

State of North Carolina  
Department of Environment,  
Health and Natural Resources  
Division of Solid Waste Management



James B. Hunt, Jr., Governor  
Jonathan B. Howes, Secretary  
William L. Meyer, Director

May 10, 1995

Ms. Nancy Newell  
Solid Waste Process Engineer  
101 City Hall Plaza  
Durham, N.C. 27701

Fac/Perm/Co ID #	Date	Doc ID#
3201 <i>gshaw</i>	7/15/2011	DIN 14376

RE: Hydrogeologic Review Of The Transition Plan For The City Of  
Durham Landfill (Permit # 32-01)

Dear Ms. Newell,

The Solid Waste Section Hydrogeologic Unit has reviewed the Local Area Study and Water Quality Monitoring Plan portions of the Transition Plan for the Durham Landfill. There appear to be a number of errors and omissions in these portions of the Transition Plan. Please have representatives of the City of Durham or Malcolm Pirnie, Inc. address the following questions and comments:

SUMMARY REPORT

- There is a break in the text from the bottom of page 1 to the top of page 2. The missing text needs to be inserted.

LOCAL AREA STUDY

- Local Characterization Study Map: The 2000 ft. perimeter map is required to clearly identify items referenced by (i) through (v) in Rule .1629 (b)(2)(A). For item (ii), if no surface water supply intakes are located within 2000 ft. of the landfill facility, this should be noted on the margin of the map. For item (iii), the types of utilities should be identified on the map (water and sewer). For item (v), the sources of contamination should be identified on the map. The waste water treatment plant could be an additional source of potential contamination. As discussed in the Transition Plan Guidance Document, the survey control benchmarks should also be indicated on the Local Characterization Study Map.

#### WATER QUALITY MONITORING PLAN

- The Proposal For An Upgraded Monitoring System in the revised January 1995 Transition Plan is not consistent with the monitoring system approved by the Solid Waste Section. Based upon the original Transition Plan submittal and subsequent discussion with Malcolm Pirnie, Inc., the Solid Waste Section approved an upgraded monitoring system that consists of MW-2, MW-3, MW-4, MW-5, MW-6, P-1, P-3, and P-6 (assuming that the wells with the P designation were constructed properly). This is documented in my letters of July 21 and August 29, 1994. The City of Durham was also told it must continue to sample MW-1, though MW-1 would not be considered part of the detection monitoring system.
- As referenced in my August 29, 1994 letter, well MW-1 is not to be abandoned. This well must continue to be sampled and additional investigation is necessary to determine the source of contamination previously identified in this well.
- Table 2-1, Summary Of Well Construction: The "opening slot" and "filter pack" data for well P-6 appears to be incorrect. No boring logs or well construction records are provided to verify this data. If the data is correct, then the well is not properly constructed and will need to be replaced.

#### SAMPLING AND ANALYSIS PLAN

For guidelines established by the Solid Waste Section for sampling and analysis, please refer to the "North Carolina Water Quality Monitoring Guidance Document For Solid Waste Facilities" and to the July 24, 1994, Memorandum to Owners And Operators Of MSWLF Units.

- The "Equipment Decontamination" procedure described is for Teflon sampling equipment. It leaves out the final deionized or distilled water rinse outlined in the North Carolina Water Quality Monitoring Guidance Document For Solid Waste Facilities. The final DI water rinse is not specified in some EPA documents. If this final rinse is not done, it is critical that adequate time is allowed for air drying the equipment in order to allow for complete evaporation of any alcohol.

- The decontamination of the water level indicator should not include the alcohol rinse (or acid rinse).
- If permanent dedicated bladder pumps are to be installed in the monitoring wells, the Solid Waste Section must approve the specifications for the dedicated monitoring equipment.
- The use of intermediate sampling containers should generally be avoided for surface water sampling, unless the use of sample preservatives makes their use necessary.
- Table 3-1, Appendix I Constituents Of Detection Monitoring: The flame atomic absorption methods referenced for Antimony (7040) and Silver (7060) are not approved methods for these constituents, which require a low-level certification method.
- In the paragraph on Evaluation of Background Data in section **3.6.2 Statistical Analysis**, the following statements are made: "If there is significant variability between wells, then the use of background to compliance well comparisons would not be appropriate for this site. Instead, intra-well comparisons would be used to test for possible leachate contamination." The Solid Waste Section does not understand the basis for these statements. This approach would certainly not be appropriate for wells established around a landfill that has been in operation for years, since no pre-disposal data is available for monitoring wells that would enable intra-well comparisons to be made. Inter-well comparisons are essential to effectively monitoring the Durham Landfill.
- The reference on page 3-12 to the "annual report" should be changed. Water quality data is to be reported semi-annually.
- Under Assessment Monitoring at the bottom of page 3-13, the text needs to be changed to be consistent with Rule .1634(e) which states: "If the concentrations of all Appendix II constituents are shown to be at or below background values, using the approved statistical procedures, *for two consecutive sampling events*, the owner or operator shall report this information to the Division, and the Division may give approval to the owner or operator to return to detection monitoring."

- If on any point the Transition Plan is not consistent with the Solid Waste Management Rules or policies, then the rules and policies take precedence.
- Appendix A, Slug Tests: Slug test data is reported only for three of the monitoring wells. Slug test data is needed for all of the monitoring wells in the approved detection monitoring system.
- Appendix B, Soil Boring Logs: It is not clear where some of the borings are located that are included in Appendix B. Boring logs need to be provided for all the monitoring wells in the approved detection monitoring system.
- Appendix C, Well Construction Logs: Well construction logs need to be provided for all the monitoring wells in the approved detection monitoring system.
- Plate 2, Upgraded Water Quality Plan Sampling Locations: Note four on Plate 2 is not consistent with the approved monitoring plan, which includes sampling wells P-1 and P-3.

INITIAL BASELINE SAMPLING REPORT of October 1994

- No Well Completion Records have been submitted for the newly installed monitoring wells. No information has been provided on hydraulic conductivity, porosity, effective porosity, gradients, or the direction and rate of ground-water flow for each of the monitoring wells in the approved detection monitoring system.
- The Solid Waste Section has no record that Durham's Brown Water Treatment Laboratory is certified by the Division of Environmental Management for ground-water analysis.
- The report indicates that disposable bailers were used, but there is no documentation that certified cleaned Teflon disposable bailers were used. This documentation needs to be provided.

- An incorrect method (624) was used for analysis of the volatile organic constituents. A SW-846 GC/MS method is required (8240 or 8260).
- The analytical methods are not specifically referenced for the metals analysis. The report seems to indicate that Flame Atomic Absorption methods were used for most of the metals. Flame AA is not approved for most of the metals, since they require a low-level certified method (typically, graphite furnace methods).
- No organic data is reported for wells MW-1, MW-2, MW-3, MW-4, MW-5, MW-6, P-1, P-3, P-6, or surface water sampling locations SW-1 and SW-2. The volatile organic constituent list reported for wells MW-7 and MW-8 and surface water sampling locations SW-3 and SW-4 is incomplete. (VOC data is reported for only 31 of the 47 constituents required.)
- No metals data is reported for wells MW-1 and P-1, or for surface water locations SW-1 and SW-2.
- No trip blank or equipment blank data was submitted.

FINAL BASELINE SAMPLING REPORT of April 1995

- The statement at the bottom of page 2 of the report (that the North Carolina Groundwater Standards are "based on dissolved metals") is not correct. The Groundwater Rules (15A NCAC 2L) do not specify dissolved or total metals analysis. The policy of DEM is to require the 3030C preparation method for metals analysis, which does not equate directly to total or dissolved.
- Enclosure I, Groundwater Measurements:
  - No "Groundwater Information" or "Groundwater Velocity" information is provided for wells P-1 and P-3.
  - Support documentation and calculations need to be provided for the K, I, n, and V values of each well in the approved detection monitoring system for the "Groundwater Velocity" Table in Enclosure I.

- Enclosure II, Statistical Analysis: Because of the problems with the data analysis and the incomplete nature of the statistical analysis submitted, no evaluation of the statistical analysis has been done by the Solid Waste Section.

Enclosure III, Analytical Data:

- September 1994: Comments have already been provided on the initial sampling event (Sept. 1994).
- December 1994: Many of the questions and comments provided for the initial sampling event are also applicable to the December 1994 sampling event.
  - The Dec. report seems to indicate that the total metals analysis was done using the 3030C preparation. The 3030C preparation does not yield total metals analysis and is not authorized by the Solid Waste Section.
  - Table 2 for the Dec. 1994 sampling event indicates well P-1 was dry. Since well P-1 is part of the approved detection monitoring system, this well will need to be replaced with a properly constructed monitoring well capable of providing representative ground-water samples in all seasons of the year.
  - Table 4 indicates the results are reported in micrograms per liter (parts per billion). This appears to be incorrect. The data appears to be reported in milligrams per liter (parts per million).
  - The laboratory detection limits (PQLs) reported for several metals are too high. (Arsenic, Cadmium, Chromium, and Lead)
- February 1995 and March 1995:
  - EPA method 8260 was used for volatile organic analysis for the February and March sampling events. This is the preferred method. However, our records do not indicate that GeoChem Laboratory is certified for method 8260.

Ms. Nancy Newell  
Durham Transition Plan  
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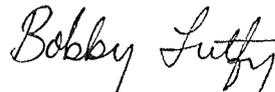
- Several of the questions and comments for the initial sampling event (Sept. 1994) also apply to the February and March 1995 sampling events.

