Check Sheet

Company Name: Southern Soil Services
Permit Number: AC49-201061, A049-222296
PSD Number:
Permit Engineer:

Application:

- ☑ Initial Application
  - ☑ Incompleteness Letters
  - ☑ Responses
  - ☐ Waiver of Department Action
  - ☐ Department Response
  - ☐ Other

Cross References:
- ☐
- ☐
- ☐

Intent:

- ☑ Intent to Issue
- ☐ Notice of Intent to Issue
- ☑ Technical Evaluation
- ☐ BACT or LAER Determination
- ☑ Unsigned Permit

Correspondence with:
- ☐ EPA
- ☐ Park Services
- ☐ Other

- ☑ Proof of Publication
  - ☐ Petitions - (Related to extensions, hearings, etc.)
  - ☐ Waiver of Department Action
  - ☐ Other

Final Determination:

- ☑ Final Determination
- ☑ Signed Permit
- ☐ BACT or LAER Determination
  - ☐ Other

Post Permit Correspondence:

- ☐ Extensions/Amendments/Modifications
- ☑ Other Application to Operate
  Permit to Operate

Is your RETURN ADDRESS completed on the reverse side?

SENDER:

- Complete items 1 and/or 2 for additional services.
- Complete items 3, and 4a & b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):

1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Button a Keene, Pres.
Southern Soil Serv
3640 Thompson Rd
Lake Mary Fl 32746

4a. Article Number P 230 524 358

4b. Service Type
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail ☐ Return Receipt for Merchandise

7. Date of Delivery

5. Signature (Addressee)

8. Addressee's Address (Only if requested and fee is paid)

6. Signature (Agent)

LAKE MARY, FL JUN 5 1993

PS Form **3811**, December 1991 U.S. GPO: 1992—323-402 **DOMESTIC RETURN RECEIPT**

Thank you for using Return Receipt Service.

P 230 524 358

Receipt for Certified Mail

No Insurance Coverage Provided
Do not use for International Mail
(See Reverse)

UNITED STATES POSTAL SERVICE

Sent to: Button Keene
Street and No.: Southern Soil Serv
P.O., State, and ZIP Code: Lake Mary Fl

Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, and Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date	5-27-93

A049-222296

PS Form **3800**, June 1991

NOTICE OF PERMIT DENIAL

THE STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

CERTIFIED MAIL

In the matter of an
Application for Permit

Mr. Burton A. Keene, President
Southern Soil Services, Inc.
3640 Thompson Road
Lake Mary, Florida 32746

DER File No. AO49-222296
Osceola County

_____/

NOTICE OF PERMIT DENIAL

The Applicant, Southern Soil Services, Inc., 3640 Thompson Road, Lake Mary, Florida 32746, applied on November 24, 1992, to the Department of Environmental Regulation for a permit to operate a mobile soil thermal treatment facility in Osceola County.

The department has permitting jurisdiction under Chapter 403, Florida Statutes (F.S.), and Section 17-4, Permits, Florida Administrative Code (F.A.C.). The department has determined that an operation permit is required for the proposed work.

The department hereby denies the permit for the following reasons:

1. Failure to install a continuous emissions monitor for carbon monoxide as required pursuant to F.A.C. Rule 17-297.500(6).

2. Failure to complete the application for permit to operate this source by supplying carbon monoxide continuous emission monitoring records for one day's operation.

A person whose substantial interests are affected by the Department's permit denial 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 receipt 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 of Permit Denial. 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.

This Notice constitutes final agency action unless a petition is filed in accordance with the above paragraphs or unless a request for extension of time in which to file a petition is filed within the time specified for filing a petition and conforms to Rule 17-103.070, F.A.C. Upon timely filing of a petition or a request for an extension of time this Notice will not be effective until further Order of the Department.

Any party to this Notice of Permit Denial has the right to seek judicial review pursuant to Section 120.68, Florida Statutes, by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Office of General Counsel, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400; and by filing a copy with the appropriate District court of Appeal. Notice of Appeal must be filed within 30

days from the date the Notice of Permit Denial is filed with the clerk of the Department.

EXECUTED in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

Howard L. Rhodes

Howard L. Rhodes, Director
Division of Air Resources
Management
2600 Blair Stone Road
Tallahassee, FL 32399-2400
(904) 488-1344

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this NOTICE OF PERMIT DENIAL and all copies were mailed before the close of business on 5-27-93 to the listed persons.

Clerk Stamp

FILING AND ACKNOWLEDGMENT

FILED, on this date, pursuant to §120.52(11), Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

Clerk 5-27-93
Date

Copies furnished to:
District Air Program Administrators
County Air Program Administrators
Tom Conrardy, BWC
John Bottorf, P.E.

March 4th, 1993

C.H. Fancy
F.D.E.R.
Twin Towers Bldg.
2600 Blair Stone Rd.
Tallahassee, Fl. 32399-2400

Re: Letter sent on December 17th, 1992

Dear Mr. Fancy:

This letter is in answer to the questions regarding additional data for permit to operate.

There is no change at this time on any of the below.

1) My Operating capacity will remain at 10 TPH.

2) Afterburner Temerature: 1500 degree F
   Retention Time: 1 second

3) I am seriously considering selling my plant, so I don't plan to operate it and will not need a CO Monitor.

4) See attached sheet for further information.

Sincerely,

Burton A Keene

Burton A. Keene, President
Southern Soil Services, Inc.

cc: M. Hands

Determination of Actual And Allowable Particulate Emissions Rate

From EPA Method No.5 (40 CFR, Ch.1, Pt.60, App A)

Particulate Mass Rate (lb/hr)

$$P_{mr_a} := 0.1323 \cdot \left[\frac{Mn_a}{Vm_{std_a}}\right] \cdot Q_{std_a}$$

Run No. 1	Run No. 2	Run No. 3
$P_{mr_1} = 0.115$	$P_{mr_2} = 0.852$	$P_{mr_3} = 0.345$

Allowable Emission Concentration at 50% Excess Air (gr/dscf)

Run No. 1	Run No. 2	Run No. 3
$c_{r_1} = 0.08$	$c_{r_2} = 0.08$	$c_{r_3} = 0.08$

Actual Particulate Emission Concentration Uncorrected (gr/dscf)

Run No. 1	Run No. 2	Run No. 3
$c_{g_1} = 0.0038$	$c_{g_2} = 0.0273$	$c_{g_3} = 0.0109$

Particulate Concentration Corrected to 50% Excess Air (gr/dscf)

$$Cs_{50_a} := \frac{100 + EA_a}{150} \cdot c_{g_a}$$

Run No. 1	Run No. 2	Run No. 3
$Cs_{50_1} = 0.0114$	$Cs_{50_2} = 0.0493$	$Cs_{50_3} = 0.0232$

Percent of Allowable Emissions (Actual vs. Allowable)

$$c_{x_a} := \frac{Cs_{50_a}}{c_{r_a}} \cdot 100$$

Run No. 1	Run No. 2	Run No. 3
$c_{x_1} = 14.2$	$c_{x_2} = 61.7$	$c_{x_3} = 29$

SENDER:

- Complete items 1 and/or 2 for additional services.
- Complete items 3, and 4a & b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt Fee will provide you the signature of the person delivered to and the date of delivery.

I also wish to receive the following services (for an extra fee):

1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Mr. Burton A. Keene, President
Southern Soil Services, Inc.
3540 Thompson Road
Lake Mary, FL 32746

4a. Article Number
P 062 922 016

4b. Service Type
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail ☐ Return Receipt for Merchandise

7. Date of Delivery
12/21/92

5. Signature (Addressee)
6. Signature (Agent)
[signature]

8. Addressee's Address (Only if requested and fee is paid)

PS Form **3811**, November 1990 ☆U.S. GPO: 1991—287-066 **DOMESTIC RETURN RECEIPT**

P 062 922 016

Receipt for Certified Mail
No Insurance Coverage Provided
Do not use for International Mail
(See Reverse)

UNITED STATES POSTAL SERVICE

Sent to Mr. Burton A. Keene, Southern Soil Services, Inc.	
Street and No. 3540 Thompson Rd.	
P.O., State and ZIP Code Lake Mary, FL 32746	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, and Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date Mailed: 12-18-92 Permit: AO 49-222296	

PS Form **3800**, June 1991

Florida Department of Environmental Regulation

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

Lawton Chiles, Governor

Carol M. Browner, Secretary

December 17, 1992

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Burton A. Keene, President
Southern Soil Services, Inc.
3640 Thompson Road
Lake Mary, Florida 32746

Re: Application for Permit to Operate

Dear Mr. Keene:

Your application for permit to operate a mobile soil thermal treatment facility is being held in abeyance by the Bureau of Air Regulation because of the new requirements by F.A.C. Rule 17-296.415 that became effective on December 1, 1992. Without additional data, the Bureau cannot recommend a permit to operate be issued to this facility. To resolve this matter, please respond to the following:

1. Specific Condition No. 19 of construction permit No. AC49-201051 limits the process weight rate for this facility to 10 TPH. If you intend to operate above this rate, this permit will need amending (no increase in allowable emission) or modification (emission increase).

2. F.A.C. Rule 17-296.415(1)(a) establishes minimum temperatures and resident times for the afterburners. What minimum temperature/time will your afterburner operate at in the future?

3. F.A.C. Rule 17-296.415(1)(b) requires the carbon monoxide emissions from the hot zone area be below 100 ppm and that the concentration be continuously monitored and recorded. Please provide the records for one day of operation of this facility to show you are in compliance with this requirement.

4. F.A.C. Rule 17-296.415(2)(b) limits the particulate matter emission from soil thermal treatment facilities to 0.04 gr/dscf (grains per dry standard cubic foot). Please have your engineer recalculate the particulate matter emissions from the November 10, 1992, test in units of gr/dscf.

The Department request you respond to these matters on or before March 1, 1993. Until notified otherwise, you may continue to operate this facility provided it is in compliance with all conditions of Permit No. AC49-201051 and the Department's pollution control regulations.

If you have any questions on this matter, please write to me or call Willard Hanks, review engineer, at (904) 488-1344.

Sincerely,

C. H. Fancy, P.E.
Chief
Bureau of Air Regulation

CHF/WH/w

Attach: Soil Thermal Treatment
Facility Regulations

cc: Charles Collins, CD
John Bottorf, P.E.

Southern Soil Services applic. AO
Rec'd. 11/24/92 fee $1500

Certificate of Completion

	PM	0.028 gr/dscf @ 50% EA	(allowable 0.08 gr/dscf @ 50% EA)
(10) analysis of soil during test →	VOC	0.98 #/hr	10 #/hr
Time / temp AB	BZ	0.015 #/hr	2.9 #/hr

Operated in excess of 10 TPH (violation S.C. 19) permit rate. This requires permit amend in plan operate future

Permit (AC 29-201051) S.C. (3) requires 1400°F @ 0.6 sec
S.C. 12 limit to 10 TPH

~~Pre treatment~~ soil analysis (S.C. 25)
+ pressure drop across baghouse...

S.C. 29 req's. VE, PM, VOC, BZ, soil analysis VOA, TRPH + metals, prod. rate, ~~ΔP baghouse~~, AB temp (low)

I/C letter drafted 12/12/92 - to PM

12-13-92

Patty,
Copy only the applic form. I've written a letter for more information on this application.

Linda

Department of Environmental Regulation

Routing and Transmittal Slip

To: (Name, Office, Location)

1. Willard Hanks
2. Bureau of Air Regulation
3.
4.

Remarks:

Alan advised me to send this one without a letter. Otherwise I would have written one.

RECEIVED

DEC 0 9 1992

Division of Air
Resources Management

From: John Turner

Date 12/8/92

Phone

Best Available Copy

PAID
1500
NOV 24 1992
DER
CENTRAL DISTRICT

NOV 1992
RECEIVED
Central Florida
District

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

AIR POLLUTION SOURCES
CERTIFICATE OF COMPLETION OF CONSTRUCTION*

PERMIT NO. AC49-201051 DATE: 11-23-92

Company Name: Southern Soil Services County: Osceola

Source Identification(s): Mobile Soil Remediation Plant

Actual costs of serving pollution control purpose: $ 29,000

Operating Rates: _____ Design Capacity: 10 TPH

Expected Normal 11 TPH During Compliance Test 11 TPH

Date of Compliance Test: 11-10-92 (Attach detailed test report)

Test Results:	Pollutant	Actual Discharge	Allowed Discharge
	Particulate	0.028 GDSCF @ 50% E.A.	0.08 GDSCF @ 50% E.A.
	VOC	0.98 lbs/hr.	10.0 lbs/hr.
	Benzene	0.015 lbs/hr.	2.9 lbs/hr.

Date plant placed in operation: 11-10-92

This is to certify that, with the exception of deviations noted**, the construction of the project has been completed in accordance with the application to construct and Construction Permit No. AC49-201051 dated 1-3-92.

A. Applicant:

Burton A. Keene, President
Name of Person Signing (Type)

Burton Alan Keene
Signature of Owner or Authorized Representative and Title

Date: 11/24/92 Telephone: 407/933-8414

B. Professional Engineer:

John W. Bottorf, Jr., P.E.
Name of Person Signing (Type)

John W. Bottorf Jr.
Signature of Professional Engineer

Bottorf & Associates, Inc.
Company Name

Florida Registration No. 13089

Date: 11-24-92

(Seal)

6729 Edgewater Commerce Parkway
Orlando, Florida 32810-4278
Mailing Address

407/298-0846
Telephone Number

*This form, satisfactorily completed, submitted in conjunction with an existing application to construct permit and payment of application processing fee will be accepted in lieu of an application to operate.

**As built, if not built as indicated include process flow sketch, plot plan sketch, and updates of applicable pages of application form.

* Afterburner constructed with 98 cu.ft. volume and "L" shaped instead of "U" shaped.

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

AIR POLLUTION SOURCES
CERTIFICATE OF COMPLETION OF CONSTRUCTION*

PERMIT NO. AC49-201051 DATE: 11-23-92

Company Name: Southern Soil Services County: Osceola

Source Identification(s): Mobile Soil Remediation Plant

Actual costs of serving pollution control purpose: $ 29,000

Operating Rates: _____ Design Capacity: 10 TPH

Expected Normal 11 TPH During Compliance Test 11 TPH

Date of Compliance Test: 11-10-92 (Attach detailed test report)

Test Results:	Pollutant	Actual Discharge	Allowed Discharge
	Particulate	0.028 GDSCF @ 50% E.A.	0.08 GDSCF @ 50% E.A.
	VOC	0.98 lbs/hr.	10.0 lbs/hr.
	Benzene	0.015 lbs/hr.	2.9 lbs/hr.

Date plant placed in operation: 11-10-92

This is to certify that, with the exception of deviations noted**, the construction of the project has been completed in accordance with the application to construct and Construction Permit No. AC49-201051 dated 1-3-92.

A. Applicant: 11/24/92

Burton A. Keene, President
Name of Person Signing (Type)

Signature of Owner or Authorized Representative and Title

Date: 11/24/92 Telephone: 407/933-8414

B. Professional Engineer:

John W. Bottorf, Jr., P.E.
Name of Person Signing (Type)

Signature of Professional Engineer

Bottorf & Associates, Inc.
Company Name

Florida Registration No. 13089

Date: 11-24-92

(Seal)

6729 Edgewater Commerce Parkway
Orlando, Florida 32810-4278
Mailing Address

407/298-0846
Telephone Number

*This form, satisfactorily completed, submitted in conjunction with an existing application to construct permit and payment of application processing fee will be accepted in lieu of an application to operate.

**As built, if not built as indicated include process flow sketch, plot plan sketch, and updates of applicable pages of application form.

* Afterburner constructed with 98 cu.ft. volume and "L" shaped instead of "U" shaped.

0613

BOTTORF ASSOCIATES INC.
CONSULTING ENGINEERS–ANALYTICAL LABORATORY
6729 EDGEWATER COMMERCE PARKWAY ORLANDO, FLORIDA 32810-4278 PHONE: (407) 298-0846 FAX: (407) 299-7053

LETTER OF TRANSMITTAL

To:
Air Resources Management
Central District
Florida Dept. of Environmental Reg.
3319 Maguire Blvd., Suite 232
Orlando, Florida 32803-3767

Date: November 24, 1992
Project No.: 11[illegible]

We are forwarding to you:

___ Tracings	X Applications	___ Delivered By	___ Reports
___ Prints	___ Shop Drawings	___ Proposal	___ Sketches
___ Specifications	___ Reports	___ Copy of Letter	___ Data
		___ Draft of Letter	___ Other _____

Copies	Dated	Description
4	11/24/92	Air Pollution Sources Certificate of Completion of Construction, Southern Soil Services, Mobile Soil Remediation Plant, Osceola County, Permit No. AC49-201051, alon with Check No. 0613 in the amount of $1,500.00 for permit fees. Also enclosed is one (1) copy of the Air Compliance Test Report dated 11-10-92.

These are transmitted:

___ For your use	___ _____ % Complete	___ For review
___ For your signature	___ Make corrections noted	___ For return
X As Required	___ Ammend and resubmit	___ No exceptions taken
___ As Requested	___ Rejected–See remarks	___ Other _____

Copies To:
Burton A. Keene, President

By: Roger T. Caldwell
Roger T. Caldwell, Vice President
Environmental Division

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

202976

RECEIPT FOR APPLICATION FEES AND MISCELLANEOUS REVENUE

Received from Southern Soil Services Date 11/24/92

Address 3505 Pugmill Rd. Kissimmee, FL 32817 Dollars $ 1500.00

Applicant Name & Address

Source of Revenue Same

Revenue Code 001032 CK0613 Application Number A049 222144

By [signature]

THIS CHECK IS DELIVERED IN CONNECTION WITH THE FOLLOWING ACCOUNT (S)			
TOTALS OF INVOICES			
LESS % DISCOUNT			
LESS			
TOTAL DEDUCTIONS			
AMOUNT OF CHECK			

SOUTHERN SOIL SERVICES, INC. 0613
3505 PUGMILL ROAD
KISSIMMEE, FL 32817

[redacted]

Nov 24 1992

PAY TO THE ORDER OF Florida Dept of Environmental Regulation $ 1,500.00

Fifteen Hundred & 00/100 DOLLARS

SunBank, N.A.
South Orlando Office 665
Orlando, Florida 32856
SunService Center (407) 299-4786

HARLAND 90

[signature]

[redacted]

Rec'd
11/24/92

Air Compliance Test Report
for
Particulate, Visible, VOC Emissions, and Afterburner Destruction Efficiency
Southern Soil Services, Inc.
Mobile Soil Thermal Treatment Facility
FDER Permit No. AC 49 - 201051
Tested: November 10, 1992

Prepared For:
Southern Soil Services, Inc.
3505 Pugmill Road
Kissimmee, Florida 34741-6462

Prepared By:
Bottorf & Associates, Inc.
6729 Edgewater Commerce Parkway
Orlando, Florida 32810-4278
Phone: (407) 298-0846

Table of Contents

Introduction

On November 10, 1992, a Particulate, Visible Emissions, and VOC Test was conducted on the permitted Mobile Thermal Soil Remediation Plant which is operated by Southern Soil Services, Inc. The test was performed using EPA Test Method No. 1, 2, 3, 4, 5, 9. and 18. The Allowable Particulate, Visible, and Afterburner Efficiency were determined by specific conditions in FDER Construction Permit No. AC 49 - 201051.

