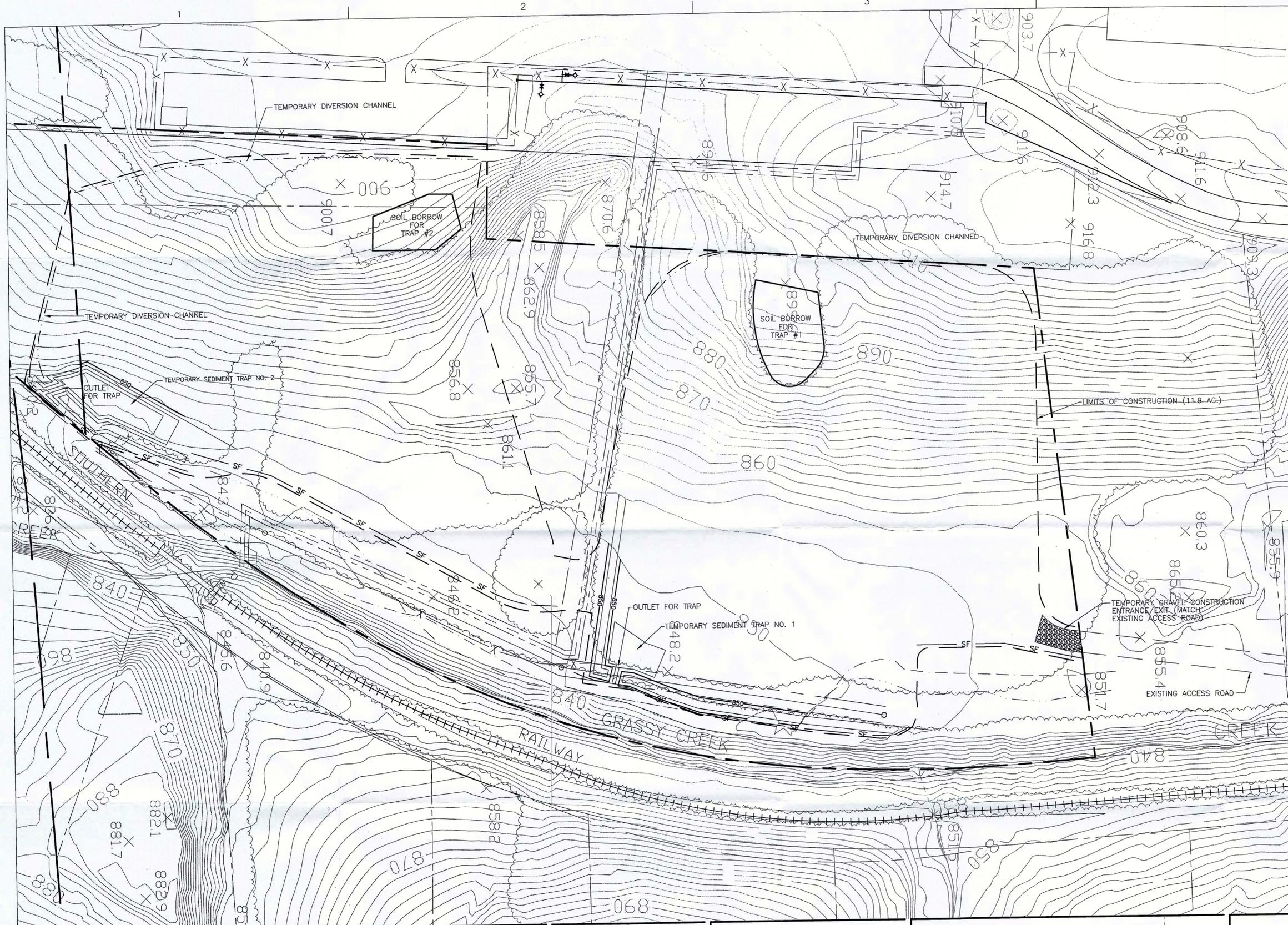
EXISTING CONDITIONS



FILENAME	00C-01
SCALE	1"=100'

SHEET
C-01

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60 0 60 120
SCALE IN FEET

EROSION AND SEDIMENTATION CONTROL GENERAL CONSTRUCTION SEQUENCE

1. ESTABLISH LIMITS OF CONSTRUCTION.
2. INSTALL SILT FENCE.
3. INSTALL A GRAVEL CONSTRUCTION ENTRANCE AND ASSOCIATED APPURTANCES.
4. CLEAR AND GRUB THE AREA IN THE VICINITY OF TEMPORARY SEDIMENT TRAP #1 (TST #1).
5. INSTALL TST #1. SOIL FOR THE CONSTRUCTION OF TST #1 SHOULD BE FROM THE DESIGNATED ON SITE SOIL BORROW AREA.
6. INSTALL TEMPORARY DIVERSION CHANNELS AS SHOWN. INSTALL ADDITIONAL DIVERSION CHANNELS AS NEEDED.
7. CLEAR AND GRUB THE AREA IN THE VICINITY OF TEMPORARY SEDIMENT TRAP #2 (TST #2).
8. INSTALL TST #2. SOIL FOR THE CONSTRUCTION OF TST #2 SHOULD BE FROM THE DESIGNATED ON SITE SOIL BORROW AREA.
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10. AFTER THE EROSION AND SEDIMENT CONTROL FEATURES ARE OPERATIONAL, BEGIN CLEARING, GRUBBING, AND SOIL EXCAVATION ACTIVITIES.
11. STABILIZE AND PERFORM PERMANENT SEEDING ON EXPOSED SLOPES OR DISTURBED AREAS IMMEDIATELY FOLLOWING COMPLETION OF ANY PHASE OF GRADING.
12. PERIODICALLY AND AFTER A MAJOR STORM EVENT, INSPECT ALL EROSION AND SEDIMENT CONTROL DEVICES. REPAIR AS NEEDED. ACCUMULATED SEDIMENT TO BE REMOVED WHEN 1/2 OF THE HOLDING CAPACITY IS DEPLETED.

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8. RESTORE AND STABILIZE ALL DISTURBED AREAS INCLUDING STOCKPILES AND STORAGE AREAS. PERFORM PERMANENT SEEDING IN ACCORDANCE WITH NCDENR STANDARDS AND THE PROJECT SPECIFICATIONS.



HDR Engineering, Inc.

