



England-Thims & Miller, Inc.

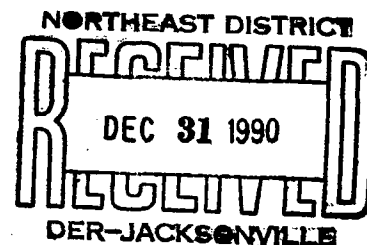
Consulting & Design Engineers
3131 St. Johns Bluff Road So. Jacksonville, FL 32216
904-642-8990

PRINCIPALS

James E. England, P.E., President
Robert E. Thims, V.Pres., Sec.
Douglas C. Miller, P.E., V. Pres.
N. Hugh Mathews, P.E., V. Pres.

December 31, 1990

Mrs. Mary C. Nogas, P.E.
Supervisor, Solid Waste
Department of Environmental Regulation
7825 Baymeadows Way
Suite 200
Jacksonville, Florida 32256-7577



Reference: Trail Ridge Landfill Plan "A"
D.E.R. Notice of its Intent to Issue Permit
ET&M NO. E89-113-8

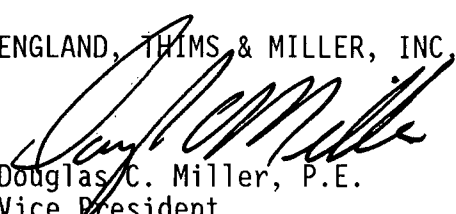
Dear Mrs. Nogas:

Enclosed is the proof of publication from the Florida Publishing Company and the Baker County Press for the above referenced project. The legal advertisement was published in the Florida Publishing Company in the December 24, 1990 (Monday) issue. The legal advertisement was published in the Baker County Press in the December 27, 1990 (Thursday) issue.

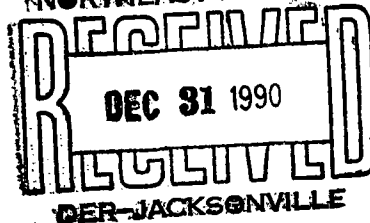
If you have any questions, please call.

Sincerely,

ENGLAND, THIMS & MILLER, INC.


Douglas C. Miller, P.E.
Vice President

DCM:k1



THE BAKER COUNTY PRESS, PUBLISH-
ED WEEKLY IN THE CITY OF MACCLENNY,
COUNTY OF BAKER AND STATE OF
FLORIDA.

STATE OF FLORIDA

COUNTY OF BAKER

AFFIDAVIT OF PUBLICATION

Before me, the undersigned authority
personally appeared Anita Patterson,
who on oath says that he is one of the
firm of the BAKER COUNTY PRESS, a week-
ly newspaper published in Macclenny,
Baker County, Florida; that the attached
copy of advertisement being a notice to
appear in re:

Notice of Intent to Issue Permit

Was published in said newspaper in the
issues of:

12/27/90

Affidavit says further that the said
BAKER COUNTY PRESS is a newspaper pub-
lished at Macclenny, in said Baker Coun-
ty, Florida, and that the said news-
paper has heretofore been continuously
published in said Baker County, Florida,
each week; has been entered as second
class mail matter at the Post Office in
Macclenny, Florida, in said Baker Coun-
ty, Florida, for a period of one year
next preceeding the first publication of
the attached copy of notice; and affiant
further states that he has neither paid
nor promised any person, firm or corpor-
ation any discount, rebate, commission
or refund for the purpose of securing
this advertisement for publication in
said newspaper.

Anita Patterson

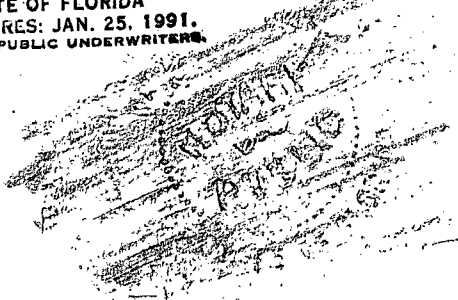
Sworn to and subscribed before me

this 28th day of December

19 90.

Kenneth S. Thomas

NOTARY PUBLIC, STATE OF FLORIDA
MY COMMISSION EXPIRES: JAN. 25, 1991.
BONDED THRU NOTARY PUBLIC UNDERWRITERS.



STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
1. NOTICE OF INTENT TO ISSUE PERMIT

The Department of Environmental Regulation gives notice of its intent to issue a permit to Trail Ridge Landfill, Inc., Post office Box 6987, Jacksonville, Florida, 32236, to construct and operate the Trail Ridge "Plan A" landfill with a total site area of 1288 ± acres of which 148 ± acres will be used for Class I solid waste disposal and 28 acres for Class III disposal. The landfill is located on the west side of US Highway 301, approximately one mile north of Maxville in Duval County.

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative proceeding (hearing) in accordance with Section 120.57, F.S. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Tallahassee, Florida, 32399-2400, within 14 days of publication of this notice. Petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, F.S.

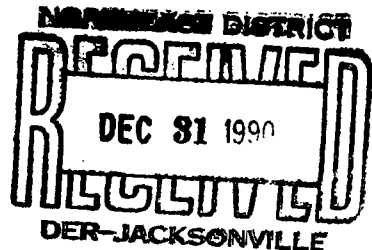
The Petition shall contain the following information:

(a) The name, address, and telephone number of each petitioner; (b) The applicant's name and address, the Department Permit File Number and the county in which the project is proposed; (c) A statement of how and when each petitioner received notice of the Department's action or proposed action; (d) A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action; (e) A statement of the material facts disputed by petitioner, if any; (f) A statement of facts which petitioner contends warrant reversal or modification of the Department's action or proposed action; (g) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; and (h) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this Notice. Persons whose substantial interests will be affected by any decision of the Department with regard to the application have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of publication of this notice in the Office of General Counsel at the above address of the Department. Failure to petition within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

The application is available for public inspection during normal business hours, 8:00 am to 5:00 pm, Monday through Friday, except legal holidays, at Department of Environmental Regulation, Northeast District Office, 7825 Baymeadows Way, Suite 200-B, Jacksonville, Florida 32256-7577.

12/27c



FLORIDA PUBLISHING COMPANY

Publisher

JACKSONVILLE, DUVAL COUNTY, FLORIDA

STATE OF FLORIDA }
COUNTY OF DUVAL }

Before the undersigned authority personally appeared _____

Christine Taylor _____ who on oath says that he is

a classified advertising rep _____ of The Florida Times-Union,

a daily newspaper published at Jacksonville in Duval County, Florida; that the

attached copy of advertisement, being a legal notice _____

in the matter of state of Florida _____

in the _____ Court,

was published in THE FLORIDA TIMES-UNION in the issues of _____

December 24th, 1990 _____

Affiant further says that the said The Florida Times-Union is a newspaper published at Jacksonville, in said Duval County, Florida, and that the said newspaper has heretofore been continuously published in said Duval County, Florida, The Florida Times-Union each day, has been entered as second class mail matter at the postoffice in Jacksonville, in said Duval County, Florida, for a period of one year next preceeding the first publication of the attached copy of advertisement; and affiant further says that he has neither paid nor promised any person, firm or corporation any discount, rebate, commission or refund for the purpose of securing this advertisement for publication in said newspaper.

Sworn to and subscribed before me
this 26th day of
December A.D. 1990

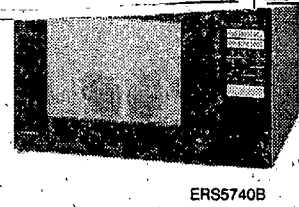
Wally Attala
Notary Public,
State of Florida at Large.

My Commission Expires _____

DA 444 Notary Public, State of Florida
My Commission Expires Dec. 2, 1994
Bonded Thru Troy Fain - Insurance Inc.

Christine Taylor

The Department
Landfill, Inc., P
Ridge "Plan A"
for Class I solid
side of U.S. Hi
A person who
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28-5-207, F.
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Northeast Di



'PLUS 10' LOW PR

For every product we sell, we'll beat a store stocking the same item. Even a lower price within 30 days, including the difference--plus 10% of the difference. buying advantage, comparisons of size and models may not be possible.

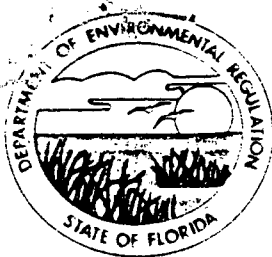
†This item appears at our ev
All backed by our 30 day Low

*All wattage stated per channel RMS
.001 and 1% from as low as 20Hz to 2

All TV screens measured diagonally.

We reserve the right to limit quantities
sufficient inventory for you, our custo

It's our policy to have a sufficient supply of advert
demand. In the event an item is not available, we
comparable item of equal or greater value.



Florida Department of Environmental Regulation

Northeast District • Suite 200, 7825 Baymeadows Way • Jacksonville, Florida 32256-7577 • 904-448-4300

Bob Martinez, Governor

Dale Twachtmann, Secretary

John Shearer, Assistant Secretary
Ernest Frey, Deputy Assistant Secretary

December 21, 1990

CERTIFIED - RETURN RECEIPT

Mr. Dwayne Igou
Trail Ridge Landfill
Post Office Box 6987
Jacksonville, Florida 32236

Dear Mr. Igou:

Trail Ridge "Plan A" Landfill
Proposed Permit No. SC16-184444
DER File Nos. 184444, 184445, and 184447
Duval County - Solid Waste

This is in reference to your application for a construction permit for the above-referenced project.

Florida Administrative Code (FAC) Rule 17-103.150 and Section 403.815, Florida Statutes, require that you publish a Notice of Intent at your own expense.

Please have the enclosed notice published one time only in the legal advertisement section of major newspapers of general circulation in Duval and Baker Counties in the area close to where the project is located (affected area) as soon as possible and no later than thirty (30) days from receipt of this notice.

Proof of publication shall be provided to the Department of Environmental Regulation within seven (7) days of publication. The processing of the application will be delayed until fourteen (14) days after this office has received the proof of publication. Failure to publish this Notice of Intent will be basis for denial of the permit.

Attached is a copy of the Intent to Issue and a draft permit for the construction of the referenced facility.

If you have any questions, please contact Emerson Raulerson at the letterhead address or telephone number.

Sincerely,


Michael J. Fitzsimmons
Waste Program Administrator

MJF:erl

Enclosures

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

In the Matter of an
Application for Permit by:

DER File No. SC16-184444,
184445, and 184447

Trail Ridge Landfill, Inc.
Post Office Box 6987
Jacksonville, Florida 32236

INTENT TO ISSUE

The Department of Environmental Regulation gives notice of its intent to issue a permit (copy attached) for the proposed project as detailed in the application specified above, for the reasons stated below.

The applicant, Trail Ridge Landfill, Inc. applied on July 27, 1990 to the Department of Environmental Regulation for a permit to construct and operate the Trail Ridge Landfill with a total site area of 1288± acres of which 148± acres will be used for Class I solid waste disposal and 28 acres for Class III disposal. The project includes a proposed surface water management system. The landfill is located on the west side of U.S. Highway 301, approximately one mile north of Maxville in Duval County.

The Department has permitting jurisdiction under provisions of Chapters 373 and 403, Florida Statutes (F.S.), and Florida Administrative Code (F.A.C.) Chapters 17-3, 17-4, and 17-701. The project is not exempt from permitting procedures. The Department has determined that a construction permit is required for the proposed work. This Intent to Issue is in accordance with the application received July 27, 1990 and additional information provided September 12, 1990 and October 10 and 11, 1990. The applicant has provided reasonable assurance that the proposed work will comply with all applicable Department regulations and Chapters 373 and 403, Florida Statutes.

Pursuant to Section 403.815, F.S., and DER Rule 17-103.150, F.A.C., you (the applicant) are required to publish at your own expense the enclosed Notice of Intent to Issue Permit. The notice shall be published one time only within 30 days, in the legal ad section of a newspaper of general circulation in the area affected. For the purpose of this rule, "publication in a newspaper of general circulation in the area affected" means publication in a newspaper meeting the requirements of Sections 50.011 and 50.031, F.S., in the county where the activity is to take place and in the adjoining county. The applicant shall provide proof of publication to the Department, at the Northeast District Office, 7825 Baymeadows Way, Suite 200-B, Jacksonville, Florida, 32256-7577 within seven (7) days of publication. Failure to publish the notice and provide proof of publication within the allotted time may result in the denial of the permit.

The Department will issue the permit with the attached conditions unless a petition for an administrative proceeding (hearing) is filed pursuant to the provisions of Section 120.57, F.S.

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative proceeding (hearing) in accordance with Section 120.57, F.S. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400. Petitions filed by the permit applicant and the parties listed below must be filed within 14 days of receipt of this intent. Petitions filed by other persons must be filed within 14 days of publication of the public notice or within 14 days of their receipt of this intent, whichever first occurs. Petitioner shall mail a copy of the petition

to the applicant at the address indicated above at the time of filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, F.S.

The Petition shall contain the following information;

- (a) The name, address, and telephone number of each petitioner, the applicant's name and address, the Department Permit File Number and the county in which the project is proposed;
- (b) A statement of how and when each petitioner received notice of the Department's action or proposed action;
- (c) A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action;
- (d) A statement of the material facts disputed by petitioner, if any;
- (e) A statement of facts which petitioner contends warrant reversal or modification of the Department's action or proposed action;
- (f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; and
- (g) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this intent. Persons whose substantial interests will be affected by any

decision of the Department with regard to the application have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of receipt of this intent, in the Office of General Counsel at the above address of the Department. Failure to petition within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

Executed in Jacksonville, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION



Ernest E. Frey, P.E.
Deputy Assistant Secretary
Northeast District Office
7825 Baymeadows Way, Suite 200-B
Jacksonville, Florida 32256-7577
(904) 448-4300

CERTIFICATE OF SERVICE

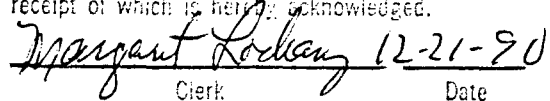
The undersigned duly designated deputy clerk hereby certifies that this INTENT TO ISSUE and all copies were mailed before the close of business on December 21, 1990 to the listed persons.

Copies furnished to:

- Honorable Thomas Hazouri
- Honorable Sherry Walker
- Honorable George Crady
- Honorable Steve Kennedy
- Honorable Marvin E. Godbold, Jr.
- Honorable Eric Smith
- Honorable Watson Goodwin
- Doug Miller

FILING AND ACKNOWLEDGEMENT

FILED, on this date, pursuant to §120.52, Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.


Clerk Date

Trail Ridge Landfill Intent to Issue

Copies furnished to (cont'd.):

Mr. & Mrs. Fred Munson, Sr.
Ms. Karen Peterson
Ms. Janice Whatley
Mr. Nolan Green
Mr. Darrell Sperry
Mr. Will E. Furlong, P.E.
Ms. Pamela Presnell Garvin
Ms. Ellen Long
Ms. Sylvia Thibault
Mr. Lambert L. Herring
Mr. John G. Herring
Mr. Maurice T. Samples
Mr. Ronnie E. Hall

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
NOTICE OF INTENT TO ISSUE PERMIT

The Department of Environmental Regulation gives notice of its intent to issue a permit to Trail Ridge Landfill, Inc., Post Office Box 6987, Jacksonville, Florida, 32236, to construct and operate the Trail Ridge "Plan A" landfill with a total site area of 1288± acres of which 148± acres will be used for Class I solid waste disposal and 28 acres for Class III disposal. The landfill is located on the west side of U.S. Highway 301, approximately one mile north of Maxville in Duval County.

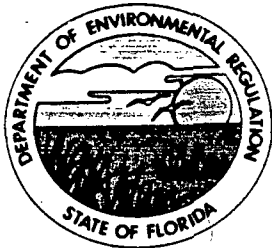
A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative proceeding (hearing) in accordance with Section 120.57, F.S. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400, within 14 days of publication of this notice. Petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, F.S.

The Petition shall contain the following information; (a) The name, address, and telephone number of each petitioner; (b) The applicant's name and address, the Department Permit File Number and the county in which the project is proposed; (c) A statement of how and when each petitioner received notice of the Department's action or proposed action; (d) A statement of how each petitioner's

substantial interests are affected by the Department's action or proposed action; (e) A statement of the material facts disputed by petitioner, if any; (f) A statement of facts which petitioner contends warrant reversal or modification of the Department's action or proposed action; (g) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; and (h) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this Notice. Persons whose substantial interests will be affected by any decision of the Department with regard to the application have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of publication of this notice in the Office of General Counsel at the above address of the Department. Failure to petition within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

The application is available for public inspection during normal business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday, except legal holidays, at Department of Environmental Regulation, Northeast District Office, 7825 Baymeadows Way, Suite 200-B, Jacksonville, Florida, 32256-7577.



Florida Department of Environmental Regulation

Northeast District • Suite 200, 7825 Baymeadows Way • Jacksonville, Florida 32256-7577 • 904-448-4300

Bob Martinez, Governor

Dale Twachtmann, Secretary

John Shearer, Assistant Secretary

Ernest Frey, Deputy Assistant Secretary

PERMITTEE:

Trail Ridge Landfill, Inc.
Post Office Box 6987
Jacksonville, Florida 32236

I.D. Number: GMS3116P03090
Permit/Cert Number: SC16-184444
Date of Issue: 12- -90
Expiration Date: 12- -95
County: Duval
Lat/Long: 30°14'00"N/82°02'30"W
Section/Township/Range: 18, 19, 20, 21/3S/23E
Project: Trail Ridge "Plan A" Landfill

This permit is issued under the provisions of Chapters 373 and 403, Florida Statutes and Florida Administrative Code Chapters 17-3, 17-4, and 17-701. The above-named Permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawing(s), plans, and other documents attached hereto or on file with the department and made a part hereof and specifically described as follows:

To construct and operate the Trail Ridge "Plan A" Landfill, with a total site area of 1288± acres of which 148± acres will be used for disposal of Class I wastes and 28 acres will be used for disposal of Class III wastes. The leachate containment system is a double liner system as spelled out in Florida Administrative Code Rule 17-701.050(5)(d)1.b., with the addition of 0.25 inches of Claymax below the bottom liner. The primary and secondary leachate collection systems will consist of synthetic geodrains and a two (2)-foot protective soil layer will lie above the primary drain.

The facility design includes wetland mitigation and a surface water management system. A groundwater monitoring system is also included.

The Trail Ridge Landfill entrance is located on the west side of U.S. Highway 301 approximately one mile north of Maxville in Duval County.

This permit is issued in accordance with the application received July 27, 1990 and additional information provided on September 12 and October 10 and 11, 1990, and includes Department File Nos. 184444, 184445, and 184447.

PERMITTEE:

Trail Ridge Landfill, Inc.

I.D. Number: GMS3116P03090

Permit/Cert Number: SC16-184444

Date of Issue: 12- -90

Expiration Date: 12- -95

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth herein are "Permit Conditions" and as such are binding upon the Permittee and enforceable pursuant to the authority of Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The Permittee is hereby placed on notice that the department will review this permit periodically and may initiate enforcement action for any violation of the "Permit Conditions" by the Permittee, its agents, employees, servants, or representatives.
2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the department.
3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Nor does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit does not constitute a waiver of or approval of any other department permit that may be required for other aspects of the total project which are not addressed in the permit.
4. This permit conveys no title to land or water, does not constitute state recognition or acknowledgement of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the state. Only the Trustees of the Internal Improvement Trust Fund may express state opinion as to title.
5. This permit does not relieve the Permittee from liability for harm or injury to human health or welfare, animal, plant or aquatic life or property and penalties therefore caused by the construction or operation of this permitted source, nor does it allow the Permittee to cause pollution in contravention of Florida Statutes and department rules, unless specifically authorized by an order from the department.
6. The Permittee shall at all times properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the Permittee to achieve compliance with the conditions of this permit, as required by department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by department rules.
7. The Permittee, by accepting this permit, specifically agrees to allow authorized department personnel, upon presentation of credentials or other documents as may be required by law, access to the premises, at reasonable times, where the permitted activity is located or conducted for the purpose of:

PERMITTEE:

Trail Ridge Landfill, Inc.

I.D. Number: GMS3116P03090

Permit/Cert Number: SC16-184444

Date of Issue: 12- -90

Expiration Date: 12- -95

GENERAL CONDITIONS:

- a. Having access to and copying any records that must be kept under the conditions of the permit;
- b. Inspecting the facility, equipment, practices, or operations regulated or required under this permit; and
- c. Sampling or monitoring any substances or parameters at any location reasonably necessary to assure compliance with this permit or department rules.

Reasonable time may depend on the nature of the concern being investigated.

8. If, for any reason, the Permittee does not comply with, or will be unable to comply with, any condition or limitation specified in this permit, the Permittee shall immediately notify and provide the department with the following information:
 - a. A description of and cause of non-compliance; and
 - b. the period of non-compliance, including exact dates and times; or, if not corrected, the anticipated time the non-compliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the non-compliance.

The Permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the department for penalties or revocation of this permit.

9. In accepting this permit, the Permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source, which are submitted to the department, may be used by the department as evidence in any enforcement case arising under the Florida Statutes or department rules, except where such use is proscribed by Sections 403.73 and 403.111, Florida Statutes.
10. The Permittee agrees to comply with changes in department rules and Florida Statutes after a reasonable time for compliance, provided however, the Permittee does not waive any other rights granted by Florida Statutes or department rules.
11. This permit is transferable only upon department approval in accordance with Florida Administrative Code Rules 17-4.12 and 17-30.30, as applicable. The Permittee shall be liable for any noncompliance of the permitted activity until the transfer is approved by the department.
12. This permit is required to be kept at the work site of the permitted activity during the entire period of construction or operation.

PERMITTEE:

Trail Ridge Landfill, Inc.

I.D. Number: GMS3116P03090

Permit/Cert Number: SC16-184444

Date of Issue: 12- -90

Expiration Date: 12- -95

GENERAL CONDITIONS:

13. This permit also constitutes:

- () Determination of Best Available Control Technology (BACT)
- () Determination of Prevention of Significant Deterioration (PSD)
- (X) Certification of Compliance with State Water Quality Standards
- () (Section 401, PL 92-500)
- () Compliance with New Source Performance Standards

14. The Permittee shall comply with the following monitoring and record keeping requirements:

- a. Upon request, the Permittee shall furnish all records and plans required under department rules. The retention period for all records will be extended automatically, unless otherwise stipulated by the department, during the course of any unresolved enforcement action.
- b. The Permittee shall retain at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation), copies of all reports required by this permit, and records of all data used to complete the application for this permit. The time period of retention shall be at least three years from the date of the sample, measurement, report or application unless otherwise specified by department rule.
- c. Records of monitoring information shall include:
 - the date, exact place, and time of sampling or measurements;
 - the person responsible for performing the sampling or measurements;
 - the date(s) analyses were performed;
 - the person responsible for performing the analyses;
 - the analytical techniques or methods used; and
 - the results of such analyses.

15. When requested by the department, the Permittee shall, within a reasonable period of time furnish any information required by law which is needed to determine compliance with the permit. If the Permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the department, such facts or information shall be submitted or corrected promptly.

PERMITTEE:

Trail Ridge Landfill, Inc.

I.D. Number: GMS3116P03090

Permit/Cert Number: SC16-184444

Date of Issue: 12- -90

Expiration Date: 12- -95

SPECIFIC CONDITIONS:

1. Construction of the Trail Ridge "Plan A" Landfill shall be in conformance with plans, specifications, and contract drawings submitted in support of the application received July 27, 1990 and the additional information provided on September 12 and October 10 and 11, 1990. Permittee shall submit, in writing, to the Department of Environmental Regulation, Northeast District, 7825 Baymeadows Way, Suite 200-B, Jacksonville, Florida, 32256-7577, notification of the date that construction activities authorized by this permit commence.
2. The Permittee shall submit to the Department for approval a revised Quality Control/Quality Assurance Plan for installing the Class I area synthetic liner system, after selection of the synthetic liner manufacturer, and prior to its installation. The plan shall include the following:
 - a. Retention of a registered professional engineer for independent quality assurance.
 - b. Minimum qualifications of the Construction Quality Assurance engineer and supporting Quality Assurance personnel.
 - c. Sampling activities, size and locations, frequency of testing, acceptance and rejection criteria, and plans for implementing corrective measures that may be necessary.
 - d. Procedure for testing the density of the compacted clay subbase at least once per acre.
 - e. Procedures for testing the permeability of the Claymax at least once per 40,000 square feet.
 - f. The synthetic liner manufacturer's and installer's specific recommendations for acceptability of the soil portion ("subgrade" for the synthetic liner) and the Claymax portion of the liner system. The Permittee shall ensure that the installation contractor of the synthetic portion submits his certification of acceptance of the subgrade to the Department immediately upon its execution.
 - g. The synthetic liner manufacturer's specifications and recommendations for installing and testing the specific liner selected and demonstrating that it meets or exceeds NSF Standard 54. Quality Assurance Reports shall be submitted to the Department with the Certification of Completion. Installation of the synthetic liner for the leachate holding basin shall be performed in accordance with the Department approved Construction Quality Assurance Plan and shall meet the liner manufacturer's recommended installation procedures, pursuant to FAC Rule 17-701.050(4)(c).
3. The Permittee shall establish financial assurance for closure and long-term care. Proof that the financial assurance mechanism is funded in accordance with FAC Rule 17-701.076 shall be submitted to the Department sixty (60) days prior to the acceptance of any solid waste at the facility [17-701.076(2)]. All submittals in response to this specific condition shall be submitted to: Financial Coordinator, Solid Waste Section, Department of Environmental Regulation, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400.

PERMITTEE:

Trail Ridge Landfill, Inc.

I.D. Number: GMS3116P03090

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SPECIFIC CONDITIONS (CONT'D):

4. Surface water runoff and/or diversion controls included in the plans and/or this permit shall be installed and operational prior to construction of the disposal areas. Surface water runoff shall be controlled during the construction stage and shall comply with FAC Chapter 17-3 at the site boundary.
5. Following completion of all significant construction activities, the Permittee or authorized representative shall complete and submit to the Department, DER Form 17-7.130(2), entitled "Certification of Construction Completion Application to Operate only Resource Recovery and Management Facility." The Permittee shall submit to the Department, Record Drawings signed and sealed by a professional engineer registered in the State of Florida, and a Quality Assurance Report on liner installation prepared, signed, and sealed by a professional engineer registered in the State of Florida. The Permittee shall specify where leachate will be treated and/or disposed of; and the Permittee shall submit to the Department for approval, a letter of acceptance from the wastewater treatment plant which will provide treatment and/or disposal. At such time the Permittee shall arrange for Department representatives to inspect the facility in the company of the Permittee, engineer, and on-site operator, as required by FAC Rule 17-701.030(6). The facility shall not be operated or accept solid waste until the Department has notified the Permittee in writing that all applicable submissions required for the permit, including financial responsibility documentation have been received and found acceptable.
6. The facility shall not be operated or accept solid waste until the Department has notified the Permittee, in writing, that the applicable certification, attesting that the surface water management system has been constructed in accordance with the permitted design, has been received and approved.
7. Following notification that the Department has found the submittals acceptable, the Permittee shall operate the facility in conformance with the criteria contained in FAC Rule 17-701.050 and the operation plan submitted with the permit application.
8. Daily records of waste quantities and types received shall be kept at the site. These records shall be summarized and a monthly waste quantity report shall be submitted to the Department by the fifteenth (15th) day of the following month.
9. Hazardous waste as defined in FAC Chapter 17-730, or biohazardous wastes as defined in FAC Rule 17-712.100(2) shall be prohibited from disposal. The Department shall be notified immediately in the event such wastes are discovered. If such wastes are discovered, the Permittee shall implement the waste control procedures as contained in the operations plan.
10. Laws of Florida, Chapter 88-130, Section 15, prohibits the disposal of whole tires, lead acid batteries, and white goods in solid waste landfills.
11. All construction and demolition debris must be disposed of in segregated areas according to FAC Rule 17-701.061(2).

PERMITTEE:

Trail Ridge Landfill, Inc.

I.D. Number: GMS3116P03090

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SPECIFIC CONDITIONS (CONT'D):

12. An effective barrier to prevent unauthorized entry shall be installed and maintained in accordance with the plans in the permit application. Unauthorized scavenging or salvaging shall be prohibited. A screening barrier (i.e., trees or other vegetation) shall be installed and maintained to shield landfill operations from public view in accordance with FAC Rule 17-701.040(2)(h).
13. Objectionable odors originating from the site shall be effectively controlled. A gas venting system shall be installed in accordance with the plans and specifications in the permit application. Should objectionable odors or gas migration become a problem, the passive gas venting system shall be converted to an active system with a flare or other means to destroy the landfill decomposition gas(es).
14. Litter control devices shall be installed as necessary to prevent litter from leaving the disposal areas.
15. Any interruption of regular landfill activities (fire, natural disasters, equipment breakdown) shall be immediately reported to the Department by phone. In the event of equipment breakdown, reserve equipment capable of performing basic disposal operations shall be made available at the site within 24 hours, excluding holidays or other days when the landfill is closed.
16. A trained supervisor or foreman shall be responsible for maintaining the site in an orderly, safe, and sanitary manner in accordance with FAC Rules 17-703.300 and 17-703.400. This includes maintenance of the leachate collection system by water jet cleaning. Sufficient personnel shall be employed as noted in the operations plan to adequately operate the facility.
17. All-weather access roads to the site and disposal areas shall be maintained. Dust control methods (i.e. water sprays) shall be employed as necessary.
18. Quantitative records of leachate collected and sent off-site for treatment shall be kept and made available to the Department upon request. Disposal of leachate shall be in accordance with all applicable regulations and shall include the running of a TCLP analysis prior to disposal to determine if it is hazardous. Within six months of placing waste in the lined facility or when sufficient leachate has been generated, a detailed chemical characterization of a representative sample of the leachate shall be performed pursuant to FAC Rule 17-28.700(6)(a)2. This characterization shall include those parameters listed for initial sampling of the ground water monitoring wells. Routine sampling and analysis of leachate shall be established and incorporated by permit modification following review of the initial leachate characterization.
19. In Accordance with FAC Rules 17-28.700(6) and 17-701.050, the Permittee shall within ninety (90) days of the issuance of this permit install and place into operation a Ground Water Monitoring system.

PERMITTEE:

Trail Ridge Landfill, Inc.

I.D. Number: GMS3116P03090

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SPECIFIC CONDITIONS (CONT'D):

- a. The Ground Water Monitoring System shall be designed and constructed in accordance with plans submitted to and approved by the Department.
- b. Approximate monitoring well locations and designations shall be in accordance with Attachment 1. A surveyed drawing shall be submitted showing the location of all monitoring wells (active and abandoned) which will be horizontally located by metes and bounds or equivalent surveying techniques. The surveyed drawing shall include the monitor well identification number as well as location and elevation of all permanent benchmark(s) and/or corner monument marker(s) at the site. The survey shall be conducted by a Florida Registered Surveyor. All wells are to be clearly labeled and easily visible at all times.

Background Wells	B-2 S,I	Locations as indicated on
Phase IV	B-3 S,I	Drawing No. 9
	B-9 S,I	

Compliance Wells

Phase I	B-7 S,I,D	B-11 S,I	B-12 S,I,D
	B-18	B-19	B-20 B-21 B-22

Phase II	B-16	B-17
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Phase III	B-13 S,I	B-14 S,I,D	B-23
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Phase IV	as above
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Phase V	B-24	B-25 S,I,D	B-26	B-27	B-28	B-29	B-30
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- c. Upon completion of construction of the groundwater monitoring wells, the following information shall be submitted for all groundwater monitoring wells (permanent and temporary) and any new well(s) constructed:

Well identification	Driller's Lithologic Log
Latitude/Longitude	Total well depth
Aquifer monitored	Casing diameter
Screen type and slot size	Casing type and length
Elevation at top of pipe	SJRWMD well construction
Elevation at land surface	permit number

- d. In the event any monitoring well becomes damaged or inoperable, the Permittee shall notify the Department within seventy-two (72) hours and a detailed written report shall follow within seven (7) days. The written report shall detail what problem has occurred and remedial measures that have been taken to prevent a recurrence. All monitoring well design and replacement shall be approved by the Department prior to installation.

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Trail Ridge Landfill, Inc.

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SPECIFIC CONDITIONS (CONT'D):

- e. The zone of discharge shall extend horizontally to the property line or one-hundred (100) feet beyond the waste management area, whichever is less, and vertically to the base of the surficial aquifer, in accordance with F.A.C. Rule 17-28.700(2). This zone of discharge shall remain in effect unless it becomes necessary to seek a change, pursuant to F.A.C. Rule 17-28.700(5).
- f. The Permittee shall ensure that the water quality standards for Class G-II ground waters will not be exceeded at the boundary of the zone of discharge according to F.A.C. Rules 17-3.402 and 17-3.404.
- g. The Permittee shall ensure that the minimum criteria for ground water specified in F.A.C. Rule 17-3.402 shall not be violated within the zone of discharge.
- h. Ground water levels shall be recorded no less than forty-eight (48) hours after well installation and prior to evacuating the well for sample collection. Measurements, referenced to N.G.V.D., shall include ground water surface elevation, the top of well casing, and land surface at each site at a precision of plus or minus 0.01 feet. This information shall be submitted to the Department with the quarterly ground water analytical results. A map must be constructed depicting locations of wells and piezometers and corresponding water level measurements.
- i. Upon completion of construction of the ground water monitoring wells, the Permittee shall initially sample and analyze all monitoring wells for the parameters listed in Attachment 2 and all E.P.A. Priority Pollutant Parameters. Tentative identification of all peaks greater than 10 ppb is required.
- j. All sample collection and water quality analysis shall be performed by organizations with approved comprehensive or Generic Quality Assurance Plans (CompQAPs) on file with the Department. The CompQAP shall address all sampling and analysis requirements of this permit. Within 60 days of permit issuance, the Permittee shall submit to the Department for approval the name of the sample collecting organization and laboratory to be utilized. The Department reserves the right to reject all results generated by the Permittee prior to CompQAP approval, or which are not in accordance with the Department approved CompQAP. Sampling and analytical work is also subject to the provisions of FAC Rule 17-28.700(6)(d). In addition, the Permittee shall be in compliance with the provisions of FAC Rule 17-160 within 90 days of the effective date of that rule.
- k. Ground water sampling results shall be reported on the attached Parameter Monitoring Report Form [DER Form 17-1.216(2)] (Attachment 5). In order to facilitate entry of this data into the state computer system, these forms or an exact replica must be used and must not be altered as to content. The original forms should be retained so that the necessary information is available to properly complete future reports. The report forms received from the

PERMITTEE:

Trail Ridge Landfill, Inc.

I.D. Number: GMS3116P03090**Permit/Cert Number:** SC16-184444**Date of Issue:** 12- -90**Expiration Date:** 12- -95**SPECIFIC CONDITIONS (CONT'D):**

laboratory must be submitted along with the DER Parameter Monitoring Report Forms described above. The Permittee shall submit to the Department the results of the ground water monitoring well water quality analysis no later than the fifteenth (15th) day of the month immediately following the end of the sampling period. Quarterly analytical results shall be accompanied by a brief narrative summary. The results shall be sent to the Department of Environmental Regulation, Northeast District, 7825 Baymeadows Way, Suite 200-B, Jacksonville, Florida, 32256-7577.

1. All ground water monitoring wells shall be sampled and analyzed quarterly for the parameters listed in Attachment 2. However, additional samples, wells, and parameters may be required based upon subsequent analyses.
- m. If, at any time, ground water standards and/or criteria are exceeded, the Permittee has fifteen (15) days in which to resample the monitor well(s) to verify the original analysis. Should the Permittee choose not to resample, the Department will consider the water quality analysis as representative of current ground water conditions at the facility.
- n. Following two (2) years of quarterly sampling, data will be reviewed by the Department to evaluate changes in parameters and sampling frequencies that may be appropriate.
- o. Sixty (60) days prior to the renewal of this permit, the Permittee shall sample and analyze all monitoring wells for the parameters listed on Attachment 1.
- p. Compliance with ground water standards and/or criteria shall be determined by analysis of unfiltered or settled ground water samples.
- q. Within sixty (60) days of issuance of this permit, all piezometers and wells not a part of the approved ground water monitoring plan are to be plugged and abandoned in accordance with F.A.C. Rule 17-21.10(4) and St. Johns River Water Management District Rule 40C3.531. The Permittee shall submit a written report to the Department providing verification of the well plugging and abandonment. A written request for exemption to the plugging and abandonment of a well must be submitted to the Department for approval.
- r. F.A.C. Rule 17-28.700(6)(d)11 requires that the ground water monitoring program must inventory and map surface waters within one mile of the landfill. If there are any modifications to surface waters within one mile of the landfill, the Permittee shall upon request submit to the Department a revised inventory and map of surface waters within ninety (90) days.
- s. F.A.C. Rule 17-28.700(6)(d)7 requires an inventory of all wells within a one (1) mile radius of the landfill, including the owners' names and addresses, well locations, well specifications (well depth, diameter, screened interval, capacity, etc.) and utilization. If there are any changes to the well inventory, the Permittee shall upon request of the Department revise the well inventory and shall submit the revised inventory to the Department within ninety (90) days.

PERMITTEE:

Trail Ridge Landfill, Inc.

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SPECIFIC CONDITIONS (CONT'D):

20. In accordance with F.A.C. Rule 17-28.700(6)(d)11, surface water monitoring is required on a quarterly basis in conjunction with the ground water monitoring schedule. The following Surface Water Monitoring Program shall be implemented within ninety (90) days of the issuance of this permit.

a. The Surface Water Monitoring System shall be designed and operated in accordance with plans submitted to and approved by the Department.

b. The surface water monitoring sites shall be located as follows:

Site Number

Location

SW-1

SW-2

SW-3

As indicated on Drawing No. 9

c. All surface water sampling sites shall be sampled and analyzed quarterly for the parameters listed in Attachment 4. However, additional sampling sites and parameters may be required based upon subsequent analyses. Following two (2) years of quarterly sampling, data will be reviewed by the Department to evaluate changes in parameters and sampling frequencies that may be appropriate.

21. Closure of the landfill is subject to the provisions of FAC Rules 17-701.070 through 17-701.076. Pursuant to FAC Rule 17-701.072, at least ninety (90) days prior to the date when wastes will no longer be accepted, the Permittee shall submit a closure permit application to the Department for review and approval. The application shall include a closure plan which meets the requirements of FAC Rule 17-701.073.

22. A copy of the Department approved engineering drawings, plans, reports, operational plan, and supporting information shall be kept at this landfill at all times for reference and inspections.

23. The Permittee shall immediately notify the Department by telephone whenever a serious problem occurs at this facility. During regular business hours notification shall be made to the Northeast District Office at (904)448-4300. If an emergency occurs outside regular business hours, the Permittee shall telephone the 24-hour emergency phone number (904)488-1320. This number is for emergencies only. Within 7 days of telephone notification, the Permittee shall submit to the Department a written report explaining the extent of the problem, its cause, and what actions have been or will be taken to correct the problem.

24. The Department shall be notified and prior approval shall be obtained for any changes or revisions made during construction.

25. Receipt of this permit from the Department does not relieve the applicant from obtaining other federal, state, and local permits required by law.

PERMITTEE:

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SPECIFIC CONDITIONS (CONT'D):

26. A survey of the waste disposal area shall be conducted at the end of each year from the date of permit issuance until it is within ten (10) feet of design height after which it shall be conducted quarterly. This information is to be submitted to the Department within 30 days and shall include the maximum elevation at the design high point, all points designed for terraces, and the location of the toe of the slope.
27. The mitigation plan, "Trail Ridge Landfill Wetland Impacts and Mitigation Plan," submitted on June 18, 1990, shall be appended as a Specific Condition of this permit. Any specific condition requirements listed herein, shall supersede or modify any requirements contained in the appended mitigation plans.
28. Prior to initiating any construction, Permittee must record a conservation easement on the real property pursuant to Section 704.06, F.S., prohibiting all construction including clearing, dredging or filling, except that which is authorized by this permit within the conservation creation/preservation areas as delineated on plans dated as received by the Department on June 18, 1990. The easement must contain provisions as set forth in subsections 1(a)-(b) of Section 704.06, F.S., as well as provisions indicating that they may be enforced by the Department and may not be amended without Department approval. Within 30 days of the date of issuance of this permit and prior to recording, said easement must be submitted to the Department for review and approval. Within 30 days of receipt of Department approval, Permittee must provide to the Department a certified copy of the recorded easement showing the date they were recorded and the official records book and page number.
29. The initial planting of the mitigation areas, per appended mitigation plan Section 4(b)(4), shall be completed no later than one year after commencement of the construction activities authorized by this permit.
30. The Permittee shall submit an as-built survey of the wetland creation areas showing dimensions, grades, ground elevations, and water surface elevations certified by a registered surveyor or professional engineer. The as-builts must be submitted within thirty (30) days of the initial planting.
31. The Permittee shall furnish the Department with monitoring reports on the wetland creation areas describing:
 - a. Percent survival and diversity of planted species within each stratum;
 - b. Recruitment density and composition within each stratum;
 - c. Recorded growth via established parameters for planted trees and shrubs;
 - d. Percent cover of herbaceous species;
 - e. Surface water elevations referenced to N.G.V.D., or if surface water is not present, groundwater elevation referenced to N.G.V.D.

The first monitoring year shall start as of the planting date and data shall be collected and submitted in accordance with Specific Condition No. 4. Reports to the Department must also include photographs, descriptions of problems encountered, and solutions undertaken.

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Trail Ridge Landfill, Inc.

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SPECIFIC CONDITIONS (CONT'D):

32. Within the wetland creation areas, non-native vegetation and nuisance vegetation such as Typha spp. shall be controlled by hand clearing or other methods approved by the Department so that they constitute no more than 10% of the areal cover at any monitoring period.
33. Successful establishment of wetland creation shall occur when:
 - a. on an annual basis at least 80% of the planted individuals in each stratum have survived and are showing signs of normal annual growth, based on standard growth parameters such as height and base diameter, or canopy circumference; and
 - b. the above criteria has been achieved and maintained for a three (3)-year period following initial planting
34. In the event that the success criteria as stated in Specific Condition No. 33 are not achieved by the expiration date of this permit, Permittee shall enter into a long-term agreement with the Department so as to ensure the success of the mitigation plan.
35. All wetland areas or water bodies which are outside the specific limits of construction authorized by this permit must be protected from erosion, siltation, scouring or excess turbidity or dewatering.
36. All disturbed areas adjacent to the mitigation area must be sodded or seeded and mulched within 10 days following their completion and a substantial vegetation cover must be established within 60 days of sodding or seeding.
37. The Permittee shall submit to the Department within sixty (60) days prior to acceptance of wastes, two copies of the final version of the Department approved Operations Plan.
38. Pursuant to FAC Rule 17-4.090, prior to sixty (60) days before the expiration of this permit, the Permittee shall apply for a renewal of the permit on forms and in a manner prescribed by the Department.

Executed in Jacksonville, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

FILING AND ACKNOWLEDGEMENT

FILED, on this date, pursuant to §120.52, Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

Ernest E. Frey, P.E.
Deputy Assistant Secretary

Clerk

Date

ATTACHMENT 1
Initial Groundwater Parameters

Field Parameters

Specific Conductance	Temperature
Groundwater Elevation	pH

Indicator Parameters

Total Organic Carbon (TOC)	Total Kjeldahl Nitrogen (TKN)
Chemical Oxygen Demand (COD)	Biochemical Oxygen Demand (BOD)
Total Phosphorous	Ortho Phosphorous
Total Dissolved Solids (TDS)	Total Suspended Solids (TSS)
NO2 & NO3 as N	NH3 & NH4 as N
Color	Odor
Turbidity	Foaming Agents
Bicarbonate	Carbonate
Dissolved Oxygen (DO)	Sulfate

Inorganic Parameters

Arsenic	Chromium	Manganese
Barium	Copper	Mercury
Bicarbonate	Iron	Potassium
Cadmium	Fluoride	Selenium
Calcium	Lead	Silver
Chloride	Magnesium	Sodium
		Zinc

Microbiological Parameters

Total Coliform	Fecal Coliform
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Organic Parameters

EPA Priority Pollutant Parameters

ATTACHMENT 2
Quarterly Groundwater Parameters

Field Parameters

Specific Conductance	Temperature
Groundwater Elevation	pH

Indicator Parameters

Total Organic Carbon (TOC)	Total Kjeldahl Nitrogen (TKN)
Chemical Oxygen Demand (COD)	Biochemical Oxygen Demand (BOD)
Total Phosphorous	Ortho Phosphorous
Total Dissolved Solids (TDS)	Total Suspended Solids (TSS)
NO2 & NO3 as N	NH3 & NH4 as N
Color	Odor
Turbidity	Foaming Agents
Bicarbonate	Carbonate
Dissolved Oxygen (DO)	Sulfate

Inorganic Parameters

Arsenic	Chromium	Manganese
Barium	Copper	Mercury
Bicarbonate	Iron	Potassium
Cadmium	Fluoride	Selenium
Calcium	Lead	Silver
Chloride	Magnesium	Sodium
		Zinc

Microbiological Parameters

Total Coliform	Fecal Coliform
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VOC's (Method 601)

Bromodichloromethane	1,1-Dichloroethane
Bromoform	1,2-Dichloroethane
Bromomethane	trans-1,2-Dichloroethane
Carbon Tetrachloride	cis-1,3-Dichloropropene
Chlorobenzene	trans-1,3-Dichloropropene
Chloroethane	1,2-Dichloropropane
2-Chloroethylvinyl ether	Methylene Chloride
Chloroform	1,1,2,2-Tetrachloroethane
Chloromethane	Tetrachloroethene
Dibromochloromethane	1,1,1-Trichloroethane
1,2-Dichlorobenzene	1,1,2-Trichloroethane
1,3-Dichlorobenzene	Trichloroethene
1,4-Dichlorobenzene	Trichlorofluoromethane
Dichlorodifluoromethane	Vinyl Chloride
1,1-Dichloroethane	

VOC's (Method 602)

Benzene	1,4-Dichlorobenzene
Chlorobenzene	Ethylbenzene
1,2-Dichlorobenzene	Toluene

ATTACHMENT 3

Surface Water Parameters

Field Parameters

Specific Conductance
Temperature
pH

Indicator Parameters

Dissolved Oxygen	Total Organic Carbon (TOC)
Chemical Oxygen Demand (COD)	Biochemical Oxygen Demand (BOD)
Total Dissolved Solids (TDS)	Total Suspended Solids (TSS)
Total Nitrogen	Total Organic Nitrogen
Nitrate	Un-ionized Ammonia
NH3	NH4+
Total Phosphorous	Turbidity
Sodium	Chlorides
Sulfates	

Inorganic Parameters

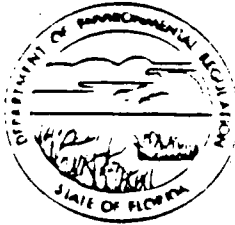
Arsenic	Magnesium
Barium	Manganese
Cadmium	Mercury
Chromium	Nickel
Copper	Selenium
Iron	Silver
Lead	Zinc

Microbiological Parameters

Total Coliform	Fecal Coliform
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STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32399-2400



BOB MARTINEZ
GOVERNOR

DALE TWACHTMANN
SECRETARY

QUARTERLY REPORT ON GROUND WATER MONITORING
Rule 17-4.245(6)(k)2.

GMS # _____ DATE _____

DER PERMIT # _____

Installation Name _____

Address _____ City _____ State _____ Zip _____ County _____

Owner or Authorized Representative's Name _____ Title _____

Method of Discharge _____

Type of Industry _____

Report for Period _____ to _____
date date

Attach monitoring data as approved in monitoring plan using parameter monitoring report forms. When applicable, attach additional sheets describing any changes in the background water quality and the discharge plume since the last reported description. Include any changes in size, direction of movement, rate of movement, and concentration changes of plume constituents in violation of the applicable standards.

NOTE: Pursuant to Rule 17-4.245(6)(k)3., at any time there is a change in the permitted volume, location or chemical, physical or microbiological composition of the discharge plume, the permittee shall notify the department and, if required by the department, submit a new report stating the volume and chemical, physical and microbiological compositions of the discharge at the point of release or contact with the ground water at the site boundary.

CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Owner or Authorized Representative's Signature _____ Date _____

Sample Date _____

Well Type: [] Background
 [] Site Bound
 [] Intermedia
 [] Compliance

[] Site Bound
[] Intermedia:
[] Compliance

Ground Water Elevation
(above MSL) _____

STORET Code	Parameter Monitored	Sampling Method	Analysis Method	Analysis Result	Units	Sample Filtered/Unfiltered	Pres vati Add

*Well development is the process of pumping the well prior to sampling in order to obtain a representative ground water sample.

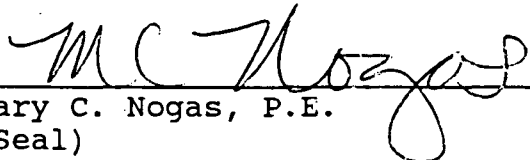
CERTIFICATION

PROJECT NAME: Trail Ridge "Plan A" Landfill

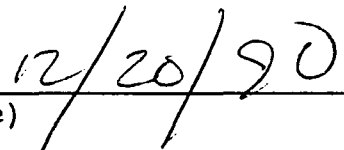
COUNTY: Duval

APPLICATION NOS.: 184444, 184445, and 184447

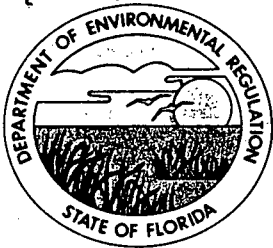
I HEREBY CERTIFY that the engineering features described in Application Nos. 184444, 184445, and 184447 provide reasonable assurance of compliance with the applicable provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Title 17. However, I have not evaluated and I do not certify aspects of the proposal outside of my area of expertise (including, but not limited to, the electrical, mechanical, structural, hydrological, and geological features).



Mary C. Nogas, P.E.
(Seal)



(Date)



Florida Department of Environmental Regulation

Northeast District • Suite 200, 7825 Baymeadows Way • Jacksonville, Florida 32256-7577 • 904-448-4300

Bob Martinez, Governor

Dale Twachtmann, Secretary

John Shearer, Assistant Secretary
Ernest Frey, Deputy Assistant Secretary

NORTHEAST DISTRICT - JACKSONVILLE

TO: Mary Nogas
THROUGH: Jeremy Tyler
FROM: Michael Eaton
DATE: December 7, 1990
SUBJECT: Trail Ridge Landfill, Inc.
MSSW Mitigation Plan - Plan A
Recommended Specific Conditions

The attached Specific Conditions are recommended. These conditions are consistent with those being required for D/F permit 161821182 for this project.

ME/eml



PERMITTEE:

Trail Ridge Landfill, Inc.

I.D. Number:

Permit Number: 161821182

Date of Issue:

Expiration Date:

DRAFT

SPECIFIC CONDITIONS:

1. The permittee is hereby advised that Florida law states: "No person shall commence any excavation, construction, or other activity involving the use of sovereign or other lands of the state, title to which is vested in the Board of Trustees of the Internal Improvement Trust Fund of the Department of Natural Resources under Chapter 253, until such person has received from the Board of Trustees of the Internal Improvement Trust Fund the required lease, license, easement, or other form of consent authorizing the proposed use." Pursuant to Florida Administrative Code Rule 16Q-14, if such work is done without consent, or if a person otherwise damages state land or products of state land, the Board of Trustees may levy administrative fines of up to \$10,000 per offense.
2. If historical or archeological artifacts, such as Indian canoes, are discovered at any time within the project site the permittee shall immediately notify the Northeast District Office of the Department of Environmental Regulation and the Bureau of Historic Preservation, Division of Archives, History and Records Management, R.A. Gray Building, Tallahassee, Florida 32301.
3. Prior to commencement of work authorized by this permit, the permittee shall provide written notification of the date of the commencement and proposed schedule of construction to the Northeast District Office of the Department of Environmental Regulation, Wetland Management Section, Suite B-200, 7825 Baymeadows Way, Jacksonville, FL 32256-7577.
4. This permit does not constitute any approval of the stormwater management system which must be obtained separately from the appropriate agency.
5. The project shall comply with applicable State Water Quality Standards, namely:
 - 17-302.500 - Minimum Criteria for All Waters at All Times and All Places.
 - 17-302.510 - Surface Waters: General Criteria.
 - 17-302.560 - Criteria - Class III Waters - Recreation, Propagation and Management of Fish and Wildlife: Surface Waters.
16. The mitigation plan, "Trail Ridge Landfill Wetland Impacts and Mitigation Plan," submitted on June 18, 1990, shall be appended as a Specific Condition of this permit. Any specific condition requirements listed herein, shall supercede or modify any requirements contained in the appended mitigation plan.
27. Prior to initiating any construction, permittee must record a conservation easement on the real property pursuant to Section 704.06, F.S., prohibiting all construction including clearing, dredging or filling, except that which is authorized by this permit within the conservation creation/preservation areas as delineated on plans dated as received by the Department on June 18, 1990. The easement must contain provisions as set forth in subsections 1 (a) - (b) of Section 704.06, F.S., as well as provisions indicating that they may be enforced by the Department and may not be amended without Department approval. Within 30 days of the date of issuance of this permit and prior to recording, said easement must be submitted to the Department for

CONTINUED NEXT PAGE

PERMITTEE:

Trail Ridge Landfill, Inc.

I.D. Number:

Permit Number: 161821182

Date of Issue:

Expiration Date:

DRAFT

SPECIFIC CONDITIONS CONTINUED:

review and approval. Within 30 days of receipt of Department approval, permittee must provide to the Department a certified copy of the recorded easement showing the date they were recorded and the official records book and page number.

3. The permittee shall submit, in writing, to the Department of Environmental Regulation, Northeast District, 7825 Baymeadows Way, Suite 200B, Jacksonville, FL 32256-7577, notification of the date that activities authorized by this permit commence.
 4. The initial planting of the mitigation areas, per appended mitigation plan section 4 (b)(4), shall be completed no later than one year after commencement of the activities authorized by this permit.
 5. The permittee shall submit an as-built survey of the wetland creation areas showing dimensions, grades, ground elevations and water surface elevations certified by a registered surveyor or professional engineer. The as-built must be submitted within thirty (30) days of the initial planting.
 6. The permittee shall furnish the Department with monitoring reports on the wetland creation areas describing:
 - a. Percent survival and diversity of planted species within each stratum;
 - b. Recruitment density and composition within each stratum;
 - c. Recorded growth via established parameters for planted trees and shrubs;
 - d. Percent cover of herbaceous species;
 - e. Surface water elevations referenced to N.G.V.D., or if surface water is not present, groundwater elevation referenced to N.G.V.D.
- The first monitoring year shall start as of the planting date and data shall be collected and submitted in accordance with Specific Condition Number 9. Reports to the Department must also include photographs, descriptions of problems encountered and solutions undertaken.
7. Within the wetland creation areas, non-native vegetation and nuisance vegetation such as Typha spp. shall be controlled by hand clearing or other methods approved by the Department so that they constitute no more than 10% of the areal cover at any monitoring period.

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PERMITTEE:

Trail Ridge Landfill, Inc.

I.D. Number:

Permit Number: 161821182

Date of Issue:

Expiration Date:

DRAFT

SPECIFIC CONDITIONS CONTINUED:

8. Successful establishment of the wetland creation shall occur when:
- on an annual basis at least 80 percent of the planted individuals in each stratum have survived and are showing signs of normal annual growth, based on standard growth parameters such as height and base diameter, or canopy circumference; and
 - the above criteria has been achieved and maintained for a three (3) year period following initial planting.
9. In the event that the success criteria as stated in Specific Condition Number 13 are not achieved by the expiration date of this permit, the permittee shall enter into a long term agreement with the Department so as to insure the success of the mitigation plan.
10. All wetland areas or water bodies which are outside the specific limits of construction authorized by this permit must be protected from erosion, siltation, scouring or excess turbidity or dewatering.
11. All disturbed areas adjacent to the mitigation area must be sodded or seeded and mulched within 10 days following their completion and a substantial vegetation cover must be established within 60 days of sodding or seeding.

Issued this day of , 1990

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

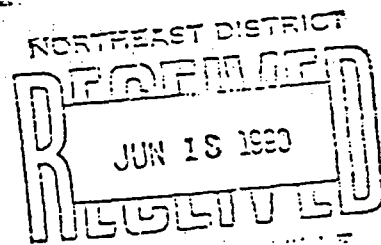
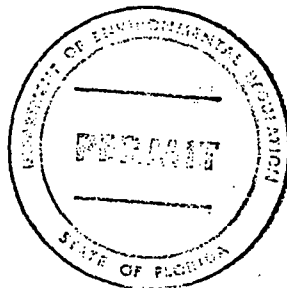
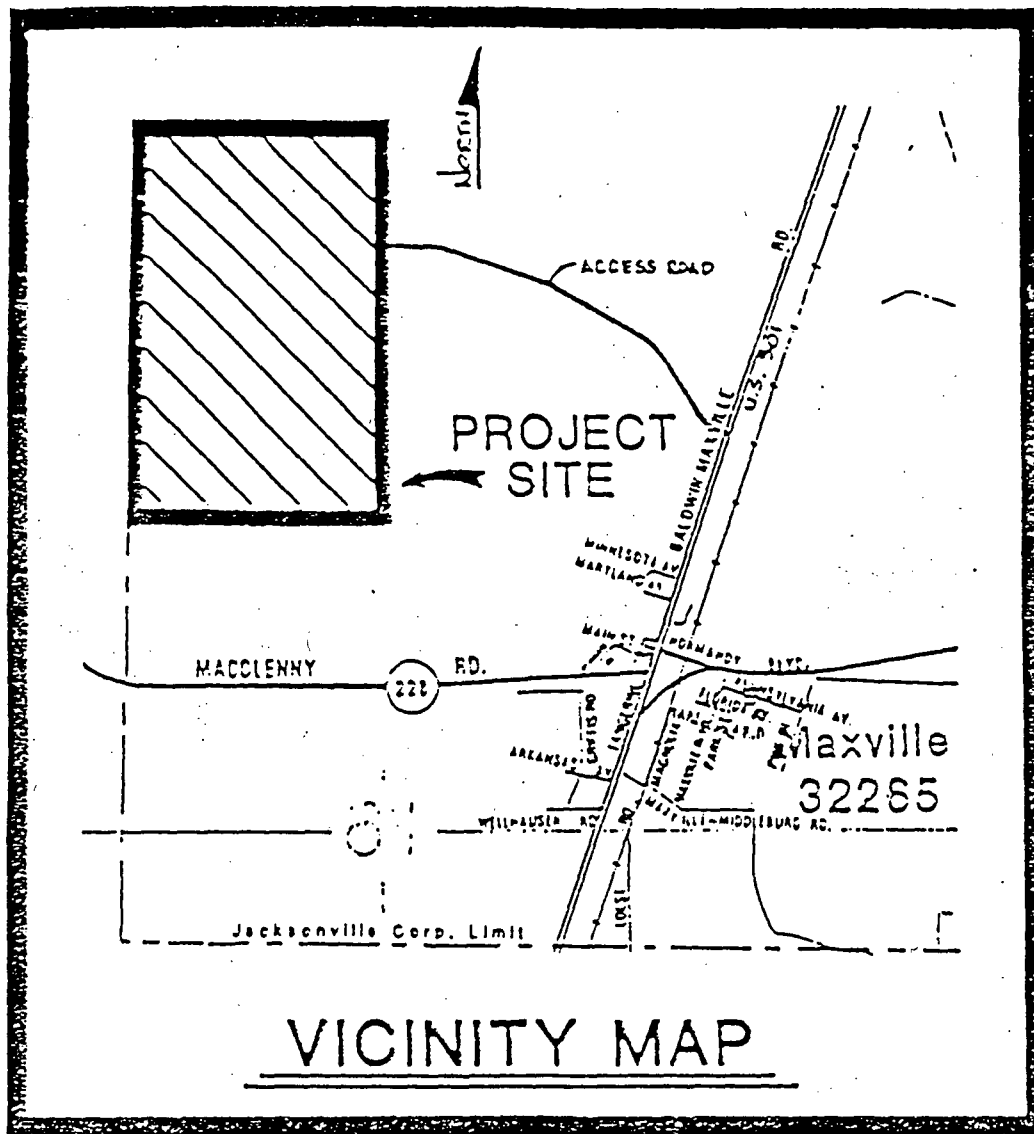
DRAFT

Ernest E. Frey, P.E.
Deputy Assistant Secretary

Copy to: ACDE, Jacksonville
DNR, Jacksonville
County Tax Assessor

CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this NOTICE OF PERMIT and all copies were mailed before the close of business on _____ to the listed persons.



England, Thims
& Miller, Inc.

VICINITY MAP
TRAILRIDGE LANDFILL
TRAIL RIDGE LANDFILL, INC.

PROJ. NO. E89-113
DATE JUNE 11, 1990
SCALE 1" = 4000'
DRAWING NO. 1

DER.

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6-11-90

TRAIL RIDGE LANDFILL WETLAND IMPACTS AND MITIGATION PLAN

I. INTRODUCTION

Waste Management, Inc. is proposing the development of Trail Ridge Landfill in western Duval County (Figure 1). Of the approximately 560 wetland acres occurring on the property, only 4.44 acres of relatively low quality wetlands would be impacted, (refer to Trail Ridge Landfill Wetlands Assessment Report. Wetlands impacted by jurisdiction are Corps of Engineers, 4.44 acres; St. Johns River Water Management District, 3.17 acres; and Florida Department of Environmental Regulation, 1.61 acres. To offset the wetland impacts, conversion of 4.76 acres of uplands into high quality wetlands would occur as mitigation.

The following report provides a general overview of the property, a detailed description of the wetland impacts, and the plan for mitigation creation.

II. SITE DESCRIPTION

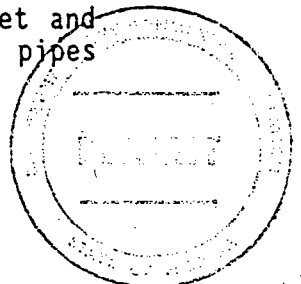
The tract consists of approximately 1,280 acres in western Duval County between U.S. 301 and the Baker County line. The land was previously owned by the Gilman Paper Company and has been intensively managed for pulpwood. The property is surrounded on all sides by forest land. A network of unpaved logging roads exists throughout the property. The design plans produced by England, Thims & Miller, Inc., propose the development of separate Class I and Class III landfill cells along with two stormwater ponds/borrow pits, and the widening and improvement of the existing, dirt roads.

III. WETLAND IMPACTS

Development of this site as a landfill would involve 4.44 acres of wetland impacts, the majority of which (2.54 acres) would occur as a result of filling portions of roadside ditches and swales. The remainder of the impacts would consist of filling a 0.8-acre isolated, shallow, pine/cypress wetland, 0.9 acre of bay/pine seepage slope and 0.20 acre of wetland pine plantation. Except for these 4.44 acres of impact, the remaining wetlands will not be disturbed.

A. Road Impacts

The majority of the wetland impacts would occur as a result of widening an existing logging road. This road extends for 1.6 miles from U.S. 301 to the edge of the property and would serve as the main access to the landfill. From the eastern property line it continues for an additional 0.4 mile to the Class I landfill cell. The road is currently an unpaved logging road. It will be widened to 24 feet and paved with asphalt. In addition, the existing corrugated metal pipes under the road will be replaced with reinforced concrete pipes.



From U.S. 3 the entrance road extends for approximately 3,000± feet through a pine plantation. The vegetation here consists of rows of planted slash pine (Pinus elliotti) with an understory and ground cover of saw palmetto (Serenoa repens), gallberry (Ilex glabra), and bracken fern (Pteridium aquilinum). The roadside swales here average 4 to 5 feet across and 1 to 2 feet deep. The swales are considered jurisdictional wetlands only where they intersect adjacent wetlands.

Within the upland pine plantation there are ten depressional, wetland areas. The eastern three areas are jurisdictional only by the U.S. Army Corps of Engineers (CE). The road widening will entail impacting 0.24 acres of these three wetlands. The dominant plant species are not on the state's list of wetland plants. The dominant vegetation consists of blackberry (Rubus cuneifolius), Amphicarpum muhlenbergianum, wiregrass (Aristida stricta), and panic grass (Dicanthelium sp.). The remaining seven wetland areas are wholly owned and isolated. Six of these areas are each less than 0.5 acres in size. The vegetation in all seven areas consists of St. John's wort (Hypericum fasciculatum), yellow-eyed grass (Xyris sp.) and red root (Lachnanthes caroliniana). The road widening will entail impacting 0.17 acres (CE/SJRWMD) of swales in these seven depressional areas.

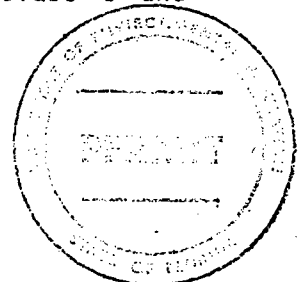
From the edge of the pine plantation the entrance road continues for 3,000± feet through a pine swamp known locally as Hell's Bay. There are ditches along both sides of the road all the way across the swamp. The ditches measure approximately 8 feet across and 2-3 feet deep. Under normal conditions the ditches contain at least 12 inches of water. The vegetation within the ditches consists of pickerelweed (Pontederia cordata), water lily (Nymphaea odorata), and bladderwort (Utricularia sp.). The existing ditches serve to drain the adjacent swamp. During the past 12 months, standing water has not been observed in the swamp on either side of the road.

The vegetation of the pine swamp south of the road consists of a canopy of slash pine mixed with scattered red maple (Acer rubrum), tupelo (Nyssa sylvatica var. biflora), and cypress (Taxodium distichum). The swamp on the north side of the road has been recently clear-cut. The dominant ground cover vegetation there now includes such species as sedges (Cyperus spp.), beak rushes (Rhynchospora spp.), and cinnamon fern (Osmunda cinnamomea).

The entrance road across the swamp will be widened approximately 10 feet on each side. This will result in filling most of the roadside ditches (1.24 acres SJRWMD/DER/CE and 0.17 acres CE only).

From the western edge of Hell's Bay, the entrance road continues into the property to the Class I landfill cell. Wetland impacts due to this portion of roadwork include filling wetland pine plantation (0.65 acres CE) and a narrow slough (0.07 acres DER/SJRWMD/CE).

Widening West Fiftone Road would entail filling 0.3 acres (DER/SJRWMD/CE) of bay/pine seepage wetlands between the Class I and Class III landfill cells.



Two wetland impacts would occur as a result of construction of the Class I landfill cell. These impacts include filling an isolated cypress/pine depressional wetland and a narrow finger of bay/pine seepage slope. The cypress/pine wetland is an isolated, shallow, depressional area comprising 0.80 acres (SJRWMD/CE). Following prolonged heavy rains, it will hold some standing water (<1 foot); however, it is dry during much of the year. The vegetation within the cypress/pine wetland consists of a canopy of slash pine and cypress with an understory of scattered myrtle-leaved holly (Ilex myrtifolia) and a ground cover of black-stemmed chain fern (Woodwardia virginica).

The bay/pine wetland consists of 0.60 acres (SJRWMD/CE) and occurs as a narrow finger of seepage slope along the north side of West Fiftone Road. The vegetation here consists of a canopy of tupelo, slash pine and various bay trees with and ground cover of fetterbush (Lyonia lucida) and sweet gallberry (Ilex coriacea).

Wetland impacts will be mitigated with 4.76 acres of wetland creation. An area of upland pine plantation surrounded by a cypress/gum swamp and a pine/bay wetland will be scraped down to form two depressional areas at or below the water table.

IV. MITIGATION PLAN

A. Existing Site Conditions

The mitigation site is located in the northeastern portion of the property in an area bounded by Hat Road to the north, West Fiftone Road to the west, Sellers Road to the south, and the property line to the east (Figure 2). The site is characterized as an upland finger surrounded by forested wetlands on three sides.

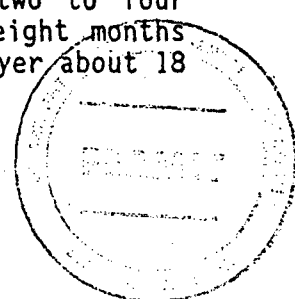
1. Elevations

The U.S. Geological Survey Map (Maxville, Florida, 1970) indicates that the elevations within the mitigation site range from +95 to +100 feet N.G.V.D. To more accurately describe the area, a site-specific topographic survey was conducted by Sunshine State Surveyors. Elevations were found to range from 100.8 feet on the upland ridge to the south to 94.7 on the wetland fringe to the north. The site slopes downhill gradually to the east.

2. Soils

The Soil Conservation Service (Soil Survey of Duval County, 1978) indicates that the upland soil of the mitigation area is Leon fine sand and the wetland soil is Wesconnett fine sand.

Leon fine sand is a poorly drained soil typically found in broad pine flatwood areas. Under natural conditions this soil has a water table at a depth of less than 10 inches for two to four months and at a depth of 10 to 30 inches for two to eight months during most years. There is often a weakly cemented layer about 18 inches below the surface.



Wesconnett fine sand is a very poorly drained soil in shallow depressions and large drainageways. Under natural conditions this soil has a water table at a depth of 0 to 10 inches, or the soil is covered by water for six to twelve months during most years.

3. Hydrology

There is a ditch that extends across a section of the mitigation site. This section of upland-cut ditch is less than 35 square feet in cross section and contains less than 3 feet of standing water at the point where it intersects the DER wetland line. The ditch averages 18 to 20 feet across from top-of-bank to top-of-bank and 12 to 18 inches deep. Water periodically flows east through the ditch from the tupelo swamp to the wet pine plantation. During much of the year, the ditch appears to be dry.