The many problems with the Baseline Sampling make determinations difficult at this time. Additional sampling will be necessary to correct problems with the lack of data, incomplete data, and data based on incorrect sampling and analysis procedures.

Several of the metals and a couple of the volatile organics are present in wells at levels that are above the N.C. Groundwater Standards and/or appear to be statistically significant. Thus within 90 days of the April 10, 1995, date on the report, Durham must either sample all detection monitoring wells in the approved monitoring system for all Appendix II constituents or make a demonstration as provided by Rule .1633(c)(3). The demonstration must be approved by the Solid Waste Section, or Appendix II monitoring is triggered. More detailed and specific information would be necessary to support arguments that: the Methylene Chloride and Acetone are laboratory relics, and that the high values for the metals can be attributed to something other than a release from the landfill.

If representatives of the City of Durham or representatives of Malcolm Pirnie have any questions or comments regarding this letter, please contact me at (919) 733-0692, extension 258. Revisions to the Transition Plan should be submitted within the next 30 days. Thank you for your assistance in providing the additional information and clarifications to the items addressed in this letter.

Sincerely,



Bobby Lutfy, Hydrogeologist  
Solid Waste Section

cc: Lula Melton, SWS Raleigh  
Mark Fry, SWS Fayetteville  
Steve Nesbitt, Malcolm Pirnie, Inc.

June 6, 1995

Mr. Bobby Lutfy  
North Carolina Department of Environment  
Health and Natural Resources  
401 Oberlin Road  
Suite 150  
Raleigh, North Carolina 27605

Re: City of Durham Landfill  
Response to Technical Review Comments

Dear Mr. Lutfy:

Per our meeting of May 22, 1995, we provide the following comments concerning our proposed approach in responding to questions arising from your technical review of the City's amended transition plan submitted in January 1995. These comments reiterate your most recent telephone discussion with Mr. Richard Stahr of this office.

Comment letters were received pertaining to the following :

- Comments issued by Lula Melton of your office pertaining to the those portions of the Transition Plan excluding the Groundwater Quality Monitoring Plan, dated May 5, 1995.
- Comments issued by yourself pertaining to the review of the Local Area Study, Water Quality Monitoring Plan and Groundwater Quality Report. The major thrust of these comments was related to the proposed amendment to the City's existing groundwater monitoring network, as well as comments related to compilation of data contained in the baseline sampling reports and water quality report submitted April 10, 1995.

#### **Technical Review Excluding Groundwater Quality Monitoring Plan**

We are in the process of addressing comments raised by Lula Melton and anticipate submitting final responses within the specified 45-day compliance period.

#### **Technical Review of Local Area Study, Water Quality Monitoring Plan, and Groundwater Quality Report**

Review comments were largely related to the following two primary areas of concern.

#### ***Groundwater Quality Monitoring Network***

Per our meeting, we indicated our desire to use the Transition Plan document as the regulatory vehicle for amending the City's groundwater quality monitoring network. When we last met we agreed Malcolm Pirnie would provide to you technical justification for modifications to the City's groundwater

Mr. Bobby Lutfy  
North Carolina Department of Environment  
Health and Natural Resources

June 6, 1995  
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monitoring network, prior to finalizing the response to your comments and making final revisions to the Transition Plan. Supporting documents will be provided to you the week of June 12, allowing time for your technical review and consideration prior to our meeting with you the week of June 19 or 26. We will seek your approval of the modified monitoring network at that time.

*Annual Water Quality Report*

Revisions to the annual water quality report will be completed pending your decision concerning the groundwater monitoring network. Additional sampling may be required which will impact the final submittal date of the water quality report. Remaining comments concerning our presentation of existing data are currently being addressed and will be included in the final submittal.

*Compliance Schedule*

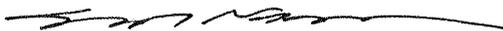
Your letter indicated that revisions should be submitted to you within 30 days following your letter. Per discussions during our meeting at your offices, we understand the Solid Waste Section will provide additional time per the schedule outlined in this letter and will not institute any enforcement actions until such time as technical justification for amendment to the groundwater monitoring network is completed.

Additionally, because of questions regarding the monitoring network, the City cannot make a determination regarding Assessment Monitoring. This decision will only be made after consensus is reached on the monitoring network. The City anticipates an extension from the 90 days required by the regulations and the Solid Waste Section memo. The City will comply with Section .1634 of the regulations, if required, within 90 days following written confirmation of the monitoring network from the Solid Waste Section.

We trust this meets your present requirements. Please call us immediately if you do not agree with this approach to responding to your department's review comments.

Very truly yours,

MALCOLM PIRNIE, INC.



Steve R. Nesbitt  
Associate

djk  
0759-022

c: S. R. Nesbitt, Malcolm Pirnie  
R. W. Stahr, Jr., Malcolm Pirnie  
M. P. Robinson, Jr., Malcolm Pirnie  
N. L. Newell, City of Durham  
L. Melton, DEHNR

SRNL0605.WPF

June 12, 1995

Lula H. Melton, EIT  
North Carolina Department of Environment,  
Health and Natural Resources  
P.O. Box 27687  
401 Oberlin Road  
Raleigh, North Carolina 27687

Re: Permit No. 32-01  
City of Durham Landfill  
Response to Comments

Dear Ms. Melton:

We have completed our response to your technical review comments pertaining to the City's Transition Plan, dated May 5, 1995. Please see the following enclosed revised sheets for inclusion in the Transition Plan, originally amended January 1995.

- Summary Report, pages 1 through 4.
- Operations Plan, pages ii, iii, 2-1 through 2-4 including Figures 2-1 and 2-2, Sections 5, 7, and 8, in their entirety, pages 11-1 and 12-1, as well as Figure 12-1.
- Closure Plan, pages 2-4 and 3-8.

We trust this meets your requirements. Please call me if you have any questions.

Very truly yours,

MALCOLM PIRNIE, INC.



Steve R. Nesbitt  
Associate

djk  
0759-022-920

Enclosure

c: N. L. Newell, City of Durham, w/encl  
R. W. Stahr, Jr., Malcolm Pirnie, w/encl  
S. R. Nesbitt, Malcolm Pirnie, w/encl

SRNL0612.WPF

# LETTER OF TRANSMITTAL

**To:** North Carolina Department of Environment,  
 Health and Natural Resources  
 401 Oberlin Road  
 Raleigh, North Carolina 27687

**Date:** June 13, 1995  
**Re:** Permit No. 32-01  
 Response to Comments

**Attention:** Lula H. Melton, EIT

- I am sending you  Enclosed  Under separate cover via  Mail  Messenger, the following items:
- shop drawings                       prints                                       data sheets                                       Revised Sheets
  - specifications                       sketches                                       brochures                                       \_\_\_\_\_

COPIES	PREPARED BY	REFERENCE NO.	DESCRIPTION
1	Malcolm Pirnie	0759-022	Revised pages 2-2 and 2-3 of Operations Plan

**THESE ARE TRANSMITTED AS CHECKED BELOW:**

- As requested
- For your use
- For review & comment
- For your information
- Approved
- Approved as Corrected
- Revise and Resubmit
- Not Approved
- Resubmit \_\_\_\_\_ copies for approval
- Submit \_\_\_\_\_ copies for distribution
- Return \_\_\_\_\_ corrected Prints
- \_\_\_\_\_

Remarks:

Very truly yours,  
**MALCOLM PIRNIE, INC.**

Copies to: N. L. Newell, City of Durham, w/encl  
 R. W. Stahr, Jr., Malcolm Pirnie  
 S. R. Nesbitt, Malcolm Pirnie, w/encl

  
 by Steve R. Nesbitt

## **2.2 PROHIBITED WASTE**

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The following types of waste are prohibited from disposal at the site:

- Hazardous wastes as defined by 15A NCAC 13A.
- Polychlorinated biphenyls (PCB) wastes as defined in 40 CFR 761.
- Liquid wastes as defined in Section 10.0, Liquid Restrictions, in this Operations Plan.

## **2.3 PUTRID WASTE**

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Putrid waste such as animal carcasses, hatchery waste, and other animal waste will be disposed of on the working face and shall be covered immediately with minimum 6 inches of daily cover soils to reduce impact of vectors. Vectors are defined in Section 4.0, Disease Vector Control, of this Operations Plan.

## **2.4 ASBESTOS WASTE**

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Although not prohibited, this facility does not accept any asbestos waste materials.

## **2.5 WASTEWATER TREATMENT SLUDGE**

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Stabilized wastewater treatment sludge will be used at agronomic rates in the final vegetative layer. The City will apply for a waste determination from the Solid Waste Section prior to using the wastewater treatment sludge.

## **2.6 DETECTION AND PREVENTION OF PROHIBITED WASTE**

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### **2.6.1 Random Inspection**

On a weekly basis, at the discretion of the landfill manager and as weather permits, the landfill manager or his designee shall direct 1 percent of waste collection vehicles, selected at random, to discharge a portion of their contents within a lined bermed area located adjacent to the existing scalehouse facility. Details of the inspection area are shown

on Figure 2-1. The composition of the waste will be identified by landfill staff trained to identify prohibited waste materials. Any questionable waste should be brought to the immediate attention of the landfill manager. The landfill manager will make the final determination of waste acceptability.