The overall hydrocarbon destruction efficiency of the complete system including the rotary dryer and afterburner was determined by material balance versus outlet emissions. This was done by comparing the potential inlet emissions that were calculated from the amount of Total Recoverable Petroleum Hydrocarbons (TRPH) removed from the soil to the actual outlet emissions. Composite soil samples were taken from the belts as the soil entered and exited the dryer and analyzed for TRPH using EPA Method No. 9073.

The test results show that this source is in compliance for Particulate, Visible, VOC Emissions, and Afterburner Efficiency. A summary of the results are as follows:

	Run No. 1	Run No. 2	Run No. 3	Average
Output Process Rate (tons/hour)	O_1 =11	O_2 =11	O_3 =11	O_{avg} =11
Primary Burner No.2 Fuel Oil (gallons/hour)	Fp_1 :=14	Fp_2 :=17	Fp_3 :=17	Fp_{avg} :=16
Secondary Burner No.2 Fuel Oil (gallons/hour)	Fs_1 :=33	Fs_2 :=38	Fs_3 :=36	Fs_{avg} :=36
Afterburner Temperature (F)	Ta_1 :=1138	Ta_2 :=1559	Ta_3 :=1468	Ta_{avg} :=1388
Baghouse Pressure Drop (inches of water)	P_{d_1} =5.3	P_{d_2} =5.3	P_{d_3} =6.7	Pd_{avg} =5.7
Particulate Emissions Concentration corrected to 50% Excess Air (gr/dscf)	Cs_{50_1} =0.0114	Cs_{50_2} =0.0493	Cs_{50_3} =0.0232	Cs_{avg} =0.028
Allowable Emission Concentration corrected to 50% Excess Air (gr/dscf)	c_{r_1} =0.08	c_{r_2} =0.08	c_{r_3} =0.08	A_{avg} =0.08
Emission Rate of Total Hydrocarbon (pounds/hour)	EH_1 =2.5	EH_2 =0.25	EH_3 =0.18	EH_{avg} =0.98
Allowable Emission Rate of Total Hydrocarbon (pounds/hour)	AH_1 :=10.0	AH_2 :=10.0	AH_3 :=10.0	AH_{avg} :=10.0

Introduction

	Run No. 1	Run No. 2	Run No. 3	Average
Emission Rate of Benzene (pounds/hour)	EB_1 =0.04	EB_2 =$4.36 \cdot 10^{-3}$	EB_3 =$1.38 \cdot 10^{-3}$	EB_{avg} =0.01
Allowable Emission Rate of Benzene (pounds/hour)	AB_1 :=2.9	AB_2 :=2.9	AB_3 :=2.9	AB_{avg} :=2.9
Afterburner Destruction Efficiency (%)	Eff_1 =88.7	Eff_2 =98.5	Eff_3 =98.9	Eff_{avg} =95.36
Required Afterburner Destruction Efficiency (%)	Efr_1 :=95	Efr_2 :=95	Efr_3 :=95	Efr_{avg} :=95
Isokinetic Sampling Rate (%)	I_1 =90.37	I_2 =104.11	I_3 =97.79	Iavg =97.43
Average Visible Emissions (% opacity)		VE_2 = 0		VE_{avg} = 0
Average Allowable Visible Emissions (% opacity)		VA_2 =5		VA_2 =5

The test, analysis of samples, and all other procedures were performed in a professional manner and, are in accordance with the official procedures outlined in 40 C.F.R. Chapter I, Part 60, Appendix A and F.A.C. Chapter 17-2, latest edition, of the State of Florida Department of Environmental Regulation Rules.

Certification of Data

To whom it may concern:

We, the undersigned, hereby certify that, to the best of our knowledge, all data and material in this report is true and correct.

Kent D. Bottorf, President

Roger T. Caldwell, Vice President - Environmental Division

General Information

Facility Name: Southern Soil Services, Inc.

Facility Address: 3505 Pugmill Road Kissimmee, Florida

Type of Facility: Mobile Soil Thermal Treatment Facility

Type of Source: Rotary Dryer

Type of Pollution Control Device: Baghouse and Afterburner

Permit Number: AC49 - 201051

Date of Test: November 10, 1992

Persons Conducting Test: Roger T. Caldwell, Test Equipment Operator
John Geving, Test Equipment Operator
Paul C. Lippert, V.E. Observer
Evelyn J. Bottorf, Sample Analysis
Kent D. Bottorf, Report Preparation

Plant Personnel Involved: Alan Keene

Agency Observer: Garry Kuberski, F.D.E.R. Central District

Nomenclature

The variables shown below are used for calculations in this report. The "a" subscript represents the run number. Average values have a "avg" subscript. The symbol ":=" is an assignment statement and is used to define variables in terms of constants or other variables. The "=" forces calculation of the variable.

Calculations and report generation is performed on MathCad Version 3.0. Care was taken to insure consistancy with the cited federal test methods. Software used within MathCad is propriatary in nature and unathuorized duplication of this material is prohibited.

Wf_a - Final weight of silica gel in impinger train in grams.

Wi_a - Initial weight of silica gel in impinger train in grams.

Vf_a - Final volume of water in impinger train in milliliters.

Vi_a - Initial volume of water in impinger train in milliliters.

Vm_a - Metered dry gas volume in cubic feet.

tm_a - Temperature of the dry gas meter in degrees Fahrenheit.

Tm_a - Temperature of the dry gas meter in degrees Rankine.

Pg_a- Static Pressure in stack in inches of water.

$Pbar_a$ - Ambient barometric pressure at the test site.

ts_a - Average temperature of the stack gas during the run in degrees Fahrenheit.

Ts_a - Average temperature of the stack gas during the run in degrees Rankine.

θ_a - Total sampling time of the test run in minutes.

ΔH_a - Average differential pressure across the orifice during the test run in inches of water.

P_a - Average square root of the velocity head in the stack gas in inches of water.

Dn_a - The calibrated nozzle diameter prior to test in inches.

Fno_a - The sample filter I.D. number.

Wff_a - Final sample filter weight in grams.

Wfi_a - Initial sample filter weight in grams.

Pno_a - Front half catch acetone wash beaker number.

Wwf_a - Final Front half catch acetone wash beaker weight after drying in grams.

Nomenclature

A_s - Stack area in square feet or square inches depending on it's location in the report.

An_a - Sampling nozzle area in square feet.

Ps_a - Absolute stack pressure in inches of mercury.

Vlc_a - Volume of liquid collected in the impinger train in milliliters.

C_a - Acetone blank concentration in milligrams per milliliter.

W_a - Acetone wash blank in milligrams.

Mn_a - Total weight of particulate collected during the sample run in grams.

$Vwcstd_a$ - Volume of the water condensed in the first three impingers in standard cubic feet.

$Vwsgstd_a$ - Volume of the water condensed in the silica gel in standard cubic feet.

$Vmstd_a$ - Sample gas volume in dry standard cubic feet

Bws_a - Stack gas moisture content in percent.

Ms_a - Stack gas molecular weight in pounds per pound-mole.

vs_a - Stack gas velocity in feet per second.

$Qstd_a$ - Stack gas volumetric flow rate in dry standard cubic feet per minute.

I_a - Sampling isokinetic variation in percent.

cs_a - Particulate emission rate in grams per second.

cg_a - Particulate concentration in grains per dry standard cubic feet.

cmg_a - Particulate concentration in milligrams per dry standanrd cubic meter.

Pmr_a - Particulate emissions rate in pounds per hour.

y_a - Sampling point location in inches.

x_a - Sampling port location in inches.

I_r - Dryer input rate during the test run.

Nomenclature

Wwi_a - Initial Front half catch acetone wash beaker weight before drying in grams.

O_a - Source output process weight during the test run in tons per hour.

cr_a - Allowable emission from the source in grains per dry standard cubic feet.

Fr_a - Consumption of fuel in gallons per hour during the test.

Pd_a - Pressure drop across the baghouse in inches of water.

VE_a - Observed visible emissions during the test run in percent opacity.

VA_a - Allowable visible emission during the test run in percent opacity.

V_a - Acetone wash volume in milliliters.

Awb_f - Final acetone wash blank weight in grams.

Awb_i - Initial acetone wash blank weight in grams.

a - Test run number variable.

K_p - Pitot tube constant .

C_p - Pitot tube coefficient.

D_s - Stack diameter in inches for round stacks only.

L_s - Stack length in inches for rectangular stacks only.

W_s - Stack width in inches for rectangular stacks only.

Y - Dry gas meter calibration coefficient.

M_w - Molecular weight of water.

p_a - density of acetone.

P_{std} - Standard pressure in inches of mercury.

T_{std} - Standard temperatue in degrees Rankinee.

Md_a - Stack gas dry molecular weight.

Stack Test Input Data

	Run No. 1	Run No. 2	Run No. 3
Final Silica Gel Weight (g)	W_{f_1}:=213.15	W_{f_2}:=211.28	W_{f_3}:=210.85
Inital Silica Gel Weight (g)	W_{i_1}:=200.00	W_{i_2}:=200.00	W_{i_3}:=200.00
Final Impinger Volume (ml)	V_{f_1}:=415	V_{f_2}:=320	V_{f_3}:=302
Initial Impinger Volume (ml)	V_{i_1}:=200	V_{i_2}:=200	V_{i_3}:=200
Dry Gas Volume (dcf)	V_{m_1}:=50.72	V_{m_2}:=60.67	V_{m_3}:=58.42
Temperature at Meter (F)	t_{m_1}:=85.9	t_{m_2}:=94.7	t_{m_3}:=100.8
Stack Static Pressure (in H2O)	P_{g_1}:=-0.42	P_{g_2}:=-0.42	P_{g_3}:=-0.42
Barometric Pressure (in Hg)	P_{bar_1}:=30.23	P_{bar_2}:=30.23	P_{bar_3}:=30.23
Average Stack Temperature (F)	t_{s_1}:=1138.0	t_{s_2}:=1558.5	t_{s_3}:=1468.4
Total Sampling Time (min)	θ_1:=60	θ_2:=60	θ_3:=60
Average Pressure Differential across the Orifice (in H2O)	ΔH_1:=2.42	ΔH_2:=3.47	ΔH_3:=3.14
Average Square Root of Velocity Head of Stack Gas (in H2O)	P_1:=1.04	P_2:=1.11	P_3:=1.09
Diameter of Nozzle (in)	D_{n_1}:=.3113	D_{n_2}:=.3113	D_{n_3}:=.3113
Filter I.D. Number	F_{no_1}:=736	F_{no_2}:=737	F_{no_3}:=738
Final Filter Weight (g)	Wf_{f_1}:=.3813	Wf_{f_2}:=.3783	Wf_{f_3}:=.3878
Initial Filter Weight (g)	Wf_{i_1}:=.3744	Wf_{i_2}:=.3711	Wf_{i_3}:=.3747
Probe Wash Beaker No.	P_{no_1}:=1	P_{no_2}:=2	P_{no_3}:=3
Final Probe Wash Weight (g)	Ww_{f_1}:=153.9258	Ww_{f_2}:=153.7683	Ww_{f_3}:=148.9740
Initial Probe Wash Weight (g)	Ww_{i_1}:=153.9204	Ww_{i_2}:=153.6735	Ww_{i_3}:=148.9481
Output Process Weight During the Test Run (tons/hr)	O_1:=11	O_2:=11	O_3:=11

Stack Test Input Data

	Run No. 1	Run No. 2	Run No. 3
Allowable Emissions at 50% Excess Air (gr/dscf)	$c_{r_1} := 0.08$	$c_{r_2} := 0.08$	$c_{r_3} := 0.08$
Percent Oxygen in Stack Gas	$O2_1 := 16.5$	$O2_2 := 13.5$	$O2_3 := 14.6$
Percent Carbon Dioxide in Stack Gas	$CO2_1 := 3.1$	$CO2_2 := 5.4$	$CO2_3 := 4.8$
Pressure Drop Across Baghouse (inches of water)	$P_{d_1} := 5.25$	$P_{d_2} := 5.25$	$P_{d_3} := 6.7$
Average Visible Emissions		$VE_2 := 0$	
Allowable Visible Emissions		$VA_2 := 5$	
Total MTBE Concentration in Stack Gas (ng/l)	$HM_1 := 50$	$HM_2 := 1460$	$HM_3 := 100$
Total Ethylbenzene Concentration in Stack Gas (ng/l)	$HE_1 := 135$	$HE_2 := 26$	$HE_3 := 10$
Total Benzene Concentration in Stack Gas (ng/l)	$HB_1 := 2890$	$HB_2 := 320$	$HB_3 := 100$
Total Toluene Concentration in Stack Gas (ng/l)	$HT_1 := 920$	$HT_2 := 160$	$HT_3 := 39$
Total Xylene Concentration in Stack Gas (ng/l)	$HX_1 := 350$	$HX_2 := 76$	$HX_3 := 40$
Total Hydrocarbon Concentration in Stack Gas (ng/l)	$HH_1 := 188000$	$HH_2 := 18650$	$HH_3 := 13200$
Carbon Monoxide Concentration in Stack Gas (%)	$CO_1 := 0.0$	$CO_2 := 0.0$	$CO_3 := 0.0$
Petroleum Hydrocarbon Input to Dryer (mg/kg)	$HCin_1 := 1015.24$	$HCin_2 := 792.12$	$HCin_3 := 751.12$
Petroleum Hydrocarbon Output to Dryer (mg/kg)	$HCout_1 := 11.92$	$HCout_2 := 10.15$	$HCout_3 := 9.15$

Calculated and Physical Constants

Acetone Wash Volume (ml)	$V_a := 250$
Final Acetone Wash Blank Weight (g)	$Awb_f := 155.5528$
Initial Acetone Wash Blank Weight (g)	$Awb_i := 155.5525$
Number of Test Runs Range Variable	$a := 1,2..3$
Pitot Tube Constant	$K_p := 85.49$
Pitot Tube Coefficient	$C_p := 0.8402$
Stack Diameter (in)	$D_s := 19.5$
Stack Length (in)	$L_s := 0$
Stack Width (in)	$W_s := 0$
Dry Gas Meter Calibration Factor	$Y := 0.9842$
Molecular Weight of Water (lb/lb-mole)	$M_w := 18.00$
Density of Acetone (g/ml)	$p_a := 0.7899$
Standard Pressure (in Hg)	$P_{std} := 29.92$
Standard Temperature (R)	$T_{std} := 528$

Area of Stack (square feet)

$$A_s := \frac{\pi \left[\frac{D_s}{2}\right]^2}{144}$$

$A_s = 2.1$

Area of Sampling Nozzle (square feet)

$$A_{n_a} := \frac{\pi \left[\frac{D_{n_a}}{2}\right]^2}{144}$$

Run No. 1	Run No. 2	Run No. 3
$A_{n_1} = 5.285 \cdot 10^{-4}$	$A_{n_2} = 5.285 \cdot 10^{-4}$	$A_{n_3} = 5.285 \cdot 10^{-4}$

Calculated and Physical Constants

Absolute Stack Pressure (in Hg)

$$Ps_a := Pbar_a + \left[\frac{Pg_a}{13.6}\right]$$

Run No. 1	Run No. 2	Run No. 3
$Ps_1 = 30.2$	$Ps_2 = 30.2$	$Ps_3 = 30.2$

Absolute Stack Temperature (R)

$$Ts := ts + 460$$

Run No. 1	Run No. 2	Run No. 3
$Ts_1 = 1598$	$Ts_2 = 2018.5$	$Ts_3 = 1928.4$

Absolute Meter Temperature (R)

$$Tm_a := tm_a + 460$$

Run No. 1	Run No. 2	Run No. 3
$Tm_1 = 545.9$	$Tm_2 = 554.7$	$Tm_3 = 560.8$

Volume of Water Collected (ml)

$$Vlc_a := \left[Vf_a - Vi_a\right] + \left[Wf_a - Wi_a\right]$$

Run No. 1	Run No. 2	Run No. 3
$Vlc_1 = 228.2$	$Vlc_2 = 131.3$	$Vlc_3 = 112.9$

Particulate Measurment Calculations

From EPA Method No.5 (40 CFR, Ch.1, Pt.60, App A)

Acetone Blank Concentration (mg/mg)

$$C_a := \frac{[Awb_f - Awb_i] \cdot 1000}{[V_a \cdot p_a]}$$

$C_a = 0.0015$

Acetone Wash Blank (mg)

$W_a := C_a \cdot V_a \cdot p_a$

$W_a = 0.3$

Total Weight of Particulate Collected in the Filter and Probe Wash (g)

$$M_{n_a} := [[Wf_{f_a} - Wf_{i_a}] + [Ww_{f_a} - Ww_{i_a}]] - \left[\frac{W_a}{1000}\right]$$

Run No. 1	Run No. 2	Run No. 3
$M_{n_1} = 0.012$	$M_{n_2} = 0.1017$	$M_{n_3} = 0.0387$

Determination of Stack Gas Moisture Content

From EPA Method No. 4 (40 CFR, Ch.I, Pt.60, App.A)

Volume of Water Condensed in the First Three Impingers (scf)

$$Vwc_{std_a} := 0.04707 \cdot [V_{f_a} - V_{i_a}]$$

Run No. 1	Run No. 2	Run No. 3
$Vwc_{std_1} = 10.12$	$Vwc_{std_2} = 5.65$	$Vwc_{std_3} = 4.8$

Volume of Water Collected in the Silica Gel (scf)

$$Vwsg_{std_a} := 0.04715 \cdot [W_{f_a} - W_{i_a}]$$

Run No. 1	Run No. 2	Run No. 3
$Vwsg_{std_1} = 0.62$	$Vwsg_{std_2} = 0.53$	$Vwsg_{std_3} = 0.51$

Sample Gas Volume Corrected to Standard Conditions (dscf)

$$Vm_{std_a} := 17.64 \cdot Y \cdot \frac{[Vm_a \cdot Pbar_a]}{Tm_a}$$

Run No. 1	Run No. 2	Run No. 3
$Vm_{std_1} = 48.8$	$Vm_{std_2} = 57.4$	$Vm_{std_3} = 54.7$

Stack Gas Moisture Content (%)

$$B_{ws_a} := \frac{[Vwc_{std_a} + Vwsg_{std_a}]}{[Vwc_{std_a} + Vwsg_{std_a} + Vm_{std_a}]} \cdot 100$$

Run No. 1	Run No. 2	Run No. 3
$B_{ws_1} = 18$	$B_{ws_2} = 9.7$	$B_{ws_3} = 8.9$

Determination of Stack Gas Dry Molecular Weight

From EPA Method No.3 (40 CFR, Ch.I, Part 60, App. A)

Stack Gas Oxygen Content (%)

Run No. 1	Run No. 2	Run No. 3
$O2_1 = 16.5$	$O2_2 = 13.5$	$O2_3 = 14.6$

Stack Gas Carbon Dioxide Content (%)

Run No. 1	Run No. 2	Run No. 3
$CO2_1 = 3.1$	$CO2_2 = 5.4$	$CO2_3 = 4.8$

Stack Gas Nitrogen and Carbon Monoxide Content (%)

$$NCO_a := 100 - [CO2_a + O2_a]$$

Run No. 1	Run No. 2	Run No. 3
$NCO_1 = 80.4$	$NCO_2 = 81.1$	$NCO_3 = 80.6$

Stack Gas Dry Molecular Weight (lb/lb-mole)

$$Md_a := [0.440 \cdot CO2_a] + [0.320 \cdot O2_a] + [0.280 \cdot NCO_a]$$

Run No. 1	Run No. 2	Run No. 3
$Md_1 = 29.2$	$Md_2 = 29.4$	$Md_3 = 29.4$

Excess Air (%)

$$EA_a := \frac{O2_a - [.5 \cdot CO_a]}{[.264 \cdot NCO_a] - [O2_a - [.5 \cdot CO_a]]} \cdot 100$$