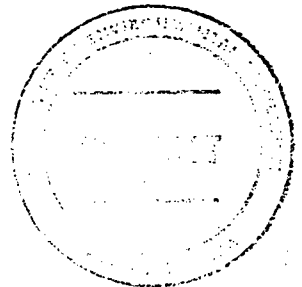
4. Vegetation

The upland pine plantation is characterized by a 15 to 20 year old row-planted slash pine that is approaching canopy closure. The understory and ground cover mostly consist of gallberry, saw palmetto, bracken fern, huckleberry (Vaccinium sp.), broomsedge (Andropogon sp.), wire grass (Aristida stricta), and Aronia arbutifolia.

The wet pine plantation to the east has been clear-cut, bedded, and row-planted with slash pine about 15 to 20 years ago. Logging debris and soil have been pushed into windrows. Other vegetation in this area include scattered tupelo, sweet bay (Magnolia virginiana), loblolly bay (Gordonia lasianthus), red maple, wax myrtle (Myrica cerifera), possumhaw viburnum (Viburnum nudum), maidencane (Panicum hemitomon), panicum (Dichanthelium sp.), bluestem (Andropogon sp.), and Asiatic coinwork (Centella asiatica).

The wetland to the west and south is a moderately deep cypress-hardwood swamp dominated by tupelo and cypress and scattered sweetbay, swamp bay (Persea palustris), and red maple. The dominant shrub is fetterbush with some Virginia willow (Itea virginica) and wax myrtle. Royal fern (Osmunda regalis), cinnamon fern, net-leaved chain fern (Woodwardia areolata), and sphagnum moss (sphagnum sp.) are also found.

Wetland vegetation within the ditch itself consists of rush (Juncus sp.), Dicanthelium sp., yellow-eyed grass (Xyris sp.), buttonbush (Cephalanthus occidentalis), sphagnum moss, and some slash pine. Along the edge of the ditch or berm is wild grape (Vitis sp.), saw palmetto, red chokeberry (Aronia arbutifolia), sweet gallberry, wax myrtle, black stemmed chain fern, poison summac (Toxicodendron vernix) and scattered tupelo, swamp bay, and sweet bay.



B. Proposed Site Conditions

1. Elevations

The elevation of the wetland creation area will range from +99 feet at the western edge to +94.5 feet near the eastern end. It is proposed that the existing rim of the tupelo swamp be maintained (+99 feet) to prevent draining it. The mitigation area will be scraped down to form two shallow depressional bowls each with a transitional and submerged zone (Figure 5). Each transitional zone will be scraped down to the average water table to establish saturated soil conditions. Each submerged zone will be scraped down to a maximum of 1 foot below the average water table to establish areas of intermittent/seasonal standing water. The edge of the eastern depressional bowl will approach the elevation of the wet pine plantation (+95 feet).

2. Soils

The mitigation basins area will be over-excavated approximately 0.5 foot and backfilled with the upper soil layer from the impacted wetlands. This mulch will provide a source of propagules (seeds, roots, tubers, etc.) that will help establish naturally occurring wetland ground cover vegetation.

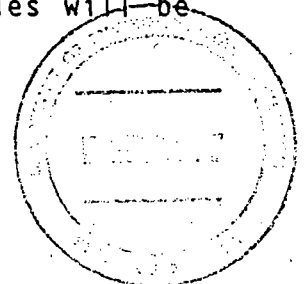
3. Hydrology

The two depressional creations within the mitigation area are designed to be contiguous with the surrounding wetland systems, thus promoting regular and periodic inundation of the site. Fluctuations in the water table are normal and are expected to cause the soils in the mitigation area to be periodically saturated or flooded with water.

The upland-cut portion of the drainage ditch will be realigned. It will curve to the north and outfall into the western basin. Water coming through the ditch will be allowed to sheet flow across the transition zone into the submerged zone.

4. Vegetation

The design of the mitigation area is to create a cypress/hardwood swamp. To accomplish this a variety of wetland tree and shrub species will be planted. The trees will average 4 to 6 feet in height in three-gallon containers to be planted on 10-foot centers or approximately 440 trees/acre. The shrubs will average 2 to 4 feet in height in one-gallon containers to be planted along all edges. Throughout the transitional zones, transitional wetland species will be planted, such as:



red maple (Acer rubrum)
sweetgum (Liquidambar styraciflua)
laurel oak (Quercus laurifolia)
wax myrtle (Myrica cerifera)
fetterbush (Lyonia lucida)

The deeper, submerged zones will be planted with such wetland species as:

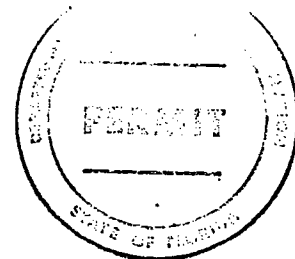
cypress (Taxodium distichum)
tupelo (Nyssa sylvatica var. biflora)
sweet bay (Magnolia virginiana)
button bush (Cephalanthus occidentalis)
Virginia willow (Itea virginica)

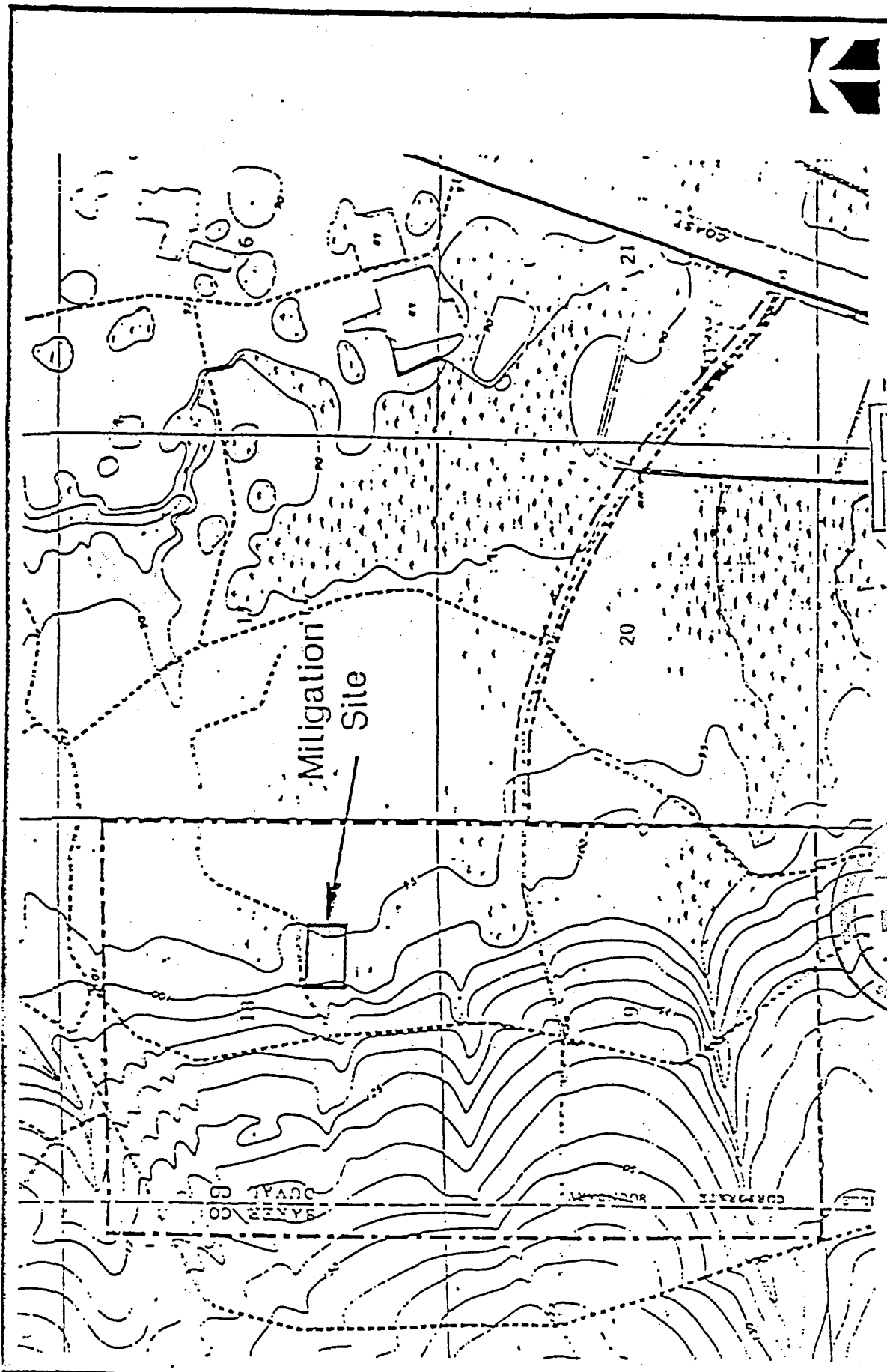
WETLAND CREATION RATIO

<u>Jurisdiction</u>	<u>Wetland Impacted</u>	<u>Wetlands Created</u>	<u>Ratio</u>
Corps of Engineers	4.44 AC	4.76 AC	1.07:1
St. Johns River Water Management District	3.17 AC	4.76 AC	1.50:1
Florida Department of Environmental Regulation	1.61 AC	4.76 AC	2.8:1

5. Maintenance and Monitoring

The creation area will be inspected every six months for two years following planting. Monitoring reports will be forwarded to the appropriate regulatory agencies. Standard mitigation requirements will be met, such as ensuring 75 percent survival of plantings. Routine maintenance will be performed as necessary to control nuisance weed species and to ensure success of the planting.





Proj No.	89-395
Date	JUNE 11, 1990
Scale	1" = 2000'
Drawing No.	13

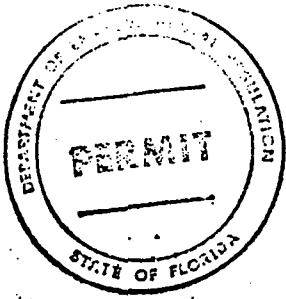
RECEIVED
JUN 13 1990
FEDERAL BUREAU OF INVESTIGATION
U.S. DEPARTMENT OF JUSTICE
JACKSONVILLE

Figure 1 Location Map
Trail Ridge Landfill
Mitigation Plan

ENVIRONMENTAL
SERVICES, INC.

DER

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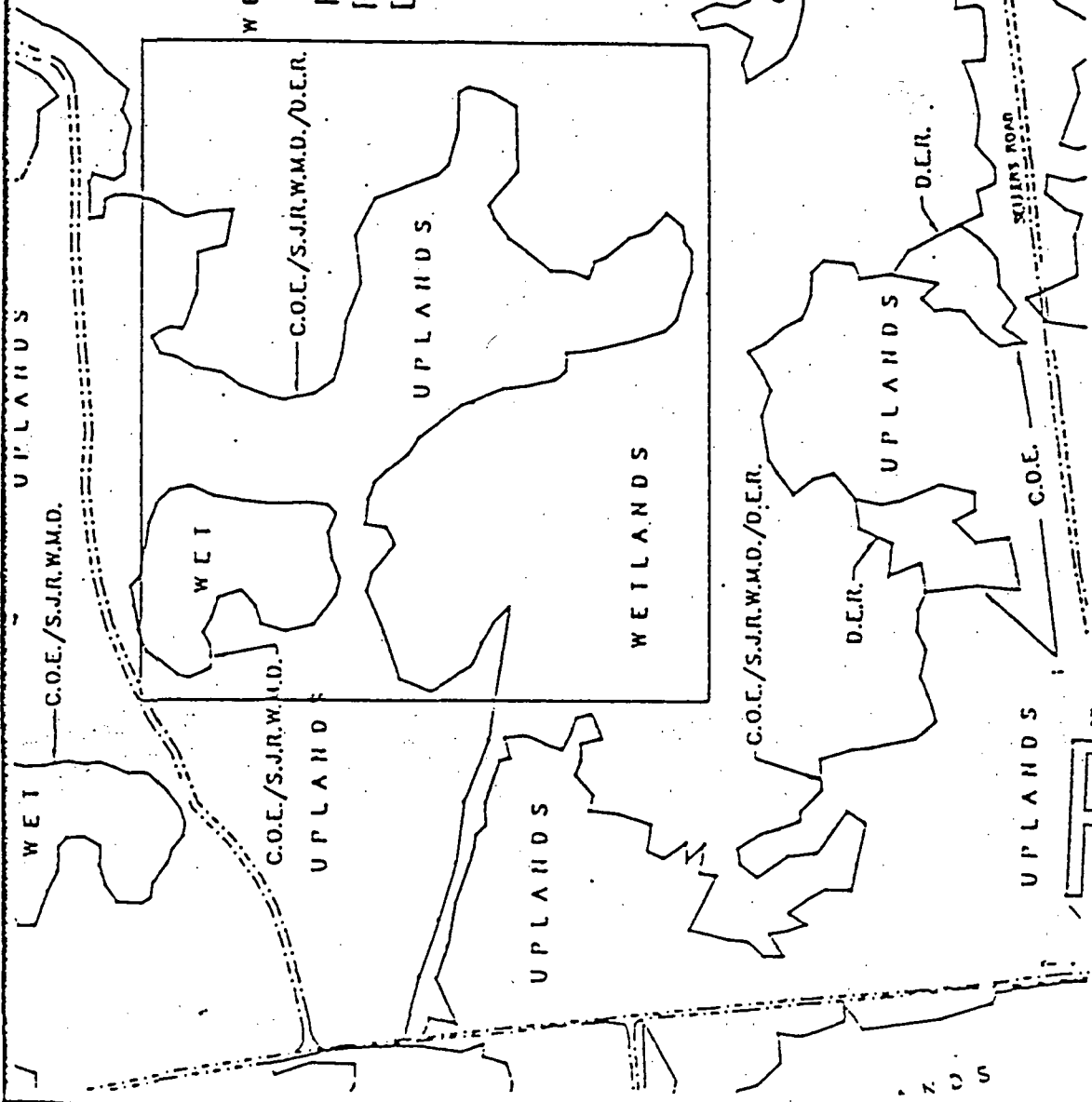
WETLANDS

For Details of Millgallon Site
Please Refer to
Drawing 3 of 5

WETLANDS

C.O.E./S.J.R.W.M.D./D.E.R.

C.O.E./S.J.R.W.M.D./D.E.R.



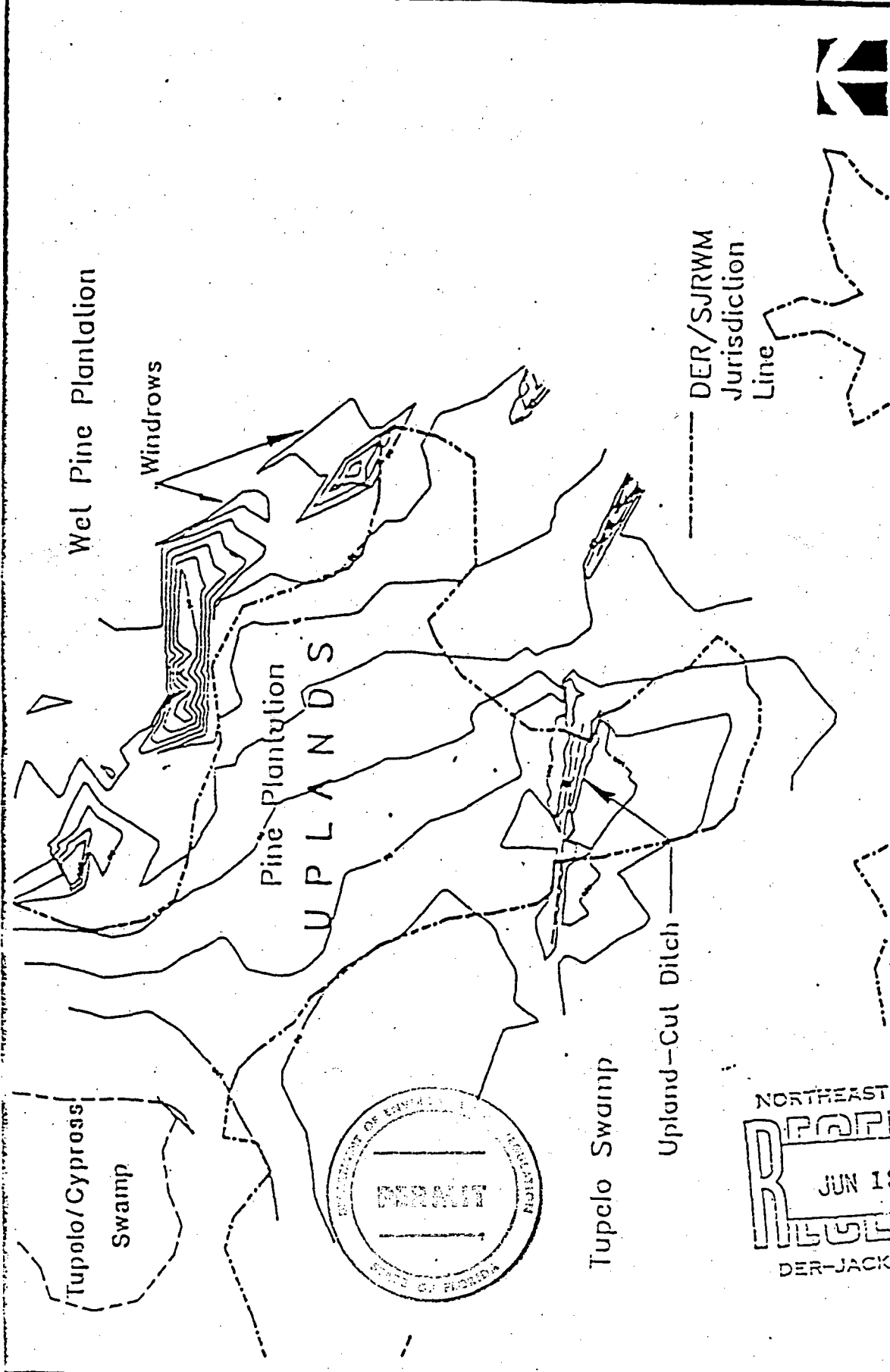
Proj No.	89-395
Date	JUNE 11, 1980
Scale	1"=300'
Drawing No.	14

Figure 2 Millgallon Site Location
Trail Ridge Landfill
Mitigation Plan

NORTHEAST
JUN 13
ENVIRONMENTAL
SERVICES, INC.
DER-JACKSON

DER

Small
6-11-80



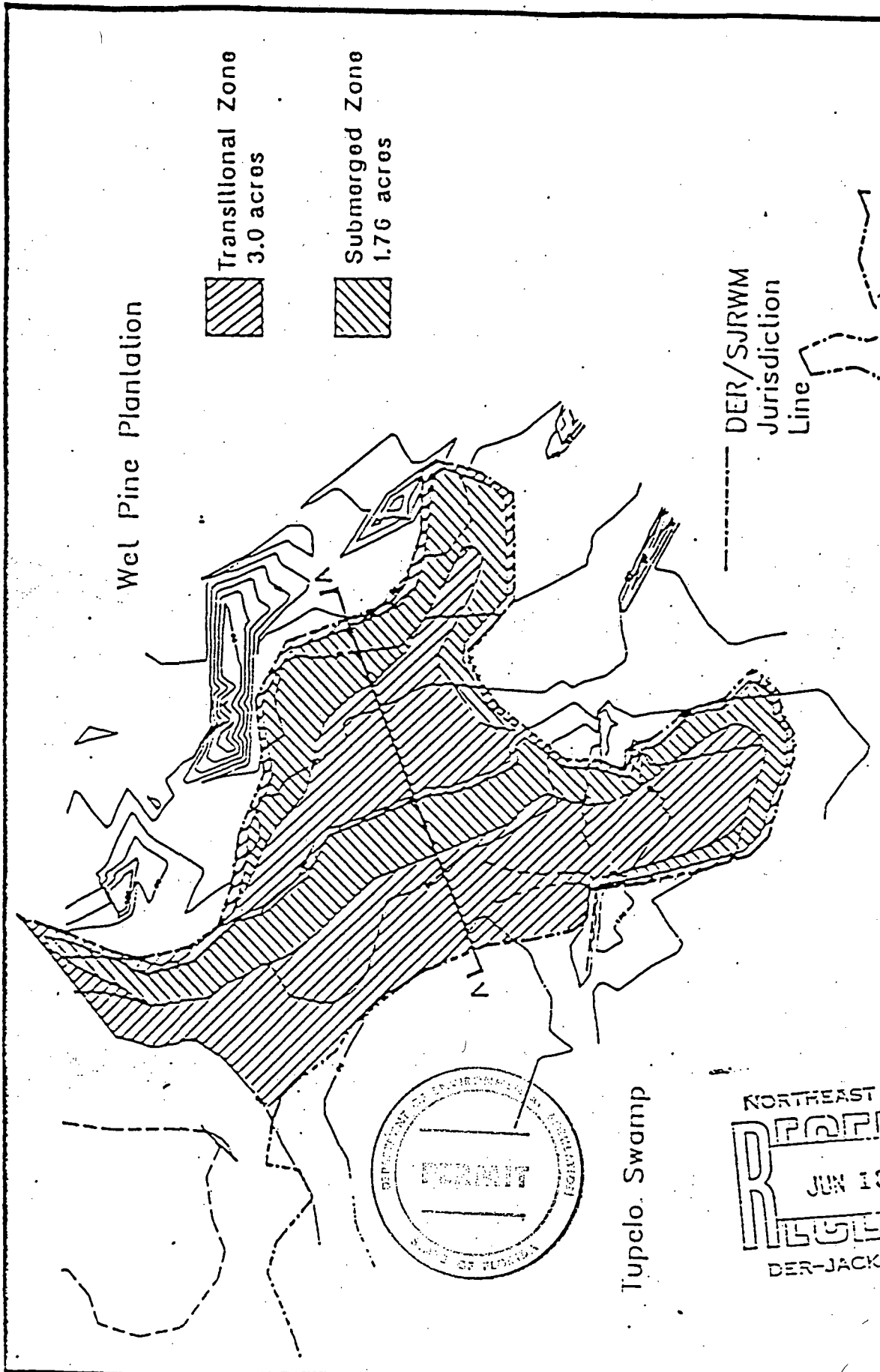
Proj No.	89-395
Date	JUNE 11, 1990
Scale	1"=150'
Drawing No.	15

Figure 3 Existing Conditions
Trail Ridge Landfill
Mitigation Plan

ENVIRONMENTAL
SERVICES, INC.

DER

gammell
6-11-90



Proj No.	89-395
Date	JUNE 11, 1990
Scale	1"=150'
Drawing No.	16

Figure 4 Proposed Conditions
Trail Ridge Landfill
Mitigation Plan

ENVIRONMENTAL
SERVICES, INC.

DER

Lyman
6-11-90

DER/SJRW/110 Jurisdiction Line

DER/SJRW/110 Jurisdiction Line

Transitional Zone

Submerged Zone

Transitional Zone

Submerged Zone

Tupelo Swamp

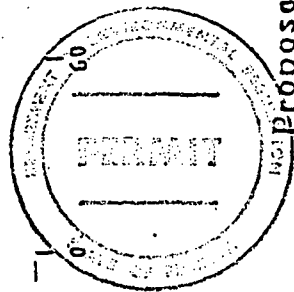
Wet Pine Plantation

Existing Grade

Proposed Grade

100
99
98
97
96
95
94

120 100 240 300 360 420 480



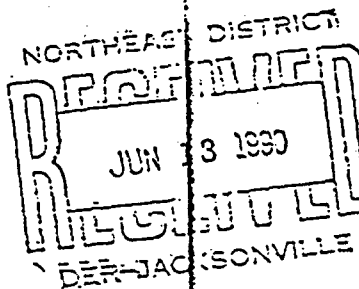
Proposed Planting Schedule

Transitional Zone

Red Maple
Sweetgum
Laurel Oak
Wax Myrtle
Fetterbush

Submerged Zone

Cypress
Tupelo
Sweet Bay
Buttonbush
Virginia Willow



ENVIRONMENTAL
SERVICES, INC.

Figure 5 Mitigation Cross-Section
Trail Ridge Landfill
Mitigation Plan

Proj No. 89-395

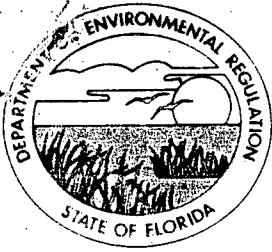
Date JUNE 11, 1980

Scale as shown

Drawing No. 17

DER

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11-11-80



Florida Department of Environmental Regulation

Northeast District • Suite 200, 7825 Baymeadows Way • Jacksonville, Florida 32256-7577 • 904-448-4300

Bob Martinez, Governor

Dale Twachtman, Secretary

John Shearer, Assistant Secretary
Ernest Frey, Deputy Assistant Secretary

November 27, 1990

Mr. John G. Herring
7810 U.S. Highway 301 South
Baldwin, Florida 32234

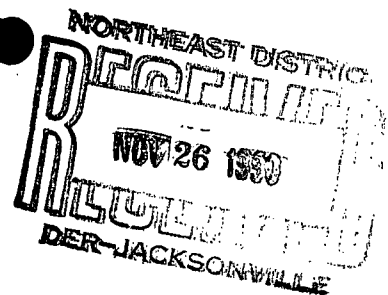
Dear Mr. Herring:

Please be advised that your name has been added to the list of persons to be notified of any further agency action regarding the proposed Trail Ridge Landfill.

Sincerely,


Michael J. Fitzsimmons
Waste Program Administrator

MJF:ml



November 12, 1990

Mr. Mike Fitzsimmons
Department of Environmental Regulations
7825 Baymeadows Way, Suite 200-B
Jacksonville, Florida 32256-7577

Dear Mr. Fitzsimmons:

I request to be notified of any proposed agency action regarding the proposed Trail Ridge Land Fill Site in West Duval County. Further, I request an acknowledgement receipt form with this advisement.

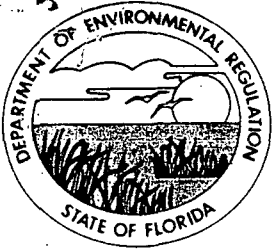
My name and address is as follows.

John G. Herring
7810 U. S. Highway 301 South
Baldwin, Florida 32234

Yours very truly,


John Herring

b:der



Florida Department of Environmental Regulation

Northeast District • Suite 200, 7825 Baymeadows Way • Jacksonville, Florida 32256-7577 • 904-448-4300

Bob Martinez, Governor

Dale Twachtmann, Secretary

John Shearer, Assistant Secretary

Ernest Frey, Deputy Assistant Secretary

November 26, 1990

Mr. Ronnie E. Hall
7806 U.S. Highway 301 South
Baldwin, Florida 32234

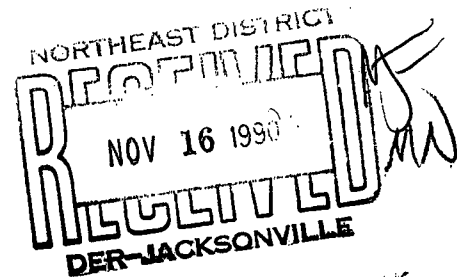
Dear Mr. Hall:

Please be advised that your name has been added to the list of persons to be notified of any further agency action regarding the proposed Trail Ridge Landfill.

Sincerely,


Michael J. Fitzsimmons
Waste Program Administrator

MJF:ml



November 12, 1990

Mr. Mike Fitzsimmons
Department of Environmental Regulations
7825 Baymeadows Way, Suite 200-B
Jacksonville, Florida 32256-7577

Dear Mr. Fitzsimmons:

I request to be notified of any proposed agency action regarding the proposed Trail Ridge Land Fill Site in West Duval County. Further, I request an acknowledgement receipt form with this advisement.

My name and address is as follows.

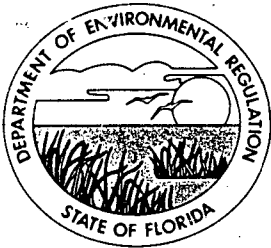
Ronnie E. Hall
7806 U. S. Highway 301 South
Baldwin, Florida 32234

Yours very truly,

A handwritten signature in cursive script that reads "Ronnie E. Hall".

Ronnie E. Hall

b:der



Florida Department of Environmental Regulation

Northeast District • Suite 200, 7825 Baymeadows Way • Jacksonville, Florida 32256-7577 • 904-448-4300

Bob Martinez, Governor

Dale Twachtmann, Secretary

John Shearer, Assistant Secretary
Ernest Frey, Deputy Assistant Secretary

November 21, 1990

Mr. Donald E. Rowe
375 Magnolia Street
Macclenny, Florida 32063

Dear Mr. Rowe:

Thank you for your November 10 letter expressing concern for the proposed Trail Ridge Landfill.

Please understand that the Department does not select sites for landfills. When the Department receives a permit application for a new landfill, the Department carefully and thoroughly reviews the application to ensure that the landfill will comply with all of the Department's regulations and environmental standards. The Department evaluates the landfill's potential effect on groundwater, surface water, and wetlands.

The Solid Waste Rule was recently amended to provide additional groundwater protection by requiring either a double synthetic liner or a composite liner (synthetic liner plus clay) for all new landfills. If the Trail Ridge Landfill is permitted, it will be required to meet the more stringent liner requirements.

The Department is required to issue or deny permit applications based on whether or not the applicant has provided the Department with reasonable assurance that the landfill will comply with all applicable regulations.

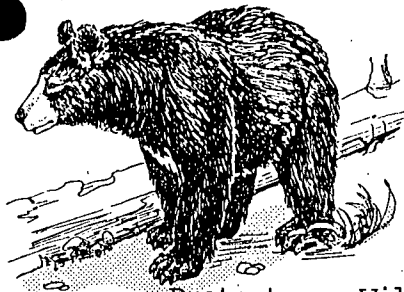
Let me assure you that the Department will not issue a permit unless it has reasonable assurances that the landfill will not adversely affect public health or the environment.

Sincerely,

Ernest E. Frey, P.E.
Deputy Assistant Secretary

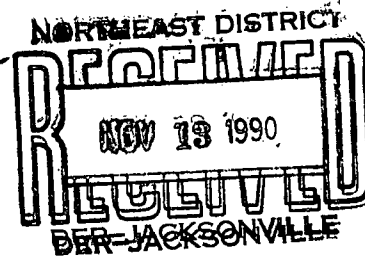
EEF:mfl *ME*





BLACK BEAR

Protect our Wildlife.



Nov. 10th

Dept. of Environmental Regulations
Deputy Secretary,
Mr. Ernie Frey

Sir,

I have been told by Tallahassee DER does not become involved in LOCAL environment issues. With your location, in Jacksonville I don't expect any intervention in the "TRAILRIDGE, Maxville Proposed Landfill".

The Loyalty to favorite Son--Hazouri--with his GANG of BIG SHOTS on the line,,Attala,,Williams,,Miller, and Waste Managements, Smith, add a compromising commissioner from Baker county-- it seems only a matter of WHEN!!

However a reminder to you. let me give my "DEFINITION" of DER. With emphasis on ENVIRONMENT in it's entirety,,, not POLITICS, BIG BUSINESS, or the ability to buy through it...

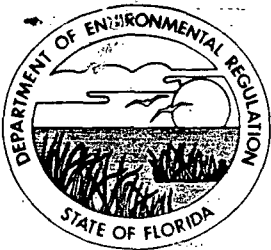
Hazouri's wild grasp for "LANDFILL'S" (dumps) he and Waste Management seek the weak, rural area's and attempt to roll over them with complete disregard to the ECOLOGICAL structure, or residents.

When Smith, Waste Managements states, "its only a small WETLANDS" equal to saying "she's only a LITTLE pregnant". Wetlands PERIOD are protected and your job---to keep them as such!!!! Water pollution (wells, ground, and rivers) are another protection assigned to DER. This LANDFILL violates those two basic codes. Not to mention--it makes 3 landfill's, the states only HAZARDOUS WASTE site, and many hundred acres to be strip mined (for minerals) by Dupont (also near the ridge) all this Rape of the ENVIRONMENT is in a 15 mile radus of Maxville, Macclenny and Raiford.---TRAILRIDGE is not a "LANDFILL SITE, nor is Waste Management qualified to undertake an operation of this magnitude.

Your DISAPPROVAL is a must... This issue is one of total ECOLOGY protection of ths small area, not that of Big Business, Politics, or Bucks. In addition this issue lack concerned, knowledgeable leadership...

Thank you for this opportunity to address you.

Donald E. Rowe
Donald E. Rowe
375 Magnolia St.
Macclenny, FL 32063



Florida Department of Environmental Regulation

Northeast District • Suite 200, 7825 Baymeadows Way • Jacksonville, Florida 32256-7577 • 904-448-4300

Bob Martinez, Governor

Dale Twachtman, Secretary

John Shearer, Assistant Secretary

Ernest Frey, Deputy Assistant Secretary

November 20, 1990

Mr. Darrell Sperry
505 U.S. Highway 301 South
Baldwin, Florida 32234

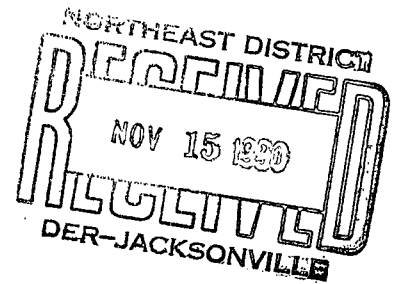
Dear Mr. Sperry:

Please be advised that your name has been added to the list of persons to be notified of any further agency action regarding the proposed Trail Ridge Landfill.

Sincerely,

Michael J. Fitzsimmons
Waste Program Administrator

MJF:ml



November 12, 1990

Mr. Mike Fitzsimmons
Department of Environmental Regulations
7825 Baymeadows Way, Suite 200-B
Jacksonville, Florida 32256-7577

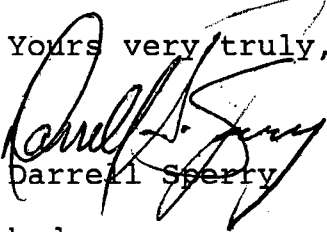
Dear Mr. Fitzsimmons:

I request to be notified of any proposed agency action regarding the proposed Trail Ridge Land Fill Site in West Duval County. Further, I request an acknowledgement receipt form with this advisement.

My name and address is as follows.

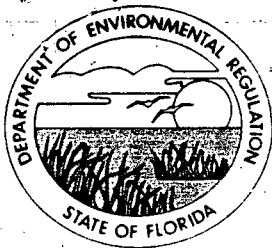
Darrell Sperry
505 U. S. Highway 301 South
Jacksonville, Florida 32234

Yours very truly,


Darrell Sperry

b:der

*already on list
ml*



Florida Department of Environmental Regulation

Northeast District • Suite 200, 7825 Baymeadows Way • Jacksonville, Florida 32256-7577 • 904-448-4300

Bob Martinez, Governor

Dale Twachtman, Secretary

John Shearer, Assistant Secretary
Ernest Frey, Deputy Assistant Secretary

November 20, 1990

Mr. Maurice T. Samples
7814 U.S. Highway 301 South
Baldwin, Florida 32234

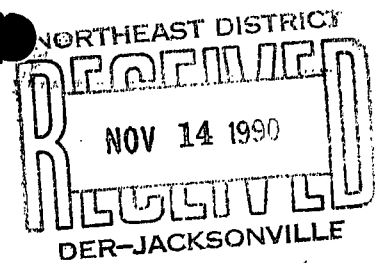
Dear Mr. Samples:

Please be advised that your name has been added to the list of persons to be notified of any further agency action regarding the proposed Trail Ridge Landfill.

Sincerely,

Michael J. Fitzsimmons
Waste Program Administrator

MJF:ml



November 12, 1990

Mr. Mike Fitzsimmons
Department of Environmental Regulations
7825 Baymeadows Way, Suite 200-B
Jacksonville, Florida 32256-7577

Dear Mr. Fitzsimmons:

I request to be notified of any proposed agency action regarding the proposed Trail Ridge Land Fill Site in West Duval County. Further, I request an acknowledgement receipt form with this advisement.

My name and address is as follows.

Maurice T. Samples
7814 U. S. Highway 301 South
Baldwin, Florida 32234

Yours very truly,

Maurice T. Samples
Maurice T. Samples

b:der



Florida Department of Environmental Regulation

Northeast District • Suite 200, 7825 Baymeadows Way • Jacksonville, Florida 32256-7577 • 904-448-4300

Bob Martinez, Governor

Dale Twachtman, Secretary

John Shearer, Assistant Secretary
Ernest Frey, Deputy Assistant Secretary

November 20, 1990

Mr. Lambert L. Herring
7810 U.S. Highway 301 South
Baldwin, Florida 32234

Dear Mr. Herring:

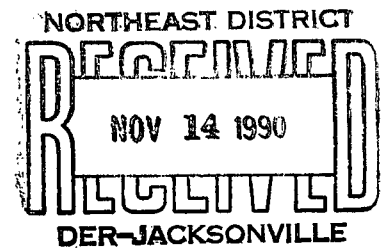
Please be advised that your name has been added to the list of persons to be notified of any further agency action regarding the proposed Trail Ridge Landfill.

Sincerely,

Michael J. Fitzsimmons
Waste Program Administrator

MJF:ml

LLHERRING
7810 US Hwy. 301 South
Baldwin, Florida 32234



November 12, 1990

Mr. Mike Fitzsimmons
Department of Environmental Regulations
7825 Baymeadows Way, Suite 200-B
Jacksonville, Florida 32256-7577

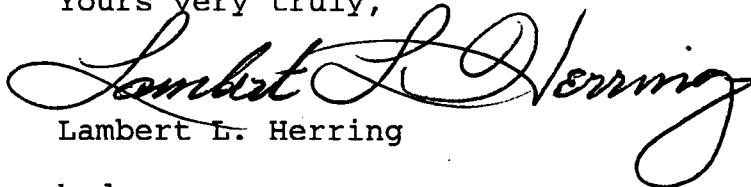
Dear Mr. Fitzsimmons:

I request to be notified of any proposed agency action regarding the proposed Trail Ridge Land Fill Site in West Duval County. Further, I request an acknowledgement receipt form with this advisement.

My name and address is as follows.

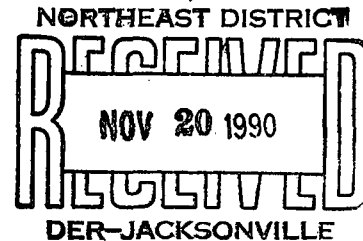
Lambert L. Herring
7810 U. S. Highway 301 South
Baldwin, Florida 32234

Yours very truly,


Lambert L. Herring

b:der

STATE OF FLORIDA
DIVISION OF ADMINISTRATIVE HEARINGS



SAVE TRAIL RIDGE AND THE
ENVIRONMENT ASSOCIATION,
DAVID PHILLIPS, ELLEN LONG,
AND SOLLIE SOLOMONS,

Petitioners, .

vs.

OGC CASE NO. 90-1635

TRAIL RIDGE LANDVILL, INC., AND
STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION,

Respondents.

**REQUEST FOR ASSIGNMENT OF HEARING OFFICER
AND NOTICE OF PRESERVATION OF RECORD**

YOU ARE HEREBY NOTIFIED that the State of Florida Department of Environmental Regulation has received the attached Petition for Hearing in the above-styled case. Pursuant to Section 120.57(1)(b)3., Florida Statutes, the Secretary has decided not to act as hearing officer and requests that the Division of Administrative Hearings assign this matter to a hearing officer to conduct all necessary proceedings required by law and to submit a recommended order to the Department. The forwarding of this Petition is not a waiver of the Department's right to object to any material defects in the Petition or to Petitioner's standing to institute this proceeding.

YOU ARE FURTHER NOTIFIED that the Department is responsible for preserving the record of any evidentiary hearings in this case in accordance with Florida Administrative Code Rule 17-103.205. Such a record may be preserved by a court reporter or by mechanical recording equipment. The Department will use mechanical recording equipment unless one of the parties makes arrangements to provide a court reporter, including payment of the court reporter's fees. Any party arranging for the presence of a court reporter at hearing should notify the hearing officer and all parties prior to the hearing of the court reporter's name, mailing address, and telephone number.

Whenever a court reporter is used, Florida Administrative Code Rule 28-5.306 provides that the court reporter's recordation becomes the official transcript. The Department may tape a hearing for its own use even when a court reporter is present. If the Department tapes a proceeding which is also recorded by a court reporter, copies of the tapes can be made available to all parties upon request at cost of reproduction. However, parties should not assume in all instances that the Department will tape a proceeding.

If a party decides to file exceptions to any finding of fact made by the Department, the party will need to submit an official transcript of the proceeding. A transcript may be prepared, at the expense of the requesting party, from a court reporter's notes or, when no court reporter has been hired, from the tapes made by the Department.

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that a true and correct copy of the foregoing has been furnished to:

Save Trail Ridge and the Environment
22002 Paul Coleman Road
Maxville, FL 32234

David Phillips
Paul Coleman Road
Maxville, FL 32234

Sollie Solomons
Paul Coleman Road
Maxville, FL 32234


Ellen Long
22002 Paul Coleman Road
Maxville, FL 32234

Thomas G. Tomasello, Esq.
Oertel, Hoffman, Fernandez,
and Cole, P.A.
2700 Blair Stone Rd Ste C
Tallahassee, FL 32301

Trail Ridge Landfill, Inc.
c/o Douglas C. Miller, P.E.
England, Thims & Miller, Inc.
3131 St. Johns Bluff Road South
Jacksonville, Florida 32216

by U.S. Mail on this 16th day of November, 1990.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION


WILLIAM H. CONGDON
Assistant General Counsel

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400
Telephone: (904)488-9730

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

RECEIVED
OCT 30 1990

SAVE TRAIL RIDGE AND THE ENVIRONMENT
ASSOCIATION, David Phillips,
Ellen Long and Sollie Solomons,

Dept. of Environmental Reg.
Office of General Counsel

Petitioners.

vs.

DER File No.: 161821182
Duval County - D/F

TRAIL RIDGE LANDFILL, INC. and
STATE OF FLORIDA, DEPARTMENT OF
ENVIRONMENTAL REGULATION,

Respondents.

PETITIONER'S, SAVE TRAIL RIDGE AND THE
ENVIRONMENT, ASSOCIATION, DAVID PHILLIPS, ELLEN
LONG AND SOLLIE SOLOMONS PETITION FOR A FORMAL
HEARING PURSUANT TO SECTION 120.57, FLORIDA STATUTES

Petitioner's, Save Trail Ridge and the Environment Association ("STRATE"), Mr. David Phillips, Ms. Ellen Long and Sollie Solomon file this Petition for formal administrative proceedings pursuant to Section 120.57(1), Florida Statutes, and Rules 17-103.155, 22I-6.004 and 28.5.201, Florida Administrative Code.

1. The agency affected in this proceeding is the State of Florida, Department of Environmental Regulation ("DER" or "Department"), 2600 Blair Stone Road, Tallahassee, Florida 32301. The DER Permit Number in this proceeding is 161821182.

2. Respondent, Trail Ridge Landfill, Inc. ("Trail Ridge") is the permit applicant for DER Permit Number 161821182. Trail Ridge's address is c/o Douglas C. Miller, P.E., England, Thims &

EXHIBIT 1

Miller, Inc., 3131 St. Johns Bluff Road South, Jacksonville, Florida 32216.

3. Petitioner, STRATE, is a not-for-profit association dedicated to the conservation, preservation, and wise use of the environment, natural resources, historical sites, and cultural resources of the Trail Ridge area of Duval County and adjacent counties. STRATE's address is 22002 Paul Coleman Road, Maxville, Florida 32234.

4. Petitioner, David Phillips, is a Duval County, Florida resident whose address is Paul Coleman Road, Maxville, Florida 32234. He lives nearby the proposed project.

5. Petitioner, Ellen Long, is a Duval County, Florida resident whose address is 22002 Paul Coleman Road, Maxville, Florida 32234. She lives nearby the proposed project.

6. Petitioner, Sollie Solomons, is a Duval County, Florida resident whose address is Paul Coleman Road, Maxville, Florida 32234. He lives nearby the proposed project.

7. By Intent to Issue dated October 11, 1990, DER proposes to issue a dredge and fill permit to Trail Ridge to fill approximately 1.61 acres of state waters to widen a road to provide access to a proposed solid waste facility. The project is located approximately 1.14 miles north of State Road 228 on the west side of U. S. Highway 301 in Duval County, Florida near Maxville.

8. Petitioner STRATE's substantial interests will be affected by the Department's proposed agency action. The primary purposes of the STRATE are to promote the conservation, preservation and

wise use of the natural and historical resources of Duval County. The proposed dredge and fill project proposed for permitting by DER will impair, pollute and otherwise injure the natural resources of Duval County and thus substantially and adversely affect the Petitioner.

9. Petitioners Phillips, Long and Solomons live and reside in the area of the proposed project. They regularly use and enjoy the natural resources of the Trail Ridge area of Duval County for environmental, recreational and scenic purposes. Their substantial interests will be adversely effected because the proposed project for permitting by DER will impair, pollute and otherwise injure the natural resources of the Trail Ridge area of Duval County, thus substantially and adversely affecting these Petitioners.

The following are the disputed issues of fact:

- (a) Whether the applicant has provided the Department with reasonable assurances that water quality standards will not be violated;
- (b) Whether the applicant provided the Department with reasonable assurances that the project is not contrary to the public interest;
- (c) Whether the project will adversely affect the public health, safety, or welfare or the property of others;
- (d) Whether the project will adversely affect the conservation of fish and wildlife, including endangered or threatened species, or their habitats;
- (e) Whether the project will adversely affect the flow of

water or cause harmful erosion or shoaling;

- (f) Whether the project will adversely affect the fishing or recreational values in the vicinity of the project;
- (g) Whether the project will be of a temporary or permanent nature;
- (h) Whether the project will adversely affect or will enhance significant historical and archaeological resources;
- (i) The current condition and relative value of functions being performed by areas affected by the proposed activity;
- (j) Whether the Department adequately considered the cumulative impact of this project and related projects;
- (k) Whether the project adequately avoids adverse impacts to state waters and whether such impacts have been sufficiently minimized;
- (l) Whether the proposed mitigation is sufficient; and
- (m) Whether the application demonstrates that Trail Ridge holds a sufficient interest in the land on which the proposed construction activities are to take place.

11. Petitioners are entitled to relief pursuant to Chapters 120 and 403, Florida Statutes, and Chapters 17-4 and 17-103, Florida Administrative Code.


12. Petitioners demand that Permit Application No. 161821182 be denied.

WHEREFORE, Petitioners respectfully request that this matter be referred to a hearing officer of the Division of Administrative

Hearings for commencement of formal proceedings pursuant to Section 120.57(1), Florida Statutes; that the hearing officer issue a recommended order recommending that the permit application be denied, and providing other relief including that DER issue a final order denying Permit Application No. 161821182.

Respectfully submitted this 30th day of October, 1990.

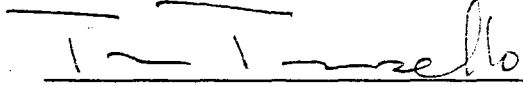
OERTEL, HOFFMAN, FERNANDEZ
& COLE, P.A.
2700 Blair Stone Road
Suite C
Tallahassee, Florida 32301
(904) 877-0099


THOMAS G. TOMASELLO
Fla. Bar ID: 233587

Attorneys for Petitioners

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that the original and one copy of the foregoing have been furnished by hand-delivery for filing to the Agency Clerk, State of Florida, Department of Environmental Regulation, 2600 Blair Stone Road, Tallahassee, Florida 32301, this 30th day of October, 1990.


Attorney

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

OCT 12 1990

Dept. of Environmental Reg.
Office of General Counsel

In the Matter of:)	
Application for Permit by:)	DER File No.: 161821182
)	Duval County-D/F
Trail Ridge Landfill, Inc.)	
c/o Douglas C. Miller, P.E.)	
England, Thims & Miller, Inc.)	
3131 St. Johns Bluff Road South)	
Jacksonville, FL 32216)	

INTENT TO ISSUE

The Department of Environmental Regulation gives notice of its intent to issue a permit (copy attached) for the proposed project as detailed in the application specified above, for the reasons stated below.

The applicant, Trail Ridge Landfill, Inc., applied through an agent, England, Thims & Miller, Inc., on June 13, 1990, to the Department of Environmental Regulation for a permit and water quality certification to fill 1.61 acres of roadside ditches, which discharge to Deep Creek, to facilitate the widening of an existing road to provide access to a solid waste landfill facility. To mitigate the loss of these ditches, 4.76 acres of freshwater hardwood swamp wetlands shall be created on site. The project is located 1.14 miles north of State Road 228 (Normandy Boulevard) on the west side of U.S. Highway 301 in Duval County, in the vicinity of Maxville in Sections 18, 19, 20, 21, Township 3 South, Range 23 East.

The Department has permitting jurisdiction under Chapter 403, Florida Statutes, and Florida Administrative Code Rules 17-4 and

17-312, Public Law 92-500 for the construction of pollution sources within waters of the State. The project is not exempt from permitting procedures. The Department has determined that a Wetland Resource Management (dredge/fill) permit is required for the proposed work.

The Department intends to issue this permit (copy attached) with specific conditions for the following reasons:

The applicant has provided the Department with affirmative reasonable assurance, pursuant to Florida Administrative Code Rule 17-312.080(1) that the immediate and long-term impact of the project will not result in violation of State Water Quality Standards.

In addition, the applicant has provided the Department with reasonable assurance pursuant to Florida Administrative Code Rule 17-312.080(2) that based on plans, test results or other information that the project is not contrary to the public interest in accordance with Section 403.918(2), Florida Statutes.

Section 403.918(2), Florida Statutes, states that,

"No permit shall be issued under this part unless the applicant provides the department with reasonable assurance that the project is not contrary to the public interest...(a) In determining whether a project is not contrary to the public interest the Department shall consider and balance the following criteria:

File No.: 161821182

- (1) Whether the project will adversely affect the public health, safety, or welfare or property of others;
- (2) Whether the project will adversely affect the conservation of fish and wildlife, including endangered or threatened species, or their habitats;
- (3) Whether the project will adversely affect navigation or the flow of water or cause harmful erosion or shoaling;
- (4) Whether the project will adversely affect the fishing or recreation values or marine productivity in the vicinity of the project;
- (5) Whether the project will be of a temporary or permanent nature;
- (6) Whether the project will adversely affect or enhance significant historical and archeological resources under the provision of s. 267.061; and
- (7) The current condition and relative value of functions being performed by areas affected by the proposed activity.

Pursuant to Section 403.815, Florida Statutes and DER Rule 17-103.150, F.A.C., you (the applicant) are required to publish at your own expense the enclosed Notice of Intent to Issue Permit. The notice shall be published one time only within 30 days, in the legal ad section of a newspaper of general circulation in the area affected. For the purpose of this rule, "publication in a newspaper of general circulation in the area affected" means publication in a newspaper meeting the requirements of Sections 50.011 and 50.031, F.S., in the county where the activity is to take place. The applicant shall provide proof of publication to the Department, at 7825 Baymeadows Way, Suite 200B, Jacksonville, Florida 32256-7577, within seven days of publication. Failure to publish the notice and provide proof of publication within the allotted time may result in the denial of the permit.

File No.: 161821182

The Department will issue the permit with the attached conditions unless a petition for an administrative proceeding (hearing) is filed pursuant to the provisions of Section 120.57, F.S.

A person whose substantial interests are affected by this permit may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400. Petitions filed by the permit applicant and the parties listed below must be filed within 14 days of receipt of this intent. Petitions filed by other persons must be filed within 14 days of publication of the public notice or within 14 days of their receipt of this intent, whichever first occurs. Petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

The Petition shall contain the following information:

File No.: 161821182

(a) The name, address, and telephone number of each petitioner, the applicant's name and address, the Department Permit File Number and the county in which the project is proposed;

(b) A statement of how and when each petitioner received notice of the Department's action or proposed action;

(c) A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action;

(d) A statement of the material facts disputed by Petitioner, if any;

(e) A statement of facts which petitioner contends warrant reversal or modification of the Department's action or proposed action;

(f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; and

(g) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this intent. Persons whose substantial interests will be affected by any decision of the Department with regard to the application have the

File No.: 161821182

right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of receipt of this notice in the Office of General Counsel at the above address of the Department. Failure to petition within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

Executed in Jacksonville, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

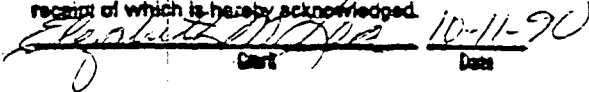

Ernest E. Frey, P.E.

Deputy Assistant Secretary
Northeast District Office
7825 Baymeadows Way,
Suite 200B
Jacksonville, FL 32256-7577

Phone: (904) 448-4300

FILING AND ACKNOWLEDGEMENT

FILED, on this date, pursuant to S120.52, Florida
Statutes, with the designated Department Clerk,
receipt of which is hereby acknowledged.


Clerk Date 10-11-90

Copies furnished to:

Trail Ridge Landfill, Inc. (Certified #P 771 963 696)
Pamela Presnell Garvin (Certified #P 771 962 166)
William Congdon, Permit Attorney, DER, Tallahassee
John Adams, ACOE, Jacksonville
Forrest Watson, DNR, Jacksonville
Michael Eaton, DER, Jacksonville
Jeremy Tyler, DER, Jacksonville
Mary Nogas, DER, Jacksonville

CERTIFICATE OF SERVICE

This is to certify that the NOTICE OF PERMIT and all copies were mailed before the close of business on 10-11-90 to the listed persons.

File No.: 161821182

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
NOTICE OF INTENT TO ISSUE PERMIT

The Department of Environmental Regulation gives notice of its intent to issue a permit to fill 1.61 acres of roadside ditches, which discharge to Deep Creek, to facilitate the widening of an existing road to provide access to a solid waste landfill facility. To mitigate the loss of these ditches, 4.76 acres of freshwater hardwood swamp wetlands shall be created on site. The project is located 1.14 miles north of State Road 228 (Normandy Boulevard) on the west side of U.S. Highway 301 in Duval County, in the vicinity of Maxville in Sections 18, 19, 20, 21, Township 3 South, Range 23 East.

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400, within 14 days of publication of this notice. Petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

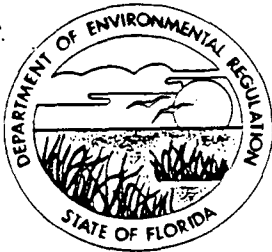
The Petition shall contain the following information:

(a) The name, address, and telephone number of each petitioner, the applicant's name and address, the Department Permit File Number and the county in which the project is proposed; (b) A statement of how and when each petitioner received notice of the Department's action or proposed action; (c) A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action; (d) A statement of the material facts disputed by Petitioner, if any; (e) A statement of facts which petitioner contends warrant reversal or modification of the Department's action or proposed action; (f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; and (g) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this Notice. Persons whose substantial interests will be affected by any decision of the Department with regard to the application have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of receipt of this notice in the Office of General Counsel at the above address of the Department. Failure to

petition within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

The application is available for public inspection during normal business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday, except legal holidays at the Northeast District Office of the Department of Environmental Regulation, 7825 Baymeadows Way, Suite 200B, Jacksonville, FL 32256-7577.



Florida Department of Environmental Regulation

Northeast District • Suite 200, 7825 Baymeadows Way • Jacksonville, Florida 32256-7577 • 904-448-4300

Bob Martinez, Governor

Dale Twachtmann, Secretary

John Shearer, Assistant Secretary

Ernest Frey, Deputy Assistant Secretary

D R A F T

DRAFT

PERMITTEE:

Trail Ridge Landfill, Inc.
c/o Douglas C. Miller, P.E.
England, Thims & Miller, Inc.
3131 St. Johns Bluff Road South
Jacksonville, FL 32216

I.D. Number: WRM

Permit/Cert. Number: 161821182

Date of Issue:

Expiration Date:

County:

Lat/Long: 30°13'20"/82°02'30"

Section/Township/Range: 18,19,20,21/3S/23E

Project: Construct a road.

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Rule(s) 17-312. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawing(s), plans, and other documents attached hereto or on file with the department and made a part hereof and specifically described as follows:

Fill 1.61 acres of roadside ditches, which discharge to Deep Creek, to facilitate the widening of an existing road to provide access to a solid waste landfill facility. To mitigate the loss of these ditches, 4.76 acres of freshwater hardwood swamp wetlands shall be created on site. The project is located 1.14 miles north of State Road 228 (Normandy Boulevard) on the west side of U.S. Highway 301 in Duval County, in the vicinity of Maxville.

PERMITTEE:

Trail Ridge Landfill, Inc.

I.D. Number:

Permit Number: 161821182

Date of Issue:

Expiration Date:

DRAFT

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth herein are "Permit Conditions" and as such are binding upon the permittee and enforceable pursuant to the authority of Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is hereby placed on notice that the department will review this permit periodically and may initiate enforcement action for any violation of the "Permit Conditions" by the permittee, its agents, employees, servants, or representatives.
2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the department.
3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Nor does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit does not constitute a waiver of or approval of any other department permit that may be required for other aspects of the total project which are not addressed in the permit.
4. This permit conveys no title to land or water, does not constitute state recognition or acknowledgement of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the state. Only the Trustees of the Internal Improvement Trust Fund may express state opinion as to title.
5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, plant or aquatic life or property and penalties therefore caused by the construction or operation of this permitted source, nor does it allow the permittee to cause pollution in contravention of Florida Statutes and department rules, unless specifically authorized by an order from the department.
6. The permittee shall at all times properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by department rules.
7. The permittee, by accepting this permit, specifically agrees to allow authorized department personnel, upon presentation of credentials or other documents as may be required by law, access to the premises, at reasonable times, where the permitted activity is located or conducted for the purpose of:

PERMITTEE:

Trail Ridge Landfill, Inc.

I.D. Number:

Permit Number: 161821182

Date of Issue:

Expiration Date:

DRAFT

- a. Having access to and copying any records that must be kept under the conditions of the permit;
- b. Inspecting the facility, equipment, practices, or operations regulated or required under this permit; and
- c. Sampling or monitoring any substances or parameters at any location reasonably necessary to assure compliance with this permit or department rules.

Reasonable time may depend on the nature of the concern being investigated.

8. If, for any reason, the permittee does not comply with, or will be unable to comply with, any condition or limitation specified in this permit, the permittee shall immediately notify and provide the department with the following information:
 - a. A description of and cause of non-compliance; and
 - b. the period of non-compliance, including exact dates and times; or, if not corrected, the anticipated time the non-compliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the non-compliance.

The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the department for penalties or revocation of this permit.

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source, which are submitted to the department, may be used by the department as evidence in any enforcement case arising under the Florida Statutes or department rules, except where such use is proscribed by Sections 403.73 and 403.111, Florida Statutes.
10. The permittee agrees to comply with changes in department rules and Florida Statutes after a reasonable time for compliance, provided however, the permittee does not waive any other rights granted by Florida Statutes or department rules.
11. This permit is transferable only upon department approval in accordance with Florida Administrative Code Rules 17-4.12 and 17-30.30, as applicable. The permittee shall be liable for any noncompliance of the permitted activity until the transfer is approved by the department.
12. This permit is required to be kept at the work site of the permitted activity during the entire period of construction or operation.

PERMITTEE:

Trail Ridge Landfill, Inc.

I.D. Number:

Permit Number: 161821182

Date of Issue:

Expiration Date:

DRAFT

13. This permit also constitutes:

- () Determination of Best Available Control Technology (BACT)
- () Determination of Prevention of Significant Deterioration (PSD)
- (X) Certification of Compliance with State Water Quality Standards
(Section 401, PL 92-500)
- () Compliance with New Source Performance Standards

14. The permittee shall comply with the following monitoring and record keeping requirements:

- a. Upon request, the permittee shall furnish all records and plans required under department rules. The retention period for all records will be extended automatically, unless otherwise stipulated by the department, during the course of any unresolved enforcement action.
- b. The permittee shall retain at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation), copies of all reports required by this permit, and records of all data used to complete the application for this permit. The time period of retention shall be at least three years from the date of the sample, measurement, report or application unless otherwise specified by department rule.
- c. Records of monitoring information shall include:
 - the date, exact place, and time of sampling or measurements;
 - the person responsible for performing the sampling or measurements;
 - the date(s) analyses were performed;
 - the person responsible for performing the analyses;
 - the analytical techniques or methods used; and
 - the results of such analyses.

15. When requested by the department, the permittee shall, within a reasonable period of time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the department, such facts or information shall be submitted or corrected promptly.

PERMITTEE:

Trail Ridge Landfill, Inc.

I.D. Number:

Permit Number: 161821182

Date of Issue:

Expiration Date:

DRAFT

SPECIFIC CONDITIONS:

1. The permittee is hereby advised that Florida law states: "No person shall commence any excavation, construction, or other activity involving the use of sovereign or other lands of the state, title to which is vested in the Board of Trustees of the Internal Improvement Trust Fund of the Department of Natural Resources under Chapter 253, until such person has received from the Board of Trustees of the Internal Improvement Trust Fund the required lease, license, easement, or other form of consent authorizing the proposed use." Pursuant to Florida Administrative Code Rule 16Q-14, if such work is done without consent, or if a person otherwise damages state land or products of state land, the Board of Trustees may levy administrative fines of up to \$10,000 per offense.
2. If historical or archeological artifacts, such as Indian canoes, are discovered at any time within the project site the permittee shall immediately notify the Northeast District Office of the Department of Environmental Regulation and the Bureau of Historic Preservation, Division of Archives, History and Records Management, R.A. Gray Building, Tallahassee, Florida 32301.
3. Prior to commencement of work authorized by this permit, the permittee shall provide written notification of the date of the commencement and proposed schedule of construction to the Northeast District Office of the Department of Environmental Regulation, Wetland Management Section, Suite B-200, 7825 Baymeadows Way, Jacksonville, FL 32256-7577.
4. This permit does not constitute any approval of the stormwater management system which must be obtained separately from the appropriate agency.
5. The project shall comply with applicable State Water Quality Standards, namely:
 - 17-302.500 - Minimum Criteria for All Waters at All Times and All Places.
 - 17-302.510 - Surface Waters: General Criteria.
 - 17-302.560 - Criteria - Class III Waters - Recreation, Propagation and Management of Fish and Wildlife: Surface Waters.
6. The mitigation plan, "Trail Ridge Landfill Wetland Impacts and Mitigation Plan," submitted on June 18, 1990, shall be appended as a Specific Condition of this permit. Any specific condition requirements listed herein, shall supercede or modify any requirements contained in the appended mitigation plan.
7. Prior to initiating any construction, permittee must record a conservation easement on the real property pursuant to Section 704.06, F.S., prohibiting all construction including clearing, dredging or filling, except that which is authorized by this permit within the conservation creation/preservation areas as delineated on plans dated as received by the Department on June 18, 1990. The easement must contain provisions as set forth in subsections 1 (a) - (b) of Section 704.06, F.S., as well as provisions indicating that they may be enforced by the Department and may not be amended without Department approval. Within 30 days of the date of issuance of this permit and prior to recording, said easement must be submitted to the Department for

CONTINUED NEXT PAGE

PERMITTEE:

Trail Ridge Landfill, Inc.

I.D. Number:

Permit Number: 161821182

Date of Issue:

Expiration Date:

DRAFT

SPECIFIC CONDITIONS CONTINUED:

review and approval. Within 30 days of receipt of Department approval, permittee must provide to the Department a certified copy of the recorded easement showing the date they were recorded and the official records book and page number.

8. The permittee shall submit, in writing, to the Department of Environmental Regulation, Northeast District, 7825 Baymeadows Way, Suite 200B, Jacksonville, FL 32256-7577, notification of the date that activities authorized by this permit commence.
9. The initial planting of the mitigation areas, per appended mitigation plan section 4 (b)(4), shall be completed no later than one year after commencement of the activities authorized by this permit.
10. The permittee shall submit an as-built survey of the wetland creation areas showing dimensions, grades, ground elevations and water surface elevations certified by a registered surveyor or professional engineer. The as-built must be submitted within thirty (30) days of the initial planting.
11. The permittee shall furnish the Department with monitoring reports on the wetland creation areas describing:
 - a. Percent survival and diversity of planted species within each stratum;
 - b. Recruitment density and composition within each stratum;
 - c. Recorded growth via established parameters for planted trees and shrubs;
 - d. Percent cover of herbaceous species;
 - e. Surface water elevations referenced to N.G.V.D., or if surface water is not present, groundwater elevation referenced to N.G.V.D.

The first monitoring year shall start as of the planting date and data shall be collected and submitted in accordance with Specific Condition Number 9. Reports to the Department must also include photographs, descriptions of problems encountered and solutions undertaken.

12. Within the wetland creation areas, non-native vegetation and nuisance vegetation such as Typha spp. shall be controlled by hand clearing or other methods approved by the Department so that they constitute no more than 10% of the areal cover at any monitoring period.

CONTINUED NEXT PAGE

PERMITTEE:

Trail Ridge Landfill, Inc.

I.D. Number:

Permit Number: 161821182

Date of Issue:

Expiration Date:

DRAFT

SPECIFIC CONDITIONS CONTINUED:

13. Successful establishment of the wetland creation shall occur when:

- a. on an annual basis at least 80 percent of the planted individuals in each stratum have survived and are showing signs of normal annual growth, based on standard growth parameters such as height and base diameter, or canopy circumference; and
- b. the above criteria has been achieved and maintained for a three (3) year period following initial planting.

14. In the event that the success criteria as stated in Specific Condition Number 13 are not achieved by the expiration date of this permit, the permittee shall enter into a long term agreement with the Department so as to insure the success of the mitigation plan.

15. All wetland areas or water bodies which are outside the specific limits of construction authorized by this permit must be protected from erosion, siltation, scouring or excess turbidity or dewatering.

16. All disturbed areas adjacent to the mitigation area must be sodded or seeded and mulched within 10 days following their completion and a substantial vegetation cover must be established within 60 days of sodding or seeding.

Issued this day of , 1990

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION


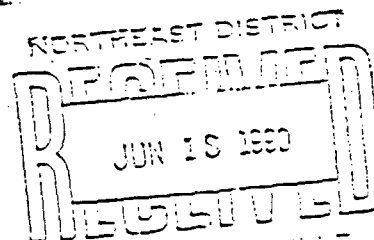
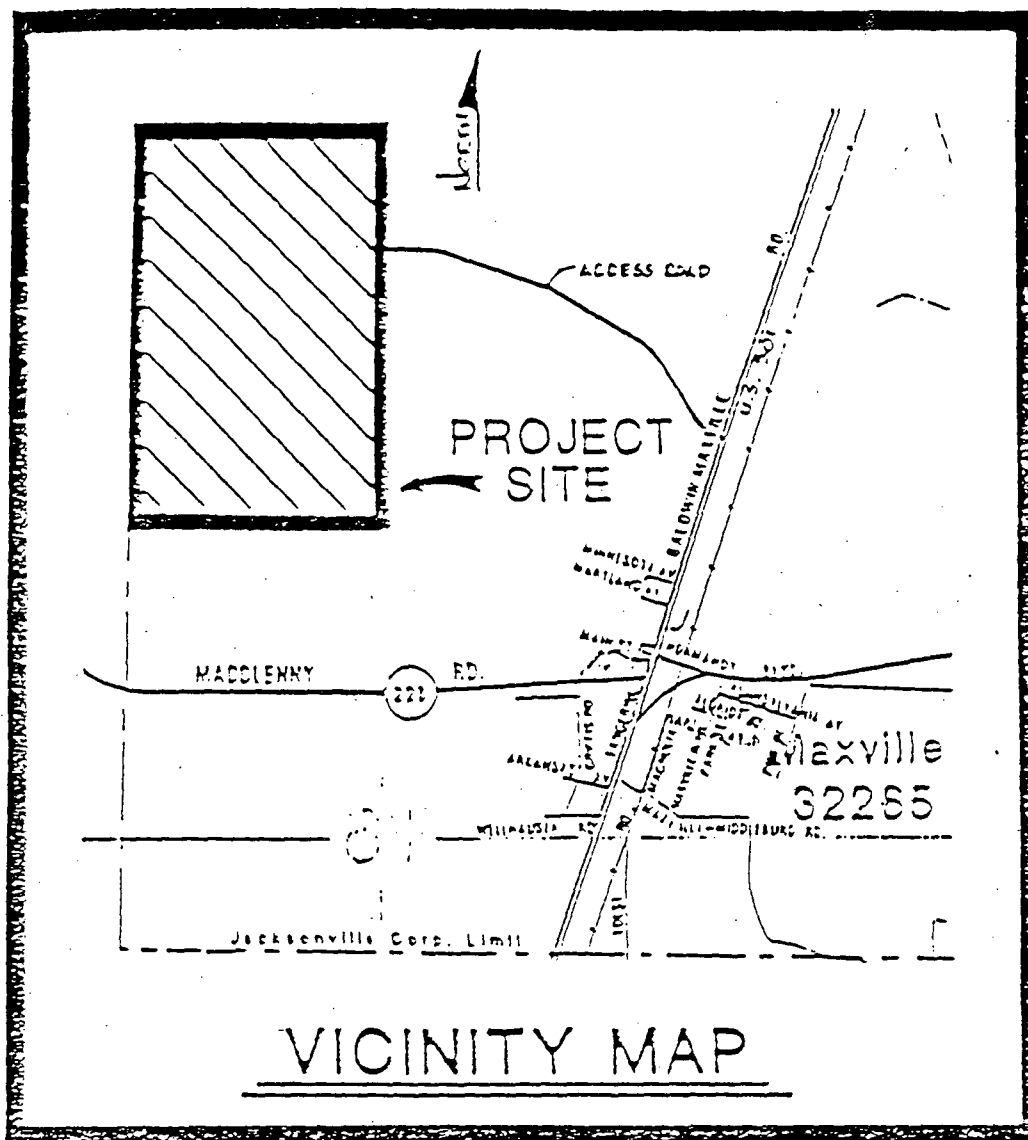
DRAFT

Ernest E. Frey, P.E.
Deputy Assistant Secretary

Copy to: ACOE, Jacksonville
DNR, Jacksonville
County Tax Assessor

CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this NOTICE OF PERMIT and all copies were mailed before the close of business on _____ to the listed persons.