In addition to visual inspections, random inspection utilizing a photo ionization detector or a flame ionization detector may be conducted. These detectors are able to register the presence of volatile organic compounds. Volatile Organic Compounds are present in the majority of the hazardous waste compounds in 15A NCAC 13A. These inspections may be conducted by hazardous materials trained personnel who have the capability to investigate readings.

### **2.6.2 Contingency Plan**

On the working face, the facility will maintain a spotter to back up vehicles during peak periods of incoming waste. Spotters will be trained to identify prohibited waste materials. The spotter will watch for suspicious waste or waste containers and free liquids discharging from the waste hauling vehicles. Any potential prohibited waste will be isolated and removed from the facility by the original vehicle transporting the suspected material or by an appropriately trained and licensed waste hauler.

In the event prohibited materials have been discovered after disposal, the landfill staff should notify the landfill manager and implement the following procedures:

- Note time when discovery of prohibited waste was made.
- Notify Division of Solid Waste Management within 24 hours.
- Redirect traffic to other parts of the working face.
- Notify City of Durham Fire Department Hazardous Material Unit if unidentified or hazardous waste materials are suspected to be present.
- Follow hazardous material procedures for containing prohibited waste.
- Dispose of waste through permitted contractor/hauler.
- Forward proper disposal receipts to Division.

## SUMMARY REPORT

This Summary Report comprises part of the City of Durham Landfill Transition Plan prepared in accordance with Subchapter 13B of the North Carolina Administrative Code, Title 15A, Department of Environment, Health and Natural Resources.

This report summarizes the transition plan application and addresses specific criteria outlined in Rule .1603(d)(2)(C). Particular attention has been paid to item (vii) of the rule which refers to the schedule for making arrangements to transfer waste to an approved solid waste disposal facility.

### TRANSITION PLAN SUMMARY

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The City does not intend to submit any new permit application or permit renewal application for this landfill facility. The City proposes to continue accepting waste at its existing solid waste landfill until January 1, 1998, corresponding with anticipated completion of its planned Transfer Station and diversion of all municipal solid waste materials to a landfill designed and constructed in accordance with current regulatory requirements. The Transition Plan provides supporting documentation for proposed interim waste filling until January 1, 1998.

The Transition Plan includes measures for the interim operations of the facility in accordance with all current regulatory criteria as set forth in Rule 1626. In addition, the City has been proactive in pursuing a permanent regional Household Hazardous Waste (HHW) collection program.

Closure of the facility will include a low permeability final cap comprised of compacted earthen materials placed over the proposed interim fill area as well as older portions of the fill area which received waste materials subsequent to October 9, 1991. The closure plan demonstrates that, with the exception of localized areas, portions of the landfill which stopped receiving waste by October 9, 1991 have been provided with satisfactory soil cover and are deemed closed in accordance with Federal Subtitle D and State regulatory requirements.

The groundwater quality monitoring system has been designed to provide early detection of any potential release of hazardous constituents to the uppermost aquifer. The

of 7 groundwater monitoring wells and 4 surface water monitoring stations. Background water quality will be obtained from a new monitoring well proposed at an up-gradient location along the east perimeter. The remaining groundwater monitoring wells are located down-gradient of this location and surround the landfill at the relevant point of compliance, less than 250 feet from the limits of waste, and approximately 50 feet from the facility property boundary. Detection monitoring for Appendix I Constituents will be performed on a semi-annual basis for all groundwater and surface water monitoring locations. The first monitoring event will be performed prior to completion of the transition to a Subtitle D facility and will comprise a minimum of four independent samples collected and analyzed from each groundwater monitoring well at least 2 weeks apart, as well as one sample from each surface water monitoring station. Landfill performance will be evaluated by statistical comparison of up and down-gradient water quality for each sampling event in accordance with Rule .1632.

#### **SITE SPECIFIC EVALUATION CRITERIA**

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The following site specific criteria have been addressed for the Department's use in their evaluation of the anticipated closure schedule for this facility in accordance with Rule .1603 (d)(2)(C).

##### ***Proximity of Human and Environmental Receptors***

The local characterization study demonstrated that only 35 residences were identified between 300 and 1500 feet from the permitted facility boundary. A total of approximately 170 existing private residences were identified within a 2000 foot radius of the permitted facility boundary. The majority of these residents were located between 1500 and 2000 feet from the boundary.

No known surface water supply intakes were identified within the local characterization study area. Approximately 81 street addresses were identified which are not currently provided with service connections to the City of Durham water distribution system. These represent unconfirmed potable drinking water wells. Less than 40 of these street addresses were located within 1,000 feet of the permitted facility boundary. The remaining street addresses were located between approximately 1,000 and 2,000 feet of the boundary.

### *Design of the MSWLF Unit*

The landfill was originally designed as a natural attenuation site, and is underlain by overburden material comprised of sapprolite which has been formed by weathering of the underlying parent bedrock material. A transition zone between the sapprolite (weathered) and unweathered parent bedrock may be expected and is typical throughout the region.

The sapprolite and transition zone is expected to comprise the uppermost groundwater unit in the vicinity of the landfill. The estimated hydraulic conductivity of the groundwater unit may be expected to vary between  $1 \times 10^{-3}$  cm/sec to  $1 \times 10^{-4}$  cm/sec.

The sapprolite is underlain by relatively massive, thickly bedded, mudstone, siltstone and sandstone which comprise the Pekin formation. This bedrock formation underlies the site at relatively shallow depth ranging from between approximately 20 feet to 80 feet and effectively mitigates vertical groundwater flow. Given the nature of the bedrock and overlying sapprolite, the dominant direction of groundwater flow is anticipated to be horizontal.

Preliminary piezometric data indicates that groundwater flow in the vicinity of the site is radial, which appears consistent with localized topography and site geology. The landfill is surrounded by stream channels that represent points of groundwater discharge which should mitigate lateral migration of groundwater.

### *Age of the MSWLF Unit*

The City of Durham landfill has been receiving municipal solid waste for over 20 years. The facility began to receive municipal solid waste in 1973.

### *The Size of the MSWLF Unit*

Waste disposal footprint and soil borrow/stockpiles areas are approximately 89 and 20 acres respectively.

### *Types and Quantities of Waste Disposed*

The estimated maximum inventory of municipal solid waste materials disposed upon fill-out is approximately 3.2 million tons.

*Compliance Record of Owner and Operator*

Landfill inspection and evaluation reports compiled since 1986 indicate overall very good performance.

*A schedule to fulfilling intent of landfill design standards*

The City does not intend to submit any new permit application or permit renewal application for this landfill facility. The City anticipates beginning closure of this existing landfill in May 1995, upon completion of its planned solid waste transfer station and diversion of all municipal solid waste materials to a new regional landfill designed and constructed in accordance with current regulatory requirements.

*Resource value of underlying aquifer*

The uppermost aquifer underlying the site is not capable of producing high yielding potable wells and as such has limited resource value.

## 2.5 CLOSURE SCHEDULE

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The table below summarizes the anticipated closure schedule for the facility. The estimated closure dates are preliminary and will be impacted by actual filling rates and other factors. The actual closure dates will be provided to the NCDEHNR as they occur.

In accordance with Rule .1627(c), prior to beginning closure, a notice of intent to close the landfill will be placed in the operating record. Within 30 days after final receipt of waste, closure activities will begin and within 180 days of beginning closure activities, closure activities will be completed. Following closure, the NCDEHNR will be notified of closure certification and a notation of closure will be recorded on the deed.

*Must be signed by state engineer*

SUMMARY OF ANTICIPATED CLOSURE SCHEDULE	
Activity	Date
Submit Transition Plan	April 9, 1994
Re-Submit Transition Plan	December 1, 1994
Preparation of Closure Construction Documents Complete	December 1, 1997
Final Receipt of Waste	January 1, 1998
Notice of Intent to NCDEHNR	January 1, 1998
Award Construction Contract	February 1, 1998
Initiate Closure Action	February 1, 1998
Closure Completion	August 1998
Notification of Certification to NCDEHNR	August 1998
Recording of Closure	August 1998

## 2.6 LOCAL CHARACTERIZATION STUDY

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A Local Characterization Study was performed in accordance with Rule .1629(b)(2)(A). Results of the characterization study are summarized on Plate 1 and in the following paragraphs.

### 3.5 POST-CLOSURE LAND USE

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The City of Durham plans a passive use of the landfill during the post-closure period. No disturbance will be made to the integrity of the final cap, waste containment systems, or monitoring systems.

### 3.6 POST-CLOSURE COST ESTIMATE

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The capital cost estimate for post-closure activities for the City of Durham Sanitary Landfill is included in Appendix F. The estimated maximum annual total post-closure cost is approximately \$256,300 (in 1994 dollars). Given a 30-year post-closure period, the estimated present worth of post-closure care and maintenance throughout the maximum anticipated post-closure period at year 1996 is approximately \$8,477,000 (in 1996 dollars). The City will provide financial assurance for this amount in accordance with one of the financial instruments outlined in Rule .1628.

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B	Landfill Gas Monitoring Procedures
C	Paint Filter Liquids Test USEPA SW 846 (Test Method 9095)

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2	Phasing Plan
3	Final Grades
4	Gas Management System
5	Details

## 2.0 WASTE ACCEPTANCE AND DISPOSAL

### 2.1 ACCEPTABLE WASTE

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#### 2.1.1 Landfill Waste

This landfill facility currently receives municipal solid waste from the City of Durham and County of Durham. Major refuse collection and transportation users include: Browning Ferris Industries, Waste Management, Waste Industries, and the City of Durham Sanitation Department.