Run No. 1	Run No. 2	Run No. 3
$EA_1 = 349.16$	$EA_2 = 170.66$	$EA_3 = 218.62$

Determination of Stack Gas Velocity and Volumetric Flow Rate (Type S Pitot Tube)

From EPA Method No. 2 (40 CFR, Ch.I, Pt.60, App.A)

Stack Gas Wet Molecular Weight (lb/lb-mole)

$$M_{s_a} := M_{d_a} \cdot \left[1 - \frac{B_{ws_a}}{100}\right] + \left[18.0 \cdot \frac{B_{ws_a}}{100}\right]$$

Run No. 1	Run No. 2	Run No. 3
$M_{s_1} = 27.1$	$M_{s_2} = 28.3$	$M_{s_3} = 28.3$

Stack Gas Velocity (ft/sec)

$$v_{s_a} := K_p \cdot C_p \cdot P_a \cdot \sqrt{\frac{T_{s_a}}{P_{s_a} \cdot M_{s_a}}}$$

Run No. 1	Run No. 2	Run No. 3
$v_{s_1} = 104.3$	$v_{s_2} = 122.5$	$v_{s_3} = 117.5$

Stack Gas Volumetric Flow Rate (acf/min)

$$Q_{a_a} := v_{s_a} \cdot 60 \cdot A_s$$

Run No. 1	Run No. 2	Run No. 3
$Q_{a_1} = 12979.2$	$Q_{a_2} = 15248.5$	$Q_{a_3} = 14622.6$

Stack Gas Volumetric Flow Rate (dscf/min)

$$Q_{std_a} := 60 \cdot \left[1 - \frac{B_{ws_a}}{100}\right] \cdot v_{s_a} \cdot A_s \cdot \left[\frac{T_{std}}{T_{s_a}}\right] \cdot \left[\frac{P_{s_a}}{P_{std}}\right]$$

Run No. 1	Run No. 2	Run No. 3
$Q_{std_1} = 3547.2$	$Q_{std_2} = 3634.6$	$Q_{std_3} = 3683.1$

Determination of Isokinetic Variation and Particulate Emissions

From EPA Method No.5 (40 CFR, Ch.1, Pt.60, App A)

Isokinetic Variation (%)

$$I_a := \frac{100 \cdot T_{s_a} \cdot \left[0.002669 \cdot V_{lc_a} + \left[V_{m_a} \cdot \frac{Y}{T_{m_a}} \right] \cdot \left[P_{bar_a} + \frac{\Delta H_a}{13.6} \right] \right]}{60 \cdot \theta_a \cdot v_{s_a} \cdot P_{s_a} \cdot A_{n_a}}$$

Run No. 1	Run No. 2	Run No. 3
$I_1 = 90.37$	$I_2 = 104.11$	$I_3 = 97.79$

Particulate Concentration (gr/dscf)

$$c_{g_a} := \frac{M_{n_a}}{Vm_{std_a}} \cdot 15.43$$

Run No. 1	Run No. 2	Run No. 3
$c_{g_1} = 0.0038$	$c_{g_2} = 0.0273$	$c_{g_3} = 0.0109$

Particulate Concentration (mg/dscm)

$$c_{mg_a} := \frac{M_{n_a}}{Vm_{std_a}} \cdot 1000 \cdot 35.31$$

Run No. 1	Run No. 2	Run No. 3
$c_{mg_1} = 8.7$	$c_{mg_2} = 62.6$	$c_{mg_3} = 25$

Particulate Mass Rate (g/sec)

$$c_{s_a} := \frac{\frac{M_{n_a}}{Vm_{std_a}} \cdot Q_{std_a}}{60}$$

Run No. 1	Run No. 2	Run No. 3
$c_{s_1} = 0.0145$	$c_{s_2} = 0.1073$	$c_{s_3} = 0.0435$

Determination of Actual And Allowable Particulate Emissions Rate

From EPA Method No.5 (40 CFR, Ch.1, Pt.60, App A)

Particulate Mass Rate (lb/hr)

$$P_{mr_a} := 0.1323 \cdot \left[\frac{M_{n_a}}{Vm_{std_a}}\right] \cdot Q_{std_a}$$

Run No. 1	Run No. 2	Run No. 3
$P_{mr_1} = 0.115$	$P_{mr_2} = 0.852$	$P_{mr_3} = 0.345$

Allowable Emission Concentration at 50% Excess Air (gr/dscf)

Run No. 1	Run No. 2	Run No. 3
$c_{r_1} = 0.08$	$c_{r_2} = 0.08$	$c_{r_3} = 0.08$

Actual Particulate Emission Concentration Uncorrected (gr/dscf)

Run No. 1	Run No. 2	Run No. 3
$c_{g_1} = 0.0038$	$c_{g_2} = 0.0273$	$c_{g_3} = 0.0109$

Particulate Concentration Corrected to 50% Excess Air (gr/dscf)

$$Cs50_a := \frac{100 + EA_a}{150} \cdot c_{g_a}$$

Run No. 1	Run No. 2	Run No. 3
$Cs50_1 = 0.0114$	$Cs50_2 = 0.0493$	$Cs50_3 = 0.0232$

Percent of Allowable Emissions (Actual vs. Allowable)

$$c_{x_a} := \frac{Cs50_a}{c_{r_a}} \cdot 100$$

Run No. 1	Run No. 2	Run No. 3
$c_{x_1} = 14.2$	$c_{x_2} = 61.7$	$c_{x_3} = 29$

Calculation of Organic Emission Rates

Benzene Emission Rate (Lb/Hr)

$$EB_a := \frac{HB_a \cdot 28.316 \cdot 60 \cdot Q_{std\ a} \cdot 10^{-9}}{453.5924}$$

Run No. 1	Run No. 2	Run No. 3
$EB_1 = 0.0384$	$EB_2 = 0.0044$	$EB_3 = 0.0014$

Toluene Emission Rate (Lb/Hr)

$$ET_a := \frac{HT_a \cdot 28.316 \cdot 60 \cdot Q_{std\ a} \cdot 10^{-9}}{453.5924}$$

Run No. 1	Run No. 2	Run No. 3
$ET_1 = 0.0122$	$ET_2 = 0.0022$	$ET_3 = 0.0005$

Xylene Emission Rate (Lb/Hr)

$$EX_a := \frac{HX_a \cdot 28.3161 \cdot 60 \cdot Q_{std\ a} \cdot 10^{-9}}{453.5924}$$

Run No. 1	Run No. 2	Run No. 3
$EX_1 = 0.0047$	$EX_2 = 0.001$	$EX_3 = 0.0006$

Hydrocarbon Emission Rate (Lb/Hr)

$$EH_a := \frac{HH_a \cdot 28.316 \cdot 60 \cdot Q_{std\ a} \cdot 10^{-9}}{453.5924}$$

Run No. 1	Run No. 2	Run No. 3
$EH_1 = 2.4978$	$EH_2 = 0.2539$	$EH_3 = 0.1821$

Afterburner Efficiency Calculations

Hydrocarbon Input to Dryer (pounds/hour)

$HCd_{in_a} := O_a \cdot 2000 \cdot HC_{in_a} \cdot 10^{-6}$

Run No. 1	Run No. 2	Run No. 3
$HCd_{in_1} = 22.3353$	$HCd_{in_2} = 17.4266$	$HCd_{in_3} = 16.5246$

Hydrocarbon Output from Dryer (pounds/hour)

$HCd_{out_a} := O_a \cdot 2000 \cdot HC_{out_a} \cdot 10^{-6}$

Run No. 1	Run No. 2	Run No. 3
$HCd_{out_1} = 0.2622$	$HCd_{out_2} = 0.2233$	$HCd_{out_3} = 0.2013$

Hydrocarbon Removed From Soil By Thermal Treatment (pounds/hour)

$HCd_{rem_a} := HCd_{in_a} - HCd_{out_a}$

Run No. 1	Run No. 2	Run No. 3
$HCd_{rem_1} = 22.073$	$HCd_{rem_2} = 17.2033$	$HCd_{rem_3} = 16.3233$

Afterburner Destruction Efficiency (%)

$$Eff_a := \left[1 - \frac{EH_a}{HCd_{rem_a}}\right] \cdot 100$$

Run No. 1	Run No. 2	Run No. 3
$Eff_1 = 88.68$	$Eff_2 = 98.52$	$Eff_3 = 98.88$

Calculation of Average Values

Average Stack Temperature (F)

$$ts_{avg} := \sum_a \frac{ts_a}{3} \qquad ts_{avg} = 1388.3$$

Average Stack Gas Moisture Content (%)

$$Bws_{avg} := \sum_a \frac{Bws_a}{3} \qquad Bws_{avg} = 12.2$$

Average Sample Gas Volume Corrected To Standard Conditions (dscf)

$$Vm_{avg} := \sum_a \frac{Vmstd_a}{3} \qquad Vm_{avg} = 53.6$$

Average Stack Gas Velocity (ft/sec)

$$vs_{avg} := \sum_a \frac{vs_a}{3} \qquad vs_{avg} = 114.8$$

Average Stack Gas Volumetric Flow Rate (dscf/min)

$$Qstd_{avg} := \sum_a \frac{Qstd_a}{3} \qquad Qstd_{avg} = 3621.6$$

Average Isokinetic Variation (%)

$$Iavg := \sum_a \frac{I_a}{3} \qquad Iavg = 97.4$$

Average Allowable Particulate Emission Concentration at 50% EA (gr/dscf)

$$A_{avg} := \sum_a \frac{cr_a}{3} \qquad A_{avg} = 0.08$$

Average Particulate Emission Concentration (gr/dscf)

$$Cs_{avg} := \sum_a \frac{Cs50_a}{3} \qquad Cs_{avg} = 0.028$$

Average Afterburner Efficiency (%)

$$Eff_{avg} := \sum_a \frac{Eff_a}{3} \qquad Eff_{avg} = 95.36$$

Calculation of Average Values

Average Output Process Rate (tons/hour)

$$O_{avg} := \sum_a \frac{O_a}{3} \qquad O_{avg} = 11$$

Average Baghouse Pressure Drop (inches of water)

$$Pd_{avg} := \sum_a \frac{Pd_a}{3} \qquad Pd_{avg} = 5.7$$

Average Emission Rate (pounds/hour)

$$Pmr_{avg} := \sum_a \frac{Pmr_a}{3} \qquad Pmr_{avg} = 0.44$$

Average Visible Emission

$$VE_{avg} := \sum_a \frac{VE_2}{1} \qquad VE_{avg} = 0$$

Average Benzene Emission (pounds/hour)

$$EB_{avg} := \sum_a \frac{[EB_a]}{3} \qquad EB_{avg} = 0.01$$

Average Toluene Emission (pounds/hour)

$$ET_{avg} := \sum_a \frac{[ET_a]}{3} \qquad ET_{avg} = 0.005$$

Average Xylene Emission (pounds/hour)

$$EX_{avg} := \sum_a \frac{[EX_a]}{3} \qquad EX_{avg} = 0.0021$$

Average Hydrocarbon Emission Rate (pounds/hour)

$$EH_{avg} := \sum_a \frac{[EH_a]}{3} \qquad EH_{avg} = 0.98$$

Summary of Test Results

Stack Temperature (F)

Run No. 1	Run No. 2	Run No. 3	Average
t_{s_1} =1138	t_{s_2} =1558.5	t_{s_3} =1468.4	ts_{avg} =1388.3

Stack Gas Moisture Content (%)

Run No. 1	Run No. 2	Run No. 3	Average
B_{ws_1} =18	B_{ws_2} =9.7	B_{ws_3} =8.9	Bws_{avg} =12.2

Stack Gas Velocity (ft/sec)

Run No. 1	Run No. 2	Run No. 3	Average
v_{s_1} =104.3	v_{s_2} =122.5	v_{s_3} =117.5	vs_{avg} =114.8

Stack Gas Volumetric Flow Rate (dscfm)

Run No. 1	Run No. 2	Run No. 3	Average
Q_{std_1} =3547.2	Q_{std_2} =3634.6	Q_{std_3} =3683.1	$Qstd_{avg}$ =3621.6

Isokinetic Variation (%)

Run No. 1	Run No. 2	Run No. 3	Average
I_1 =90.4	I_2 =104.1	I_3 =97.8	Iavg =97.4

Particulate Emissions Concentration at 50% Excess Air (gr/dscf)

Run No. 1	Run No. 2	Run No. 3	Average
Cs_{50_1} =0.0114	Cs_{50_2} =0.0493	Cs_{50_3} =0.0232	Cs_{avg} =0.028

Allowable Emission Concentration at 50% Excess Air (gr/dscf)

Run No. 1	Run No. 2	Run No. 3	Average
c_{r_1} =0.08	c_{r_2} =0.08	c_{r_3} =0.08	A_{avg} =0.08

Benzene Emission Rate (pounds/hour)

Run No. 1	Run No. 2	Run No. 3	Average
$EB_1 = 3.84 \cdot 10^{-2}$	$EB_2 = 4.36 \cdot 10^{-3}$	$EB_3 = 1.38 \cdot 10^{-3}$	$EB_{avg} = 1.47 \cdot 10^{-2}$

Toluene Emission Rate (pounds/hour)

Run No. 1	Run No. 2	Run No. 3	Average
$ET_1 = 1.22 \cdot 10^{-2}$	$ET_2 = 2.18 \cdot 10^{-3}$	$ET_3 = 5.38 \cdot 10^{-4}$	$ET_{avg} = 4.98 \cdot 10^{-3}$

Hydrocarbon Emission Rate (pounds/hour)

Run No. 1	Run No. 2	Run No. 3	Average
EH_1 =2.5	EH_2 =0.25	EH_3 =0.18	EH_{avg} =0.98

Calculation of Traverse Point Locations

Stack Diameter

$D_s = 19.5$

Stack Area

$A_s := \pi \cdot \left[\frac{D_s}{2}\right]^2$

Stack Radius

$r := \frac{D_s}{2}$

Sampling Port Offset

$O_s := 6$

Concentric Area Determination

$d_1 := \sqrt{\frac{\frac{A_s}{12}}{.785375}}$ $r_1 := \frac{d_1}{2}$ $r_1 = 2.8$

$p_6 := r - r_1$ $p_6 = 6.9$

$p_7 := r + r_1$ $p_7 = 12.6$

$d_2 := \sqrt{\frac{\frac{3 \cdot A_s}{12}}{.785375}}$ $r_2 := \frac{d_2}{2}$ $r_2 = 4.9$

$p_5 := r - r_2$ $p_5 = 4.9$

$p_8 := r + r_2$ $p_8 = 14.6$

$d_3 := \sqrt{\frac{\frac{5 \cdot A_s}{12}}{.785375}}$ $r_3 := \frac{d_3}{2}$ $r_3 = 6.3$

$p_4 := r - r_3$ $p_4 = 3.5$

$p_9 := r + r_3$ $p_9 = 16$

$d_4 := \sqrt{\frac{\frac{7 \cdot A_s}{12}}{.785375}}$ $r_4 := \frac{d_4}{2}$ $r_4 = 7.4$

$p_3 := r - r_4$ $p_3 = 2.3$

$p_{10} := r + r_4$ $p_{10} = 17.2$

$d_5 := \sqrt{\frac{\frac{9 \cdot A_s}{12}}{.785375}}$ $r_5 := \frac{d_5}{2}$ $r_5 = 8.4$

$p_2 := r - r_5$ $p_2 = 1.3$

$p_{11} := r + r_5$ $p_{11} = 18.2$

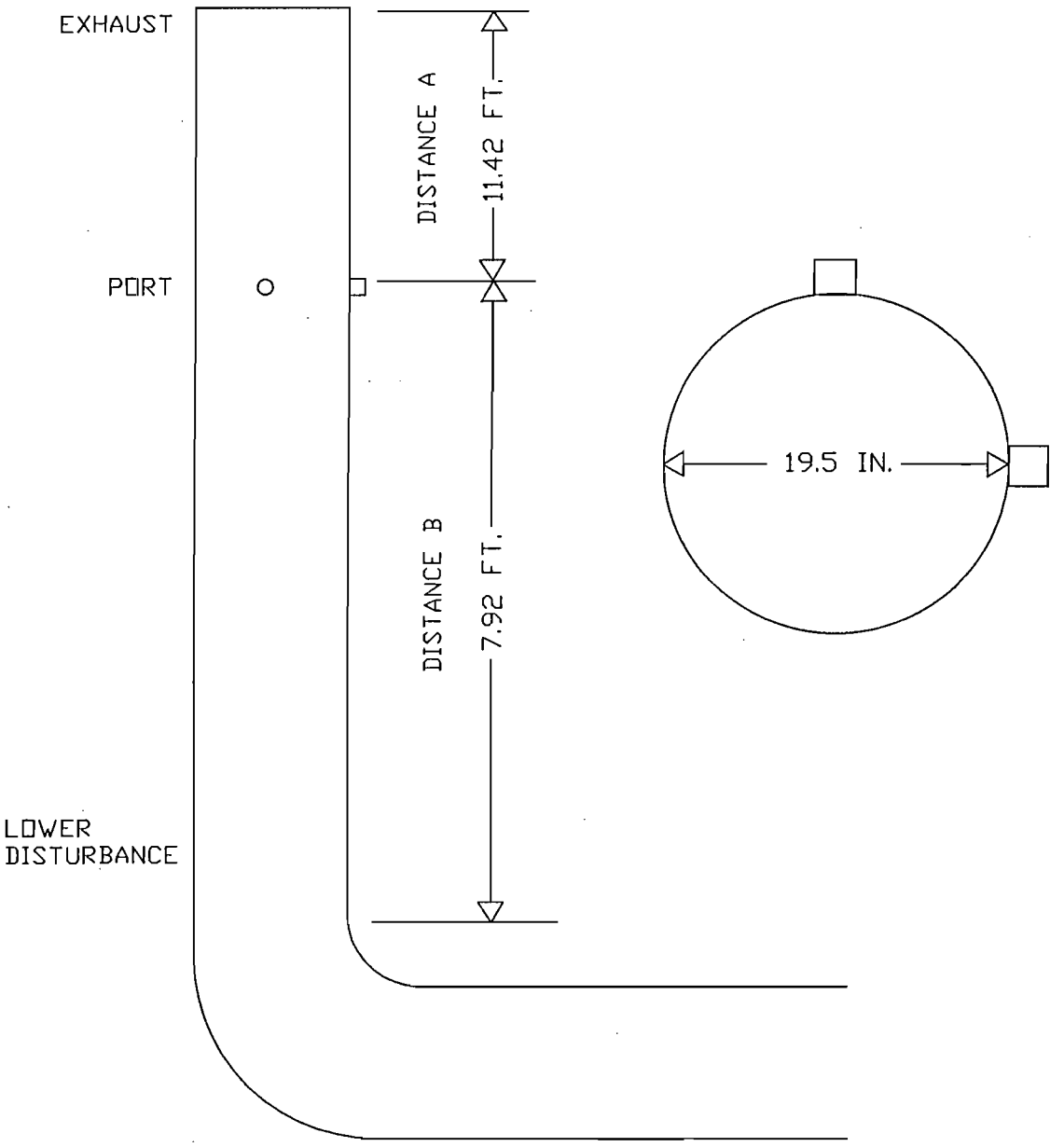
$d_6 := \sqrt{\frac{\frac{11 \cdot A_s}{12}}{.785375}}$ $r_6 := \frac{d_6}{2}$ $r_6 = 9.3$

$p_1 := r - r_6$ $p_1 = 0.4$

$p_{12} := r + r_6$ $p_{12} = 19.1$

Probe Marks to Locate Sample Points (in)

$p_1 + O_s = 6.4$	$p_7 + O_s = 18.6$
$p_2 + O_s = 7.3$	$p_8 + O_s = 20.6$
$p_3 + O_s = 8.3$	$p_9 + O_s = 22$
$p_4 + O_s = 9.5$	$p_{10} + O_s = 23.2$
$p_5 + O_s = 10.9$	$p_{11} + O_s = 24.2$
$p_6 + O_s = 12.9$	$p_{12} + O_s = 25.1$



BOTTORF ASSOCIATES INC.
CONSULTING ENGINEERS-ANALYTICAL LABORATORY
6729 EDGEWATER COMMERCE PARKWAY ORLANDO, FLORIDA 32810-4278
PHONE: (407) 298-0946

Southern Soil Services, Inc.
Stack Diagram

DRAWN BY:	KDB	DATE: 11/24/92	1117-4
REVIEWED BY:	RTC	VERSION: 10/386	
SCALE:	No Scale	FILENAME: STK1117	PROJECT NO.