England-Thimble
& Miller, Inc.

VICINITY MAP

TRAILRIDGE LANDFILL
TRAIL RIDGE LANDFILL, INC.

PROJ. NO. E89-113
DATE JUNE 11, 1990
SCALE 1" = 4000'
DRAWING NO. 1

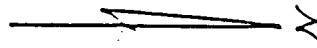
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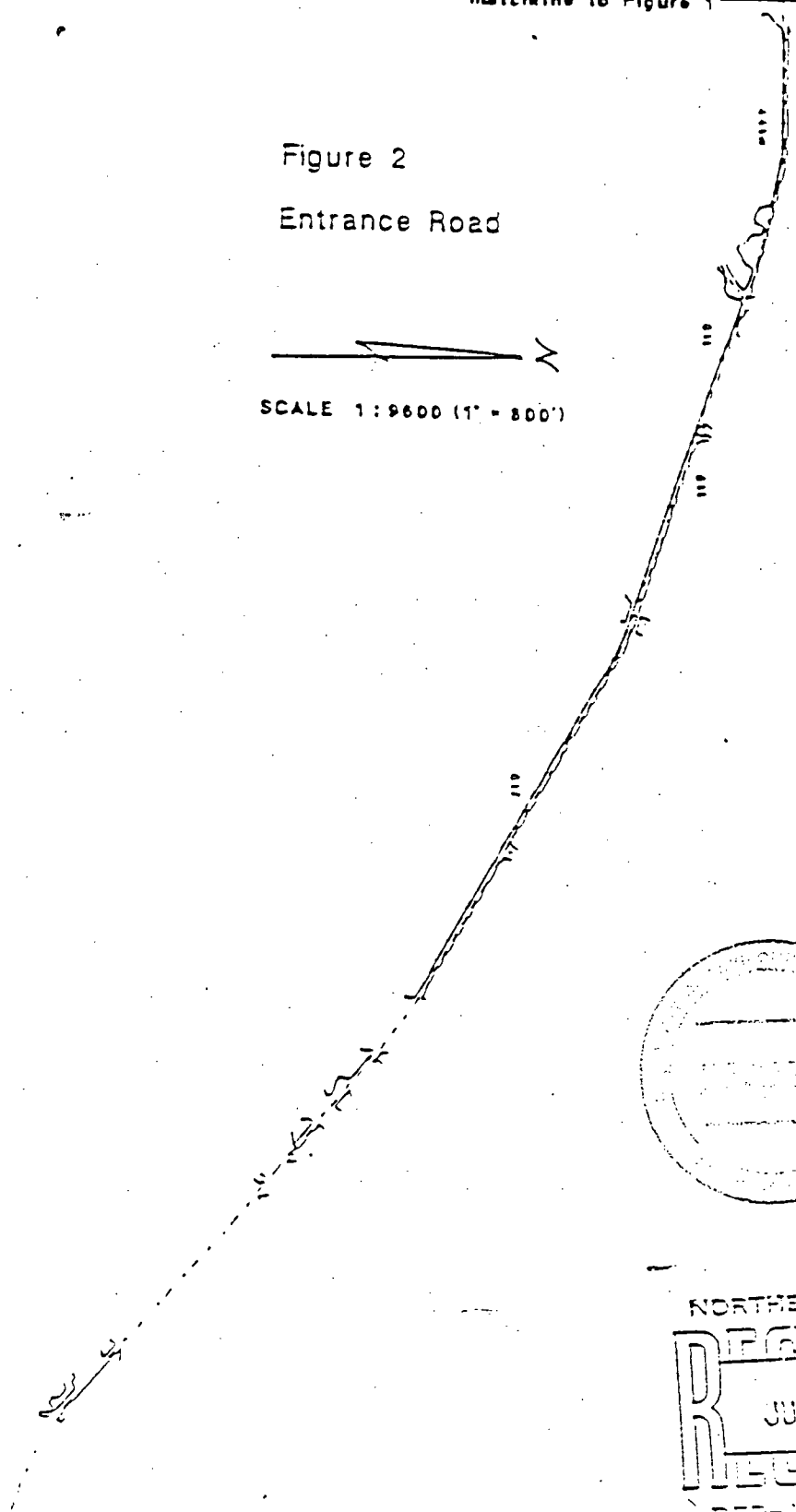
matchline to Figure 1

Figure 2

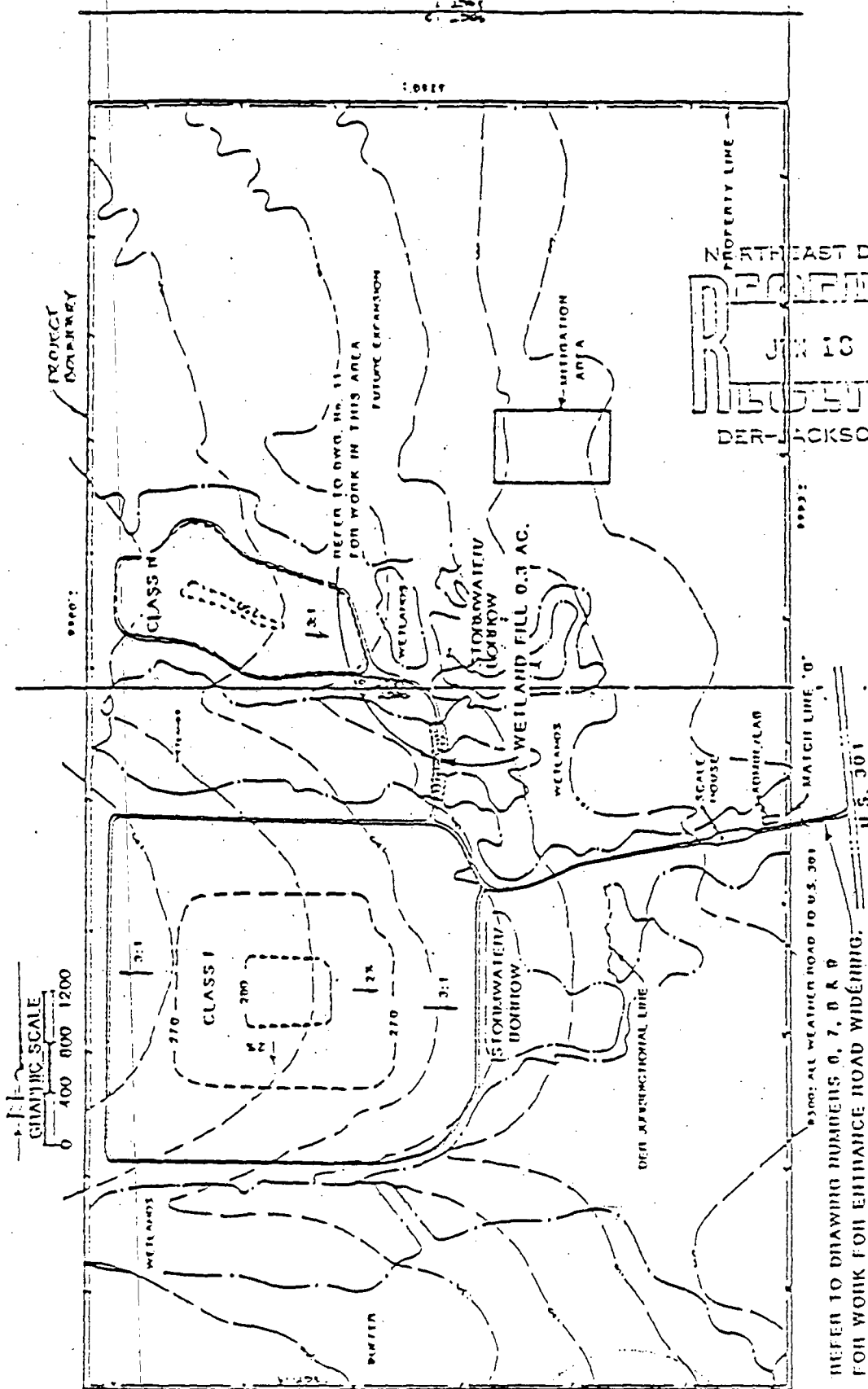
Entrance Road



SCALE 1:9600 (1" = 800')



NORTHEAST DISTRICT
RECEIVED
JUN 18 1930
RECEIVED
DER-JACKSONVILLE



England-Thirns
& Miller, Inc.

SITE PLAN

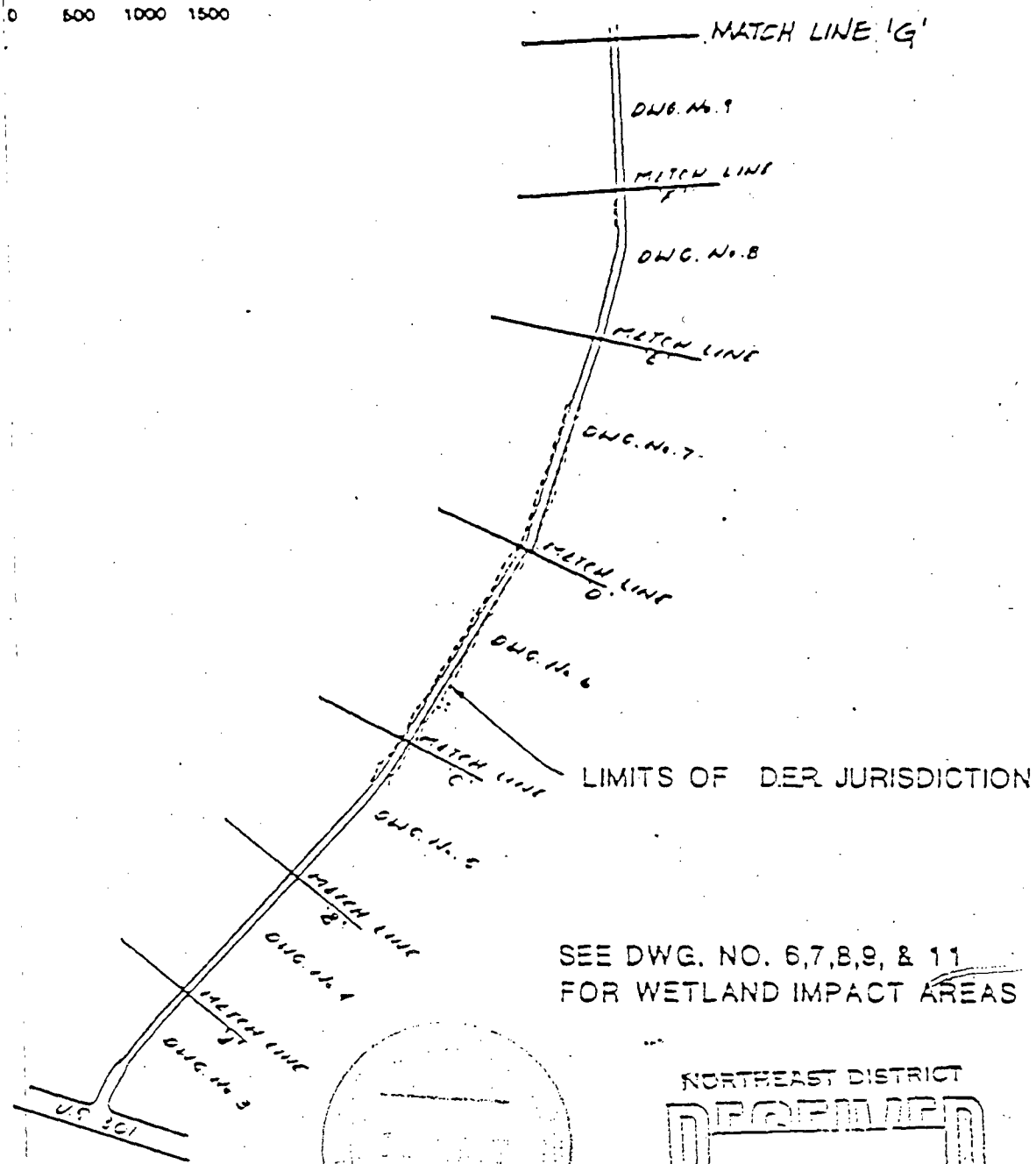
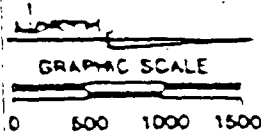
TRAIL RIDGE LANDFILL
FOR: TRAIL RIDGE LANDFILL

PROD. NO. E 88-113-B

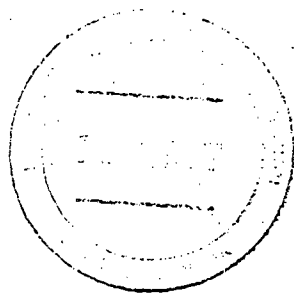
DATE JUNE 11, 1980

SCALE SEE GRAPHIC

DRAWING NO. 2



SEE DWG. NO. 6, 7, 8, 9, & 11
FOR WETLAND IMPACT AREAS



NORTHEAST DISTRICT
RECEIVED
JUN 18 1990
RECEIVED
DER-JACKSONVILLE



England-Thims
& Miller, Inc.

SITE PLAN
ENTRANCE ROAD
TRAIL RIDGE LANDFILL
TRAIL RIDGE LANDFILL, INC.

PROJ. NO. E89-113
DATE JUNE 11, 1990
SCALE SEE GRAPHIC
DRAWING NO. 3

DER

[Signature]
10-11-90

200 100 0
GRAPHIC SCALE

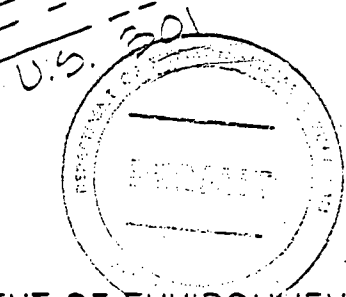
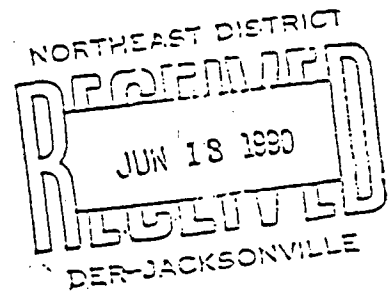
NO D.E.R. IMPACTS THIS SHEET

MATCH LINE 'A'

NORTH

EXISTING TRAIL ROAD

PROPOSED PAVED ENTRANCE ROAD



LEGEND

——— LIMITS OF CONSTRUCTION
////// D.E.R. WETLAND IMPACT
===== PROPOSED 24' ASPHALT PYMT.

TOTAL DEPARTMENT OF ENVIRONMENTAL
REGULATION WETLAND IMPACTS
1.61 ACRES TOTAL FILL 5384 C.Y.



England-Thims
& Miller, Inc.

SITE PLAN

TRAIL RIDGE LANDFILL
TRAIL RIDGE LANDFILL, INC.

PROJ. NO.	59-113
DATE	JUNE 11, 1990
SCALE	GRAPHIC
DRAWING NO.	4

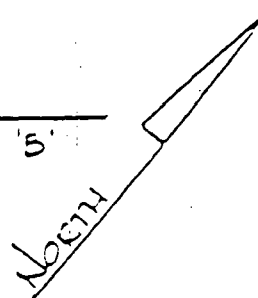
DER

Granite
6-11-90

GRAPHIC SCALE

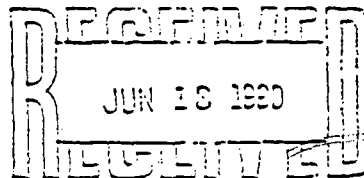
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MATCH LINE 'B'



EXISTING TRAIL ROAD

NORTHEAST DISTRICT

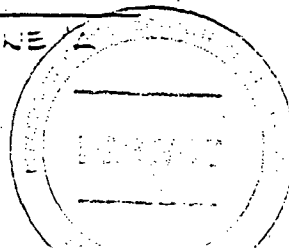


DER-JACKSONVILLE

MATCH LINE

LEGEND

LIMITS OF CONSTRUCTION
D.E.M. WETLAND IMPACT
PROPOSED 24' ASPHALT PYMT.



England, Thims
& Miller, Inc.

SITE PLAN

PROJ. NO. 89-113

DATE JUNE 11, 1990

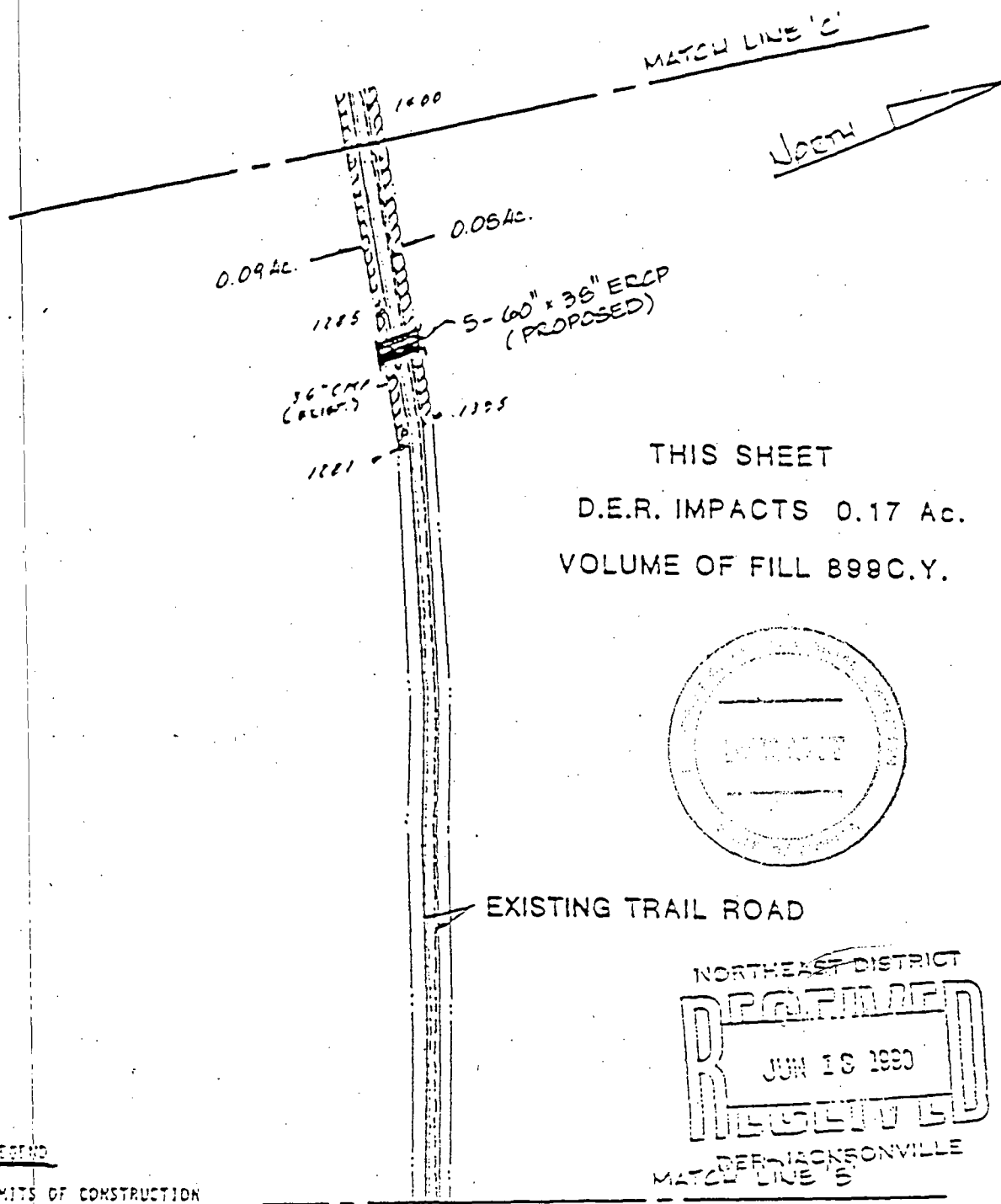
TRAIL RIDGE LANDFILL
TRAIL RIDGE LANDFILL, INC.

SCALE GRAPHIC

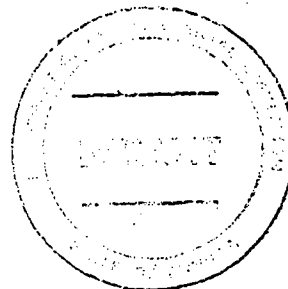
DRAWING NO. 5

DER

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6-11-90



THIS SHEET
D.E.R. IMPACTS 0.17 AC.
VOLUME OF FILL 898 C.Y.



EXISTING TRAIL ROAD

NORTHEAST DISTRICT
RECEIVED
JUN 18 1990
DER JACKSONVILLE
MATCH LINE 'B'

LEGEND

- LIMITS OF CONSTRUCTION
- //// D.E.R. WETLAND IMPACT
- ===== PROPOSED 24' ASPHALT PAVT.



England-Thims
& Miller, Inc.

SITE PLAN

TRAIL RIDGE LANDFILL
TRAIL RIDGE LANDFILL, INC.

PROJ. NO. 89-113
DATE JUNE 11, 1990
SCALE GRAPHIC
DRAWING NO. 6

DER

Lyman
6-11-90

200 100 0 100
GRAPHIC SCALE

1307 --- 1394 MATCH LINE 'D'

NORTH

30" CMP

2-48" RCP (PROPOSED)

1195 1380

0.34 Ac.

24" CMP (EXIST.)

1-36" RCP (PROPOSED)

0.35 Ac.

18" CMP (EXIST.)

1190 1375

1-36" RCP (PROPOSED)

1372

1404

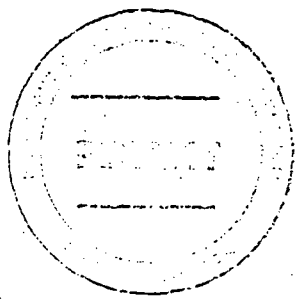
1-30" RCP (PROPOSED)

(2) 24" CMP (EXIST.)

EXISTING TRAIL ROAD

1400

MATCH LINE 'C'



NORTHEAST DISTRICT
RECEIVED
JUN 12 1990
DER-JACKSONVILLE

LEGEND

LIMITS OF CONSTRUCTION
D.E.R. WETLAND IMPACT
PROPOSED 24" ASPHALT PAVT.

England Thims
& Miller, Inc.

SITE PLAN

TRAIL RIDGE LANDFILL
TRAIL RIDGE LANDFILL, INC.

PROJ. NO. 89-113
DATE JUNE 11, 1990
SCALE GRAPHIC
DRAWING NO. 7

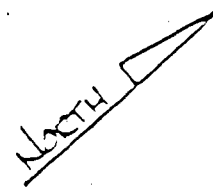
DER

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11-11-90

200 100 0

GRAPHIC SCALE

MATCH LINE E



0.17 Ac.

1300

EXISTING TRAIL ROAD

1305

0.21 Ac.

1310

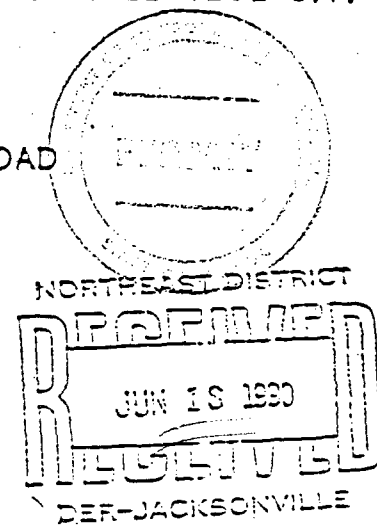
1320

1307

1306

MATCH LINE D

THIS SHEET
D.E.R. IMPACTS 0.38 Ac.
VOLUME OF FILL 1282 C.Y.



LEGEND

LIMITS OF CONSTRUCTION
D.E.R. WETLAND IMPACT
PROPOSED 24' ASPHALT PYMT.



England, Thims
& Miller, Inc.

SITE PLAN

TRAIL RIDGE LANDFILL
TRAIL RIDGE LANDFILL, INC.

PROJ. NO. 88-113

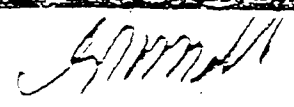
DATE JUNE 11, 1990

SCALE GRAPHIC

DRAWING NO. 8

DER

Handwritten signature
6-11-90



200 100 0

GRAPHIC SCALE

NORTH

PROPERTY LINE

MATCH LINE 'G'

EXISTING TRAIL ROAD

NORTHEAST DISTRICT

RECEIVED
JUN 15 1990
RECEIVED
DER-JACKSONVILLE

MATCH LINE 'E'

LEGEND

LIMITS OF CONSTRUCTION
D.E.R. WETLAND IMPACT
PROPOSED 24' ASPHALT PYMT.

THIS SHEET
NO D.E.R. IMPACTS



England-Thims
& Miller, Inc.

SITE PLAN

TRAIL RIDGE LANDFILL
TRAIL RIDGE LANDFILL, INC.

PROJ. NO. 89-113
DATE JUNE 11, 1990
SCALE GRAPHIC
DRAWING NO. 10

DER

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6-11-90

CLASS III

SECTION 10

SECTION 10

THIS SHEET

D.E.R. IMPACTS 0.30 AC.

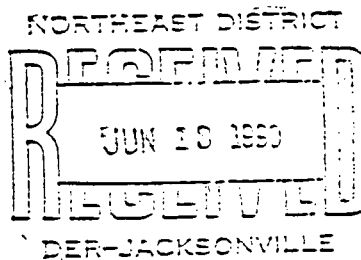
VOLUME OF FILL 924 C.Y.

PROPOSED DBL. 48" CMPS.

LIMITS OF JURISDICTION

CLASS I

EXISTING TRAIL ROAD



LEGEND

LIMITS OF CONSTRUCTION
D.E.R. WETLAND IMPACT
PROPOSED 24" ASPHALT PAVEMENT

England-Thimby
& Miller, Inc.
Surveying & Engineering
301 S. Main St., Jacksonville, FL 32209

SITE PLAN

TRAIL RIDGE LANDFILL
TRAIL RIDGE LANDFILL, INC.

PROJ. NO. 89-113

DATE JUNE 11, 1980

SCALE GRAPHIC

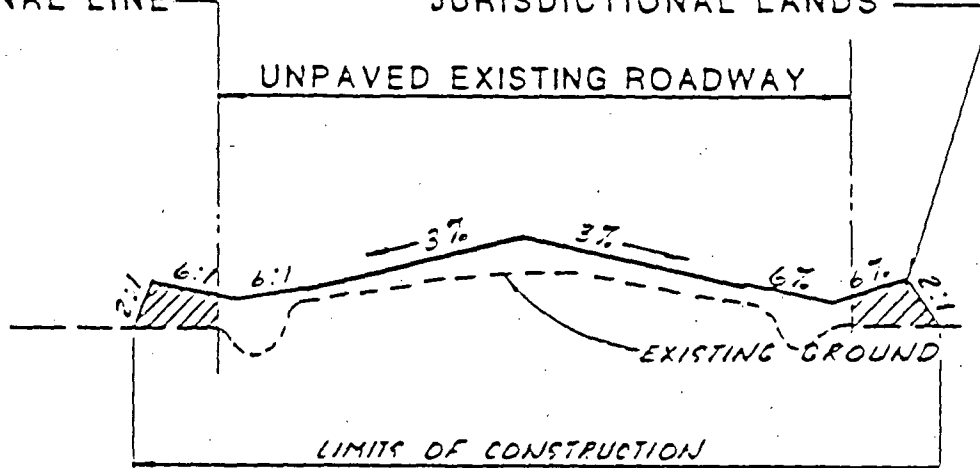
DRAWING NO. 11

DER

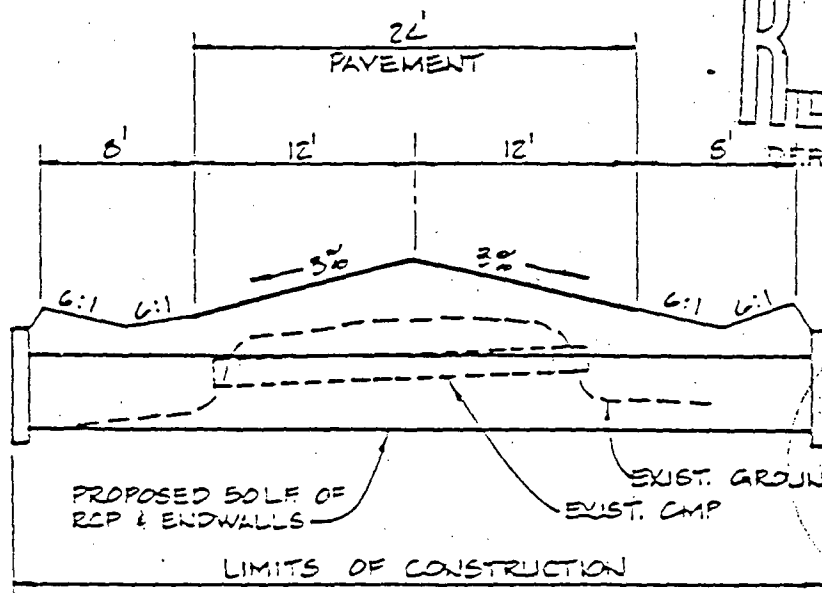
Handwritten signature

D.E.R.
JURISDICTIONAL LINE

IMPACTS TO D.E.R.
JURISDICTIONAL LANDS



TYPICAL SECTION WHERE
IMPACTING D.E.R. JURISDICTION



RECEIVED
JUN 13 1990
DER-JACKSONVILLE

TYPICAL CULVERT REPLACEMENT



England-Thims
& Miller, Inc.

ROADWAY SECTIONS

TRAIL RIDGE LANDFILL

TRAIL RIDGE LANDFILL, INC.

PROJ. NO. 89-113

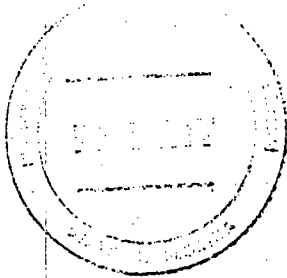
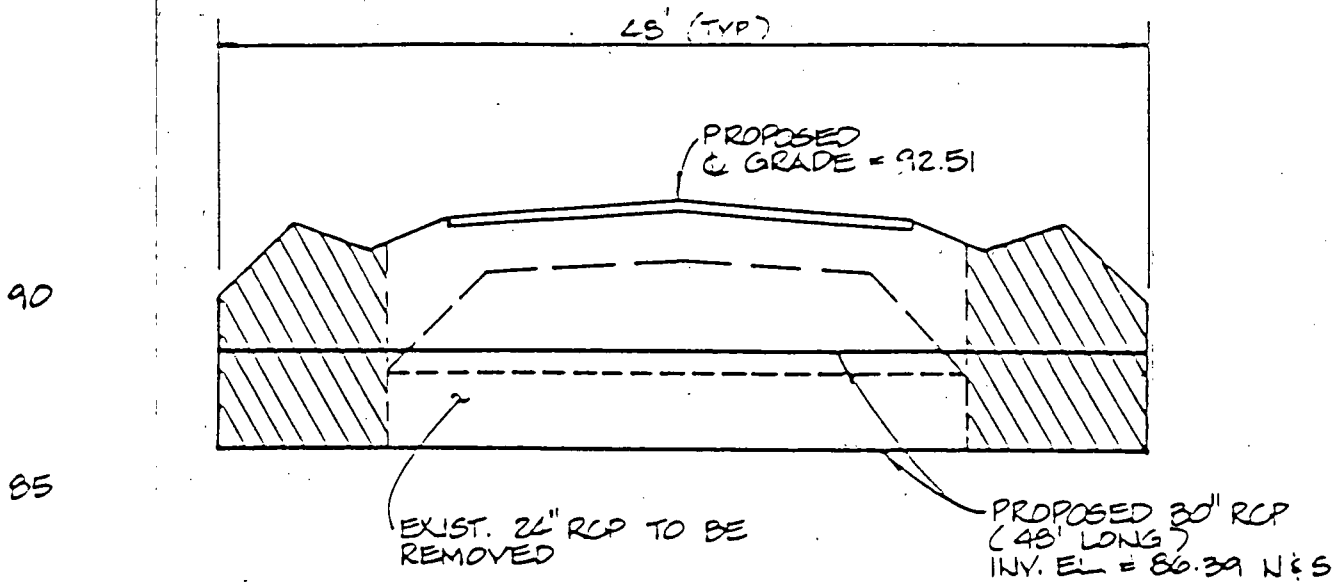
DATE JUNE 11, 1990

SCALE 1'-10'

DRAWING NO. 12

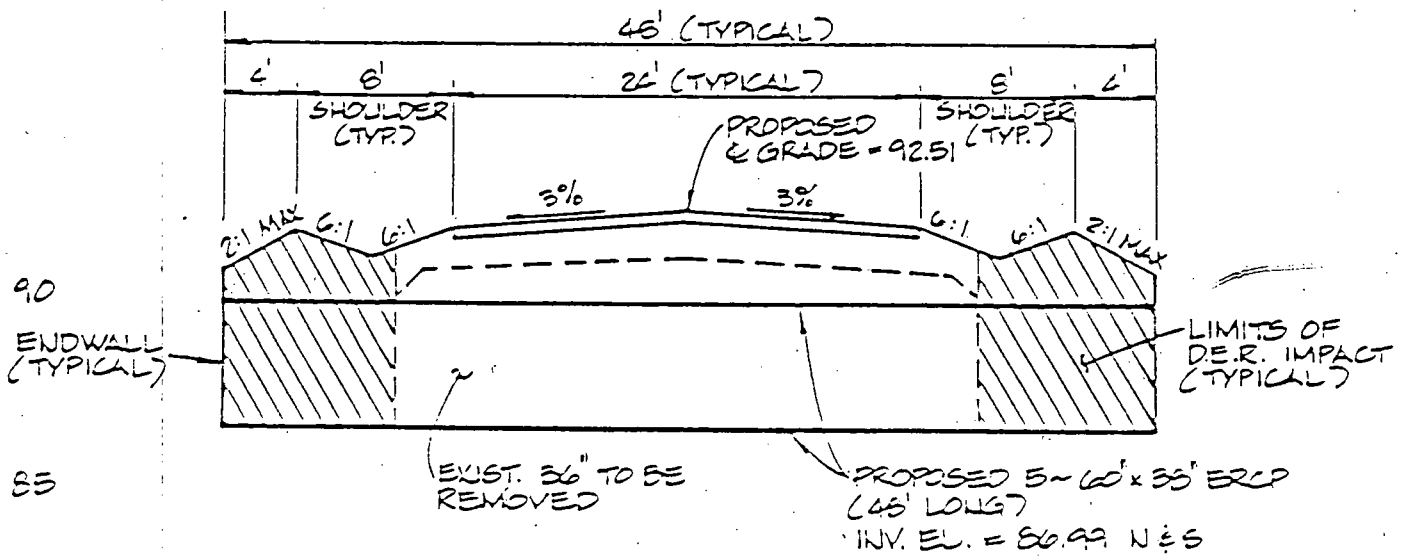
DER

Signature



STA. 49 + 03

NORTHEAST DISTRICT
RECEIVED
 JUL 16 1990
REGISTERED
 DER-JACKSONVILLE



STA. 42 + 87

7-14-90 ADDED X-SECT'S PER DER.

England-Thims
 & Miller, Inc.
 Consulting Engineers

CULVERT SECTIONS

TRAIL RIDGE LANDFILL
 TRAIL RIDGE LANDFILL, INC.

PROJ. NO.	89-113
DATE	JULY 14, 1990
SCALE	1" = 10'
DRAWING NO.	18

DER

Handwritten signature

EXIST.
TRAIL
ROAD

PROPOSED
& GRADE = 94.01

90

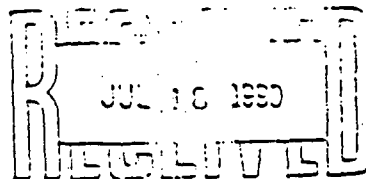
PROPOSED 15" RCP
INV. EL. = 88.70

EXIST. 24" TO BE REMOVED

85

STA. 76 + 70

NORTHEAST CORNER OF

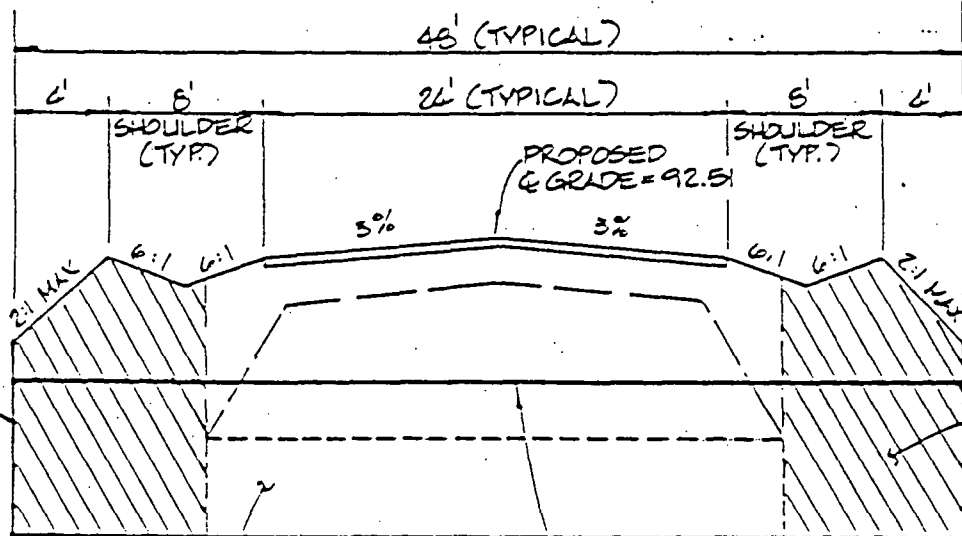


DER-JACKSONVILLE

ENDWALL
(TYPICAL)

90

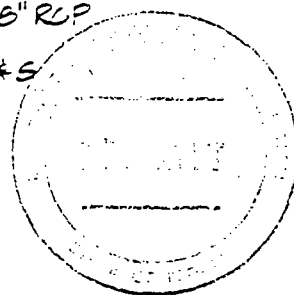
85



EXIST. 30" TO BE
REMOVED

PROPOSED DER 48" RCP
(48' LONG)
INV. EL. = 84.97 N&S

STA. 59 + 04



7-16-90 ADDED X-SECT'S PER D.E.R.

England-Thims
& Miller, Inc.
Consulting & Design Engineers

CULVERT SECTIONS

TRAIL RIDGE LANDFILL

TRAIL RIDGE LANDFILL, INC.

PROJ. NO. 89-113

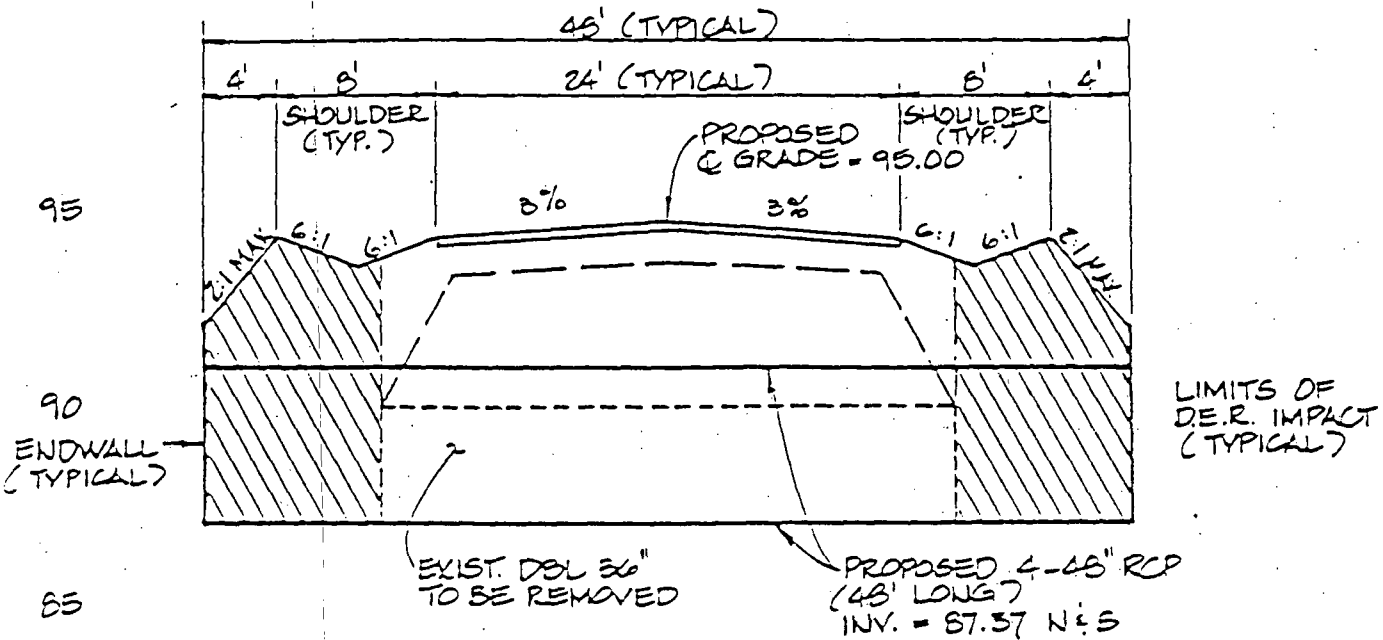
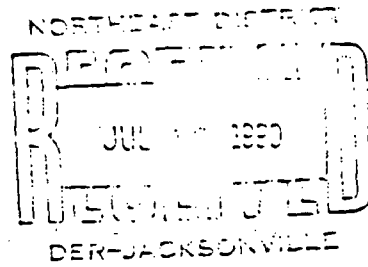
DATE JULY 14, 1990

SCALE 1"=10'

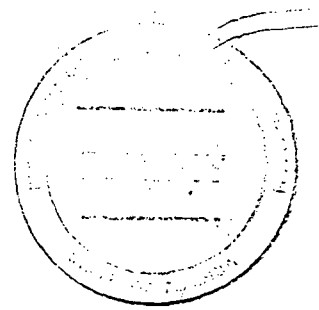
DRAWING NO. 20

DER

Handwritten signature



STA. 85 + 00



7-14-90 ADDED X-SECT.'S PER D.E.R.

England-Thims
 & Miller, Inc.

CULVERT SECTIONS

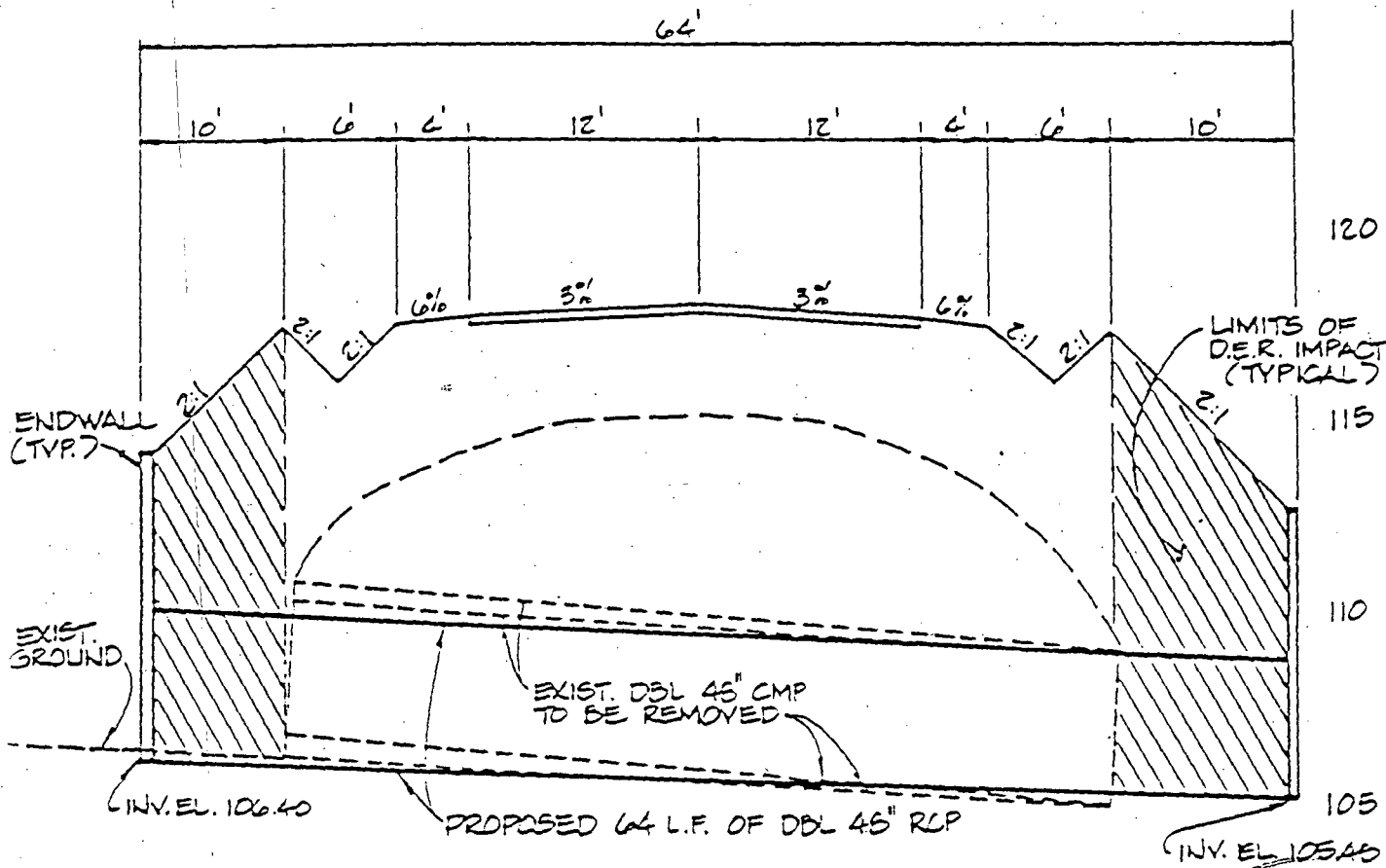
TRAIL RIDGE LANDFILL
 TRAIL RIDGE LANDFILL, INC.

PROJ. NO. 89-113
 DATE JULY 14, 1990
 SCALE 1" 10'
 DRAWING NO. 21

DER

Handwritten signature/initials

NORTHEAST DISTRICT
 JUL 14 1990
 DER-JACKSONVILLE



ROAD CROSSING BETWEEN CLASS I & CLASS III



7-14-90 ADDED X-SECTIONS PER D.E.R.

England, Thimms
 & Miller, Inc.

CULVERT SECTIONS
 TRAIL RIDGE LANDFILL
 TRAIL RIDGE LANDFILL, INC.

PROJ. NO. 29-113
 DATE JULY 14, 1990
 SCALE 1" 10'
 DRAWING NO. 22

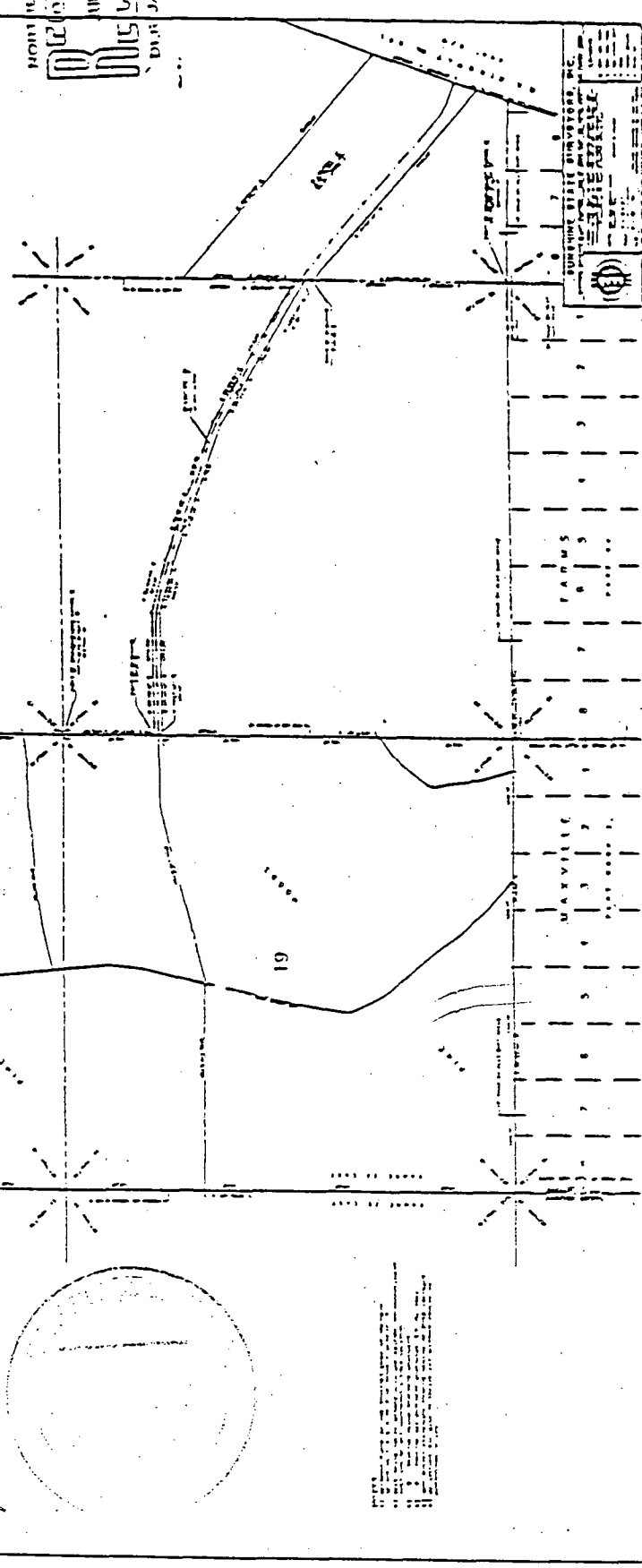
DER

MAP SHOWING BOUNDARY SURVEY OF :

A PORTION OF SECTIONS 17, 18 AND 20
TOWNSHIP 20 NORTH RANGE 15 EAST
JACKSONVILLE, DUVAL COUNTY, FLORIDA.
BEING MORE PARTICULARLY DESCRIBED BELOW

SECTION 17

SECTION 18



NOTICE
JUL 13 1900
JACKSONVILLE
DUVAL COUNTY
FLORIDA

DUVAL COUNTY SURVEYOR
JACKSONVILLE, FLORIDA

TRAIL RIDGE LANDFILL WETLAND IMPACTS AND MITIGATION PLAN

I. INTRODUCTION

Waste Management, Inc. is proposing the development of Trail Ridge Landfill in western Duval County (Figure 1). Of the approximately 560 wetland acres occurring on the property, only 4.44 acres of relatively low quality wetlands would be impacted, (refer to Trail Ridge Landfill Wetlands Assessment Report. Wetlands impacted by jurisdiction are Corps of Engineers, 4.44 acres; St. Johns River Water Management District, 3.17 acres; and Florida Department of Environmental Regulation, 1.61 acres. To offset the wetland impacts, conversion of 4.76 acres of uplands into high quality wetlands would occur as mitigation.

The following report provides a general overview of the property, a detailed description of the wetland impacts, and the plan for mitigation creation.

II. SITE DESCRIPTION

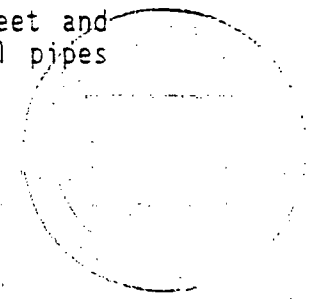
The tract consists of approximately 1,280 acres in western Duval County between U.S. 301 and the Baker County line. The land was previously owned by the Gilman Paper Company and has been intensively managed for pulpwood. The property is surrounded on all sides by forest land. A network of unpaved logging roads exists throughout the property. The design plans produced by England, Thims & Miller, Inc., propose the development of separate Class I and Class III landfill cells along with two stormwater ponds/borrow pits, and the widening and improvement of the existing, dirt roads.

III. WETLAND IMPACTS

Development of this site as a landfill would involve 4.44 acres of wetland impacts, the majority of which (2.54 acres) would occur as a result of filling portions of roadside ditches and swales. The remainder of the impacts would consist of filling a 0.8-acre isolated, shallow, pine/cypress wetland, 0.9 acre of bay/pine seepage slope and 0.20 acre of wetland pine plantation. Except for these 4.44 acres of impact, the remaining wetlands will not be disturbed.

A. Road Impacts

The majority of the wetland impacts would occur as a result of widening an existing logging road. This road extends for 1.6 miles from U.S. 301 to the edge of the property and would serve as the main access to the landfill. From the eastern property line it continues for an additional 0.4 mile to the Class I landfill cell. The road is currently an unpaved logging road. It will be widened to 24 feet and paved with asphalt. In addition, the existing corrugated metal pipes under the road will be replaced with reinforced concrete pipes.



From U.S. 30 entrance road extends for approximately 3,000± feet through a pine plantation. The vegetation here consists of rows of planted slash pine (Pinus ellioti) with an understory and ground cover of saw palmetto (Serenoa repens), gallberry (Ilex glabra), and bracken fern (Pteridium aquilinum). The roadside swales here average 4 to 5 feet across and 1 to 2 feet deep. The swales are considered jurisdictional wetlands only where they intersect adjacent wetlands.

Within the upland pine plantation there are ten depressional, wetland areas. The eastern three areas are jurisdictional only by the U.S. Army Corps of Engineers (CE). The road widening will entail impacting 0.24 acres of these three wetlands. The dominant plant species are not on the state's list of wetland plants. The dominant vegetation consists of blackberry (Rubus cuneifolius), Amphicarpum muhlenbergianum, wiregrass (Aristida stricta), and panic grass (Dicanthelium sp.). The remaining seven wetland areas are wholly owned and isolated. Six of these areas are each less than 0.5 acres in size. The vegetation in all seven areas consists of St. John's wort (Hypericum fasciculatum), yellow-eyed grass (Xyris sp.) and red root (Lachnanthes caroliniana). The road widening will entail impacting 0.17 acres (CE/SJRWMD) of swales in these seven depressional areas.

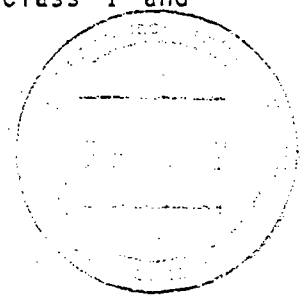
From the edge of the pine plantation the entrance road continues for 3,000± feet through a pine swamp known locally as Hell's Bay. There are ditches along both sides of the road all the way across the swamp. The ditches measure approximately 8 feet across and 2-3 feet deep. Under normal conditions the ditches contain at least 12 inches of water. The vegetation within the ditches consists of pickerelweed (Pontederia cordata), water lily (Nymphaea odorata), and bladderwort (Utricularia sp.). The existing ditches serve to drain the adjacent swamp. During the past 12 months, standing water has not been observed in the swamp on either side of the road.

The vegetation of the pine swamp south of the road consists of a canopy of slash pine mixed with scattered red maple (Acer rubrum), tupelo (Nyssa sylvatica var. biflora), and cypress (Taxodium distichum). The swamp on the north side of the road has been recently clear-cut. The dominant ground cover vegetation there now includes such species as sedges (Cyperus spp.), beak rushes (Rhynchospora spp.), and cinnamon fern (Osmunda cinnamomea).

The entrance road across the swamp will be widened approximately 10 feet on each side. This will result in filling most of the roadside ditches (1.24 acres SJRWMD/DER/CE and 0.17 acres CE only).

From the western edge of Hell's Bay, the entrance road continues into the property to the Class I landfill cell. Wetland impacts due to this portion of roadwork include filling wetland pine plantation (0.65 acres CE) and a narrow slough (0.07 acres DER/SJRWMD/CE).

Widening West Fiftone Road would entail filling 0.3 acres (DER/SJRWMD/CE) of bay/pine seepage wetlands between the Class I and Class III landfill cells.



Two wetland impacts would occur as a result of construction of the Class I landfill cell. These impacts include filling an isolated cypress/pine depressional wetland and a narrow finger of bay/pine seepage slope. The cypress/pine wetland is an isolated, shallow, depressional area comprising 0.80 acres (SJRWMD/CE). Following prolonged heavy rains, it will hold some standing water (<1 foot); however, it is dry during much of the year. The vegetation within the cypress/pine wetland consists of a canopy of slash pine and cypress with an understory of scattered myrtle-leaved holly (*Ilex myrtifolia*) and a ground cover of black-stemmed chain fern (*Woodwardia virginica*).

The bay/pine wetland consists of 0.60 acres (SJRWMD/CE) and occurs as a narrow finger of seepage slope along the north side of West Fiftone Road. The vegetation here consists of a canopy of tupelo, slash pine and various bay trees with a ground cover of fetterbush (*Lyonia lucida*) and sweet gallberry (*Ilex coriacea*).

Wetland impacts will be mitigated with 4.76 acres of wetland creation. An area of upland pine plantation surrounded by a cypress/gum swamp and a pine/bay wetland will be scraped down to form two depressional areas at or below the water table.

IV. MITIGATION PLAN

A. Existing Site Conditions

The mitigation site is located in the northeastern portion of the property in an area bounded by Hat Road to the north, West Fiftone Road to the west, Sellers Road to the south, and the property line to the east (Figure 2). The site is characterized as an upland finger surrounded by forested wetlands on three sides.

1. Elevations

The U.S. Geological Survey Map (Maxville, Florida, 1970) indicates that the elevations within the mitigation site range from +95 to +100 feet N.G.V.D. To more accurately describe the area, a site-specific topographic survey was conducted by Sunshine State Surveyors. Elevations were found to range from 100.8 feet on the upland ridge to the south to 94.7 on the wetland fringe to the north. The site slopes downhill gradually to the east.

2. Soils

The Soil Conservation Service (Soil Survey of Duval County, 1978) indicates that the upland soil of the mitigation area is Leon fine sand and the wetland soil is Wesconnett fine sand.

Leon fine sand is a poorly drained soil typically found in broad pine flatwood areas. Under natural conditions this soil has a water table at a depth of less than 10 inches for two to four months and at a depth of 10 to 30 inches for two to eight months during most years. There is often a weakly cemented layer about 18 inches below the surface.

Wesconnett fine sand is a very poorly drained soil in shallow depressions and large drainageways. Under natural conditions this soil has a water table at a depth of 0 to 10 inches, or the soil is covered by water for six to twelve months during most years.

3. Hydrology

There is a ditch that extends across a section of the mitigation site. This section of upland-cut ditch is less than 35 square feet in cross section and contains less than 3 feet of standing water at the point where it intersects the DER wetland line. The ditch averages 18 to 20 feet across from top-of-bank to top-of-bank and 12 to 18 inches deep. Water periodically flows east through the ditch from the tupelo swamp to the wet pine plantation. During much of the year, the ditch appears to be dry.

4. Vegetation

The upland pine plantation is characterized by a 15 to 20 year old row-planted slash pine that is approaching canopy closure. The understory and ground cover mostly consist of gallberry, saw palmetto, bracken fern, huckleberry (Vaccinium sp.), broomsedge (Andropogon sp.), wire grass (Aristida stricta), and Aronia arbutifolia.

The wet pine plantation to the east has been clear-cut, bedded, and row-planted with slash pine about 15 to 20 years ago. Logging debris and soil have been pushed into windrows. Other vegetation in this area include scattered tupelo, sweet bay (Magnolia virginiana), loblolly bay (Gordonia lasianthus), red maple, wax myrtle (Myrica cerifera), possumhaw viburnum (Viburnum nudum), maidencane (Panicum hemitomon), panicum (Dichanthelium sp.), bluestem (Andropogon sp.), and Asiatic coinwork (Centella asiatica).

The wetland to the west and south is a moderately deep cypress-hardwood swamp dominated by tupelo and cypress and scattered sweetbay, swamp bay (Persea palustris), and red maple. The dominant shrub is fetterbush with some Virginia willow (Itea virginica) and wax myrtle. Royal fern (Osmunda regalis), cinnamon fern, net-leaved chain fern (Woodwardia areolata), and sphagnum moss (sphagnum sp.) are also found.

Wetland vegetation within the ditch itself consists of rush (Juncus sp.), Dicanthelium sp., yellow-eyed grass (Xyris sp.), buttonbush (Cephalanthus occidentalis), sphagnum moss, and some slash pine. Along the edge of the ditch or berm is wild grape (Vitis sp.), saw palmetto, red chokeberry (Aronia arbutifolia), sweet gallberry, wax myrtle, black stemmed chain fern, poison summac (Toxicodendron vernix) and scattered tupelo, swamp bay, and sweet bay.



B. Proposed Conditions

1. Elevations

The elevation of the wetland creation area will range from +99 feet at the western edge to +94.5 feet near the eastern end. It is proposed that the existing rim of the tupelo swamp be maintained (+99 feet) to prevent draining it. The mitigation area will be scraped down to form two shallow depressional bowls each with a transitional and submerged zone (Figure 5). Each transitional zone will be scraped down to the average water table to establish saturated soil conditions. Each submerged zone will be scraped down to a maximum of 1 foot below the average water table to establish areas of intermittent/seasonal standing water. The edge of the eastern depressional bowl will approach the elevation of the wet pine plantation (+95 feet).

2. Soils

The mitigation basins area will be over-excavated approximately 0.5 foot and backfilled with the upper soil layer from the impacted wetlands. This mulch will provide a source of propagules (seeds, roots, tubers, etc.) that will help establish naturally occurring wetland ground cover vegetation.

3. Hydrology

The two depressional creations within the mitigation area are designed to be contiguous with the surrounding wetland systems, thus promoting regular and periodic inundation of the site. Fluctuations in the water table are normal and are expected to cause the soils in the mitigation area to be periodically saturated or flooded with water.

The upland-cut portion of the drainage ditch will be realigned. It will curve to the north and outfall into the western basin. Water coming through the ditch will be allowed to sheet flow across the transition zone into the submerged zone.

4. Vegetation

The design of the mitigation area is to create a cypress/hardwood swamp. To accomplish this a variety of wetland tree and shrub species will be planted. The trees will average 4 to 6 feet in height in three-gallon containers to be planted on 10-foot centers or approximately 440 trees/acre. The shrubs will average 2 to 4 feet in height in one-gallon containers to be planted along all edges. Throughout the transitional zones, transitional wetland species will be planted, such as:

red maple (Acer rubrum)
sweetgum (Liquidambar styraciflua)
laurel oak (Quercus laurifolia)
wax myrtle (Myrica cerifera)
fetterbush (Lyonia lucida)

The deeper, submerged zones will be planted with such wetland species as:

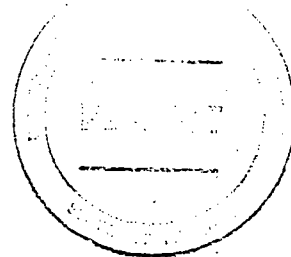
cypress (Taxodium distichum)
tupelo (Nyssa sylvatica var. biflora)
sweet bay (Magnolia virginiana)
button bush (Cephalanthus occidentalis)
Virginia willow (Itea virginica)

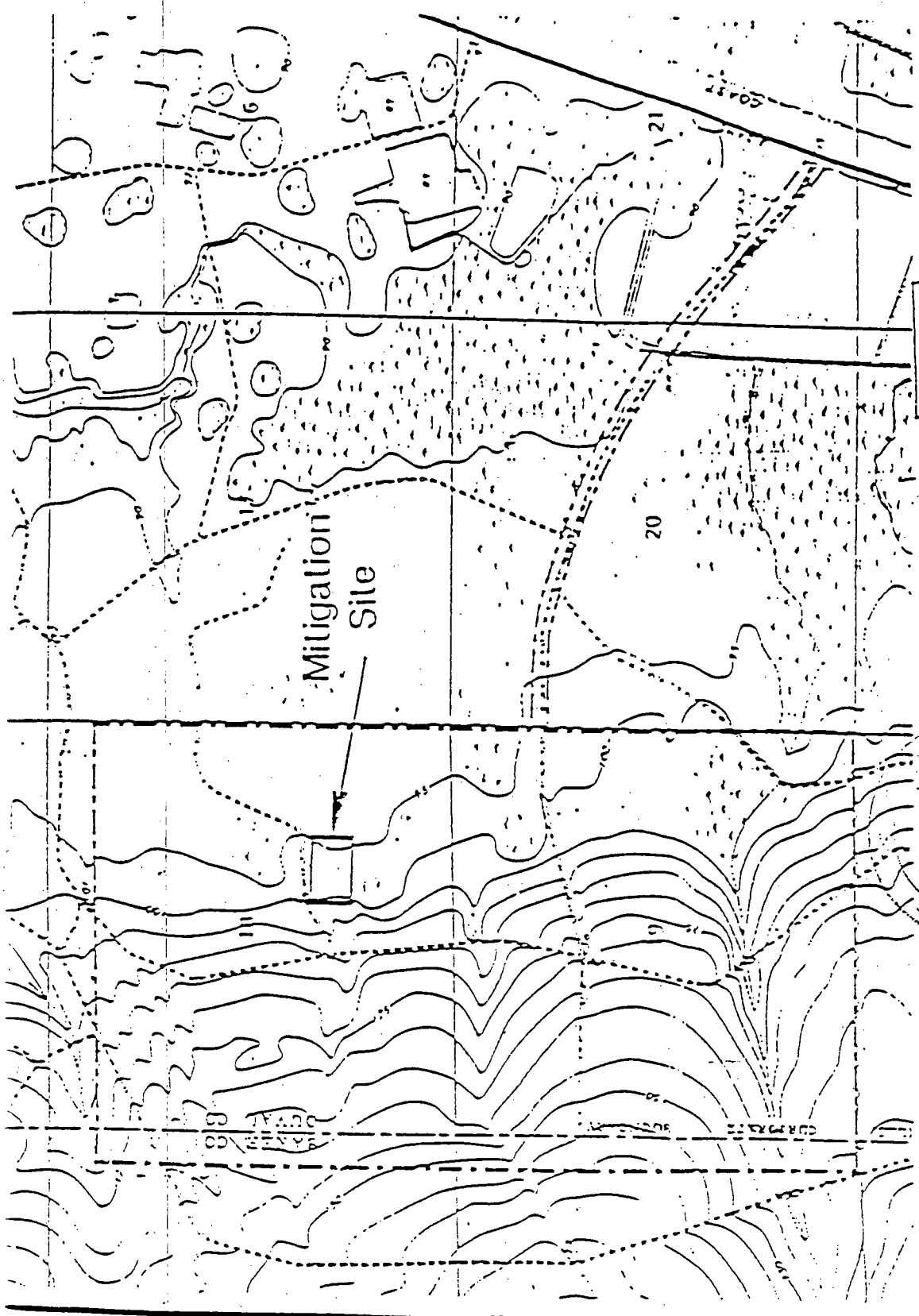
WETLAND CREATION RATIO

<u>Jurisdiction</u>	<u>Wetland Impacted</u>	<u>Wetlands Created</u>	<u>Ratio</u>
Corps of Engineers	4.44 AC	4.76 AC	1.07:1
St. Johns River Water Management District	3.17 AC	4.76 AC	1.50:1
Florida Department of Environmental Regulation	1.61 AC	4.76 AC	2.8:1

5. Maintenance and Monitoring

The creation area will be inspected every six months for two years following planting. Monitoring reports will be forwarded to the appropriate regulatory agencies. Standard mitigation requirements will be met, such as ensuring 75 percent survival of plantings. Routine maintenance will be performed as necessary to control nuisance weed species and to ensure success of the planting.