#### 2.1.2 Other Waste

The landfill facility has provisions for receiving and processing:

- Tires
- White goods
- Yard waste

These items are not disposed of within the landfill unit. Tires and white goods are collected and transported off-site. Yard waste is processed into a mulch and/or compost product which are distributed to users.

The City of Durham is participating in a regional household hazardous waste (HHW) collection and disposal program implemented through the Triangle Region Solid Waste Planners Committee. The City in conjunction with the regional effort, is proposing development of a HHW collection facility at the proposed transfer station to help divert these materials from the landfill. A permanent facility will be developed to serve the City of Durham in order to maximize the capture of HHW. Included in Appendix A is Draft Resolution Regarding Regional Coordination of Household Hazardous Waste Collection.

#### 2.1.3 Notification

The landfill manager shall notify the Division of Solid Waste Management within 24 hours of an attempt to dispose of any waste that landfill is not permitted to receive.

## **2.2 PROHIBITED WASTE**

---

The following types of waste are prohibited from disposal at the site:

- Hazardous wastes as defined by 15A NCAC 13A.
- Polychlorinated biphenyls (PCB) wastes as defined in 40 CFR 761.
- Liquid wastes as defined in Section 10.0, Liquid Restrictions, in this Operations Plan.

## **2.3 PUTRID WASTE**

---

Putrid waste such as animal carcasses, hatchery waste, and other animal waste will be disposed of on the working face and shall be covered immediately with minimum 6 inches of daily cover soils to reduce impact of vectors. Vectors are defined in Section 4.0, Disease Vector Control, of this Operations Plan.

## **2.4 ASBESTOS WASTE**

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Although not prohibited, this facility does not accept any asbestos waste materials.

## **2.5 WASTEWATER TREATMENT SLUDGE**

---

Stabilized wastewater treatment sludge will be used at agronomic rates in the final vegetative layer.

## **2.6 DETECTION AND PREVENTION OF PROHIBITED WASTE**

---

### **2.6.1 Random Inspection**

On a daily basis, at the discretion of the landfill manager and as weather permits, the landfill manager or his designee shall direct a waste collection vehicle, selected at random, to discharge a portion of its content within a lined bermed area. The composition of the waste will be identified by landfill staff trained to identify prohibited waste materials. Any

questionable waste should be brought to the immediate attention of the landfill manager. The landfill manager will make the final determination of waste acceptability.

In addition to visual inspections, random inspection utilizing a photo ionization detector or a flame ionization detector may be conducted. These detectors are able to register the presence of volatile organic compounds. Volatile Organic Compounds are present in the majority of the hazardous waste compounds in 15A NCAC 13A. These inspections may be conducted by hazardous materials trained personnel who have the capability to investigate readings.

### **2.6.2 Contingency Plan**

On the working face, the facility will maintain a spotter to back up vehicles during peak periods of incoming waste. Spotters will be trained to identify prohibited waste materials. The spotter will watch for suspicious waste or waste containers and free liquids discharging from the waste hauling vehicles. Any potential prohibited waste will be isolated and removed from the facility by the original vehicle transporting the suspected material or by an appropriately trained and licensed waste hauler.

In the event prohibited materials have been discovered after disposal, the landfill staff should notify the landfill manager and implement the following procedures:

- Note time when discovery of prohibited waste was made.
- Notify Division of Solid Waste Management within 24 hours.
- Redirect traffic to other parts of the working face.
- Notify City of Durham Fire Department Hazardous Material Unit (if necessary).
- Follow hazardous material procedures for containing prohibited waste.
- Store containers in secured area adjacent to scalehouse.
- Dispose of waste through permitted contractor/hauler.
- Forward proper disposal receipts to Division.

### **2.6.3 Records of Inspection**

Figure 1 provides a sample of an inspection record to be maintained for each inspection. The landfill manager shall maintain all Records of Inspection.

### **2.6.4 Training**

Each landfill operator receives several levels of training in order to identify prohibited waste including:

- Orientation by the landfill manager
- Hazardous materials training

### **2.6.5 Waste Placement**

The landfill manager or his designee will identify the direction and sequence of filling and location and orientation of the working face. Waste placement will be within the permitted limits of the landfill and contained within limits of waste filling established prior to October 9, 1993. Refer to operational drawing phasing plan and final grade sheets 2 and 3 for limits and directions of waste filling.

FIGURE 1

RECORD OF INSPECTION

Inspection No.: \_\_\_\_\_  
Day: \_\_\_\_\_ Time Crossed Scales: \_\_\_\_\_  
Weather Condition: \_\_\_\_\_  
Truck Owner: \_\_\_\_\_ Driver Name: \_\_\_\_\_  
Truck Type: \_\_\_\_\_  
Vehicle ID# or Tag#: \_\_\_\_\_  
Weight: \_\_\_\_\_  
Tare: \_\_\_\_\_  
General Description of Waste: \_\_\_\_\_  
\_\_\_\_\_

Waste Generating Company/Source: \_\_\_\_\_

Reason Load Inspected: \_\_\_\_\_ random inspection \_\_\_\_\_ staff initials  
\_\_\_\_\_ detained by scalehouse \_\_\_\_\_ staff initials  
\_\_\_\_\_ detained by LF operating staff \_\_\_\_\_ staff initials

Approved County "Special Waste Determination" letter present \_\_\_ Yes \_\_\_ No \_\_\_ N/A

Description of waste load: \_\_\_\_\_  
\_\_\_\_\_

Disposition: Load Accepted (signature) \_\_\_\_\_ Date: \_\_\_\_\_  
Load Not Accepted (signature) \_\_\_\_\_ Date: \_\_\_\_\_

Reason Load Not Accepted: (complete this section only if waste NOT ACCEPTED)

Description of Suspicious Contents:  
color \_\_\_\_\_ Haz. Waste markings \_\_\_\_\_  
texture \_\_\_\_\_ smell \_\_\_\_\_  
drums present \_\_\_\_\_ approx Cu.Yds. present in load \_\_\_\_\_  
approx tons present in load \_\_\_\_\_

County Emergency Management Contact: \_\_\_\_\_ Yes \_\_\_\_\_ No

Prohibited Waste:

	Yes	No
Hazardous Waste	<input type="checkbox"/>	<input type="checkbox"/>
Hazardous Material Labels	<input type="checkbox"/>	<input type="checkbox"/>
Medical Waste	<input type="checkbox"/>	<input type="checkbox"/>
Polychlorinated biphenyls (PCBs)	<input type="checkbox"/>	<input type="checkbox"/>
Electrical Transformer or Similar Equipment	<input type="checkbox"/>	<input type="checkbox"/>
Liquid Waste	<input type="checkbox"/>	<input type="checkbox"/>
Drums	<input type="checkbox"/>	<input type="checkbox"/>
Containers	<input type="checkbox"/>	<input type="checkbox"/>
Sludge	<input type="checkbox"/>	<input type="checkbox"/>
Asbestos	<input type="checkbox"/>	<input type="checkbox"/>
Other _____	<input type="checkbox"/>	<input type="checkbox"/>

Hauler notified (if waste not accepted)

Phone: \_\_\_\_\_ Time person contacted: \_\_\_\_\_

Other observations: \_\_\_\_\_  
\_\_\_\_\_

Final Disposition: \_\_\_\_\_

Signed by: \_\_\_\_\_ Date: \_\_\_\_\_

(Waste Screening Inspector or Landfill Manager)

Inspection Report Reviewed By: \_\_\_\_\_

## 5.0 EXPLOSIVE GASES CONTROL

### 5.1 MONITORING

---

Gas monitoring shall be conducted quarterly and scheduled by the landfill manager. The gas management system shall be operated in such a manner as to maintain combustible gas readings at the permitted boundary and within facility structures in accordance with the following:

<u>Location</u>	<u>Frequency</u>	<u>Limits (% LEL)</u>
Permitted Boundary	Quarterly	100
Facility Structures	Quarterly	25

All perimeter boundary and on-site structure locations shown on Operational Drawings will be monitored on a quarterly basis for percent lower explosive limit (percent LEL) and percent total volume (percent TV) of methane. All data will be recorded on a monitoring sheet and maintained on file at the landfill site. LEL is the lowest percent (by volume) of a mixture of explosive gases in air that will propagate a flame at 25°C and atmospheric pressure.

A sample gas monitoring report is shown in Figure 2.

#### 5.1.1 Permitted Boundary

Explosive gases control monitoring at the permitted boundary will be conducted utilizing a series of gas probes installed around the perimeter. The gas probes were installed at approximate 500-foot spacing around the permitted property boundary. The wells were installed 1 foot below seasonal low groundwater table.

Operational Drawings, Gas Management System (Sheet 4) show the locations of the gas monitoring probes installed. Details on the Operational Drawings present a typical gas monitoring probe.

Operational Manuals for gas monitoring equipment and methods of sampling are contained in Appendix B.