EPA METHOD NO.5
SAMPLING & ANALYSIS PROCEDURE

4.1 SAMPLING The complexity of this method is such that, in order to obtain reliable results, testers should be trained and experienced with the test procedures.

4.1.1 PRETEST PREPARATION It is suggested that sampling equipment be maintained according to the procedure described in APTD-0576.

Weigh several 200 g. portions of silica gel in air-tight containers to the nearest 0.1 g. Record the total weight of the silica gel plus container, on each container.

Check filters visually against light for irregularities and flaws or pinhole leaks. Label filters of the proper diameter on the back side near the edge using numbering machine ink. Label the shipping containers (glass or plastic petri dished) and keep the filters in these containers at all times except during sampling and weighing.

The filters must be oven dried at 105 C (220 F) for 2 to 3 hours, desiccated for 2 hours, and weighed. Weigh at intervals of at least 6 hours to a constant weight, i.e., 0.5 mg change from previous weighing; record results to the nearest 0.1 mg. During each weighing the filter must not be exposed to the laboratory atmosphere for a period greater than 2 minutes and a relative humidity above 50 percent. Procedures other than those described, which account for relative humidity effects, may be used, subject to the approval of the Administrator.

4.1.2 PRELIMINARY DETERMINATIONS Select the sampling site and the minimum number of sampling points according to Method 1 or as specified by the Administrator. Determine the stack pressure, temperature, and the range of velocity heads using Method 2; it is recommended that a leak-check of the pitot lines performed. Determine the moisture content using Approximation Method 4 or assume a moisture content from previous test data for the purpose of making isokinetic sampling rate settings. Determine the stack gas dry molecular weight, as described in Method 2, Section 3.6; if integrated Method 3 sampling is used for molecular weight determination, the integrated bag sample shall be taken simultaneously with, and for the same total length of time as, the particulate sample run.

Select a nozzle size based on the range of velocity heads, such that it is not necessary to change the nozzle size in order to maintain isokinetic sampling rates. During the run, do not change the nozzle size. Ensure that the proper differential pressure gauge is chosen for the range of velocity heads encountered.

Select a suitable probe liner and probe length such that all traverse points can be sampled. For large stacks, consider sampling from opposite sides of the stack to reduce the length of probes.

Select a total sampling time greater than or equal to the minimum total sampling time specified in the test procedures for the specific industry such that (1) the sampling time per point is not less than 2 min. (or some greater time interval as specified by the Administrator), and (2) the sample volume taken (corrected to standard conditions) will exceed the required minimum total gas sample volume. The latter is based on an approximate average sampling rate.

It is recommended that the number of minutes sampled at each point be an integer or an integer plus one-half minute, in order to avoid timekeeping errors. The sampling time at each point shall be the same.

In some circumstances, e.g., batch cycles, it may be necessary to sample for shorter times at the traverse points and to obtain smaller gas sample volumes. In these cases, the Administrator's approval must first be obtained.

4.1.3 PREPARATION OF COLLECTION TRAIN During preparation and assembly of the sampling train, keep all openings where contamination can occur covered until just prior to assembly or until sampling is about to begin.

Place 100 ml of water in each of the first two impingers, leave the third impinger empty, and transfer approximately 200 g. of preweighed silica gel from its container to the fourth impinger. More silica gel may be used, but care should be taken to ensure that it is not entrained and carried out from the impinger during sampling. Place the container in a clean place for later use in the sample recovery. Alternatively, the weight of the silica gel plus impinger may be determined to the nearest 0.5 g and recorded.

Using a tweezers or clean disposable surgical gloves, place a labeled (identified) and weighed filter in the filter holder. Be sure that the filter is properly centered and the gasket properly placed so as to prevent the sample gas stream from circumventing the filter. Check the filter for tears after assembly is completed.

When glass liners are used, install the selected nozzle using a Viton A O-ring when stack temperatures are less than 260 C (500 F) and an asbestos string gasket when temperatures are higher. Other connecting systems using either 316 stainless steel or Teflon ferrules may be used. When metal liners are used, install the nozzle as above or by a leak-free probe with heat resistant tape or by some other method to denote the proper distance into the stack or duct for each sampling point.

Set up the train as shown in the sampling equipment schematic diagram. A very light coat of silicone grease on all ground glass joints, greasing only the outer portion to avoid possibility of contamination by the silicone grease. Subject to the approval of the Administrator, a glass cyclone may be used between the probe and filter holder when the total particulate catch is expected to exceed 100 mg or when water droplets are present in the stack gas. Place crushed ice around the impingers.

4.1.4. LEAK-CHECK PROCEDURES

4.1.4.1 PRETEST LEAK-CHECK A pretest leak-check is recommended, but not required. If the tester opts to conduct the pretest leak-check, the following procedure shall be used.

After the sampling train has been assembled, turn on and set the filter and probe heating systems at the desired operating temperatures. Allow time for the temperatures to stabilize. If a Viton A O-ring or other leak-free connection is used in assembling the probe nozzle to the probe liner, leak-check the train at the sampling site by plugging the nozzle and pulling a 380 mm Hg (15 in. Hg) vacuum. A lower vacuum may be used, provided that it is not exceeded during the test.

If an asbestos string is used, do not connect the probe to the train during the leak-check. Instead, leak-check the train by first plugging the inlet to the filter holder (cyclone, if applicable) and pulling a 380 mm Hg (15 in. Hg) vacuum. Then connect the probe to the train and leak-check at about 25 mm Hg (1 in Hg) vacuum alternately, the probe may be leak-checked with the rest of the sampling train, in one step, at about 25 mm Hg ((15 in. Hg) Vacuum. Leakage rates in excess of 4 percent of the average samplingrate or 0.00057 m3/min (0.02 cfm), whichever is less, are unacceptable.

The following leak-check instructions for the sampling train described in APTD-0576 and APTD-0581 may be helpful. Start the pump with bypass valve fully open and coarse adjust valve, completely closed. Partially open the coarse adjust valve and slowly close the bypass valve until the desired vacuum is reached. Do not reverse direction of bypass value; this will cause water to back up into the filter holder. If the desired vacuum is exceeded, either leak-check at this higher vacuum or end the leak-check as shown below and start over.

When the leak-check is completed, first slowly remove the plug from the inlet to the probe, filter holder, or cyclone (if applicable) and immediately turn off the vacuum pump. This prevents the water in the impingers from being forced backward into the filter holder and silica gel from being entrained backward into the third impinger.

4.1.4.2 LEAK CHECKS DURING SAMPLE RUN If, during the sampling run, a component (e.g., filter assembly or impinger) change becomes unnecessary, a leak-check shall be conducted immediately before the change is made. The leak-check shall be done according to the procedure outlined in Section 4.1.4.1 above, except that it shall be done at a vacuum equal to or greater than the maximum value recorded up to that point in the test. If the leakage rate is found to be no greater than 0.00057 m3/min (0.02 cfm) or 4 percent of the average sampling rate (whichever is less), the results are acceptable, and no correction will need to be applied to the total volume of dry gas metered; if, however, a higher leakage rate is obtained, the tester shall either record the leakage rate and plan to correct the sample volume as shown in Section 6.3 of this method, or shall void the sample run.

Immediately after component changes, leak-checks are optional; if such leak-checks are done, the procedure outlined in Section 4.1.4.1 above shall

be used.

4.1.4.3 POST-TEST LEAK-CHECK A leak-check is mandatory at the conclusion of each sampling run. The leak-check shall be done in accordance with the procedures outlined in Section 4.1.4.1 except that it shall be conducted at a vacuum equal to or greater than the maximum value reached during the sampling run. If the leakage rate is found to be no greater than 0.00057 m3/min (0.02 cfm) or 4 percent of the average sampling rate (whichever is less), the results are acceptable, and no correction need be applied to the total volume of dry gas metered. If, however, a higher leakage rate is obtained, the tester shall either record the leakage rate and correct the sample volume as shown in Section 6.3 of this method, or shall void the run.

4.1.5 PARTICULATE TRAIN OPERATION During the sampling run, maintain an isokinetic sampling rate (with 10 percent of true isokinetic unless otherwise specified by the Administrator) and a temperature around the filter of 120‡14 C.(248‡25 F), or such other temperature as specified by an applicable subpart of the standards or approved by the Administrator.

For each run, record the data required on a data sheet such as the one shown in Figure 5-2. Be sure to record the initial dry gas meter reading. Record the dry gas meter readings at the beginning and end of each sampling time increment, when changes in flow rates are made, before and after each leak-check, and when sampling is halted. Take other readings required by Figure 5-2 at least once at each sample point during each time increment and additional readings when significant changes (20 percent variation in velocity head readings) necessitate additional adjustments in flow rate. Level and zero the manometer. Because the manometer level and zero may drift due to vibrations and temperature changes, make periodic checks during the traverse.

Clean the portholes prior to the test run to minimize the chance of sampling deposited material. To begin sampling, remove the nozzle cap, verify that the filter and probe heating systems are up to temperature, and that the pitot tube and probe are properly positioned. Position the nozzle at the first traverse point with the tip pointing directly into the gas stream. Immediately start the pump and adjust the flow to isokinetic conditions. Nomographs are available, which aid in the rapid adjustment of the isokinetic sampling rate without excessive computations. These nomographs are designed for use when the Type S pitot tube coefficient is 0.85‡0.02, and the stack gas equivalent density (dry molecular weight is equal to 29‡4 APDT-0576 details the procedure for using the nomographs. If Cp and Md are outside the stated ranges do not use the nomographs unless appropriate steps (see Citation 7 in Bibliography) are taken to compensate for the deviations.

When the stack is under significant negative pressure (height of impinger stem), take care to close the coarse adjust valve before inserting the probe into the stack to prevent water from backing into the filter holder. If necessary, the pump may be turned on with the coarse adjust valve closed.

When the probe is in position, block off the openings around the probe

and porthole to prevent unrepresentative dilution of the gas stream.

Traverse the stack cross-section, as required by Method 1 or as specified by the Administrator, being careful not to bump the probe nozzle into the stack walls when sampling near the walls or when removing or inserting the probe through the portholes; this minimizes the chance of extracting deposited material.

During the test run, make periodic adjustments to keep the temperature around the filter holder at the proper level; add more ice and, if necessary, salt to maintain a temperature of less than 20 C (68 F) at the condenser/silica gel outlet. Also, periodically check the level and zero of the manometer.

If the pressure drop across the filter becomes too high, making isokinetic sampling difficult to maintain, the filter may be replaced in the middle of a sample run. It is recommended that another complete filter assembly be used rather than attempting to change the filter itself. Before a new filter assembly is installed, conduct a leak-check. The total particulate weight shall include the summation of all filter assembly catches.

A single train shall be used for the entire sample run, except in cases where simultaneous sampling is required in two or more separate ducts or at two or more different locations within the same duct, or, in cases where equipment failure necessitates a change of trains. In all other situations, the use of two or more trains will be subject to the approval of the Administrator.

Note that when two or more trains are used, separate analyses of the front-half and (if applicable) impinger catches from each train shall be performed, unless identical nozzles sizes were used on all trains, in which case, the front-half catches from the individual trains may be combined (as may the impinger catches and one analysis of front-half catch and one analysis of impinger catch may be performed. Consult with the Administrator for details concerning the calculation of results when two or more trains are used.

At the end of the sample run, turn off the course adjust valve, remove the probe and nozzle from the stack, turn off the pump, record the final dry gas meter reading, and conduct a post-test leak-check, as outlined in Section 4.1.4.3. Also, leak-check the pitot lines as described in Method 2, Section 3.1; the lines must pass this leak-check in order to validate the velocity head data.

4.1.6 CALCULATION OF PERCENT ISOKINETIC Calculate percent isokinetic to determine whether the run was valid or another test run should be made. If
there was difficulty in maintaining isokinetic rates due to source conditions consult with the Administrator for possible variance on the isokinetic rates.

4.2 SAMPLE RECOVERY Proper cleanup procedure begins as soon as the probe is removed from the stack at the end of the sampling period. Allow the probe to cool.

When the probe can be safely handled, wipe off all external particulate matter near the tip of the probe nozzle and place a cap over it to prevent losing or gaining particulate matter. Do not cap off the probe tip tightly while sampling train is cooling down as this would create a vacuum in the filter holder, thus drawing water from the impingers into the filter holder.

Before moving the sample train to the cleanup site, remove the probe from the sample train, wipe off the silicone grease, and cap the open outlet of the probe. Be careful not to lose any condensate that might be present. Wipe off the silicone grease from the filter inlet where the probe was fastened and cap it. Remove the umbilical cord from the last impinger and cap the impinger. If a flexible line is used between the first impinger or condenser and the filter holder, disconnect the line at the filter holder and let any condensed water or liquid drain into the impingers or condenser. After wiping off the silicone grease, cap off the filter holder outlet and impinger inlet. Either ground-glass stoppers, plastic caps or serum caps may be used to close these openings.

Transfer the probe and filter-impinger assembly to the cleanup area. This area should be clean and protected from the wind so that the chances of contaminating or losing the sample will be minimized.

Save a portion of the acetone used for cleanup as a blank. Take 200 ml of this acetone directly from the wash bottle being used and place it in a glass sample container labeled "acetone blank."

Inspect the train prior to and during disassembly and note any abnormal conditions. Treat the samples as follows.

Container No. 1 Carefully remove the filter from the filter holder and place it in its identified petri dish container. Use a pair of tweezers and/or clean disposable surgical gloves to handle the filter. If it is necessary to fold the filter, do so such that the particulate cake is inside the fold. Carefully transfer to the petri dish any particulate matter and/or filter fibers which adhere to the filter holder gasket, by using a dry Nylon bristle brush and/or a sharp-edged blade. Seal the container.

Container No. 2. Taking care to see that dust on the outside of the probe or other exterior surfaces does not get into the sample, quantitatively recover particulate matter or any condensate from the probe nozzle, probe fitting, probe liner, and front half of the filter holder by washing these components with acetone and placing the wash in a glass container. Distilled water may be used instead of acetone when approved by the Administrator and shall be used when specified by the Administrator, in these cases, save a water blank and follow the Administrator's directions on analysis. Perform the acetone rinses as follows:

Carefully remove the probe nozzle and clean the inside surface by rinsing with acetone from a wash bottle and brushing with a Nylon bristle brush. Brush until the acetone rinse shows no visible particles, after which make a final rinse of the inside surface with acetone. Brush and rinse the inside parts of the Swagelok fitting with acetone in a similar way until no visible particles remain.

Rinse the probe liner with acetone by tilting and rotating the probe while squirting acetone into its upper end so that all inside surfaces will be wetted with acetone. Let the acetone drain from the lower end into the sample container. A funnel (glass or polyethylene) may be used to aid on transferring liquid washes to the container. Follow the acetone rinse with a probe brush. Hold the probe in an inclined position, squirt acetone into the upper end as the probe brush is being pushed with a twisting action through the probe; hold a sample container underneath the lower end of the probe and catch any acetone and particulate matter which is brushed from the probe. Run the brush through the probe three times or more until no visible particulate matter is carried out with the acetone or until none remains in the probe liner on visual inspection. With stainless steel or other metal probes, run the brush through in the above prescribed manner at least six times since metal probes have small crevices in which particulate matter can be entrapped. Rinse the brush with acetone, and quantitatively collect these washings in the sample container. After the brushing, make a final acetone rinse of the probe as described above.

It is recommended that two people clean the probe to minimize sample losses. Between sampling runs, keep brushes clean and protected from contaminations.

After ensuring that all joints have been wiped clean of silicone grease, clean the inside of the front half of the filter holder by rubbing the surfaces with a Nylon bristle brush and rinsing with acetone. Rinse each surface three times or more if needed to remove visible particulate. Make a final rinse of the brush and filter holder. Carefully rinse out the glass cyclone, also (if applicable). After all acetone washings and particulate matter have been collected in the sample container, tighten the lid on the sample container so that acetone will not leak out when it is shipped to the laboratory. Mark the height of the fluid level to determine whether or not leakage occurred during transport. Label the container to clearly identify its contents.

Container No. 3 Note the color of the indicating silica gel to determine if it has been completely spent and make a notation of its condition. Transfer the silica gel from the fourth impinger to its original container and seal. A funnel may make it easier to pour the silica gel without spilling. A rubber policeman may be used as an aid in removing the silica gel from the impinger. It is not necessary to remove the small amount of dust particles that may adhere to the impinger wall and are difficult to remove. Since the gain in weight is to be used for moisture calculations; do not use any water or other liquids to transfer the silica gel.

Impinger Water Treat the impingers as follows: Make a notation of any color or film in the liquid catch. Measure the liquid which is in the first three impingers to within ‡1 ml by using graduated cylinder or by weighing it to within ‡0.5 g by using a balance (if one is available). Record the volume or weight of liquid present. This information is required to calculate the moisture content of the effluent gas.

Discard the liquid after measuring and recording the volume or weight, unless analysis of the impinger catch is required.

If a different type of condenser is used, measure the amount of moisture condensed either volumetrically or gravimetrically.

Whenever possible, containers should be shipped in such a way that they remain upright at all times.

4.3 ANALYSIS Record the data required on a sheet such as the one shown in Figure 5.3. Handle each sample container as follows:

Container No. 1 Leave the contents in the shipping container or transfer the filter and any loose particulate from the sample container to a tared glass weighing dish. Desiccate for 24 hours in a desiccator containing anhydrous calcium sulfate. Weigh to a constant weight and report the results to the nearest 0.1 mg. For purposes of this Section 4.3, the term "constant weight" means a difference of no more than 0.5 mg or 1 percent of total weight less tare weight, whichever is greater, between two consecutive weighings, with no less than 6 hours of desiccation time between weighings.

Alternatively, the sample may be oven dried at 105 C (220 F) for 2 to 3 hours, cooled in the desiccator, and weighted to a constant weight, unless otherwise specified by the Administrator. The tester may also opt to oven dry the sample at 105 C (220 F) for 2 to 3 hours, weigh the sample, and use this weight as a final weight.