Proj No. 89-395

Date JUNE 11, 1990

Scale 1" = 2000'

Drawing No. 13

JUN 13 1990

Figure 1 Location Map

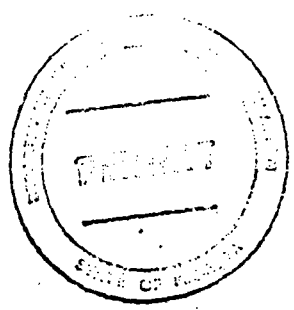
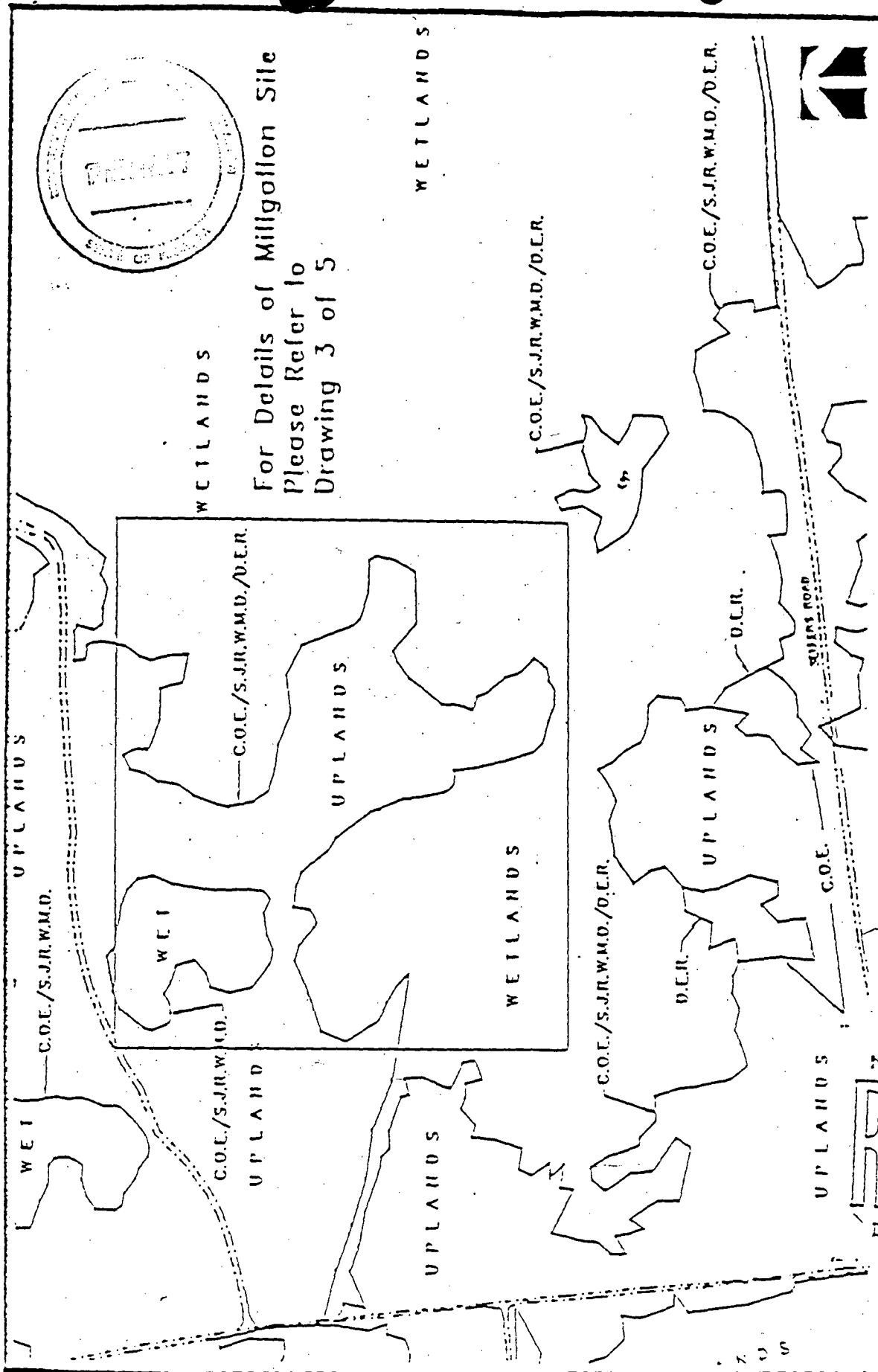
Trail Ridge Landfill

Mitigation Plan

ENVIRONMENTAL
SERVICES, INC.

DER

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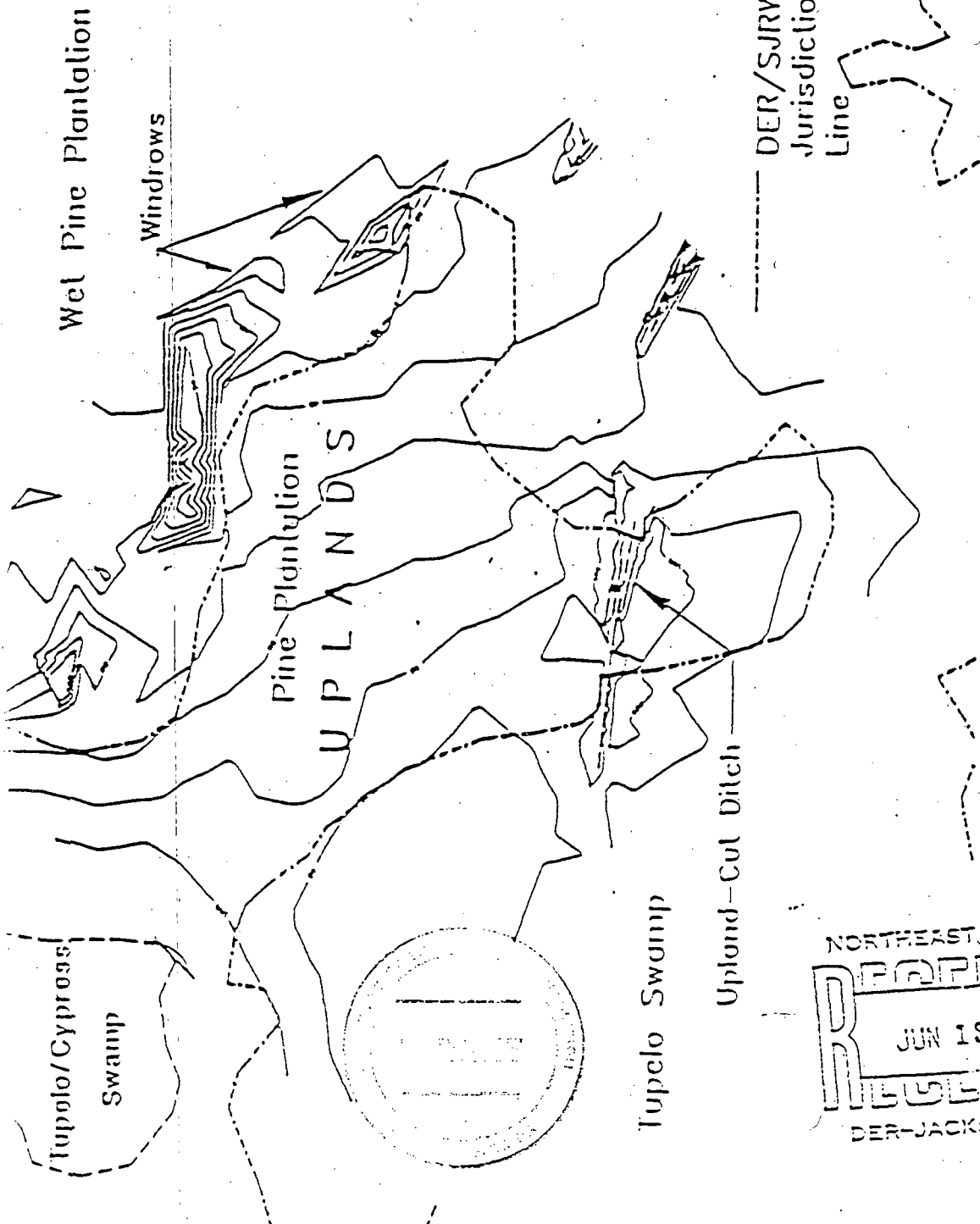
For Details of Millgallon Site
Please Refer to
Drawing 3 of 5

Proj No.	89-395
Date	JUNE 11, 1990
Scale	1"=300'
Drawing No.	14

Figure 2 Millgallon Site Location
Trail Ridge Landfill
Mitigation Plan

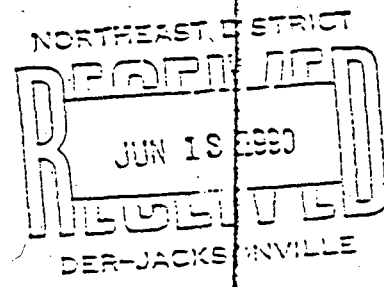
ENVIRONMENTAL
SERVICES, INC.
JUN 13 1990
FORT JACKSON
SOUTH CAROLINA

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6-11-90



Proj No.	09-395
Date	JUNE 11, 1990
Scale	1"=150'
Drawing No.	15

Figure 3 Existing Conditions
Trail Ridge Landfill
Mitigation Plan



ENVIRONMENTAL
SERVICES, INC.

DER

Signature
6-11-90

Wet Pine Plantation

Transitional Zone
3.0 acres

Submerged Zone
1.76 acres

DER/SJRW
Jurisdiction
Line

Tupelo Swamp

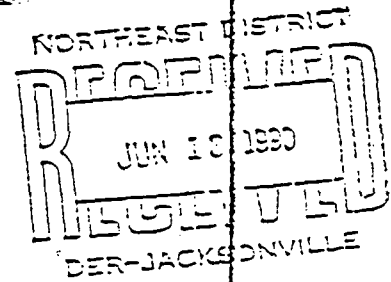


Figure 4 Proposed Conditions
Trail Ridge Landfill
Mitigation Plan

Proj No. 89-395

Date JUNE 11, 1990

Scale 1"=150'

Drawing No. 16

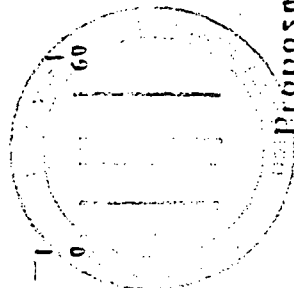
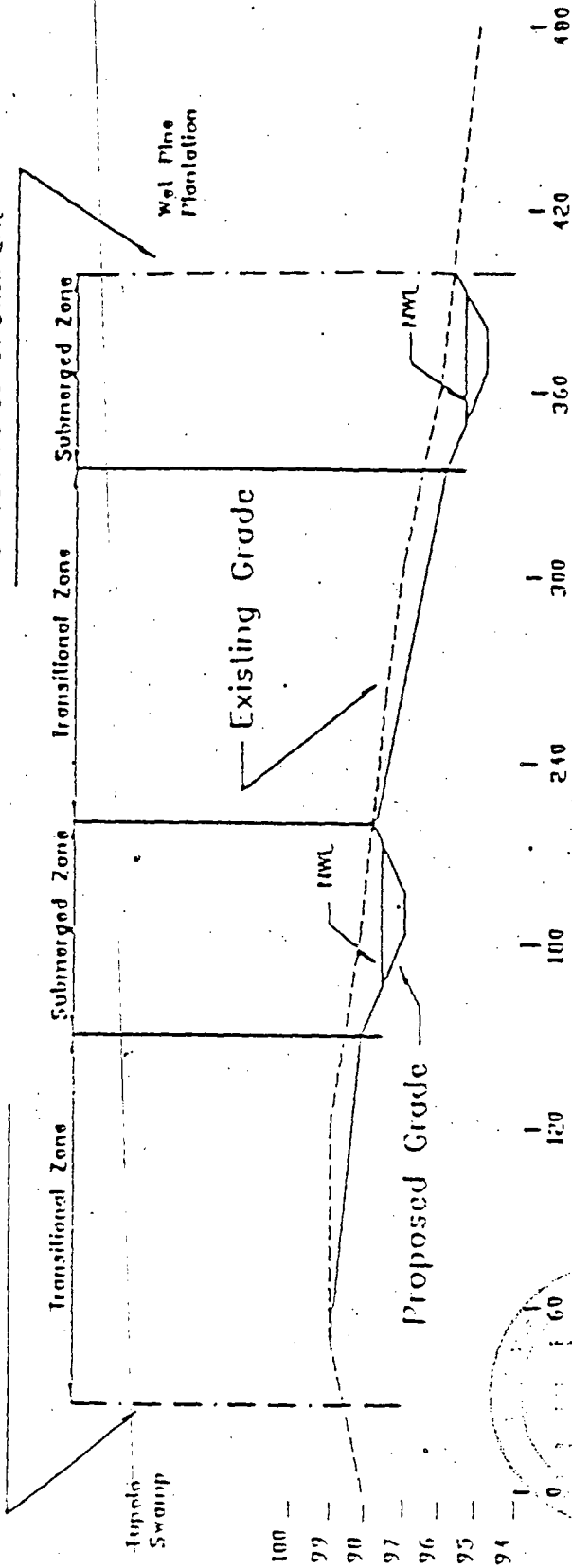
ENVIRONMENTAL
SERVICES, INC.

DER

Germel
6-11-90

DER/SURVIV Jurisdiction Line

DER/SURVIV Jurisdiction Line



Proposed Planting Schedule

Transitional Zone

Red Maple
Sweetgum
Live Oak
White Myrtle
Fetterbush

Submerged Zone

Cypress
Tupelo
Sweet Bay
Buttonbush
Virginia Willow

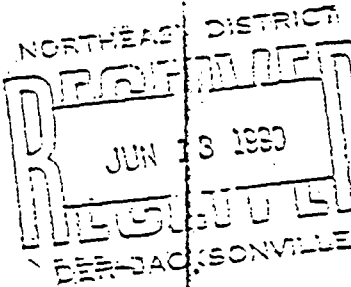
Figure 5 Mitigation Cross-Section
Trail Ridge Landfill
Mitigation Plan

Proj No. 89-395

Date JUNE 11, 1980

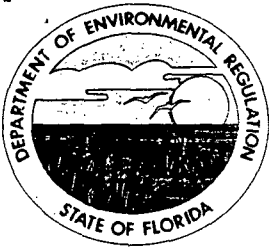
Scale as shown

Drawing No. 17



ENVIRONMENTAL
SERVICES, INC.

DER



Florida Department of Environmental Regulation

Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-2400

Bob Martinez, Governor

Dale Twachtmann, Secretary

John Shearer, Assistant Secretary

November 16, 1990

Trail Ridge Landfill, Inc.
c/o Douglas C. Miller, P.E.
England, Thims & Miller, Inc.
3131 St. Johns Bluff Road South
Jacksonville, Florida 32216

Dear Mr. Miller:

Please be advised that the Department of Environmental Regulation Office of General Counsel has received a petition for administrative hearing, pursuant to Section 120.57, Florida Statutes, challenging the Department's Intent to Issue permit application No. 16-182118-2. Therefore, the Department's action on this matter is proposed agency action only, and no permit has been issued. Accordingly, no action may be taken based on the above permit application, until the Department issues a Final Order either issuing or denying the above permit, pursuant to Chapter 403, Florida Statutes. As permit applicant, you must demonstrate entitlement to the permit issuance in any administrative proceeding held pursuant to the filing of the petition.

The Office of General Counsel, located at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400, (904) 488-9730, will notify you whether a formal administrative hearing will be conducted regarding your permit application. The case has been assigned OGC 90-1635. Please send all correspondence to the undersigned attorney at the Office of General Counsel in Tallahassee. Thank you for your cooperation.

Sincerely,


WILLIAM H. CONGDON
Assistant General Counsel

WHC/il



OGC FILE CLOSING FORM

FITZ MN
CF M⁴ ECR

Deputy General Counsel

Carol Frothman

Attorney

Bill Congdon

Date

10/19/90

OGC File #

90-1196

Case Style

Waste Management, Inc. of Florida
N. DER

The above-referenced OGC file is being closed and sent to archives for storage. See below for summary of final disposition.

ENFORCEMENT CASE

- ☐ Draft Consent Order received, case resolved informally.
- ☐ Consent Order executed, all conditions met.
- ☐ Draft Notice of Violation received, case resolved informally.
- ☐ Notice of Violation issued, Final Order filed, all conditions met.
- ☐ Circuit Court action, document processed, all conditions met.
- ☐ Other (please specify) _____

PERMITTING CASE: Permit Application # *MS16-164100*

Final Permit Status: ☐ Issued ☐ Denied ☐ Withdrawn
Date: _____

- ☐ Request for Extension of Time - No Petition was Filed.
- ☐ Request for Extension of Time - Petition Filed.
Final Order Filed (date) _____
- ☒ Petition for Hearing Filed.
Final Order Filed (date) *8/27/90*
- ☐ Appellate Court action, document processed, all conditions met.
- ☐ Other (please specify) _____

OTHER CASES (RULEMAKING, PERSONNEL, ETC.)

Final Disposition _____

cc: District Manager

NED

March 1990



England-Thims & Miller, Inc.

Consulting & Design Engineers
3131 St. Johns Bluff Road So. Jacksonville, FL 32216
904-642-8990

PRINCIPALS

James E. England, P.E., President
Robert E. Thims, V.Pres., Sec.
Douglas C. Miller, P.E., V. Pres.
N. Hugh Mathews, P.E., V. Pres.

October 11, 1990

Mrs. Mary C. Nogas, P.E.
Supervisor, Solid Waste
Department of Environmental Regulation
7825 Baymeadows Way
Suite 200
Jacksonville, Florida 32256-7577

Reference: Trail Ridge Landfill Plan "A"
FDER No. 184444
ET&M NO. E89-113-09

Dear Mrs. Nogas:

Pursuant to our meeting of October 10, 1990, please find enclosed herewith additional information concerning the above referenced permit application.

1. GAS VENTING LAYOUT

A gas survey will be conducted prior to the installation of the gas wells and the number and spacing of said wells shall be modified, if required, based upon the results of that survey.

2. H.E.L.P. ANALYSIS

The calculations for the Leakage Rate and Depth of Flow in the LDS are enclosed. These calculations indicate the LDS does not become saturated while conveying the leakage rate of 100 GPAD. As suggested, we are providing as supplemental data, revised H.E.L.P. model runs for your analysis.

I trust this additional information is satisfactory and completes the Trail Ridge Landfill Plan "A" application file.

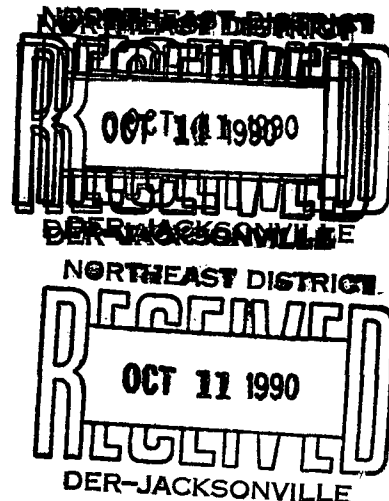
If I can be of further service, please do not hesitate to contact me.

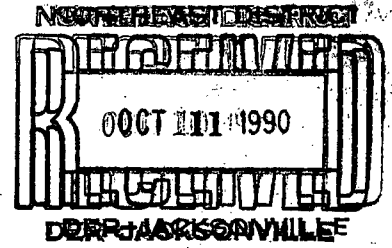
Sincerely,

ENGLAND, THIMS & MILLER, INC.


Douglas C. Miller, P.E.
Vice President

DCM:kl





SUPPLEMENTAL DATA

LINER LEAKAGE FRACTION
= 0.00 FOR SECONDARY
LINER

TRAILRIDGE LANDFILL - LINER ANALYSIS
JACKSONVILLE, DUVAL COUNTY, FLORIDA
E39-113-9 OCTOBER 9, 1990

BARE GROUND

LAYER 1

VERTICAL PERCOLATION LAYER

THICKNESS	=	6.00 INCHES
POROSITY	=	0.4570 VOL/VOL
FIELD CAPACITY	=	0.1309 VOL/VOL
WILTING POINT	=	0.0580 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.1309 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	0.0010000000475 CM/SEC

LAYER 2

VERTICAL PERCOLATION LAYER

THICKNESS	=	72.00 INCHES
POROSITY	=	0.5200 VOL/VOL
FIELD CAPACITY	=	0.2942 VOL/VOL
WILTING POINT	=	0.1400 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.2942 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	0.0001999999949 CM/SEC

LAYER 3

VERTICAL PERCOLATION LAYER

THICKNESS	=	24.00 INCHES
POROSITY	=	0.4570 VOL/VOL
FIELD CAPACITY	=	0.1309 VOL/VOL
WILTING POINT	=	0.0580 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.1309 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	0.0010000000475 CM/SEC

LAYER 4

LATERAL DRAINAGE LAYER

THICKNESS	=	0.22 INCHES
POROSITY	=	0.7000 VOL/VOL
FIELD CAPACITY	=	0.0450 VOL/VOL
WILTING POINT	=	0.0200 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0225 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	19.6849994659424 CM/SEC
SLOPE	=	2.00 PERCENT
DRAINAGE LENGTH	=	150.0 FEET

LAYER 5

BARRIER SOIL LINER WITH FLEXIBLE MEMBRANE LINER

THICKNESS	=	0.06 INCHES
POROSITY	=	0.7000 VOL/VOL
FIELD CAPACITY	=	0.0450 VOL/VOL
WILTING POINT	=	0.0200 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0225 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	19.6849994659424 CM/SEC
LINER LEAKAGE FRACTION	=	0.00001000

LAYER 6

LATERAL DRAINAGE LAYER

THICKNESS	=	0.22 INCHES
POROSITY	=	0.7000 VOL/VOL
FIELD CAPACITY	=	0.0450 VOL/VOL
WILTING POINT	=	0.0200 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0450 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	19.6849994659424 CM/SEC
SLOPE	=	2.00 PERCENT
DRAINAGE LENGTH	=	150.0 FEET

LAYER 7

BARRIER SOIL LINER WITH FLEXIBLE MEMBRANE LINER

THICKNESS	=	0.25 INCHES
POROSITY	=	0.4000 VOL/VOL
FIELD CAPACITY	=	0.3560 VOL/VOL
WILTING POINT	=	0.2899 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0225 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	0.0000000100000 CM/SEC
LINER LEAKAGE FRACTION	=	0.00000000

LAYER 8

THICKNESS	=	6.00 INCHES
POROSITY	=	0.4750 VOL/VOL
FIELD CAPACITY	=	0.3777 VOL/VOL
WILTING POINT	=	0.2648 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.3777 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	0.0000170000003 CM/SEC

```

SCS RUNOFF CURVE NUMBER      =      93.31
TOTAL AREA OF COVER          =      435600. SQ FT
EVAPORATIVE ZONE DEPTH       =      8.00 INCHES
POTENTIAL RUNOFF FRACTION    =      0.000000
UPPER LIMIT VEG. STORAGE     =      3.7820 INCHES
INITIAL VEG. STORAGE         =      1.3738 INCHES
SOIL WATER CONTENT INITIALIZED BY USER.

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SYNTHETIC RAINFALL WITH SYNTHETIC DAILY TEMPERATURES AND
SOLAR RADIATION FOR -- JACKSONVILLE FLORIDA

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MAXIMUM LEAF AREA INDEX          = 0.00
START OF GROWING SEASON (JULIAN DATE) = 37
END OF GROWING SEASON (JULIAN DATE)   = 4

```

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
-----	-----	-----	-----	-----	-----
55.20	55.10	61.30	67.70	74.10	79.00
81.30	81.00	78.20	69.50	60.80	54.80

AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1 THROUGH 5

PRECIPITATION

TOTALS	2.60	3.54	2.57	2.82	3.68	4.36
	7.46	9.03	8.11	2.39	2.64	3.05
STD. DEVIATIONS	1.70	2.18	2.39	2.31	2.48	2.07
	3.02	1.53	1.98	1.69	1.98	1.40

TOTALS	0.000	0.000	0.000	0.000	0.000	0.000
--------	-------	-------	-------	-------	-------	-------

	0.000	0.000	0.000	0.000	0.000	0.000
STD.. DEVIATIONS	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000

EVAPOTRANSPIRATION

TOTALS	1.584	2.228	2.159	1.517	2.630	2.984
	4.262	4.202	4.082	2.439	1.658	2.049

STD. DEVIATIONS	0.618	0.683	0.886	1.101	1.370	0.583
	1.246	1.479	0.498	0.907	0.735	0.563

LATERAL DRAINAGE FROM LAYER 4

TOTALS	0.0184	0.0142	0.0237	0.0191	0.0205	0.0211
	0.0258	0.0745	0.2006	0.0697	0.0220	0.0231

STD. DEVIATIONS	0.0212	0.0097	0.0174	0.0234	0.0151	0.0139
	0.0179	0.0921	0.1178	0.0210	0.0060	0.0172

PERCOLATION FROM LAYER 5

TOTALS	1.0091	0.8795	1.1765	1.0123	1.1101	1.1358
	1.2812	2.2383	4.2301	2.4424	1.3091	1.2969

STD. DEVIATIONS	0.7923	0.5159	0.8016	0.8237	0.6925	0.6533
	0.7455	1.6668	1.6828	0.4129	0.1767	0.5029

LATERAL DRAINAGE FROM LAYER 6

TOTALS	1.0108	0.8778	1.1969	1.0133	1.1036	1.1361
	1.2784	2.2338	4.2290	2.4490	1.3112	1.2960

STD. DEVIATIONS	0.8004	0.5141	0.8024	0.8244	0.6914	0.6538
	0.7453	1.6657	1.6799	0.4151	0.1768	0.4999

PERCOLATION FROM LAYER 7

TOTALS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

PERCOLATION FROM LAYER 8

TOTALS	0.0148	0.0090	0.0077	0.0062	0.0056	0.0048
	0.0045	0.0041	0.0037	0.0036	0.0032	0.0032

STD. DEVIATIONS	0.0254	0.0135	0.0105	0.0076	0.0062	0.0050
	0.0043	0.0037	0.0031	0.0029	0.0025	0.0023

AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1 THROUGH 5

	(INCHES)	(CU. FT.)	PERCENT
PRECIPITATION	52.26 (6.568)	1997110.	100.00

RUNOFF	0.000 (0.000)	0	0.00
--------	----------------	---	------

EVAPOTRANSPIRATION	31.795 (0.214)	1154165.	60.84
LATERAL DRAINAGE FROM LAYER 4	0.5327 (0.2196)	19338.	1.02
PERCOLATION FROM LAYER 5	19.1414 (6.3925)	694833.	36.63
LATERAL DRAINAGE FROM LAYER 6	19.1408 (6.3982)	694810.	36.62
PERCOLATION FROM LAYER 7	0.0000 (6.3982)	0.	0.00
PERCOLATION FROM LAYER 8	0.0702 (0.0867)	2548.	0.13
CHANGE IN WATER STORAGE	0.723 (3.989)	26249.	1.39

PEAK DAILY VALUES FOR YEARS 1 THROUGH 5

	(INCHES)	(CU. FT.)
PRECIPITATION	4.79	173877.0
RUNOFF	0.000	0.0
LATERAL DRAINAGE FROM LAYER 4	0.0266	967.1
PERCOLATION FROM LAYER 5	0.3608	13097.1
HEAD ON LAYER 5	0.1	
LATERAL DRAINAGE FROM LAYER 6	0.3586	13019.5
PERCOLATION FROM LAYER 7	0.0000	0.0
HEAD ON LAYER 7	0.1	
PERCOLATION FROM LAYER 8	0.0027	97.6
SNOW WATER	0.00	0.0

MAXIMUM VEG. SOIL WATER (VOL/VOL) 0.4059

MINIMUM VEG. SOIL WATER (VOL/VOL) 0.0743

FINAL WATER STORAGE AT END OF YEAR 5

LAYER	(INCHES)	(VOL/VOL)
-------	----------	-----------

1	0.78	0.0634
---	------	--------

LINER LEAKAGE
FRACTION = 0.00
FOR SECONDARY
LINER

TRAILRIDGE LANDFILL - FINAL COVER ANALYSIS
JACKSONVILLE, DUVAL COUNTY, FLORIDA
E89-113-9 OCTOBER 11, 1990

FAIR GRASS

LAYER 1

VERTICAL PERCOLATION LAYER

THICKNESS	=	12.00 INCHES
POROSITY	=	0.4730 VOL/VOL
FIELD CAPACITY	=	0.2217 VOL/VOL
WILTING POINT	=	0.1043 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.4026 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	0.0015400000042 CM/SEC

LAYER 2

LATERAL DRAINAGE LAYER

THICKNESS	=	12.00 INCHES
POROSITY	=	0.4570 VOL/VOL
FIELD CAPACITY	=	0.1309 VOL/VOL
WILTING POINT	=	0.0580 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.4570 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	0.00100000000475 CM/SEC
SLOPE	=	2.00 PERCENT
DRAINAGE LENGTH	=	850.0 FEET

LAYER 3

BARRIER SOIL LINER

THICKNESS	=	12.00 INCHES
POROSITY	=	0.4300 VOL/VOL
FIELD CAPACITY	=	0.3663 VOL/VOL
WILTING POINT	=	0.2802 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.4300 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	0.0000001000000 CM/SEC

LAYER 4

VERTICAL PERCOLATION LAYER

THICKNESS = 12.00 INCHES
 POROSITY = 0.4570 VOL/VOL
 FIELD CAPACITY = 0.1309 VOL/VOL
 WILTING POINT = 0.0580 VOL/VOL
 INITIAL SOIL WATER CONTENT = 0.2020 VOL/VOL
 SATURATED HYDRAULIC CONDUCTIVITY = 0.0010000000475 CM/SEC

LAYER 5

VERTICAL PERCOLATION LAYER

THICKNESS = 1200.00 INCHES
 POROSITY = 0.5200 VOL/VOL
 FIELD CAPACITY = 0.2942 VOL/VOL
 WILTING POINT = 0.1400 VOL/VOL
 INITIAL SOIL WATER CONTENT = 0.2763 VOL/VOL
 SATURATED HYDRAULIC CONDUCTIVITY = 0.0001999999949 CM/SEC

LAYER 6

VERTICAL PERCOLATION LAYER

THICKNESS = 24.00 INCHES
 POROSITY = 0.4570 VOL/VOL
 FIELD CAPACITY = 0.1309 VOL/VOL
 WILTING POINT = 0.0580 VOL/VOL
 INITIAL SOIL WATER CONTENT = 0.1671 VOL/VOL
 SATURATED HYDRAULIC CONDUCTIVITY = 0.0010000000475 CM/SEC

LAYER 7

LATERAL DRAINAGE LAYER

THICKNESS = 0.22 INCHES
 POROSITY = 0.7000 VOL/VOL
 FIELD CAPACITY = 0.0450 VOL/VOL
 WILTING POINT = 0.0200 VOL/VOL
 INITIAL SOIL WATER CONTENT = 0.0457 VOL/VOL
 SATURATED HYDRAULIC CONDUCTIVITY = 19.6849994659424 CM/SEC
 SLOPE = 2.00 PERCENT
 DRAINAGE LENGTH = 150.0 FEET

LAYER 8

FIELD CAPACITY	=	0.0450 VOL/VOL
WILTING POINT	=	0.0200 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.7000 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	19.6849994659424 CM/SEC
LINER LEAKAGE FRACTION	=	0.00001000

LAYER 9

LATERAL DRAINAGE LAYER

THICKNESS	=	0.22 INCHES
POROSITY	=	0.7000 VOL/VOL
FIELD CAPACITY	=	0.0450 VOL/VOL
WILTING POINT	=	0.0200 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0457 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	17.6849994659424 CM/SEC
SLOPE	=	2.00 PERCENT
DRAINAGE LENGTH	=	150.0 FEET

LAYER 10

BARRIER SOIL LINER WITH FLEXIBLE MEMBRANE LINER

THICKNESS	=	0.25 INCHES
POROSITY	=	0.4000 VOL/VOL
FIELD CAPACITY	=	0.3560 VOL/VOL
WILTING POINT	=	0.2899 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.4000 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	0.0000000100000 CM/SEC
LINER LEAKAGE FRACTION	=	0.00000000

LAYER 11

VERTICAL PERCOLATION LAYER

THICKNESS	=	6.00 INCHES
POROSITY	=	0.4750 VOL/VOL
FIELD CAPACITY	=	0.3777 VOL/VOL
WILTING POINT	=	0.2648 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.3405 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	0.0000170000003 CM/SEC

GENERAL SIMULATION DATA

SCS RUNOFF CURVE NUMBER	=	74.26
TOTAL AREA OF COVER	=	435600. SQ FT
EVAPORATIVE ZONE DEPTH	=	8.00 INCHES
UPPER LIMIT VEG. STORAGE	=	3.7840 INCHES
INITIAL VEG. STORAGE	=	2.9575 INCHES

SOIL WATER CONTENT INITIALIZED BY PROGRAM.

SYNTHETIC RAINFALL WITH SYNTHETIC DAILY TEMPERATURES AND
SOLAR RADIATION FOR JACKSONVILLE FLORIDA

MAXIMUM LEAF AREA INDEX = 2.00
START OF GROWING SEASON (JULIAN DATE) = 37
END OF GROWING SEASON (JULIAN DATE) = 4

NORMAL MEAN MONTHLY TEMPERATURES, DEGREES FAHRENHEIT

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
53.20	55.10	61.30	67.70	74.10	79.00
81.30	81.00	79.20	69.50	60.80	54.80

AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1 THROUGH 5

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	2.60 7.46	3.54 9.03	2.57 8.11	2.82 2.39	3.68 2.64	4.36 3.05
STD. DEVIATIONS	1.70 3.02	2.19 1.53	2.39 1.98	2.31 1.69	2.48 1.98	2.07 1.40
RUNOFF						
TOTALS	0.191 0.846	1.026 1.314	0.633 2.840	0.053 0.194	0.259 0.096	0.153 0.685
STD. DEVIATIONS	0.376 1.479	1.429 0.691	1.415 2.267	0.113 0.434	0.487 0.186	0.341 1.320
EVAPOTRANSPIRATION						
TOTALS	1.674 5.677	2.302 5.349	2.632 5.674	2.668 3.322	3.990 1.692	3.948 1.868
STD. DEVIATIONS	0.445 1.625	0.600 2.108	1.104 0.310	1.715 1.074	2.369 0.911	1.592 0.238
LATERAL DRAINAGE FROM LAYER 2						
TOTALS	0.0322 0.0296	0.0317 0.0328	0.0322 0.0346	0.0283 0.0301	0.0300 0.0274	0.0275 0.0324
STD. DEVIATIONS	0.0046 0.0011	0.0043 0.0026	0.0037 0.0032	0.0014 0.0030	0.0034 0.0014	0.0024 0.0064
PERCOLATION FROM LAYER 3						

STD. DEVIATIONS 0.0271 0.0152 0.0112 0.0221 0.0177
0.0070 0.0162 0.0151 0.0197 0.0134 0.0350

LATERAL DRAINAGE FROM LAYER 7

TOTALS 0.0001 0.0001 0.0001 0.0001 0.0001 0.0001
0.0001 0.0001 0.0001 0.0002 0.0001 0.0002

STD. DEVIATIONS 0.0001 0.0001 0.0001 0.0001 0.0001 0.0001
0.0001 0.0000 0.0000 0.0000 0.0000 0.0000

PERCOLATION FROM LAYER 8

TOTALS 0.0903 0.0838 0.0938 0.0925 0.0973 0.0957
0.1003 0.1017 0.0997 0.1042 0.1020 0.1064

STD. DEVIATIONS 0.0309 0.0268 0.0272 0.0245 0.0235 0.0212
0.0204 0.0190 0.0173 0.0170 0.0156 0.0155

LATERAL DRAINAGE FROM LAYER 9

TOTALS 0.0903 0.0838 0.0938 0.0925 0.0972 0.0957
0.1003 0.1017 0.0997 0.1042 0.1020 0.1064

STD. DEVIATIONS 0.0309 0.0268 0.0272 0.0245 0.0235 0.0212
0.0204 0.0191 0.0173 0.0170 0.0156 0.0155

PERCOLATION FROM LAYER 10

TOTALS 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000
0.0000 0.0000 0.0000 0.0000 0.0000 0.0000

STD. DEVIATIONS 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000
0.0000 0.0000 0.0000 0.0000 0.0000 0.0000

PERCOLATION FROM LAYER 11

TOTALS 0.0030 0.0026 0.0027 0.0025 0.0025 0.0023
0.0023 0.0022 0.0021 0.0021 0.0020 0.0020

STD. DEVIATIONS 0.0021 0.0017 0.0017 0.0016 0.0015 0.0013
0.0013 0.0012 0.0011 0.0011 0.0010 0.0009

AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1 THROUGH 5

	(INCHES)	(CU. FT.)	PERCENT
PRECIPITATION	52.26 (6.568)	1997110.	100.00
RUNOFF	8.270 (2.855)	300211.	15.82
EVAPOTRANSPIRATION	40.846 (3.440)	1482716.	78.16
LATERAL DRAINAGE FROM LAYER 2	0.3688 (0.0064)	13387.	0.71
PERCOLATION FROM LAYER 3	3.1183 (0.0502)	113195.	5.97

LATERAL DRAINAGE FROM LAYER 7	0.0016 (0.0006)	59.	0.00
PERCOLATION FROM LAYER 8	1.1677 (0.0006)	42388.	2.23
LATERAL DRAINAGE FROM LAYER 9	1.1677 (0.2580)	42386.	2.23
PERCOLATION FROM LAYER 10	0.0000 (0.0000)	0.	0.00
PERCOLATION FROM LAYER 11	0.0284 (0.0165)	1032.	0.05
CHANGE IN WATER STORAGE	1.579 (1.762)	57321.	3.02

PEAK DAILY VALUES FOR YEARS 1 THROUGH 5

	(INCHES)	(CU. FT.)
PRECIPITATION	4.79	173877.0
RUNOFF	3.451	125277.2
LATERAL DRAINAGE FROM LAYER 2	0.0014	51.1
PERCOLATION FROM LAYER 3	0.0103	372.4
HEAD ON LAYER 3	24.6	
LATERAL DRAINAGE FROM LAYER 7	0.0000	0.2
PERCOLATION FROM LAYER 8	0.0040	145.5
HEAD ON LAYER 8	0.0	
LATERAL DRAINAGE FROM LAYER 9	0.0040	145.6
PERCOLATION FROM LAYER 10	0.0000	0.0
HEAD ON LAYER 10	0.0	
PERCOLATION FROM LAYER 11	0.0002	7.8
SNOW WATER	0.00	0.0
MAXIMUM VEG. SOIL WATER (VOL/VOL)	0.4730	
MINIMUM VEG. SOIL WATER (VOL/VOL)	0.1034	

1	3.12	0.2602
2	5.48	0.4570
3	5.16	0.4300
4	2.39	0.1990
5	340.85	0.2840
6	4.49	0.1871
7	0.01	0.0473
8	0.04	0.7000
9	0.01	0.0473
10	0.10	0.4000
11	1.90	0.5162
SNOW WATER	0.00	



England-Thimby & Miller, Inc.

Consulting & Design Engineers
3131 St. Johns Bluff Road So. Jacksonville, FL 32216

904-642-8990

BY

JT

SHEET NO.

1 OF 3

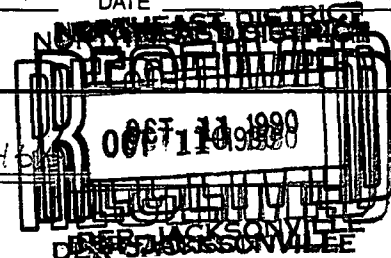
CHECKED BY

DATE

10-11-90

REVISED BY

DATE



PROJ. NAME

TRAIL RIDGE "PLAN A"

PROJ. NO.

89-113-9

LEAKAGE RATE CALCULATIONS FOR LINER ANALYSIS

LATERAL DRAINAGE FROM LAYER FOUR (PER H.E.L.P. MODEL)

LARGEST AVERAGE MONTHLY VALUE (SEPTEMBER) = 4.4307 IN/MTH

AVERAGE ANNUAL TOTAL 19.6741 IN/YR

$$4.4307 \text{ IN/MTH} > 19.6741 \text{ IN/YR}$$

$$4.4307 \text{ IN/MTH} = 4.3 \times 10^{-8} \text{ M/SEC}$$

$$Q (\text{IMPINGEMENT RATE}) = 4.3 \times 10^{-8} \text{ M/SEC}$$

$$H = L \left(\sqrt{Q/K + \tan^2 \beta} - \tan \beta \right)$$

H = HEAD ON PRIMARY LINER

Q = IMPINGEMENT RATE ($4.3 \times 10^{-8} \text{ M/SEC}$)

K = HYDRAULIC CONDUCTIVITY OF GEODRAIN ($19.6 \text{ cm/s} \approx 0.2 \text{ M/SEC}$)

$\tan \beta$ = BASE SLOPE (2% = 0.02)

L = DRAINAGE LENGTH (150 FT \approx 46 M)

$$H = 46 \left(\sqrt{\frac{4.3 \times 10^{-8}}{0.2} + (0.02)^2} - 0.02 \right)$$

$$= 0.00025 \text{ M}$$

$$= \underline{\underline{0.0097 \text{ IN}}}$$



BY ST

SHEET NO. 2 OF 3

CHECKED BY _____

DATE _____

REVISED BY _____

DATE 10-11-90

PROJ. NAME TRAIL RIDGE

PROJ. NO. 89-113-9

ASSUME : 1 HOLE/AC

$$AREA_{HOLE} = 0.1 CM^2 = 1 \times 10^{-5} M^2$$

$$Q = 0.6 A \sqrt{2 g H}$$

Q = LEAKAGE RATE

A = AREA OF HOLE ($1 \times 10^{-5} M^2$)

$$g = 9.8 M/sec$$

H = 0.00025 M (SEE PREVIOUS SHEET)

$$Q = 0.6 (1 \times 10^{-5}) \sqrt{2 (9.8) (0.00025)}$$

$$= 4.2 \times 10^{-7} M^3/sec / HOLE$$

$$4.2 \times 10^{-7} M^3/sec / HOLE \times 1 HOLE/AC \times 1 AC / 4047 M^2$$

$$Q = 1.04 \times 10^{-10} M/sec$$

$$= \underline{\underline{9.6 GAL/AC/DAY}}$$

FOR CONSERVATIVE MEASURES, ASSUME THE GEODRAIN (PRIMARY) IS SATURATED.
 HEAD = 0.22 IN = 0.0055 M

$$Q = 46.2 GPAD$$

∴ ASSUME A LEAKAGE RATE IN EXCESS OF 100 GPAD WOULD REQUIRE REMEDIATION.

PROJ. NAME TRAIL RIDGE PLAN "A"

PROJ. NO. 89-113-9

DEPTH OF FLOW CALCULATIONS IN LDS (AS SUGGESTED BY
GIROUD ET AL [1990])

ASSUMED LEAKAGE RATE = 100 GPD

$$\text{DEPTH OF FLOW} = \frac{Q}{B K i}$$

Q = LEAKAGE RATE (100 GPD = 1×10^{-9} M³/s)

* B = WIDTH OF LEAKAGE FLOW

K = HYDRAULIC CONDUCTIVITY OF LDS ($19.6 \text{ cm/s} = 0.2 \text{ M/s}$)

i = HYDRAULIC GRADIENT OF LDS SLOPE (0.02)

$$\begin{aligned} D &= \frac{1 \times 10^{-9} \text{ M}^3/\text{SEC}}{(1 \text{ M})(0.2 \text{ M/s})(0.02)} \\ &= 0.00000025 \text{ M} \\ &\approx 0.0000098 \text{ IN} \end{aligned}$$

$0.0000098 \text{ IN} < 0.22 \text{ IN}$ (DEPTH OF LDS)

\therefore LDS DOES NOT BECOME SATURATED

REFERENCE: EQUATIONS & METHODOLOGY OBTAINED FROM PERMIT DOCUMENTS
SUBMITTED TO D.E.R. FOR MEDLEY LANDFILL EXPANSION FROM
GEOSERVICES INC

* (GIROUD SUGGESTS A CONSERVATIVE FLOW WIDTH TO BE 1M - 5M)

LINER LEAKAGE FRACTION
= 0.00 FOR PRIMARY LINER

TRAILRIDGE LANDFILL - LINER ANALYSIS
JACKSONVILLE, DUVAL COUNTY, FLORIDA
E89-113-9 OCTOBER 9, 1990

BARE GROUND

LAYER 1

VERTICAL PERCOLATION LAYER

THICKNESS	=	4.00 INCHES
POROSITY	=	0.4570 VOL/VOL
FIELD CAPACITY	=	0.1309 VOL/VOL
WILTING POINT	=	0.0580 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.1309 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	0.0010000000475 CM/SEC

LAYER 2

VERTICAL PERCOLATION LAYER

THICKNESS	=	72.00 INCHES
POROSITY	=	0.5200 VOL/VOL
FIELD CAPACITY	=	0.2542 VOL/VOL
WILTING POINT	=	0.1400 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.2542 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	0.0001999999999 CM/SEC

LAYER 3

VERTICAL PERCOLATION LAYER

THICKNESS	=	24.00 INCHES
POROSITY	=	0.4570 VOL/VOL
FIELD CAPACITY	=	0.1309 VOL/VOL
WILTING POINT	=	0.0580 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.1309 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	0.0010000000475 CM/SEC

LAYER

LATERAL DRAINAGE LAYER

THICKNESS = 0.22 INCHES
 POROSITY = 0.7000 VOL/VOL
 FIELD CAPACITY = 0.0450 VOL/VOL
 WILTING POINT = 0.0200 VOL/VOL
 INITIAL SOIL WATER CONTENT = 0.0225 VOL/VOL
 SATURATED HYDRAULIC CONDUCTIVITY = 19.6349994659424 CM/SEC
 SLOPE = 2.00 PERCENT
 DRAINAGE LENGTH = 150.0 FEET

LAYER 5

BARRIER SOIL LINER WITH FLEXIBLE MEMBRANE LINER

THICKNESS = 0.06 INCHES
 POROSITY = 0.7000 VOL/VOL
 FIELD CAPACITY = 0.0450 VOL/VOL
 WILTING POINT = 0.0200 VOL/VOL
 INITIAL SOIL WATER CONTENT = 0.0225 VOL/VOL
 SATURATED HYDRAULIC CONDUCTIVITY = 19.6349994659424 CM/SEC
 LINER LEAKAGE FRACTION = 0.00000000

LAYER 6

LATERAL DRAINAGE LAYER

THICKNESS = 0.22 INCHES
 POROSITY = 0.7000 VOL/VOL
 FIELD CAPACITY = 0.0450 VOL/VOL
 WILTING POINT = 0.0200 VOL/VOL
 INITIAL SOIL WATER CONTENT = 0.0450 VOL/VOL
 SATURATED HYDRAULIC CONDUCTIVITY = 19.6349994659424 CM/SEC
 SLOPE = 2.00 PERCENT
 DRAINAGE LENGTH = 150.0 FEET

LAYER 7

BARRIER SOIL LINER WITH FLEXIBLE MEMBRANE LINER

THICKNESS = 0.25 INCHES
 POROSITY = 0.4000 VOL/VOL
 FIELD CAPACITY = 0.3560 VOL/VOL
 WILTING POINT = 0.2899 VOL/VOL
 INITIAL SOIL WATER CONTENT = 0.0225 VOL/VOL
 SATURATED HYDRAULIC CONDUCTIVITY = 0.0000000100000 CM/SEC
 LINER LEAKAGE FRACTION = 0.00000000

LAYER 9

STD. DEVIATIONS	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000

EVAPOTRANSPIRATION

TOTALS	1.584	2.229	2.159	1.517	2.630	2.984
	4.262	4.202	4.082	2.439	1.658	2.049

STD. DEVIATIONS	0.618	0.683	0.886	1.101	1.370	0.383
	1.246	1.479	0.498	0.907	0.735	0.563

LATERAL DRAINAGE FROM LAYER 4

TOTALS	1.0275	0.8936	1.2202	1.0314	1.1306	1.1369
	1.3070	2.3129	4.4307	2.5123	1.3311	1.3200

STD. DEVIATIONS	0.8186	0.8252	0.8204	0.8461	0.7072	0.6668
	0.7131	1.7321	1.7995	0.4308	0.1827	0.5199

PERCOLATION FROM LAYER 5

TOTALS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

LATERAL DRAINAGE FROM LAYER 6

TOTALS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

PERCOLATION FROM LAYER 7

TOTALS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

PERCOLATION FROM LAYER 8

TOTALS	0.0148	0.0090	0.0077	0.0052	0.0036	0.0046
	0.0045	0.0041	0.0037	0.0036	0.0032	0.0032

STD. DEVIATIONS	0.0254	0.0135	0.0105	0.0076	0.0062	0.0050
	0.0043	0.0037	0.0031	0.0029	0.0025	0.0023

AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1 THROUGH 5

	(INCHES)	(CU. FT.)	PERCENT
PRECIPITATION	52.26 (5.568)	1897110.	100.00
RUNOFF	0.000 (0.000)	0.	0.00

LATERAL DRAINAGE FROM LAYER 4 19.674 0.0000 714171. 37.65

PERCOLATION FROM LAYER 5 0.0000 (0.0000) 0. 0.00

LATERAL DRAINAGE FROM LAYER 6 0.0000 (0.0000) 0. 0.00

PERCOLATION FROM LAYER 7 0.0000 (0.0000) 0. 0.00

PERCOLATION FROM LAYER 8 0.0702 (0.0067) 2548. 0.13

CHANGE IN WATER STORAGE 0.722 (3.982) 26224. 1.38

PEAK DAILY VALUES FOR YEARS 1 THROUGH 5

	(INCHES)	(CU. FT.)
PREDIPITATION	4.79	173577.0
RUNOFF	0.000	0.0
LATERAL DRAINAGE FROM LAYER 4	0.3874	14064.2
PERCOLATION FROM LAYER 5	0.0000	0.0
HEAD ON LAYER 5	0.1	
LATERAL DRAINAGE FROM LAYER 6	0.0000	0.0
PERCOLATION FROM LAYER 7	0.0000	0.0
HEAD ON LAYER 7	0.0	
PERCOLATION FROM LAYER 8	0.0027	97.6
SNOW WATER	0.00	0.0

MAXIMUM VEG. SOIL WATER (VOL/VOL) 0.4059

MINIMUM VEG. SOIL WATER (VOL/VOL) 0.0743

FINAL WATER STORAGE AT END OF YEAR 5

LAYER	(INCHES)	(VOL/VOL)
1	0.38	0.0626

3	5.3	0.2230
4	0.01	0.0396
5	0.00	0.0225
6	0.01	0.0450
7	0.01	0.0225
8	1.92	0.3192

SNOW WATER 0.00

LINER LEAKAGE RATE
= 0.00 FOR PRIMARY LINER

TRAILRIDGE LANDFILL - FINAL COVER ANALYSIS
JACKSONVILLE, DUVAL COUNTY, FLORIDA
E89-113-7 OCTOBER 11, 1990

FAIR GRADE

LAYER 1

VERTICAL PERCOLATION LAYER

THICKNESS	=	12.00 INCHES
POROSITY	=	0.4750 VOL/VOL
FIELD CAPACITY	=	0.2217 VOL/VOL
WILTING POINT	=	0.1043 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.4026 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	0.00156000000042 CM/SEC

LAYER 2

LATERAL DRAINAGE LAYER

THICKNESS	=	12.00 INCHES
POROSITY	=	0.4570 VOL/VOL
FIELD CAPACITY	=	0.1309 VOL/VOL
WILTING POINT	=	0.0580 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.4570 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	0.001000000000475 CM/SEC
SLOPE	=	2.00 PERCENT
DRAINAGE LENGTH	=	850.0 FEET

LAYER 3

BARRIER SOIL LINER

THICKNESS	=	12.00 INCHES
POROSITY	=	0.4300 VOL/VOL
FIELD CAPACITY	=	0.3663 VOL/VOL
WILTING POINT	=	0.2802 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.4300 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	0.0000001000000 CM/SEC

LAYER

VERTICAL PERCOLATION LAYER

THICKNESS = 12.00 INCHES
 POROSITY = 0.4570 VOL/VOL
 FIELD CAPACITY = 0.1309 VOL/VOL
 WILTING POINT = 0.0580 VOL/VOL
 INITIAL SOIL WATER CONTENT = 0.2020 VOL/VOL
 SATURATED HYDRAULIC CONDUCTIVITY = 0.0010000000475 CM/SEC

LAYER 5

VERTICAL PERCOLATION LAYER

THICKNESS = 1200.00 INCHES
 POROSITY = 0.3200 VOL/VOL
 FIELD CAPACITY = 0.2942 VOL/VOL
 WILTING POINT = 0.1400 VOL/VOL
 INITIAL SOIL WATER CONTENT = 0.2763 VOL/VOL
 SATURATED HYDRAULIC CONDUCTIVITY = 0.0001999999949 CM/SEC

LAYER 6

VERTICAL PERCOLATION LAYER

THICKNESS = 24.00 INCHES
 POROSITY = 0.4570 VOL/VOL
 FIELD CAPACITY = 0.1309 VOL/VOL
 WILTING POINT = 0.0580 VOL/VOL
 INITIAL SOIL WATER CONTENT = 0.1671 VOL/VOL
 SATURATED HYDRAULIC CONDUCTIVITY = 0.0010000000475 CM/SEC

LAYER 7

LATERAL DRAINAGE LAYER

THICKNESS = 0.22 INCHES
 POROSITY = 0.7000 VOL/VOL
 FIELD CAPACITY = 0.0450 VOL/VOL
 WILTING POINT = 0.0200 VOL/VOL
 INITIAL SOIL WATER CONTENT = 0.0457 VOL/VOL
 SATURATED HYDRAULIC CONDUCTIVITY = 19.6849994659424 CM/SEC
 SLOPE = 2.00 PERCENT
 DRAINAGE LENGTH = 150.0 FEET

LAYER 8

BARRIER SOIL LINER WITH FLEXIBLE MEMBRANE LINER

THICKNESS = 0.06 INCHES
 POROSITY = 0.7000 VOL/VOL

CLIMATOLOGICAL DATA

SYNTHETIC RAINFALL WITH SYNTHETIC DAILY TEMPERATURES AND
SOLAR RADIATION FOR JACKSONVILLE FLORIDA

MAXIMUM LEAF AREA INDEX = 2.00
START OF GROWING SEASON (JULIAN DATE) = 37
END OF GROWING SEASON (JULIAN DATE) = 4

NORMAL MEAN MONTHLY TEMPERATURES, DEGREES FAHRENHEIT

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
53.20	55.10	61.30	67.70	74.10	79.00
81.30	81.00	78.20	69.50	60.50	54.80

AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1 THROUGH 5

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	2.60	3.54	2.57	2.82	3.68	4.35
	7.46	9.03	8.11	2.39	2.64	3.05
STD. DEVIATIONS	1.70	2.18	2.39	2.31	2.48	2.07
	3.02	1.53	1.98	1.69	1.98	1.40
RUNOFF						
TOTALS	0.181	1.026	0.633	0.053	0.259	0.153
	0.546	1.314	2.240	0.194	0.086	0.685
STD. DEVIATIONS	0.376	1.429	1.415	0.113	0.487	0.341
	1.479	0.691	2.267	0.434	0.156	1.320
EVAPOTRANSPIRATION						
TOTALS	1.674	2.302	2.682	2.668	3.990	3.948
	5.677	5.349	5.674	3.322	1.692	1.868
STD. DEVIATIONS	0.445	0.600	1.104	1.715	2.369	1.592
	1.625	2.108	0.310	1.074	0.911	0.238
LATERAL DRAINAGE FROM LAYER 2						
TOTALS	0.0322	0.0317	0.0322	0.0283	0.0300	0.0275
	0.0296	0.0328	0.0346	0.0301	0.0274	0.0324
STD. DEVIATIONS	0.0046	0.0043	0.0037	0.0014	0.0034	0.0024
	0.0011	0.0026	0.0032	0.0030	0.0014	0.0064
PERCOLATION FROM LAYER 3						
TOTALS	0.2718	0.2616	0.2750	0.2471	0.2555	0.2367
	0.2545	0.2714	0.2784	0.2581	0.2781	0.2710

STD. DEVIATIONS	0.0271	0.0152	0.0171	0.0112	0.0221	0.0177
	0.0070	0.0151	0.0197	0.0134	0.0350	

LATERAL DRAINAGE FROM LAYER 7

TOTALS	0.0904	0.0840	0.0939	0.0926	0.0974	0.0958
	0.1005	0.1019	0.0998	0.1044	0.1021	0.1066

STD. DEVIATIONS	0.0310	0.0269	0.0272	0.0245	0.0236	0.0212
	0.0204	0.0191	0.0174	0.0170	0.0157	0.0155

PERCOLATION FROM LAYER 8

TOTALS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

LATERAL DRAINAGE FROM LAYER 9

TOTALS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

PERCOLATION FROM LAYER 10

TOTALS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

PERCOLATION FROM LAYER 11

TOTALS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1 THROUGH 5

	(INCHES)	(CU. FT.)	PERCENT
PRECIPITATION	52.26 (6.568)	1897110.	100.00
RUNOFF	8.270 (2.855)	300211.	15.82
EVAPOTRANSPIRATION	40.846 (3.440)	1482716.	78.16
LATERAL DRAINAGE FROM LAYER 2	0.3688 (0.0064)	13387.	0.71
PERCOLATION FROM LAYER 3	3.1183 (0.0502)	113195.	5.97
LATERAL DRAINAGE FROM	1.1401 (0.0505)	40416	2.04

LAYER 7

PERCOLATION FROM LAYER 8	0.0000 (0.0000)	0.	0.00
LATERAL DRAINAGE FROM LAYER 7	0.0000 (0.0000)	0.	0.00
PERCOLATION FROM LAYER 10	0.0000 (0.0000)	0.	0.00
PERCOLATION FROM LAYER 11	0.0000 (0.0000)	0.	0.00
CHANGE IN WATER STORAGE	1.607 (1.766)	58350.	3.08

PEAK DAILY VALUES FOR YEARS 1 THROUGH 5

	(INCHES)	(CU. FT.)
PRECIPITATION	4.79	173877.0
RUNOFF	3.451	135277.2
LATERAL DRAINAGE FROM LAYER 2	0.9014	51.1
PERCOLATION FROM LAYER 3	0.9105	372.4
HEAD ON LAYER 3	24.8	
LATERAL DRAINAGE FROM LAYER 7	0.0040	145.3
PERCOLATION FROM LAYER 8	0.0000	0.0
HEAD ON LAYER 8	0.0	
LATERAL DRAINAGE FROM LAYER 9	0.0000	0.0
PERCOLATION FROM LAYER 10	0.0000	0.0
HEAD ON LAYER 10	0.0	
PERCOLATION FROM LAYER 11	0.0000	0.0
SNOW WATER	0.90	0.0

MAXIMUM VEG. SOIL WATER (VOL/VOL) 0.4730

MINIMUM VEG. SOIL WATER (VOL/VOL) 0.1034

FINAL WATER STORAGE AT END OF YEAR 5

1	3.12	0.2602
2	5.48	0.4570
3	5.16	0.4300
4	2.39	0.1990
5	340.85	0.2840
6	4.49	0.1971
7	0.01	0.0473
8	0.04	0.7000
9	0.00	0.0200
10	0.10	0.4000
11	1.59	0.1848

SNOW WATER 0.00

SLOPE STABILITY ANALYSIS

S T A B R G

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TRAIL RIDGE LANDFILL CLASS I 90-11.5

CONTROL DATA

NUMBER OF SPECIFIED CENTERS	0
NUMBER OF DEPTH LIMITING TANGENTS	1
NUMBER OF VERTICAL SECTIONS	10
NUMBER OF SOIL LAYER BOUNDARIES	6
NUMBER OF PORE PRESSURE LINES	1
NUMBER OF POINTS DEFINING COLLISION PROFILE	0

SEISMIC COEFFICIENT S_1, S_2 = .00 .00

SEARCH STARTS AT CENTER (1000.0, -100.0), WITH FINAL GRID OF 5.0

ALL CIRCLES TANGENT TO DEPTH, 30.0,

GEOMETRY

SECTIONS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1. CAPACITIES	141.0	145.0	152.0	150.0	274.0	270.0	270.0	273.0	310.0	310.0	310.0	310.0	310.0	310.0	310.0	310.0	310.0	310.0	310.0	310.0
W IN CAPAC	141.0	145.0	152.0	150.0	274.0	270.0	270.0	273.0	310.0	310.0	310.0	310.0	310.0	310.0	310.0	310.0	310.0	310.0	310.0	310.0
BOUNDARY 1	141.0	145.0	152.0	150.0	274.0	270.0	270.0	273.0	310.0	310.0	310.0	310.0	310.0	310.0	310.0	310.0	310.0	310.0	310.0	310.0
BOUNDARY 2	278.0	282.0	287.0	289.0	293.0	297.0	300.0	303.0	307.0	310.0	310.0	310.0	310.0	310.0	310.0	310.0	310.0	310.0	310.0	310.0
BOUNDARY 3	278.0	282.0	287.0	289.0	293.0	297.0	300.0	303.0	307.0	310.0	310.0	310.0	310.0	310.0	310.0	310.0	310.0	310.0	310.0	310.0
BOUNDARY 4	333.0	333.0	333.0	333.0	333.0	333.0	333.0	333.0	333.0	333.0	333.0	333.0	333.0	333.0	333.0	333.0	333.0	333.0	333.0	333.0
BOUNDARY 5	304.0	304.0	304.0	304.0	304.0	304.0	304.0	304.0	304.0	304.0	304.0	304.0	304.0	304.0	304.0	304.0	304.0	304.0	304.0	304.0
BOUNDARY 6	500.0	500.0	500.0	500.0	500.0	500.0	500.0	500.0	500.0	500.0	500.0	500.0	500.0	500.0	500.0	500.0	500.0	500.0	500.0	500.0

SOIL PROPERTIES

LAYER	COHESION	FRICTION ANGLE	DENSITY
1	1.0	.0	48.1
2	.0	30.0	110.0
3	.0	32.0	115.0
4	.0	34.0	115.0
5	4000.0	1.0.0	1.0.0

PORE PRESSURE DATA

WIRE PRESSURE DATA

COORDINATES OF EQUI-PRESSURE LINES

SECTIONS .0 300.0 800.0 900.0 1280.0 1360.0 1440.0 1510.0 1610.0 2200.0
 LINE 1 278.0 286.0 287.0 289.0 293.0 284.0 284.0 299.0 299.0 299.0

NUMBER	TANGENT	RADIUS	(X) CENTER	(Y) CENTER	FS(BISHOP)	FS(OMS)
1	320.0	440.0	1200.0	-120.0	1.658	1.607
2	320.0	440.0	1210.0	-120.0	1.670	1.616
3	320.0	430.0	1200.0	-110.0	1.660	1.607
4	320.0	440.0	1190.0	-120.0	1.655	1.606
5	320.0	440.0	1195.0	-120.0	1.657	1.607
6	320.0	435.0	1190.0	-115.0	1.654	1.605
7	320.0	435.0	1195.0	-115.0	1.657	1.606
8	320.0	430.0	1190.0	-110.0	1.654	1.604
9	320.0	430.0	1195.0	-110.0	1.657	1.605
10	320.0	425.0	1190.0	-105.0	1.654	1.603
11	320.0	425.0	1195.0	-105.0	1.657	1.605
12	320.0	420.0	1190.0	-100.0	1.654	1.602
13	320.0	425.0	1185.0	-105.0	1.654	1.604
14	320.0	420.0	1195.0	-100.0	1.657	1.604
15	320.0	420.0	1185.0	-100.0	1.654	1.603
16	320.0	430.0	1185.0	-110.0	1.654	1.605
17	320.0	430.0	1195.0	-110.0	1.657	1.605

F.S. MINIMUM= 1.654 FOR THE CIRCLE OF CENTER (1190.0, -105.0)

STABRG

SLOPE STABILITY ANALYSIS

S T A B R G

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TRAIL RIDGE LANDFILL CLASS I 90-11.5

CONTROL DATA

NUMBER OF SPECIFIED CENTERS	0
NUMBER OF DEPTH LIMITING TANGENTS	1
NUMBER OF VERTICAL SECTIONS	10
NUMBER OF SOIL LAYER BOUNDARIES	6
NUMBER OF PORE PRESSURE LINES	1
NUMBER OF POINTS DEFINING COHESION PROFILE	0

SEISMIC COEFFICIENT S_1, S_2 = .00 .00

SEARCH STARTS AT CENTER (1100.0, -105.0), WITH FINISH GRID OF 5.0

ALL CIRCLES TANGENT TO DEPTH, 300.0,

GEOMETRY

SECTIONS	.0	500.0	800.0	900.0	1200.0	1360.0	1440.0	1510.0	1610.0	2000.0
1. CRACKS	141.0	145.0	152.0	150.0	274.0	290.0	280.0	299.0	310.0	310.0
W IN CRACK	141.0	145.0	152.0	150.0	274.0	290.0	280.0	299.0	310.0	310.0
BOUNDARY 1	141.0	145.0	152.0	150.0	274.0	290.0	280.0	299.0	310.0	310.0
BOUNDARY 2	278.0	282.0	287.0	289.0	293.0	280.0	280.0	299.0	310.0	310.0
BOUNDARY 3	278.0	282.0	287.0	289.0	293.0	290.0	280.0	299.0	310.0	310.0
BOUNDARY 4	303.0	303.0	303.0	303.0	303.0	303.0	303.0	303.0	303.0	303.0
BOUNDARY 5	304.0	304.0	304.0	304.0	304.0	304.0	304.0	304.0	304.0	304.0
BOUNDARY 6	500.0	500.0	500.0	500.0	500.0	500.0	500.0	500.0	500.0	500.0

SOIL PROPERTIES

LAYER	COHESION	FRICTION ANGLE	DENSITY
1	.0	18.0	98.1
2	.0	31.0	110.0
3	.0	33.0	115.0
4	.0	34.0	115.0
5	4000.0	20.0	120.0

PORE PRESSURE DATA

COORDINATES OF 100 PRESSURE LINES

SECTIONS 10 300.0 800.0 900.0 1000.0 1100.0 1200.0 1300.0 1400.0 1500.0 1600.0 1700.0
 LINE 1 278.0 206.0 207.0 207.0 203.0 204.0 204.0 209.0 203.0 209.0

NUMBER	TANGENT	RADIUS	(X) CENTER	(Y) CENTER	FS (HISIDU)	FS (DMS)
1	310.0	415.0	1190.0	105.0	2.581	2.333
2	310.0	425.0	1200.0	-105.0	2.576	2.343
3	310.0	415.0	1190.0	-75.0	2.574	2.312
4	310.0	415.0	1195.0	-95.0	2.581	2.316
5	310.0	410.0	1190.0	-90.0	2.572	2.316
6	310.0	410.0	1195.0	-90.0	2.579	2.321
7	310.0	405.0	1190.0	-85.0	2.569	2.311
8	320.0	405.0	1195.0	-85.0	2.577	2.316
9	310.0	400.0	1190.0	-80.0	2.567	2.306
10	310.0	400.0	1195.0	-80.0	2.575	2.312
11	310.0	395.0	1190.0	-75.0	2.565	2.301
12	320.0	395.0	1195.0	-75.0	2.574	2.308
13	310.0	390.0	1190.0	-70.0	2.563	2.296
14	320.0	390.0	1195.0	-70.0	2.573	2.304
15	310.0	385.0	1190.0	-65.0	2.562	2.292
16	320.0	385.0	1195.0	-65.0	2.573	2.301
17	310.0	380.0	1190.0	-60.0	2.561	2.280
18	310.0	380.0	1195.0	-60.0	2.573	2.298
19	310.0	375.0	1190.0	-55.0	2.561	2.285
20	320.0	375.0	1195.0	-55.0	2.574	2.296
21	310.0	370.0	1190.0	-50.0	2.561	2.282
22	320.0	375.0	1185.0	-55.0	2.570	2.277
23	310.0	370.0	1185.0	-50.0	2.560	2.273
24	320.0	370.0	1190.0	-50.0	2.561	2.282
25	310.0	365.0	1185.0	-45.0	2.550	2.270
26	320.0	370.0	1180.0	-50.0	2.544	2.270
27	310.0	365.0	1180.0	-45.0	2.544	2.266
28	320.0	365.0	1185.0	-45.0	2.550	2.270
29	310.0	360.0	1180.0	-40.0	2.544	2.263
30	320.0	365.0	1175.0	-45.0	2.542	2.265
31	310.0	360.0	1175.0	-40.0	2.542	2.261
32	320.0	360.0	1180.0	-40.0	2.544	2.262
33	310.0	355.0	1175.0	-35.0	2.542	2.257
34	320.0	360.0	1170.0	-40.0	2.542	2.262
35	310.0	355.0	1180.0	-35.0	2.545	2.260
36	310.0	355.0	1170.0	-35.0	2.542	2.258
37	310.0	350.0	1170.0	-30.0	2.542	2.254
38	320.0	355.0	1165.0	-35.0	2.546	2.263
39	310.0	350.0	1175.0	-30.0	2.542	2.254
40	320.0	350.0	1165.0	-30.0	2.546	2.258
41	310.0	360.0	1165.0	-40.0	2.547	2.267
42	320.0	360.0	1175.0	-40.0	2.542	2.261

F.S. MINIMUM= 2.542 FOR THE CIRCLE OF CENTER (1170.0, -35.0)

STABRG

Settlement analysis for footing beneath or adjacent to boring no. B1

INPUT DATA:

B, ft	L, ft	Df, ft.	GWT, ft.	Gamma, PCF	q, PSF	Es/qc	Time t, yr
72600.0	72600.0	0.00	1.00	110.0	3907	2.50	100.0

Calculated Values:

Ratio L/B =	1.00000	po, TSF =	0.00000
Iz(max.) =	0.52306	SigmaV, TSF =	36.74620
C1 =	1.00000	C2 =	1.60000

Layer No	Dz, ft.	SPT	qc/N	qc, tsf	Es/qc	Es, tsf	H _z , ft.	I _z	(I _z /E _s)D _z
1	25.00	17	4.5	76.5	2.5	191.3	12.5	0.10407	0.013604
2	80.00	85	5.0	425.0	2.5	1062.5	65.0	0.12115	0.009122
3	30.00	35	4.5	157.5	2.5	393.8	120.0	0.13905	0.010594
4	10.00	17	3.5	59.5	2.5	148.8	140.0	0.14556	0.009786
5	75055.00	50	5.0	250.0	2.5	625.0	2672.5	0.30898	2.741679
									SUM = 2.784785

Settlement = 0.4495 inches
 Ellis & Associates, Inc.
 Settlement Analysis - Schmertmann Method

Order No. CLASS I

Settlement analysis for footing beneath or adjacent to boring no. B2

INPUT DATA:

B, ft	L, ft	Df, ft.	GWT, ft	Gamma, PCF	q, PSF	Es/qc	Time t, yr
71300.0	71300.0	0.00	1.00	110.0	3346	2.50	10.0

Calculated Values:

Ratio L/B =	1.00000	po, TSF =	0.00000
Iz(max.) =	0.53129	SigmaV, TSF =	17.08870
C1 =	1.00000	C2 =	1.40000

Layer No	Dz, ft.	SPT	qc/N	qc, tsf	Es/qc	Es, tsf	H _z , ft.	I _z	(I _z /E _s)D _z
1	15.00	15	4.5	67.5	2.5	168.8	7.5	0.10498	0.009331
2	65.00	35	5.0	175.0	2.5	437.5	47.5	0.13152	0.019540
3	70.00	30	5.0	150.0	2.5	375.0	115.0	0.17630	0.032910
4	2450.00	100	5.0	500.0	2.5	1250.0	21375.0	0.33376	0.654167
									SUM = 0.715948

Settlement = 0.1227 inches

2.784785
 - 2.741679
 0.043106 / 2.784785 =

0.715948
 - 0.59167
 0.124278 / 0.715948 = 0.173620122 =

Ellis & Associates, Inc.
Settlement Analysis - Schmertmann Method

Order No. CLASS I

Settlement analysis for footing beneath or adjacent to boring no. B2

INPUT DATA.