**FIGURE 2**  
**GAS MONITORING REPORT**

TECHNICIAN:

DATE:

GAS INSTRUMENT TYPE:

SERIAL NO.:

DATE LAST CALIBRATED:

METHOD:

PRESSURE INSTRUMENT TYPE:

SERIAL NO.:

WATER LEVEL INSTRUMENT TYPE:

SERIAL NO.:

BAROMETRIC PRESSURE:

STATUS (R,F,S):

GAS MONITORING PROBE	TIME	PRESSURE	PERCENT METHANE	WATER LEVEL	COMMENT (CONDITION OF PROBE)
----------------------------	------	----------	--------------------	----------------	------------------------------------

NOTES: All readings are 0-100% methane by volume in air  
All pressure readings are expressed as inches of H<sub>2</sub>O

WEATHER:

0759-022

Landfill gas monitoring will be performed with a dual range, natural gas indicator that measures concentrations as percent by volume of methane equivalents. Two ranges of detection should be available: 0 to 5 percent and 0 to 100 percent methane by volume. A device such as the GAS-TECH Model NP-204, or equivalent will be used. The combustible gas indicator will be equipped with a flexible extension hose and rigid metal or fiberglass 30-inch long probe. At a minimum, the combustible gas indicator will be calibrated prior to each monitoring event. The amount of monitoring and the handling of the meter will dictate if the calibration frequency should be increased.

The instrument is not to be used at locations where compounds such as tetraethyl lead or hydraulic fluids or lubricants, which contain silanes, silicates, or silicones may be present in the atmosphere. These chemicals contaminate the sensor and thus reduce measurement accuracy. If it is suspected that such compounds may be present in the test area, check the calibration of the instrument after making a maximum of five measurements.

Combustible gas monitoring procedures will be done initially in the high range. If the reading is less than 5 percent, the procedure will be repeated at the low range.

Pressure readings in probes provide useful data for assessing the migration of combustible gas and are typically expressed in inches of water column (in-w.c.) and measured with devices such as a Dywer Magnehelic, or equivalent pressure gauge. These gauges are available for measuring positive or negative (vacuum) pressures ranging from zero to 100 in w.c.

Liquid level measurements will be considered in evaluating the performance of probes. If the liquid level is above the screened or perforated portion of the probe, then the probe is to be considered "watered out" and the monitoring data considered invalid. Liquid levels obtained during probe installations will be considered when determining the screened or perforated length of the probe. A liquid level measuring device will be used to measure liquid levels in the probes.

#### *Permanent Gas Probes*

Gas monitoring at the permitted boundary will be performed via perimeter soil-gas probes. Permanent gas probes will be monitored for: 1) gas pressure, 2) combustible gas concentration, and 3) liquid levels. In order to minimize air infiltration during monitoring and also to obtain accurate pressure readings, the top end of the probe will be fitted with either a rubber stopper and flexible hose, or a PVC end cap with a threaded plastic sample port. The flexible hose and sample port will be clamped off to provide positive closure when

not being sampled. The fitting will facilitate a simple connection to the combustible gas indicator's sampling hose.

To effectively monitor the permanent probes, the following procedures will be implemented, in the following order:

1. Obtain pressure reading.
2. Purge a predetermined volume of gas from the permanent probe.
3. Observe the gas concentration after purging and record the steady-state (continuous) gas reading.
4. Obtain liquid level readings.

When the percentage of gas, liquid level, and pressure have been obtained, one of four general categories will be applied to analyze the data:

1. High percent gas and high pressure

In this situation, there is an indication of combustible gas accumulation and migration, attributed to elevated pressure. Special attention should be taken in reporting these findings. Additional barhole probing may be required to determine the extent of migration.

2. High percent gas and no/low pressure

In this situation, there is an indication that combustible gas accumulation and migration, attributed to diffusion (movement from higher concentration to lower concentration), rather than pressure. Although this does not present an immediate concern, the analyst should pay special attention to the probe during upcoming monitoring.

3. No/low percent-gas and high pressure

In this situation, the pressure observed may be attributed to the water level rising above the screened section of the probe, or to the barometric pressure of that particular day. The analyst should observe the liquid level measurements and make special note if the screened portion is below the liquid level.

4. No percent gas and no pressure

In this situation, there is no evidence of combustible gas accumulation within the probe.

### *Interim Bar Probes*

Prior to October 9, 1994, drive bar probe holes will be used to measure soil gases. Drive bar probes are steel or wood stake driven in the soil 2 to 3 feet deep and removed. Soil gas readings are taken upon removal of the probe.

Barhole probing is most useful when conducted along the perimeter of a landfill to determine whether combustible gas is migrating off-site. Areas with gas-stressed vegetation (burned-out areas) are usually indicators of near surface landfill gas migration.

With the aid of a plunger bar, a hole is made to a depth of 2.5 to 3 feet below ground surface. Upon removal of the plunger bar, the sampling probe is immediately inserted into the hole and sealed to minimize air infiltration of the barhole sample. With the instrument in the HIGH range, the aspirator bulb is slowly squeezed and released several times, recording the reading obtained following continuous sampling (stabilized value). If the concentration of gas is less than 5 percent on the HIGH scale, another barhole is punched and the sampling procedure is repeated in the LOW range. When barhole monitoring yields a high concentration of combustible gas, additional barhole probing is required. Barholes are punched and sampled at "as directed" intervals, radiating out in various directions from the original barhole of concern, until readings of zero are obtained. By employing a radial or grid-type pattern, a graph depicting the apparent movement of gas based on concentration can be plotted.

Barhole probing will be done at varying depths from the ground surface to a depth of about 3 feet. Shallower barhole probing on the order of 6 to 12 inches will be done when investigating for cover soil gas concentrations in vegetation stressed areas.

The monitoring technician should note that there are a number of seasonal variables which may affect the overall effectiveness of the barhole probe method. The moisture content of the ground greatly affects the concentration of gas detected because combustible gas migrates readily through dry soil and water saturated conditions may prohibit the use of the barhole probe method. Under these conditions, water infiltrates the barhole and can be sucked into the instrument during sampling. This would damage the filament and render the instrument useless. The use of a moisture trap and an aluminum probe with small diameter cross-drilled holes about 6 inches from the tip, helps reduce the possibility of liquid drawing into the gas detector, but does not prevent it.

During testing, the technician should note the retraction of the aspirator bulb. If the bulb is very slow in returning to its normal inflated form, this is an indication that liquids are being drawn through the probe.

Frozen ground conditions will inhibit plunger bar penetration. The preferred months for employing the barhole probe technique are the summer months, when conditions are dry. Though seasonal weather conditions may inhibit the use of the barhole technique, they do not prohibit its use as a year-round monitoring technique.

### **5.1.2 Facility Structures**

The monitoring of structures can present a sensitive situation due to the possibility/proximity of human inhabitants. Combustible gas accumulation should be monitored within confined areas of the structure such as corners, along baseboards, crawl spaces, attics, underground facilities, drainage structures (drains, toilets, sumps, etc.) or any area where air movement is restricted.

Monitoring for combustible gases in facility structures will be via two mechanisms:

- Quarterly monitoring of air using portable gas detector instruments.
- Continuous monitoring with credible alarm using fixed combustible gas monitors at selected locations.

When monitoring for combustible gas in buildings or structures, a rigid fiberglass probe will be used. The narrow tip allows for easy access to cracks and other narrow spaces. An aluminum probe can also be used for sampling; however, the two cross-drilled holes should first be covered to prevent the dilution of the sample.

The instrument will not be used at locations where compounds such as tetraethyl lead or hydraulic fluids or lubricants, which contain silanes, silicates, or silicones, may be present in the atmosphere. These chemicals contaminate the sensor and thus reduce measurement accuracy.

#### ***Permanent Gas Detector Installations***

In addition to routine sampling, buildings may be monitored by permanently installed gas detectors. As continuous monitoring devices, these detectors have a built-in alarm system which sounds if gas concentrations exceed a predetermined value.

The Sierra Model 2001 Combustible Gas Monitor, or equivalent (see Appendix B), which is factory and dealer calibrated to sound an internal alarm when combustible gas concentrations reach or exceed by volume 1 percent methane (10,000 ppm), will be used for structure monitoring. The monitors will be installed where combustible gas is most likely to accumulate and in areas of potential leaks, as discussed above.

The monitors will be recalled periodically for calibration. A simple check of the alarm should be performed each month to verify sensor activity. This can be achieved using an ordinary butane lighter. More frequent checks are necessary during periods of extreme humidity and temperature changes.

Care should be taken in the placement of the monitors, because they will be affected by the following:

- High concentrations of carbon monoxide
- Paint thinner, gasoline fumes, and other similar vapor emitting components
- Aerosol spray or cleaners

Situations such as these should be avoided because several occurrences may affect the calibration of the monitor.

## 5.2 CONTINGENCY PLAN

---

In the event that any gas probe indicates a concentration of methane exceeding 25 percent LEL, the following contingency measures will be taken to further evaluate the source of landfill gas and mitigate any hazardous effects.

- Place methane/gas monitoring data in Operating Record within 7 days from detection.
- Additional readings will be taken on a weekly basis from any gas probe which indicates repeatable measurements of methane in concentrations exceeding 25 percent LEL.
- If additional readings indicate the concentration of methane subsides for 2 consecutive weeks, then no additional contingency actions are required and monitoring shall revert to the original quarterly frequency.

- Consecutive methane concentrations in excess of the trigger level at perimeter gas probe locations will require installation of additional gas probes at approximately 100-foot spacing along the site perimeter in the vicinity of the elevated gas concentrations.
- Additional gas probes will be monitored at weekly intervals to evaluate the extent of gas migration. The Division of Solid Waste Management will be notified immediately in the event of any confirmed off-site gas migration.
- Confirmed off-site migration of methane gas in concentrations exceeding 100 percent LEL will initiate immediate development of remedial measures to mitigate any potential impacts.
- In the event of persistent elevated methane concentrations, investigations will be made as to the extent of gas accumulation beneath the landfill cap system and contingency actions proposed to vent and relieve build-up of any accumulation of methane.
- If any occupied dwelling exist in close proximity to the landfill in the direction of migration, gas measurements shall be taken at least weekly in basements and/or crawlspaces.
- A remediation plan shall be developed and implemented within 60 days of a high reading. Notification to the Division of Solid Waste Management will be made once the remediation plan has been implemented.