Container No. 2 Note the level of liquid in the container and confirm on the analysis sheet whether or not leakage occurred during transport. If a noticeable amount of leakage has occurred, either void the sample or use methods, subject to the approval of the Administrator, to correct the final results. Measure the liquid in this container either volumetrically to ‡1 ml or gravimetrically to ‡0.5 g. Transfer the contents to a tared 250-ml beaker and evaporate to dryness at ambient temperature and pressure. Desiccate for
24 hours and weigh to a constant weight. Report the results to the nearest 0.1 mg.

Container No. 3 Weigh the spent silica gel(or silica gel plus impinger) to the nearest 0.5 g using a balance. This step may be conducted in the field.

"Acetone Blank" Container Measure acetone in this container either volumetrically or gravimetrically. Transfer the acetone to a tared 250-ml beaker and evaporate to dryness at ambient temperature and pressure. Desiccate for 24 hours and weigh to a constant weight. Report the results to the nearest 0.1 mg.

NOTE: At the option of the tester, the contents of Container No. 2 as well as the acetone blank container may be evaporated at temperatures higher than ambient. If evaporation is done at an elevated temperature, the temperature must be below the boiling point of the solvent; also, to prevent "bumping" the evaporation process must be closely supervised, and the contents of the beaker must be swirled occasionally to maintain an even temperature. Use extreme care, as acetone is highly flammable and has a low flash point.

4.4 QUALITY CONTROL PROCEDURES The following quality control procedures are suggested to check the volume metering system calibration values at the field test site prior to sample collection. These procedures are optional for the tester.

4.4.1 METER ORIFICE CHECK Using the calibration data obtained during the calibration procedure described in Section 5.3, determine the H@ for the metering system orifice. The H@ is the orifice pressure differential in units of in. H_2O that correlates to 0.75 cfm of air at 528 R and 29.92 in Hg. The H@ is calculated as follows:

Before beginning the field test (a set of three runs usually constitutes a field test), operate the metering system (i.e., pump volume meter, and orifice) at the H@ pressure differential for 10 minutes. Record the volume collected, the dry gas meter temperature, and the barometric pressure. Calculate a dry gas meter calibration check value. Yc, as follows:

Where:

Yc=Dry gas meter calibration check value, dimensionless.
10=10 minutes of run time.

Compare the Yc value with the dry gas meter calibration factor Y to determine
that: $0.97Y<Yc<1.03Y$. If the Yc value is not within this range, the volume metering system should
be investigated before beginning the test.

4.4.2 CALIBRATED CRITICAL ORIFICE A calibrated critical orifice, calibrated against a wet test meter or spirometer and designed to be inserted at the inlet of the sampling meter box may be used as a quality control check by following the procedure of Section 7.2.

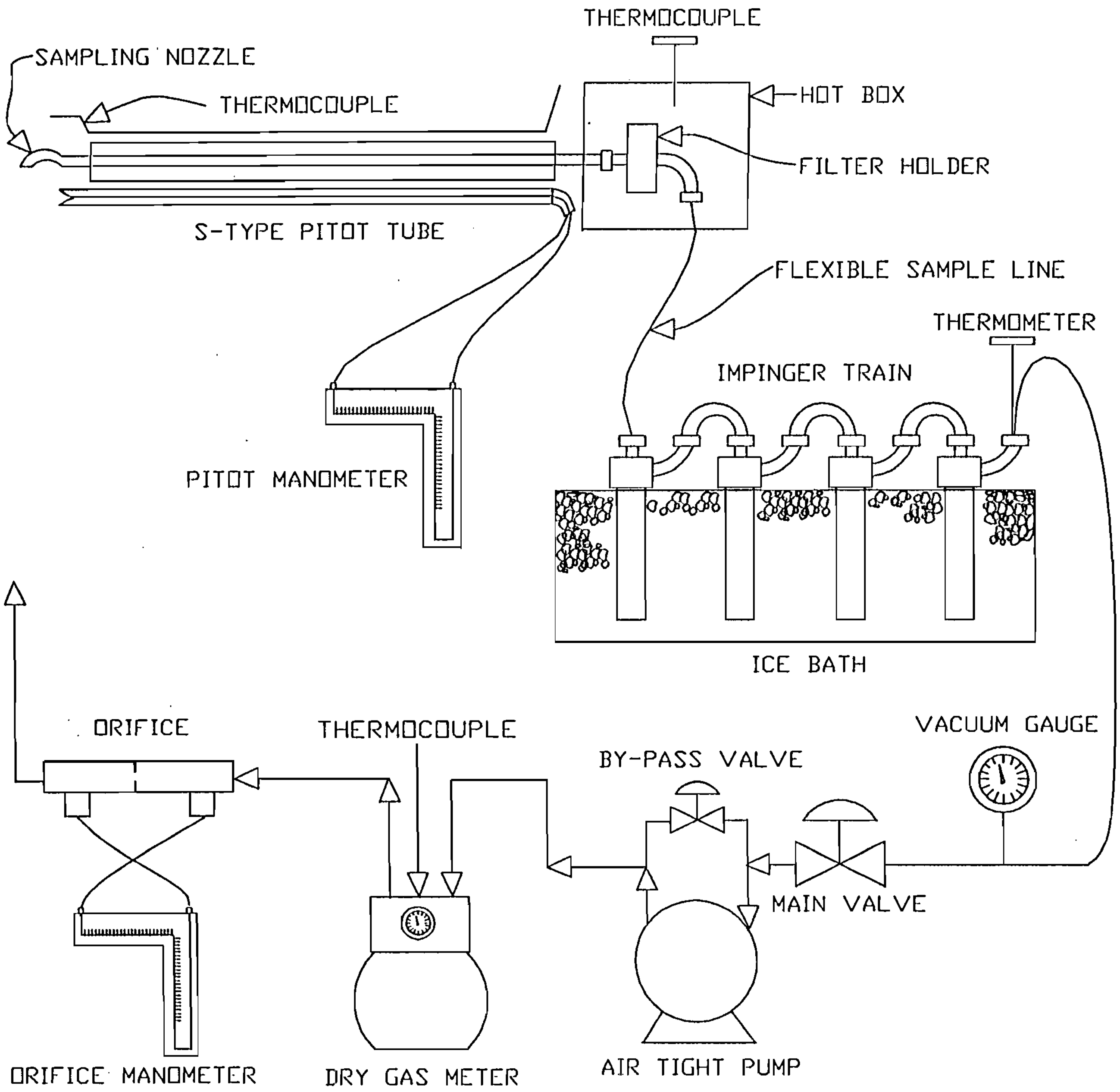
5.1 PROBE NOZZLE Probe nozzles shall be calibrated before their initial use in the field. Using a micrometer, measure the inside diameter of the nozzle to the nearest 0.025 mm (0.001 in.). Make three separate measurements using different diameters each time, and obtain the average of the measurements. The difference between the high and low numbers shall not exceed 0.1 mm (0.004 in.). When nozzles become nicked, dented, or corroded, they shall be reshaped, sharpened, and recalibrated before use. Each nozzle shall be permanently and uniquely identified.

5.2 PITOT TUBE. The Type S pitot tube assembly shall be calibrated according to the procedure outlined in Section 4 of Method 2.

5.3 METERING SYSTEM

5.31 CALIBRATION PRIOR TO USE Before its initial use in the field, the metering system shall be calibrated as follows: Connect the metering system inlet to the outlet of a wet test meter that is accurate to within 1 percent. Refer to Figure 5.5. The wet test meter should have a capacity of 30 liters/rev (1 ft^3/rev). A spirometer of 400 liters (14 ft^3) or more capacity, or equivalent, may be used for this calibration, although a wet test meter is usually more practical. The wet test meter should be periodically calibrated

with a spirometer or a liquid displacement meter to ensure the accuracy of the wet test meter. Spirometers or wet test meters of other sizes may be used, provided that the specified accuracies of the procedure are maintained. Run the metering system pump for about 15 minutes with the orifice manometer indicating a median reading as expected in field use to allow the pump to warm up and to permit the interior surface of the wet test meter to be thoroughly wetted. Then, at each of a minimum of three orifice manometer settings, pass an exact quantity of gas through the wet test meter and not the gas volume indicated by the dry gas meter. Also note the barometric pressure, and the temperatures of the wet test meter, the inlet of the dry gas meter, and the outlet of the dry gas meter. Select the highest and lowest orifice settings to bracket the expected field operating range of the orifice. Use a minimum volume of 0.15 m3 (5 cf) at all orifice settings. Record all the data on a form similar to Figure 5.6, and calculate Y, the dry gas meter calibration factor, and H@, the orifice calibration factor, at each orifice setting as shown on Figure 5.6. Allowable tolerances for individual Y and H@, values are given in Figure 5.6. Use the average of the Y values in the calculations in Section 6._



SAMPLING EQUIPMENT SHCEMATIC DIAGRAM

DATE:	REVISION:

Bottorf Associates Inc.
CONSULTING ENGINEERS–ANALYTICAL LABORATORY

EPA METHOD 5 SAMPLING TRAIN

DRAWN BY: KDB	DATE: 1/22/91	0001
REVIEWED BY: RTC	VERSION: AUTOSKETCH	PROJECT NO.
SCALE: NO SCALE	FILENAME: EPA5DIAG	

Pitot Tube Calibration

Calibration Date: September 21, 1991
Pitot Tube Identification: 6' Probe
Calibration Device: Wind Tunnel
Calibrated By: Roger T. Caldwell

$a := 1,2..3$

A Side Calibration

Run No.1

1	$P_{testa_1} := 0.260$	$P_{stda_1} := 0.17$
2	$P_{testa_2} := 0.740$	$P_{stda_2} := 0.55$
3	$P_{testa_3} := 1.000$	$P_{stda_3} := 0.74$

$$Cp_{sidea_a} := \left[\sqrt{0.99 \cdot \left[\frac{P_{stda_a}}{P_{testa_a}}\right]}\right] \qquad Cp_{sidea} := \frac{\left[\sum_a Cp_{sidea_a}\right]}{3} \qquad Cp_{sidea} = 0.8394$$

B Side Calibration

Run No.1

1	$P_{testb_1} := 0.240$	$P_{stdb_1} := 0.15$
2	$P_{testb_2} := 0.750$	$P_{stdb_2} := 0.57$
3	$P_{testb_3} := 1.000$	$P_{stdb_3} := 0.76$

$$Cp_{sideb_a} := \left[\sqrt{0.99 \cdot \left[\frac{P_{stdb_a}}{P_{testb_a}}\right]}\right] \qquad Cp_{sideb} := \frac{\left[\sum_a Cp_{sideb_a}\right]}{3} \qquad Cp_{sideb} = 0.8405$$

Average Cp Value

$$Cp := \frac{Cp_{sidea} + Cp_{sideb}}{2} \qquad Cp = 0.8399$$

Dry Gas Meter Calibration

Calibration Date: September 21, 1992
Console Identification: Meter No.1
Wet Test Meter No.: 29045
Barometric Pressure: 29.97
Calibrated By: Roger T. Caldwell

$Pb := 29.97$
$a := 1,2..6$
$b := 0,1..5$

Test Meter Delta H	Wet Test Meter Volume	Dry Gas Meter Volume	Wet Test Meter Temperature	Dry Gas Meter Inlet Temperature	Dry Gas Meter Outlet Temperature	Run Time
$H_1 := 0.5$	$Vw_1 := 5.87$	$Vd_1 := 6.06$	$Tw_1 := 76$	$Tdi_1 := 85$	$Tdo_1 := 85$	$T_1 := 15$
$H_2 := 0.75$	$Vw_2 := 4.71$	$Vd_2 := 4.89$	$Tw_2 := 74$	$Tdi_2 := 88$	$Tdo_2 := 88$	$T_2 := 10$
$H_3 := 1.0$	$Vw_3 := 5.38$	$Vd_3 := 5.61$	$Tw_3 := 74$	$Tdi_3 := 89$	$Tdo_3 := 89$	$T_3 := 10$
$H_4 := 1.5$	$Vw_4 := 6.64$	$Vd_4 := 6.94$	$Tw_4 := 74$	$Tdi_4 := 92$	$Tdo_4 := 92$	$T_4 := 10$
$H_5 := 2.0$	$Vw_5 := 7.57$	$Vd_5 := 7.93$	$Tw_5 := 74$	$Tdi_5 := 94$	$Tdo_5 := 94$	$T_5 := 10$
$H_6 := 4.0$	$Vw_6 := 5.26$	$Vd_6 := 5.52$	$Tw_6 := 75$	$Tdi_6 := 96$	$Tdo_6 := 96$	$T_6 := 5$

Calculation of Average Meter Temperature

$$Tda_a := \frac{[Tdo_a + Tdi_a]}{2}$$

Calculation of Dry Gas Meter Calibration Factor

$$Y_a := \frac{Vw_a \cdot Pb \cdot [Tda_a + 460]}{Vd_a \cdot \left[Pb + \frac{H_a}{13.6}\right] \cdot [Tw_a + 460]}$$

Intermediate Y Values

a	Y_a
1	0.9837
2	0.9866
3	0.9835
4	0.9854
5	0.9855
6	0.9807

Average Dry Gas Meter Calibration Factor

$$Y := \frac{\left[\sum_a Y_a\right]}{6}$$

$Y = 0.9842$

Note: The acceptable range for Y is + or - 0.02 of the average value.

The Difference Between Intermediate Y Values and Average Y

a	$Y_a - 0.9842$
1	-0.0005
2	0.0024
3	-0.0007
4	0.0012
5	0.0013
6	-0.0035

Dry Gas Meter Calibration

Calibration Date: September 21, 1992
Console Identification: Meter No.1
Wet Test Meter No.: 29045
Barometric Pressure: 29.97
Calibrated By: Roger T. Caldwell

Calculation of Delta H at the Orifice

$$Hat_a := \frac{[0.0317 \cdot H_a]}{[Pb \cdot [Tdo_a + 460]]} \cdot \left[\frac{[[Tw_a + 460] \cdot T_a]}{Vw_a}\right]^2$$

Intermeidate Delta H at the Orifice Values

a	Hat_a
1	1.82
2	1.861
3	1.898
4	1.859
5	1.9
6	1.968

Calculation of Average Delta H at the Orifice

$$Hat := \frac{\left[\sum_a Hat_a\right]}{6}$$

$Hat = 1.8844$

Note: The acceptable difference between Average Hat and individual Hat must not be more than 0.20.

The Difference Between Intermediate Delta Hat Values and Average Delta Hat

a	$Hat_a - 1.8844$
1	-0.0639
2	-0.0236
3	0.0137
4	-0.0254
5	0.0157
6	0.0836

Thermocouple and Barometer Calibration

Calibration Date: September 21, 1992
Calibration Device: NIST Thermometer
Calibrated By: Roger Caldwell

Thermometer Calibration

Device	Ice Bath	Ambient Air	Hot Water
NIST Thermometer	35	92	190
Meter Thermocouple	36	94	189
Impinger Oulet Temperature	37	93	191
Stack Temperature	35	91	187
Fitler Thermometer	34	92	188

Barometer Calibration:

Calibration Date: September 21, 1992
Calibration Device: Mercury Barometer
Calibrated By: Roger Caldwell

Mercury Barometer = 29.97

Aneriod Barometer 29.97

BOTTORF ASSOCIATES INC.
CONSULTING ENGINEERS-ANALYTICAL LABORATORY
8729 EDGEWATER COMMERCE PARKWAY ORLANDO, FLORIDA 32810-4278
PHONE: (407) 298-0848 FAX: (407) 299-7053

PARTICULATE FIELD DATA

RUN NUMBER 1

FACILITY Southern Soil Services
SOURCE Mobile Soil Remediation Plant
PROJECT NUMBER 1117-4
ΔH AT ORIFICE (IN. H_2O) 1.8844
DATE 11-10-92
NOZZLE DIAMETER (IN.) .311, .312, .311 Avg. = .3113
OPERATOR RC
STACK DIAMETER 19.5
START TIME 8:30 FINISH TIME 9:33
STATIC PRESSURE (IN. H_2O) -.42
K FACTOR 2.2
BAROMETRIC PRESSURE (IN. HG.) 30.23
ASSUMED MOISTURE (%) 20
TEST TIME (MIN.) 60
DRY GAS METER NUMBER 1
METERED VOLUME (FT^3) 50.72
POST LEAK CHECK 0.00 @ 5" H_2O
AVERAGE $\sqrt{\Delta P}$ 1.04
C_P .8399 6' probe
AVERAGE ΔH (IN. H_2O) 2.42
Y .9842
AVERAGE METER TEMPERTURE (°F) 85.9
Y/Y_I
AVERAGE STACK TEMPERTURE (°F) 1138.0

	POINT NUMBER	SAMPLING TIME (MINUTES)	DRY GAS METER (CUBIC FEET) 152.05	VELOCITY HEAD ΔP (IN. H_2O)	PRESSURE DIFFERENTIAL ACROSS ORIFICE ΔH (IN. H_2O)	DRY GAS METER TEMPERTURE (°F)	PUMP VACUUM (IN. HG.)	IMPINGER TEMPERTURE (°F)	HOTBOX TEMPERTURE (°F)	STACK TEMPERTURE (°F)
NE	1	2.5	153.9	.85	1.87	72	0	56	262	990
	2	5	155.8	.86	1.89	73	0	53	260	1134
	3	7.5	157.9	1.1	2.42	73	0	56	261	1107
	4	10	160.1	1.2	2.64	75	0	57	257	1111
	5	12.5	162.2	1.2	2.64	76	0	58	255	1130
	6	15	164.3	1.1	2.42	77	0	58	253	1144
	7	17.5	166.5	1.1	2.42	79	0	58	253	1140
	8	20	168.7	1.2	2.64	80	0	58	251	1155
	9	22.5	171.0	1.3	2.86	82	0	59	249	1170
	10	25	173.4	1.3	2.86	84	0	59	253	1093
	11	27.5	175.6	1.3	2.86	86	0	59	257	1092
	12	30	177.5	1.2	2.64	87	0	59	258	1082
SE	13	1	179.6	1.1	2.42	27	0	60	251	1070
	14	2	181.8	1.1	2.42	88	0	59	249	1076
	15	3	184.0	1.1	2.42	90	0	59	255	1080
	16	4	186.3	1.2	2.64	91	0	59	258	1130
	17	5	188.3	1.1	2.42	93	0	59	257	1128
	18	6	190.5	1.1	2.42	93	0	60	258	1195
	19	7	192.7	1.1	2.42	94	0	60	256	1208
	20	8	194.8	1.1	2.42	95	0	60	259	1225
	21	9	196.9	1.1	2.42	96	1	60	256	1216
	22	10	199.2	1.0	2.2	97	0	60	260	1215
	23	11	200.9	.87	1.9	97	0	60	264	1214
	24	12	202.77	.82	1.8	98	0	60	262	1208

BOTTORF ASSOCIATES INC.
CONSULTING ENGINEERS-ANALYTICAL LABORATORY
6729 EDGEWATER COMMERCE PARKWAY ORLANDO, FLORIDA 32810-4278
PHONE: (407) 298-0046 FAX: (407) 299-7053