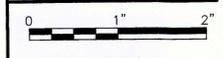
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PROJECT MANAGER	M.D. PLUMMER, P.E. P. WESTMORELAND J. GAUL
PROJECT NUMBER	00009095.018

**Forum 52 Yard Waste Facility
Erosion and Sediment
Control Plans**

WINSTON-SALEM NORTH CAROLINA

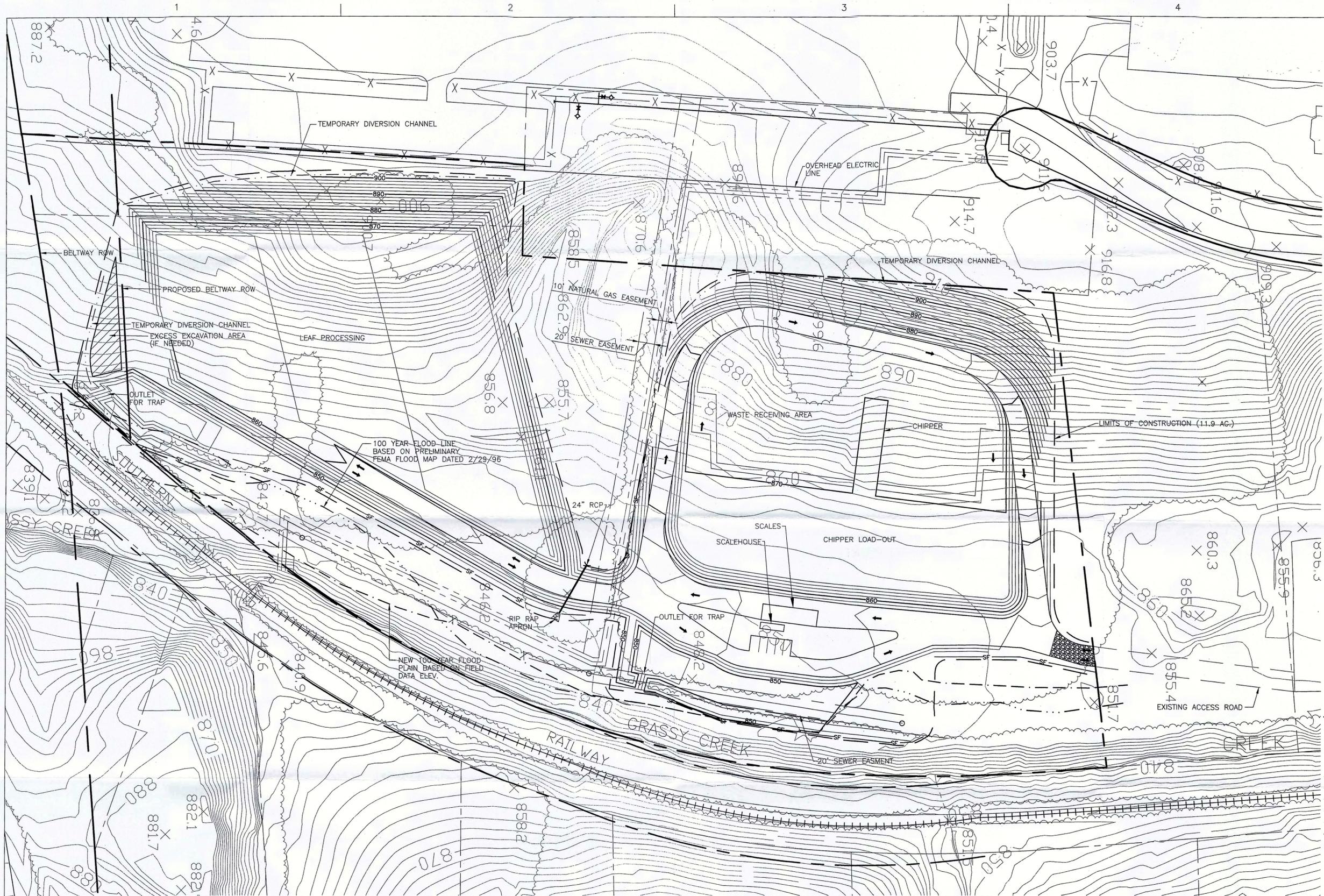
EROSION CONTROL PLAN



FILENAME 00C-02
SCALE 1"=60'

SHEET
C-02

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- NOTES**
- LAND USE COVER
 - AREAS TO BE PAVED INCLUDE
 - ACCESS ROADS
 - CHIPPER LOAD-OUT
 - WASTE RECEIVING AREA
 - AREAS TO GRAVEL
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 - EXCESS SOIL MATERIAL WILL BE STOCKPILED ON SITE.

- LEGEND**
- 860 ——— EXISTING CONTOUR
 - +++++ RAILROAD TRACKS
 - ~~~~~ TREE LINE
 - ~~~~~ CREEK
 - FEMA FLOODPLAIN
 - FIELD FLOODPLAIN
 - GAS EASEMENT
 - SEWER EASEMENT
 - LIMITS OF CONSTRUCTION
 - PROPERTY LINE
 - 860 ——— PROPOSED CONTOUR
 - TRAFFIC FLOW



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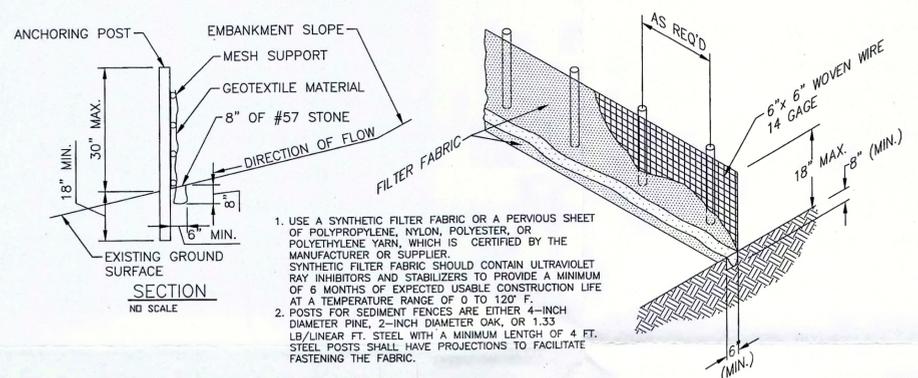
**Forum 52 Yard Waste Facility
Erosion and Sediment
Control Plans**

WINSTON-SALEM NORTH CAROLINA

SITE PLAN

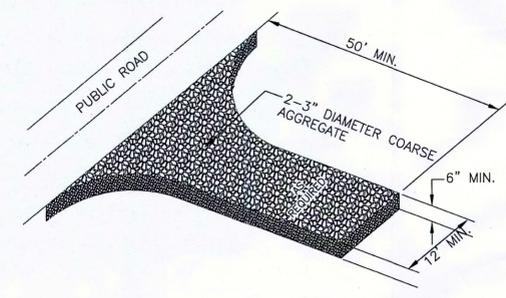
FILENAME	OOC-03	SHEET	C-03
SCALE	1"=60'		