## **7.0 ACCESS AND SAFETY**

### **7.1 SITE SECURITY**

---

The site is secured by an entrance gate which denies access to vehicles during off hours. The perimeter of the landfill site is heavily wooded which limits unauthorized vehicle entrance into the facility. The landfill manager shall make a quarterly review of the perimeter to ensure no unauthorized entrance is being gained.

### **7.2 ATTENDANT**

---

During hours of operation, a scalehouse attendant shall be on duty as well as a landfill operator. The landfill operator shall be trained and have the ability to enforce the operational requirements of this facility.

### **7.3 ACCESS ROAD**

---

The access road from the public highway to the scalehouse and to the disposal area is capable of maintaining operations in all weather conditions. Landfill operations equipment is adequate to perform emergency repairs and maintenance of the facility's internal roadways.

### **7.4 DUST CONTROL**

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Dust control shall be undertaken on an as needed basis. Dust control shall be performed using a water truck. During extreme dust conditions, other chemicals may be used. These chemicals shall be consistent with all current federal, state, and local regulations.

## **7.5 SIGNAGE**

---

Entrance sign currently in place shall be maintained with the current facility operating hours and site identification.

Signs stating prohibited liquid and hazardous waste shall not be received at this facility will be maintained.

Traffic signs between the scalehouse and disposal area shall be maintained to control vehicle speed and direct users to and from the disposal area of the facility.

## **7.6 SCAVAGING**

---

Scavaging at this facility by users and employees is strictly prohibited. Signage at the facility entrance state this strictly enforced rule.

## **7.7 BARRELS AND DRUMS**

---

Barrels and drums pose a unique risk to facility staff and operations. No drums or barrels shall be disposed of on-site unless the containers are thoroughly perforated and do not have residue from its previous contents.

## 8.0 EROSION AND SEDIMENTATION CONTROL

The disposal facility utilizes a series of benches, chutes, ditches and stormwater ponds to control stormwater and minimize erosion and sedimentation control. These measures attempt to trap the sediment as close to the source as possible. Additionally, erosion and sediment control features may be used to divert stormwater runoff away from active cell areas within the landfill.

The landfill's erosion and sediment and stormwater control features will be developed to the following criteria:

- Maximum slope steepness 4 horizontal to 1 vertical
- Reverse sloped benches every 40 vertical feet
- Lined down chutes
- Stabilized outfalls
- Stormwater basin upgrades

These features are depicted on the Operations Drawings.

The benches divert stormwater runoff from the slopes into stabilized structures thereby minimizing unprotected slopes to 40 feet. These stormwater structures will be maintained on the schedule indicated below. Benches will not be constructed in previously filled areas.

All stormwater and erosion control structures have been designed and sized to accommodate 25-year, 24-hour storm events. Both the TR55 computer model and the Rationale Methods were utilized in design of these structures.

All denuded areas will be seeded and mulched between within 60 and 120 days of completion of any phase, to stabilize soil, thereby minimizing erosion once the disposition of the closure requirements are settled.

Facilities will be maintained on the following schedule:

<i>Component</i>	<i>Maintenance Procedure</i>	<i>Frequency</i>
Ditches	<ul style="list-style-type: none"><li>• Excavate sediment</li><li>• Re-establish vegetation</li></ul>	Biannually
Benches and Chutes	<ul style="list-style-type: none"><li>• Repair damaged areas</li><li>• Reinstall erosion control fabrics</li></ul>	Biannually
Stormwater Basins	<ul style="list-style-type: none"><li>• Excavate sediment</li><li>• Repair slopes</li><li>• Inspect discharge structure</li></ul>	Annually
Reseeding	<ul style="list-style-type: none"><li>• Reseed and mulch</li><li>• Inspect for vegetative stress</li></ul>	Annually

## 11.0 RECORDKEEPING

Records are kept either by the landfill manager or the City of Durham Sanitation Department at the following locations:

- City of Durham Landfill  
Durham, North Carolina

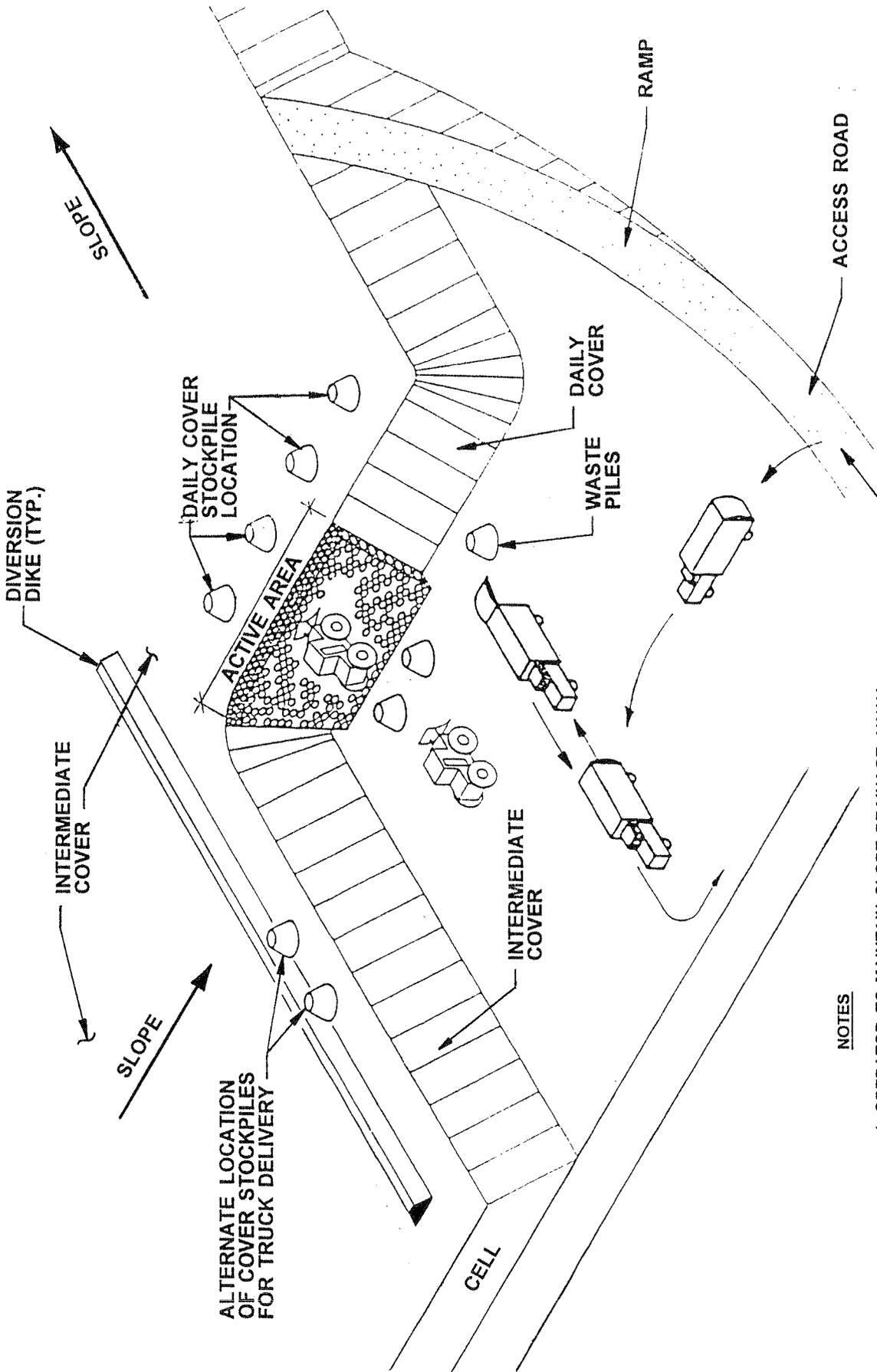
Attention: Landfill Manager

- City of Durham Sanitation Department  
101 City Hall Plaza  
Durham, North Carolina 27701

Attention: Solid Waste Process Engineer

Records to be maintained include:

- Permits
- Inspection and Records
- Training Procedures
- Amounts by Weight of Solid Waste Received
- Gas Monitoring Results
- Certifications, Monitoring and Testing Data
- Closure Cost Estimates
- Groundwater Monitoring Results



NOTES

1. OPERATOR TO MAINTAIN SLOPE DRAINAGE AWAY FROM ACTIVE FILL AREA.
2. ALTERNATELY, TEMPORARY DIVERSION DIKES TO BE UTILIZED TO DIVERT STORMWATER RUN-OFF FROM ACTIVE FILL AREA.

## 12.0 SPREADING AND COMPACTION

### 12.1 FILLING

---

The filling of the landfill unit shall be in general conformance with approved final grades and phasing plans.

During actual fill operations, confine the working face to minimum dimensions to handle anticipated peak traffic flows. This may make the working face approximately 50 feet wide. Figure 3 shows a typical working face configuration.

Filling at this facility will be conducted utilizing both the bottom and top dump area method as depicted in Figure 3. Lifts will be approximately 10 feet thick.