PARTICULATE FIELD DATA

RUN NUMBER 2

FACILITY Southern Soil Services
SOURCE Mobile Soil Remediation Plant
PROJECT NUMBER 1117-4
ΔH AT ORIFICE (IN. H_2O) 1.8844
DATE 11-10-92
NOZZLE DIAMETER (IN.) .3113
OPERATOR RC
STACK DIAMETER 19.5
START TIME 10:48 FINISH TIME 11:52
STATIC PRESSURE (IN. H_2O) -.42
K FACTOR 2.8
BAROMETRIC PRESSURE (IN. HG.) 30.23
ASSUMED MOISTURE (%) 10
TEST TIME (MIN.) 60
DRY GAS METER NUMBER 1
METERED VOLUME (FT^3) 60.67
POST LEAK CHECK 0.00@5"H_2O
AVERAGE $\sqrt{\Delta P}$ 1.11
C_p .8399 6' probe
AVERAGE ΔH (IN. H_2O) 3.47
Y .9842
AVERAGE METER TEMPERTURE (°F) 94.7
Y/Y_I
AVERAGE STACK TEMPERTURE (°F) 1558.5

	POINT NUMBER	SAMPLING TIME (MINUTES)	DRY GAS METER (CUBIC FEET) 204.65	VELOCITY HEAD ΔP (IN. H_2O)	PRESSURE DIFFERENTIAL ACROSS ORIFICE ΔH (IN. H_2O)	DRY GAS METER TEMPERTURE (°F)	PUMP VACUUM (IN. HG.)	IMPINGER TEMPERTURE (°F)	HOTBOX TEMPERTURE (°F)	STACK TEMPERTURE (°F)
SC	1	2.5	207.1	1.1	3.08	83	0	63	260	1490
	2	5	209.2	.91	2.55	83	0	55	254	1489
	3	7.5	211.6	1.05	2.94	84	0	57	255	1508
	4	10	213.9	1.1	3.08	85	0	57	258	1530
	5	12.5	216.4	1.2	3.36	86	0	57	259	1553
	6	15	218.9	1.25	3.5	88	0	58	250	1561
	7	17.5	221.5	1.3	3.64	89	1	58	254	1576
	8	20	224.0	1.3	3.64	91	1	58	260	1572
	9	22.5	226.5	1.25	3.5	92	1	59	264	1571
	10	25	229.0	1.1	3.08	94	1	59	266	1582
	11	27.5	231.3	1.0	2.8	95	1	59	266	1578
	12	30	233.4	.92	2.58	96	1	60	264	1580
13	1	2.5	235.9	1.0	2.8	95	1	62	262	1538
14	2	5	238.4	1.2	3.36	96	1	60	260	1554
15	3	7.5	241.0	1.3	3.64	97	1	60	260	1577
16	4	10	243.6	1.4	3.92	98	2	60	262	1566
17	5	12.5	246.3	1.4	3.92	100	2	60	264	1576
18	6	15	249.0	1.3	3.64	101	1	60	265	1584
19	7	17.5	251.5	1.3	3.64	102	1	60	265	1590
20	8	20	254.2	1.5	4.2	102	2	60	264	1565
21	9	22.5	257.0	1.5	4.2	103	2	60	267	1572
22	10	25	259.8	1.5	4.2	104	2	60	268	1566
23	11	27.5	262.5	1.5	4.2	105	2	60	268	1565
24	12	30	265.32	1.4	3.92	106	2	60	266	1561

FILENAME: METHOD11

BOTTORF ASSOCIATES INC.
CONSULTING ENGINEERS-ANALYTICAL LABORATORY
6729 EDGEWATER COMMERCE PARKWAY ORLANDO, FLORIDA 32810-4278
PHONE: (407) 298-0846 FAX: (407) 299-7053

PARTICULATE FIELD DATA

RUN NUMBER 3

FACILITY Southern Soil Services
SOURCE Mobile Soil Remediation Plant
PROJECT NUMBER 1117-4
ΔH AT ORIFICE (IN. H_2O) 1.8844
DATE 11-10-92
NOZZLE DIAMETER (IN.) .3113
OPERATOR RC
STACK DIAMETER 19.5
START TIME 12:35 FINISH TIME 1:38
STATIC PRESSURE (IN. H_2O) -.42
K FACTOR 2.6
BAROMETRIC PRESSURE (IN. HG.) 30.23
ASSUMED MOISTURE (%) 9
TEST TIME (MIN.) 60
DRY GAS METER NUMBER 1
METERED VOLUME (FT^3) 58.42
POST LEAK CHECK 0.00 @ 5" Hg
AVERAGE $\sqrt{\Delta P}$ 1.09
C_P .8399 6' probe
AVERAGE ΔH (IN. H_2O) 3.14
Y .9842
AVERAGE METER TEMPERTURE (°F) 100.8
Y/Y_I 1.001
AVERAGE STACK TEMPERTURE (°F) 1468.4

	POINT NUMBER	SAMPLING TIME (MINUTES)	DRY GAS METER (CUBIC FEET) 266.95	VELOCITY HEAD ΔP (IN. H_2O)	PRESSURE DIFFERENTIAL ACROSS ORIFICE ΔH (IN. H_2O)	DRY GAS METER TEMPERTURE (°F)	PUMP VACUUM (IN. HG.)	IMPINGER TEMPERTURE (°F)	HOTBOX TEMPERTURE (°F)	STACK TEMPERTURE (°F)
	1	2.5	269.0	1.2	3.12	90	0	65	259	1404
	2	5	272.0	1.3	3.38	91	0	58	254	1430
	3	7.5	274.5	1.3	3.38	91	0	59	257	1406
	4	10	276.9	1.35	3.51	92	0	60	257	1420
	5	12.5	279.5	1.30	3.38	94	0	60	255	1455
	6	15	282.0	1.25	3.25	95	0	60	257	1468
	7	17.5	284.5	1.2	3.12	97	0	60	253	1465
	8	20	287.1	1.2	3.12	98	0	60	253	1465
	9	22.5	289.4	1.3	3.38	99	0	60	252	1489
	10	25	291.9	1.4	3.64	100	0	60	255	1482
	11	27.5	294.4	1.4	3.64	101	0	60	257	1480
	12	30	297.0	1.3	3.38	102	0	60	255	1480
13	1	2.5	299.0	.95	2.47	101	0	62	258	1450
14	2	5	301.4	1.0	2.6	102	0	60	256	1448
15	3	7.5	303.7	1.15	2.99	103	0	60	253	1470
16	4	10	306.3	1.3	3.38	104	0	60	250	1476
17	5	12.5	308.8	1.35	3.51	105	1	60	247	1482
18	6	15	311.4	1.30	3.38	106	1	60	244	1480
19	7	17.5	313.9	1.20	3.12	107	0	60	242	1495
20	8	20	316.3	1.20	3.12	108	0	60	240	1505
21	9	22.5	318.7	1.20	3.12	108	0	60	244	1493
22	10	25	321.1	1.1	2.86	109	0	61	252	1498
23	11	27.5	323.4	.90	2.34	109	0	61	256	1494
24	12	30	325.37	.86	2.24	109	0	61	255	1507

EPA METHOD NO.9 TEST PROCEDURE

1. Principle and Applicability

1.1 Principle. The opacity of emissions from stationary sources is determined visually by a qualified observer.

1.2 Applicability This method is applicable for thedetermination of the opacity of emissions from stationary sourcesand for qualifying observers for visually determining opacity ofemissions.

2. Procedures

The observer qualified in accordance with paragraph 3 of thismethod shall use the following procedures for visually determiningthe opacity of emissions:

2.1 Position The qualified observer shall stand at adistance sufficient to provide a clear view of the emissions withthe sun oriented in the 140 sector to his back. Consistent withmaintain the above requirement, the observer shall, as much aspossible, make his observations from a position such that hisline of vision is approximately perpendicular to the plumedirection, and when observing opacity of emissions fromrectangular outlets(e.g., roof monitors, open baghouses,noncircular stacks), approximately perpendicular to the longeraxis of the outlet. The observer's line of sight perpendicularto the longer axis of such a set of multiples stacks (e.g., stubstacks on baghouses).

2.2 Field Records The observer shall record the name ofthe plant, emission location, type facility, observer's name andaffiliation, a sketch of the observer's position relative to thesource, and the date on a field data sheet. The time, estimateddistances to the emission location, approximate wind direction,estimated wind speed, description of the sky condition (presenceand color of clouds), and plume background are recorded on afield data sheet at the time opacity readings are initiated andcompleted.

2.3 Observations Opacity observations shall be made at thepoint of greatest opacity in that portion of the plume wherecondensed water vapor is not present. The observer shall notlook continuously at the plume, but instead shall observe theplume momentarily at 15_second intervals.

2.3.1 Attached Steam Plumes When condensed water vapor ispresent within the plume as it emerges from the emission outlet,opacity observation shall be made beyond the point in the plume
at which condensed water vapor is no longer visible. Theobserver shall record the approximate distance from the emissionoutlet to the point in the plume at which the observations aremade.

2.3.2 Detached Steam Plume When water vapor in the plumecondenses and becomes visible at a distinct distance from theemission outlet, the opacity of emissions should be evaluated atthe emission outlet prior to the condensation of water vapor and the formation of the steam plume.

2.4 Recording Observation Opacity observation shall berecorded to the nearest 5 percent at 15_second intervals on anobservation recorded sheet. A minimum of 24 observations shallbe recorded. Shall be deemed to represent the average opacity ofemissions for a 15_second period.

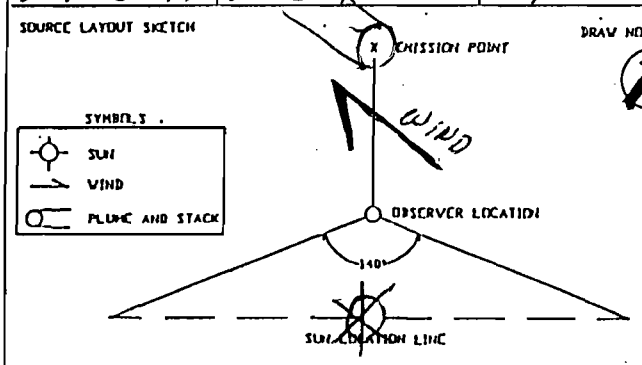
2.5 Data Reduction Opacity shall be determined as anaverage of 24 consecutive observations recorded at 15_secondintervals. Divide the observations recorded on the record sheetinto sets of 24 consecutive observations. A set is composed ofany 24 consecutive observations. Sets need not be consecutive intime and in no case shall two sets overlap. For each set 24observation, calculate the average by summing the opacity of the24 observation and dividing this sum by 24. If an applicablestandard specifies an averaging time requiring more than 24observations calculate the average for all observations madeduring the specified time period. Record the average opacity ona record sheet.

BOTTORF ASSOCIATES INC.
CONSULTING ENGINEERS-ANALYTICAL LABORATORY
8729 EDGEWATER COMMERCE PARKWAY ORLANDO, FLORIDA 32810-4278
PHONE: (407) 298-0848 FAX: (407) 299-7053

EPA METHOD NO.9
VISIBLE EMISSIONS OBSERVATION REPORT

FACILITY NAME: Southern Soil Services
ADDRESS: 3505 Pugmill Rd.
Kissimmee Fl.
COUNTY: Osceola
PERMIT NUMBER: AC49-201051
PROCESS EQUIPMENT: Mobile Soil Remediation Unit
CONTROL EQUIPMENT: Bag House and After Burner
EMISSION POINT: Stack
HEIGHT ABOVE GROUND LEVEL: 24'
HEIGHT RELATIVE TO OBSERVER: 8'
DISTANCE FROM OBSERVER: 175'
DIRECTION FROM OBSERVER: North West
DESCRIBE EMISSIONS: Heat Plume
EMISSION COLOR: Not Visible
PLUME TYPE: ☐ CONTINUOUS ☐ INTERMITTENT ☐ FUGITIVE
WAS STEAM PLUME PRESENT: ☐ YES ☒ NO
PLUME WAS: ☐ ATTACHED ☐ DETACHED
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED: 1½ X The Stack Diamter Down Wind
DESCRIBE BACKGROUND: Tree & Skyline
BACKGROUND COLOR: Green & Gray
SKY CONDITIONS: Overcast
WIND SPEED: 10 to 15 MPH
WIND DIRECTION: West
AMBIENT TEMPERTURE: 72°

SOURCE LAYOUT SKETCH



PROCESS DATA

OBSERVATION DATE: 11/10/92
START TIME: 8:30
STOP TIME: 9:30

SEC / MIN	0	15	30	45	SEC / MIN	0	15	30	45
1	0	0	0	0	31	0	0	0	0
2	0	0	0	0	32	0	0	0	0
3	0	0	0	0	33	0	0	0	0
4	0	0	0	0	34	0	0	0	0
5	0	0	0	0	35	0	0	0	0
6	0	0	0	0	36	0	0	0	0
7	0	0	0	0	37	0	0	0	0
8	0	0	0	0	38	0	0	0	0
9	0	0	0	0	39	0	0	0	0
10	0	0	0	0	40	0	0	0	0
11	0	0	0	0	41	0	0	0	0
12	0	0	0	0	42	0	0	0	0
13	0	0	0	0	43	0	0	0	0
14	0	0	0	0	44	0	0	0	0
15	0	0	0	0	45	0	0	0	0
16	0	0	0	0	46	0	0	0	0
17	0	0	0	0	47	0	0	0	0
18	0	0	0	0	48	0	0	0	0
19	0	0	0	0	49	0	0	0	0
20	0	0	0	0	50	0	0	0	0
21	0	0	0	0	51	0	0	0	0
22	0	0	0	0	52	0	0	0	0
23	0	0	0	0	53	0	0	0	0
24	0	0	0	0	54	0	0	0	0
25	0	0	0	0	55	0	0	0	0
26	0	0	0	0	56	0	0	0	0
27	0	0	0	0	57	0	0	0	0
28	0	0	0	0	58	0	0	0	0
29	0	0	0	0	59	0	0	0	0
30	0	0	0	0	60	0	0	0	0

OPACITY FOR HIGHEST SIX MINUTES: 0
NUMBER OF READINGS ABOVE 0 X WERE 0
MAXIMUM READING: 0
MINIMUM READING: 0

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

THIS IS TO CERTIFY THAT

PAUL C. LIPPERT has completed the STATIONARY visible emissions evaluation training and is a qualified observer of visible emissions as specified by EPA reference method 9.

THIS CERTIFICATE EXPIRES
Jan 17, 1993

CERTIFICATE OFFICER — HOLDER'S SIGNATURE

OBSERVER SIGNATURE: Paul C. Lippert
DATE: 11/10/92

BOTTORF Associates inc.

6729 Edgewater Commerce Parkway • Orlando, Florida • 32810-4278 • Phone 407 298-0846 • Fax: 407 299-7053

Soil Analysis Report

Sample Received From: Southern Soil Services, Inc.
3505 Pugmill Road
Kissimmee, FL 34741

Lab Control Number: 4617

Date Sampled: November 10, 1992
Date Received: November 10, 1992
Date Reported: November 24, 1992
Sample Name: Run No. 1 Input to Dryer Composite Sample

Parameter	Analysis Method	Reporting Units	Method Detection Limit	Accuracy % recovery	Precision % r.s.d.	Result
Total Petroleum Hydrocarbons	9073	mg/kg	1.0	113	9.58	1015.24
Arsenic	7061	mg/kg	0.4	102	0.0	1.0
Barium	7080	mg/kg	0.025	96.8	5.17	7.06
Cadmium	7131	mg/kg	0.05	106	3.77	<0.05
Chromium	7191	mg/kg	0.1	101	3.60	2.49
Lead	7421	mg/kg	0.05	104	7.25	4.29
Mercury	7471	mg/kg	0.001	102	13.7	<0.001
Selenium	7041	mg/kg	0.5	83.4	2.39	<0.5
Silver	7760	mg/kg	0.05	129	13.1	0.65
Methyl-tert-butyl-ether	8020	ug/kg	0.5	89.3	8.56	<2.5
Benzene	8020	ug/kg	0.1	82.4	1.84	<2.5
Toluene	8020	ug/kg	0.1	100.4	0.71	8.8
Chlorobenzene	8020	ug/kg	0.1	106.8	3.82	<2.5
Ethyl benzene	8020	ug/kg	0.1	87.6	2.26	<2.5
m&p-Xylene	8020	ug/kg	0.1	109.8	6.79	81.0
o-Xylene	8020	ug/kg	0.1	86.20	2.26	80.4
m-Dichlorobenzene	8020	ug/kg	0.1	114.5	1.36	<2.5
p-Dichlorobenzene	8020	ug/kg	0.1	114.8	0.12	<2.5
o-Dichlorobenzene	8020	ug/kg	0.1	106.0	6.42	<2.5
Total BTEX	8020	ug/kg	n/a	n/a	n/a	170.2
PID Spike	8020	ug/kg	n/a	n/a	n/a	102.7
8020 Dilution Factor	8020	x	n/a	n/a	n/a	5

Data Release Authorization

The sample integrity and reliability was verified by Laboratory personnel prior to analysis. Analysis method used are in accordance with F.A.C. 17-775 and applicable EPA protocols. Laboratory Quality Assurance is in accordance with Bottorf Associates Comprehensive Quality Assurance Plan No. 910102G.

Kent D. Bottorf
Laboratory Director

Kt D. Bottorf
Signature

11/24/92
Date

BOTTORF Associates inc.

6729 Edgewater Commerce Parkway • Orlando, Florida • 32810-4278 • Phone 407 298-0846 • Fax: 407 299-7053

Soil Analysis Report

Sample Received From: Southern Soil Services, Inc.
3505 Pugmill Road
Kissimmee, FL 34741

Lab Control Number: 4619

Date Sampled: November 10, 1992
Date Received: November 10, 1992
Date Reported: November 24, 1992
Sample Name: Run No. 2 Input to Dryer Composite Sample

Parameter	Analysis Method	Reporting Units	Method Detection Limit	Accuracy % recovery	Precision % r.s.d.	Result
Total Petroleum Hydrocarbons	9073	mg/kg	1.0	113	9.58	792.12
Arsenic	7061	mg/kg	0.4	102	0.0	1.05
Barium	7080	mg/kg	0.025	96.8	5.17	9.05
Cadmium	7131	mg/kg	0.05	106	3.77	<0.05
Chromium	7191	mg/kg	0.1	101	3.60	2.05
Lead	7421	mg/kg	0.05	104	7.25	3.50
Mercury	7471	mg/kg	0.001	102	13.7	<0.001
Selenium	7041	mg/kg	0.5	83.4	2.39	<0.5
Silver	7760	mg/kg	0.05	129	13.1	<0.05
Methyl-tert-butyl-ether	8020	ug/kg	0.5	89.3	8.56	<2.5
Benzene	8020	ug/kg	0.1	82.4	1.84	<2.5
Toluene	8020	ug/kg	0.1	100.4	0.71	18.8
Chlorobenzene	8020	ug/kg	0.1	106.8	3.82	<2.5
Ethyl benzene	8020	ug/kg	0.1	87.6	2.26	<2.5
m&p-Xylene	8020	ug/kg	0.1	109.8	6.79	125.1
o-Xylene	8020	ug/kg	0.1	86.20	2.26	86.3
m-Dichlorobenzene	8020	ug/kg	0.1	114.5	1.36	<2.5
p-Dichlorobenzene	8020	ug/kg	0.1	114.8	0.12	<2.5
o-Dichlorobenzene	8020	ug/kg	0.1	106.0	6.42	<2.5
Total BTEX	8020	ug/kg	n/a	n/a	n/a	230.2
PID Spike	8020	ug/kg	n/a	n/a	n/a	98.6
8020 Dilution Factor	8020	x	n/a	n/a	n/a	5

Data Release Authorization

The sample integrity and reliability was verified by Laboratory personnel prior to analysis. Analysis method used are in accordance with F.A.C. 17-775 and applicable EPA protocols. Laboratory Quality Assurance is in accordance with Bottorf Associates Comprehensive Quality Assurance Plan No. 910102G.