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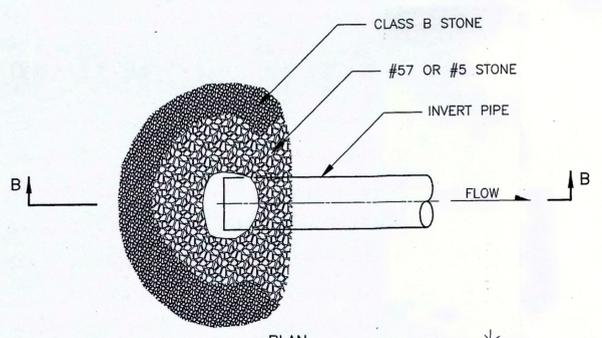


SILT FENCE
N.T.S. 1
C-02

1. USE A SYNTHETIC FILTER FABRIC OR A PERVIOUS SHEET OF POLYPROPYLENE, NYLON, POLYESTER, OR POLYETHYLENE YARN, WHICH IS CERTIFIED BY THE MANUFACTURER OR SUPPLIER. SYNTHETIC FILTER FABRIC SHOULD CONTAIN ULTRAVIOLET RAY INHIBITORS AND STABILIZERS TO PROVIDE A MINIMUM OF 6 MONTHS OF EXPECTED USABLE CONSTRUCTION LIFE AT A TEMPERATURE RANGE OF 0 TO 120° F.
2. POSTS FOR SEDIMENT FENCES ARE EITHER 4-INCH DIAMETER PINE, 2-INCH DIAMETER OAK, OR 1.33 LB./LINEAR FT. STEEL WITH A MINIMUM LENGTH OF 4 FT. STEEL POSTS SHALL HAVE PROJECTIONS TO FACILITATE FASTENING THE FABRIC.

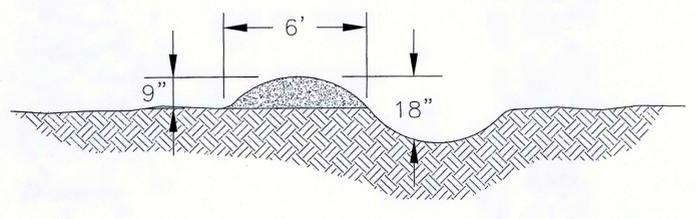


TEMPORARY GRAVEL CONSTRUCTION ENTRANCE/EXIT
N.T.S. 3
C-02

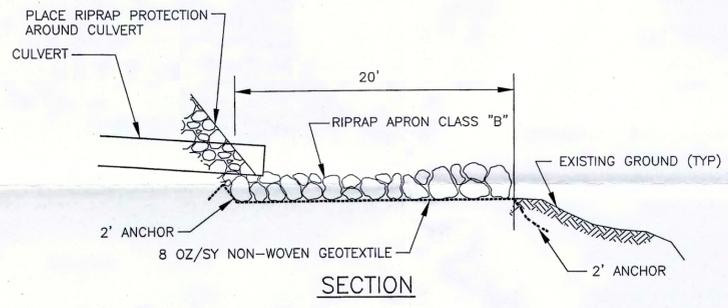
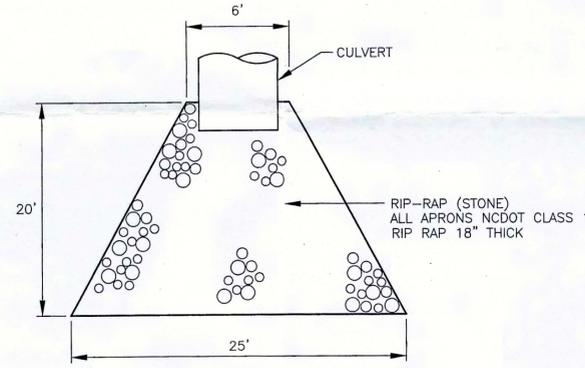


CULVERT INLET PROTECTION
N.T.S. 5
C-02

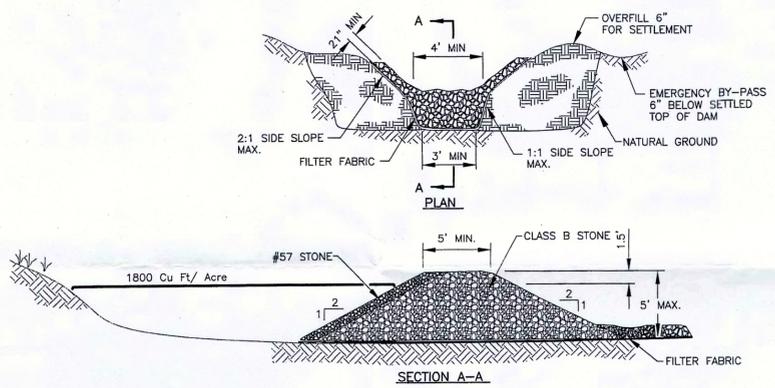
NOTES:
1. STRUCTURAL STONE SHALL BE CLASS B STONE
2. SEDIMENT CONTROL STONE SHALL BE NO. 5 OR NO. 57 STONE.
3. DIMENSIONS ARE MINIMUM ACCEPTABLE UNLESS OTHERWISE SPECIFIED BY THE ENGINEER.



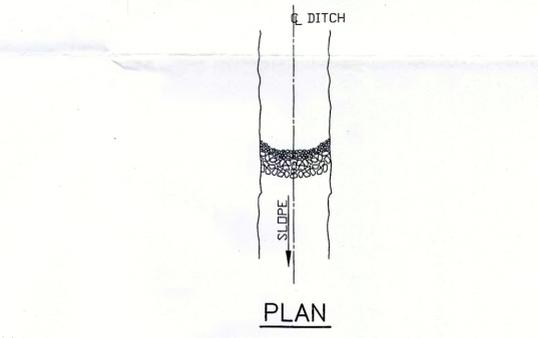
TEMPORARY DIVERSION CHANNEL
N.T.S. 2
C-02



RIP RAP APRON
N.T.S. 4
C-02



TEMPORARY SEDIMENT TRAP
N.T.S. 6
C-02



GRAVEL CHECK DAM DETAIL
N.T.S. 7
C-02

SEEDING SPECIFICATIONS:

- TEST SOIL TO DETERMINE NUTRIENT CONTENT.
- LOOSEN SURFACE TO MINIMUM DEPTH OF FOUR (4) INCHES.
- INCORPORATE NEEDED NUTRIENTS AS DETERMINED AS DETERMINED FROM SOIL TEST INTO SOIL.
- SEEDING REGIME:
 - PERMANENT SEEDING
 - SPRING (MARCH 1-APRIL 30) AND FALL (SEPTEMBER 1-NOVEMBER 15)
 - KENTUCKY-31: 175 LBS/AC
 - UNHULLED SERCIA LESPEDEZA: 50 LBS/AC
 - RYE GRAIN: 1 BUSHEL/AC
 - WINTER (NOVEMBER 16 - FEBRUARY 28)
 - KENTUCKY-31: 200 LBS/AC
 - UNHULLED SERCIA LESPEDEZA: 50 LBS/AC
 - RYE GRAIN: 3 BUSHELS/AC
 - SUMMER (MAY 1 - AUGUST 31)
 - KENTUCKY-31: 50 LBS/AC
 - UNHULLED SERCIA LESPEDEZA: 50 LBS/AC
 - KOREAN OR KOBE LESPEDEZA: 50 LBS/AC
 - WEeping LOVE GRASS: 5 LBS/AC
 - BERMUDA GRASS: 10 LBS/AC
 - MILLET: 1 BUSHEL/AC
 - TEMPORARY SEEDING
 - SPRING (MARCH 1-APRIL 30) AND WINTER (NOVEMBER 16-FEBRUARY 28)
 - RYE: 120 LBS/AC
 - SERCIA LESPEDEZA: 50 LBS/AC
 - SUMMER (MAY 1 - AUGUST 31)
 - GERMAN MILLET: 40
 - RYE: 120 LBS/AC
- CULTIPACK SEEDED AREAS.
- GRADE SEEDED AREAS TO SMOOTH, EVEN SURFACE WITH LOOSE, UNIFORMLY FINE TEXTURE.
- MULCH WITH WHEAT STRAW @ 3,000 LBS/ACRE.
- ANCHOR MULCH WITH EMULSION OR APPROVED EQUAL ANCHORING METHOD.

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A	12/04	ISSUED FOR NCDENR LAND QUALITY APPROVAL

PROJECT MANAGER	M.D. PLUMMER, P.E.
	P. WESTMORELAND
	J. GAUL
PROJECT NUMBER	00009095.018

Forum 52 Yard Waste Facility
Erosion and Sediment
Control Plans

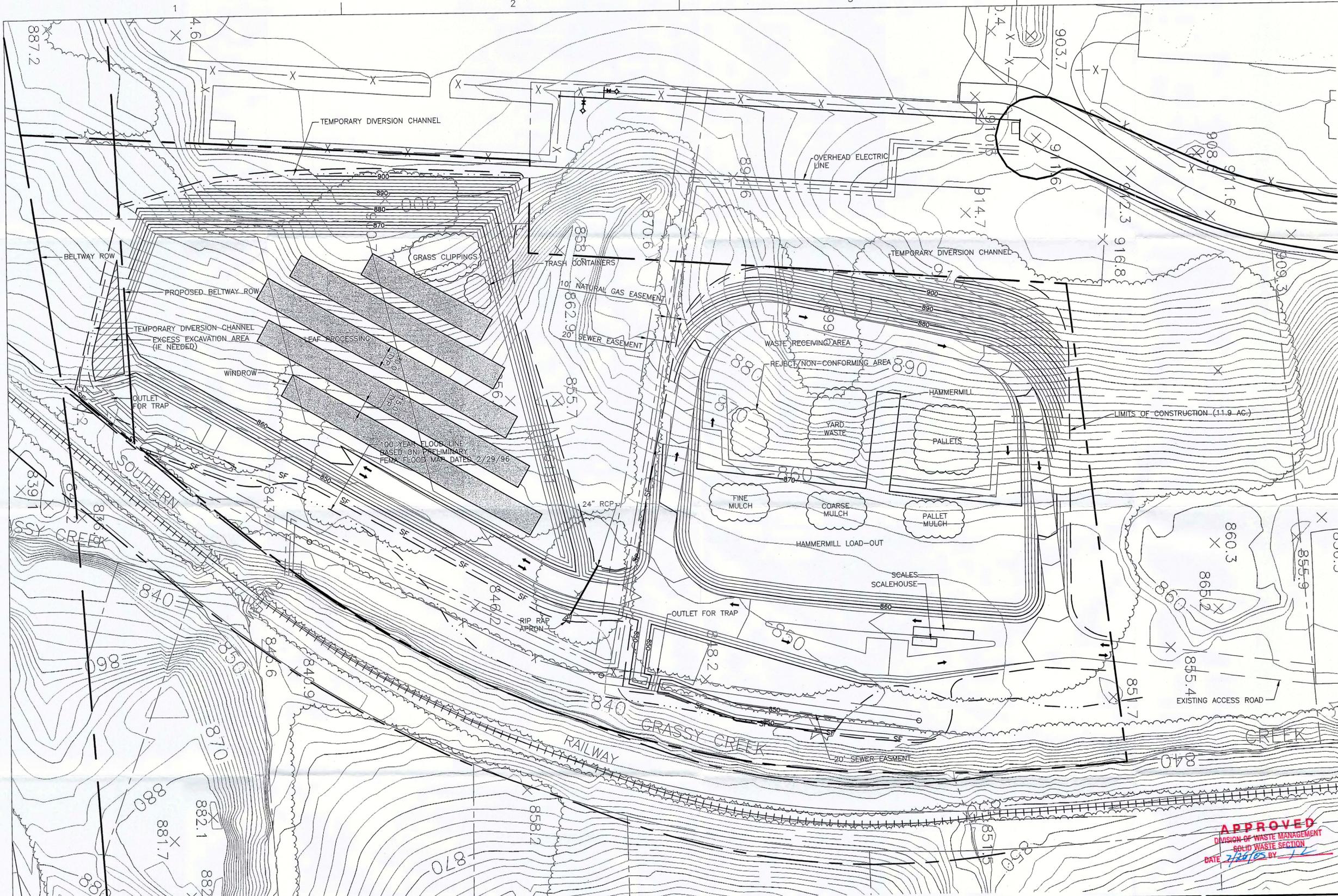
WINSTON-SALEM NORTH CAROLINA

EROSION CONTROL DETAILS	
FILENAME	00C-04
SCALE	AS SHOWN
SHEET	C-04



NOTES

- LAND USE COVER
 - AREAS TO BE PAVED INCLUDE
 - ACCESS ROADS
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 - LEAF PROCESSING AREA
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- EXCESS SOIL MATERIAL WILL BE STOCKPILED ON SITE.
- THIS DRAWING IS SHOWN TO IDENTIFY THE FACILITY LAYOUT. ACTUAL GRADES MAY CHANGE TO BALANCE EARTHWORK.