### 12.2 COMPACTION

---

Waste placed on the working face shall be compacted to the maximum practical density using the following procedures:

- Spread waste to approximately 2 to 3 feet thick.
- Make a minimum of two passes over the spread waste using either of the following heavy waste compactors:
  - Cat 826C
  - Rex 370A

### 12.3 SPECIAL PROCEDURES

---

Under certain adverse weather conditions, special procedures shall be implemented to ensure continued compliance with landfill regulation and requirements. The following is a list of procedures to follow pertinent to landfill operations.

#### Rain

- Reduce speed of vehicles on landfill access roads.
- Stockpile dry soil from borrow area to improve access to the working face and for daily cover.



U.S. Department  
of Transportation  
**Federal Aviation  
Administration**

March 6, 1995

Mr. Steve R. Nesbitt  
Malcolm Pirnie, Inc.  
11832 Rock Landing Drive, Suite 400  
Newport, VA 23606-4206

Dear Mr. Nesbitt:

Based on the data submitted with your letter of February 17, 1995, we cannot confirm that the existing/expansion landfill complies with Federal Aviation Administration's (FAA) recommendations concerning compatible land use around airports as it relates to birds/wildlife attracted by landfills and airport/air navigation safety. In general, any waste disposal site is considered a land use incompatible with safe airport operations if it attracts, or sustains hazardous bird movement from feeding, water or roosting areas into or across a runway and/or approach and departure patterns, including missed approach and aborted departure.

Based on the database in our computer system, and the location sketches submitted with your letter, we found that the subject landfill is located 9.2 miles from the Raleigh-Durham International Airport. Please be advised, in reconsidering this determination, it would expedite our reply if you provide us with a copy of the comments/recommendations resulting from your direct consultation with:

Mr. Todd A Menke, Biologist  
U. S. Department of Agriculture  
6301-E Angus Drive  
Raleigh, North Carolina 27613

Telephone 919/856-4124

We suggest that your consultation addresses specific consideration of the following questions:

MAR 10 1995  
COLUMBIANA (404) 305-7142  
SRN  
0759-022

Airports District Office  
FAA/Campus Building, Suite 2-260  
1701 Columbia Avenue  
College Park, GA 30337-2747  
(404) 305-7142 FAX: (404) 305-7155

- FILE
- XC: RWS, SRN
- XC: Nancy Maxwell PE  
City of Durham
- XC: ~~Lula Melton~~  
NCDENR  
Solid Waste Section



a) Is (or might it become, without or with expansion) the landfill an attractant to birds/wildlife?

b) Is there in the geographical area, a direction pattern for birds/wildlife attracted to the landfill, does that pattern cross the runway or the runway centerline extended in either direction, how far from the runway, how high would birds be flying when going across the runway or its extended centerline?

c) What actions may be taken to control/avoid/reduce landfill attraction to birds/wildlife?

We recommend that you provide a copy of your landfill operation manual to Mr. Todd A. Menke for his consideration and recommendations regarding the above questions. Please advise if we may be of further assistance.

Sincerely,



Walter Bauer  
Program Manager

cc:

Mr. Todd A. Menke, U.S. Department of Agriculture  
Mr. Richard W. Barks, Division of Aviation, NC DOT  
Mr. Dave R. Powell, Raleigh-Durham Airport Authority

**May 4, 1995  
City of Durham  
Meeting: 401 Berlin Rd.**

Attendees:

Jim Coffey  
Mark Fry  
Sherry Hoyt  
Lula Melton  
Nancy Newell  
Richard Stahr

Methane Gas

The City of Durham held a pre-construction meeting today to make further plans regarding controlling the migration of methane gas on the eastern portion of the landfill.

The City is conducting weekly methane monitoring currently but plans to decrease this frequency to bi-weekly, then monthly, and eventually quarterly.

Methane was detected approximately 500 feet from the eastern property boundary.

The interim remediation system will be up and running in about 30 days. Design for the permanent flare, including additional methane monitoring wells will start soon and will take approximately one year to install.

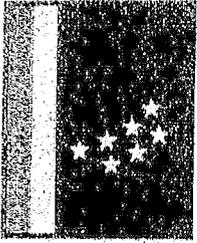
TP Status

Bobby Lutfy has not reviewed the City's water quality monitoring plan.

Future Plans

The City still plans to construct a transfer station at the proposed East Geer St. and Miami Blvd. intersection. The HHW collection facility is still proposed for this site.

DURHAM



1869

CITY OF MEDICINE

CITY OF DURHAM  
NORTH CAROLINA

DEPARTMENT OF SANITATION  
101 City Hall Plaza  
Durham, NC 27701

February 20, 1995

Mr. James C. Coffey  
Supervisor, Permitting Branch  
Solid Waste Section  
NCDEHNR  
P.O. Box 27687  
Raleigh, North Carolina 27611-7687

Re: Sanitary Landfill - Permit #32-01

Dear Mr. Coffey:

The purpose of this letter is to inform the Division of Solid Waste Management, in accordance with Section .1626(4), that methane gas in excess of the lower explosive limit (LEL) has been detected within the facility's property boundary. The City of Durham has taken the following steps to protect human health and safety:

- Monitored crawlspace and basements of occupied dwellings along the area where high gas readings have been detected. All dwellings were free of methane gas.
- Installed three new permanent gas monitoring probes on the former Veasey tract
- Instituted weekly monitoring of the effected areas that will continue until the levels of methane subside to safe levels
- Monitored shallow soil gas levels through the slam bar point in the effected area. These readings at the property boundary were not above LEL.

In addition, the City plans to install between the limits of waste and the closest occupied dwellings in the vicinity, a mechanism to control the methane migration. It will include a passive gas venting trench or a temporary extraction system that incorporates a temporary flare. Implementation of the control system installation will begin the week of February 20, 1995 and will be completed as soon as possible. The purpose of the temporary control system is to vent or flare the methane gas migrating from the waste boundary and thereby relieve some of the pressure which is the driving force in migration. In the event that methane reading in the three new monitoring probes in the former Veasey tract exceeds 75 percent of the LEL, City personnel will repeat gas measurements in the crawlspaces and basements of occupied dwellings in the effected area.

The City will also be moving up the schedule for the installation of a permanent landfill gas control system.

*gave original to  
Larry for Jim  
Coffey's request 2/21/95.*

In accordance with the regulations, the City will be working with our consultant, Malcolm Pirnie, to prepare a remediation plan. This plan will be prepared, placed in the operating record and implemented within 60 days of detection.

Please be aware that the City will take all necessary steps to protect human health and safety of residents around the landfill. We will, of course, keep the Division fully informed of the status of our activities towards resolving this situation. If you have any questions or comments, please do not hesitate to contact us.

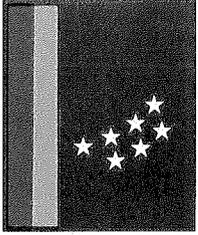
Sincerely,

A handwritten signature in cursive script that reads "Nancy Lee Newell".

Nancy Lee Newell, PE  
Solid Waste Process Engineer

cc: Gregory Bethea, Assistant City Manager  
Richard Stahr, Malcolm Pirnie  
Mark Fry, Solid Waste Section

DURHAM



1 8 6 9  
CITY OF MEDICINE

CITY OF DURHAM  
NORTH CAROLINA

DEPARTMENT OF SANITATION

101 City Hall Plaza  
Durham, NC 27701  
(919) 560-4185  
(919) 560-4647 FAX

February 9, 1995

Mr. James C. Coffey  
Supervisor, Permitting Branch  
Solid Waste Section  
NCDEHNR  
P.O. Box 27687  
Raleigh, North Carolina 27611-7687

Re: Sanitary Landfill - Permit #32-01

Dear Mr. Coffey:

The City of Durham has recently obtained additional property along the east side of the Durham Sanitary Landfill. The City requests that this property be included within the permitted boundary limits of the landfill. The current waste boundary will remain the same and no waste will be deposited on this additional property. Including this property within the permit boundary will increase the buffer on that side of the landfill to over the recommended 300 feet. It will also eliminate the use of the private well closest to the landfill. Currently, there is only a 100 foot buffer between the waste boundary and the permit boundary in that location.

A survey and property description of the entire permitted boundary is being prepared and will be sent to you as soon as possible. Enclosed you will find a map showing the location of the property and a description of the additional property. If you need additional information, please let me know as soon as possible.

Sincerely,

A handwritten signature in cursive script that reads "Nancy Lee Newell".

Nancy Lee Newell, PE  
Solid Waste Process Engineer

Enclosures

cc: Gregory A. Bethea, Assistant City Manager  
Don Robinson, Acting Solid Waste Mgmt. Director



Section 1 - Tract Affected:

The same as the Area Taken.

Section 2 - Property Interest:

A fee simple.

Section 3 - Area Taken:

That certain property, lying and being in OAK GROVE REDWOOD FIRE DISTRICT Township, Durham County, and being described as follows:

BEGINNING at a monument on the western right-of-way line of Jimmy Glenn Road, at the southeast corner of Jesse B. Veazey property, and being N 29°53'37" E 839.14 feet from an iron pin on the western right-of-way line of Jimmy Glenn Road, said iron pin being the southeast corner of City of Durham Tract No. 884; thence from the point of BEGINNING N 90°00'00" W 448.37 feet to a monument; thence N 07°39'30" E 820.69 feet to a monument; thence S 89°34'26" E 677.05 feet to a monument; thence S 12°53'53" W 464.41 feet to an iron pin; thence S 28°03'42" W 126.55 feet to an iron pin on the western right-of-way line of Jimmy Glenn Road; thence from said iron pin along an arc to the left with the western right-of-way line of Jimmy Glenn Road, said arc having a radius of 1,280.00 feet and a length of 277.54 feet to an iron pin; thence S 29°53'37" W 23.27 feet to a monument on the western right-of-way line of Jimmy Glenn Road, said monument being the point of BEGINNING, and containing 11.30 acres. For a more complete description, see the map entitled City Tract 884, prepared by the Department of Transportation and Utilities of the City of Durham, Joseph H. Hemmerle, RLS No. L-882, dated October 26, 1973, and recorded in the office of Register of Deeds of Durham County in Plat Book 79, Page 64.