Kent D. Bottorf
Laboratory Director

K D Bottorf
Signature

11/24/92
Date

BOTTORF Associates inc.

6729 Edgewater Commerce Parkway • Orlando, Florida • 32810-4278 • Phone 407 298-0846 • Fax: 407 299-7053

Soil Analysis Report

Sample Received From: Southern Soil Services, Inc.
3505 Pugmill Road
Kissimmee, FL 34741

Lab Control Number: 4621

Date Sampled: November 10, 1992
Date Received: November 10, 1992
Date Reported: November 24, 1992
Sample Name: Run No. 3 Input to Dryer Composite Sample

Parameter	Analysis Method	Reporting Units	Method Detection Limit	Accuracy % recovery	Precision % r.s.d.	Result
Total Petroleum Hydrocarbons	9073	mg/kg	1.0	113	9.58	751.12
Arsenic	7061	mg/kg	0.4	102	0.0	0.82
Barium	7080	mg/kg	0.025	96.8	5.17	10.8
Cadmium	7131	mg/kg	0.05	106	3.77	0.26
Chromium	7191	mg/kg	0.1	101	3.60	2.64
Lead	7421	mg/kg	0.05	104	7.25	7.75
Mercury	7471	mg/kg	0.001	102	13.7	<0.001
Selenium	7041	mg/kg	0.5	83.4	2.39	<0.5
Silver	7760	mg/kg	0.05	129	13.1	0.45
Methyl-tert-butyl-ether	8020	ug/kg	0.5	89.3	8.56	<2.5
Benzene	8020	ug/kg	0.1	82.4	1.84	<2.5
Toluene	8020	ug/kg	0.1	100.4	0.71	2.3
Chlorobenzene	8020	ug/kg	0.1	106.8	3.82	<2.5
Ethyl benzene	8020	ug/kg	0.1	87.6	2.26	<2.5
m&p-Xylene	8020	ug/kg	0.1	109.8	6.79	25.5
o-Xylene	8020	ug/kg	0.1	86.20	2.26	15.9
m-Dichlorobenzene	8020	ug/kg	0.1	114.5	1.36	<2.5
p-Dichlorobenzene	8020	ug/kg	0.1	114.8	0.12	<2.5
o-Dichlorobenzene	8020	ug/kg	0.1	106.0	6.42	<2.5
Total BTEX	8020	ug/kg	n/a	n/a	n/a	43.7
PID Spike	8020	ug/kg	n/a	n/a	n/a	84.2
8020 Dilution Factor	8020	x	n/a	n/a	n/a	5

Data Release Authorization

The sample integrity and reliability was verified by Laboratory personnel prior to analysis. Analysis method used are in accordance with F.A.C. 17-775 and applicable EPA protocols. Laboratory Quality Assurance is in accordance with Bottorf Associates Comprehensive Quality Assurance Plan No. 910102G.

Kent D. Bottorf
Laboratory Director

Signature

11/24/92
Date

BOTTORF Associates inc.

6729 Edgewater Commerce Parkway • Orlando, Florida • 32810-4278 • Phone 407 298-0846 • Fax: 407 299-7053

Soil Analysis Report

Sample Received From: Southern Soil Services, Inc.
3505 Pugmill Road
Kissimmee, FL 34741

Lab Control Number: 4618

Date Sampled: November 10, 1992
Date Received: November 10, 1992
Date Reported: November 24, 1992
Sample Name: Run No. 1 Output from Dryer Composite Sample

Parameter	Analysis Method	Reporting Units	Method Detection Limit	Accuracy % recovery	Precision % r.s.d.	Result
Total Petroleum Hydrocarbons	9073	mg/kg	1.0	113	9.58	11.92
Arsenic	7061	mg/kg	0.4	102	0.0	0.81
Barium	7080	mg/kg	0.025	96.8	5.17	5.04
Cadmium	7131	mg/kg	0.05	106	3.77	<0.05
Chromium	7191	mg/kg	0.1	101	3.60	1.82
Lead	7421	mg/kg	0.05	104	7.25	2.28
Mercury	7471	mg/kg	0.001	102	13.7	<0.001
Selenium	7041	mg/kg	0.5	83.4	2.39	<0.5
Silver	7760	mg/kg	0.05	129	13.1	0.12
Methyl-tert-butyl-ether	8020	ug/kg	0.5	89.3	8.56	<0.5
Benzene	8020	ug/kg	0.1	82.4	1.84	<0.5
Toluene	8020	ug/kg	0.1	100.4	0.71	0.9
Chlorobenzene	8020	ug/kg	0.1	106.8	3.82	<0.5
Ethyl benzene	8020	ug/kg	0.1	87.6	2.26	<0.5
m&p-Xylene	8020	ug/kg	0.1	109.8	6.79	0.6
o-Xylene	8020	ug/kg	0.1	86.20	2.26	<0.5
m-Dichlorobenzene	8020	ug/kg	0.1	114.5	1.36	<0.5
p-Dichlorobenzene	8020	ug/kg	0.1	114.8	0.12	<0.5
o-Dichlorobenzene	8020	ug/kg	0.1	106.0	6.42	<0.5
Total BTEX	8020	ug/kg	n/a	n/a	n/a	1.5
PID Spike	8020	ug/kg	n/a	n/a	n/a	82.0
8020 Dilution Factor	8020	x	n/a	n/a	n/a	1

Data Release Authorization

The sample integrity and reliability was verified by Laboratory personnel prior to analysis. Analysis method used are in accordance with F.A.C. 17-775 and applicable EPA protocols. Laboratory Quality Assurance is in accordance with Bottorf Associates Comprehensive Quality Assurance Plan No. 910102G.

Kent D. Bottorf
Laboratory Director

Signature

11/24/92
Date

BOTTORF Associates inc.

6729 Edgewater Commerce Parkway • Orlando, Florida • 32810-4278 • Phone 407 298-0846 • Fax: 407 299-7053

Soil Analysis Report

Sample Received From: Southern Soil Services, Inc.
3505 Pugmill Road
Kissimmee, FL 34741

Lab Control Number: 4620

Date Sampled: November 10, 1992
Date Received: November 10, 1992
Date Reported: November 24, 1992
Sample Name: Run No. 2 Output from Dryer Composite Sample

Parameter	Analysis Method	Reporting Units	Method Detection Limit	Accuracy % recovery	Precision % r.s.d.	Result
Total Petroleum Hydrocarbons	9073	mg/kg	1.0	113	9.58	10.15
Arsenic	7061	mg/kg	0.4	102	0.0	0.82
Barium	7080	mg/kg	0.025	96.8	5.17	6.71
Cadmium	7131	mg/kg	0.05	106	3.77	<0.05
Chromium	7191	mg/kg	0.1	101	3.60	1.66
Lead	7421	mg/kg	0.05	104	7.25	2.89
Mercury	7471	mg/kg	0.001	102	13.7	<0.001
Selenium	7041	mg/kg	0.5	83.4	2.39	<0.5
Silver	7760	mg/kg	0.05	129	13.1	0.55
Methyl-tert-butyl-ether	8020	ug/kg	0.5	89.3	8.56	<0.5
Benzene	8020	ug/kg	0.1	82.4	1.84	<0.5
Toluene	8020	ug/kg	0.1	100.4	0.71	0.6
Chlorobenzene	8020	ug/kg	0.1	106.8	3.82	<0.5
Ethyl benzene	8020	ug/kg	0.1	87.6	2.26	<0.5
m&p-Xylene	8020	ug/kg	0.1	109.8	6.79	0.5
o-Xylene	8020	ug/kg	0.1	86.20	2.26	<0.5
m-Dichlorobenzene	8020	ug/kg	0.1	114.5	1.36	<0.5
p-Dichlorobenzene	8020	ug/kg	0.1	114.8	0.12	<0.5
o-Dichlorobenzene	8020	ug/kg	0.1	106.0	6.42	<0.5
Total BTEX	8020	ug/kg	n/a	n/a	n/a	1.1
PID Spike	8020	ug/kg	n/a	n/a	n/a	108.2
8020 Dilution Factor	8020	x	n/a	n/a	n/a	1

Data Release Authorization

The sample integrity and reliability was verified by Laboratory personnel prior to analysis. Analysis method used are in accordance with F.A.C. 17-775 and applicable EPA protocols. Laboratory Quality Assurance is in accordance with Bottorf Associates Comprehensive Quality Assurance Plan No. 910102G.

Kent D. Bottorf
Laboratory Director

Kent D Bottorf
Signature

11/24/92
Date

BOTTORF Associates inc.

6729 Edgewater Commerce Parkway • Orlando, Florida • 32810-4278 • Phone 407 298-0846 • Fax: 407 299-7053

Soil Analysis Report

Sample Received From: Southern Soil Services, Inc.
3505 Pugmill Road
Kissimmee, FL 34741

Lab Control Number: 4622

Date Sampled: November 10, 1992
Date Received: November 10, 1992
Date Reported: November 24, 1992
Sample Name: Run No. 3 Output from Dryer Composite Sample

Parameter	Analysis Method	Reporting Units	Method Detection Limit	Accuracy % recovery	Precision % r.s.d.	Result
Total Petroleum Hydrocarbons	9073	mg/kg	1.0	113	9.58	9.15
Arsenic	7061	mg/kg	0.4	102	0.0	0.52
Barium	7080	mg/kg	0.025	96.8	5.17	9.26
Cadmium	7131	mg/kg	0.05	106	3.77	<0.05
Chromium	7191	mg/kg	0.1	101	3.60	1.97
Lead	7421	mg/kg	0.05	104	7.25	2.80
Mercury	7471	mg/kg	0.001	102	13.7	<0.001
Selenium	7041	mg/kg	0.5	83.4	2.39	<0.5
Silver	7760	mg/kg	0.05	129	13.1	0.67
Methyl-tert-butyl-ether	8020	ug/kg	0.5	89.3	8.56	<0.5
Benzene	8020	ug/kg	0.1	82.4	1.84	<0.5
Toluene	8020	ug/kg	0.1	100.4	0.71	<0.5
Chlorobenzene	8020	ug/kg	0.1	106.8	3.82	<0.5
Ethyl benzene	8020	ug/kg	0.1	87.6	2.26	<0.5
m&p-Xylene	8020	ug/kg	0.1	109.8	6.79	<0.5
o-Xylene	8020	ug/kg	0.1	86.20	2.26	<0.5
m-Dichlorobenzene	8020	ug/kg	0.1	114.5	1.36	<0.5
p-Dichlorobenzene	8020	ug/kg	0.1	114.8	0.12	<0.5
o-Dichlorobenzene	8020	ug/kg	0.1	106.0	6.42	<0.5
Total BTEX	8020	ug/kg	n/a	n/a	n/a	<0.5
PID Spike	8020	ug/kg	n/a	n/a	n/a	108.2
8020 Dilution Factor	8020	x	n/a	n/a	n/a	1

Data Release Authorization

The sample integrity and reliability was verified by Laboratory personnel prior to analysis. Analysis method used are in accordance with F.A.C. 17-775 and applicable EPA protocols. Laboratory Quality Assurance is in accordance with Bottorf Associates Comprehensive Quality Assurance Plan No. 910102G.

Kent D. Bottorf
Laboratory Director

Signature

11/24/92
Date

PC&B Environmental Laboratories, Inc.
3401 Lake Breeze Road, Orlando, Florida 32808
Phone: 407-290-3245 Fax: 407-297-6924

November 20, 1992

Roger Caldwell
Bottorf & Associates
6729 Edgewater Commerce Parkway
Orlando,Fl 32810

Dear Mr. Caldwell,

Enclosed are the results of the analysis of your samples received November 10, 1992.

Our laboratory is certified by the Florida DHRS (Lab #E83239) and operates under an FDER approved Comprehensive Quality Assurance Plan (# 900134G). All data were determined in accordance with published procedures (EPA-600/4-79-020), Methods for Chemical Analysis of Water and Wastes, Revised March 1983 and/or Standard Methods for the Examination of Water and Wastewater 17th Edition 1989 and/or Test Methods for Evaluating Solid Waste (EPA-SW-846, Revised November 1989), unless stated otherwise in our CompQAPP under method modifications.

If you have any questions, please do not hesitate to give me a call.

Sincerely,

Declan Cowley
Laboratory Director

PC&B Environmental Laboratories, Inc.
3401 Lake Breeze Road, Orlando, Florida 32808
Phone: 407-290-3245 Fax: 407-297-6924

November 20, 1992

CLIENT: Bottorf & Associates
6729 Edgewater Pkwy.
Orlando, Fl 32810

CONTACT: Roger Caldwell
407-

PROJECT NAME: Southern Soil Services
PROJECT NUMBER: 1117 Afterburner

REFERENCE: Work Order Number 9211056

Lab Sample Number	Matrix	Client ID	Date/Time Sampled
9211056-1	Air	1117-1	11-10-92 0830-0933
9211056-2	Air	1117-2	11-10-92 1048-1152
9211056-3	Air	1117-3	11-10-92 1235-1338

Parameters

3 Volatile (Air)

Declan Cowley
Laboratory Director

PC&B Environmental Laboratories, Inc.
3401 Lake Breeze Road
Orlando Fl 32808
PHONE : 407-290-3245

VOLATILE AROMATICS

CLIENT NAME : BOTTOFF & ASSOCIATES
PROJECT NAME : SOUTHERN SOIL SERVICES
PROJECT NUMBER : 1117 AFTERBURNER
DATE RECEIVED : 11-10-92
PROTOCOL : METHOD 18

Lab Reference Number	9211056-1	9211056-2	9211056-3
Client Sample ID	1117-1	1117-2	1117-3
Date Sampled	11-10-92	11-10-92	11-10-92
Date Extracted	NA	NA	NA
Date Analyzed	11-11-92	11-11-92	11-11-92
Confirmed	GCMS	GCMS	GCMS
Matrix	AIR	AIR	AIR
Benzene	2890	320	100
Toluene	920	160	39
Ethylbenzene	135	26	10 U
Chlorobenzene	10 U	10 U	10 U
m + p-Xylenes	220	52	28
o-Xylene	130	24	12
1,3-Dichlorobenzene	10 U	10 U	10 U
1,2-Dichlorobenzene	10 U	10 U	10 U
1,4-Dichlorobenzene	10 U	10 U	10 U
MTBE	50 U	1460	100
Total Hydrocarbons	188000	18650	13200
Result Units	ng/l (wt/vol)	ng/l (wt/vol)	ng/l (wt/vol)
% Moisture	NA	NA	NA
Dilution Factor	5	5	5

U = indicates the compound was analysed for, but not detected at the specified value.

CompQAP #900134G/E83239/83353

REVIEWED BY : _____

PC&B Laboratories, Inc.

3401 Lake Breeze Road, Orlando, Fl 32808
407-290-3245 (FAX) 407-297-6924

Chain of Custody

Work Order: 9211056

Date: _____ Page _____ of _____

COMPANY Bottaf & Associates Inc.
ADDRESS 6729 Edwatet Commerce Pkwy. Orlando 32810
SAMPLED BY Roget Caldwell
SIGN
PHONE NO:

#	SAMPLE ID.	DATE/TIME	MATRIX	ANALYSIS REQUEST	NUMBER OF CONTAINERS
1	1117-1	11-10-92 8:30-9:33	AIR		
2	1117-2	11-10-92 10:48-11:52			
3	1117-3	11-10-92 12:36-1:38			
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					

RELINQUISHED BY	DATE/TIME	RECEIVED BY	DATE/TIME
1: Roger Caldwell	11-10-92 1635	1:	11/10/92 1635
2:		2:	
3:		3:	

SPECIAL INSTRUCTIONS/COMMENTS:

PROJECT INFORMATION

PROJECT NAME: Southern Soil Services
PROJECT #: 1117 Afterburner
SITE ADDRESS: Pugmill Rd. Kissimmee
PROJECT MANAGER: Roger Caldwell
INVOICE TO
(IF DIFFERENT FROM ABOVE)

SAMPLE RECEIPT

Total No. of Containers
Chain of Custody Seals
Rec'd Good Condition/Cold
PO#:
SHIPPED VIA

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, and 4a & b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece next to the article number.

I also wish to receive the following services (for an extra fee):
1. ☒ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Mr. Burton A Keene, Pres.
Southern Soils Services, Inc.
3640 Thompson Road
Lake Mary, FL 32746

4a. Article Number
P 832 538 760

4b. Service Type
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail ☐ Return Receipt for Merchandise

7. Date of Delivery
1/6/92

5. Signature (Addressee)

6. Signature (Agent)
Howard Keene

8. Addressee's Address (Only if requested and fee is paid)

PS Form **3811**, October 1990 ☆U.S. GPO: 1990—273-861 **DOMESTIC RETURN RECEIPT**

P 832 538 760

Certified Mail Receipt
No Insurance Coverage Provided
Do not use for International Mail
(See Reverse)

UNITED STATES POSTAL SERVICE

Sent to Mr. Burton A. Keene, Pres.	
Street & No. Southern Soils Services, Inc. 3640 Thompson Road	
P.O., State & ZIP Code Lake Mary, FL 32746	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Address of Delivery	
TOTAL Postage & Fees	$
Postmark or Date mailed: 1/3/92 AC 49-201051	

PS Form **3800**, June 1990

File Copy

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
NOTICE OF PERMIT

In the matter of an
Application for Permit by:

DER File No. AC 49-201051
Osceola County

Mr. Burton A. Keene, President
Southern Soil Services, Inc.
3640 Thompson Road
Lake Mary, Florida 32746

/

Enclosed is Permit Number AC 49-201051 for a 10 TPH transportable soil thermal treatment facility that is allowed to operate in Osceola County, Florida. This permit is issued pursuant to Section(s) 403, Florida Statutes.

Any party to this Order (permit) has the right to seek judicial review of the permit pursuant to Section 120.68, Florida Statutes, by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Office of General Counsel, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400; and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 days from the date this Notice is filed with the Clerk of the Department.

In addition, please be advised that soil thermal treatment facilities are subject to F.A.C. Rule 17-775. This rule is administered by the Bureau of Waste Cleanup. Pursuant to that rule, Southern Soil Services, Inc. may be required to obtain a general permit to operate this unit from the Bureau of Waste Cleanup.

Executed in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

for Barry D. Andrews

C. H. Fancy, P.E., Chief
Bureau of Air Regulation
2600 Blair Stone Road
Tallahassee, FL 32399-2400
904-488-1344

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this NOTICE OF PERMIT and all copies were mailed before the close of business on 1-3-92 to the listed persons.

Clerk Stamp

FILING AND ACKNOWLEDGMENT FILED,
on this date, pursuant to
§120.52(11), Florida Statutes,
with the designated Department
Clerk, receipt of which is hereby
acknowledged.