B, ft.	L, ft.	Df, ft.	GWT, ft	Gamma, PCF	q, PSF	Es/qc	Time t, yr
12600 0	12600 0	0 00	1.00	110.0	3907	2.50	10 0

Calculated Values:

Ratio L/B = 1.00000 po, TSF = 0.00000
Iz(max.) = 0.52391 SigmaV, TSF = 34 18370
C1 = 1.00000 C2 = 1.40000

Layer No	Dz, ft	SPT	qc/N	qc, tsf	Es/qc	Es, tsf	Hs, ft.	Iz	(Iz/Es) Dz
1	15 00	15	4.5	67.5	2.5	168.8	7.5	0.10245	0.009106
2	65 00	35	5.0	175.0	2.5	437.5	47.5	0.11549	0.017158
3	70 00	30	5.0	150.0	2.5	375.0	115.0	0.13750	0.025667
4	75055 00	100	5.0	500.0	2.5	1250.0	72677.5	0.30886	1.370347
									SUM = 1.422278

1 422278
- 1 370347
0 051931
1 422278

Settlement = 46.6775 inches
Ellis & Associates, Inc
Settlement Analysis - Schmertmann Method

Order No. CLASS I

Settlement analysis for footing beneath or adjacent to boring no. B2

INPUT DATA:

B, ft	L, ft	Df, ft	GWT, ft.	Gamma, PCF	q, PSF	Es/qc	Time t, yr
11800.0	11800 0	0 00	1 00	110.0	6500	2.50	10 0

Calculated Values:

Ratio L/B = 1.00000 po, TSF = 0.00000
Iz(max.) = 0.53706 SigmaV, TSF = 23 66370
C1 = 1.00000 C2 = 1.40000

Layer No	Dz, ft.	SPT	qc/N	qc, tsf	Es/qc	Es, tsf	Hs, ft.	Iz	(Iz/Es) Dz
1	15 00	15	4.5	67.5	2.5	168.8	7.5	0.10364	0.009213
2	65.00	35	5.0	175.0	2.5	437.5	47.5	0.12307	0.018284
3	70.00	30	5.0	150.0	2.5	375.0	115.0	0.15585	0.029091
4	73450.00	100	5.0	500.0	2.5	1250.0	71875.0	0.34312	0.947015
									SUM = 1.003603

Settlement = 54.7967 inches

1 003603
- 0 947015
0 056588
1 003603
0 056588
1 003603

 * SUPRA-1 PROGRAM *
 * VERSION 1.21, JAN., 1987 *
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 * SUPRA ENGINEERING SOFTWARE *

FUNCTION MENU

-
- 1 - RUNOFF HYDROGRAPH COMPUTATION
 - A - SO5 UNIT HYDROGRAPH
 - E - LINEAR RESERVOIR ROUTING
 - 2 - RESERVOIR ROUTING
 - I - TRIANGULAR TIME
 - 3 - DAM HYDROGRAPH
 - A - 11 PM 6771
 - 4 - HYDROGRAPH ADDITION
 - E - 21 PM 6771
 - 5 - COMPUTE AT 21 PM 6771 FLOW
 - E - 21 PM 6771
 - 6 - AS A FUNCTION OF TOTAL OUTFLOW
 - 8 - INFLOW HYDROGRAPH INSERTION
 - 9 - BASEFLOW ADDITION
 - 10 - FLOW OUTLET DESIGN
 - A - ONE STAGE RECTANGULAR WEIR
 - E - TWO STAGE RECTANGULAR WEIR
 - C - CIRCULAR PIPE

TITLE: BORDO PIT DESIGN
 TRAILBLAZE LANDFILL

SIMULATION TIME (hrs) = 72.0
 TIME STEP (min.) = 9.0
 PRINT INTERVAL = 10

TOTAL RAINFALL DEPTH (in.) = 2.1
 RAINFALL TIME INTERVAL (min.) = 9.0
 TYPE OF RAINFALL DISTRIBUTION = 1

- 1 - RAINFALL DIST. IS GIVEN BY THE USER
- 2 - SO5 TYPE I DIST. (24-HR STORM)
- 3 - SO5 TYPE IA DIST. (24-HR STORM)
- 4 - SO5 TYPE II DIST. (24-HR STORM)
- 5 - SO5 TYPE III (MOD.) DIST. (24-HR STORM)
- 6 - SO5 TYPE III DIST. (24-HR STORM)

John
 10-10-90

LIVERIED TO: ENGLAND, THIMS & MILLER, INC.

* HYDROGRAPH COMPUTATION *

** SCS UNIT HYDROGRAPH METHOD **

INPUT SUMMARY

SUB-BASIN. 1
AREA (SQ MI) = 3.12
EFFECTIVE IMPERVIOUS AREA (%) = 10
NONEFFECTIVE IMPERVIOUS AREA (%) = 10
RURAL UNIMPAVED AREA (%) = 10
RURAL PAVED AREA (%) = 10
TOWN OR CITY AREA (%) = 10
FORESTED AREA (%) = 10
WATER AREA (%) = 10

TIME	Q (CFS)	OL (CFS)	TOTAL FLOW
0.00	0.0	0.0	0.0
1.00	0.0	4.0	4.0
2.00	0.0	4.0	4.0
3.00	0.0	5.4	5.4
4.00	0.0	6.6	6.6
5.00	0.0	8.1	8.1
6.00	0.0	10.0	10.0
7.00	0.0	12.0	12.0
8.00	0.0	14.0	14.0
9.00	0.0	16.0	16.0
10.00	0.0	17.0	17.0
11.00	0.0	18.0	18.0
12.00	0.0	19.0	19.0
13.00	0.0	20.0	20.0
14.00	0.0	21.0	21.0
15.00	0.0	22.0	22.0
16.00	0.0	23.0	23.0
17.00	0.0	24.0	24.0
18.00	0.0	25.0	25.0
19.00	0.0	26.0	26.0
20.00	0.0	27.0	27.0
21.00	0.0	28.0	28.0
22.00	0.0	29.0	29.0
23.00	0.0	30.0	30.0
24.00	0.0	31.0	31.0
25.00	0.0	32.0	32.0
26.00	0.0	33.0	33.0
27.00	0.0	34.0	34.0
28.00	0.0	35.0	35.0
29.00	0.0	36.0	36.0
30.00	0.0	37.0	37.0
31.00	0.0	38.0	38.0
32.00	0.0	39.0	39.0
33.00	0.0	40.0	40.0
34.00	0.0	41.0	41.0
35.00	0.0	42.0	42.0
36.00	0.0	43.0	43.0
37.00	0.0	44.0	44.0
38.00	0.0	45.0	45.0
39.00	0.0	46.0	46.0
40.00	0.0	47.0	47.0
41.00	0.0	48.0	48.0
42.00	0.0	49.0	49.0
43.00	0.0	50.0	50.0
44.00	0.0	51.0	51.0
45.00	0.0	52.0	52.0
46.00	0.0	53.0	53.0
47.00	0.0	54.0	54.0
48.00	0.0	55.0	55.0
49.00	0.0	56.0	56.0
50.00	0.0	57.0	57.0
51.00	0.0	58.0	58.0
52.00	0.0	59.0	59.0
53.00	0.0	60.0	60.0
54.00	0.0	61.0	61.0
55.00	0.0	62.0	62.0
56.00	0.0	63.0	63.0
57.00	0.0	64.0	64.0
58.00	0.0	65.0	65.0
59.00	0.0	66.0	66.0
60.00	0.0	67.0	67.0
61.00	0.0	68.0	68.0
62.00	0.0	69.0	69.0
63.00	0.0	70.0	70.0
64.00	0.0	71.0	71.0
65.00	0.0	72.0	72.0
66.00	0.0	73.0	73.0
67.00	0.0	74.0	74.0
68.00	0.0	75.0	75.0
69.00	0.0	76.0	76.0
70.00	0.0	77.0	77.0
71.00	0.0	78.0	78.0
72.00	0.0	79.0	79.0
73.00	0.0	80.0	80.0
74.00	0.0	81.0	81.0
75.00	0.0	82.0	82.0
76.00	0.0	83.0	83.0
77.00	0.0	84.0	84.0
78.00	0.0	85.0	85.0
79.00	0.0	86.0	86.0
80.00	0.0	87.0	87.0
81.00	0.0	88.0	88.0
82.00	0.0	89.0	89.0
83.00	0.0	90.0	90.0
84.00	0.0	91.0	91.0
85.00	0.0	92.0	92.0
86.00	0.0	93.0	93.0
87.00	0.0	94.0	94.0
88.00	0.0	95.0	95.0
89.00	0.0	96.0	96.0
90.00	0.0	97.0	97.0
91.00	0.0	98.0	98.0
92.00	0.0	99.0	99.0
93.00	0.0	100.0	100.0
94.00	0.0	101.0	101.0
95.00	0.0	102.0	102.0
96.00	0.0	103.0	103.0
97.00	0.0	104.0	104.0
98.00	0.0	105.0	105.0
99.00	0.0	106.0	106.0
100.00	0.0	107.0	107.0

61.50	.0	.0	.0
62.00	.0	.0	.0
64.50	.0	.0	.0
66.00	.0	.0	.0
67.50	.0	.0	.0
69.00	.0	.0	.0
70.50	.0	.0	.0
72.00	.0	.0	.0

OUTPUT SUMMARY

PEAK FLOW (cfs)	= 179.6
TIME TO PEAK (hrs)	= 10.50
RUNOFF DEPTH (in.)	2.5.0
RUNOFF VOLUME (A-FT)	30.7

LICENSED TO: ENGLAND, THIMS & MILLER, INC.

 * RESERVOIR ROUTING *

STAGE: 127.00 127.20 127.40 127.60 127.80 128.00 128.20 128.40
 124.40 124.80
 STORAGE: .00 6.05 12.11 18.19 24.29 30.42 36.56 42.72
 48.91 55.12
 FLOW: .0 3.9 8.7 15.2 21.2 27.7 34.7 42.1
 49.7 56.0

TIME	STAGE	STORAGE	FLOW
0.00	127.00	.00	.0
1.00	127.05	0.10	0.2
2.00	127.10	0.20	0.4
3.00	127.15	0.30	0.6
4.00	127.20	0.40	0.8
5.00	127.25	0.50	1.0
6.00	127.30	0.60	1.2
7.00	127.35	0.70	1.4
8.00	127.40	0.80	1.6
9.00	127.45	0.90	1.8
10.00	127.50	1.00	2.0
11.00	127.55	1.10	2.2
12.00	127.60	1.20	2.4
13.00	127.65	1.30	2.6
14.00	127.70	1.40	2.8
15.00	127.75	1.50	3.0
16.00	127.80	1.60	3.2
17.00	127.85	1.70	3.4
18.00	127.90	1.80	3.6
19.00	127.95	1.90	3.8
20.00	128.00	2.00	4.0
21.00	127.95	1.90	3.8
22.00	127.90	1.80	3.6
23.00	127.85	1.70	3.4
24.00	127.80	1.60	3.2
25.00	127.75	1.50	3.0
26.00	127.70	1.40	2.8
27.00	127.65	1.30	2.6
28.00	127.60	1.20	2.4
29.00	127.55	1.10	2.2
30.00	127.50	1.00	2.0
31.00	127.45	0.90	1.8
32.00	127.40	0.80	1.6
33.00	127.35	0.70	1.4
34.00	127.30	0.60	1.2
35.00	127.25	0.50	1.0
36.00	127.20	0.40	0.8
37.00	127.15	0.30	0.6
38.00	127.10	0.20	0.4
39.00	127.05	0.10	0.2
40.00	127.00	.00	.0
41.00	127.05	0.10	0.2
42.00	127.10	0.20	0.4
43.00	127.15	0.30	0.6
44.00	127.20	0.40	0.8
45.00	127.25	0.50	1.0
46.00	127.30	0.60	1.2
47.00	127.35	0.70	1.4
48.00	127.40	0.80	1.6
49.00	127.45	0.90	1.8
50.00	127.50	1.00	2.0
51.00	127.55	1.10	2.2
52.00	127.60	1.20	2.4
53.00	127.65	1.30	2.6
54.00	127.70	1.40	2.8
55.00	127.75	1.50	3.0
56.00	127.80	1.60	3.2
57.00	127.85	1.70	3.4
58.00	127.90	1.80	3.6
59.00	127.95	1.90	3.8
60.00	128.00	2.00	4.0
61.00	127.95	1.90	3.8
62.00	127.90	1.80	3.6
63.00	127.85	1.70	3.4
64.00	127.80	1.60	3.2
65.00	127.75	1.50	3.0
66.00	127.70	1.40	2.8
67.00	127.65	1.30	2.6
68.00	127.60	1.20	2.4
69.00	127.55	1.10	2.2
70.00	127.50	1.00	2.0
71.00	127.45	0.90	1.8
72.00	127.40	0.80	1.6
73.00	127.35	0.70	1.4
74.00	127.30	0.60	1.2
75.00	127.25	0.50	1.0
76.00	127.20	0.40	0.8
77.00	127.15	0.30	0.6
78.00	127.10	0.20	0.4
79.00	127.05	0.10	0.2
80.00	127.00	.00	.0

OUTPUT SUMMARY

PEAK FLOW (cfs)	=	11.9
PEAK STAGE (ft)	=	123.51
TIME TO PEAK (hrs)	=	12.75
RUNOFF VOLUME STORED (ac-ft)	=	5.3

***> END OF JOB ***>

England-Thimby & Miller, Inc.

Consulting & Design Engineers
301 S. Johns Bluff Road So Jacksonville FL 32216

904-642-8990

BY _____

SHEET NO _____ OF _____

CHECKED BY _____

DATE _____

REVISED BY _____

DATE _____

NAME TRAIL RIDGE LANE HILL

NO E 89 113.9

VOLUME IMPOUNDED BY PROPOSED PIT

NORMAL WATER LEVEL EL 123.0

AREA OF 123.0 CONTOUR: 30.16 ACRES

ELEVATION AT EASTERNLY END OF EOP: 100.0

AREA OF 100.0 CONTOUR: 24.15 ACRES

AVERAGE AREA OF 123 AND 100 CONTOURS

$$\bar{A} = \frac{30.16 + 24.15}{2} \\ = 27.155 \text{ ACRES}$$

DEPTH: 123 - 100 = 23 FT

TOTAL VOLUME IMPOUNDED $V = 27.155 \text{ ACRES} (23 \text{ FT})$

$$= \boxed{624.61 \text{ ACRE-FT}}$$

SLOPE STABILITY ANALYSIS

S T A B R G

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TRAIL RIDGE LANDFILL CLASS I (90-1175)

CONTROL DATA

NUMBER OF SPECIFIED CENTERS	0
NUMBER OF DEPTH LIMITING TANGENTS	1
NUMBER OF VERTICAL SECTIONS	10
NUMBER OF SOIL LAYER BOUNDARIES	6
NUMBER OF PORE PRESSURE LINES	1
NUMBER OF POINTS DEFINING COHESION PROFILE	0

GEOMETRIC COEFFICIENTS, $c_1 = 0.00$, $c_2 = 0.00$

SLOPE STARTS AT CENTER (1300.0, 400.0), WITH FINAL GRID OF 100.0

ALL CIRCLES TANGENT TO DEPTH, 3.000,

COULUMTRY

SECTIONS 1 300.0 800.0 900.0 1200.0 1300.0 1400.0 1500.0 1600.0 1700.0 1800.0

1. CRACKS	141.0	145.0	152.0	150.0	274.0	280.0	280.0	277.0	3.0	3.0	3.0
W IN CRACK	141.0	145.0	152.0	150.0	274.0	280.0	280.0	277.0	3.0	3.0	3.0
BOUNDARY 1	141.0	145.0	152.0	150.0	274.0	280.0	280.0	277.0	3.0	3.0	3.0
BOUNDARY 2	278.0	282.0	287.0	289.0	293.0	290.0	280.0	277.0	3.0	3.0	3.0
BOUNDARY 3	278.0	282.0	287.0	289.0	293.0	290.0	280.0	277.0	3.0	3.0	3.0
BOUNDARY 4	333.0	333.0	333.0	333.0	333.0	333.0	333.0	333.0	333.0	333.0	333.0
BOUNDARY 5	334.0	334.0	334.0	334.0	334.0	334.0	334.0	334.0	334.0	334.0	334.0
BOUNDARY 6	500.0	500.0	500.0	500.0	500.0	500.0	500.0	500.0	500.0	500.0	500.0

SOIL PROPERTIES

LAYER	COHESION	FRICTION ANGLE	DENSITY
1	0	18.0	98.0
2	0	31.0	110.0
3	0	33.0	115.0
4	0	34.0	115.0
5	4000.0	20.0	110.0

PORE PRESSURE DATA

COORDINATES OF POINTS ON CURVE

SECTION
LINE

278.0 280.0 287.0 289.0 293.0 294.0 299.0 299.0 299.0

NUMBER	TANGENT	RADIUS	(X) CENTER	(Y) CENTER	FS (RISHOP)	FS (OMS)
1	3.0.0	700.0	1300.0	40.0.0	2.753	2.615
2	3.0.0	780.0	1400.0	-460.0	2.823	2.712
3	3.0.0	740.0	1300.0	4.0.0	2.810	2.662
4	3.0.0	760.0	1320.0	-40.0.0	2.777	2.639
5	3.0.0	80.0.0	1300.0	500.0	2.718	2.508
6	3.0.0	80.0.0	1080.0	500.0	2.717	2.592
7	3.0.0	820.0	1400.0	-500.0	2.747	2.622
8	3.0.0	800.0	1300.0	-480.0	2.744	2.617
9	3.0.0	840.0	1300.0	5.0.0	2.696	2.575
10	3.0.0	840.0	1400.0	-520.0	2.711	2.598
11	3.0.0	840.0	1300.0	-5.0.0	2.706	2.581
12	3.0.0	800.0	1380.0	-540.0	2.678	2.562
13	3.0.0	800.0	1400.0	-540.0	2.601	2.572
14	3.0.0	800.0	1060.0	-540.0	2.600	2.576
15	3.0.0	800.0	1300.0	50.0.0	2.607	2.552
16	3.0.0	880.0	1400.0	50.0.0	2.607	2.551
17	3.0.0	880.0	1400.0	50.0.0	2.670	2.578
18	3.0.0	880.0	1400.0	-540.0	2.601	2.572
19	3.0.0	900.0	1400.0	-500.0	2.608	2.534
20	3.0.0	900.0	1400.0	-500.0	2.644	2.548
21	3.0.0	900.0	1300.0	500.0	2.607	2.545
22	3.0.0	90.0.0	1400.0	-600.0	2.603	2.502
23	3.0.0	90.0.0	140.0.0	-600.0	2.618	2.524
24	3.0.0	90.0.0	1440.0	-600.0	2.640	2.576
25	3.0.0	900.0	140.0.0	500.0	2.644	2.548
26	3.0.0	940.0	1420.0	-60.0.0	2.596	2.505
27	3.0.0	940.0	1440.0	-60.0.0	2.608	2.535
28	3.0.0	940.0	1400.0	60.0.0	2.611	2.512
29	3.0.0	900.0	140.0.0	-640.0	2.500	2.490
30	3.0.0	900.0	1440.0	-640.0	2.579	2.497
31	3.0.0	900.0	1400.0	640.0	2.608	2.525
32	3.0.0	940.0	1440.0	-620.0	2.608	2.525
33	3.0.0	900.0	1440.0	-60.0.0	2.555	2.475
34	3.0.0	900.0	1400.0	-660.0	2.577	2.505
35	3.0.0	900.0	140.0.0	-660.0	2.566	2.479
36	3.0.0	1000.0	1440.0	600.0	2.506	2.458
37	3.0.0	1000.0	1400.0	-600.0	2.548	2.477
38	3.0.0	1000.0	1400.0	-600.0	2.506	2.471
39	3.0.0	100.0.0	1440.0	-700.0	2.501	2.444
40	3.0.0	1000.0	1400.0	700.0	2.501	2.451
41	3.0.0	100.0.0	1400.0	-700.0	2.547	2.406
42	3.0.0	1000.0	1400.0	600.0	2.548	2.477
43	3.0.0	1040.0	1400.0	-70.0.0	2.499	2.400
44	3.0.0	1040.0	1400.0	70.0.0	2.500	2.400
45	3.0.0	1040.0	1440.0	70.0.0	2.509	2.434
46	3.0.0	1060.0	1400.0	-740.0	2.401	2.413
47	3.0.0	1060.0	1400.0	-740.0	2.494	2.434
48	3.0.0	1060.0	1440.0	-740.0	2.500	2.407
49	3.0.0	1080.0	1400.0	700.0	2.407	2.400
50	3.0.0	1080.0	1400.0	-760.0	2.409	2.410
51	3.0.0	1080.0	1440.0	-760.0	2.494	2.402

END

SLOPE STABILITY ANALYSIS

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TRAIL RIDGE LANDFILL CLASS I 90-1125

CONTROL DATA

NUMBER OF SPECIFIED CENTERS 0
 NUMBER OF DEPTH LIMITING TANGENTS 0
 NUMBER OF VERTICAL SECTIONS 10
 NUMBER OF SOIL LAYER BOUNDARIES 6
 NUMBER OF PORE PRESSURE LINES 1
 NUMBER OF POINTS DEFINING COMBUSTION PROFILE 0

SLIDING COEFFICIENT S1, S2 = .00 .00

SEARCH STARTS AT CENTER (1300.0, -310.0), WITH LIMIT GRID OF 100

ALL CIRCLES PASS THROUGH THE POINT (1000.0, 500.0)

GEOMETRY

SECTIONS .0 300.0 800.0 900.0 1200.0 1360.0 1440.0 1510.0 1610.0 1600.0

1. CRACKS 141.0 145.0 152.0 150.0 274.0 200.0 200.0 209.0 3.0 0.0 0.0
 WITH CRACK 141.0 145.0 152.0 150.0 274.0 200.0 200.0 209.0 3.0 0.0 0.0
 BOUNDARY 1 141.0 145.0 152.0 150.0 274.0 200.0 200.0 209.0 3.0 0.0 0.0
 BOUNDARY 2 278.0 202.0 207.0 207.0 293.0 200.0 200.0 209.0 3.0 0.0 0.0
 BOUNDARY 3 278.0 202.0 207.0 207.0 293.0 200.0 200.0 209.0 3.0 0.0 0.0
 BOUNDARY 4 242.0 303.0 303.0 303.0 303.0 303.0 303.0 303.0 3.0 0.0 0.0
 BOUNDARY 5 304.0 304.0 304.0 304.0 304.0 304.0 304.0 304.0 304.0 304.0
 BOUNDARY 6 500.0 500.0 500.0 500.0 500.0 500.0 500.0 500.0 500.0 500.0

SOIL PROPERTIES

LAYER	COHESION	FRICTION ANGLE	DENSITY
1	1.0	.0	98.1
2	.0	30.0	110.0
3	.0	32.0	115.0
4	.0	34.0	115.0
5	4000.0	1.0	170.0

PORE PRESSURE DATA

COEFFICIENT OF POROSITY 1.0

SECTIONS
LINE 1

278.0 286.0 287.0 289.0 293.0 294.0 294.0 299.0 297.0 297.0

NUMBER	TANGENT	RADIUS	(X) CENTER	(Y) CENTER	FS (ISHOP)	FS (OMS)
1	322.9	632.9	1300.0	310.0	1.807	1.765
2	321.3	631.3	1320.0	310.0	1.817	1.778
3	321.9	612.9	1300.0	-290.0	1.840	1.793
4	325.1	625.1	1290.0	-310.0	1.850	1.800
5	322.8	622.8	1300.0	-330.0	1.790	1.741
6	321.9	651.9	1310.0	-350.0	1.770	1.735
7	321.7	651.2	1320.0	-330.0	1.774	1.740
8	322.0	642.0	1310.0	-320.0	1.786	1.749
9	321.9	661.9	1310.0	-340.0	1.755	1.752
10	321.2	661.2	1320.0	-240.0	1.755	1.755
11	320.7	660.7	1330.0	-340.0	1.769	1.759
12	321.2	651.2	1320.0	-330.0	1.774	1.740
13	321.2	671.2	1320.0	-350.0	1.738	1.708
14	320.7	670.7	1330.0	-350.0	1.748	1.719
15	321.9	671.9	1310.0	-360.0	1.741	1.710
16	321.2	681.2	1320.0	-360.0	1.752	1.694
17	320.7	680.7	1330.0	-360.0	1.760	1.702
18	321.8	681.8	1310.0	-360.0	1.769	1.699
19	321.2	691.2	1320.0	-370.0	1.700	1.680
20	320.7	690.7	1330.0	-370.0	1.710	1.680
21	321.8	691.8	1310.0	-370.0	1.717	1.689
22	321.1	701.1	1320.0	-380.0	1.695	1.670
23	320.6	700.6	1330.0	-380.0	1.694	1.671
24	320.3	700.3	1340.0	-380.0	1.705	1.684
25	320.7	690.7	1330.0	-370.0	1.710	1.685
26	320.6	710.6	1330.0	-390.0	1.679	1.658
27	320.3	710.3	1340.0	-390.0	1.680	1.667
28	321.1	711.1	1320.0	-390.0	1.683	1.660
29	320.6	720.6	1330.0	-400.0	1.665	1.645
30	320.3	720.3	1340.0	-400.0	1.669	1.651
31	321.1	721.1	1320.0	-400.0	1.671	1.650
32	320.6	730.6	1330.0	-410.0	1.652	1.634
33	320.3	730.3	1340.0	-410.0	1.654	1.637
34	321.1	731.1	1320.0	-410.0	1.661	1.641
35	320.6	740.6	1330.0	-420.0	1.641	1.624
36	320.3	740.3	1340.0	-420.0	1.659	1.624
37	320.1	740.1	1350.0	-420.0	1.648	1.634
38	320.3	720.3	1340.0	-410.0	1.654	1.637
39	320.3	750.3	1340.0	-430.0	1.626	1.612
40	320.1	750.1	1350.0	-430.0	1.632	1.619
41	320.6	750.6	1330.0	-420.0	1.630	1.614
42	320.3	760.3	1340.0	-440.0	1.613	1.601
43	320.1	760.1	1350.0	-440.0	1.616	1.605
44	320.6	760.6	1330.0	-440.0	1.610	1.605
45	320.3	770.3	1340.0	-450.0	1.600	1.590
46	320.1	770.1	1350.0	-450.0	1.602	1.592
47	320.6	770.6	1330.0	-450.0	1.611	1.597
48	320.3	780.3	1340.0	-460.0	1.591	1.581
49	320.1	780.1	1350.0	-460.0	1.589	1.581
50	320.0	780.0	1360.0	-460.0	1.597	1.589
51	320.1	770.1	1350.0	-450.0	1.602	1.582

SLOPE STABILITY ANALYSIS

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TRAIL RIDGE LANDFILL CLASS I (90-11.5)

CONTROL DATA

NUMBER OF SPECIFIED CENTERS	0
NUMBER OF DEPTH LIMITING TANGENTS	0
NUMBER OF VERTICAL SECTIONS	10
NUMBER OF SOIL LAYER BOUNDARIES	6
NUMBER OF PORE PRESSURE LINES	1
NUMBER OF POINTS DEFINING COLLISION PROFILE	0

SLIP SURF COEFFICIENT S1, S2 = .000 .000

SEARCH STARTS AT CENTER (1300.0, -310.0), WITH LIMIT (RHO) OF 10.0

ALL CIRCLES PASS THROUGH THE POINT (1300.0, -310.0)

GEOMETRY

SECTIONS	.0	300.0	800.0	900.0	1200.0	1300.0	1440.0	1510.0	1610.0	1600.0
1. CRACKS	141.0	145.0	152.0	150.0	274.0	200.0	210.0	209.0	210.0	140.0
WTH CRACK	141.0	145.0	152.0	150.0	274.0	200.0	210.0	209.0	210.0	140.0
BOUNDARY 1	141.0	145.0	152.0	150.0	274.0	200.0	210.0	209.0	210.0	140.0
BOUNDARY 2	278.0	282.0	287.0	287.0	293.0	200.0	210.0	209.0	210.0	140.0
BOUNDARY 3	278.0	282.0	287.0	287.0	293.0	200.0	210.0	209.0	210.0	140.0
BOUNDARY 4	303.0	303.0	303.0	303.0	303.0	303.0	303.0	303.0	303.0	303.0
BOUNDARY 5	304.0	304.0	304.0	304.0	304.0	304.0	304.0	304.0	304.0	304.0
BOUNDARY 6	500.0	500.0	500.0	500.0	500.0	500.0	500.0	500.0	500.0	500.0

SOIL PROPERTIES

LAYER	COHESION	FRICTION ANGLE	DENSITY
1	1.0	.0	40.1
2	.0	30.0	110.0
3	.0	32.0	115.0
4	.0	34.0	115.0
5	4000.0	12.0	110.0

PORE PRESSURE DATA

LINE 1: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

SECTIONS

LINE 1

278.0 286.0 287.0 289.0 293.0 294.0 294.0 297.0 299.0 299.0

NUMBER	TANGENT	RADIUS	(X) CENTER	(Y) CENTER	FS (BISHOP)	FS (OMS)
1	370.0	340.0	1160.0	-1.0	1.673	1.615
2	370.0	340.0	1180.0	-2.0	1.606	1.617
3	370.0	340.0	1160.0	0.0	1.692	1.605
4	370.0	340.0	1140.0	-1.0	1.702	1.608
5	370.0	360.0	1160.0	-4.0	1.671	1.611
6	370.0	360.0	1170.0	-4.0	1.664	1.604
7	370.0	360.0	1180.0	-4.0	1.667	1.605
8	370.0	350.0	1170.0	-3.0	1.669	1.606
9	370.0	370.0	1170.0	-1.0	1.661	1.603
10	370.0	370.0	1180.0	-5.0	1.661	1.601
11	370.0	270.0	1190.0	-1.0	1.674	1.611
12	370.0	360.0	1180.0	4.0	1.667	1.605
13	370.0	280.0	1180.0	-1.0	1.666	1.603
14	370.0	380.0	1190.0	-6.0	1.667	1.606
15	370.0	380.0	1170.0	-6.0	1.659	1.604
16	370.0	390.0	1180.0	-7.0	1.653	1.598
17	370.0	390.0	1190.0	-7.0	1.662	1.604
18	370.0	370.0	1170.0	-7.0	1.659	1.606
19	370.0	400.0	1180.0	-8.0	1.654	1.600
20	370.0	380.0	1190.0	-6.0	1.667	1.606
21	370.0	380.0	1170.0	-6.0	1.659	1.604
22	370.0	400.0	1170.0	-8.0	1.657	1.600
23	370.0	400.0	1190.0	-8.0	1.658	1.602

F.S. MINIMUM= 1.653 FOR THE CIRCLE OF CENTER (1180.0, -7.0)

NUMBER	TANGENT	RADIUS	(X) CENTER	(Y) CENTER	FS (BISHOP)	FS (OMS)
1	340.0	420.0	1190.0	-8.0	2.209	2.147
2	340.0	420.0	1210.0	-8.0	2.257	2.179
3	340.0	400.0	1190.0	-6.0	2.310	2.134
4	340.0	420.0	1170.0	-8.0	2.305	2.144
5	340.0	420.0	1180.0	-8.0	2.200	2.140
6	340.0	420.0	1190.0	-8.0	2.300	2.147
7	340.0	410.0	1180.0	-7.0	2.299	2.132
8	340.0	410.0	1190.0	-7.0	2.300	2.130
9	340.0	400.0	1180.0	-6.0	2.297	2.126
10	340.0	400.0	1190.0	-6.0	2.310	2.134
11	340.0	390.0	1180.0	-5.0	2.296	2.121
12	340.0	390.0	1190.0	-5.0	2.313	2.132
13	340.0	380.0	1180.0	-4.0	2.297	2.116
14	340.0	370.0	1170.0	-4.0	2.291	2.113
15	340.0	380.0	1170.0	-4.0	2.289	2.117
16	340.0	380.0	1180.0	-4.0	2.297	2.116
17	340.0	370.0	1170.0	-3.0	2.289	2.107
18	340.0	370.0	1180.0	-3.0	2.300	2.114
19	340.0	360.0	1170.0	-2.0	2.290	2.102
20	340.0	370.0	1160.0	-3.0	2.287	2.109
21	340.0	260.0	1160.0	-2.0	2.287	2.103
22	340.0	360.0	1170.0	-1.0	2.290	2.100
23	340.0	350.0	1160.0	-1.0	2.287	2.098
24	340.0	360.0	1150.0	-1.0	2.290	2.112
25	340.0	350.0	1170.0	-1.0	2.293	2.099
26	340.0	350.0	1150.0	-1.0	2.290	2.105
27	340.0	370.0	1150.0	-3.0	2.296	2.100
28	340.0	370.0	1170.0	-3.0	2.283	2.107

F.S. MINIMUM= 2.287 FOR THE CIRCLE OF CENTER (1160.0, -2.0)

NUMBER	TANGENT	RADIUS	(X) CENTER	(Y) CENTER	FS (BISHOP)	FS (OMS)
1	360.0	390.0	1170.0	-3.0	2.860	2.521
2	360.0	390.0	1190.0	-3.0	2.860	2.524

3	340.0	350.0	1160.0	-10.0	2.273	2.112
4	340.0	360.0	1150.0	-10.0	2.273	2.099
5	340.0	350.0	1170.0	-10.0	2.272	2.105
6	340.0	350.0	1150.0	-30.0	2.276	2.107
7	340.0	370.0	1170.0	-30.0	2.277	2.107

F.S. MINIMUM= 2.207 FOR THE CIRCLE OF CENTER (1160.0, -20.0)

NUMBER	TANGENT	RADIUS	(X) CENTER	(Y) CENTER	FS(ISHOP)	FS(ONG)
1	360.0	390.0	1170.0	-30.0	2.860	2.501
2	360.0	390.0	1190.0	-30.0	2.878	2.544
3	360.0	370.0	1170.0	-10.0	2.858	2.500
4	360.0	370.0	1100.0	-10.0	2.878	2.512
5	360.0	360.0	1170.0	.0	2.861	2.492
6	360.0	370.0	1160.0	-10.0	2.851	2.498
7	360.0	360.0	1160.0	.0	2.849	2.487
8	360.0	360.0	1170.0	.0	2.861	2.492
9	360.0	350.0	1160.0	10.0	2.851	2.478
10	360.0	360.0	1150.0	.0	2.847	2.493
11	360.0	350.0	1170.0	10.0	2.846	2.486
12	360.0	350.0	1150.0	10.0	2.849	2.481
13	360.0	340.0	1150.0	20.0	2.850	2.471
14	360.0	350.0	1140.0	10.0	2.850	2.467
15	360.0	340.0	1160.0	20.0	2.845	2.470
16	360.0	340.0	1140.0	10.0	2.854	2.481
17	360.0	360.0	1140.0	.0	2.879	2.505
18	360.0	360.0	1160.0	.0	2.849	2.487

F.S. MINIMUM= 2.849 FOR THE CIRCLE OF CENTER (1150.0, 10.0)

STABRG

PERCOLATION FROM LAYER 8	0.0000 (0.0000)	0.	0.00
LATERAL DRAINAGE FROM LAYER 9	0.0000 (0.0000)	0.	0.00
PERCOLATION FROM LAYER 10	0.0000 (0.0000)	0.	0.00
PERCOLATION FROM LAYER 11	0.0000 (0.0000)	0.	0.00
CHANGE IN WATER STORAGE	1.607 (1.766)	5835%	2.08

ITEM	INCHES	VOL. FT
PRECIPITATION	4.75	170577.0
RUNOFF	0.451	155277.2
LATERAL DRAINAGE FROM LAYER 2	0.0014	51.1
PERCOLATION FROM LAYER 3	0.0017	572.1
HEAD ON LAYER 4	0.001	
LATERAL DRAINAGE FROM LAYER 5	0.004	145.2
PERCOLATION FROM LAYER 6	0.0001	0.1
HEAD ON LAYER 7	0.0001	
LATERAL DRAINAGE FROM LAYER 8	0.0000	0.0
PERCOLATION FROM LAYER 9	0.0000	0.0
HEAD ON LAYER 10	0.0000	
PERCOLATION FROM LAYER 11	0.0000	0.0
SNOW WATER	0.0000	0.0
MAXIMUM VEG. SOIL WATER (VOL/VOL)		0.472
MINIMUM VEG. SOIL WATER (VOL/VOL)		0.1074

FINAL WATER STORAGE AT END OF YEAR 5

1	3.12	.26 2
2	5.28	1.5570
3	5.15	1.4700
4	2.77	0.1900
5	34.25	.234
6	4.10	1.1571
7	1.01	1.0477
8	0.14	0.7000
9		.12
10		
11	2.0	1.0000

END OF PAGE



Ellis & Associates, Inc.

A GREG A EDMONDS COMPANY

GEOTECHNICAL ENGINEERING
CONSTRUCTION MATERIALS TESTING

PROJECT Class I Landfill Settlement

PROJECT NO 90-1125

CALCD. BY mc

DATE: 5/25/90

CHKD BY: _____

DATE: _____

Surface on 7,1-213

$$S = q B \frac{1-\nu^2}{E_s} I$$

$$L/B = 1.0 \quad \nu = 0.5$$

$$H/B = \frac{50}{1300} = .038$$

$$I = .038 / 0.5 \times .5 = 0.0038$$

$$S = 3907 \times 1300 \frac{1-.5^2}{515 \times 1000} \times 0.0038$$

$$S = 0.028 \text{ ft} \times 0.33 \text{ in} \times 4 = 1.35 \text{ inch @ Center}$$

$$\bar{q}_{nat} = \frac{4000 \times 1000 \times \frac{1}{2} \times 6692 + 9000 \times 9000 \times 6500}{1300 \times 1300} = 3907 \text{ psf}$$

$$B = 1300'$$

$$\bar{E}_s = 515 \text{ ksi}$$

See "Prelim Calc"

Computer Solution

$$@ B2 \quad S_{center} = 4 \times 1.70 = 6.80''$$

$$S_{corner} = 1.74$$

$$Diff = 5.06''$$

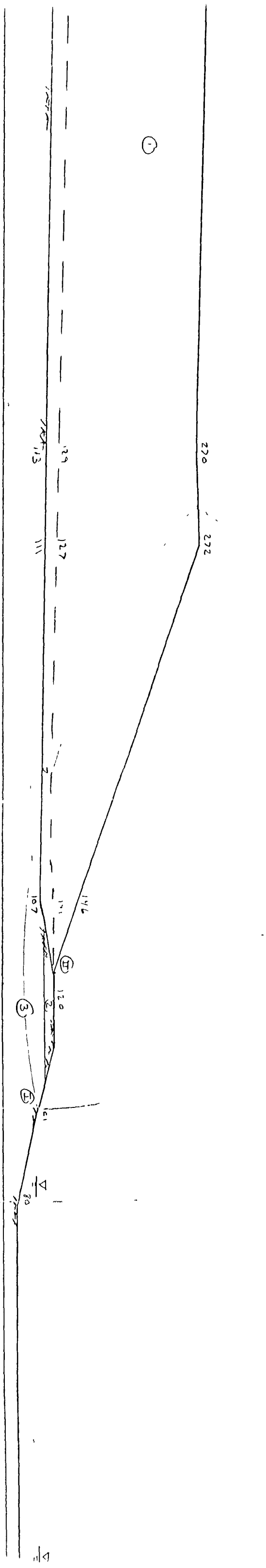
~~isell
Lund H
Stress
90-1125~~

CLAS 5

800 900

1280	1360	1440	1510	1610
------	------	------	------	------

5

[illegible]



England-Thims & Miller, Inc.

Consulting & Design Engineers
3101 St Johns Bluff Road So Jacksonville, FL 32216
904-642-8990

PRINCIPALS

James E England PE President
Robert E Thims VPres Sec
Douglas C Miller PE V Pres
N Hugh Mathews PE V Pres

October 10, 1990

Mrs. Mary C. Nogas, P E.
Supervisor, Solid Waste
Department of Environmental Regulation
7825 Baymeadows Way
Suite 200
Jacksonville, Florida 32256-7577

Reference Trail Ridge Landfill Plan "A" Class I and Class III
FDER No 184444
ET&M NO E89-113-09

Dear Mrs. Nogas:

Pursuant to our meeting of October 8, 1990, please find herein the response to the following issues:

1. H.E.L.P. Model

See revised H.E L P Model Calculations.
(See revised Drawing Nos. 15, 16, 18, and 19 - Cap Modifications)

2 Gas Wells

The applicant agrees to install additional gas wells beyond those shown on the permit documents if odor or gas concentration limits are exceeded.

3. North Borrow Area

A. Stormwater Calculations

See attached stormwater calculations for volume of impoundment, peak discharge, drawdown time and spillway capacity (See revised drawing No. 24A).

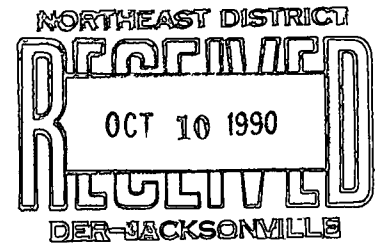
B. Staff Gauge

A staff gauge has been added in the North Borrow Area (See Drawing No. 24A).

HELP MODEL CALCULATIONS (Revised 10-10-90)

ANALYSIS ONE
BARE GROUND

- LAYER ONE (TOP) - 6" Daily Cover
VERTICAL PERCOLATION LAYER
Soil Texture Class No. 5
- LAYER TWO - 6' compacted municipal waste
VERTICAL PERCOLATION LAYER
Soil Texture Class No. 18
- LAYER THREE - 2' soil blanket over liner
VERTICAL PERCOLATION LAYER
Soil Texture Class No. 5
- LAYER FOUR - Geodrain
LATERAL DRAINAGE LAYER
Transmissivity $1.1 \times 10^{-3} \text{ m}^2/\text{sec}$
Thickness = 0.22 in.
Porosity 0.700 vol/vol
Field Capacity 0.045 vol/vol - Soil
Texture Class No. 1
Wilting Point 0.02 vol/vol - Minimum
Value
National Seal Company PN 3000
7000 PSF Loading
- LAYER FIVE - 60 mil HDPE liner with Geodrain
FLEXIBLE MEMBRANE LINER WITH BARRIER
SOIL LINER
- LAYER SIX - Geodrain
LATERAL DRAINAGE LAYER
- LAYER SEVEN - 60 mil HDPE with Claymax
FLEXIBLE MEMBRANE LINER WITH BARRIER
SOIL LINER
Soil Texture Class No. 17
- LAYER EIGHT - 6" compacted base
VERTICAL PERCOLATION LAYER
Soil Texture Class No. 15



ANALYSIS TWO
FAIR GRASS

- LAYER ONE (TOP) - 12" top soil
VERTICAL PERCOLATION LAYER
Soil Texture Class No. 7
- LAYER TWO - 12" compacted soil
LATERAL DRAINAGE LAYER
Soil Texture Class No. 5
- LAYER THREE - 12" clay
BARRIER SOIL LINER
Soil Texture Class No. 16
- LAYER FOUR - 12" intermediate soil cover
VERTICAL PERCOLATION LAYER
Soil Texture Class No. 5
- LAYER FIVE - 100' compacted municipal waste
VERTICAL PERCOLATION LAYER
Soil Texture Class No. 18
- LAYER SIX - 2' soil blanket over liner
VERTICAL PERCOLATION LAYER
Soil Texture Class No. 5
- LAYER SEVEN - Geodrain
LATERAL DRAINAGE LAYER
- LAYER EIGHT - 60 mil HDPE flexible membrane liner
and Geodrain
FLEXIBLE MEMBRANE LINER WITH BARRIER
SOIL LINER
- LAYER NINE - Geodrain
LATERAL DRAINAGE LAYER
- LAYER TEN - 60 MIL HDPE flexible membrane liner with
Claymax
FLEXIBLE MEMBRANE LINER WITH BARRIER
SOIL LINER
- LAYER ELEVEN - 6" Compacted base
VERTICAL PERCOLATION LAYER

Notes concerning revised H.E.L.P. Analyses

- A. The twelve inches of topsoil ($K=5.2 \times 10^{-4}$ cm/sec) shall come from either blending the existing material on-site with organics obtained on-site or hauling in off-site borrow meeting the specified hydraulic transmissivity.
- B. The evaporative zone depth has been revised to eight inches.



England-Thimms & Miller, Inc.

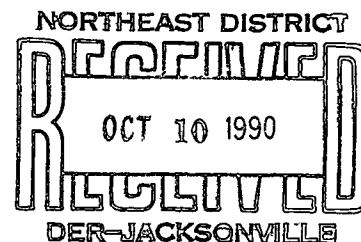
Consulting & Design Engineers
3131 St Johns Bluff Road So Jacksonville, FL 32216
904-642-8990

PRINCIPALS

James E England, P.E., President
Robert E Thims, VPres, Sec
Douglas C Miller, P.E., V Pres
N Hugh Mathews, P.E., V Pres

October 10, 1990

Mrs. Mary C. Nogas, P.E.
Supervisor, Solid Waste
Department of Environmental Regulation
7825 Baymeadows Way
Suite 200
Jacksonville, Florida 32256-7577



Reference: Trail Ridge Landfill Plan "A" Class I and Class III
FDER No. 184444
ET&M NO. E89-113-09

Dear Mrs. Nogas:

Pursuant to our meeting of October 8, 1990, please find herein the response to the following issues:

1. H.E.L.P. Model

See revised H.E.L.P. Model Calculations.
(See revised Drawing Nos. 15, 16, 18, and 19 - Cap Modifications)

2. Gas Wells

The applicant agrees to install additional gas wells beyond those shown on the permit documents if odor or gas concentration limits are exceeded.

3. North Borrow Area

A. Stormwater Calculations

See attached stormwater calculations for volume of impoundment, peak discharge, drawdown time and spillway capacity. (See revised drawing No. 24A).

B. Staff Gauge

A staff gauge has been added in the North Borrow Area (See Drawing No. 24A).

Mrs. Mary C. Nogas, P.E.
Department of Environmental Regulation

October 10, 1990
Page 2

Reference: Trail Ridge Landfill Plan "A" Class I and Class III
FDER No. 184444

C. Effects on Water Table

The crest of the spillway is elevation 123.0. This is the approximate water table at the upgradient (west) end of the borrow area. Therefore, no change in water table is anticipated at the west end of the borrow area. The water table elevation adjacent to the north, south and east side of the North Borrow Area could increase with a maximum water elevation of 123.0 in the borrow area. To mitigate this potential increase in groundwater elevation and prevent hydraulic piping through the exterior face of the embankment, a drainage blanket has been designed under the earthen dike.

This drainage blanket will dissipate the upgradient hydraulic pressure. Therefore, no significant increase in water table is anticipated. (See attached calculations from Golder and Associates and revised Drawing No. 24A).

Should you have any questions concerning this information, please do not hesitate to call.

Sincerely,

ENGLAND, THIMS & MILLER, INC.

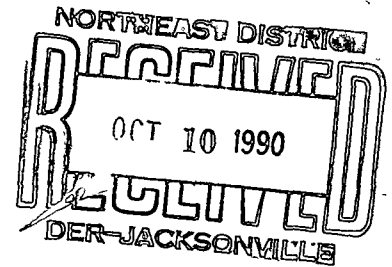

Douglas S. Miller, P.E.
Vice President

DCM:KTJ

Enclosures: 1. H.E.L.P. Model Calculations (Revised 10-10-90)
2. North Borrow Area Stormwater Calculations
3. Water Table Calculations - Golder & Associates
4. Drawings Nos. 15, 16, 18, 19, and 24A (Revised)

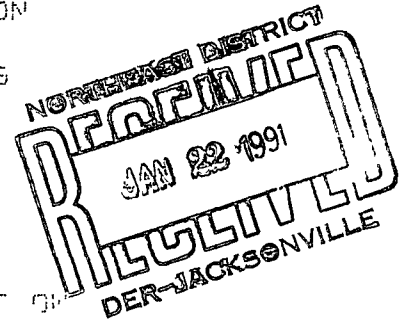
cc: Harvey Bush
Warren Smith
Don Miller

 * SUPRA-1 PROGRAM *
 * VERSION 1.21, JAN., 1987 *
 * COPYRIGHT (C) BY *
 * SUPRA ENGINEERING SOFTWARE *



FUNCTION MENU

- 1 - RUNOFF HYDROGRAPH COMPUTATION
 - A - SCS UNIT HYDROGRAPH
 - B - LINEAR RESERVOIR ROUTING
- 2 - RESERVOIR ROUTING
- 3 - CHANNEL ROUTING
- 4 - GAUGE HYDROGRAPH
- 5 - RIVER HYDROGRAPH
- 6 - HYDROGRAPH INTERSECTION
- 7 - FLOW INTERSECTION
 - A - CONTROLLED BY A MAXIMUM FLOW
 - B - EFFECT FLOW
 - C - AS A FUNCTION OF TOTAL OUTFLOW
- 8 - INFLOW HYDROGRAPH INSERTION
- 9 - OUTFLOW ADDITION
- 10 - WEIR OUTLET DESIGN
 - A - ONE-STAGE RECTANGULAR WEIR
 - B - TWO-STAGE RECTANGULAR WEIR
 - C - CIRCULAR PIPE



TITLE: CONTROL F. SECTION
 JACKSONVILLE LANDFILL

SIMULATION TIME (HRS) = 72.0
 TIME STEP (HRS) = 6.0
 PRINT INTERVAL = 10

TOTAL RAINFALL DEPTH (IN.) = 0.2
 RAINFALL TIME INTERVAL (HRS) = 30.0
 TYPE OF RAINFALL DISTRIBUTION = 1
 1 - RAINFALL DIST. IS GIVEN BY THE USER
 2 - SCS TYPE I DIST. (24 HR STORM)
 3 - SCS TYPE IA DIST. (24-HR STORM)
 4 - SCS TYPE II DIST. (24-HR STORM)
 5 - SCS TYPE III (MOD.) DIST. (24 HR STORM)
 6 - SCS TYPE III DIST. (24-HR STORM)

DOUGLAS COUNTY
 RECEIVED
 JAN 10 1991
 [Signature]

LICENSED TO: ENGLAND, THIMS & MILLER, INC.

 * HYDROGRAPH COMPUTATION *

** SCS UNIT HYDROGRAPH METHOD **

INPUT SUMMARY

SUB-BASIN: 1
 AREA (ACRES) - 31.7
 EFFECTIVE IMPERVIOUS AREA (%) - 100
 NON-EFFECTIVE IMPERVIOUS AREA (%) - 0
 PERVIOUS AREA (%) - 0
 POINT OF ORIGIN - 100
 TIME OF CONCENTRATION (HOURS) - 1.0
 PEAK FLOW FACTOR - 1.0

TIME	Q1 (CFS)	Q2 (CFS)	TOTAL FLOW
0.00	0.0	0.0	0.0
1.00	0.0	4.2	4.2
2.00	0.0	4.2	4.2
3.00	0.0	5.1	5.1
4.00	0.0	6.0	6.0
5.00	0.0	6.1	6.1
6.00	0.0	12.0	12.0
7.00	0.0	179.0	179.0
8.00	0.0	10.0	10.0
9.00	0.0	7.0	7.0
10.00	0.0	6.0	6.0
11.00	0.0	5.4	5.4
12.00	0.0	4.8	4.8
13.00	0.0	4.2	4.2
14.00	0.0	3.6	3.6
15.00	0.0	3.0	3.0
16.00	0.0	2.4	2.4
17.00	0.0	1.8	1.8
18.00	0.0	1.2	1.2
19.00	0.0	0.6	0.6
20.00	0.0	0.0	0.0
21.00	0.0	0.0	0.0
22.00	0.0	0.0	0.0
23.00	0.0	0.0	0.0
24.00	0.0	0.0	0.0
25.00	0.0	0.0	0.0
26.00	0.0	0.0	0.0
27.00	0.0	0.0	0.0
28.00	0.0	0.0	0.0
29.00	0.0	0.0	0.0
30.00	0.0	0.0	0.0
31.00	0.0	0.0	0.0
32.00	0.0	0.0	0.0
33.00	0.0	0.0	0.0
34.00	0.0	0.0	0.0
35.00	0.0	0.0	0.0
36.00	0.0	0.0	0.0
37.00	0.0	0.0	0.0
38.00	0.0	0.0	0.0
39.00	0.0	0.0	0.0
40.00	0.0	0.0	0.0
41.00	0.0	0.0	0.0
42.00	0.0	0.0	0.0
43.00	0.0	0.0	0.0
44.00	0.0	0.0	0.0
45.00	0.0	0.0	0.0
46.00	0.0	0.0	0.0
47.00	0.0	0.0	0.0
48.00	0.0	0.0	0.0
49.00	0.0	0.0	0.0
50.00	0.0	0.0	0.0
51.00	0.0	0.0	0.0
52.00	0.0	0.0	0.0
53.00	0.0	0.0	0.0
54.00	0.0	0.0	0.0
55.00	0.0	0.0	0.0
56.00	0.0	0.0	0.0
57.00	0.0	0.0	0.0
58.00	0.0	0.0	0.0

61.50	.0	.0	.0
63.00	.0	.0	.0
64.50	.0	.0	.0
66.00	.0	.0	.0
67.50	.0	.0	.0
69.00	.0	.0	.0
70.50	.0	.0	.0
72.00	.0	.0	.0

OUTPUT SUMMARY

PEAK FLOW (cfs)	=	179.6
TIME TO PEAK (hrs)	=	10.50
RUNOFF DEPTH (in.)	=	8.10
RUNOFF VOLUME (ac ft)	=	52.5

LICENSED TO: ENGLAND, THIMS & MILLER, INC.

 * RESERVOIR ROUTING *

STAGE: 123.00 123.20 123.40 123.60 123.80 124.00 124.20 124.40
 124.60 124.80
 STORAGE: .03 6.05 12.11 18.19 24.29 30.42 36.56 42.72
 48.91 55.17
 FLOW: .0 7.9 8.3 15.2 21.2 27.3 42.3 57.1
 74.7 76.8

TIME	INFLOW	STAGE	STORAGE	OUTFLOW
1.00		123.00	.03	.0
1.50	4.2	123.03	.05	.1
2.00	7.9	123.05	.07	.2
2.50	8.3	123.07	.11	.3
3.00	15.2	123.07	.19	.5
3.50	21.2	123.08	.29	.8
4.00	27.3	123.09	.42	1.1
4.50	42.3	123.10	.56	1.5
5.00	57.1	123.11	.72	1.9
5.50	74.7	123.12	.91	2.3
6.00		123.12	1.17	2.7
6.50		123.12	1.42	3.1
7.00		123.12	1.67	3.5
7.50		123.12	1.92	3.9
8.00		123.12	2.17	4.3
8.50		123.12	2.42	4.7
9.00		123.12	2.67	5.1
9.50		123.12	2.92	5.5
10.00		123.12	3.17	5.9
10.50		123.12	3.42	6.3
11.00		123.12	3.67	6.7
11.50		123.12	3.92	7.1
12.00		123.12	4.17	7.5
12.50		123.12	4.42	7.9
13.00		123.12	4.67	8.3
13.50		123.12	4.92	8.7
14.00		123.12	5.17	9.1
14.50		123.12	5.42	9.5
15.00		123.12	5.67	9.9
15.50		123.12	5.92	10.3
16.00		123.12	6.17	10.7
16.50		123.12	6.42	11.1
17.00		123.12	6.67	11.5
17.50		123.12	6.92	11.9
18.00		123.12	7.17	12.3
18.50		123.12	7.42	12.7
19.00		123.12	7.67	13.1
19.50		123.12	7.92	13.5
20.00		123.12	8.17	13.9
20.50		123.12	8.42	14.3
21.00		123.12	8.67	14.7
21.50		123.12	8.92	15.1
22.00		123.12	9.17	15.5
22.50		123.12	9.42	15.9
23.00		123.12	9.67	16.3
23.50		123.12	9.92	16.7
24.00		123.12	10.17	17.1
24.50		123.12	10.42	17.5
25.00		123.12	10.67	17.9
25.50		123.12	10.92	18.3
26.00		123.12	11.17	18.7
26.50		123.12	11.42	19.1
27.00		123.12	11.67	19.5
27.50		123.12	11.92	19.9
28.00		123.12	12.17	20.3
28.50		123.12	12.42	20.7
29.00		123.12	12.67	21.1
29.50		123.12	12.92	21.5
30.00		123.12	13.17	21.9
30.50		123.12	13.42	22.3
31.00		123.12	13.67	22.7
31.50		123.12	13.92	23.1
32.00		123.12	14.17	23.5
32.50		123.12	14.42	23.9
33.00		123.12	14.67	24.3
33.50		123.12	14.92	24.7
34.00		123.12	15.17	25.1
34.50		123.12	15.42	25.5
35.00		123.12	15.67	25.9
35.50		123.12	15.92	26.3
36.00		123.12	16.17	26.7
36.50		123.12	16.42	27.1
37.00		123.12	16.67	27.5
37.50		123.12	16.92	27.9
38.00		123.12	17.17	28.3
38.50		123.12	17.42	28.7
39.00		123.12	17.67	29.1
39.50		123.12	17.92	29.5
40.00		123.12	18.17	29.9
40.50		123.12	18.42	30.3
41.00		123.12	18.67	30.7
41.50		123.12	18.92	31.1
42.00		123.12	19.17	31.5
42.50		123.12	19.42	31.9
43.00		123.12	19.67	32.3
43.50		123.12	19.92	32.7
44.00		123.12	20.17	33.1
44.50		123.12	20.42	33.5
45.00		123.12	20.67	33.9
45.50		123.12	20.92	34.3
46.00		123.12	21.17	34.7
46.50		123.12	21.42	35.1
47.00		123.12	21.67	35.5
47.50		123.12	21.92	35.9
48.00		123.12	22.17	36.3
48.50		123.12	22.42	36.7
49.00		123.12	22.67	37.1
49.50		123.12	22.92	37.5
50.00		123.12	23.17	37.9
50.50		123.12	23.42	38.3
51.00		123.12	23.67	38.7
51.50		123.12	23.92	39.1
52.00		123.12	24.17	39.5
52.50		123.12	24.42	39.9
53.00		123.12	24.67	40.3
53.50		123.12	24.92	40.7
54.00		123.12	25.17	41.1
54.50		123.12	25.42	41.5
55.00		123.12	25.67	41.9
55.50		123.12	25.92	42.3
56.00		123.12	26.17	42.7
56.50		123.12	26.42	43.1
57.00		123.12	26.67	43.5
57.50		123.12	26.92	43.9
58.00		123.12	27.17	44.3
58.50		123.12	27.42	44.7
59.00		123.12	27.67	45.1
59.50		123.12	27.92	45.5
60.00		123.12	28.17	45.9
60.50		123.12	28.42	46.3
61.00		123.12	28.67	46.7
61.50		123.12	28.92	47.1
62.00		123.12	29.17	47.5
62.50		123.12	29.42	47.9
63.00		123.12	29.67	48.3
63.50		123.12	29.92	48.7
64.00		123.12	30.17	49.1
64.50		123.12	30.42	49.5
65.00		123.12	30.67	49.9
65.50		123.12	30.92	50.3
66.00		123.12	31.17	50.7
66.50		123.12	31.42	51.1
67.00		123.12	31.67	51.5
67.50		123.12	31.92	51.9
68.00		123.12	32.17	52.3
68.50		123.12	32.42	52.7
69.00		123.12	32.67	53.1
69.50		123.12	32.92	53.5
70.00		123.12	33.17	53.9
70.50		123.12	33.42	54.3
71.00		123.12	33.67	54.7
71.50		123.12	33.92	55.1
72.00		123.12	34.17	55.5
72.50		123.12	34.42	55.9
73.00		123.12	34.67	56.3
73.50		123.12	34.92	56.7
74.00		123.12	35.17	57.1
74.50		123.12	35.42	57.5
75.00		123.12	35.67	57.9
75.50		123.12	35.92	58.3
76.00		123.12	36.17	58.7
76.50		123.12	36.42	59.1
77.00		123.12	36.67	59.5
77.50		123.12	36.92	59.9
78.00		123.12	37.17	60.3
78.50		123.12	37.42	60.7
79.00		123.12	37.67	61.1
79.50		123.12	37.92	61.5
80.00		123.12	38.17	61.9
80.50		123.12	38.42	62.3
81.00		123.12	38.67	62.7
81.50		123.12	38.92	63.1
82.00		123.12	39.17	63.5
82.50		123.12	39.42	63.9
83.00		123.12	39.67	64.3
83.50		123.12	39.92	64.7
84.00		123.12	40.17	65.1
84.50		123.12	40.42	65.5
85.00		123.12	40.67	65.9
85.50		123.12	40.92	66.3
86.00		123.12	41.17	66.7
86.50		123.12	41.42	67.1
87.00		123.12	41.67	67.5
87.50		123.12	41.92	67.9
88.00		123.12	42.17	68.3
88.50		123.12	42.42	68.7
89.00		123.12	42.67	69.1
89.50		123.12	42.92	69.5
90.00		123.12	43.17	69.9
90.50		123.12	43.42	70.3
91.00		123.12	43.67	70.7
91.50		123.12	43.92	71.1
92.00		123.12	44.17	71.5
92.50		123.12	44.42	71.9
93.00		123.12	44.67	72.3
93.50		123.12	44.92	72.7
94.00		123.12	45.17	73.1
94.50		123.12	45.42	73.5
95.00		123.12	45.67	73.9
95.50		123.12	45.92	74.3
96.00		123.12	46.17	74.7
96.50		123.12	46.42	75.1
97.00		123.12	46.67	75.5
97.50		123.12	46.92	75.9
98.00		123.12	47.17	76.3
98.50		123.12	47.42	76.7
99.00		123.12	47.67	77.1
99.50		123.12	47.92	77.5
100.00		123.12	48.17	77.9

72.60

.0

127.05

1.7

.7

OUTPUT SUMMARY

PEAK FLOW (cfs)	=	11.9
PEAK STAGE (ft)	=	127.51
TIME TO PEAK (hrs)	=	12.75
RUNOFF VOLUME STORED (ac-ft)	=	5.3

*** END OF JOB ***



England-Thimby & Miller, Inc.

Consulting & Design Engineers
3131 St Johns Bluff Road So Jacksonville FL 32216

904 642 8990

BY _____ SHEET NO _____ OF _____

CHECKED BY _____ DATE _____

REVISED BY _____ DATE _____

PROJ NAME TRAIL RIDGE LANDFILL

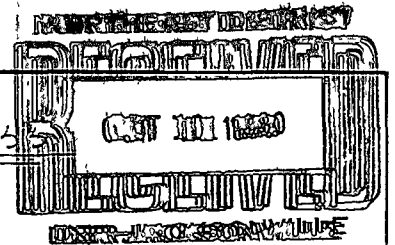
PROJ NO E89-113-9

VOLUME IMPOUNDED BY BORROW PIT

- NORMAL WATER LEVEL EL 123.0
AREA OF 123.0 CONTOUR: 30.16 ACRES
- ELEVATION AT EASTERLY END OF BORROW PIT: 100.0
AREA OF 100.0 CONTOUR: 24.15 ACRES
- AVERAGE AREA OF 123 AND 100 CONTOURS: $\bar{A} = \frac{30.16 + 24.15}{2}$
= 27.155 ACRES
- DEPTH: $123 - 100 = 23$ FT
- TOTAL VOLUME IMPOUNDED $V = 27.155 \text{ ACRES} (23 \text{ FT})$
 $= 624.61 \text{ ACRE} \cdot \text{FT}$

PROJ NAME TRAIL RIDGE "PLAN A"

PROJ NO 89-113-9



LEAKAGE RATE CALCULATIONS FOR LINER ANALYSIS

LATERAL DRAINAGE FROM LAYER FOUR (PER H.E.L.P. MODEL)

LARGEST AVERAGE MONTHLY VALUE (SEPTEMBER) = $4.4307 \times 10^{-14} \text{ m}$

AVERAGE ANNUAL TOTAL 19.6741 m/yr

$$4.4307 \times 10^{-14} \text{ m/mth} > 19.6741 \text{ m/yr}$$

$$4.4307 \times 10^{-14} \text{ m/mth} = 4.3 \times 10^{-8} \text{ m/sec}$$

$$Q (\text{IMPINGEMENT RATE}) = 4.3 \times 10^{-8} \text{ m/sec}$$

$$H = L \left(\sqrt{\frac{Q}{K} + \tan^2 \beta} - \tan \beta \right)$$

H = HEAD ON PRIMARY LINER

Q = IMPINGEMENT RATE ($4.3 \times 10^{-8} \text{ m/sec}$)

K = HYDRAULIC CONDUCTIVITY OF GEODRAIN ($19.6 \text{ cm/s} \approx 0.2 \text{ m/sec}$)

$\tan \beta$ = BASE SLOPE (2% = 0.02)

L = DRAINAGE LENGTH (150 FT \approx 46 M)

$$H = 46 \left(\sqrt{\frac{4.3 \times 10^{-8}}{0.2} + (0.02)^2} - 0.02 \right)$$

$$= 0.00025 \text{ M}$$

$$= \underline{\underline{0.0097 \text{ IN}}}$$



PROJ NAME TRAIL RIDGE

PROJ NO 89-113-9

ASSUME : 1 HOLE/AC

$$AREA_{HOLE} = 0.1 CM^2 = 1 \times 10^{-5} M^2$$

$$Q = 0.6 A \sqrt{2 g H}$$

Q = LEAKAGE RATE

A = AREA OF HOLE ($1 \times 10^{-5} M^2$)

$$g = 9.8 \text{ m/sec}^2$$

H = 0.00025 M (SEE PREVIOUS SHEET)

$$Q = 0.6 (1 \times 10^{-5}) \sqrt{2 (9.8) (0.00025)}$$

$$= 4.2 \times 10^{-7} M^3/SEC / HOLE$$

$$4.2 \times 10^{-7} M^3/SEC / HOLE \times 1 \text{ HOLE/AC} \times 1 \text{ AC}/4047 M^2$$

$$Q = 1.04 \times 10^{-10} M^3/SEC$$

$$= \underline{\underline{9.6 GFL/AC/DAY}}$$

FOR CONSERVATIVE MEASURES, ASSUME THE GEODRAIN (PRIMARY) IS SATURATED.
HEAD = 0.22 IN = 0.0056 M

$$Q = 46.2 GPAD$$

∴ ASSUME A LEAKAGE RATE IN EXCESS OF 100 gpad WOULD REQUIRE REMEDIATION.