LEGEND

- 860 ——— EXISTING CONTOUR
- +++++ RAILROAD TRACKS
- ~~~~~ TREE LINE
- ~~~~~ CREEK
- FEMA FLOODPLAIN
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- PROPERTY LINE
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- TRAFFIC FLOW

APPROVED
 DIVISION OF WASTE MANAGEMENT
 SOLID WASTE SECTION
 DATE 7/24/05 BY [Signature]

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ISSUE	DATE	DESCRIPTION
A	12/04	

PROJECT MANAGER M.D. PLUMMER, P.E.
 P. WESTMORELAND
 J. GAUL

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Forum 52 Yard Waste Facility
PERMIT APPLICATION PLANS

WINSTON-SALEM NORTH CAROLINA

PROPOSED DEVELOPMENT PLAN

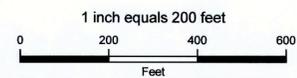
SCALE 1"=60'

FILENAME 01C-02
 SCALE 1"=60'

SHEET **C-02**



Source: Forsyth County Geographic Information Systems



Legend

- ▭ Site Property Boundary
- 1/4 Mile Radius
- Stream
- ▭ Waterbody

Zoning

- ▭ GB, HB, HB-S, LB
- ▭ GI, GI-S, LI
- ▭ RM12, RM18, RM18-S, RM8, RM8-S
- ▭ RS20, RS30, RS9

rev. June 2005 per NC DENR comments

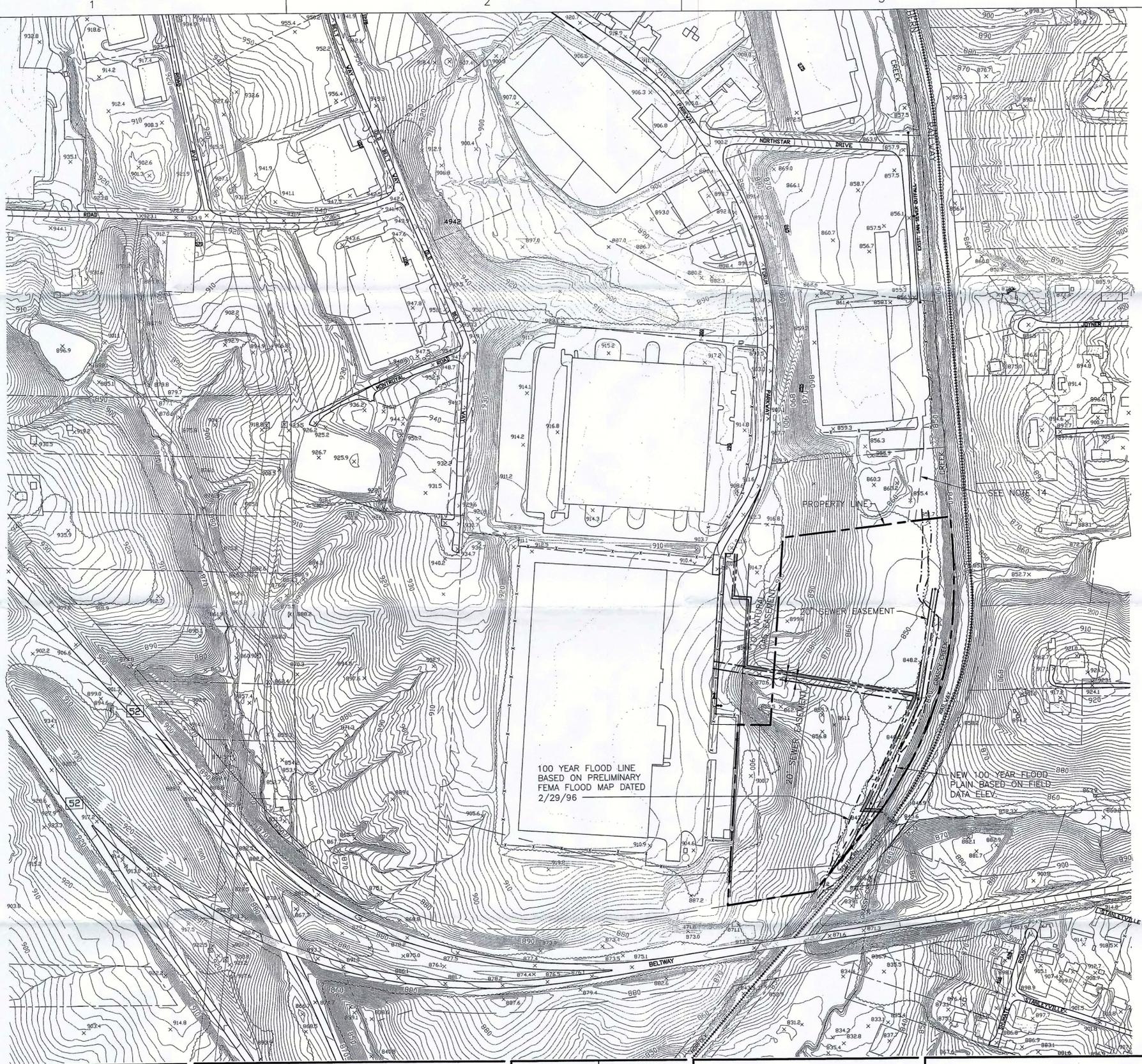
FORM 52 YARD WASTE FACILITY

Winston-Salem, NC

Date December 2004 Project No. 000162-18088-018

File Location G:\G_Temp\DanC\WS\Form52\map_docs\arcmap