A copy of that map is Exhibit B to the Complaint.



## City of Durham

- If adding additional property for disposal purposes, §1603 (a)(1)(B) requires the owner to ~~submit~~ meet new facility requirements (a site study + an application for a permit to construct as req'd. under §1617(a)).
- ↓ If adding additional property to restrict development by establishing a buffer between the landfill unit and private residences + wells, the Section will allow permit additional property ~~upset~~ via minor modification to the existing permit. §1624 (b)(3)(C)
- If adding additional property to install a GW monitoring well for compliance purposes, the Section has not decided how to permit this situation.

1/31/95 Conversation w Nancy Newell:

- Nancy will send a letter stating City's reasons as stated above for requesting additional property. Nancy also mentioned that a private drinking well is located w/in 500 feet of the LF that the State <sup>(and City)</sup> did not realize existed when the LF was originally permitted. The private well is located where the house is shown on the Veasey Property.

City of Durham Meeting - Jan. 18, 1995 10:00 a.m.

Steve Resbitt  
Richard Stacks  
Nancy Lee Howell

Capacity at site to last through 12/31/97

City bought heavy property on east side of LF -  $\approx$  11 acres.  
 $\therefore$  explosive gases control modified  
Permit should be revised.  
House on additional property now owned by City.

Survey plat will be submitted.

Add'l gas monitoring wells are shown on <sup>revised</sup> site plan / <sup>explosive</sup> <sub>control</sub>

- Adding waste to area that was previously capped.

- Used benches in final grades - <sup>New</sup> Slopes 4:1

Details show upgraded storm water detention basin.

P-6 prepared as background MW.

Prepared decommissioning MW-1 originally prepared as DL1.

- Talk to Jim @ partial approval letter ~~is~~ since permit expires in March.

- Talk to Jim @ restrictions for use of Veasey property.

# Durham ponders changing course on trash depot

By TIM VERCELLOTTI  
STAFF WRITER

**DURHAM** — Plans to ship Durham's garbage out of the county by rail from a proposed city "transfer station" in East Durham could be scrapped if the city can find a cheaper alternative.

City officials confirmed Thursday that they are exploring the costs of trucking garbage to one of two private transfer stations in Durham and Wake counties instead of building a city-owned facility.

The inquiries are part of a last-ditch search by the city for an alternative to building the \$11.8 million transfer station near East Geer Street and Miami Boulevard. Construction bids for the project are set to expire Jan. 9.

City Manager Orville Powell said he will recommend to the City Council by then whether to proceed with the station or to

change gears and negotiate a contract with one of two companies that have planned or opened similar operations in the Triangle.

The rising cost of garbage disposal threatens to drive up the city's property tax rate. Shipping the garbage by rail to a landfill in Montgomery County was expected to require a 6-cent increase in the tax rate in the first year of the arrangement. The rate is 68.1 cents per \$100 of property value.

"It would be awfully hard for citizens to understand why the city would build a transfer station and not consider these options," said Assistant City Manager Greg Bethea.

Betha said the potential change in course reflects rapid shifts in the garbage business. The two transfer stations — one owned by Waste Management Inc. and the other proposed by Brown-Ferris Industries — didn't

exist a year ago. The city has searched for an alternative to its aging landfill since the mid-1980s.

Attempts to find a site for a new landfill within Durham County met with intense opposition from residents. Instead, the City Council voted in 1992 to build a transfer station, where crews would transfer garbage from trucks onto rail cars for shipment to a landfill in Montgomery County.

The project fell behind schedule after the city ran into delays in finding a site and securing construction bids. The transfer station originally was supposed to open in January, but the city has yet to begin construction.

Bids for the project came in higher than expected in August, and city officials have spent the autumn negotiating with the bidders to bring down costs.

Durham's state permit for its landfill, off East Club Boulevard,

will expire in March. But the city says it has found more space in the landfill and is asking the state to extend the permit to July 1996.

By then, the city will either have built its transfer station or struck a deal with one of the two private facilities in the area.

Waste Management Inc. opened a garbage transfer station in Cary in September. Haulers cart garbage to the station for shipment to a Waste Management landfill in Kernersville.

BFI has proposed consolidating its Raleigh and Durham garbage collection and recycling, and building a transfer station in southeastern Durham County.

The city also is consulting with Waste Industries in Raleigh to find out whether hiring the company to transport garbage by truck from a city-owned transfer station to a private landfill would be cheaper than shipping by rail.

**NEW YORK**  
**Hantavirus traced to Eastern mouse**  
NEW YORK — Researchers say they have cracked the mystery of a New York man's death from a rare but frequently fatal virus and have found a new source of the disease: a mouse common to the Eastern United States.  
Hantavirus has infected at least 95 people in the United States since it emerged in the Southwest in May 1993. The deer mouse had been blamed until now, leading doctors to conclude there was less chance of the virus cropping up on the East Coast where the species is less common.  
But researchers said Thursday they have detected a new strain of the virus in the white-footed mouse, a species native to the East. They said the strain killed David Rosenberg, 22, a student who died Jan. 20.

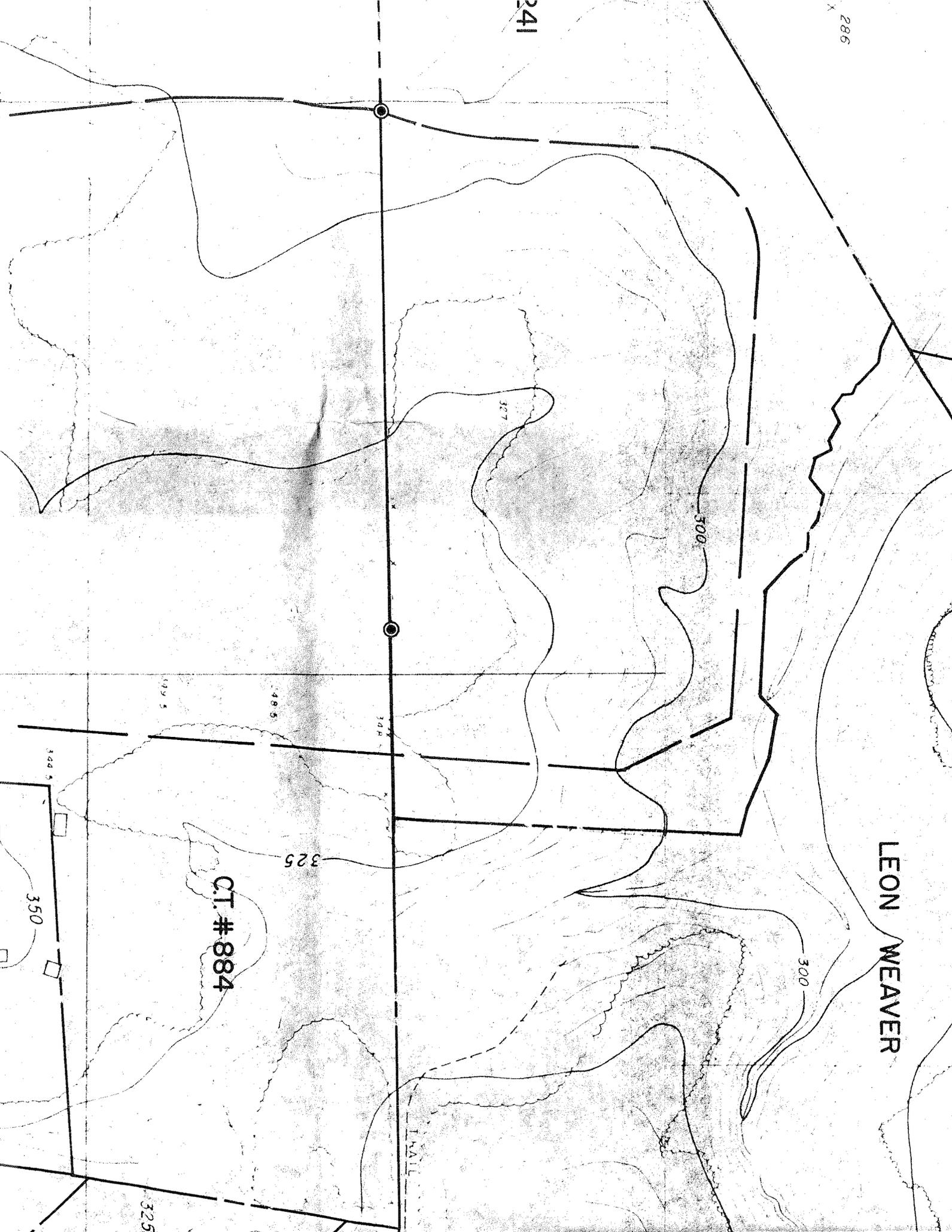
N40  
12/9/94



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LEON WEAVER



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TRAIL

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