PROJ NAME TRAIL RIDGE PLAN "A"

PROJ NO 89-113-9

DEPTH OF FLOW CALCULATIONS IN LDS (AS SUGGESTED BY
GIROUD ET AL [1993],

ASSUMED LEAKAGE RATE = 100 GPD

$$\text{DEPTH OF FLOW} = \frac{Q}{B K i}$$

Q = LEAKAGE RATE (100 GPD = 1×10^{-9} M³/S)

* B = WIDTH OF LEAKAGE FLOW

K = HYDRAULIC CONDUCTIVITY OF LDS (19.6 CM/S = 0.2 M/S)

i = HYDRAULIC GRADIENT OF LDS SLOPE (0.02)

$$D = \frac{1 \times 10^{-9} \text{ M}^3/\text{SEC}}{(1 \text{ M})(0.2 \text{ M/S})(0.02)}$$

$$= 0.00000025 \text{ M}$$

$$\approx 0.0000098 \text{ IN}$$

$$0.0000098 \text{ IN} < 0.22 \text{ IN (DEPTH OF LDS)}$$

\therefore LDS DOES NOT BECOME SATURATED

REFERENCE: EQUATIONS & METHODOLOGY OBTAINED FROM PERMIT DOCUMENTS
SUBMITTED TO D.E.R. FOR MEDLEY LANDFILL EXPANSION FROM
GEOSERVICES INC

* (GIROUD SUGGESTS A CONSERVATIVE FLOW WIDTH TO BE 1M-5M)

LINER LEAKAGE FRACTION
= 0.00 FOR PRIMARY LINER

TRAILFIDE LANDFILL - LINER ANALYSIS
JACKSONVILLE, DUVAL COUNTY, FLORIDA
EPA-117-P OCTOBER 9, 1990

BASE FOUND

LAYER 1

VERTICAL PERCOLATION LAYER

THICKNESS = 5.0 INCHES
POROSITY = 0.457 VOL/VOL
FIELD CAPACITY = 0.157 VOL/VOL
WILTING POINT = 0.055 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.457 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY = 0.00000000 CM/SEC

LAYER 2

VERTICAL PERCOLATION LAYER

THICKNESS = 0.0 INCHES
POROSITY = 0.0 VOL/VOL
FIELD CAPACITY = 0.000 VOL/VOL
WILTING POINT = 0.0 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.000 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY = 0.000000000 CM/SEC

LAYER 3

VERTICAL PERCOLATION LAYER

THICKNESS = 24.00 INCHES
POROSITY = 0.4570 VOL/VOL
FIELD CAPACITY = 0.1509 VOL/VOL
WILTING POINT = 0.0581 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.4509 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY = 0.0000000000 CM/SEC

LAYER

LATERAL DRAINAGE LAYER

THICKNESS = 0.22 INCHES
 POROSITY = 0.70 VOL/VOL
 FIELD CAPACITY = 0.0450 VOL/VOL
 WILTING POINT = 0.00 VOL/VOL
 INITIAL SOIL WATER CONTENT = 0.025 VOL/VOL
 SATURATED HYDRAULIC CONDUCTIVITY = 19.6349994559404 CM/SEC
 SLOPE = 2.00 PERCENT
 DRAINAGE LENGTH = 10.0 FEET

LAYER 1

DIFFUSE SOIL LAYER WITH FINE PORE MEMBRANE LAYER

THICKNESS = 0.25 INCHES
 POROSITY = 0.70 VOL/VOL
 FIELD CAPACITY = 0.0450 VOL/VOL
 WILTING POINT = 0.00 VOL/VOL
 INITIAL SOIL WATER CONTENT = 0.025 VOL/VOL
 SATURATED HYDRAULIC CONDUCTIVITY = 19.6349994559404 CM/SEC
 LAYER LEAKAGE FRACTION = 0.0

LAYER 2

LATERAL DRAINAGE LAYER

THICKNESS = 0.22 INCHES
 POROSITY = 0.70 VOL/VOL
 FIELD CAPACITY = 0.0450 VOL/VOL
 WILTING POINT = 0.00 VOL/VOL
 INITIAL SOIL WATER CONTENT = 0.025 VOL/VOL
 SATURATED HYDRAULIC CONDUCTIVITY = 19.6349994559404 CM/SEC
 SLOPE = 2.00 PERCENT
 DRAINAGE LENGTH = 10.0 FEET

LAYER 3

BARRIER SOIL LAYER WITH FLEXIBLE MEMBRANE LAYER

THICKNESS = 0.25 INCHES
 POROSITY = 0.4000 VOL/VOL
 FIELD CAPACITY = 0.0550 VOL/VOL
 WILTING POINT = 0.2550 VOL/VOL
 INITIAL SOIL WATER CONTENT = 0.0225 VOL/VOL
 SATURATED HYDRAULIC CONDUCTIVITY = 0.00000000000000 CM/SEC
 LAYER LEAKAGE FRACTION = 0.00000000

LAYER 4

THICKNESS		6.00 INCHES
POROSITY	=	0.4750 VOL/VOL
FIELD CAPACITY	=	0.3777 VOL/VOL
WILTING POINT	=	0.2349 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.3777 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	0.000170300093 CM/SEC

doi:10.1017/S0022292412001917

```

005 RUNOFF DATE NUMBER      = 00000000
TOTAL AREA OF DAMS         = 00000000
EXPOSURE TO THE TIDE       = 00000000
PROTECTION OF THE DAMS     = 00000000
DAMS WITH NO PROTECTION   = 00000000
TOTAL DAMS PROTECTED      = 00000000
    ALL WATER CONTROL INITIALS ARE IN USE

```

Abstract

SYNTHETIC RAINFALL WITH SYNTHETIC SUN TEMPERATURE AND
SOLAR RADIATION FOR JACOINVILLE FLORIDA

MAXIMUM LEAF AREA INDEX	= 1.0
START OF BROW NG SEASON (MILLION D.TS)	= 17
END OF BROWING SEASON (MILLION D.TS)	= 24

DATE	DESCRIPTION	AMOUNT	CHECK NO.	BANK	BALANCE
1961					
1962					
1963					
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2054					
2055					
2056					

$$\frac{1}{2} + \frac{1}{2^2} + \frac{1}{2^3} + \dots = 1$$

AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1 THROUGH 5

JAN/JUL FEB/AUG MAR/SEP APR/OCT MAY/NOV JUN/DEC

PRECIPITATION

TOTALS	2.60	3.54	2.57	2.52	3.63	4.36
	7.46	9.03	9.11	2.39	2.64	3.05
STD. DEVIATIONS	1.70	2.18	2.73	2.31	2.48	2.07
	3.02	1.53	1.76	1.69	1.98	1.40

010000

TIME	0 00	0 05	1 0	2 00	3 00	4 00
------	------	------	-----	------	------	------

STD. DEVIATIONS	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000

EVAPOTRANSPIRATION

TOTALS	1.534	2.229	2.159	1.517	2.470	2.794
	4.262	4.202	4.080	2.439	1.656	2.047

STD. DEVIATIONS	0.618	0.533	0.836	1.191	1.17	0.787
	1.246	1.479	0.498	0.907	0.735	0.563

LATERAL DRAINAGE FROM LAYER 4

TOTALS	1.027	0.5973	1.2212	1.0314	1.173	1.1559
	1.1070	2.0125	4.4717	2.5127	1.7711	1.3201

STD. DEVIATIONS	0.5133	0.2252	0.3204	0.3421	0.772	0.552
	0.521	0.735	0.795	0.4223	0.07	0.135

PERCOLATION FROM LAYER 5

TOTALS	0.000	0.0000	0.0000	0.0000	0.000	0.000
	0.000	0.0000	0.0000	0.0000	0.000	0.000

STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.000	0.000
	0.0000	0.0000	0.0000	0.0000	0.000	0.000

LATERAL DRAINAGE FROM LAYER 6

TOTALS	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000

STD. DEVIATIONS	0.0000	0.000	0.0000	0.000	0.000	0.000
	0.000	0.000	0.000	0.0000	0.000	0.000

PERCOLATION FROM LAYER 7

TOTALS	0.0000	0.000	0.000	0.000	0.000	0.000
	0.0000	0.000	0.000	0.000	0.000	0.000

STD. DEVIATIONS	0.000	0.0000	0.000	0.000	0.000	0.000
	0.000	0.0000	0.000	0.000	0.000	0.000

PERCOLATION FROM LAYER 8

TOTALS	0.0145	0.0150	0.0177	0.0152	0.0153	0.0145
	0.0045	0.0041	0.0037	0.0036	0.0032	0.0032

STD. DEVIATIONS	0.0254	0.0175	0.0105	0.0076	0.0052	0.0050
	0.0043	0.0037	0.0031	0.0029	0.0025	0.0023

AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1 THROUGH 5

	(INCHES)	(CU. FT.)	PERCENT
PRECIPITATION	52.26 (5.5e8)	1897110.	100.00
RUNOFF	0.000 (0.000)	0	0.00

LATERAL DRAINAGE FROM LAYER 4	17.6741 (0.791)	714171.	37.65
PERCOLATION FROM LAYER 5	0.0000 (0.0000)	.	0.00
LATERAL DRAINAGE FROM LAYER 6	0.0000 (0.0000)	0.	0.00
PERCOLATION FROM LAYER 7	0.0000 (0.0000)	0.	0.00
PERCOLATION FROM LAYER 8	0.0712 (0.0857)	2548.	0.17
CHANGE IN WATER STORAGE	0.712 (0.982)	25026	1.33

 TABLE VALUES FOR DATE 1 THROUGH 5

	(INCHES)	(VOL/VOL)
PRECIPITATION	4.79	173877.
RUNOFF	0.	0.
LATERAL DRAINAGE FROM LAYER 4	17674	714171.
PERCOLATION FROM LAYER 5	0.	0.
HEAD ON LAYER 6	0.1	
LATERAL DRAINAGE FROM LAYER 6	0.00	
PERCOLATION FROM LAYER 7	0.00	
HEAD ON LAYER 7		
PERCOLATION FROM LAYER 8	0.0712	2548.
SNOW WATER	0.0	

MAXIMUM VEG. SOIL WATER (VOL/VOL) 0.4059

MINIMUM VEG. SOIL WATER (VOL/VOL) 0.1747

 FINAL WATER STORAGE AT END OF YEAR 5

LAYER	(INCHES)	(VOL/VOL)
1	0.38	0.4326

3	5.75	0.2230
4	0.11	0.596
5	0.10	0.0225
6	0.11	0.450
7	0.1	0.0225
8	1.92	1.1192

SNOW WATER 0.00

=====

LINER LEAKAGE RATE
0.00 FOR PRIMARY LINER

TRAILRIDGE LANDFILL - FINAL COVER ANALYSIS
JACKSONVILLE, DUVAL COUNTY, FLORIDA
EEC-113-9 OCTOBER 11, 1990

TOP SOILS

LAYER 1

VERTICAL PERCOLATION LAYER

THICKNESS = 12.0 INCHES
POROSITY = 0.477 VOL/VOL
FIELD CAPACITY = 0.2217 VOL/VOL
WILTING POINT = 0.1047 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.424 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY = 0.000001000000 CM/SEC

LAYER 2

LATERAL DRAINAGE LAYER

THICKNESS = 12.0 INCHES
POROSITY = 0.477 VOL/VOL
FIELD CAPACITY = 0.2217 VOL/VOL
WILTING POINT = 0.1047 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.424 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY = 0.000001000000 CM/SEC
SLOPE = 2.0 PERCENT
DRAINAGE LENGTH = 350.0 FEET

LAYER 3

BARRIER SOIL LINER

THICKNESS = 12.00 INCHES
POROSITY = 0.4300 VOL/VOL
FIELD CAPACITY = 0.3663 VOL/VOL
WILTING POINT = 0.2802 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.4300 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY = 0.000001000000 CM/SEC

LAYER

VERTICAL PERCOLATION LAYER

THICKNESS = 12.00 INCHES
 POROSITY = 0.4570 VOL/VOL
 FIELD CAPACITY = 0.1309 VOL/VOL
 WILTING POINT = 0.0530 VOL/VOL
 INITIAL SOIL WATER CONTENT = 0.2020 VOL/VOL
 SATURATED HYDRAULIC CONDUCTIVITY = 0.001000000473 CM/SEC

LAYER 5

VERTICAL PERCOLATION LAYER

THICKNESS = 12.00 INCHES
 POROSITY = 0.4570 VOL/VOL
 FIELD CAPACITY = 0.1309 VOL/VOL
 WILTING POINT = 0.0530 VOL/VOL
 INITIAL SOIL WATER CONTENT = 0.2020 VOL/VOL
 SATURATED HYDRAULIC CONDUCTIVITY = 0.001000000473 CM/SEC

LAYER 6

VERTICAL PERCOLATION LAYER

THICKNESS = 12.00 INCHES
 POROSITY = 0.4570 VOL/VOL
 FIELD CAPACITY = 0.1309 VOL/VOL
 WILTING POINT = 0.0530 VOL/VOL
 INITIAL SOIL WATER CONTENT = 0.2020 VOL/VOL
 SATURATED HYDRAULIC CONDUCTIVITY = 0.001000000473 CM/SEC

LAYER 7

LATERAL DRAINAGE LAYER

THICKNESS = 12.00 INCHES
 POROSITY = 0.7000 VOL/VOL
 FIELD CAPACITY = 0.1450 VOL/VOL
 WILTING POINT = 0.0210 VOL/VOL
 INITIAL SOIL WATER CONTENT = 0.0457 VOL/VOL
 SATURATED HYDRAULIC CONDUCTIVITY = 19.6849994659424 CM/SEC
 SLOPE = 2.00 PERCENT
 DRAINAGE LENGTH = 150.0 FEET

LAYER 8

BARRIER SOIL LINER WITH FLEXIBLE MEMBRANE LINER

THICKNESS = 0.06 INCHES
 POROSITY = 0.7000 VOL/VOL

WILTING POINT = 0.0219 VOL/VOL
 INITIAL SOIL WATER CONTENT = 0.7000 VOL/VOL
 SATURATED HYDRAULIC CONDUCTIVITY = 19.6849994659424 CM/SEC
 LINER LEAKAGE FRACTION = 0.00000000

LAYER 9

LATERAL DRAINAGE LAYER

THICKNESS = 1.22 INCHES
 POROSITY = 0.7000 VOL/VOL
 FIELD CAPACITY = 0.0450 VOL/VOL
 WILTING POINT = 0.0219 VOL/VOL
 INITIAL SOIL WATER CONTENT = 0.0000 VOL/VOL
 SATURATED HYDRAULIC CONDUCTIVITY = 19.6849994659424 CM/SEC
 SLOPE = 0.0 PERCENT
 DRAINAGE LENGTH = 5 FEET

LAYER 10

BARRIER SOIL LINER WITH FLEXIBLE MEMBRANE LINER

THICKNESS = 0.12 INCHES
 POROSITY = 0.4000 VOL/VOL
 FIELD CAPACITY = 0.0350 VOL/VOL
 WILTING POINT = 0.0000 VOL/VOL
 INITIAL SOIL WATER CONTENT = 0.0000 VOL/VOL
 SATURATED HYDRAULIC CONDUCTIVITY = 0.0000000000 CM/SEC
 LINER LEAKAGE FRACTION = 0.0000

LAYER 11

VERTICAL REDUPLICATION LAYER

THICKNESS = 6.00 INCHES
 POROSITY = 0.4750 VOL/VOL
 FIELD CAPACITY = 0.0777 VOL/VOL
 WILTING POINT = 0.0048 VOL/VOL
 INITIAL SOIL WATER CONTENT = 0.2648 VOL/VOL
 SATURATED HYDRAULIC CONDUCTIVITY = 0.0000171000003 CM/SEC

GENERAL SIMULATION DATA

SCS RUNOFF CURVE NUMBER = 74.26
 TOTAL AREA OF COVER = 435600. SQ FT
 EVAPORATIVE ZONE DEPTH = 8.00 INCHES
 UPPER LIMIT VEG. STORAGE = 3.7840 INCHES
 INITIAL VEG. STORAGE = 2.9575 INCHES

SOIL WATER CONTENT INITIALIZED BY PROGRAM.

SYNTHETIC RAINFALL WITH SYNTHETIC DAILY TEMPERATURES AND
SOLAR RADIATION FOR JACKSONVILLE FLORIDA

MAXIMUM LEAF AREA INDEX = 2.00
 START OF GROWING SEASON (JULIAN DATE) = 17
 END OF GROWING SEASON (JULIAN DATE) = 4

NORMAL MEAN MONTHLY TEMPERATURES, DEGREES FAHRENHEIT

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
57.30 51.50	55.10 51.00	56.30 58.00	57.70 59.50	58.10 58.00	59.00 54.80

AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1 THROUGH 5

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	2.6 7.45	3.51 8.70	2.57 8.11	2.52 2.79	3.65 2.64	4.75 3.05
STD. DEVIATIONS	1.70 3.02	2.18 1.53	2.30 1.90	2.71 1.69	2.45 1.73	2.07 1.40
RUNOFF						
TOTALS	0.191 0.645	1.025 1.714	1.637 2.34	1.053 1.194	0.859 0.096	0.157 0.685
STD. DEVIATIONS	0.775 1.470	1.405 0.691	1.015 0.257	1.110 0.424	1.457 0.135	0.741 1.320
EVAPOTRANSPIRATION						
TOTALS	1.674 5.677	2.302 5.349	2.682 5.574	2.569 3.722	3.990 1.692	3.945 1.258
STD. DEVIATIONS	0.445 1.525	0.500 2.108	1.104 0.719	1.715 1.074	2.360 0.911	1.592 0.238
LATERAL DRAINAGE FROM LAYER 2						
TOTALS	0.0322 0.0296	0.0317 0.0328	0.0322 0.0346	0.0287 0.0701	0.0300 0.0274	0.0275 0.0324
STD. DEVIATIONS	0.0046 0.0011	0.0043 0.0026	0.0037 0.0032	0.0014 0.0030	0.0024 0.0014	0.0024 0.0064
PERCOLATION FROM LAYER 3						
TOTALS	0.2719 0.5545	0.2616 0.9741	0.2750 0.9721	0.2471 0.5501	0.2555 0.9701	0.2367 0.9610

STD. DEVIATIONS	0.0271	0.0153	0.0171	0.0112	0.0221	0.0177
	0.0070	0.0000	0.0151	0.0197	0.0134	0.0350

LATERAL DRAINAGE FROM LAYER 7

TOTALS	0.0904	0.0840	0.0979	0.0926	0.0974	0.0958
	0.1005	0.1019	0.0998	0.1044	0.1021	0.1066

STD. DEVIATIONS	0.0310	0.0259	0.0272	0.0245	0.0276	0.0212
	0.0204	0.0191	0.0174	0.0170	0.0157	0.0155

PERCOLATION FROM LAYER 8

TOTALS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

LATERAL DRAINAGE FROM LAYER 9

TOTALS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

PERCOLATION FROM LAYER 1

TOTALS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

PERCOLATION FROM LAYER 11

TOTALS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1 THROUGH 5

	(INCHES)	(CU. FT.)	PERCENT
PRECIPITATION	52.26 (6.568)	1977110.	100.00
RUNOFF	8.270 (2.855)	300211.	15.82
EVAPOTRANSPIRATION	40.846 (3.440)	1482716.	78.16
LATERAL DRAINAGE FROM LAYER 2	0.3688 (0.0064)	13387.	0.71
PERCOLATION FROM LAYER 3	3.1183 (0.0502)	113195.	5.97
LATERAL DRAINAGE FROM	1.1481 (0.0585)	12115.	0.61

LAYER 7

PERCOLATION FROM LAYER 8	0.0000 (0.0000)	0.	0.00
LATERAL DRAINAGE FROM LAYER 9	0.0000 (0.0000)	0.	0.00
PERCOLATION FROM LAYER 10	0.0000 (0.0000)	0.	0.00
PERCOLATION FROM LAYER 11	0.0000 (0.0000)	0.	0.00
CHANGE IN WATER STORAGE	1.607 (1.766)	58350.	3.08

PEAK DAILY VALUES FOR YEARS 1 THROUGH 5

	INCHES	(CU FT.)
PRECIPITATION	4.75	170877.0
RUNOFF	3.451	125277.2
LATERAL DRAINAGE FROM LAYER 2	0.0014	51.1
PERCOLATION FROM LAYER 3	0.001	372.4
HEAD ON LAYER 7	24.8	
LATERAL DRAINAGE FROM LAYER 7	0.004	145.2
PERCOLATION FROM LAYER 8	0.000	0.0
HEAD ON LAYER 8	0.0	
LATERAL DRAINAGE FROM LAYER 9	0.000	0.0
PERCOLATION FROM LAYER 10	0.000	0.0
HEAD ON LAYER 10	0.0	
PERCOLATION FROM LAYER 11	0.000	0.0
SNOW WATER	0.000	0.0
MAXIMUM VEG. SOIL WATER (VOL/VOL)	0.4737	
MINIMUM VEG. SOIL WATER (VOL/VOL)	0.1074	

FINAL WATER STORAGE AT END OF YEAR 5

2	5.48	0.572
7	5.15	0.4710
4	2.39	0.1000
5	740.25	0.2240
6	4.40	0.1571
7	1.01	0.0477
5	0.64	0.7000
3		1.0
1		1.0
1	55	1.0115

END OF FILE

HELP MODEL CALCULATIONS (Revised 10-10-90)

ANALYSIS ONE
BARE GROUND

LAYER ONE (TOP)

- 6" Daily Cover
VERTICAL PERCOLATION LAYER
Soil Texture Class No. 5

LAYER TWO

- 6' compacted municipal waste
VERTICAL PERCOLATION LAYER
Soil Texture Class No. 18

LAYER THREE

- 2' soil blanket over liner
VERTICAL PERCOLATION LAYER
Soil Texture Class No. 5

LAYER FOUR

- Geodrain
LATERAL DRAINAGE LAYER
Transmissivity $1.1 \times 10^{-3} \text{ m}^2/\text{sec}$
Thickness = 0.22 in.
Porosity 0.700 vol/vol
Field Capacity 0.045 vol/vol - Soil
Texture Class No. 1
Wilting Point 0.02 vol/vol - Minimum
Value
National Seal Company PN 3000
7000 PSF Loading

LAYER FIVE

- 60 mil HDPE liner with Geodrain
FLEXIBLE MEMBRANE LINER WITH BARRIER
SOIL LINER

LAYER SIX

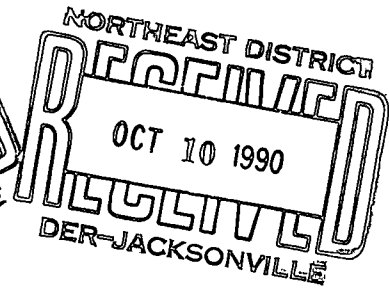
- Geodrain
LATERAL DRAINAGE LAYER

LAYER SEVEN

- 60 mil HDPE with Claymax
FLEXIBLE MEMBRANE LINER WITH BARRIER
SOIL LINER
Soil Texture Class No. 17

LAYER EIGHT

- 6" compacted base
VERTICAL PERCOLATION LAYER
Soil Texture Class No. 15



ANALYSIS TWO
FAIR GRASS

- LAYER ONE (TOP) - 12" top soil
VERTICAL PERCOLATION LAYER
Soil Texture Class No. 7
- LAYER TWO - 12" compacted soil
LATERAL DRAINAGE LAYER
Soil Texture Class No. 5
- LAYER THREE - 12" clay
BARRIER SOIL LINER
Soil Texture Class No. 16
- LAYER FOUR - 12" intermediate soil cover
VERTICAL PERCOLATION LAYER
Soil Texture Class No. 5
- LAYER FIVE - 100' compacted municipal waste
VERTICAL PERCOLATION LAYER
Soil Texture Class No. 18
- LAYER SIX - 2' soil blanket over liner
VERTICAL PERCOLATION LAYER
Soil Texture Class No. 5
- LAYER SEVEN - Geodrain
LATERAL DRAINAGE LAYER
- LAYER EIGHT - 60 mil HDPE flexible membrane liner
and Geodrain
FLEXIBLE MEMBRANE LINER WITH BARRIER
SOIL LINER
- LAYER NINE - Geodrain
LATERAL DRAINAGE LAYER
- LAYER TEN - 60 MIL HDPE flexible membrane liner with
Claymax
FLEXIBLE MEMBRANE LINER WITH BARRIER
SOIL LINER
- LAYER ELEVEN - 6" Compacted base
VERTICAL PERCOLATION LAYER

Notes concerning revised H.E.L.P. Analyses

- A. The twelve inches of topsoil ($K=5.2 \times 10^{-4}$ cm/sec) shall come from either blending the existing material on-site with organics obtained on-site or hauling in off-site borrow meeting the specified hydraulic transmissivity.
- B. The evaporative zone depth has been revised to eight inches

TRAILRIDGE LANDFILL - LINER ANALYSIS
JACKSONVILLE, DUVAL COUNTY, FLORIDA
E89-113-9 OCTOBER 9, 1990

BARE GROUND

LAYER 1

VERTICAL PERCOLATION LAYER

THICKNESS	=	6.00 INCHES
POROSITY	=	0.4570 VOL/VOL
FIELD CAPACITY	=	0.1309 VOL/VOL
WILTING POINT	=	0.0580 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.1309 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	0.0010000000475 CM/SEC

LAYER 2

VERTICAL PERCOLATION LAYER

THICKNESS	=	72.00 INCHES
POROSITY	=	0.5200 VOL/VOL
FIELD CAPACITY	=	0.2942 VOL/VOL
WILTING POINT	=	0.1400 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.2942 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	0.0001999999949 CM/SEC

LAYER 3

VERTICAL PERCOLATION LAYER

THICKNESS	=	24.00 INCHES
POROSITY	=	0.4570 VOL/VOL
FIELD CAPACITY	=	0.1309 VOL/VOL
WILTING POINT	=	0.0580 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.1309 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	0.0010000000475 CM/SEC

LAYER 4

LATERAL DRAINAGE LAYER

THICKNESS	=	0.22 INCHES
POROSITY	=	0.7000 VOL/VOL
FIELD CAPACITY	=	0.0450 VOL/VOL
WILTING POINT	=	0.0200 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0225 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	19.6849994659424 CM/SEC
SLOPE	=	2.00 PERCENT
DRAINAGE LENGTH	=	150.0 FEET

LAYER 5

BARRIER SOIL LINER WITH FLEXIBLE MEMBRANE LINER

THICKNESS	=	0.22 INCHES
POROSITY	=	0.7000 VOL/VOL
FIELD CAPACITY	=	0.0450 VOL/VOL
WILTING POINT	=	0.0200 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0225 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	19.6849994659424 CM/SEC
LINER LEAKAGE FRACTION	=	0.00001000

LAYER 6

LATERAL DRAINAGE LAYER

THICKNESS	=	0.22 INCHES
POROSITY	=	0.7000 VOL/VOL
FIELD CAPACITY	=	0.0450 VOL/VOL
WILTING POINT	=	0.0200 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0450 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	19.6849994659424 CM/SEC
SLOPE	=	2.00 PERCENT
DRAINAGE LENGTH	=	150.0 FEET

LAYER 7

BARRIER SOIL LINER WITH FLEXIBLE MEMBRANE LINER

THICKNESS	=	0.25 INCHES
POROSITY	=	0.4000 VOL/VOL
FIELD CAPACITY	=	0.3560 VOL/VOL
WILTING POINT	=	0.2899 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0225 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	0.0000000100000 CM/SEC
LINER LEAKAGE FRACTION	=	0.00001000

LAYER 8

VERTICAL PERCOLATION LAYER

THICKNESS	=	6.00 INCHES
POROSITY	=	0.4750 VOL/VOL
FIELD CAPACITY	=	0.3777 VOL/VOL
WILTING POINT	=	0.2648 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.3777 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	0.0000170000003 CM/SEC

GENERAL SIMULATION DATA

SCS RUNOFF CURVE NUMBER	=	83.31
TOTAL AREA OF COVER	=	43560. SQ FT
EVAPORATIVE ZONE DEPTH	=	8.00 INCHES
POTENTIAL RUNOFF FRACTION	=	1.000000
UPPER LIMIT VEG. STORAGE	=	3.7820 INCHES
INITIAL VEG. STORAGE	=	1.3738 INCHES

SOIL WATER CONTENT INITIALIZED BY USER.

CLIMATOLOGICAL DATA

SYNTHETIC RAINFALL WITH SYNTHETIC DAILY TEMPERATURES AND
SOLAR RADIATION FOR JACKSONVILLE FLORIDA

MAXIMUM LEAF AREA INDEX	=	0.00
START OF GROWING SEASON (JULIAN DATE)	=	37
END OF GROWING SEASON (JULIAN DATE)	=	4

NORMAL MEAN MONTHLY TEMPERATURES, DEGREES FAHRENHEIT

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
-----	-----	-----	-----	-----	-----
53.20	55.10	61.30	67.70	74.10	79.00
81.30	81.00	78.20	69.50	60.80	54.80

AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1 THROUGH 5

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC

PRECIPITATION						

TOTALS	2.60 7.46	3.54 9.03	2.57 8.11	2.82 2.39	3.68 2.64	4.36 3.05
STD. DEVIATIONS	1.70 3.02	2.18 1.53	2.39 1.98	2.31 1.69	2.48 1.98	2.07 1.40
RUNOFF						

TOTALS	0.224 0.606	0.062 0.707	0.100 0.609	0.103 0.018	0.199 0.058	0.152 0.103
STD. DEVIATIONS	0.498 0.629	0.112 0.220	0.224 0.759	0.105 0.041	0.351 0.086	0.304 0.132
EVAPOTRANSPIRATION						

TOTALS	1.583 4.268	2.228 4.203	2.159 4.082	1.517 2.439	2.631 1.654	2.985 2.049
STD. DEVIATIONS	0.617 1.235	0.683 1.479	0.886 0.498	1.101 0.907	1.370 0.741	0.582 0.563
LATERAL DRAINAGE FROM LAYER 4						

TOTALS	0.0182 0.0199	0.0119 0.0497	0.0200 0.1687	0.0170 0.0701	0.0171 0.0224	0.0170 0.0223
STD. DEVIATIONS	0.0212 0.0140	0.0090 0.0562	0.0173 0.0986	0.0199 0.0255	0.0131 0.0070	0.0104 0.0162
PERCOLATION FROM LAYER 5						

TOTALS	0.9500 1.0772	0.7689 1.6419	1.0399 3.2656	0.9091 2.2324	0.9660 1.2533	0.9751 1.2119
STD. DEVIATIONS	0.7390 0.6150	0.4629 1.0785	0.6865 1.2887	0.7005 0.4250	0.6066 0.1831	0.5458 0.4378
LATERAL DRAINAGE FROM LAYER 6						

TOTALS	0.9515 1.0760	0.7679 1.6380	1.0399 3.2632	0.9099 2.2374	0.9650 1.2553	0.9753 1.2113
STD. DEVIATIONS	0.7407 0.6147	0.4620 1.0756	0.6870 1.2887	0.7009 0.4266	0.6062 0.1834	0.5463 0.4353

PERCOLATION FROM LAYER 7

TOTALS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

PERCOLATION FROM LAYER 8

TOTALS	0.0148	0.0090	0.0077	0.0062	0.0056	0.0048
	0.0045	0.0041	0.0037	0.0036	0.0032	0.0032
STD. DEVIATIONS	0.0254	0.0135	0.0105	0.0076	0.0062	0.0050
	0.0043	0.0037	0.0031	0.0029	0.0025	0.0023

AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1 THROUGH 5

	(INCHES)	(CU. FT.)	PERCENT
PRECIPITATION	52.26 (6.568)	189711.	100.00
RUNOFF	2.941 (1.057)	10677.	5.63
EVAPOTRANSPIRATION	31.798 (2.931)	115427.	60.84
LATERAL DRAINAGE FROM LAYER 4	0.4543 (0.1931)	1649.	0.87
PERCOLATION FROM LAYER 5	16.2914 (5.6000)	59138.	31.17
LATERAL DRAINAGE FROM LAYER 6	16.2908 (5.6051)	59136.	31.17
PERCOLATION FROM LAYER 7	0.0000 (5.6051)	0.	0.00
PERCOLATION FROM LAYER 8	0.0702 (0.0867)	255.	0.13
CHANGE IN WATER STORAGE	0.707 (3.837)	2568.	1.35

PEAK DAILY VALUES FOR YEARS 1 THROUGH 5

	(INCHES)	(CU. FT.)
PRECIPITATION	4.79	17387.7
RUNOFF	1.590	5771.7
LATERAL DRAINAGE FROM LAYER 4	0.0172	62.4
PERCOLATION FROM LAYER 5	0.2114	767.5
HEAD ON LAYER 5	0.0	
LATERAL DRAINAGE FROM LAYER 6	0.2106	764.4
PERCOLATION FROM LAYER 7	0.0000	0.0
HEAD ON LAYER 7	0.0	
PERCOLATION FROM LAYER 8	0.0027	9.8
SNOW WATER	0.00	0.0

MAXIMUM VEG. SOIL WATER (VOL/VOL) 0.3733

MINIMUM VEG. SOIL WATER (VOL/VOL) 0.0743

FINAL WATER STORAGE AT END OF YEAR 5

LAYER	(INCHES)	(VOL/VOL)
1	0.38	0.0637
2	23.27	0.3232
3	5.33	0.2222
4	0.01	0.0592
5	0.00	0.0225
6	0.01	0.0590
7	0.01	0.0225
8	1.92	0.3192
SNOW WATER	0.00	

TRAILRIDGE LANDFILL - FINAL COVER ANALYSIS
JACKSONVILLE, DUVAL COUNTY, FLORIDA
E89-113-9 OCTOBER 9, 1990

FAIR GRASS

LAYER 1

VERTICAL PERCOLATION LAYER

THICKNESS	=	12.00 INCHES
POROSITY	=	0.4730 VOL/VOL
FIELD CAPACITY	=	0.2217 VOL/VOL
WILTING POINT	=	0.1043 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.2217 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	0.0015600000042 CM/SEC

LAYER 2

LATERAL DRAINAGE LAYER

THICKNESS	=	12.00 INCHES
POROSITY	=	0.4570 VOL/VOL
FIELD CAPACITY	=	0.1309 VOL/VOL
WILTING POINT	=	0.0580 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.1309 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	0.00100000000475 CM/SEC
SLOPE	=	2.00 PERCENT
DRAINAGE LENGTH	=	850.0 FEET

LAYER 3

BARRIER SOIL LINER

THICKNESS	=	12.00 INCHES
POROSITY	=	0.4300 VOL/VOL
FIELD CAPACITY	=	0.3663 VOL/VOL
WILTING POINT	=	0.2802 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.4300 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	0.0000001000000 CM/SEC

LAYER 4

VERTICAL PERCOLATION LAYER

THICKNESS	=	12.00 INCHES
POROSITY	=	0.4570 VOL/VOL
FIELD CAPACITY	=	0.1309 VOL/VOL
WILTING POINT	=	0.0580 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.1309 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	0.0010000000475 CM/SEC

LAYER 5

VERTICAL PERCOLATION LAYER

THICKNESS	=	1200.00 INCHES
POROSITY	=	0.5200 VOL/VOL
FIELD CAPACITY	=	0.2942 VOL/VOL
WILTING POINT	=	0.1400 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.2942 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	0.0001999999949 CM/SEC

LAYER 6

VERTICAL PERCOLATION LAYER

THICKNESS	=	24.00 INCHES
POROSITY	=	0.4570 VOL/VOL
FIELD CAPACITY	=	0.1309 VOL/VOL
WILTING POINT	=	0.0580 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.1309 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	0.0010000000475 CM/SEC

LAYER 7

LATERAL DRAINAGE LAYER

THICKNESS	=	0.22 INCHES
POROSITY	=	0.7000 VOL/VOL
FIELD CAPACITY	=	0.0450 VOL/VOL
WILTING POINT	=	0.0200 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0225 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	19.6849994659424 CM/SEC
SLOPE	=	2.00 PERCENT
DRAINAGE LENGTH	=	150.0 FEET

LAYER 8

BARRIER SOIL LINER WITH FLEXIBLE MEMBRANE LINER

THICKNESS	=	0.22 INCHES
POROSITY	=	0.7000 VOL/VOL
FIELD CAPACITY	=	0.0450 VOL/VOL
WILTING POINT	=	0.0200 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0225 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	19.6849994659424 CM/SEC
LINER LEAKAGE FRACTION	=	0.00001000

LAYER 9

LATERAL DRAINAGE LAYER

THICKNESS	=	0.22 INCHES
POROSITY	=	0.7000 VOL/VOL
FIELD CAPACITY	=	0.0450 VOL/VOL
WILTING POINT	=	0.0200 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0225 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	19.6849994659424 CM/SEC
SLOPE	=	2.00 PERCENT
DRAINAGE LENGTH	=	150.0 FEET

LAYER 10

BARRIER SOIL LINER WITH FLEXIBLE MEMBRANE LINER

THICKNESS	=	0.25 INCHES
POROSITY	=	0.4000 VOL/VOL
FIELD CAPACITY	=	0.3560 VOL/VOL
WILTING POINT	=	0.2899 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.4000 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	0.0000000100000 CM/SEC
LINER LEAKAGE FRACTION	=	0.00001000

LAYER 11

VERTICAL PERCOLATION LAYER

THICKNESS	=	6.00 INCHES
POROSITY	=	0.4750 VOL/VOL
FIELD CAPACITY	=	0.3777 VOL/VOL
WILTING POINT	=	0.2648 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.3778 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	0.0000170000003 CM/SEC

GENERAL SIMULATION DATA

SCS RUNOFF CURVE NUMBER = 95.00
TOTAL AREA OF COVER = 43560. SQ FT
EVAPORATIVE ZONE DEPTH = 8.00 INCHES
UPPER LIMIT VEG. STORAGE = 3.7840 INCHES
INITIAL VEG. STORAGE = 1.7736 INCHES
SOIL WATER CONTENT INITIALIZED BY USER.

CLIMATOLOGICAL DATA

SYNTHETIC RAINFALL WITH SYNTHETIC DAILY TEMPERATURES AND
SOLAR RADIATION FOR JACKSONVILLE FLORIDA

MAXIMUM LEAF AREA INDEX = 2.00
START OF GROWING SEASON (JULIAN DATE) = 37
END OF GROWING SEASON (JULIAN DATE) = 4

NORMAL MEAN MONTHLY TEMPERATURES, DEGREES FAHRENHEIT

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
53.20	55.10	61.30	67.70	74.10	79.00
81.30	81.00	78.20	69.50	60.80	54.80

AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1 THROUGH 5

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	2.60 7.46	3.54 9.03	2.57 8.11	2.82 2.39	3.68 2.64	4.36 3.05
STD. DEVIATIONS	1.70 3.02	2.18 1.53	2.39 1.98	2.31 1.69	2.48 1.98	2.07 1.40
RUNOFF						
TOTALS	0.735 2.365	0.756 3.311	0.698 2.760	0.785 0.423	1.183 0.613	1.086 0.785
STD. DEVIATIONS	1.202 1.296	0.829 0.630	1.181 1.625	0.779 0.652	1.275 0.546	1.202 0.707

PERCOLATION FROM LAYER 11

TOTALS	0.0148	0.0090	0.0077	0.0062	0.0056	0.0048
	0.0045	0.0041	0.0037	0.0036	0.0032	0.0032
STD. DEVIATIONS	0.0256	0.0136	0.0105	0.0076	0.0062	0.0050
	0.0043	0.0037	0.0031	0.0029	0.0025	0.0023

AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1 THROUGH 5

	(INCHES)	(CU. FT.)	PERCENT
PRECIPITATION	52.26 (6.568)	189711.	100.00
RUNOFF	15.502 (3.329)	56271.	29.66
EVAPOTRANSPIRATION	33.414 (3.680)	121293.	63.94
LATERAL DRAINAGE FROM LAYER 2	0.2592 (0.1157)	941.	0.50
PERCOLATION FROM LAYER 3	2.3447 (0.8189)	8511.	4.49
LATERAL DRAINAGE FROM LAYER 7	0.0048 (0.0020)	17.	0.01
PERCOLATION FROM LAYER 8	1.9266 (0.0020)	6993.	3.69
LATERAL DRAINAGE FROM LAYER 9	1.9254 (0.6433)	6989.	3.68
PERCOLATION FROM LAYER 10	0.0000 (0.0000)	0.	0.00
PERCOLATION FROM LAYER 11	0.0703 (0.0869)	255.	0.13
CHANGE IN WATER STORAGE	1.087 (1.361)	3944.	2.08

EVAPOTRANSPIRATION

TOTALS	1.576	2.204	2.266	1.918	2.744	3.249
	4.465	4.685	4.671	2.426	1.362	1.849
STD. DEVIATIONS	0.506	0.681	1.226	1.282	1.453	0.833
	1.289	1.702	0.949	0.981	0.784	0.446

LATERAL DRAINAGE FROM LAYER 2

TOTALS	0.0208	0.0201	0.0220	0.0202	0.0202	0.0192
	0.0202	0.0212	0.0230	0.0242	0.0229	0.0251
STD. DEVIATIONS	0.0118	0.0116	0.0127	0.0116	0.0116	0.0111
	0.0098	0.0089	0.0094	0.0076	0.0069	0.0038

PERCOLATION FROM LAYER 3

TOTALS	0.1908	0.1792	0.1979	0.1807	0.1797	0.1705
	0.1869	0.1985	0.2133	0.2199	0.2065	0.2208
STD. DEVIATIONS	0.0774	0.0876	0.1024	0.0949	0.0955	0.0915
	0.0606	0.0516	0.0553	0.0465	0.0408	0.0265

LATERAL DRAINAGE FROM LAYER 7

TOTALS	0.0004	0.0003	0.0004	0.0004	0.0004	0.0004
	0.0004	0.0004	0.0004	0.0004	0.0004	0.0005
STD. DEVIATIONS	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001

PERCOLATION FROM LAYER 8

TOTALS	0.1462	0.1353	0.1508	0.1483	0.1561	0.1546
	0.1640	0.1686	0.1675	0.1772	0.1748	0.1833
STD. DEVIATIONS	0.0824	0.0739	0.0784	0.0728	0.0704	0.0617
	0.0554	0.0459	0.0354	0.0282	0.0207	0.0161

LATERAL DRAINAGE FROM LAYER 9

TOTALS	0.1462	0.1345	0.1506	0.1483	0.1561	0.1546
	0.1639	0.1686	0.1675	0.1771	0.1747	0.1833
STD. DEVIATIONS	0.0824	0.0757	0.0788	0.0729	0.0704	0.0617
	0.0554	0.0460	0.0355	0.0283	0.0207	0.0162

PERCOLATION FROM LAYER 10

TOTALS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

PEAK DAILY VALUES FOR YEARS	1 THROUGH	5
	(INCHES)	(CU. FT.)
PRECIPITATION	4.79	17387.7
RUNOFF	3.505	12722.5
LATERAL DRAINAGE FROM LAYER 2	0.0013	4.6
PERCOLATION FROM LAYER 3	0.0098	35.5
HEAD ON LAYER 3	22.6	
LATERAL DRAINAGE FROM LAYER 7	0.0000	0.1
PERCOLATION FROM LAYER 8	0.0063	22.9
HEAD ON LAYER 8	0.0	
LATERAL DRAINAGE FROM LAYER 9	0.0063	22.9
PERCOLATION FROM LAYER 10	0.0000	0.0
HEAD ON LAYER 10	0.0	
PERCOLATION FROM LAYER 11	0.0027	9.8
SNOW WATER	0.00	0 0
MAXIMUM VEG. SOIL WATER (VOL/VOL)	0.4252	
MINIMUM VEG. SOIL WATER (VOL/VOL)	0.1035	

FINAL WATER STORAGE AT END OF YEAR 5

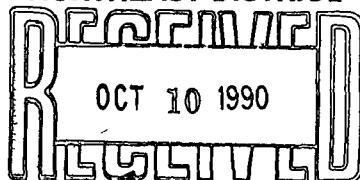
LAYER	(INCHES)	(VOL/VOL)
1	2.46	0.2050
2	5.48	0.4570
3	5.16	0.4300
4	2.38	0.1981
5	352.75	0.2940
6	4.69	0.1953
7	0.01	0.0486
8	0.00	0.0225
9	0.01	0.0486
10	0.10	0.4000
11	1.92	0.3192
SNOW WATER	0.00	



Golder Associates Inc.

CONSULTING ENGINEERS

NORTHEAST DISTRICT

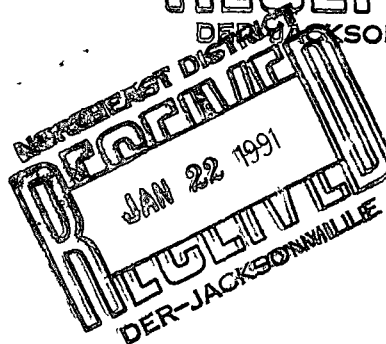


DER-JACKSONVILLE

October 10, 1990

903-3010

Mr. Doug Miller
England - Thims & Miller, Inc.
3131 St. Johns Bluff Road, South
Jacksonville, Florida 32216



RE: BORROW PIT INFLUENCE ON GROUNDWATER SYSTEM

Dear Doug:

Attached are the calculations for determining the hydraulic influence of the borrow pit on the natural groundwater system. Based on the water level in the borrow pit being at an elevation of 123 feet (MSL), the pit should have no dewatering impact of the wetlands to the west of the borrow pit. However, along the east side of the pit, the calculations predict that a seepage face would develop which would impair structural stability of the berm. A down-gradient drain should be included in the berm design.

We trust that these calculations satisfactorily address the issues relative to the borrow pit. Please call if you have any questions.

Very truly yours,

GOLDER ASSOCIATES INC.

Donald J. Miller, P.Eng.
Senior Engineer

DJM:kab

Attachments

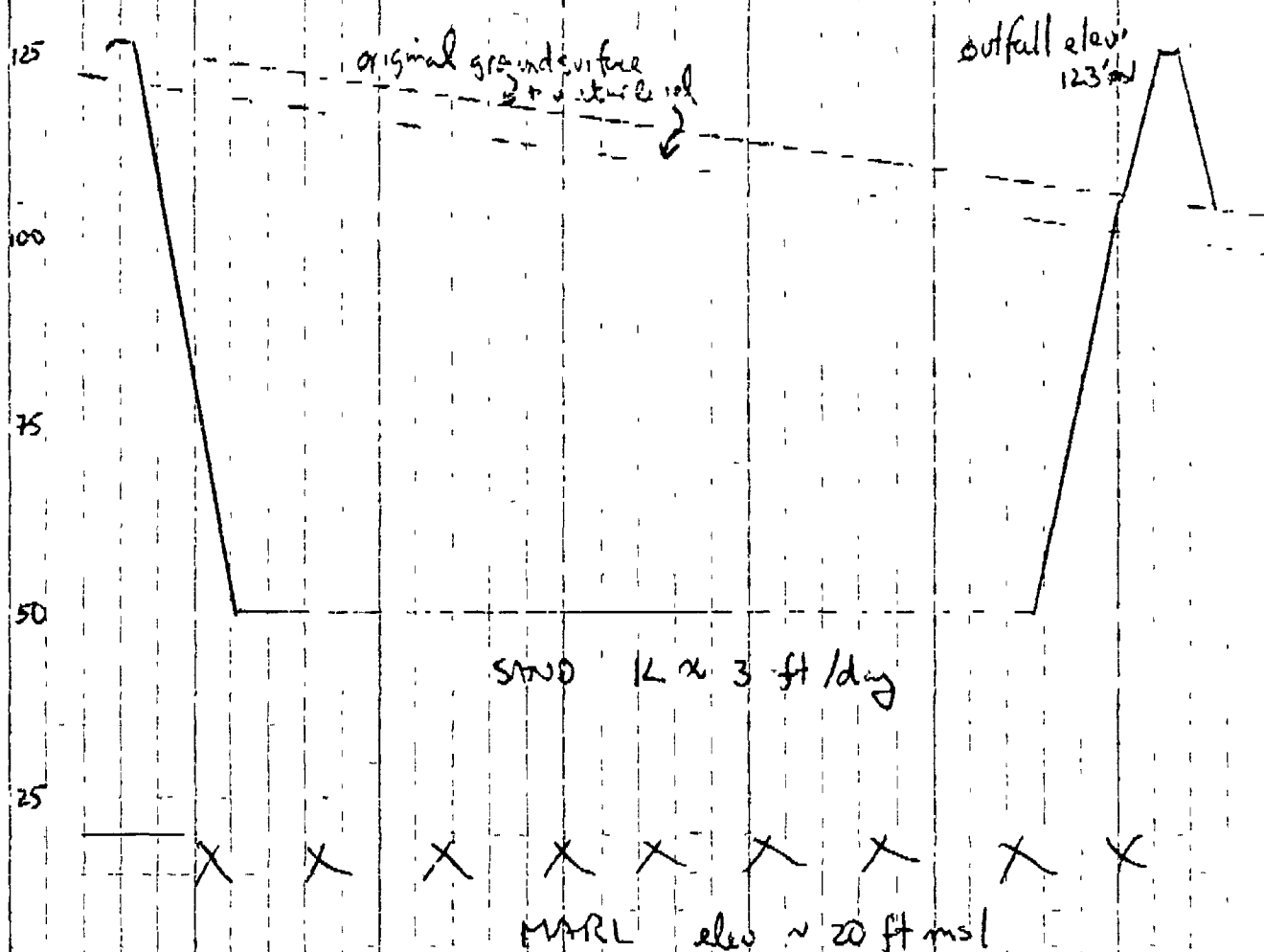
cc: Scott McCallister

**Golder
Associates**

SUBJECT TRAIL RIDGE LANDFILL - BORROW AREA		
Job No 903-3010	Made by DJM	Date 2/10/1990
Ref.	Checked	Sheet 1 of 7
	Reviewed	

OBJECTIVE

- To determine the hydraulic influence of the borrow pit on the natural groundwater system.



**Golder
Associates**

SUBJECT **TRAIL RIDGE LANDFILL - BORROW AREA**

Job No 903-3010

Made by DJM

Date October 10, 1990

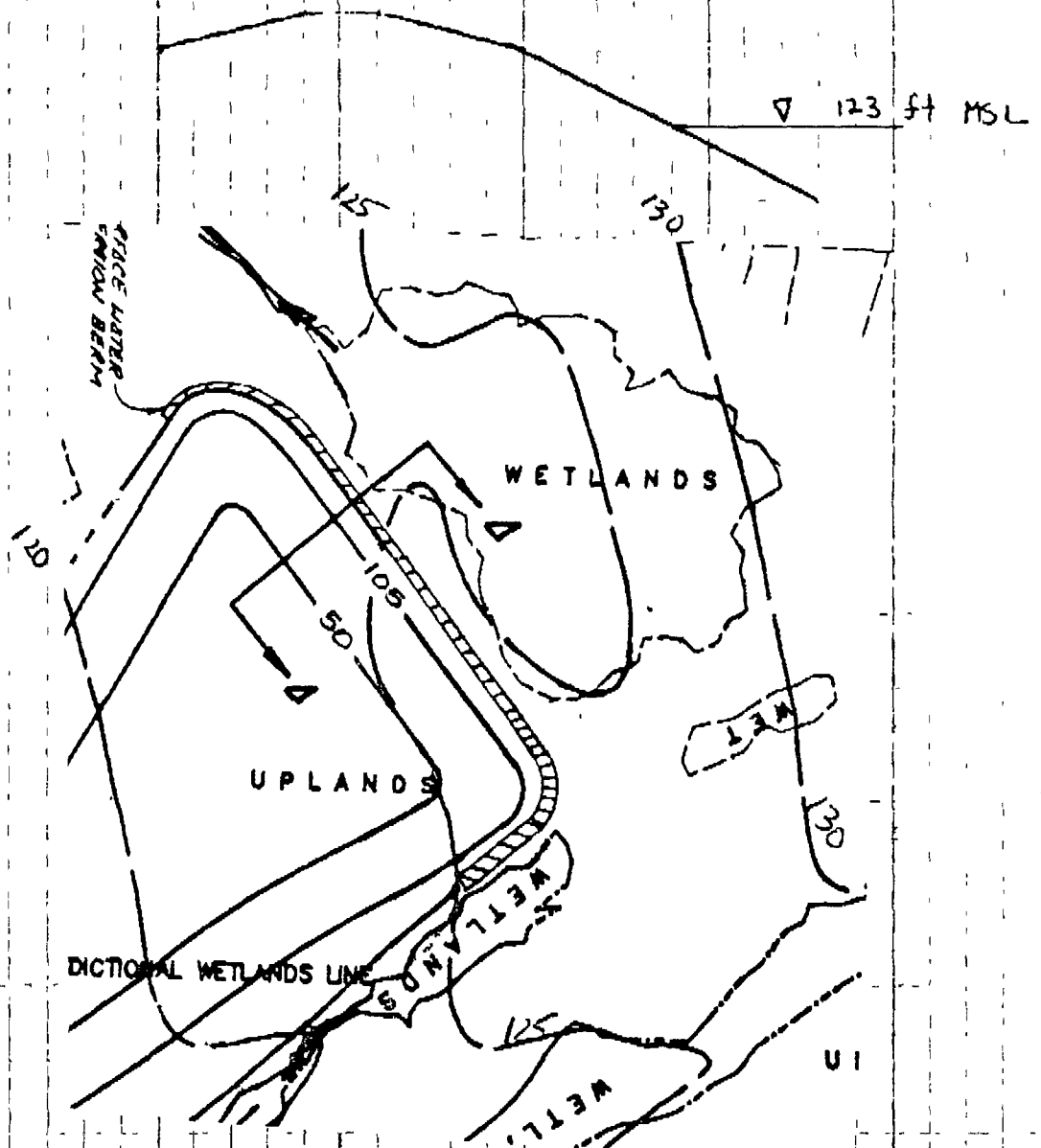
Ref

Checked

Sheet 2 of 7

Reviewed

1) At Up-gradient Edge
Wetland <
50' buffer



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SUBJECT TRAIL RIDGE LANDFILL - BORROW AREA

Job No 903-3010

Made by DJM

Date OCT 10, 1990

Ref

Checked

Sheet

3 of 7

Reviewed

- Water level in pit controlled at an elevation of 123 ft msl
- Wet land at an elevation of 125 ft msl
- Ditch drains wetland (approx 2 ft deep)
- Groundwater in wetland \leq 123 ft msl

If water level in wetland = 123 ft msl
Borrow Pit will have no influence
on wetland

If water level in wetland $<$ 123 ft msl
Borrow Pit will recharge the wet lands

**Golder
Associates**

SUBJECT **TRAIL RIDGE LANDFILL - BARROW AREA**

Job No. 903-3010

Made by **DTM**

Date **Oct 10, 1990**

Ref

Checked

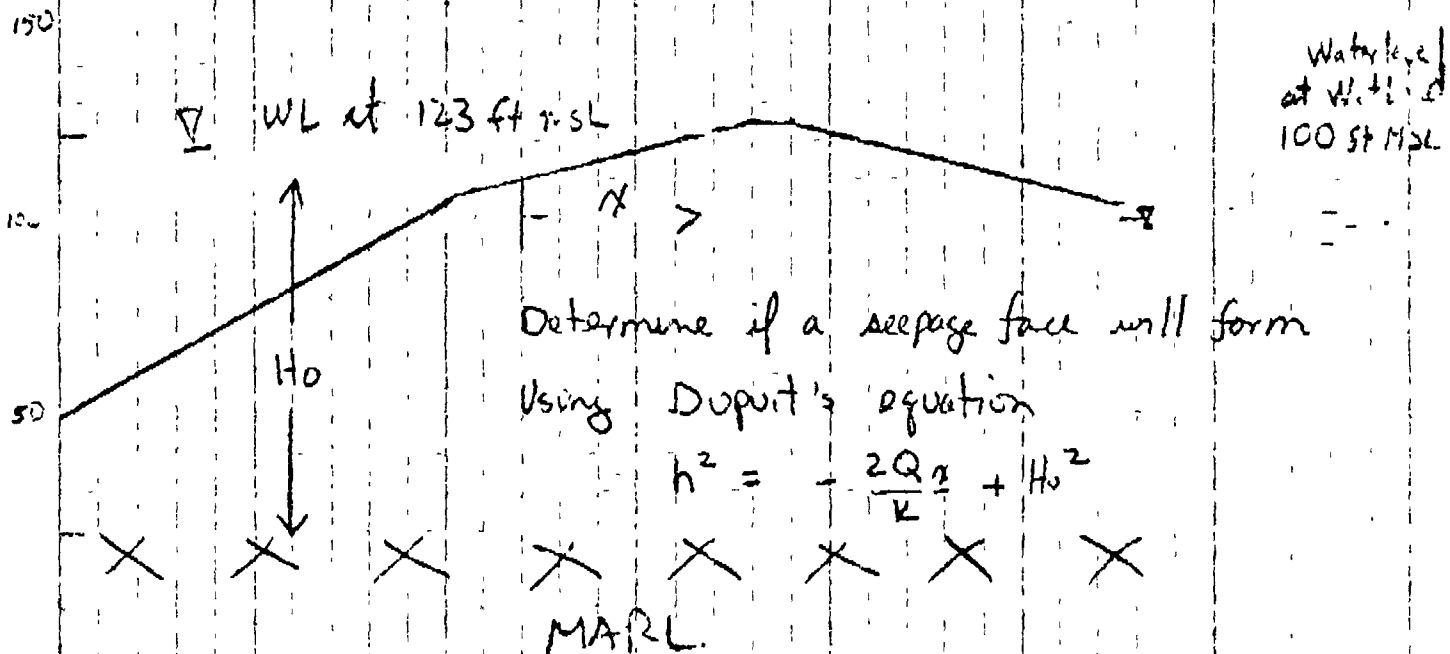
Sheet

4 of 7

Reviewed

Step 2 - Predict effect at down-gradient boundary

Scale $1'' = 50' H$
 $1'' = 50' V$



where h is head at distance x
 Q is flow per unit length of berm
 k is hydraulic conductivity

$Q =$ netural flux out of pit = flux into pit

Flux in = Groundwater Recharge

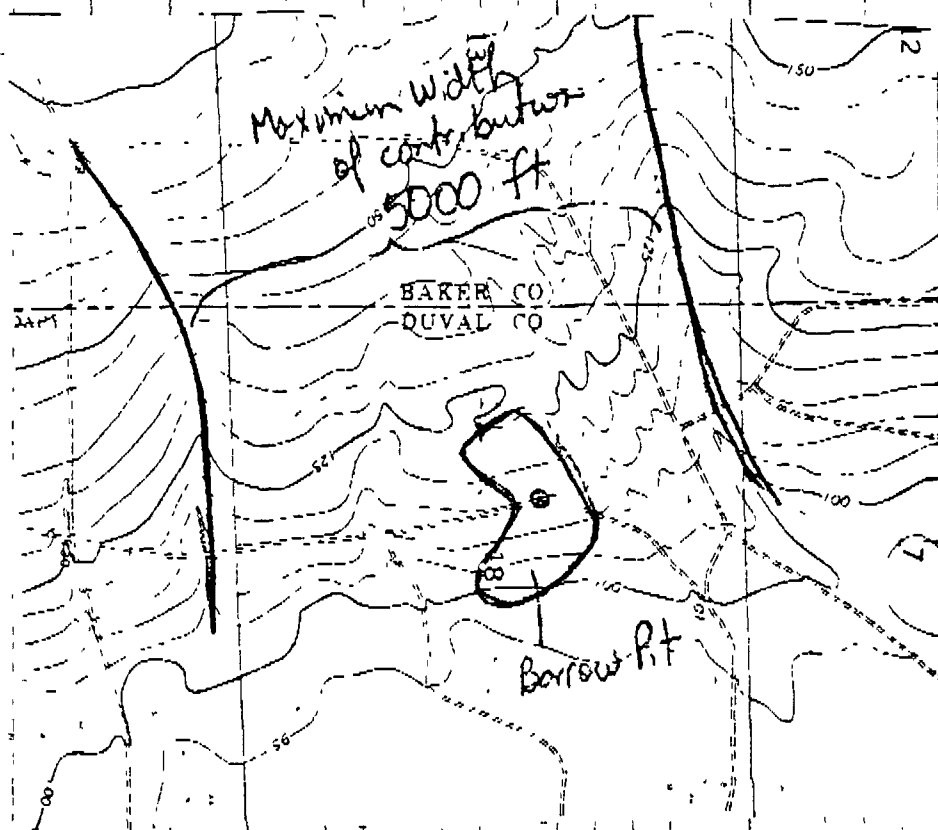
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Associates**

SUBJECT TRAIL RIDGE LANDFILL - BORROW AREA		
Job No 903-3010	Made by DJM	Date Oct 10, 1990
Ref	Checked	Sheet 5 of 7
	Reviewed	

Groundwater Recharge = $k i A$

where A = area of flow

= sat depth \times flow width
(assume 100 ft) \times (5000 ft)



$$\begin{aligned}
 Q &= 3 \text{ ft/day} \times 0.01 \text{ ft/ft} \times 100 \text{ ft} \times 5000 \text{ ft} / 3000 \text{ ft} \\
 &= 5 \text{ ft}^3/\text{day} / \text{ft}
 \end{aligned}$$

\uparrow
 length of
 down-gradient
 berm

**Golder
Associates**

SUBJECT TRAIL RIDGE LANDFILL - BORROW AREA

Job No. 903-3010

Made by QTM

Date Oct 10, 1990

Ref.

Checked

Sheet

6 of 7

Reviewed

$$h^2 = - \frac{2Qx}{K} + H_p^2$$

$$H_0 = 102 \text{ ft}$$

at $x = 170$ feet (distance across berm)

$$h = 100 \text{ ft}$$

$$\text{water level} = 120 \text{ ft msl}$$

\therefore a seepage face will develop across dam.

Possible solutions (Ref: Earth and Earth-Rock Dams
Sherard, Woodward, Grzenski, and
Clawenger; John Wiley & Sons, NY, 1963)

Design Considerations 23

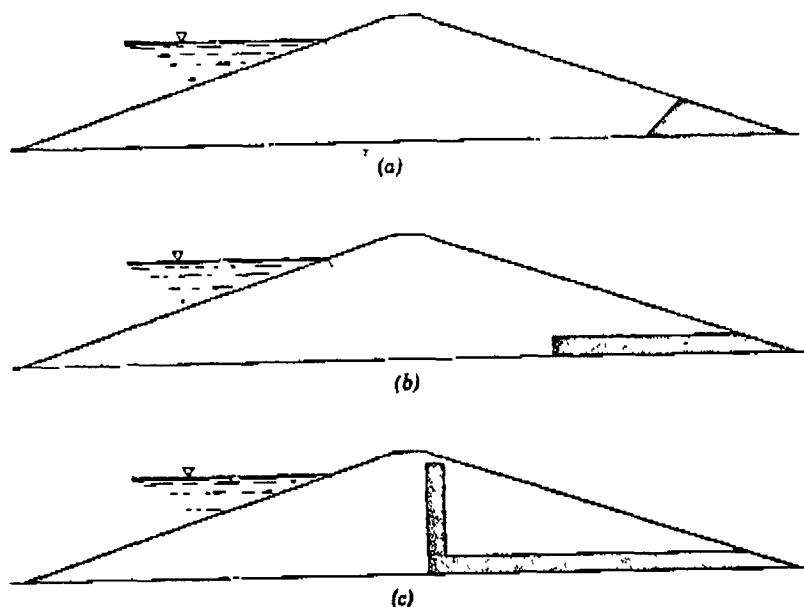


Fig 121 Drains used in homogeneous dams (a) Toe drains (b) Horizontal blanket drains (c) "Chimney" drain.

**Golder
Associates**

SUBJECT TRAIL RIDGE LANDFILL - BORROW AREA		
Job No. 903 3010	Made by DTM	Date Oct 10, 1990
Rel.	Checked	Sheet 7 of 7
	Reviewed	

A blanket drain would likely be a preferred solution based on ease of construction and effectiveness.

Blanket drain would consist of a gravel drainage layer (gravel size depending on the grain size distribution of the borrow). Additional filtering could also be achieved with a geotextile filter fabric or natural sand filters.

TRAILRIDGE LANDFILL - LINER ANALYSIS
JACKSONVILLE, DUVAL COUNTY, FLORIDA
E89-113-9 OCTOBER 9, 1990

BARE GROUND

LAYER 1

VERTICAL PERCOLATION LAYER

THICKNESS	=	6.00 INCHES
POROSITY	=	0.4570 VOL/VOL
FIELD CAPACITY	=	0.1309 VOL/VOL
WILTING POINT	=	0.0580 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.1309 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	0.0010000000475 CM/SEC

LAYER 2

VERTICAL PERCOLATION LAYER

THICKNESS	=	72.00 INCHES
POROSITY	=	0.5200 VOL/VOL
FIELD CAPACITY	=	0.2942 VOL/VOL
WILTING POINT	=	0.1400 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.2942 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	0.0001999999949 CM/SEC

LAYER 3

VERTICAL PERCOLATION LAYER

THICKNESS	=	24.00 INCHES
POROSITY	=	0.4570 VOL/VOL
FIELD CAPACITY	=	0.1309 VOL/VOL
WILTING POINT	=	0.0580 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.1309 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	0.0010000000475 CM/SEC

LAYER 4

LATERAL DRAINAGE LAYER

THICKNESS	=	0.22 INCHES
POROSITY	=	0.7000 VOL/VOL
FIELD CAPACITY	=	0.0450 VOL/VOL
WILTING POINT	=	0.0200 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0225 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	19.6849994659424 CM/SEC
SLOPE	=	2.00 PERCENT
DRAINAGE LENGTH	=	150.0 FEET

LAYER 5

BARRIER SOIL LINER WITH FLEXIBLE MEMBRANE LINER

THICKNESS	=	0.22 INCHES
POROSITY	=	0.7000 VOL/VOL
FIELD CAPACITY	=	0.0450 VOL/VOL
WILTING POINT	=	0.0200 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0225 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	19.6849994659424 CM/SEC
LINER LEAKAGE FRACTION	=	0.00001000

LAYER 6

LATERAL DRAINAGE LAYER

THICKNESS	=	0.22 INCHES
POROSITY	=	0.7000 VOL/VOL
FIELD CAPACITY	=	0.0450 VOL/VOL
WILTING POINT	=	0.0200 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0450 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	19.6849994659424 CM/SEC
SLOPE	=	2.00 PERCENT
DRAINAGE LENGTH	=	150.0 FEET

LAYER 7

BARRIER SOIL LINER WITH FLEXIBLE MEMBRANE LINER

THICKNESS	=	0.25 INCHES
POROSITY	=	0.4000 VOL/VOL
FIELD CAPACITY	=	0.3560 VOL/VOL
WILTING POINT	=	0.2899 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0225 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	0.0000000100000 CM/SEC
LINER LEAKAGE FRACTION	=	0.00001000

LAYER 8

VERTICAL PERCOLATION LAYER

THICKNESS	=	6.00 INCHES
POROSITY	=	0.4750 VOL/VOL
FIELD CAPACITY	=	0.3777 VOL/VOL
WILTING POINT	=	0.2648 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.3777 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	0.0000170000003 CM/SEC

GENERAL SIMULATION DATA

SCS RUNOFF CURVE NUMBER	=	83.31
TOTAL AREA OF COVER	=	43560. SQ FT
EVAPORATIVE ZONE DEPTH	=	8.00 INCHES
POTENTIAL RUNOFF FRACTION	=	1.000000
UPPER LIMIT VEG. STORAGE	=	3.7820 INCHES
INITIAL VEG. STORAGE	=	1.3738 INCHES

SOIL WATER CONTENT INITIALIZED BY USER.