Figure: 1.0



NOTES

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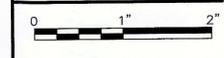
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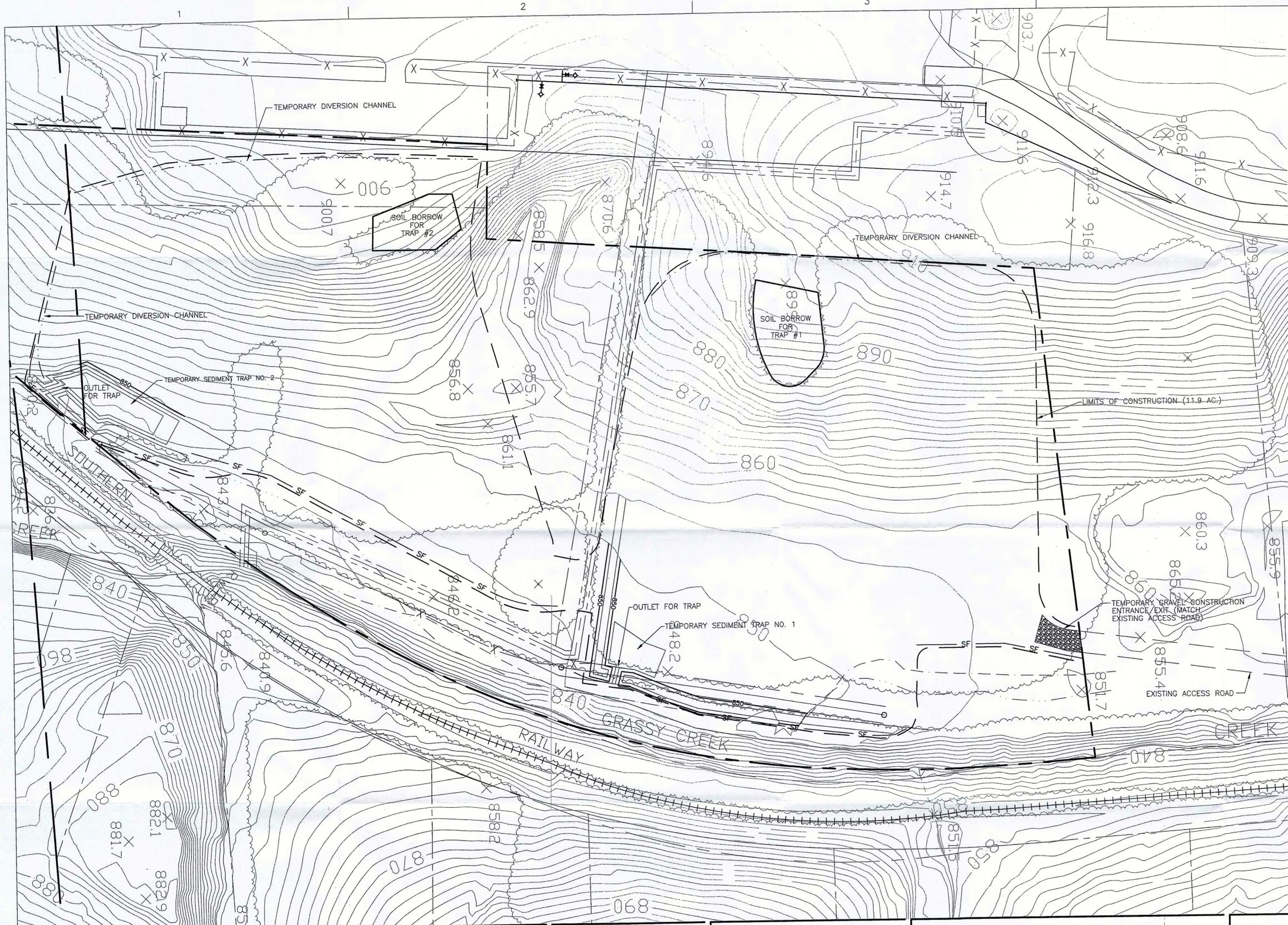
EXISTING CONDITIONS



FILENAME	00C-01
SCALE	1"=100'

SHEET
C-01

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60 0 60 120
SCALE IN FEET

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8. INSTALL TST #2. SOIL FOR THE CONSTRUCTION OF TST #2 SHOULD BE FROM THE DESIGNATED ON SITE SOIL BORROW AREA.
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8. RESTORE AND STABILIZE ALL DISTURBED AREAS INCLUDING STOCKPILES AND STORAGE AREAS. PERFORM PERMANENT SEEDING IN ACCORDANCE WITH NCDENR STANDARDS AND THE PROJECT SPECIFICATIONS.



HDR Engineering, Inc.

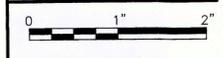
ISSUE	DATE	DESCRIPTION
A	12/04	ISSUED FOR NCDENR LAND QUALITY APPROVAL

PROJECT MANAGER	M.D. PLUMMER, P.E. P. WESTMORELAND J. GAUL
PROJECT NUMBER	00009095.018

**Forum 52 Yard Waste Facility
Erosion and Sediment
Control Plans**

WINSTON-SALEM NORTH CAROLINA

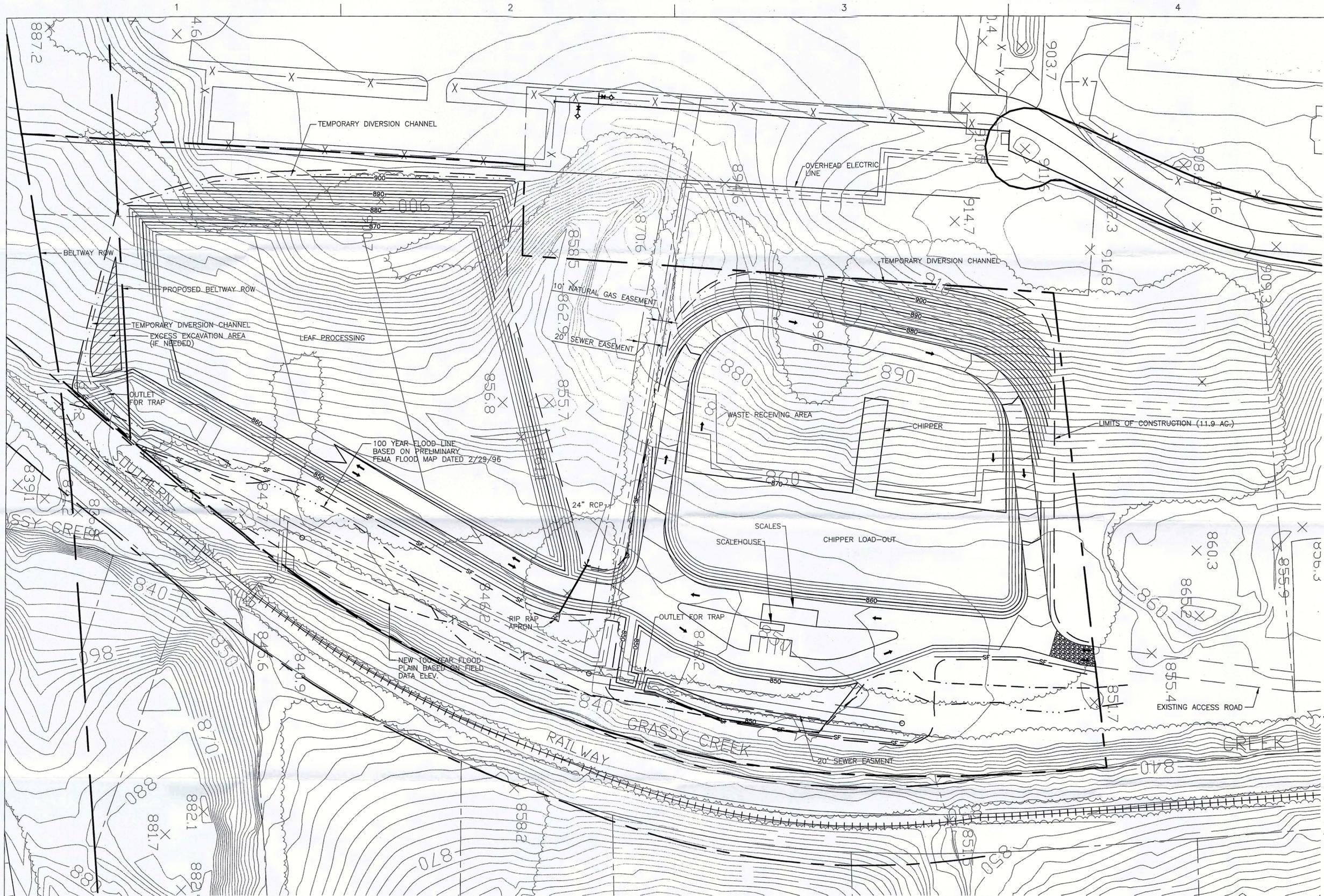
EROSION CONTROL PLAN



FILENAME 00C-02
SCALE 1"=60'