CLIMATOLOGICAL DATA

SYNTHETIC RAINFALL WITH SYNTHETIC DAILY TEMPERATURES AND
SOLAR RADIATION FOR JACKSONVILLE FLORIDA

MAXIMUM LEAF AREA INDEX	=	0.00
START OF GROWING SEASON (JULIAN DATE)	=	37
END OF GROWING SEASON (JULIAN DATE)	=	4

NORMAL MEAN MONTHLY TEMPERATURES, DEGREES FAHRENHEIT

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
-----	-----	-----	-----	-----	-----
53.20	55.10	61.30	67.70	74.10	79.00
81.30	81.00	78.20	69.50	60.80	54.80

AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1 THROUGH 5

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC

PRECIPITATION						

TOTALS	2.60 7.46	3.54 9.03	2.57 8.11	2.82 2.39	3.68 2.64	4.36 3.05
STD. DEVIATIONS	1.70 3.02	2.18 1.53	2.39 1.98	2.31 1.69	2.48 1.98	2.07 1.40
RUNOFF						

TOTALS	0.224 0.606	0.062 0.707	0.100 0.609	0.103 0.018	0.199 0.058	0.152 0.103
STD. DEVIATIONS	0.498 0.629	0.112 0.220	0.224 0.759	0.105 0.041	0.351 0.086	0.304 0.132
EVAPOTRANSPIRATION						

TOTALS	1.583 4.268	2.228 4.203	2.159 4.082	1.517 2.439	2.631 1.654	2.985 2.049
STD. DEVIATIONS	0.617 1.235	0.683 1.479	0.886 0.498	1.101 0.907	1.370 0.741	0.582 0.563
LATERAL DRAINAGE FROM LAYER 4						

TOTALS	0.0182 0.0199	0.0119 0.0497	0.0200 0.1687	0.0170 0.0701	0.0171 0.0224	0.0170 0.0223
STD. DEVIATIONS	0.0212 0.0140	0.0090 0.0562	0.0173 0.0986	0.0199 0.0255	0.0131 0.0070	0.0104 0.0162
PERCOLATION FROM LAYER 5						

TOTALS	0.9500 1.0772	0.7689 1.6419	1.0399 3.2656	0.9091 2.2324	0.9660 1.2533	0.9751 1.2119
STD. DEVIATIONS	0.7390 0.6150	0.4629 1.0785	0.6865 1.2887	0.7005 0.4250	0.6066 0.1831	0.5458 0.4378
LATERAL DRAINAGE FROM LAYER 6						

TOTALS	0.9515 1.0760	0.7679 1.6380	1.0399 3.2632	0.9099 2.2374	0.9650 1.2553	0.9753 1.2113
STD. DEVIATIONS	0.7407 0.6147	0.4620 1.0756	0.6870 1.2887	0.7009 0.4266	0.6062 0.1834	0.5463 0.4353

PERCOLATION FROM LAYER 7

TOTALS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

PERCOLATION FROM LAYER 8

TOTALS	0.0148	0.0090	0.0077	0.0062	0.0056	0.0048
	0.0045	0.0041	0.0037	0.0036	0.0032	0.0032
STD. DEVIATIONS	0.0254	0.0135	0.0105	0.0076	0.0062	0.0050
	0.0043	0.0037	0.0031	0.0029	0.0025	0.0023

AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1 THROUGH 5

	(INCHES)	(CU. FT.)	PERCENT
PRECIPITATION	52.26 (6.568)	189711.	100.00
RUNOFF	2.941 (1.057)	10677.	5.63
EVAPOTRANSPIRATION	31.798 (2.931)	115427.	60.84
LATERAL DRAINAGE FROM LAYER 4	0.4543 (0.1931)	1649.	0.87
PERCOLATION FROM LAYER 5	16.2914 (5.6000)	59138.	31.17
LATERAL DRAINAGE FROM LAYER 6	16.2908 (5.6051)	59136.	31.17
PERCOLATION FROM LAYER 7	0.0000 (5.6051)	0.	0.00
PERCOLATION FROM LAYER 8	0.0702 (0.0867)	255.	0.13
CHANGE IN WATER STORAGE	0.707 (3.837)	2568.	1.35

PEAK DAILY VALUES FOR YEARS 1 THROUGH 5

	(INCHES)	(CU. FT.)
PRECIPITATION	4.79	17387.7
RUNOFF	1.590	5771.7
LATERAL DRAINAGE FROM LAYER 4	0.0172	62.4
PERCOLATION FROM LAYER 5	0.2114	767.5
HEAD ON LAYER 5	0.0	
LATERAL DRAINAGE FROM LAYER 6	0.2106	764.4
PERCOLATION FROM LAYER 7	0.0000	0.0
HEAD ON LAYER 7	0.0	
PERCOLATION FROM LAYER 8	0.0027	9.8
SNOW WATER	0.00	0.0
MAXIMUM VEG. SOIL WATER (VOL/VOL)	0.3733	
MINIMUM VEG. SOIL WATER (VOL/VOL)	0.0743	

FINAL WATER STORAGE AT END OF YEAR 5

LAYER	(INCHES)	(VOL/VOL)
1	0.38	0.0637
2	23.27	0.3232
3	5.33	0.2222
4	0.01	0.0592
5	0.00	0.0225
6	0.01	0 0590
7	0.01	0.0225
8	1.92	0.3192
SNOW WATER	0.00	

TRAILRIDGE LANDFILL - FINAL COVER ANALYSIS
JACKSONVILLE, DUVAL COUNTY, FLORIDA
E89-113-9 OCTOBER 9, 1990

FAIR GRASS

LAYER 1

VERTICAL PERCOLATION LAYER

THICKNESS	=	12.00 INCHES
POROSITY	=	0.4730 VOL/VOL
FIELD CAPACITY	=	0.2217 VOL/VOL
WILTING POINT	=	0.1043 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.2217 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	0.0015600000042 CM/SEC

LAYER 2

LATERAL DRAINAGE LAYER

THICKNESS	=	12.00 INCHES
POROSITY	=	0.4570 VOL/VOL
FIELD CAPACITY	=	0.1309 VOL/VOL
WILTING POINT	=	0.0580 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.1309 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	0.00100000000475 CM/SEC
SLOPE	=	2.00 PERCENT
DRAINAGE LENGTH	=	850.0 FEET

LAYER 3

BARRIER SOIL LINER

THICKNESS	=	12.00 INCHES
POROSITY	=	0.4300 VOL/VOL
FIELD CAPACITY	=	0.3663 VOL/VOL
WILTING POINT	=	0.2802 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.4300 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	0.0000001000000 CM/SEC

LAYER 4

VERTICAL PERCOLATION LAYER

THICKNESS	=	12.00 INCHES
POROSITY	=	0.4570 VOL/VOL
FIELD CAPACITY	=	0.1309 VOL/VOL
WILTING POINT	=	0.0580 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.1309 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	0.0010000000475 CM/SEC

LAYER 5

VERTICAL PERCOLATION LAYER

THICKNESS	=	1200.00 INCHES
POROSITY	=	0.5200 VOL/VOL
FIELD CAPACITY	=	0.2942 VOL/VOL
WILTING POINT	=	0.1400 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.2942 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	0.0001999999949 CM/SEC

LAYER 6

VERTICAL PERCOLATION LAYER

THICKNESS	=	24.00 INCHES
POROSITY	=	0.4570 VOL/VOL
FIELD CAPACITY	=	0.1309 VOL/VOL
WILTING POINT	=	0.0580 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.1309 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	0.0010000000475 CM/SEC

LAYER 7

LATERAL DRAINAGE LAYER

THICKNESS	=	0.22 INCHES
POROSITY	=	0.7000 VOL/VOL
FIELD CAPACITY	=	0.0450 VOL/VOL
WILTING POINT	=	0.0200 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0225 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	19.6849994659424 CM/SEC
SLOPE	=	2.00 PERCENT
DRAINAGE LENGTH	=	150.0 FEET

LAYER 8

BARRIER SOIL LINER WITH FLEXIBLE MEMBRANE LINER

THICKNESS	=	0.22 INCHES
POROSITY	=	0.7000 VOL/VOL
FIELD CAPACITY	=	0.0450 VOL/VOL
WILTING POINT	=	0.0200 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0225 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	19.6849994659424 CM/SEC
LINER LEAKAGE FRACTION	=	0.00001000

LAYER 9

LATERAL DRAINAGE LAYER

THICKNESS	=	0.22 INCHES
POROSITY	=	0.7000 VOL/VOL
FIELD CAPACITY	=	0.0450 VOL/VOL
WILTING POINT	=	0.0200 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0225 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	19.6849994659424 CM/SEC
SLOPE	=	2.00 PERCENT
DRAINAGE LENGTH	=	150.0 FEET

LAYER 10

BARRIER SOIL LINER WITH FLEXIBLE MEMBRANE LINER

THICKNESS	=	0.25 INCHES
POROSITY	=	0.4000 VOL/VOL
FIELD CAPACITY	=	0.3560 VOL/VOL
WILTING POINT	=	0.2899 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.4000 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	0.0000000100000 CM/SEC
LINER LEAKAGE FRACTION	=	0.00001000

LAYER 11

VERTICAL PERCOLATION LAYER

THICKNESS	=	6.00 INCHES
POROSITY	=	0.4750 VOL/VOL
FIELD CAPACITY	=	0.3777 VOL/VOL
WILTING POINT	=	0.2648 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.3778 VOL/VOL
SATURATED HYDRAULIC CONDUCTIVITY	=	0.0000170000003 CM/SEC

GENERAL SIMULATION DATA

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SCS RUNOFF CURVE NUMBER      =      95.00
TOTAL AREA OF COVER          =    43560. SQ FT
EVAPORATIVE ZONE DEPTH       =        8.00 INCHES
UPPER LIMIT VEG. STORAGE     =        3.7840 INCHES
INITIAL VEG. STORAGE         =        1.7736 INCHES
      SOIL WATER CONTENT INITIALIZED BY USER.
  
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CLIMATOLOGICAL DATA

SYNTHETIC RAINFALL WITH SYNTHETIC DAILY TEMPERATURES AND
SOLAR RADIATION FOR JACKSONVILLE FLORIDA

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MAXIMUM LEAF AREA INDEX      = 2.00
START OF GROWING SEASON (JULIAN DATE) = 37
END OF GROWING SEASON (JULIAN DATE)   = 4
  
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NORMAL MEAN MONTHLY TEMPERATURES, DEGREES FAHRENHEIT

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
53.20	55.10	61.30	67.70	74.10	79.00
81.30	81.00	78.20	69.50	60.80	54.80

AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1 THROUGH 5

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	2.60 7.46	3.54 9.03	2.57 8.11	2.82 2.39	3.68 2.64	4.36 3.05
STD. DEVIATIONS	1.70 3.02	2.18 1.53	2.39 1.98	2.31 1.69	2.48 1.98	2.07 1.40
RUNOFF						
TOTALS	0.735 2.365	0.756 3.311	0.698 2.760	0.785 0.423	1.183 0.613	1.086 0.785
STD. DEVIATIONS	1.202 1.296	0.829 0.630	1.181 1.625	0.779 0.652	1.275 0.546	1.202 0.707

TOTALS	1.576 4.465	2.204 4.685	2.266 4.671	1.918 2.426	2.744 1.362	3.249 1.849
STD. DEVIATIONS	0.506 1.289	0.681 1.702	1.226 0.949	1.282 0.981	1.453 0.784	0.833 0.446

TOTALS	0.0208	0.0201	0.0220	0.0202	0.0202	0.0192
	0.0202	0.0212	0.0230	0.0242	0.0229	0.0251
STD. DEVIATIONS	0.0118	0.0116	0.0127	0.0116	0.0116	0.0111
	0.0098	0.0089	0.0094	0.0076	0.0069	0.0038

TOTALS	0.1908	0.1792	0.1979	0.1807	0.1797	0.1705
	0.1869	0.1985	0.2133	0.2199	0.2065	0.2208
STD. DEVIATIONS	0.0774	0.0876	0.1024	0.0949	0.0955	0.0915
	0.0606	0.0516	0.0553	0.0465	0.0408	0.0265

TOTALS	0.0004	0.0003	0.0004	0.0004	0.0004	0.0004
	0.0004	0.0004	0.0004	0.0004	0.0004	0.0005
STD. DEVIATIONS	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001

TOTALS	0.1462	0.1353	0.1508	0.1483	0.1561	0.1546
	0.1640	0.1686	0.1675	0.1772	0.1748	0.1833
STD. DEVIATIONS	0.0824	0.0739	0.0784	0.0728	0.0704	0.0617
	0.0554	0.0459	0.0354	0.0282	0.0207	0.0161

TOTALS	0.1462	0.1345	0.1506	0.1483	0.1561	0.1546
	0.1639	0.1686	0.1675	0.1771	0.1747	0.1833
STD. DEVIATIONS	0.0824	0.0757	0.0788	0.0729	0.0704	0.0617
	0.0554	0.0460	0.0355	0.0283	0.0207	0.0162

TOTALS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

PERCOLATION FROM LAYER 11

TOTALS	0.0148	0.0090	0.0077	0.0062	0.0056	0.0048
	0.0045	0.0041	0.0037	0.0036	0.0032	0.0032
STD. DEVIATIONS	0.0256	0.0136	0.0105	0.0076	0.0062	0.0050
	0.0043	0.0037	0.0031	0.0029	0.0025	0.0023

AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1 THROUGH 5

	(INCHES)	(CU. FT.)	PERCENT
PRECIPITATION	52.26 (6.568)	189711.	100.00
RUNOFF	15.502 (3.329)	56271.	29.66
EVAPOTRANSPIRATION	33.414 (3.680)	121293.	63.94
LATERAL DRAINAGE FROM LAYER 2	0.2592 (0.1157)	941.	0.50
PERCOLATION FROM LAYER 3	2.3447 (0.8189)	8511.	4.49
LATERAL DRAINAGE FROM LAYER 7	0.0048 (0.0020)	17.	0.01
PERCOLATION FROM LAYER 8	1.9266 (0.0020)	6993.	3.69
LATERAL DRAINAGE FROM LAYER 9	1.9254 (0.6433)	6989.	3.68
PERCOLATION FROM LAYER 10	0.0000 (0.0000)	0.	0.00
PERCOLATION FROM LAYER 11	0.0703 (0.0869)	255.	0.13
CHANGE IN WATER STORAGE	1.087 (1.361)	3944.	2.08

PEAK DAILY VALUES FOR YEARS	1 THROUGH	5
	(INCHES)	(CU. FT.)
PRECIPITATION	4.79	17387.7
RUNOFF	3.505	12722.5
LATERAL DRAINAGE FROM LAYER 2	0.0013	4.6
PERCOLATION FROM LAYER 3	0.0098	35.5
HEAD ON LAYER 3	22.6	
LATERAL DRAINAGE FROM LAYER 7	0.0000	0.1
PERCOLATION FROM LAYER 8	0.0063	22.9
HEAD ON LAYER 8	0.0	
LATERAL DRAINAGE FROM LAYER 9	0.0063	22.9
PERCOLATION FROM LAYER 10	0.0000	0.0
HEAD ON LAYER 10	0.0	
PERCOLATION FROM LAYER 11	0.0027	9.8
SNOW WATER	0.00	0 0
MAXIMUM VEG. SOIL WATER (VOL/VOL)	0.4252	
MINIMUM VEG. SOIL WATER (VOL/VOL)	0.1035	

FINAL WATER STORAGE AT END OF YEAR 5

LAYER	(INCHES)	(VOL/VOL)
1	2.46	0.2050
2	5.48	0.4570
3	5.16	0.4300
4	2.38	0.1981
5	352.75	0.2940
6	4.69	0.1953
7	0.01	0.0486
8	0.00	0.0225
9	0.01	0.0486
10	0.10	0.4000
11	1.92	0.3192
SNOW WATER	0.00	

Mary Nogas

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

In the Matter of:)	
Application for Permit by:)	DER File No.: 161821182
)	Duval County-D/F
Trail Ridge Landfill, Inc.)	
c/o Douglas C. Miller, P.E.)	
England, Thims & Miller, Inc.)	
3131 St. Johns Bluff Road South)	
Jacksonville, FL 32216)	

INTENT TO ISSUE

The Department of Environmental Regulation gives notice of its intent to issue a permit (copy attached) for the proposed project as detailed in the application specified above, for the reasons stated below.

The applicant, Trail Ridge Landfill, Inc., applied through an agent, England, Thims & Miller, Inc., on June 13, 1990, to the Department of Environmental Regulation for a permit and water quality certification to fill 1.61 acres of roadside ditches, which discharge to Deep Creek, to facilitate the widening of an existing road to provide access to a solid waste landfill facility. To mitigate the loss of these ditches, 4.76 acres of freshwater hardwood swamp wetlands shall be created on site. The project is located 1.14 miles north of State Road 228 (Normandy Boulevard) on the west side of U.S. Highway 301 in Duval County, in the vicinity of Maxville in Sections 18, 19, 20, 21, Township 3 South, Range 23 East.

The Department has permitting jurisdiction under Chapter 403, Florida Statutes, and Florida Administrative Code Rules 17-4 and

17-312, Public Law 92-500 for the construction of pollution sources within waters of the State. The project is not exempt from permitting procedures. The Department has determined that a Wetland Resource Management (dredge/fill) permit is required for the proposed work.

The Department intends to issue this permit (copy attached) with specific conditions for the following reasons:

The applicant has provided the Department with affirmative reasonable assurance, pursuant to Florida Administrative Code Rule 17-312.080(1) that the immediate and long-term impact of the project will not result in violation of State Water Quality Standards.

In addition, the applicant has provided the Department with reasonable assurance pursuant to Florida Administrative Code Rule 17-312.080(2) that based on plans, test results or other information that the project is not contrary to the public interest in accordance with Section 403.918(2), Florida Statutes.

Section 403.918(2), Florida Statutes, states that,
"No permit shall be issued under this part unless the applicant provides the department with reasonable assurance that the project is not contrary to the public interest...(a) In determining whether a project is not contrary to the public interest the Department shall consider and balance the following criteria:

File No.: 161821182

- (1) Whether the project will adversely affect the public health, safety, or welfare or property of others;
- (2) Whether the project will adversely affect the conservation of fish and wildlife, including endangered or threatened species, or their habitats;
- (3) Whether the project will adversely affect navigation or the flow of water or cause harmful erosion or shoaling;
- (4) Whether the project will adversely affect the fishing or recreation values or marine productivity in the vicinity of the project;
- (5) Whether the project will be of a temporary or permanent nature;
- (6) Whether the project will adversely affect or enhance significant historical and archeological resources under the provision of s. 267.061; and
- (7) The current condition and relative value of functions being performed by areas affected by the proposed activity.

Pursuant to Section 403.815, Florida Statutes and DER Rule 17-103.150, F.A.C., you (the applicant) are required to publish at your own expense the enclosed Notice of Intent to Issue Permit. The notice shall be published one time only within 30 days, in the legal ad section of a newspaper of general circulation in the area affected. For the purpose of this rule, "publication in a newspaper of general circulation in the area affected" means publication in a newspaper meeting the requirements of Sections 50.011 and 50.031, F.S., in the county where the activity is to take place. The applicant shall provide proof of publication to the Department, at 7825 Baymeadows Way, Suite 200B, Jacksonville, Florida 32256-7577, within seven days of publication. Failure to publish the notice and provide proof of publication within the allotted time may result in the denial of the permit.

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The Department will issue the permit with the attached conditions unless a petition for an administrative proceeding (hearing) is filed pursuant to the provisions of Section 120.57, F.S.

A person whose substantial interests are affected by this permit may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400. Petitions filed by the permit applicant and the parties listed below must be filed within 14 days of receipt of this intent. Petitions filed by other persons must be filed within 14 days of publication of the public notice or within 14 days of their receipt of this intent, whichever first occurs. Petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

The Petition shall contain the following information:

File No.: 161821182

(a) The name, address, and telephone number of each petitioner, the applicant's name and address, the Department Permit File Number and the county in which the project is proposed;

(b) A statement of how and when each petitioner received notice of the Department's action or proposed action;

(c) A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action;

(d) A statement of the material facts disputed by Petitioner, if any;

(e) A statement of facts which petitioner contends warrant reversal or modification of the Department's action or proposed action;

(f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; and

(g) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this intent. Persons whose substantial interests will be affected by any decision of the Department with regard to the application have the

File No.: 161821182

right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of receipt of this notice in the Office of General Counsel at the above address of the Department. Failure to petition within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

Executed in Jacksonville, Florida.

FILING AND ACKNOWLEDGEMENT
FILED, on this date, pursuant to §120.52, Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

[Signature] 10-11-90
Clerk Date

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

[Signature]
Ernest E. Frey, P.E.
Deputy Assistant Secretary
Northeast District Office
7825 Baymeadows Way,
Suite 200B
Jacksonville, FL 32256-7577

Phone: (904) 448-4300

Copies furnished to:

Trail Ridge Landfill, Inc. (Certified #P 771 963 696)
Pamela Presnell Garvin (Certified #P 771 962 166)
William Congdon, Permit Attorney, DER, Tallahassee
John Adams, ACOE, Jacksonville
Forrest Watson, DNR, Jacksonville
Michael Eaton, DER, Jacksonville
Jeremy Tyler, DER, Jacksonville
Mary Nogas, DER, Jacksonville

CERTIFICATE OF SERVICE

This is to certify that the NOTICE OF PERMIT and all copies were mailed before the close of business on 10-11-90 to the listed persons.

File No.: 161821182

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
NOTICE OF INTENT TO ISSUE PERMIT

The Department of Environmental Regulation gives notice of its intent to issue a permit to fill 1.61 acres of roadside ditches, which discharge to Deep Creek, to facilitate the widening of an existing road to provide access to a solid waste landfill facility. To mitigate the loss of these ditches, 4.76 acres of freshwater hardwood swamp wetlands shall be created on site. The project is located 1.14 miles north of State Road 228 (Normandy Boulevard) on the west side of U.S. Highway 301 in Duval County, in the vicinity of Maxville in Sections 18, 19, 20, 21, Township 3 South, Range 23 East.

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400, within 14 days of publication of this notice. Petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

The Petition shall contain the following information:

(a) The name, address, and telephone number of each petitioner, the applicant's name and address, the Department Permit File Number and the county in which the project is proposed; (b) A statement of how and when each petitioner received notice of the Department's action or proposed action; (c) A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action; (d) A statement of the material facts disputed by Petitioner, if any; (e) A statement of facts which petitioner contends warrant reversal or modification of the Department's action or proposed action; (f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; and (g) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this Notice. Persons whose substantial interests will be affected by any decision of the Department with regard to the application have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of receipt of this notice in the Office of General Counsel at the above address of the Department. Failure to

petition within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

The application is available for public inspection during normal business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday, except legal holidays at the Northeast District Office of the Department of Environmental Regulation, 7825 Baymeadows Way, Suite 200B, Jacksonville, FL 32256-7577.



Florida Department of Environmental Regulation

Northeast District • Suite 200, 7825 Baymeadows Way • Jacksonville, Florida 32256-7577 • 904-448-4300

Bob Martinez, Governor

Dale Twachtmann, Secretary

John Shearer, Assistant Secretary

Ernest Frey, Deputy Assistant Secretary

D R A F T

DRAFT

PERMITTEE:

Trail Ridge Landfill, Inc.
c/o Douglas C. Miller, P.E.
England, Thims & Miller, Inc.
3131 St. Johns Bluff Road South
Jacksonville, FL 32216

I.D. Number: WRM

Permit/Cert. Number: 161821182

Date of Issue:

Expiration Date:

County:

Lat/Long: 30°13'20"/82°02'30"

Section/Township/Range: 18,19,20,21/3S/23E

Project: Construct a road.

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Rule(s) 17-312. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawing(s), plans, and other documents attached hereto or on file with the department and made a part hereof and specifically described as follows:

Fill 1.61 acres of roadside ditches, which discharge to Deep Creek, to facilitate the widening of an existing road to provide access to a solid waste landfill facility. To mitigate the loss of these ditches, 4.76 acres of freshwater hardwood swamp wetlands shall be created on site. The project is located 1.14 miles north of State Road 228 (Normandy Boulevard) on the west side of U.S. Highway 301 in Duval County, in the vicinity of Maxville.

PERMITTEE:

Trail Ridge Landfill, Inc.

I.D. Number:

Permit Number: 161821182

Date of Issue:

Expiration Date:

DRAFT

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth herein are "Permit Conditions" and as such are binding upon the permittee and enforceable pursuant to the authority of Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is hereby placed on notice that the department will review this permit periodically and may initiate enforcement action for any violation of the "Permit Conditions" by the permittee, its agents, employees, servants, or representatives.
2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the department.
3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Nor does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit does not constitute a waiver of or approval of any other department permit that may be required for other aspects of the total project which are not addressed in the permit.
4. This permit conveys no title to land or water, does not constitute state recognition or acknowledgement of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the state. Only the Trustees of the Internal Improvement Trust Fund may express state opinion as to title.
5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, plant or aquatic life or property and penalties therefore caused by the construction or operation of this permitted source, nor does it allow the permittee to cause pollution in contravention of Florida Statutes and department rules, unless specifically authorized by an order from the department.
6. The permittee shall at all times properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by department rules.
7. The permittee, by accepting this permit, specifically agrees to allow authorized department personnel, upon presentation of credentials or other documents as may be required by law, access to the premises, at reasonable times, where the permitted activity is located or conducted for the purpose of:

PERMITTEE:

Trail Ridge Landfill, Inc.

I.D. Number:

Permit Number: 161821182

Date of Issue:

Expiration Date:

DRAFT

- a. Having access to and copying any records that must be kept under the conditions of the permit;
- b. Inspecting the facility, equipment, practices, or operations regulated or required under this permit; and
- c. Sampling or monitoring any substances or parameters at any location reasonably necessary to assure compliance with this permit or department rules.

Reasonable time may depend on the nature of the concern being investigated.

8. If, for any reason, the permittee does not comply with, or will be unable to comply with, any condition or limitation specified in this permit, the permittee shall immediately notify and provide the department with the following information:
 - a. A description of and cause of non-compliance; and
 - b. the period of non-compliance, including exact dates and times; or, if not corrected, the anticipated time the non-compliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the non-compliance.

The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the department for penalties or revocation of this permit.

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source, which are submitted to the department, may be used by the department as evidence in any enforcement case arising under the Florida Statutes or department rules, except where such use is proscribed by Sections 403.73 and 403.111, Florida Statutes.
10. The permittee agrees to comply with changes in department rules and Florida Statutes after a reasonable time for compliance, provided however, the permittee does not waive any other rights granted by Florida Statutes or department rules.
11. This permit is transferable only upon department approval in accordance with Florida Administrative Code Rules 17-4.12 and 17-30.30, as applicable. The permittee shall be liable for any noncompliance of the permitted activity until the transfer is approved by the department.
12. This permit is required to be kept at the work site of the permitted activity during the entire period of construction or operation.

PERMITTEE:

Trail Ridge Landfill, Inc.

I.D. Number:

Permit Number: 161821182

Date of Issue:

Expiration Date:

DRAFT

13. This permit also constitutes:

- () Determination of Best Available Control Technology (BACT)
- () Determination of Prevention of Significant Deterioration (PSD)
- (X) Certification of Compliance with State Water Quality Standards
(Section 401, PL 92-500)
- () Compliance with New Source Performance Standards

14. The permittee shall comply with the following monitoring and record keeping requirements:

- a. Upon request, the permittee shall furnish all records and plans required under department rules. The retention period for all records will be extended automatically, unless otherwise stipulated by the department, during the course of any unresolved enforcement action.
- b. The permittee shall retain at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation), copies of all reports required by this permit, and records of all data used to complete the application for this permit. The time period of retention shall be at least three years from the date of the sample, measurement, report or application unless otherwise specified by department rule.
- c. Records of monitoring information shall include:
 - the date, exact place, and time of sampling or measurements;
 - the person responsible for performing the sampling or measurements;
 - the date(s) analyses were performed;
 - the person responsible for performing the analyses;
 - the analytical techniques or methods used; and
 - the results of such analyses.

15. When requested by the department, the permittee shall, within a reasonable period of time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the department, such facts or information shall be submitted or corrected promptly.

PERMITTEE:

Trail Ridge Landfill, Inc.

I.D. Number:

Permit Number: 161821182

Date of Issue:

Expiration Date:

DRAFT

SPECIFIC CONDITIONS:

1. The permittee is hereby advised that Florida law states: "No person shall commence any excavation, construction, or other activity involving the use of sovereign or other lands of the state, title to which is vested in the Board of Trustees of the Internal Improvement Trust Fund of the Department of Natural Resources under Chapter 253, until such person has received from the Board of Trustees of the Internal Improvement Trust Fund the required lease, license, easement, or other form of consent authorizing the proposed use." Pursuant to Florida Administrative Code Rule 16Q-14, if such work is done without consent, or if a person otherwise damages state land or products of state land, the Board of Trustees may levy administrative fines of up to \$10,000 per offense.
2. If historical or archeological artifacts, such as Indian canoes, are discovered at any time within the project site the permittee shall immediately notify the Northeast District Office of the Department of Environmental Regulation and the Bureau of Historic Preservation, Division of Archives, History and Records Management, R.A. Gray Building, Tallahassee, Florida 32301.
3. Prior to commencement of work authorized by this permit, the permittee shall provide written notification of the date of the commencement and proposed schedule of construction to the Northeast District Office of the Department of Environmental Regulation, Wetland Management Section, Suite B-200, 7825 Baymeadows Way, Jacksonville, FL 32256-7577.
4. This permit does not constitute any approval of the stormwater management system which must be obtained separately from the appropriate agency.
5. The project shall comply with applicable State Water Quality Standards, namely:
 - 17-302.500 - Minimum Criteria for All Waters at All Times and All Places.
 - 17-302.510 - Surface Waters: General Criteria.
 - 17-302.560 - Criteria - Class III Waters - Recreation, Propagation and Management of Fish and Wildlife: Surface Waters.
6. The mitigation plan, **"Trail Ridge Landfill Wetland Impacts and Mitigation Plan,"** submitted on June 18, 1990, shall be appended as a Specific Condition of this permit. Any specific condition requirements listed herein, shall supercede or modify any requirements contained in the appended mitigation plan.
7. Prior to initiating any construction, permittee must record a conservation easement on the real property pursuant to Section 704.06, F.S., prohibiting all construction including clearing, dredging or filling, except that which is authorized by this permit within the conservation creation/preservation areas as delineated on plans dated as received by the Department on June 18, 1990. The easement must contain provisions as set forth in subsections 1 (a) - (b) of Section 704.06, F.S., as well as provisions indicating that they may be enforced by the Department and may not be amended without Department approval. Within 30 days of the date of issuance of this permit and prior to recording, said easement must be submitted to the Department for

CONTINUED NEXT PAGE

PERMITTEE:

Trail Ridge Landfill, Inc.

I.D. Number:

Permit Number: 161821182

Date of Issue:

Expiration Date:

DRAFT

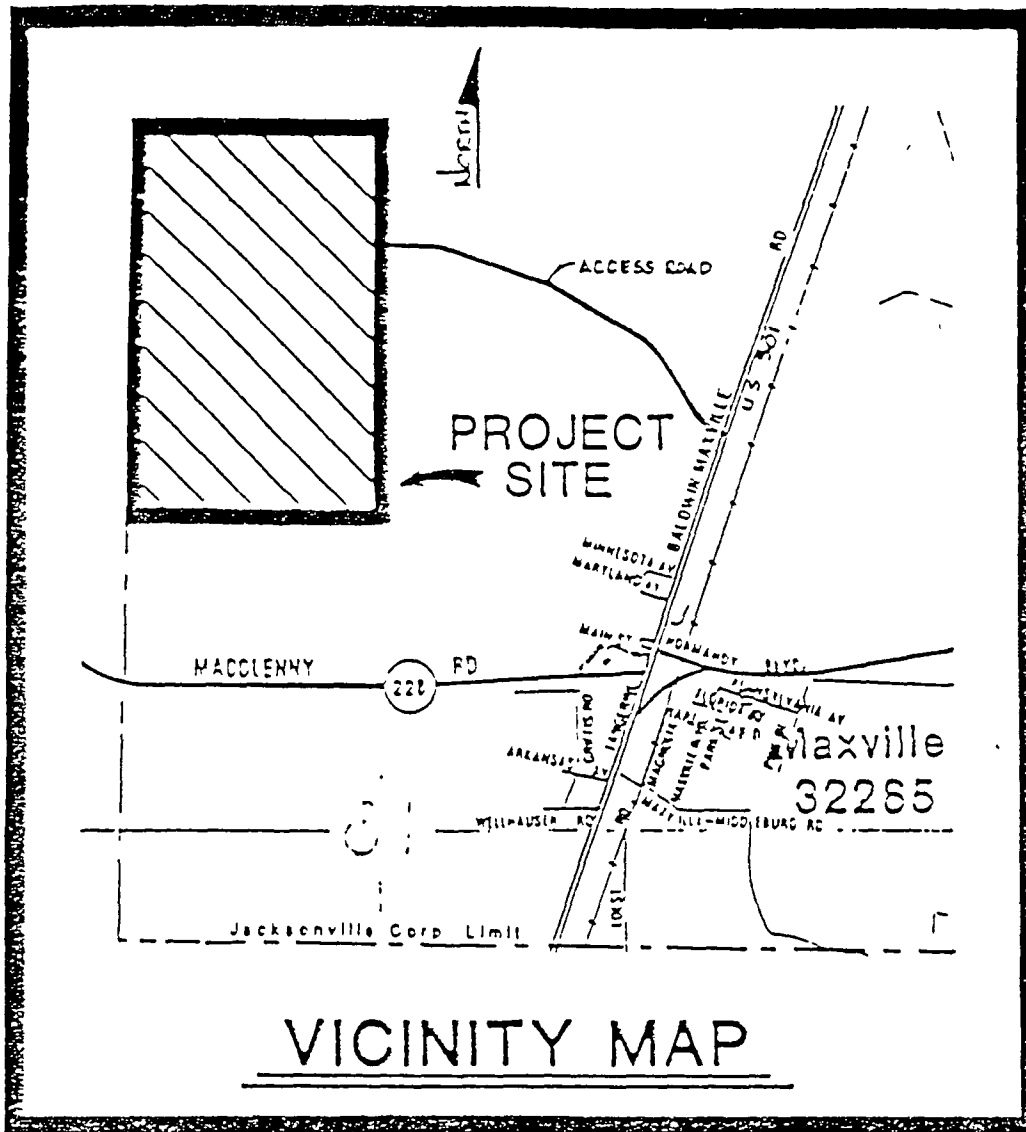
SPECIFIC CONDITIONS CONTINUED:

review and approval. Within 30 days of receipt of Department approval, permittee must provide to the Department a certified copy of the recorded easement showing the date they were recorded and the official records book and page number.

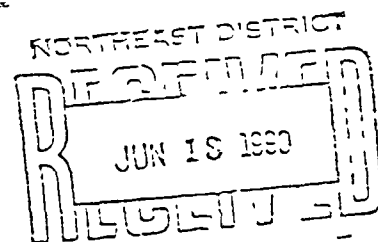
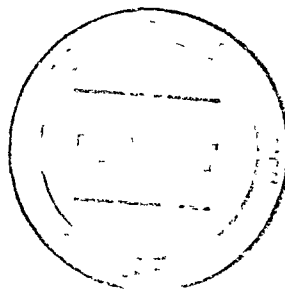
8. The permittee shall submit, in writing, to the Department of Environmental Regulation, Northeast District, 7825 Baymeadows Way, Suite 200B, Jacksonville, FL 32256-7577, notification of the date that activities authorized by this permit commence.
9. The initial planting of the mitigation areas, per appended mitigation plan section 4 (b)(4), shall be completed no later than one year after commencement of the activities authorized by this permit.
10. The permittee shall submit an as-built survey of the wetland creation areas showing dimensions, grades, ground elevations and water surface elevations certified by a registered surveyor or professional engineer. The as-built must be submitted within thirty (30) days of the initial planting.
11. The permittee shall furnish the Department with monitoring reports on the wetland creation areas describing:
 - a. Percent survival and diversity of planted species within each stratum;
 - b. Recruitment density and composition within each stratum;
 - c. Recorded growth via established parameters for planted trees and shrubs;
 - d. Percent cover of herbaceous species;
 - e. Surface water elevations referenced to N.G.V.D., or if surface water is not present, groundwater elevation referenced to N.G.V.D.

The first monitoring year shall start as of the planting date and data shall be collected and submitted in accordance with Specific Condition Number 9 . Reports to the Department must also include photographs, descriptions of problems encountered and solutions undertaken.
12. Within the wetland creation areas, non-native vegetation and nuisance vegetation such as Typha spp. shall be controlled by hand clearing or other methods approved by the Department so that they constitute no more than 10% of the areal cover at any monitoring period.

CONTINUED NEXT PAGE



VICINITY MAP



England, Thims
& Miller, Inc.

VICINITY MAP
TRAILRIDGE LANDFILL
TRAIL RIDGE LANDFILL, INC.

PROJ. NO. E89-113
DATE JUNE 11, 1990
SCALE 1" = 4000'
DRAWING NO. 1

DER

[Handwritten signature]

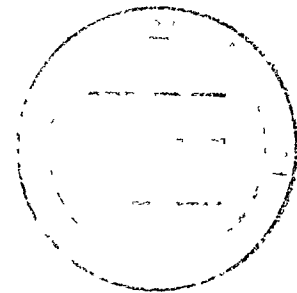
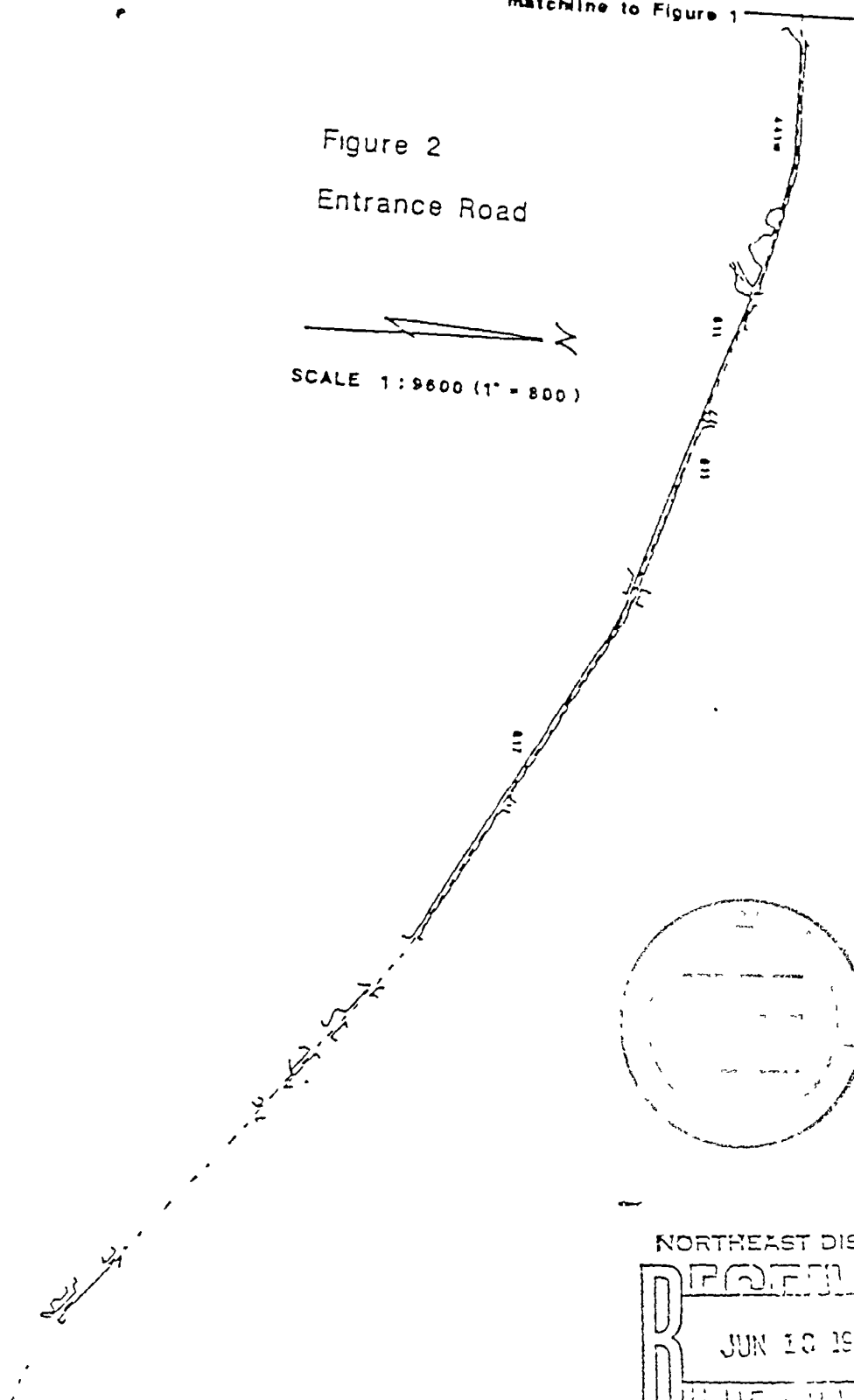
6-11-90

6-11-90

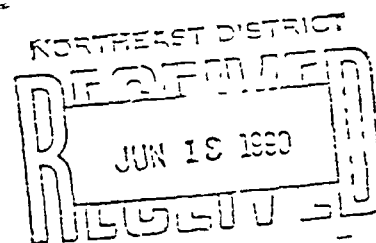
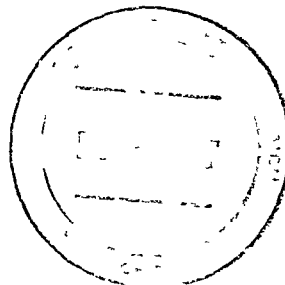
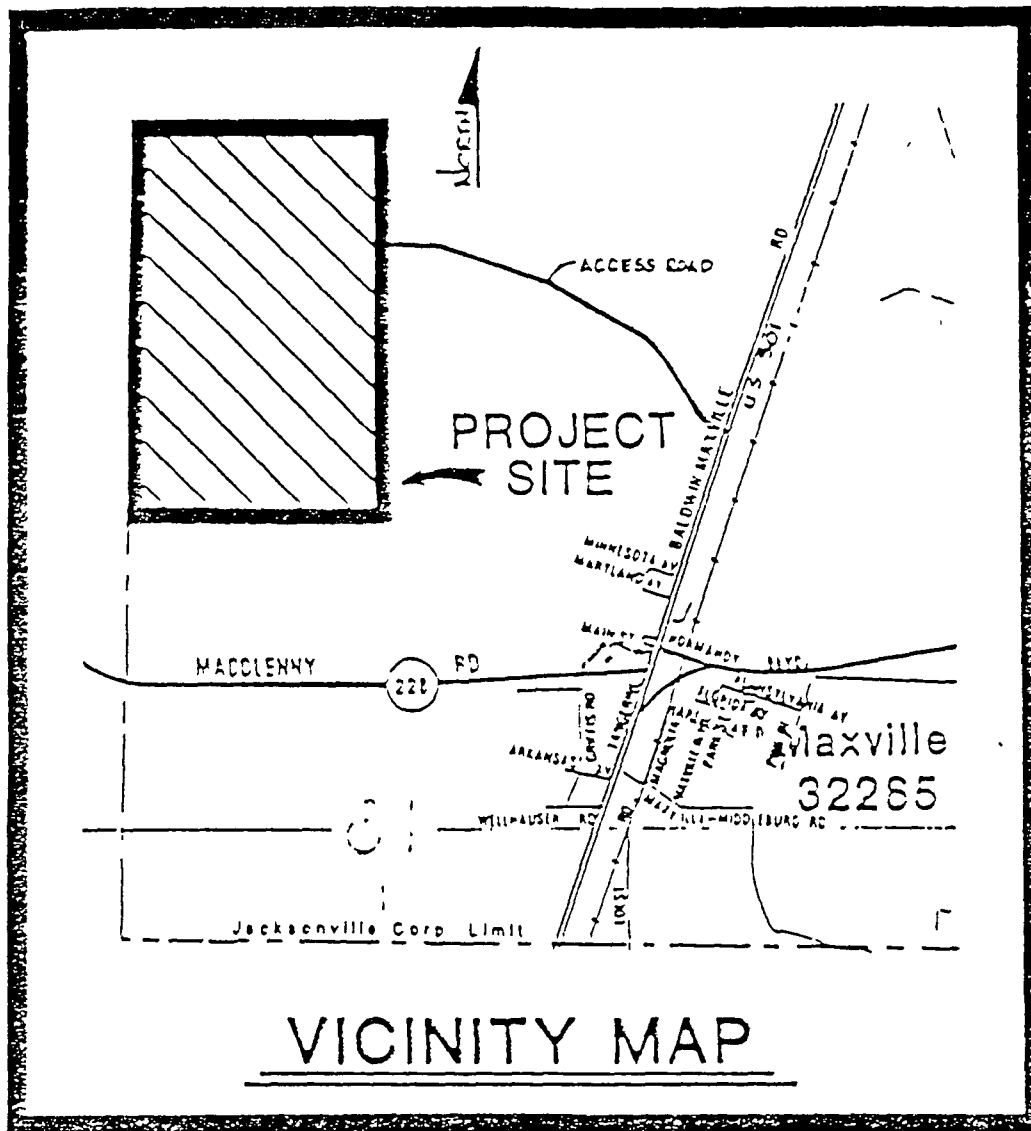
matchline to Figure 1

Figure 2
Entrance Road

SCALE 1 : 9600 (1" = 800')



NORTHEAST DISTRICT
RECEIVED
JUN 18 1990
DER-JACKSONVILLE



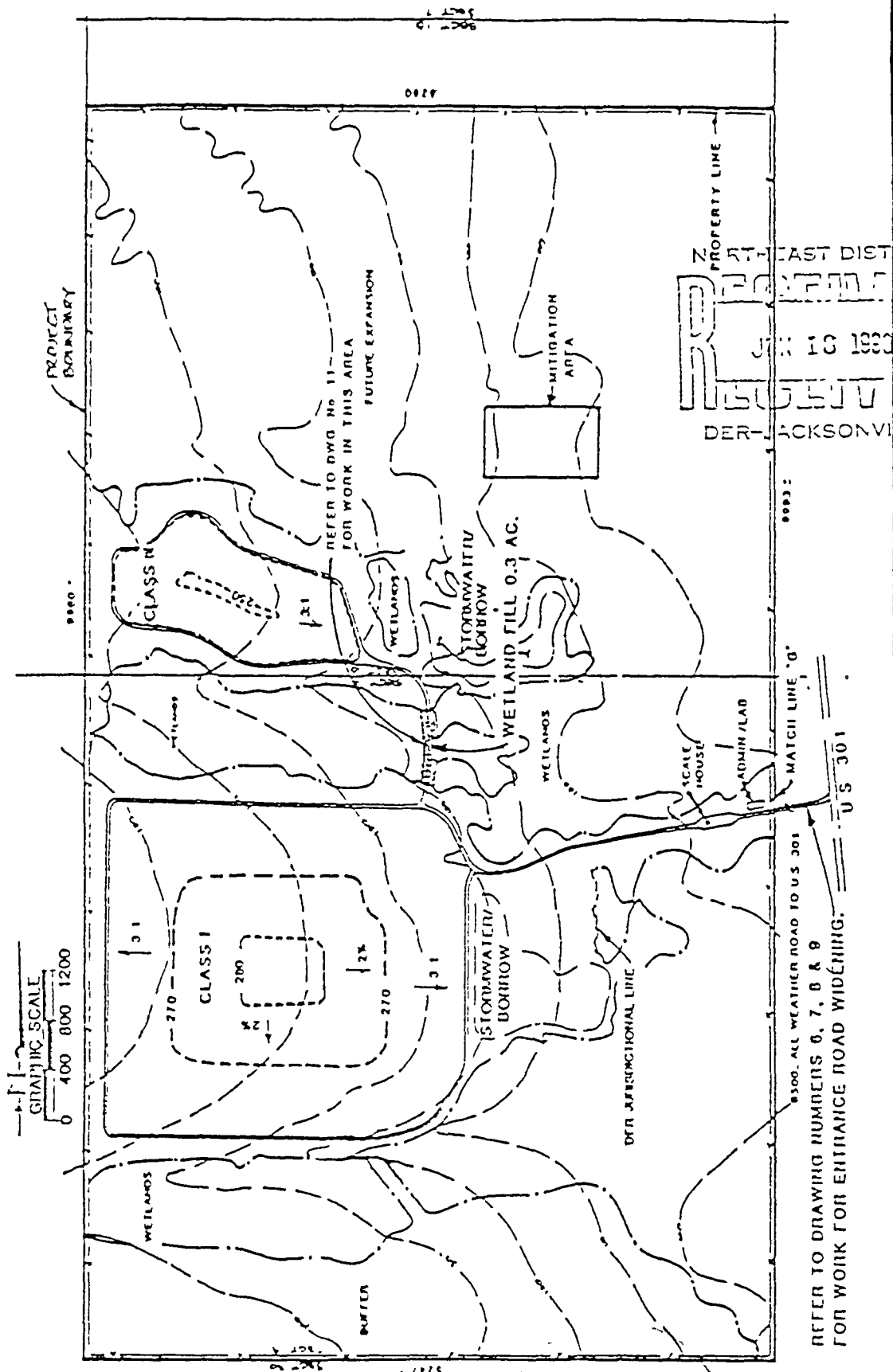
England, Thims
& Miller, Inc.

VICINITY MAP
TRAILRIDGE LANDFILL
TRAIL RIDGE LANDFILL, INC.

PROJ. NO. E89-113
DATE JUNE 11, 1990
SCALE 1" = 4000'
DRAWING NO. 1

DER

Handwritten signature
66-11-90

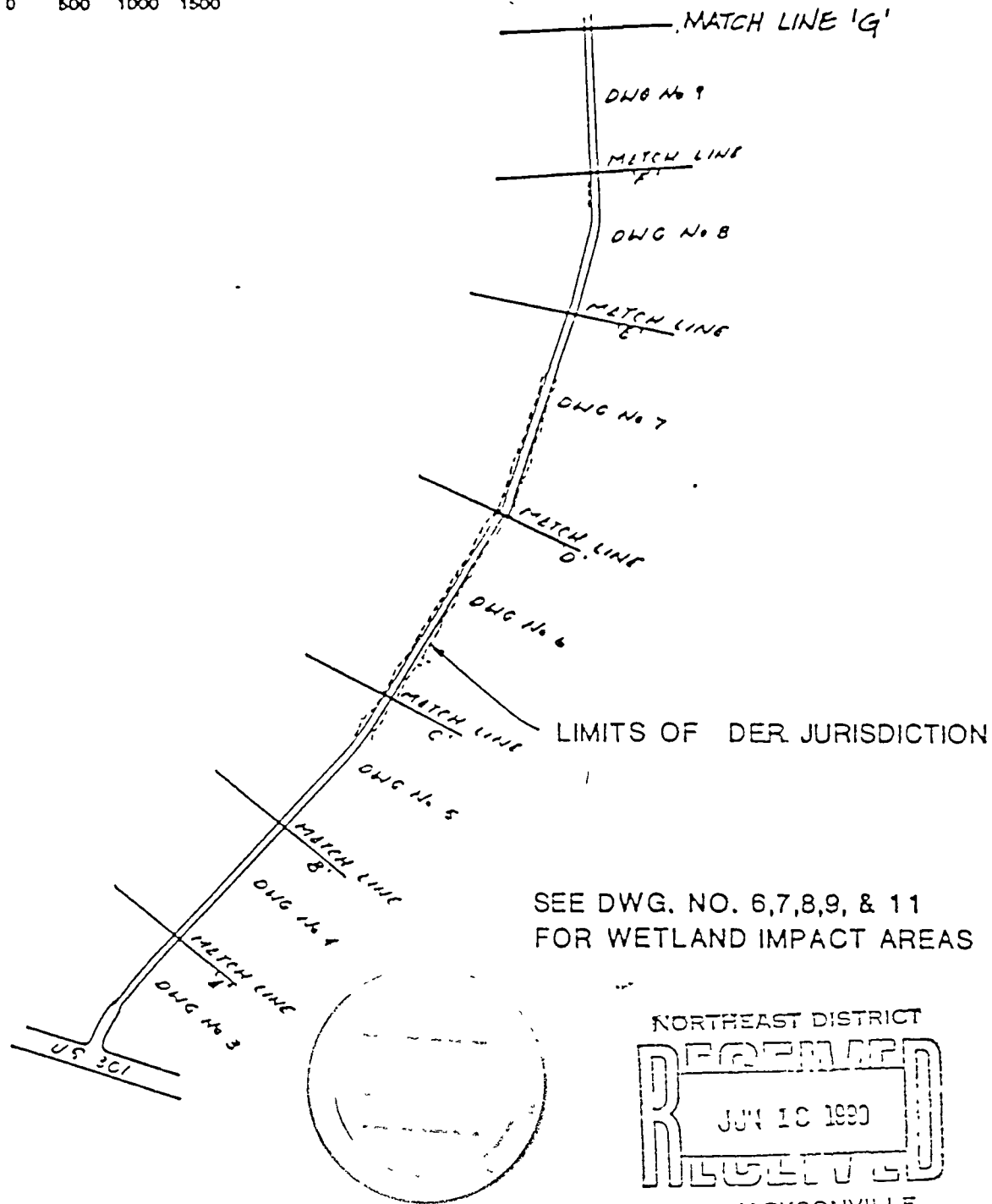
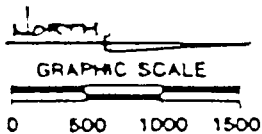


PROJ. NO. E 89-113-B
DATE JUNE 11, 1990
SCALE SEE GRAPHIC
DRAWING NO. 2

SITE PLAN
TRAIL RIDGE LANDFILL
FOR: TRAIL RIDGE LANDFILL

England-Thim
& Miller, Inc.
301 N. 30th St. Jacksonville, FL 32209

DER
6-11-90



NORTHEAST DISTRICT
RECEIVED
 JUN 10 1990
REGISTERED
 DER-JACKSONVILLE



England-Thims
 & Miller, Inc.

SITE PLAN
 ENTRANCE ROAD

TRAIL RIDGE LANDFILL
 TRAIL RIDGE LANDFILL, INC

PROJ. NO. E89-113

DATE JUNE 11, 1990

SCALE SEE GRAPHIC

DRAWING NO 3

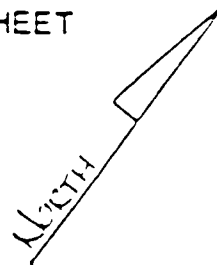
DER

Handwritten signature
 6-11-90

200 100 0 200
GRAPHIC SCALE

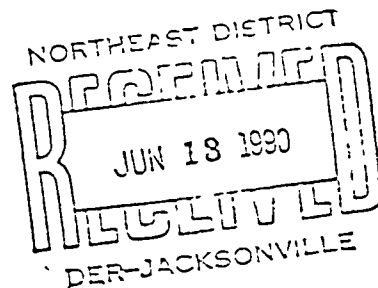
NO D.E.R. IMPACTS THIS SHEET

MATCH LINE 'A'



EXISTING TRAIL ROAD

PROPOSED PAVED ENTRANCE ROAD



U.S. 301

LEGEND

——— LIMITS OF CONSTRUCTION
////// D.E.R. WETLAND IMPACT
===== PROPOSED 24' ASPHALT PYMT.

TOTAL DEPARTMENT OF ENVIRONMENTAL
REGULATION WETLAND IMPACTS
1.61 ACRES TOTAL FILL 5384 C.Y.



England, Thims
& Miller, Inc.

SITE PLAN

TRAIL RIDGE LANDFILL
TRAIL RIDGE LANDFILL, INC.

PROJ. NO 89-113

DATE JUNE 11, 1990

SCALE GRAPHIC

DRAWING NO 4

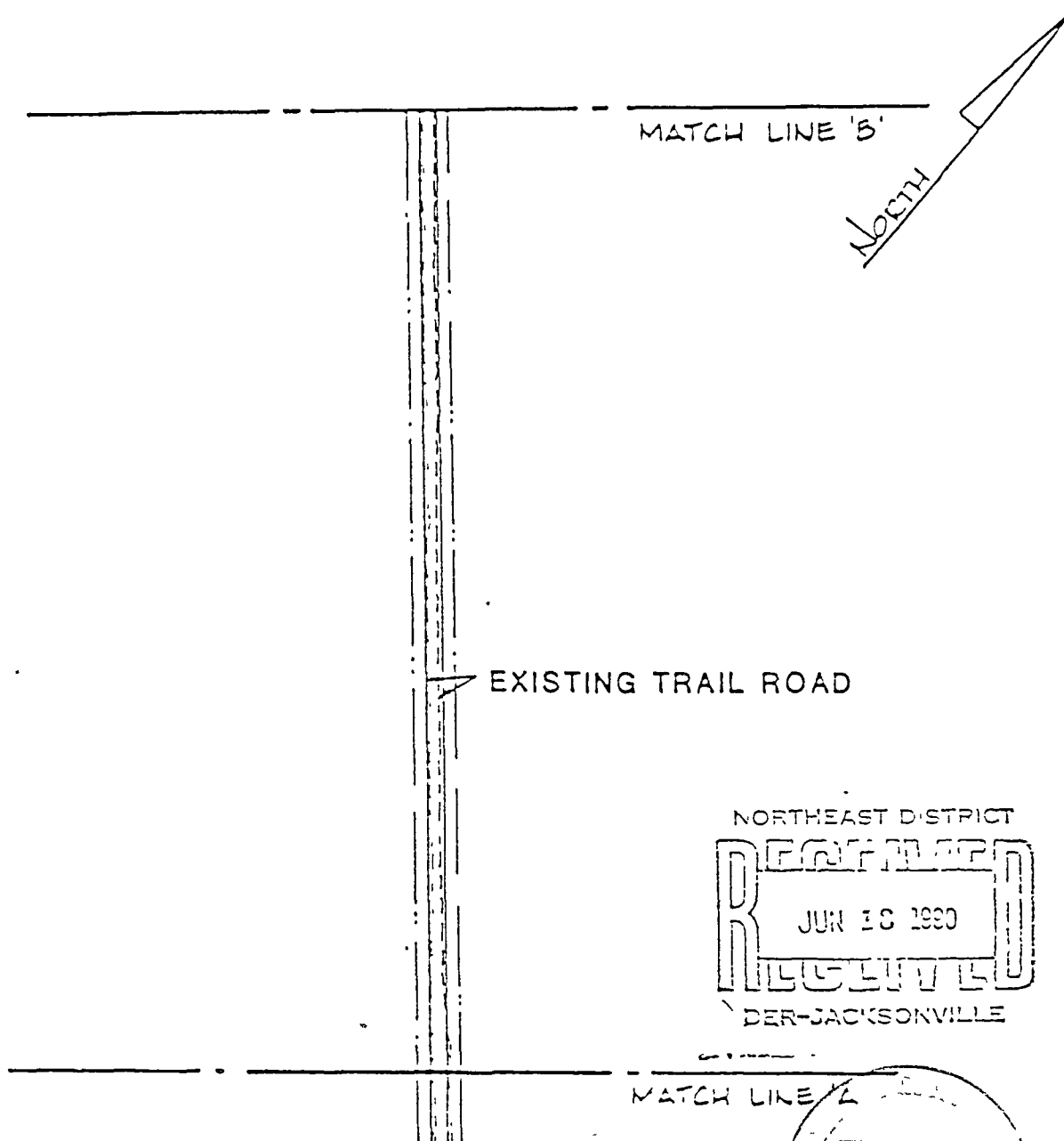
DER

Granville
6-11-90

200 100 0

GRAPHIC SCALE

NO D.E.M. IMPACTS THIS SHEET



LEGEND

——— LIMITS OF CONSTRUCTION
/////// D E R WETLAND IMPACT
===== PROPOSED 24' ASPHALT PYMT.

England, Thims
& Miller, Inc.

SITE PLAN

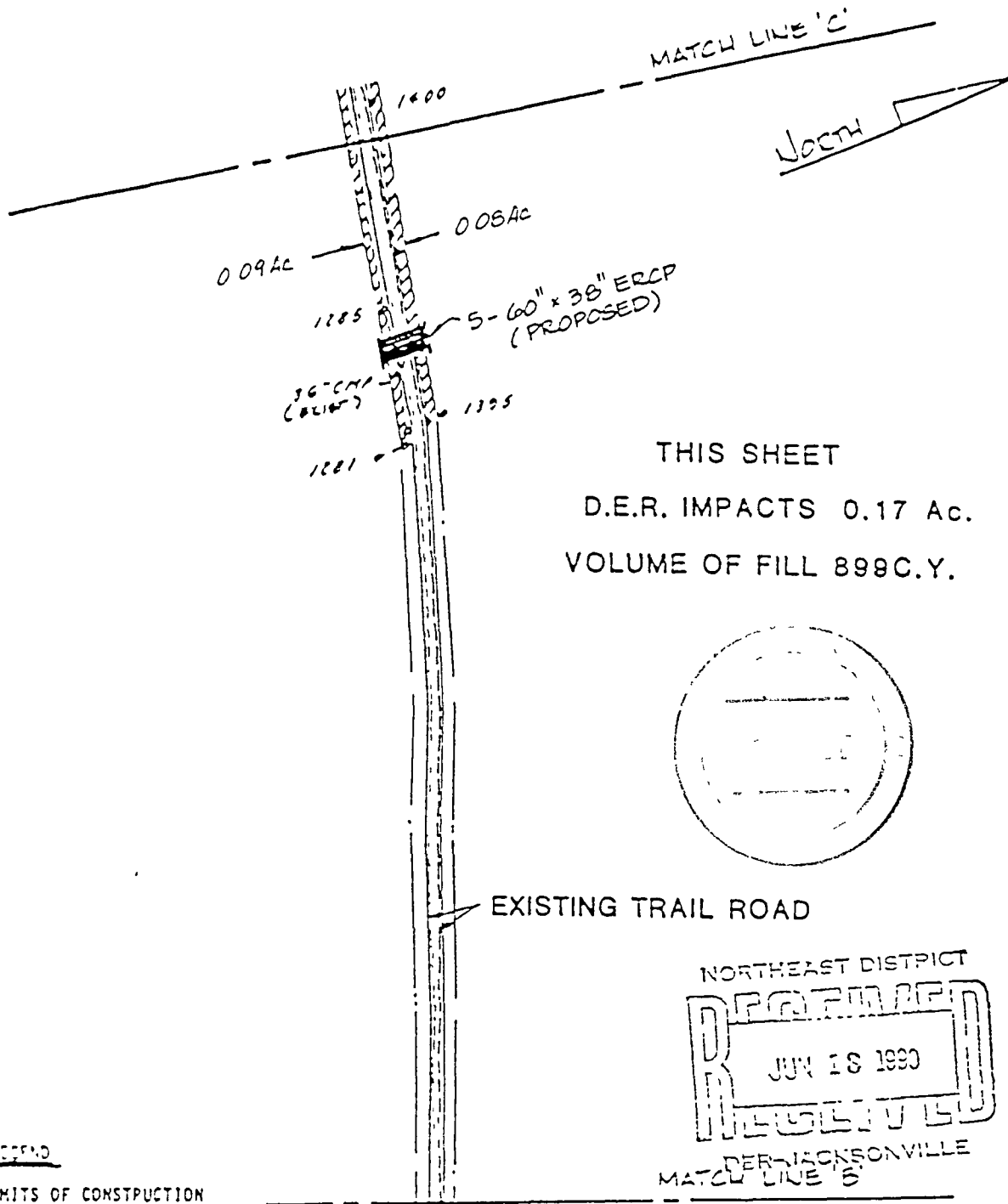
TRAIL RIDGE LANDFILL
TRAIL RIDGE LANDFILL, INC

PROJ NO 89-113
DATE JUNE 11, 1990
SCALE GRAPHIC
DRAWING NO 5

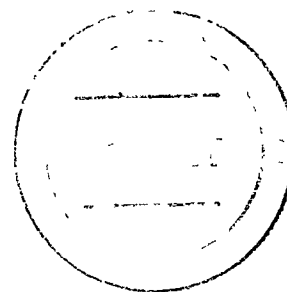
DER

Signature
6-11-90

200 00 0 00
GRAPHIC SCALE



THIS SHEET
D.E.R. IMPACTS 0.17 Ac.
VOLUME OF FILL 898 C.Y.



EXISTING TRAIL ROAD

NORTHEAST DISTRICT
RECEIVED
JUN 18 1990

DER JACKSONVILLE
MATCH LINE B

LEGEND
—— LIMITS OF CONSTRUCTION
////// D E R WETLAND IMPACT
===== PROPOSED 24' ASPHALT PYMT.



England, Thims
& Miller, Inc.

SITE PLAN

TRAIL RIDGE LANDFILL
TRAIL RIDGE LANDFILL, INC

PROJ NO 89-113

DATE JUNE 11, 1990

SCALE GRAPHIC

DRAWING NO 6

DER

Lyman
6-11-90

200 100 0 100

GRAPHIC SCALE

MATCH LINE 'D'

NORTH

1307 1394

30" CMP

2-48" RCP (PROPOSED)

1295

1380

THIS SHEET

D.E.R. IMPACTS 0.69 Ac.

VOLUME OF FILL 2200 C.Y.

0.34 Ac

24" CMP (EXIST.)

1-36" RCP (PROPOSED)

0.35 Ac

18" CMP (EXIST.)

1290

1375

1-36" RCP (PROPOSED)

1372

1404

1-30" RCP (PROPOSED)

(2) 24" CMP (EXIST.)

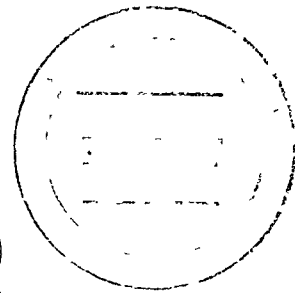
EXISTING TRAIL ROAD

1400

MATCH LINE 'C'

LEGEND

LIMITS OF CONSTRUCTION
D.E.R. WETLAND IMPACT
PROPOSED 24" ASPHALT PAVT.



NORTHEAST DISTRICT
JUN 15 1990
DER-JACKSONVILLE

England, Thims
& Miller, Inc.

SITE PLAN

TRAIL RIDGE LANDFILL
TRAIL RIDGE LANDFILL, INC.

PROJ. NO. 89-113

DATE JUNE 11, 1990

SCALE GRAPHIC

DRAWING NO 7

DER

Small
6-11-90

200 100 0 100

GRAPHIC SCALE

PAC

MATCH LINE 'D'

NORTH

1307 1394

30" CMP

2-48" RCP (PROPOSED)

1295

1380

THIS SHEET

D.E.R. IMPACTS 0.69 Ac.

VOLUME OF FILL 2200 C.Y.

034 Lc

24" CMP (EXISTS)

1-36" RCP (PROPOSED)

035 Lc

18" CMP (EXISTS)

1290

1375

1-36" RCP (PROPOSED)

1372

1404

1-30" RCP (PROPOSED)

(2) 24" CMP (EXISTS)

EXISTING TRAIL ROAD

1400

MATCH LINE 'C'

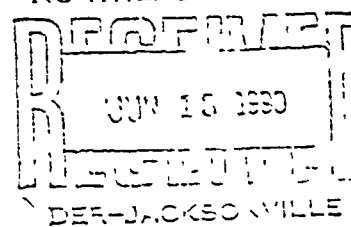
LEGEND

LIMITS OF CONSTRUCTION

D.E.R. WETLAND IMPACT

PROPOSED 24" ASPHALT PAVT.

NORTHEAST DISTRICT



SITE PLAN

TRAIL RIDGE LANDFILL
TRAIL RIDGE LANDFILL, INC.

PROJ. NO 89-113

DATE JUNE 11, 1990

SCALE GRAPHIC

DRAWING NO 7

DER

Signature
6-11-90

200 100 0 200
GRAPHIC SCALE

MATCH LINE 'E'



0.17 Ac

1300

EXISTING TRAIL ROAD

1305

0.21 Ac

1310

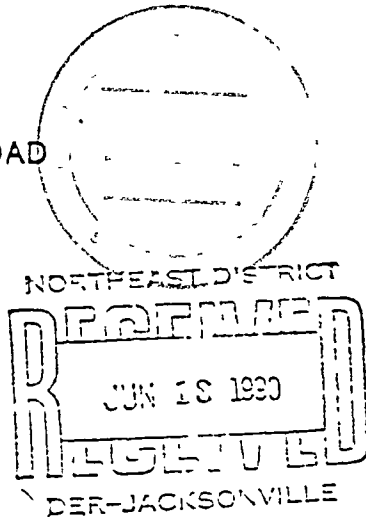
1320

1307

1314

MATCH LINE 'D'

THIS SHEET
D.E.R. IMPACTS 0.38 Ac.
VOLUME OF FILL 1282 C.Y.



LEGEND

—— LIMITS OF CONSTRUCTION
//// D.E.R. WETLAND IMPACT
===== PROPOSED 24' ASPHALT PYMT.



England-Thims
& Miller, Inc.

SITE PLAN

TRAIL RIDGE LANDFILL
TRAIL RIDGE LANDFILL, INC.

PROJ. NO. 89-113

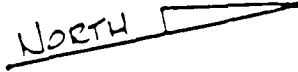
DATE JUNE 11, 1990

SCALE GRAPHIC

DRAWING NO 8

DER

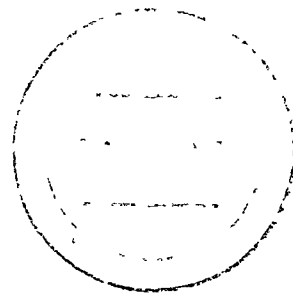
Handwritten signature
6-11-90



MATCH LINE 'F'

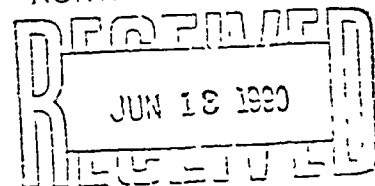
133' 36' CMP
133' 36' (EXIST)
133' 36' (PROPOSED)
133' 36' (PROPOSED)

THIS SHEET
D.E.R. IMPACTS 0.07Ac.
VOLUME OF FILL 68C.Y.



-EXISTING TRAIL ROAD

NORTHEAST DISTRICT



DER-JACKSONVILLE

MATCH LINE 'E'

15554

LIMITS OF CONSTRUCTION
D E R. WETLAND IMPACT
PROPOSED 24' ASPHALT PYMT.



England-Thimble
& Miller, Inc.

SITE PLAN

TRAIL RIDGE LANDFILL
TRAIL RIDGE LANDFILL, INC.

PROJ. NO. 89-113

DATE JUNE 11, 1990

SCALE, GRAPHIC

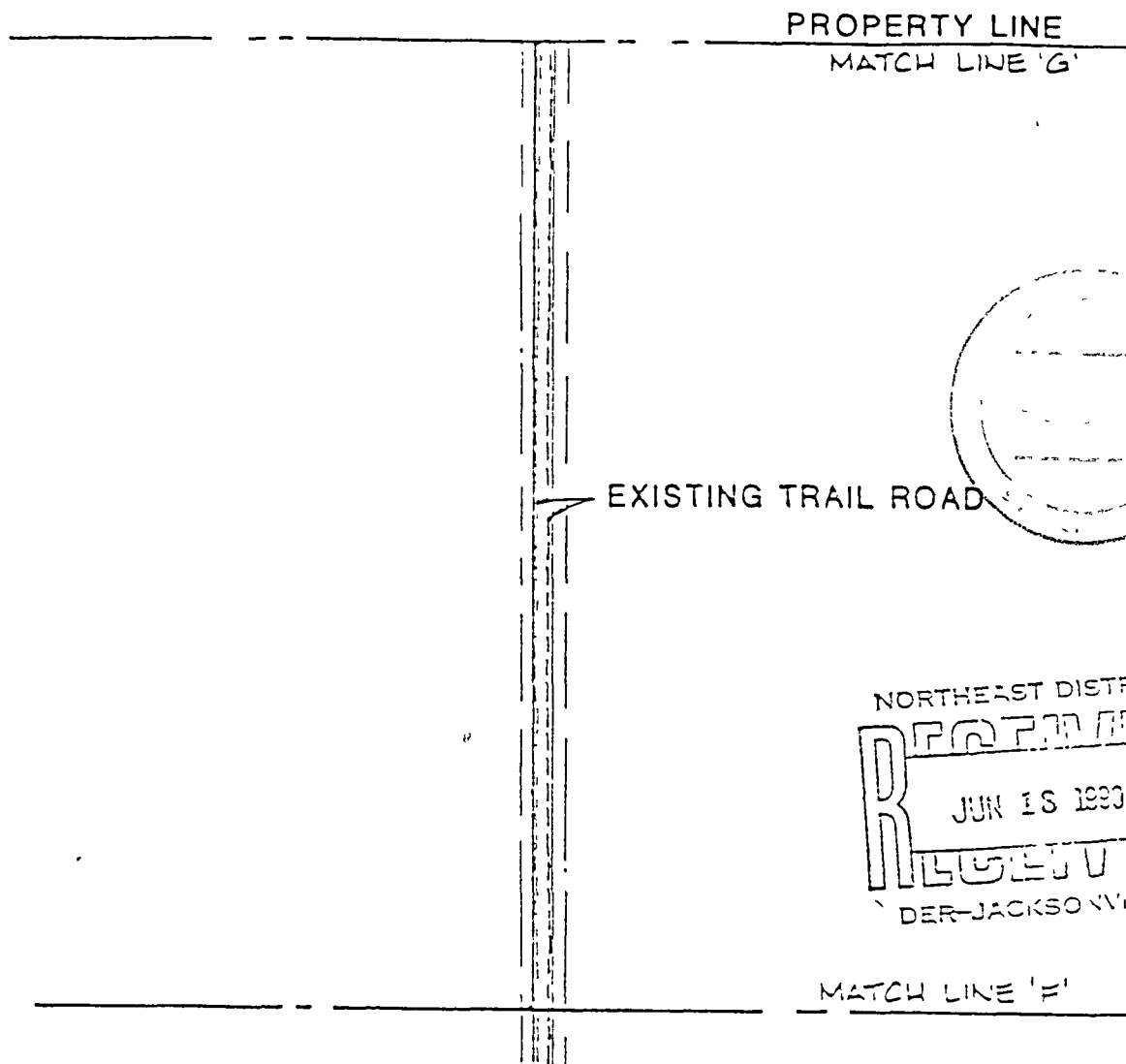
DRAWING NO. 9

DER

Small

200 100 0 200
GRAPHIC SCALE

NORTH



NORTHEAST DISTRICT
RECEIVED
JUN 15 1990
DER-JACKSONVILLE

LEGEND

—— LIMITS OF CONSTRUCTION
////// D E R WETLAND IMPACT
===== PROPOSED 24' ASPHALT PAVT.

THIS SHEET
NO D.E.R. IMPACTS



England-Thims
& Miller, Inc.

SITE PLAN

TRAIL RIDGE LANDFILL
TRAIL RIDGE LANDFILL, INC.

PROJ. NO. 89-113
DATE JUNE 11, 1990
SCALE GRAPHIC
DRAWING NO 10

DER

Handwritten signature
6-11-90

6-11-90

CLASS III

SECTION 18

SECTION 19

THIS SHEET

D.E.R. IMPACTS 0.30 AC.

VOLUME OF FILL 924 C.Y.

PROPOSED DBL. 48" CMPS.

LIMITS OF JURISDICTION

CLASS I

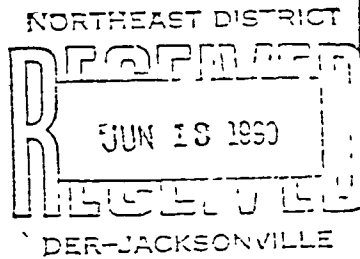
EXISTING TRAIL ROAD



GRAPHIC SCALE

LEGEND

- LIMITS OF CONSTRUCTION
- D E R WETLAND IMPACT
- PROPOSED 24 ASPHALT FWT



England-Thimms
& Miller, Inc.

Professional Engineer
JUL 31 1990
FL 37296

SITE PLAN

TRAIL RIDGE LANDFILL
TRAIL RIDGE LANDFILL, INC.

PROJ. NO. 89-113

DATE JUNE 11, 1990

SCALE GRAPHIC

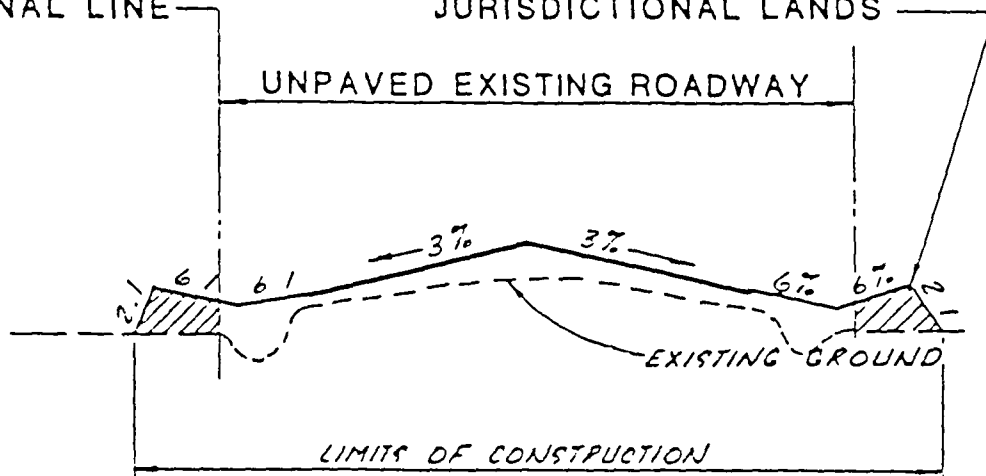
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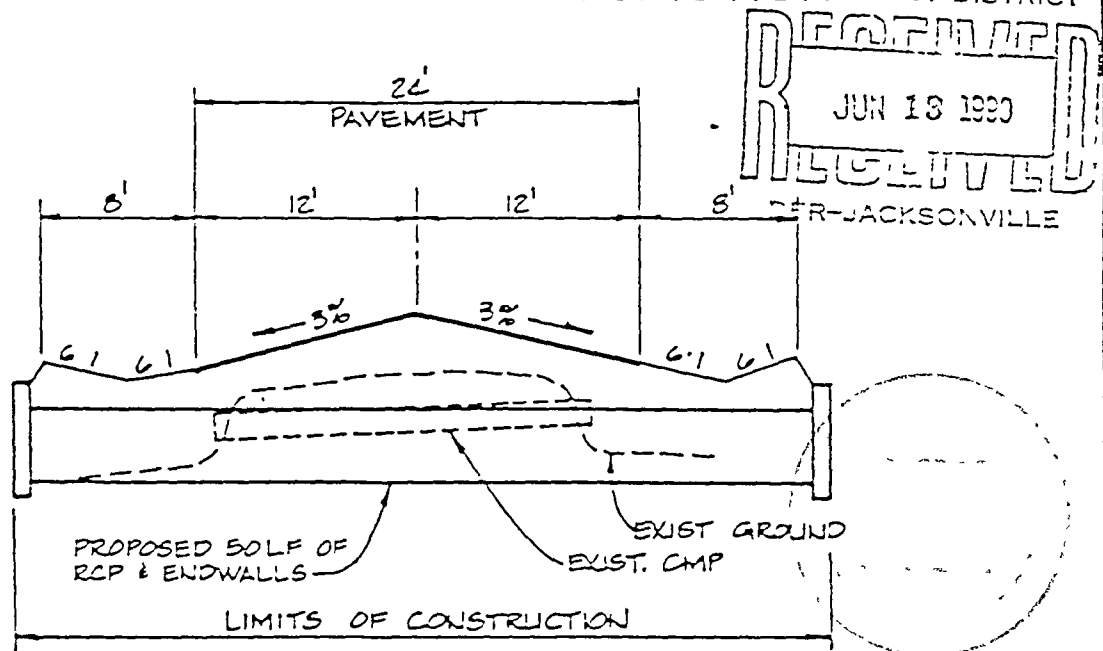
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D.E.R.
JURISDICTIONAL LINE

IMPACTS TO D.E.R.
JURISDICTIONAL LANDS



TYPICAL SECTION WHERE
IMPACTING D.E.R. JURISDICTION



TYPICAL CULVERT REPLACEMENT



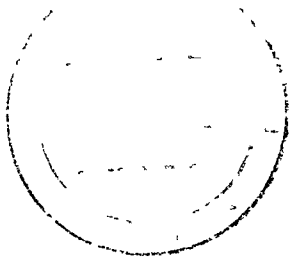
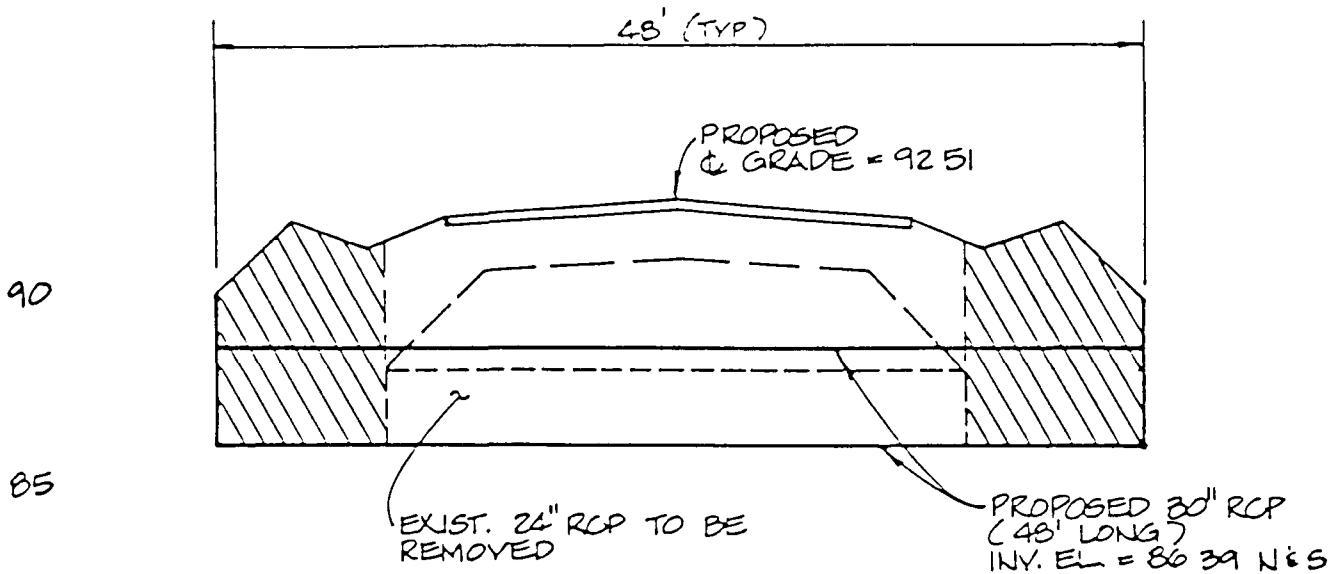
England-Thims
& Miller, Inc.

ROADWAY SECTIONS
TRAIL RIDGE LANDFILL
TRAIL RIDGE LANDFILL, INC.

PROJ. NO.	89-113
DATE	JUNE 11, 1990
SCALE	1"=10'
DRAWING NO	12

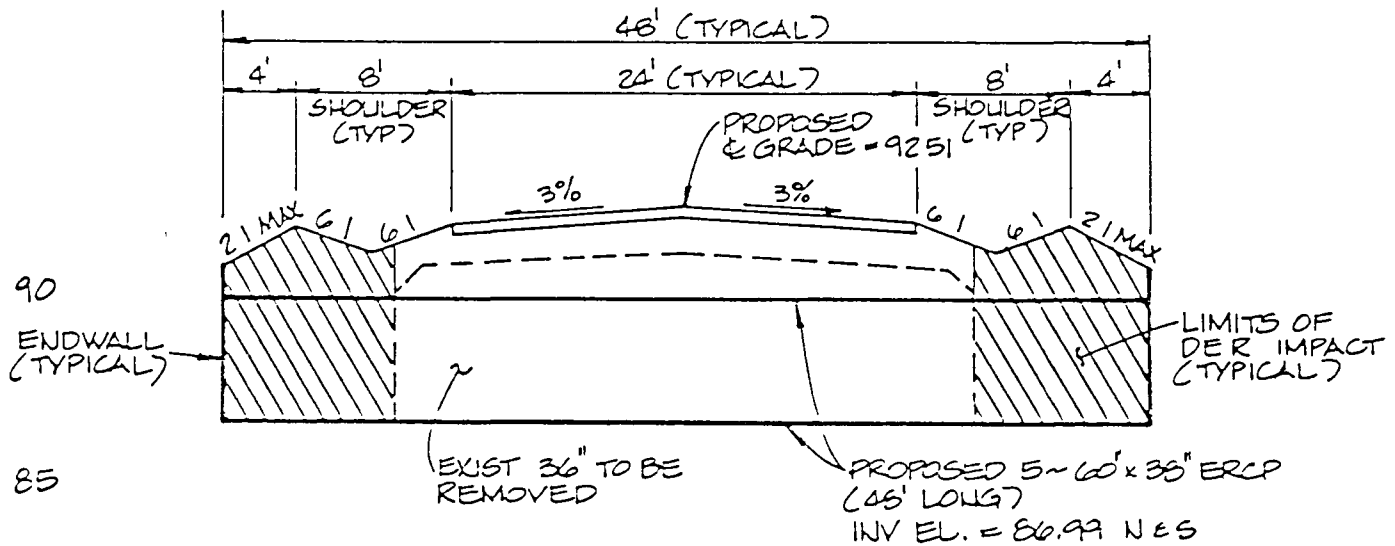
DER

Handwritten signature
6-11-90



STA. 49 + 03

NORTH-EAST DISTRICT
RECEIVED
 JUL 18 1990
RECEIVED
 DER-JACKSONVILLE



STA. 42 + 87

7-14-90 ADDED X-SECTIONS PER DER

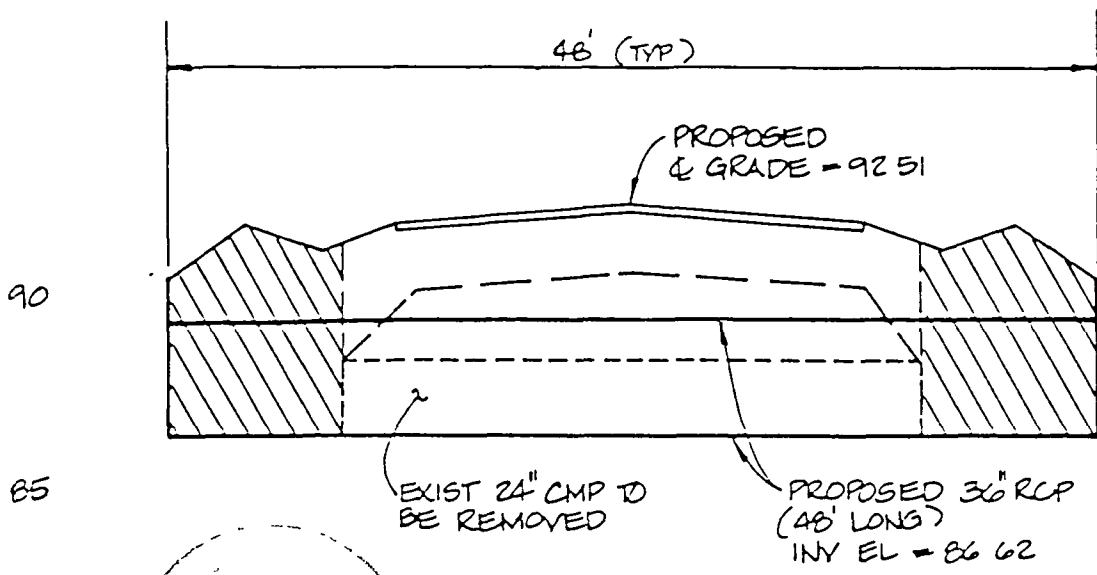
England-Thimms
 & Miller, Inc.
 Consulting Engineers

CULVERT SECTIONS
TRAIL RIDGE LANDFILL
 TRAIL RIDGE LANDFILL, INC.

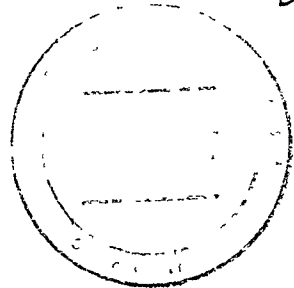
PROJ. NO. 89-113
 DATE JULY 14, 1990
 SCALE 1" = 10'
 DRAWING NO 18

DER

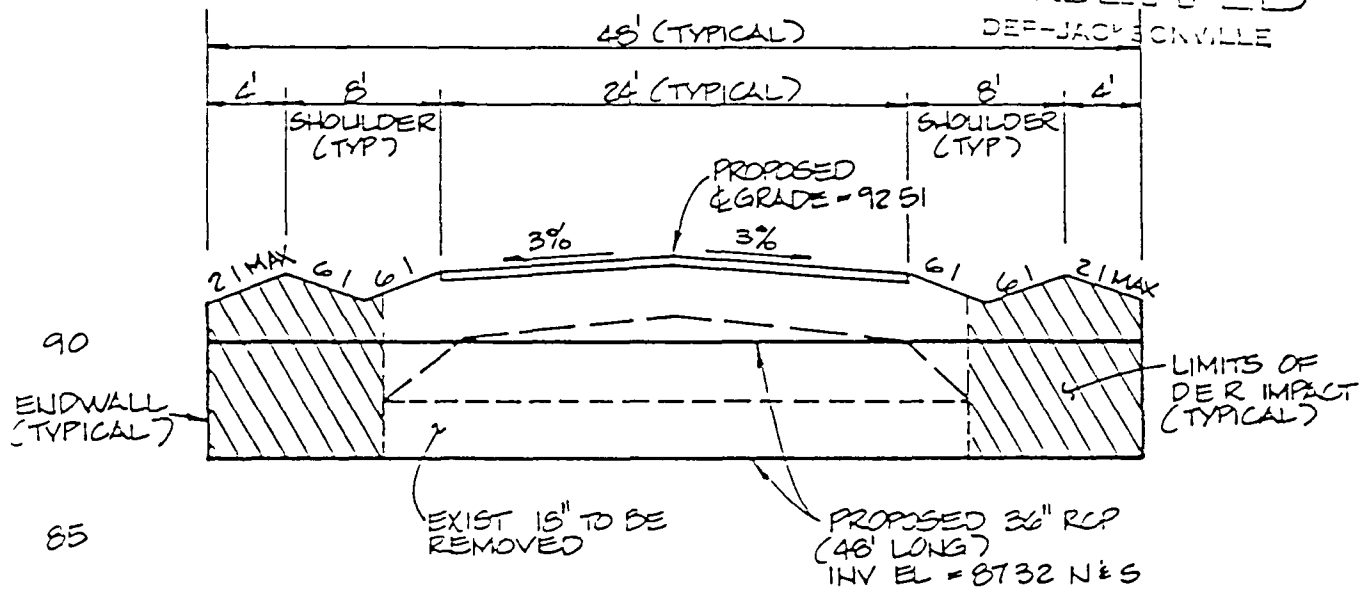
Handwritten signature/initials
 7-17-90



STA. 53 + 01



NORTH-EAST DISTRICT
JUL 15 1990
RECEIVED
DEF-JACK SCHVILLE



STA. 50 + 98

7-16-90 ADDED X-SECT'S PER DER

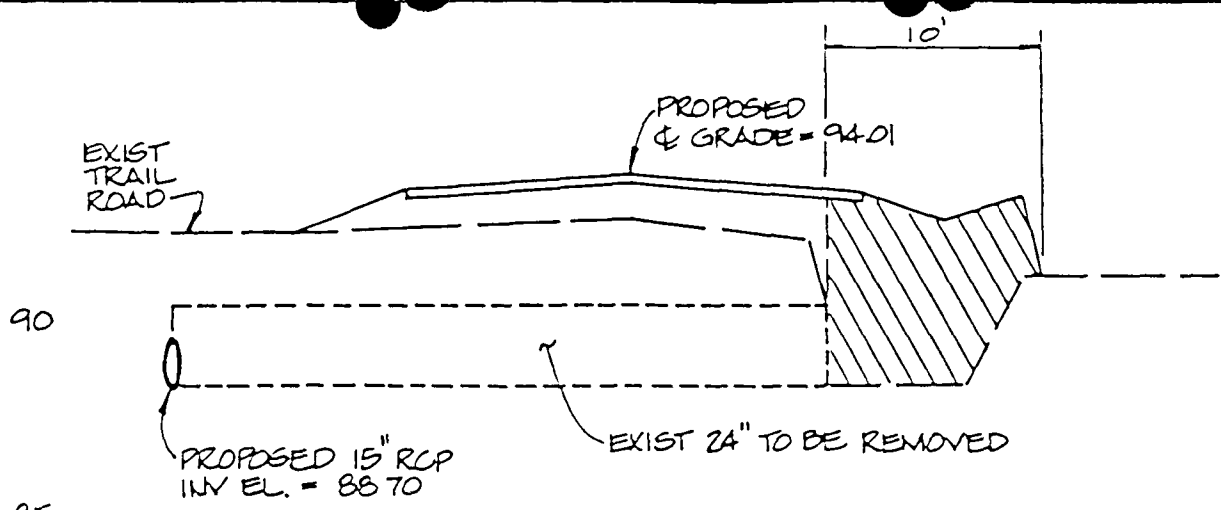
England-Thims
& Miller, Inc.
Consulting Engineers

CULVERT SECTIONS
TRAIL RIDGE LANDFILL
TRAIL RIDGE LANDFILL, INC.

PROJ NO 89-113
DATE JULY 14, 1990
SCALE 1"=10'
DRAWING NO 19,

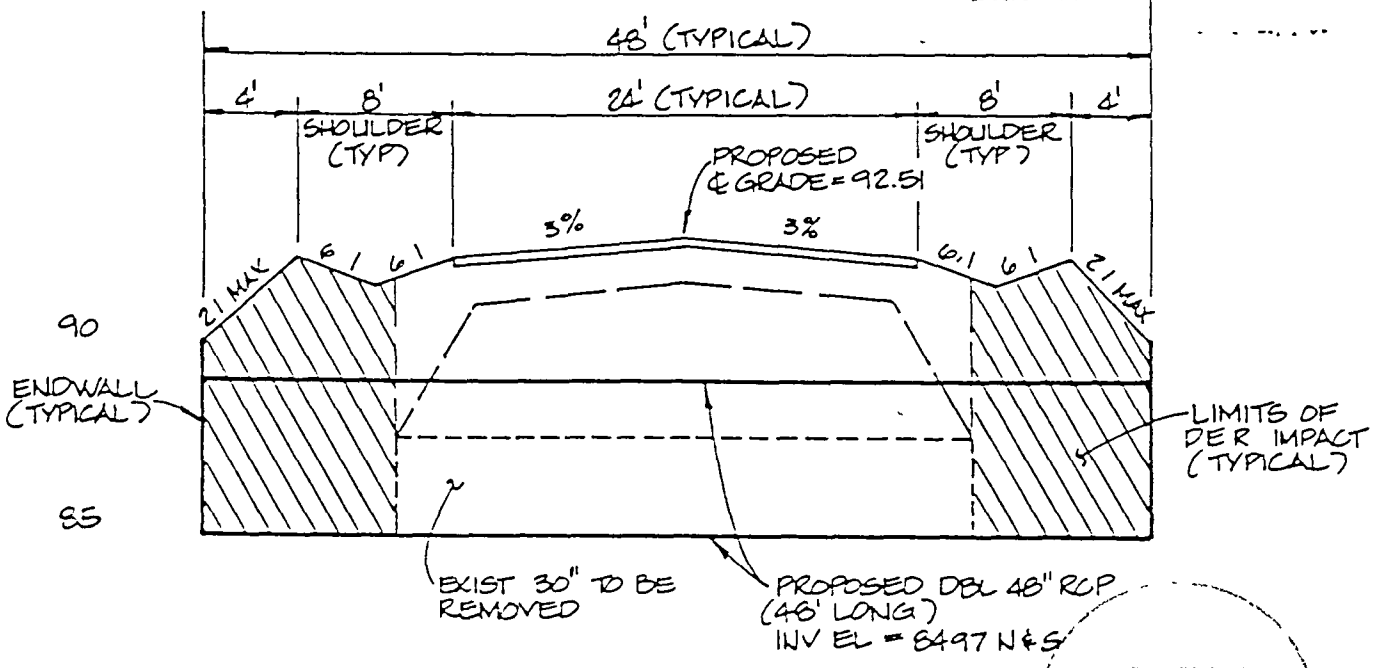
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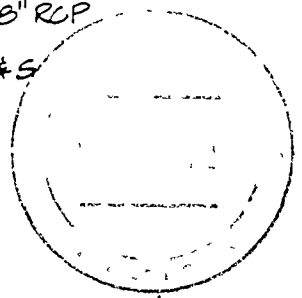


STA. 76 + 70

RECEIVED
JUL 16 1990
DER-JACKSONVILLE



STA. 59 + 04



7-16-90 ADDED X-SECT'S PER DER

England-Thimby
& Miller, Inc.
Consulting & Design Engineers

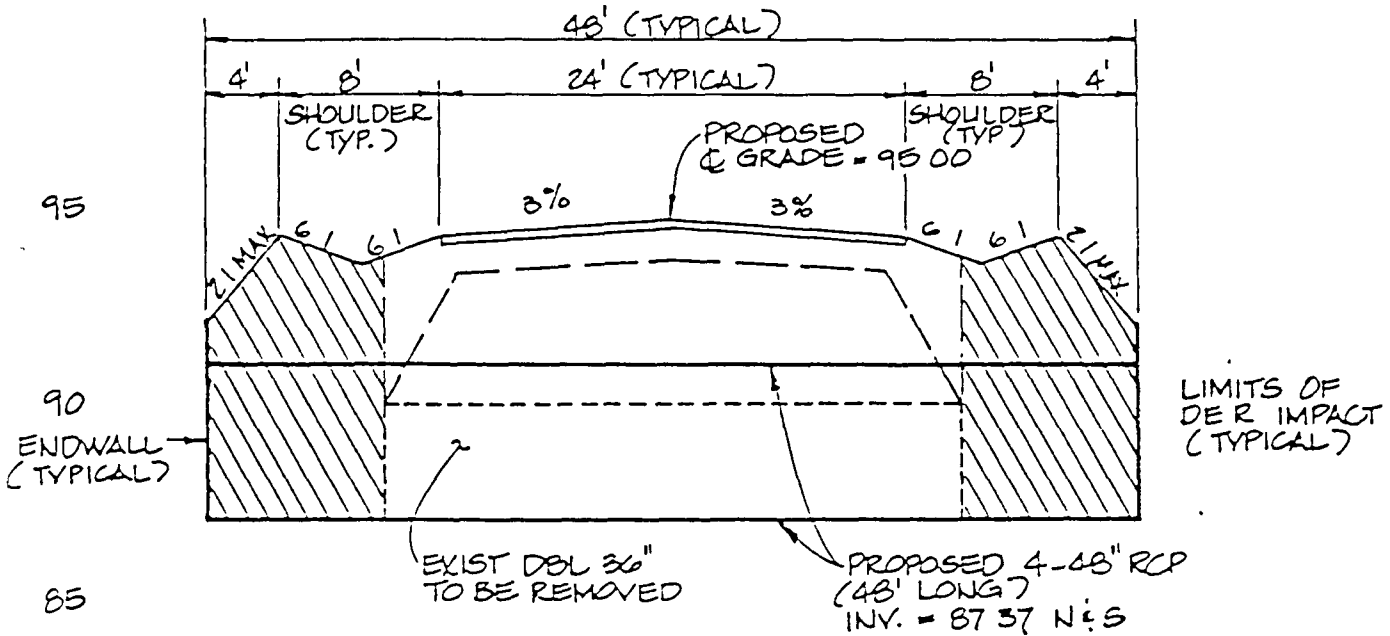
CULVERT SECTIONS
TRAIL RIDGE LANDFILL
TRAIL RIDGE LANDFILL, INC.

PROJ. NO. 89-113
DATE JULY 14, 1990
SCALE 1"=10'
DRAWING NO 20

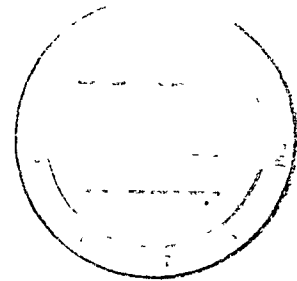
DER

Handwritten signature or initials.

NORTH EAST DATE
 JUL 1990
 DER-JACKSONVILLE



STA. 85 + 00



7-14-90 ADDED X-SECT'S PER DER

England-Thims
 & Miller, Inc.
 Consulting Engineers

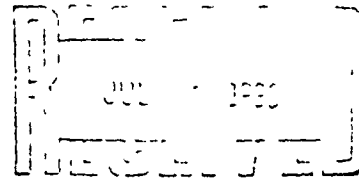
CULVERT SECTIONS
 TRAIL RIDGE LANDFILL
 TRAIL RIDGE LANDFILL, INC.

PROJ. NO. 89-113
 DATE JULY 14, 1990
 SCALE 1" 10'
 DRAWING NO 21

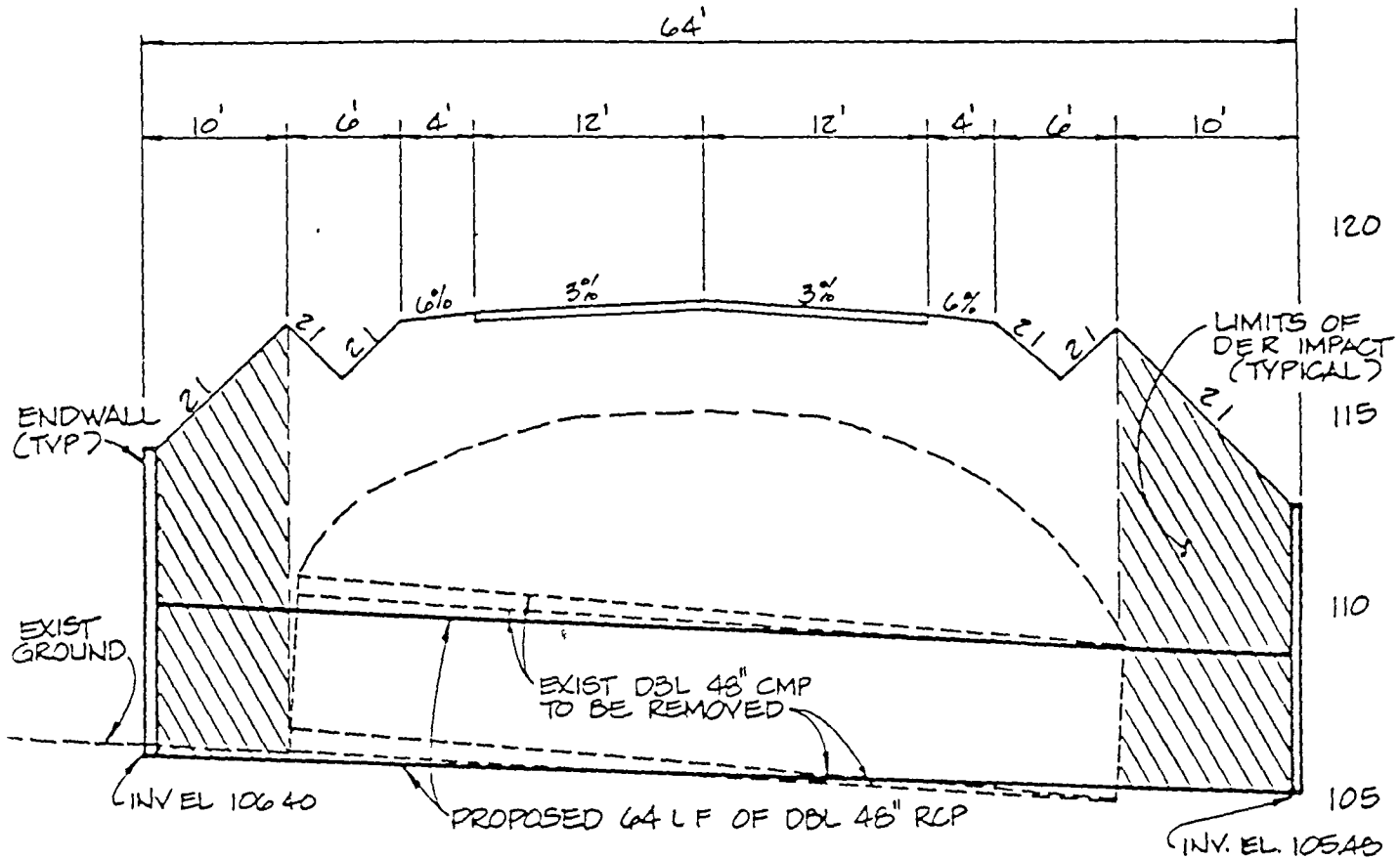
DER

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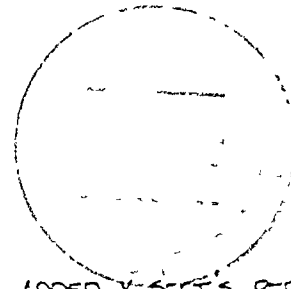
NORTHEAST DISTRICT



DER-JACKSONVILLE



ROAD CROSSING BETWEEN CLASS I & CLASS III



7-14-90 ADDED X-SECT'S PER DER

England-Thimby
& Miller, Inc.
Consulting & Design Engineers

CULVERT SECTIONS

TRAIL RIDGE LANDFILL
TRAIL RIDGE LANDFILL, INC.

PROJ. NO. 29-113
DATE JULY 14, 1990
SCALE 1" = 10'
DRAWING NO 22

DER

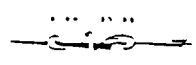
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MAP SHOWING BOUNDARY SURVEY OF

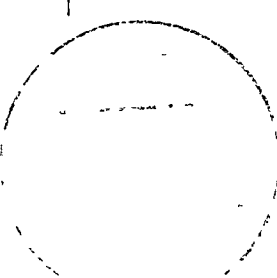
A PORTION OF SECTIONS 17, 18 AND 20
TOWNSHIP 19 NORTH, RANGE 11 WEST
JACKSONVILLE DUVAL COUNTY, FLORIDA
BEING MORE PARTICULARLY DESCRIBED BELOW

SECTION 17

SECTION 18



GRAPHIC SCALE



TRAIL RIDGE LANDFILL WETLAND IMPACTS AND MITIGATION PLAN

I. INTRODUCTION

Waste Management, Inc. is proposing the development of Trail Ridge Landfill in western Duval County (Figure 1). Of the approximately 560 wetland acres occurring on the property, only 4.44 acres of relatively low quality wetlands would be impacted, (refer to Trail Ridge Landfill Wetlands Assessment Report. Wetlands impacted by jurisdiction are Corps of Engineers, 4.44 acres; St. Johns River Water Management District, 3.17 acres; and Florida Department of Environmental Regulation, 1.61 acres. To offset the wetland impacts, conversion of 4.76 acres of uplands into high quality wetlands would occur as mitigation.

The following report provides a general overview of the property, a detailed description of the wetland impacts, and the plan for mitigation creation.

II. SITE DESCRIPTION

The tract consists of approximately 1,280 acres in western Duval County between U.S. 301 and the Baker County line. The land was previously owned by the Gilman Paper Company and has been intensively managed for pulpwood. The property is surrounded on all sides by forest land. A network of unpaved logging roads exists throughout the property. The design plans produced by England, Thims & Miller, Inc., propose the development of separate Class I and Class III landfill cells along with two stormwater ponds/borrow pits, and the widening and improvement of the existing, dirt roads.

III. WETLAND IMPACTS

Development of this site as a landfill would involve 4.44 acres of wetland impacts, the majority of which (2.54 acres) would occur as a result of filling portions of roadside ditches and swales. The remainder of the impacts would consist of filling a 0.8-acre isolated, shallow, pine/cypress wetland, 0.9 acre of bay/pine seepage slope and 0.20 acre of wetland pine plantation. Except for these 4.44 acres of impact, the remaining wetlands will not be disturbed.

A. Road Impacts

The majority of the wetland impacts would occur as a result of widening an existing logging road. This road extends for 1.6 miles from U.S. 301 to the edge of the property and would serve as the main access to the landfill. From the eastern property line it continues for an additional 0.4 mile to the Class I landfill cell. The road is currently an unpaved logging road. It will be widened to 24 feet and paved with asphalt. In addition, the existing corrugated metal pipes under the road will be replaced with reinforced concrete pipes.

From U.S. the entrance road extends for approximately 3,000+ feet through a pine plantation. The vegetation here consists of rows of planted slash pine (Pinus elliotii) with an understory and ground cover of saw palmetto (Serenoa repens), gallberry (Ilex glabra), and bracken fern (Pteridium aquilinum). The roadside swales here average 4 to 5 feet across and 1 to 2 feet deep. The swales are considered jurisdictional wetlands only where they intersect adjacent wetlands.

Within the upland pine plantation there are ten depressional, wetland areas. The eastern three areas are jurisdictional only by the U.S. Army Corps of Engineers (CE). The road widening will entail impacting 0.24 acres of these three wetlands. The dominant plant species are not on the state's list of wetland plants. The dominant vegetation consists of blackberry (Rubus cuneifolius), Amphicarpum muhlenbergianum, wiregrass (Aristida stricta), and panic grass (Dicanthelium sp.). The remaining seven wetland areas are wholly owned and isolated. Six of these areas are each less than 0.5 acres in size. The vegetation in all seven areas consists of St. John's wort (Hypericum fasciculatum), yellow-eyed grass (Xyris sp.) and red root (Lachnanthes caroliniana). The road widening will entail impacting 0.17 acres (CE/SJRWMD) of swales in these seven depressional areas.

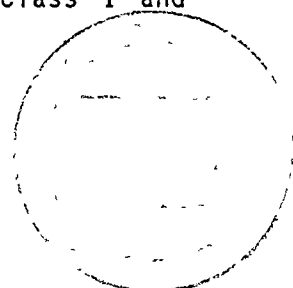
From the edge of the pine plantation the entrance road continues for 3,000+ feet through a pine swamp known locally as Hell's Bay. There are ditches along both sides of the road all the way across the swamp. The ditches measure approximately 8 feet across and 2-3 feet deep. Under normal conditions the ditches contain at least 12 inches of water. The vegetation within the ditches consists of pickerelweed (Pontederia cordata), water lily (Nymphaea odorata), and bladderwort (Utricularia sp.). The existing ditches serve to drain the adjacent swamp. During the past 12 months, standing water has not been observed in the swamp on either side of the road.

The vegetation of the pine swamp south of the road consists of a canopy of slash pine mixed with scattered red maple (Acer rubrum), tupelo (Nyssa sylvatica var. biflora), and cypress (Taxodium distichum). The swamp on the north side of the road has been recently clear-cut. The dominant ground cover vegetation there now includes such species as sedges (Cyperus spp.), beak rushes (Rhynchospora spp.), and cinnamon fern (Osmunda cinnamomea).

The entrance road across the swamp will be widened approximately 10 feet on each side. This will result in filling most of the roadside ditches (1.24 acres SJRWMD/DER/CE and 0.17 acres CE only).

From the western edge of Hell's Bay, the entrance road continues into the property to the Class I landfill cell. Wetland impacts due to this portion of roadwork include filling wetland pine plantation (0.65 acres CE) and a narrow slough (0.07 acres DER/SJRWMD/CE).

Widening West Fiftone Road would entail filling 0.3 acres (DER/SJRWMD/CE) of bay/pine seepage wetlands between the Class I and Class III landfill cells.



B. Landfill Impacts

Two wetland impacts will occur as a result of construction of the Class I landfill cell. These impacts include filling an isolated cypress/pine depressional wetland and a narrow finger of bay/pine seepage slope. The cypress/pine wetland is an isolated, shallow, depressional area comprising 0.80 acres (SJRWMD/CE). Following prolonged heavy rains, it will hold some standing water (<1 foot); however, it is dry during much of the year. The vegetation within the cypress/pine wetland consists of a canopy of slash pine and cypress with an understory of scattered myrtle-leaved holly (Ilex myrtifolia) and a ground cover of black-stemmed chain fern (Woodwardia virginica).

The bay/pine wetland consists of 0.60 acres (SJRWMD/CE) and occurs as a narrow finger of seepage slope along the north side of West Fiftone Road. The vegetation here consists of a canopy of tupelo, slash pine and various bay trees with a ground cover of fetterbush (Lyonia lucida) and sweet gallberry (Ilex coriacea).

Wetland impacts will be mitigated with 4.76 acres of wetland creation. An area of upland pine plantation surrounded by a cypress/gum swamp and a pine/bay wetland will be scraped down to form two depressional areas at or below the water table.

IV. MITIGATION PLAN

A. Existing Site Conditions

The mitigation site is located in the northeastern portion of the property in an area bounded by Hat Road to the north, West Fiftone Road to the west, Sellers Road to the south, and the property line to the east (Figure 2). The site is characterized as an upland finger surrounded by forested wetlands on three sides.

1. Elevations

The U.S. Geological Survey Map (Maxville, Florida, 1970) indicates that the elevations within the mitigation site range from +95 to +100 feet N.G.V.D. To more accurately describe the area, a site-specific topographic survey was conducted by Sunshine State Surveyors. Elevations were found to range from 100.8 feet on the upland ridge to the south to 94.7 on the wetland fringe to the north. The site slopes downhill gradually to the east.

2. Soils

The Soil Conservation Service (Soil Survey of Duval County, 1978) indicates that the upland soil of the mitigation area is Leon fine sand and the wetland soil is Wesconnett fine sand.

Leon fine sand is a poorly drained soil typically found in broad pine flatwood areas. Under natural conditions this soil has a water table at a depth of less than 10 inches for two to four months and at a depth of 10 to 30 inches for two to eight months during most years. There is often a weakly cemented layer about 18 inches below the surface.

Wesconnett fine sand is a very poorly drained soil in shallow depressions and large drainageways. Under natural conditions this soil has a water table at a depth of 0 to 10 inches, or the soil is covered by water for six to twelve months during most years.

3. Hydrology

There is a ditch that extends across a section of the mitigation site. This section of upland-cut ditch is less than 35 square feet in cross section and contains less than 3 feet of standing water at the point where it intersects the DER wetland line. The ditch averages 18 to 20 feet across from top-of-bank to top-of-bank and 12 to 18 inches deep. Water periodically flows east through the ditch from the tupelo swamp to the wet pine plantation. During much of the year, the ditch appears to be dry.

4. Vegetation

The upland pine plantation is characterized by a 15 to 20 year old row-planted slash pine that is approaching canopy closure. The understory and ground cover mostly consist of gallberry, saw palmetto, bracken fern, huckleberry (Vaccinium sp.), broomsedge (Andropogon sp.), wire grass (Aristida stricta), and Aronia arbutifolia.

The wet pine plantation to the east has been clear-cut, bedded, and row-planted with slash pine about 15 to 20 years ago. Logging debris and soil have been pushed into windrows. Other vegetation in this area include scattered tupelo, sweet bay (Magnolia virginiana), loblolly bay (Gordonia lasianthus), red maple, wax myrtle (Myrica cerifera), possumhaw viburnum (Viburnum nudum), maidencane (Panicum hemitomon), panicum (Dichanthelium sp.), bluestem (Andropogon sp.), and Asiatic coinwork (Centella asiatica).

The wetland to the west and south is a moderately deep cypress-hardwood swamp dominated by tupelo and cypress and scattered sweetbay, swamp bay (Persea palustris), and red maple. The dominant shrub is fetterbush with some Virginia willow (Itea virginica) and wax myrtle. Royal fern (Osmunda regalis), cinnamon fern, net-leaved chain fern (Woodwardia areolata), and sphagnum moss (sphagnum sp.) are also found.

Wetland vegetation within the ditch itself consists of rush (Juncus sp.), Dicanthelium sp., yellow-eyed grass (Xyris sp.), buttonbush (Cephalanthus occidentalis), sphagnum moss, and some slash pine. Along the edge of the ditch or berm is wild grape (Vitis sp.), saw palmetto, red chokeberry (Aronia arbutifolia), sweet gallberry, wax myrtle, black stemmed chain fern, poison summac (Toxicodendron vernix) and scattered tupelo, swamp bay, and sweet bay.

B. Proposed Site Conditions

1. Elevations

The elevation of the wetland creation area will range from +99 feet at the western edge to +94.5 feet near the eastern end. It is proposed that the existing rim of the tupelo swamp be maintained (+99 feet) to prevent draining it. The mitigation area will be scraped down to form two shallow depressional bowls each with a transitional and submerged zone (Figure 5). Each transitional zone will be scraped down to the average water table to establish saturated soil conditions. Each submerged zone will be scraped down to a maximum of 1 foot below the average water table to establish areas of intermittent/seasonal standing water. The edge of the eastern depressional bowl will approach the elevation of the wet pine plantation (+95 feet).

2. Soils

The mitigation basins area will be over-excavated approximately 0.5 foot and backfilled with the upper soil layer from the impacted wetlands. This mulch will provide a source of propagules (seeds, roots, tubers, etc.) that will help establish naturally occurring wetland ground cover vegetation.

3. Hydrology

The two depressional creations within the mitigation area are designed to be contiguous with the surrounding wetland systems, thus promoting regular and periodic inundation of the site. Fluctuations in the water table are normal and are expected to cause the soils in the mitigation area to be periodically saturated or flooded with water.

The upland-cut portion of the drainage ditch will be realigned. It will curve to the north and outfall into the western basin. Water coming through the ditch will be allowed to sheet flow across the transition zone into the submerged zone.

4. Vegetation

The design of the mitigation area is to create a cypress/hardwood swamp. To accomplish this a variety of wetland tree and shrub species will be planted. The trees will average 4 to 6 feet in height in three-gallon containers to be planted on 10-foot centers or approximately 440 trees/acre. The shrubs will average 2 to 4 feet in height in one-gallon containers to be planted along all edges. Throughout the transitional zones, transitional wetland species will be planted, such as:

red maple (Acer rubrum)
sweetgum (Liquidambar styraciflua)
laurel oak (Quercus laurifolia)
wax myrtle (Myrica cerifera)
fetterbush (Lyonia lucida)

The deeper, submerged zones will be planted with such wetland species as:

cypress (Taxodium distichum)
tupelo (Nyssa sylvatica var. biflora)
sweet bay (Magnolia virginiana)
button bush (Cephalanthus occidentalis)
Virginia willow (Itea virginica)

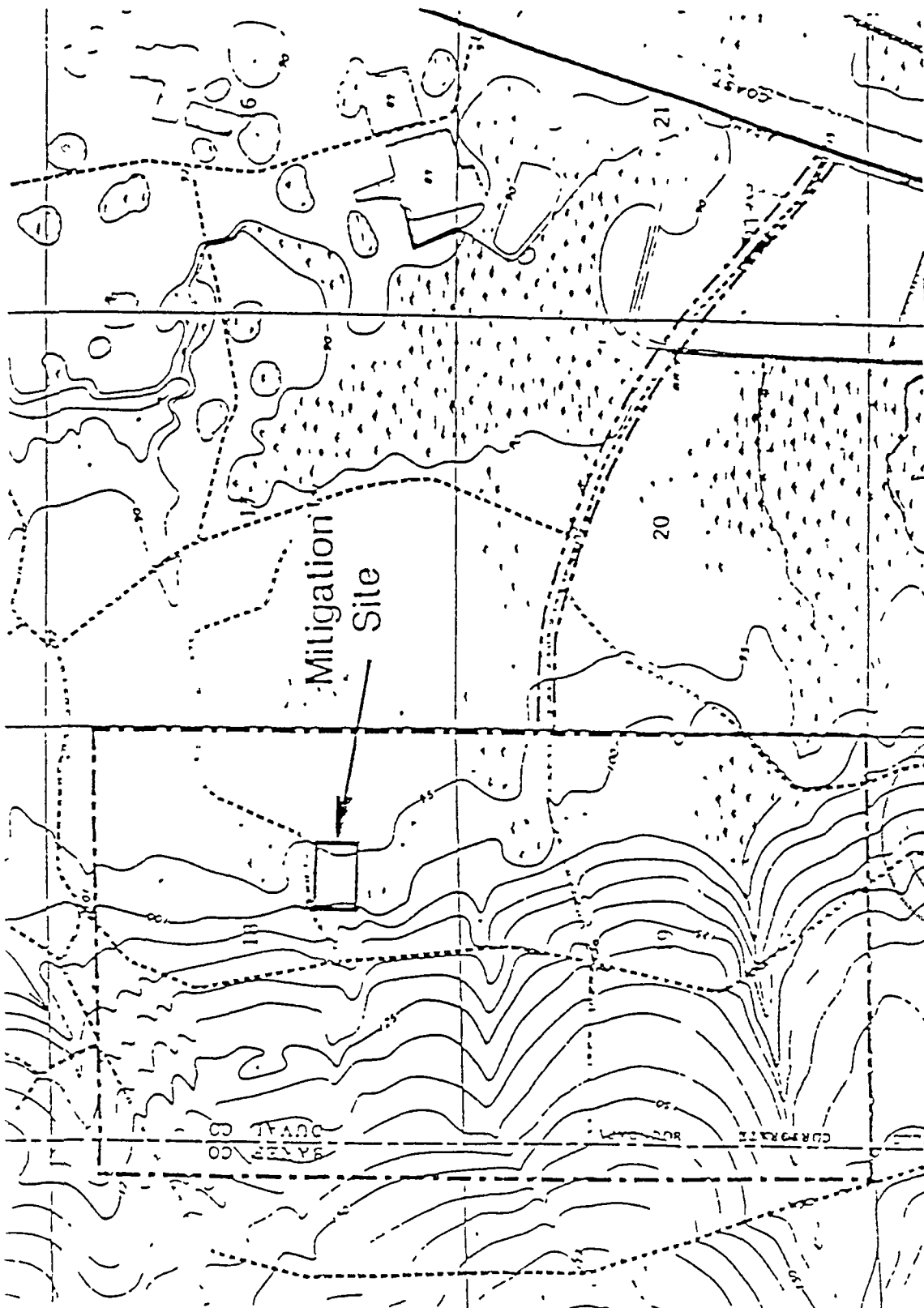
WETLAND CREATION RATIO

<u>Jurisdiction</u>	<u>Wetland Impacted</u>	<u>Wetlands Created</u>	<u>Ratio</u>
Corps of Engineers	4.44 AC	4.76 AC	1.07:1
St. Johns River Water Management District	3.17 AC	4.76 AC	1.50:1
Florida Department of Environmental Regulation	1.61 AC	4.76 AC	2.8:1

5. Maintenance and Monitoring

The creation area will be inspected every six months for two years following planting. Monitoring reports will be forwarded to the appropriate regulatory agencies. Standard mitigation requirements will be met, such as ensuring 75 percent survival of plantings. Routine maintenance will be performed as necessary to control nuisance weed species and to ensure success of the planting.





Proj No.	89-395
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Date JUNE 11, 1980

Scale 1" = 2000'

Drawing No. 13

JUN 13 1990

Figure 1 Locallon Map of
Trail Ridge Landfill
Mitigation Plan

Trail Ridge Landfill

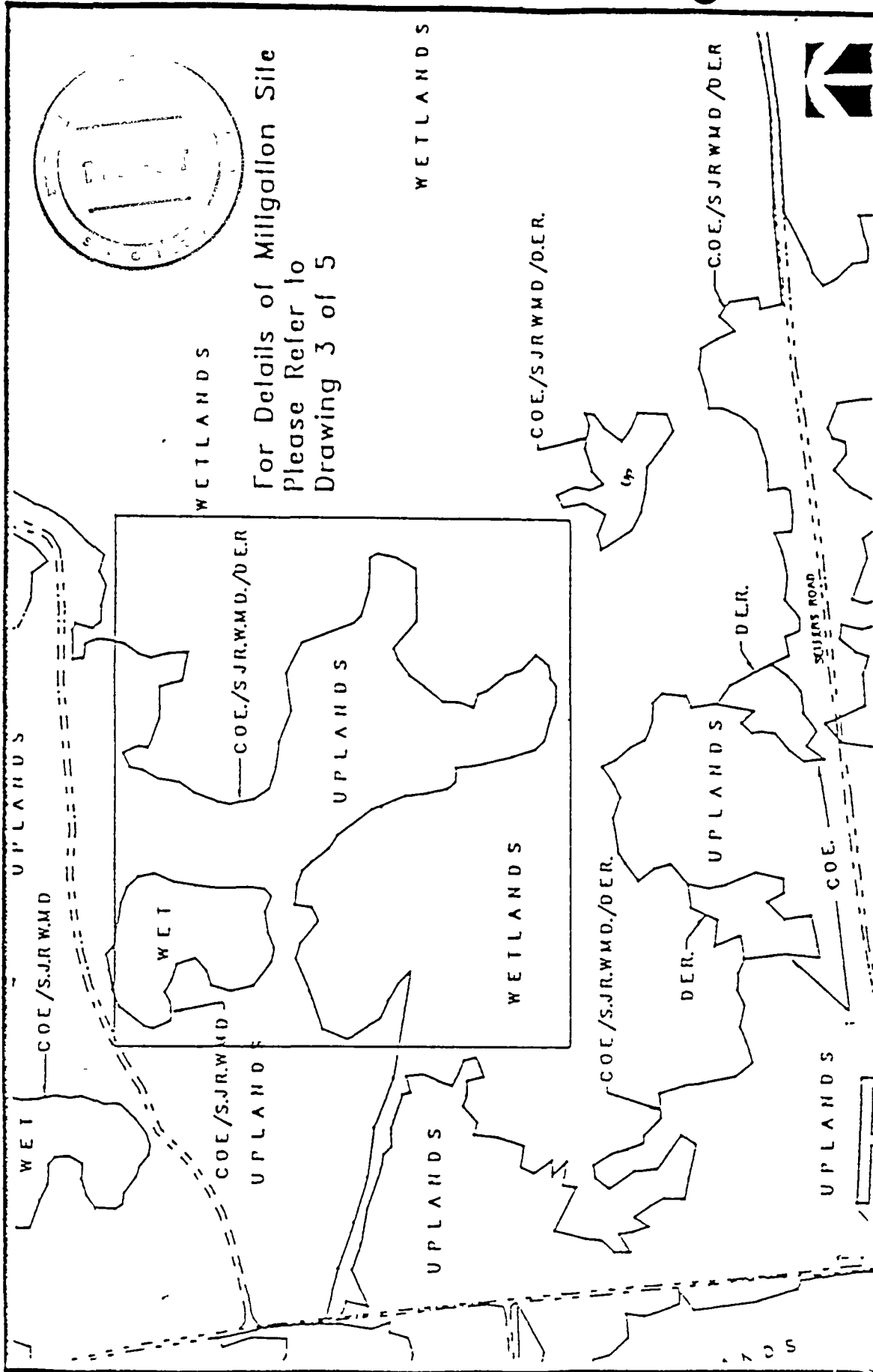
Mitigation Plan



**ENVIRONMENTAL
SERVICES, INC.**

DER

G. M. L.
4-11-00



WETLANDS

For Details of Millgallon Site
Please Refer to
Drawing 3 of 5

WETLANDS

COE./SJR.WMD./DER.

COE./SJR.WMD./DER.



Proj No.	89-395
Date	JUNE 11, 1990
Scale	1"-300'
Drawing No.	14

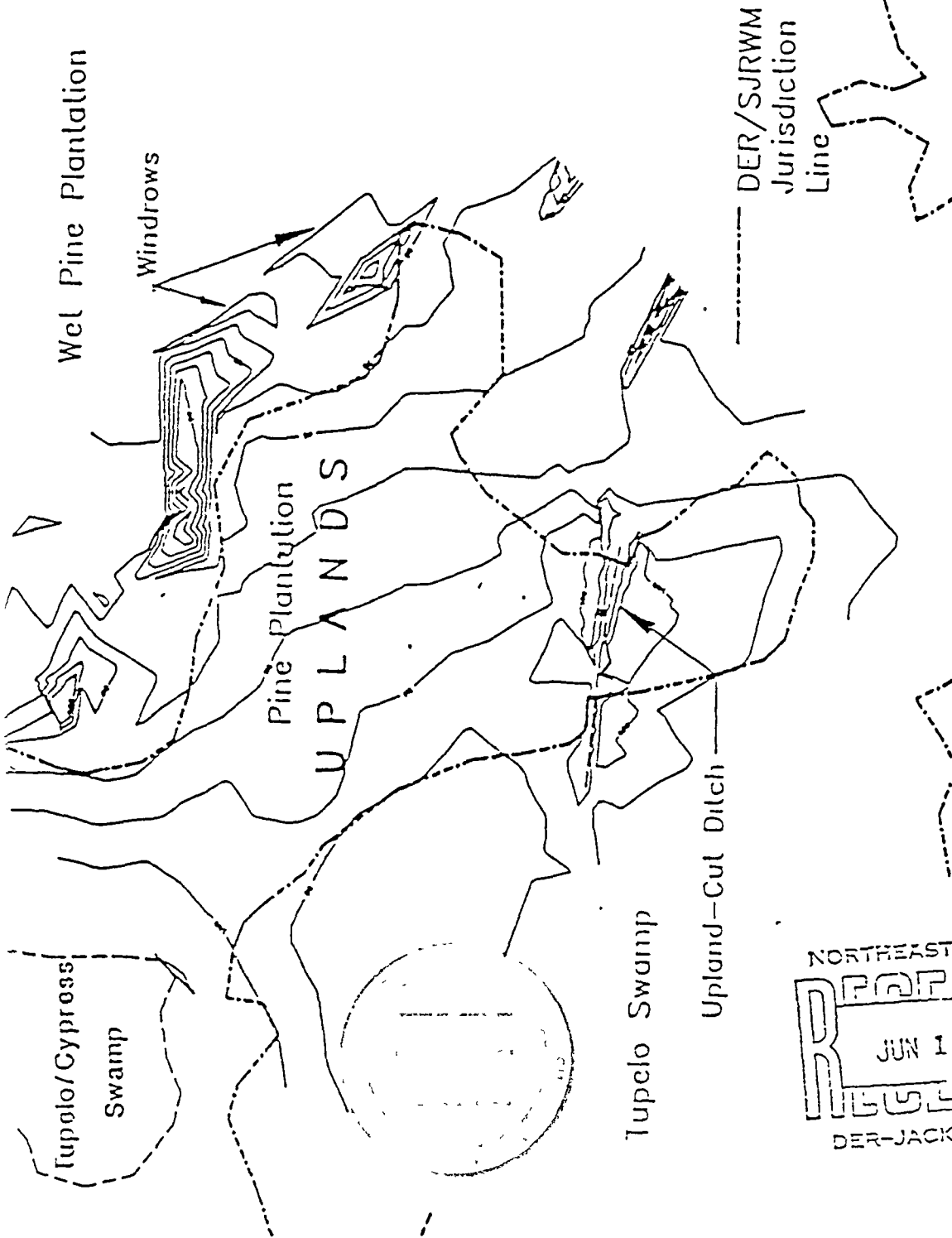
Figure 2 Millgallon Site Location
Trail Ridge Landfill
Mitigation Plan

JUN 13

ENVIRONMENTAL
SERVICES, INC.

DER

Small
6-11-90



Proj No. 89-395


Date JUNE 11, 1990

Scale 1"=150'

Drawing No. 15

Figure 3 Existing Conditions
Trail Ridge Landfill
Mitigation Plan

NORTHEAST DISTRICT
RECEIVED
JUN 13 1990
DER-JACKSONVILLE

 ENVIRONMENTAL
SERVICES, INC.

DER

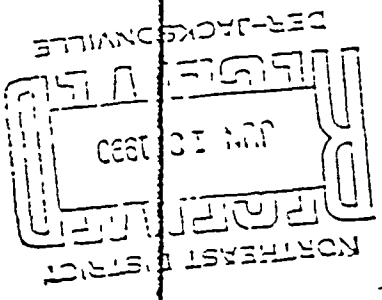
Handwritten signature
6-11-90

Handwritten notes in the right margin, including "1" and "2" with arrows pointing to specific areas on the map.

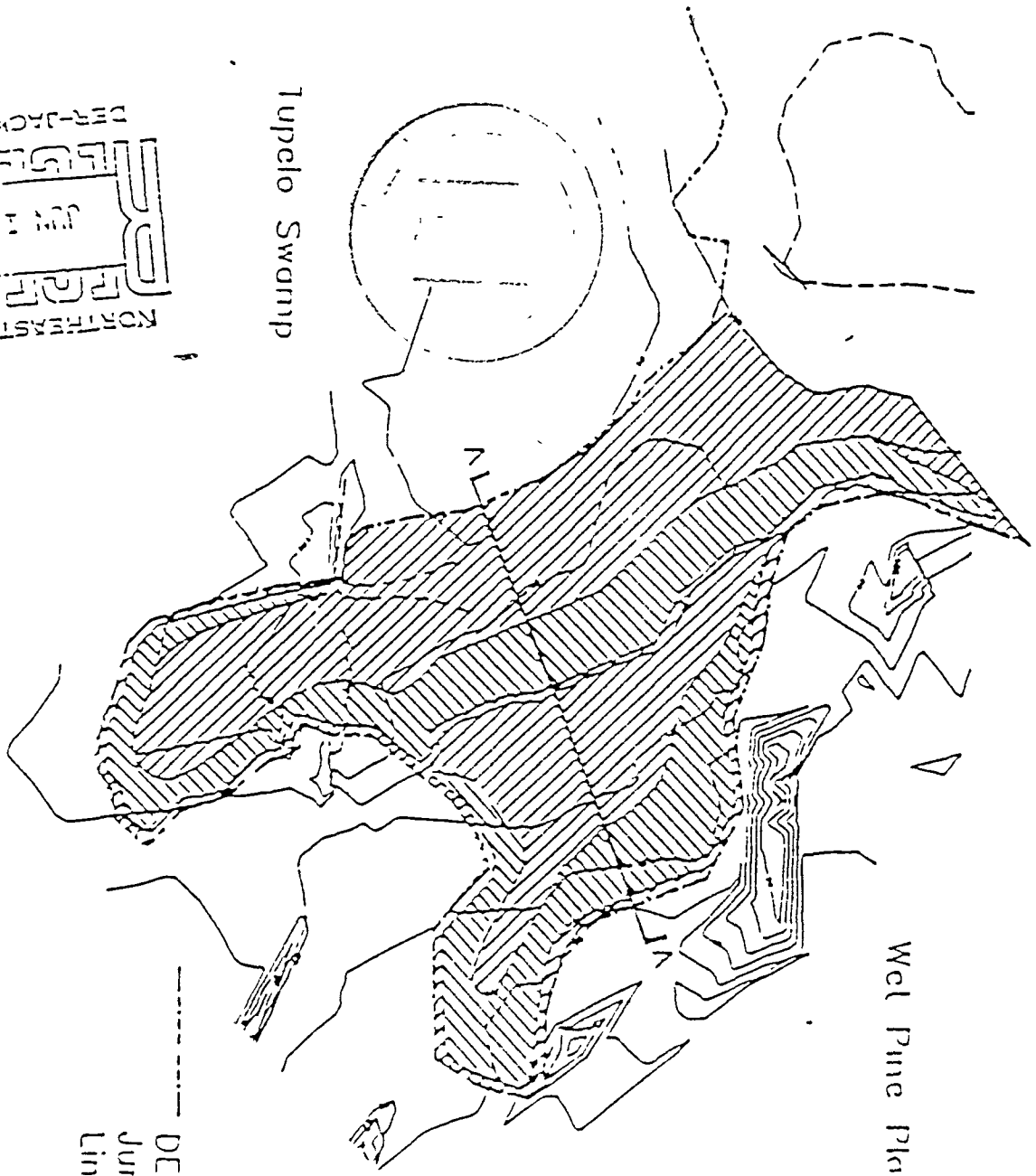
DER

Handwritten signature and date: *6-11-80*

ENVIRONMENTAL SERVICES, INC.



Tupelo Swamp



Wet Pine Plantation

Transitional Zone
3.0 acres

Submerged Zone
1.76 acres

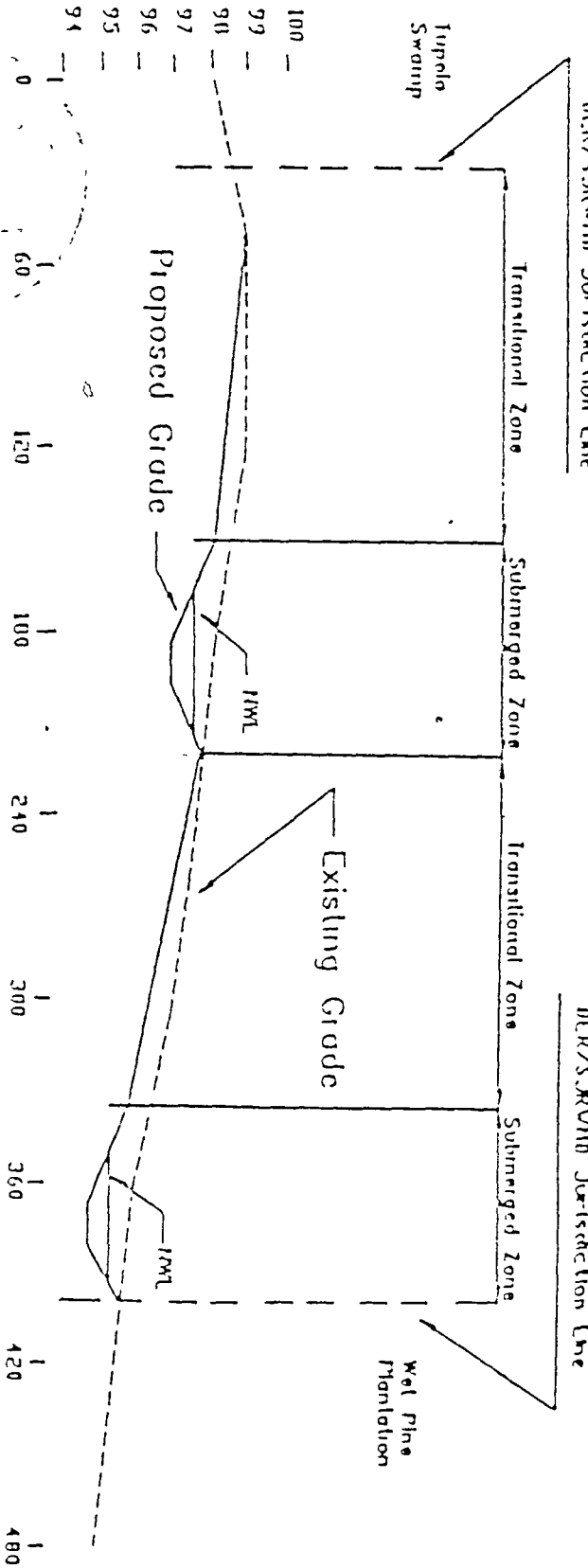
DER/SJRWWM
Jurisdiction
Line

Figure 4 Proposed Conditions
Trail Ridge Landfill
Mitigation Plan

Proj No.	89-395
Date	JUNE 11, 1980
Scale	1"=150'
Drawing No.	16

D.R./S.R.V.11111 Jurisdiction Line

D.R./S.R.V.11111 Jurisdiction Line



Proposed Planting Schedule

Transitional Zone

Red Maple
Sweetgum
Laurel Oak
Wax Myrtle
Fetterbush

Submerged Zone

Cypress
Tupelo
Sweet Bay
Buttonbush
Virginia Willow

ENVIRONMENTAL
SERVICES, INC.

Figure 5 Mitigation Cross-Section
Trail Ridge Landfill
Mitigation Plan

Proj No	89-395
Date	JUNE 11, 1980
Scale	as shown
Drawing No.	17

OFFICE OF GENERAL COUNSEL
NOTIFICATION OF CASE ASSIGNMENT/TRACKING SYSTEM ENTRY

NORTHEAST DISTRICT
RECEIVED
NOV 13 1990
REGISTRY
DER-JACKSONVILLE

ASSIGNMENT DATE:

11/06/90

DISTRICT DATE OPEN:

REASSIGNMENT DATE:

OGC FILE NUMBER:

90-1688

TO:

Bill Congdon

THROUGH:

FROM:

Carol Forthman

THE BELOW REFERENCED CASE HAS BEEN ASSIGNED/REASSIGNED TO YOU. PLEASE HANDLE. ALL FURTHER INQUIRIES FROM DEPARTMENT STAFF WILL BE DIRECTED TO YOU.

cc: District Manager

CASE NAME:

*Coastal Environmental Society, Inc. &
St. Johns Preservation Assoc. Inc. v. Trail Ridge
Landfill, Inc. & DER*

MODE:

PROGRAM(s):

DE 1 1 1 1

DISTRICT:

NED

COUNTY:

16 - Duval

PERMIT/APPLICATION/FACILITY ID #:

16-182118-2

Petition for Administrative Hearing Received:

11/02/90

Request for Extension of Time to File

Petition for Administrative Hearing Received:

Draft Consent Order Received:

Draft N.O.V. Received:

Case Report Received:

Other:

OFFICE OF GENERAL COUNSEL
NOTIFICATION OF CASE ASSIGNMENT/TRACKING SYSTEM ENTRY

ASSIGNMENT DATE: 10/31/90

DISTRICT DATE OPEN: _____

REASSIGNMENT DATE: _____

OGC FILE NUMBER: 90-1635

NORTHEAST DISTRICT

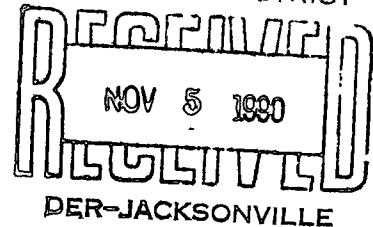
TO:

Bill Congdon

THROUGH:

FROM:

Carol Forthman



THE BELOW REFERENCED CASE HAS BEEN ASSIGNED/REASSIGNED TO YOU. PLEASE HANDLE. ALL FURTHER INQUIRIES FROM DEPARTMENT STAFF WILL BE DIRECTED TO YOU.

cc: District Manager

CASE NAME:

*Save Trail Ridge & the Environment Assoc.,
David Phillips, Ellen Long, & Jellis Solomon
v. Trail Ridge Landfill, Inc. & DER*

MODE:

T

PROGRAM(s):

DFI

DISTRICT:

NED

COUNTY:

16 - Duval

PERMIT/APPLICATION/FACILITY ID #:

182118-2

Petition for Administrative Hearing Received:

10/30/90

Request for Extension of Time to File

Petition for Administrative Hearing Received:

Draft Consent Order Received:

Draft N.O.V. Received:

Case Report Received:

Other:

o: Ernest Frey
rom: Iris A. Littleton
ubject: Memo

DERJAX

Date: 10/31/90

FITZ
NY 144ER

distribution:

Ernest Frey

TO: Ernest Frey

FROM: Iris - OGC - Tallahassee

Received 10/30/90 request for an Administrative Hearing from Save Trail Ridge and the Environment Assoc., David Phillips, Ellen Long, and Sollie Solomons against intent to issue dredge and fill permit 16-182118-2 to Trail Ridge Landfill, Inc.

Received 10/30/90 request for an Extension of Time from Moody Brothers of Jacksonville, Inc., concerning dredge and fill permit 16-176273-2.