SHEET
C-02

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- NOTES**
- LAND USE COVER
 - AREAS TO BE PAVED INCLUDE
 - ACCESS ROADS
 - CHIPPER LOAD-OUT
 - WASTE RECEIVING AREA
 - AREAS TO GRAVEL
 - LEAF PROCESSING AREA
 - ALL OTHER AREAS TO BE VEGETATED.
 - EXCESS SOIL MATERIAL WILL BE STOCKPILED ON SITE.

- LEGEND**
- 860 ——— EXISTING CONTOUR
 - +++++ RAILROAD TRACKS
 - ~~~~~ TREE LINE
 - ~~~~~ CREEK
 - FEMA FLOODPLAIN
 - FIELD FLOODPLAIN
 - GAS EASEMENT
 - SEWER EASEMENT
 - LIMITS OF CONSTRUCTION
 - PROPERTY LINE
 - 860 ——— PROPOSED CONTOUR
 - TRAFFIC FLOW



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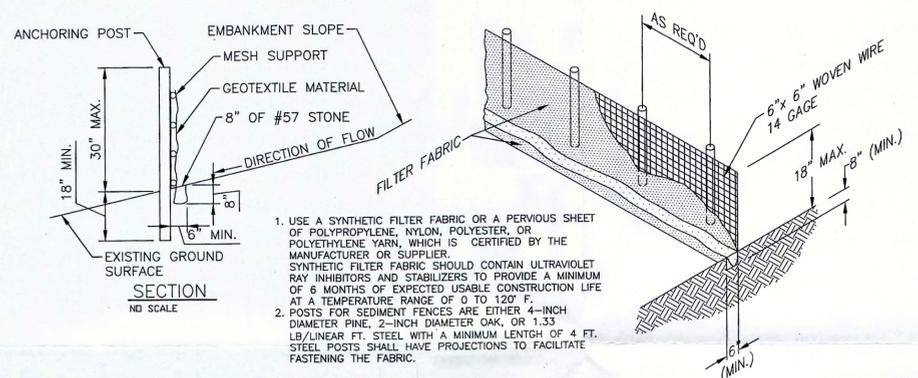
**Forum 52 Yard Waste Facility
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WINSTON-SALEM NORTH CAROLINA

SITE PLAN

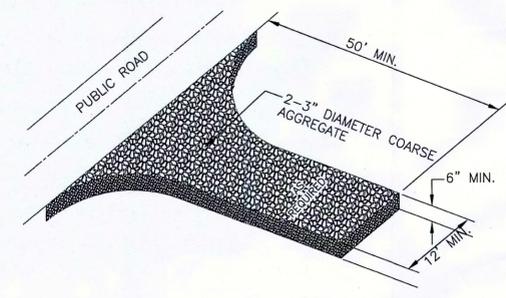
FILENAME	OOC-03	SHEET	
SCALE	1"=60'		C-03

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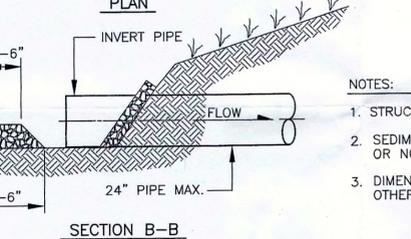
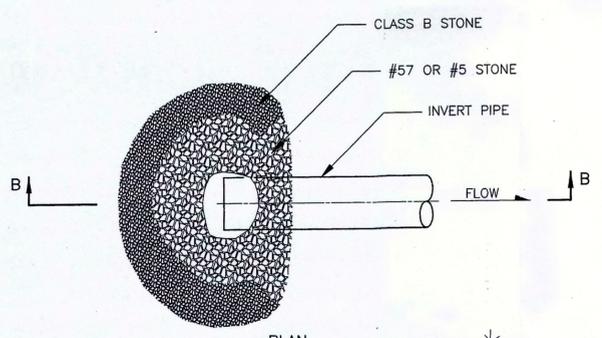


SILT FENCE
N.T.S. 1
C-02

1. USE A SYNTHETIC FILTER FABRIC OR A PERVIOUS SHEET OF POLYPROPYLENE, NYLON, POLYESTER, OR POLYETHYLENE YARN, WHICH IS CERTIFIED BY THE MANUFACTURER OR SUPPLIER. SYNTHETIC FILTER FABRIC SHOULD CONTAIN ULTRAVIOLET RAY INHIBITORS AND STABILIZERS TO PROVIDE A MINIMUM OF 6 MONTHS OF EXPECTED USABLE CONSTRUCTION LIFE AT A TEMPERATURE RANGE OF 0 TO 120° F.
2. POSTS FOR SEDIMENT FENCES ARE EITHER 4-INCH DIAMETER PINE, 2-INCH DIAMETER OAK, OR 1.33 LB./LINEAR FT. STEEL WITH A MINIMUM LENGTH OF 4 FT. STEEL POSTS SHALL HAVE PROJECTIONS TO FACILITATE FASTENING THE FABRIC.

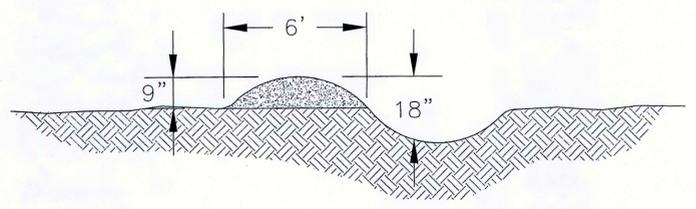


TEMPORARY GRAVEL CONSTRUCTION ENTRANCE/EXIT
N.T.S. 3
C-02

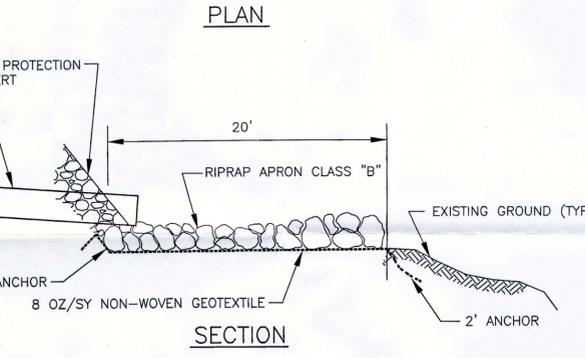
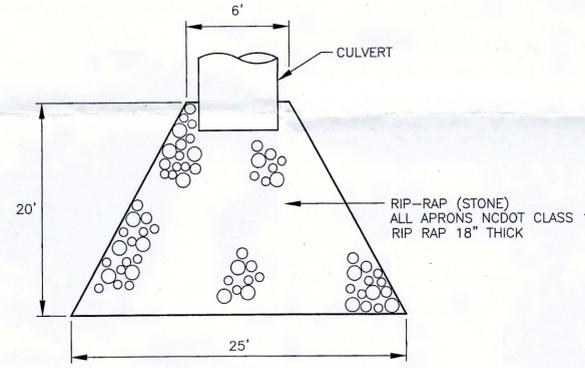


NOTES:
1. STRUCTURAL STONE SHALL BE CLASS B STONE
2. SEDIMENT CONTROL STONE SHALL BE NO. 5 OR NO. 57 STONE.
3. DIMENSIONS ARE MINIMUM ACCEPTABLE UNLESS OTHERWISE SPECIFIED BY THE ENGINEER.

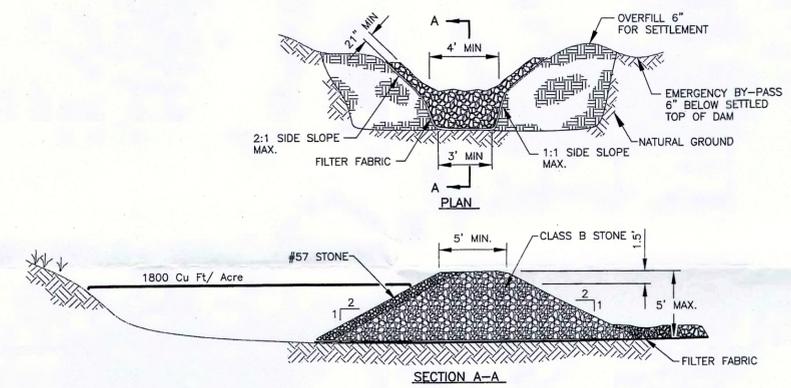
CULVERT INLET PROTECTION
N.T.S. 5
C-02



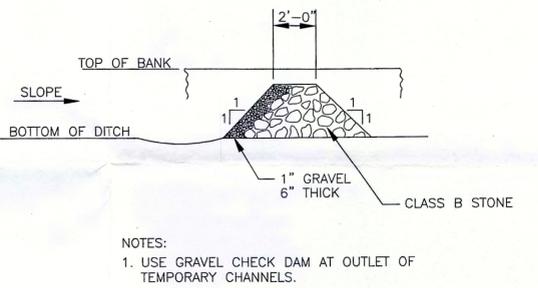
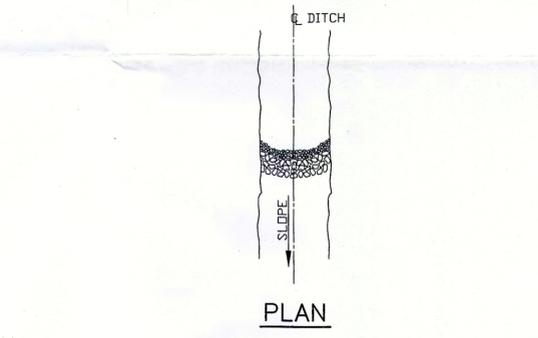
TEMPORARY DIVERSION CHANNEL
N.T.S. 2
C-02



RIP RAP APRON
N.T.S. 4
C-02



TEMPORARY SEDIMENT TRAP
N.T.S. 6
C-02



NOTES:
1. USE GRAVEL CHECK DAM AT OUTLET OF TEMPORARY CHANNELS.

GRAVEL CHECK DAM DETAIL
N.T.S. 7
C-02

- SEEDING SPECIFICATIONS:**
- TEST SOIL TO DETERMINE NUTRIENT CONTENT.
 - LOOSEN SURFACE TO MINIMUM DEPTH OF FOUR (4) INCHES.
 - INCORPORATE NEEDED NUTRIENTS AS DETERMINED AS DETERMINED FROM SOIL TEST INTO SOIL.
 - SEEDING REGIME:
 - PERMANENT SEEDING
 - SPRING (MARCH 1-APRIL 30) AND FALL (SEPTEMBER 1-NOVEMBER 15)
 - KENTUCKY-31: 175 LBS/AC
 - UNHULLED SERCIA LESPEDEZA: 50 LBS/AC
 - RYE GRAIN: 1 BUSHEL/AC
 - WINTER (NOVEMBER 16 - FEBRUARY 28)
 - KENTUCKY-31: 200 LBS/AC
 - UNHULLED SERCIA LESPEDEZA: 50 LBS/AC
 - RYE GRAIN: 3 BUSHELS/AC
 - SUMMER (MAY 1 - AUGUST 31)
 - KENTUCKY-31: 50 LBS/AC
 - UNHULLED SERCIA LESPEDEZA: 50 LBS/AC
 - KOREAN OR KOBE LESPEDEZA: 50 LBS/AC
 - WEEPING LOVE GRASS: 5 LBS/AC
 - BERMUDA GRASS: 10 LBS/AC
 - MILLET: 1 BUSHEL/AC
 - TEMPORARY SEEDING
 - SPRING (MARCH 1-APRIL 30) AND WINTER (NOVEMBER 16-FEBRUARY 28)
 - RYE: 120 LBS/AC
 - SERCIA LESPEDEZA: 50 LBS/AC
 - SUMMER (MAY 1 - AUGUST 31)
 - GERMAN MILLET: 40
 - RYE: 120 LBS/AC
 - CULTIPACK SEEDED AREAS.
 - GRADE SEEDED AREAS TO SMOOTH, EVEN SURFACE WITH LOOSE, UNIFORMLY FINE TEXTURE.
 - MULCH WITH WHEAT STRAW @ 3,000 LBS/ACRE.
 - ANCHOR MULCH WITH EMULSION OR APPROVED EQUAL ANCHORING METHOD.

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Control Plans

WINSTON-SALEM NORTH CAROLINA

EROSION CONTROL DETAILS

0 1" 2"

FILENAME	O0C-04	SHEET
SCALE	AS SHOWN	C-04