Patricia Albritton 1-3-92
(Clerk) (Date)

Copies furnished to:

District Air Program Administrators
County Air Program Administrators
Tom Conrardy, BWC
John Bottorf, Jr., P.E.
Bill Goazion, Co. Adm., Osceola Co.
Ready File
Willard Hanks

} 1/3/92 RAM

Final Determination

Southern Soil Services, Inc.
Lake Mary, Seminole County, Florida

10 TPH Transportable Soil Thermal Treatment Facility

Permit Number: AC 49-201051

Department of Environmental Regulation
Division of Air Resources Management
Bureau of Air Regulation

December 6, 1991

Final Determination

The Technical Evaluation and Preliminary Determination for the permit to construct a 10 TPH transportable thermal soil treatment facility (rotary kiln with a baghouse and afterburner) was distributed on October 25, 1991. The Notice of Intent to Issue was published on October 31, 1991, in The Orlando Sentinel. Copies of the evaluation were available for public inspection at all Department District offices and the following county air program offices: Broward, Dade, Duval, Hillsborough, Palm Beach, Pinellas, Sarasota, and Orange.

The Department received comments from the Environmental Protection Commission of Hillsborough County and the Department's Southwest District.

The County requested the NEDs number and make/model number of the rotary dryer and baghouse be included in the permit. A more detailed description of this equipment is included on the first page of the permit. The County questioned whether "off-spec" material can be treated in this unit. Specific Condition No. 15 describes a procedure for the permittee to request permission to treat "off-spec" material. It allows the Department to consider the request on a case-by-case basis. As it does not commit the Department to approving such a request, this condition is being left in the permit.

The Southwest District submitted several comments including the following: a concern about analyzing the soil to determine if the petroleum product is "on-spec"; the need for a leaching test on the soil; the need for clarification on compliance with local regulations and notification of local governments agencies; the need to specify the items to include in the unit's operating log; the need to state how to determine compliance with the fuel restrictions; the need to report all test results to the Department; the need to include records of the plant operation during the compliance test in the report and a concern that the permittee might treat soil containing metals above the limits specified in the permit. The Department's response to these comments follows:

The rule on soil thermal treatment facilities currently being drafted by the Department will replace the previous policies for these operations. To separate the oil from the soil prior to analysis may not be feasible. The leachable metal content of the soil is part of the criteria for determining if the soil is hazardous waste. The air program is also concerned with whether the total metal content of the soil could result in an exceedance of the no threat level for the metals. Therefore, the requirement that the permittee analyze for both total and TCLP metals is being left in Specific Condition No. 14 of this permit.

Specific Condition No. 23 was reworded to clarify that this construction permit requires compliance with the air regulations of any Department approved county environmental program.

Specific Condition No. 24 was reworded to clarify that the relocation notification will be sent to the District and County environmental agency in which the unit proposed to operate.

Specific Condition No. 25 was reworded to list the data to be included in the facility operation log.

Specific Condition No. 13 was amended to require the fuel analysis report be the basis to determine compliance with the fuel sulfur content limitation.

Specific Condition No. 29 was amended to specify the data required with the stack tests report and the distribution list for the report.

F.A.C. Rule 17-775 allows some blending of soils to meet the clean soil criteria. Specific Condition No. 14 was amended to note that the metal concentrations in the soil were to be based on dry samples.

The final action of the Department will be to issue construction permit No. AC 49-201051 as proposed in the Technical Evaluation and Preliminary Determination except for the changes discussed above.

Florida Department of Environmental Regulation

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

Lawton Chiles, Governor

Carol M. Browner, Secretary

PERMITTEE:
Southern Soil Services, Inc.
3640 Thompson Road
Lake Mary, Florida 32746

Permit Number: AC 49-201051
Expiration Date: January 1, 1993
County: Mobile Operation
Project: 10 TPH Transportable Mobile Soil Thermal Treatment Facility
NEDS No. 30 ORL 4900 4101

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Chapters 17-2 and 17-4. 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:

Authorization to construct a 10 TPH relocatable soil thermal treatment facility. The main components of the facility are a contaminated soil charge chute, a variable speed and pitch 4 ft. diameter by 20 ft. long rotary dryer with 16 flights that are 16 inches deep and run the full length of the dryer, a 99% efficient custom built reverse air cleaning baghouse containing 804.25 sq. ft. of acrylic filter, a 95% efficient custom built 1.5 ft. diameter by 48 ft. long afterburner having 0.6 seconds retention time at 1400°F, two No. 2 fuel oil burners (8.6 and 6.0 MMBtu/hr), a 6000 CFM exhaust fan, a 2 ft. square by 25 ft. high stack, and associated equipment.

This facility will operate in Osceola County.

The facility may be operated in other counties within the State after satisfactorily completing the public notice requirements (F.A.C. Rule 17-2.220) for the counties and receiving Department authorization to operate at the new location.

The source shall be constructed in accordance with the permit application, plans, documents, amendments and drawings, except as otherwise noted in the General and Specific Conditions.

Attachments are listed below:

1. Application received Aug. 15, 1991.
2. DER letter dated Aug. 28, 1991.
3. Bottorf Assoc. letter dated Sept. 4, 1991.
4. EPCHC letter dated October 31, 1991.
5. DER letter dated November 4, 1991.

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth in this permit are "Permit Conditions" and are binding and enforceable pursuant to Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.

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. Neither 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 is not 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, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefore; 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.

GENERAL CONDITIONS:

6. The permittee shall 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 and at a reasonable time, access to the premises, where the permitted activity is located or conducted to:

a. Have access to and copy any records that must be kept under the conditions of the permit;

b. Inspect the facility, equipment, practices, or operations regulated or required under this permit; and

c. Sample or monitor 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 provide the Department with the following information:

a. a description of and cause of non-compliance; and

b. the period of noncompliance, including 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.

GENERAL CONDITIONS:

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 for 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 involving the permitted source arising under the Florida Statutes or Department rules, except where such use is prescribed by Sections 403.73 and 403.111, Florida Statutes. Such evidence shall only be used to the extent it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules.

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 17-4.120 and 17-30.300, F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

12. This permit or a copy thereof shall be kept at the work site of the permitted activity.

13. The permittee shall comply with the following:

a. Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.

b. The permittee shall hold 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

GENERAL CONDITIONS:

continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application for this permit. These materials shall be retained 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 dates analyses were performed;
- the person responsible for performing the analyses;
- the analytical techniques or methods used; and
- the results of such analyses.

14. When requested by the Department, the permittee shall within a reasonable 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 corrected promptly.

SPECIFIC CONDITIONS:

Construction Requirements

1. The construction of this facility shall reasonably conform to the plans and schedule submitted in the application.

2. The stack sampling facilities must comply with F.A.C. Rule 17-2.700(4).

3. The afterburner shall be capable of operating above 1400°F with a 0.6 second retention time and have a minimum VOC destruction efficiency of 95%. A minimum afterburner operation temperature, based on the compliance tests data, will be incorporated into any permit to operate issued for this unit.

SPECIFIC CONDITIONS:

Emission Restrictions

4. Particulate matter emissions from the afterburner stack shall neither exceed 0.08 grains/dscf corrected to 50% excess air nor 1.3 lbs/hr. Visible emissions from the stack shall not exceed 5% opacity.

5. Benzene emissions from the afterburner stack shall not exceed 2.9 lbs/hr. Total VOC emissions shall not exceed 10 lbs/hr. Compliance shall be determined by a material balance using soil analysis, production rate, and the afterburner destruction efficiency.

6. The operation of this facility shall not result in the emissions of air pollutants which cause or contribute to an objectionable odor pursuant to F.A.C. Rule 17-2.600(c)2.

Operation Requirements

7. The facility shall be properly operated and maintained (F.A.C. Rule 17-2.210(2)). No person shall circumvent any pollution control device or allow the emissions of air pollutants without the applicable air pollution control device operating properly (F.A.C. Rule 17-2.240).

8. Reasonable precautions shall be used to minimize unconfined emissions of particulate matter generated by this operation (F.A.C. Rule 17-2.610(3)). For this facility, reasonable precautions shall be defined as wetting the treated soil and keeping the work areas wet where the soil is being removed and treated. The treated soil shall be kept wet until it is disposed of.

9. The unit shall not be operated at a location or in a manner that may create a nuisance. The unit shall only be operated at the site where the soil was contaminated.

10. Untreated soil removed from the ground shall be stored under waterproof covers to control unconfined emissions.

11. This unit shall be allowed to operate 10 hours per day, 5 days per week, but not more than 2,500 hours per year.

12. Maximum soil charging rate to the unit shall not exceed 10 TPH. The soil entering the kiln cannot be larger than 2 inches in diameter. The permittee shall have means to determine the feed or production rate on site.

SPECIFIC CONDITIONS:

13. Only No. 2 oil with a maximum of 0.5% sulfur shall be used as fuel for the kiln and afterburner. Compliance shall be determined by records of the analysis of the fuel by the appropriate ASTM Method for sulfur by either the fuel supplier or the permittee. Maximum permitted fuel consumption is 14.6 MMBtu/hr (106 GPH No. 2).

14. Only soils contaminated with gasoline, No. 2 type oils, and motor oils shall be treated in this unit unless otherwise approved by the Bureau of Air Regulation.

Hazardous waste as defined in 40 CFR 261.3 shall not be processed by this unit.

Metals in the untreated soil shall not exceed the following:

Metals	Maximum Concentration (Dry) TCLP(mg/L)	Total(mg/Kg)
Arsenic	5.0	55
Barium	100.0	2750
Cadmium	1.0	55
Chromium	5.0	275
Lead	5.0	77
Mercury	0.2	17
Selenium	1.0	165
Silver	5.0	165

The quantity of Volatile Organic Aromatics (VOA) constituent in the soil shall not have the potential to exceed the acceptable ambient air concentration or the VOC emission limit for this unit (see Specific Conditions Nos. 5, 17, and 27).

To show compliance with this condition, the permittee shall analyze composite samples of the contaminated soil (see Specific Condition No. 16) by the EPA SW 846 Methods, Test Method for Evaluating Solid Waste Physical/Chemical, for VOA (EPA Method 5030/8020), TRPH (EPA draft Method 9073), and Metals (EPA Method 1311, 3050, 6010, 7040, 7041, 7060, 7061, 7080, 7130, 7131, 7190, 7191, 7420, 7421, 7471, and 7760). All soil samples taken at the remediation site and exiting the dryer shall be stored in a sealed glass container immediately upon sampling.

15. The permittee may request, in writing, permission to treat "off-spec" material. The request shall include the history of the site to be treated, an analysis of the contaminants suspected to be

SPECIFIC CONDITIONS:

in the soil, an estimate of the emissions from the unit while processing the soil, and calculations showing that the ambient air impact from the unit will not exceed the acceptable ambient air concentration for any toxic pollutant. The Department will approve or deny each request in writing, after a public notice for the specific project, on a case-by-case basis.

16. Sampling and analysis of the contaminated soil at each site, based on the procedures prescribed in SW-846, shall be conducted prior to remediation. Minimum number of composite samples for analysis at each site prior to remediation shall be as follows:

Soil Quantity ($yards^3$)	No. of Composite Samples
Less than 100	1
100 to 500	3
500 to 1000	5
Each additional 500 yds	1 additional sample

17. Unless the Department has determined other concentrations are required to protect public health and safety, predicted ambient air impact of any toxic pollutant, as determined by the PTPLU 6 model or other DARM approved models, shall not exceed the concentration calculated by the following formula:

$$AAC = \frac{40}{X} \cdot \frac{1}{\text{safety factor}} \cdot (OEL)$$

where,

AAC = acceptable ambient concentration

Safety Factor = 100 for category A substances and
50 for category B substances

X = 40 or the hours/week of actual operation, whichever is larger

OEL - Occupational exposure level such as the TWA-TLV published by the ACGIH, OSHA, and NIOSH published standards for toxic materials.

TWA-TLV is the threshold limit value (8 hrs/day, 40 hrs/wk) maximum exposure concentration considered safe for workers by the ACGIH.

SPECIFIC CONDITIONS:

Data in the application shows that, for continuous operation, an emission of 1 gram/sec will have a maximum ambient impact of 34.4 ug/m^3 (8 hr. avg) and 19.6 ug/m^3 (24 hr. impact). If the stack parameters are different than the values listed in the application, the permittee must determine and use the actual impact factor calculated by the EPA Approved Screen - 1.1 Model.

$$\text{Maximum Allowable Emissions (g/sec)} = \frac{\text{AAC}}{\text{Impact of 1 g/s emission}}$$

18. Pressure drop across the baghouse shall be recorded hourly and temperature of the afterburner shall be recorded continuously during operations. The instruments used to obtain these measurements shall be properly calibrated, maintained, and in operation any time the unit is in service.

Compliance Requirements

19. This unit shall be tested at a process weight rate of 9 to 10 TPH. All compliance tests shall meet the requirements listed in F.A.C. Rule 17-2.700. The unit shall not operate above the maximum permitted rate of 10 TPH.

20. When the Department, after investigation, has good reason (such as complaints, increased visible emissions, or questionable maintenance of control equipment) to believe that any applicable emission standard contained in Chapter 17-2, F.A.C., or in this permit is being violated, it may require the owner or operator of the unit to conduct compliance tests which identify the nature and quantity of pollutant emissions from the source and to provide a report on the results of said tests to the Department.

21. The exhaust stack for this process must be tested concurrently for particulate matter and visible emissions by EPA Methods 5 and 9 pursuant to 40 CFR 60, Appendix A, revised as of July 1, 1990, within 5 days after placing the unit in commercial operation under this permit and annually thereafter. Operation at each subsequent site requires an EPA Method 9 test to be performed within 3 days of placing the unit in service.

22. The unit destruction efficiency, benzene, and VOC emissions shall be established by a material balance using a Method 18, or 25 test (40 CFR 60, Appendix A, revised as of July 1, 1990) and soil analysis before and after treatment or other methods as approved by the Department.

SPECIFIC CONDITIONS:

Administrative Requirements

23. The permittee shall furnish the available information listed in Specific Condition No. 24 prior to operating the mobile soil thermal treatment facility at its initial site. This permit requires compliance with any applicable air regulation of a Department approved county environment agency prior to operating in the county. This may include requirements for county operation permits and additional restrictions on the operation of this unit.

24. The permittee shall notify the BAR, and the District and county environmental agency where the unit is moving to by registered mail at least 3 days prior to moving to the new site. The notification shall provide the permit number of the unit, a copy of the last stack test results, the date of the proposed move, the new site for the unit, and the location and contamination levels of the soil to be treated. The Department shall notify the permittee of any new air pollutant emission conditions the unit must meet after the receipt of the relocation notice.

25. The permittee shall maintain a log(s) covering the preceding 12 months operation that include date/ operation times, site location, pre-treatment soil analysis, feed rate, pressure drop across the PM air pollution control equipment, fuel usage, sulfur content of fuel, afterburner temperature, visible emissions, and any significant operation/equipment problems. All required records must be available for inspection at the job site for the unit within 3 working days of a request by the Department.

26. The BAR shall be notified in writing at least 15 days in advance of any annual compliance test to be conducted on this facility.

27. Any analysis required by Specific Condition No. 16 which indicates a violation of any condition in this permit shall be reported within 5 days of receiving the analytical test report to the District office. An average concentration of benzene above 2,913 ppm in the soil or total hydrocarbons above 10,000 ppm is a potential violation of this permit. The soil may be decontaminated by operating at less than the 10 TPH production rate, or by other means, with prior approval from the Department district office. The permittee must propose the method of compliance with this permit.

28. Records shall be kept by the permittee on the location, date, time, and number of samples taken for each composite sample. Soil analysis results shall be available for Department inspection during the clean up of the site and for 3 years thereafter.

SPECIFIC CONDITIONS:

29. A complete compliance stack test reports (F.A.C. Rule 17-2.700(7)) shall include, where applicable: field data sheets on emission measurements for visible emissions, particulate matter, volatile organic compounds, benzenes, and metal (when required); pre and post treatment soil analysis for VOA, TRPH, and metals (TCLP and total); production rate; and logs or charts showing pressure drop of baghouse/scrubber and afterburner temperature during tests. The report shall be submitted to BAR, the Department District, and County environmental program regulating the site the tests were conducted. The report shall be submitted within 45 days of the test

30. The permittee, for good cause, may request that this construction permit be extended. Such a request shall be submitted to the BAR prior to 60 days before the expiration of the permit (F.A.C. Rule 17-4.090).

31. An application for an operation permit must be submitted to the BAR at least 90 days prior to the expiration date of this construction permit or within 45 days after completion of compliance testing, whichever occurs first. To properly apply for an operation permit, the applicant shall submit the appropriate application form, fee, certification that construction was completed noting any deviations from the conditions in the construction permit, and compliance test reports as required by this permit (F.A.C. Rule 17-4.220).

Issued this 31st day
of December, 1991

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

Carol M. Browner, Secretary

State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

For Routing To Other Than The Addressee			
To:		Location:	
To:		Location:	
To:		Location:	
From:		Date:	

Interoffice Memorandum

TO: Carol Browner

FROM: Steve Smallwood

DATE: December ~~31~~ 31, 1991

SUBJ: Approval of a Construction Permit
Southern Soil Services, Inc.

Attached for your approval and signature is a permit to construct a 10 TPH transportable soil thermal treatment facility with initial operations in Osceola County for the subject company. Comments on the proposed permit were submitted by the Southwest District and the Environmental Protection Commission of Hillsborough County. Several specific conditions in the proposed permit were revised in response to these comments.

I recommend your approval and signature.

attachment

SS/WH/t

Carol- we've attached the preliminary determination and draft permit that was subject to public comment. The Final Determination (next page) addresses the comments received, as does the final permit. If you would like us to give you a verbal briefing, call me at Clair 8-1344

O S C E O L A C O U N T Y
BOARD OF COUNTY COMMISSIONERS

PHONE: 407 / 847-1200 17 SOUTH VERNON AVENUE, ROOM 155 KISSIMMEE, FLORIDA 34741-5488

November 14, 1991

Florida Department of Environmental Regulation
Mr. Preston Lewis
Twin Towers Office Bldg.
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

REF: SOUTHERN SOIL SERVICES, INC.
MOBILE SOIL REMEDIATION UNIT

Dear Mr. Lewis:

We are in receipt of correspondence from your office regarding application by Southern Soil Services, Inc. pertaining to the utilization of a mobile soil remediation unit that they state will be utilized in Osceola County.

This type of operation is handled as a Conditional Use in Osceola County and we have this date sent them an application and a letter of explanation regarding the Conditional Use procedure.

If you require further information, please feel free to contact our staff at (407)847-1405.

Respectfully,

Judy Strandmark

Judy Strandmark
Development Specialist, Osceola County

cc: File
Planning Department

WmH

O S C E O L A C O U N T Y
BOARD OF COUNTY COMMISSIONERS

PHONE: 407 / 847-1200 17 SOUTH VERNON AVENUE, ROOM 155 KISSIMMEE, FLORIDA 34741-5488

November 14, 1991

Southern Soil Services, Inc.
3640 Thompson Road
Lake Mary, Florida 32746

REF: Mobile Soil Recycling

Dear Sirs:

Osceola County has received information that you would like to set up mobile recylcing plants where needed to process petroleum contaminated soils.

This type of temporary operation may be authorized in Osceola County through Conditional Use application and approval by the Board of County Commissioners.

Attached is a copy of a Conditional Use application. The application form indicates the documentation that you will need to submit. It is recommended that you also include a narrative of the operation, length of time requested for the operation to be completed, and a brief description of the type and extent of the procedures required. This would keep delays in approval at a minimum. The length of time required from submittal to Board approval is approximately seven to eight weeks.

Please feel free to contact our staff at (407)847-1405 if you have any questions or require further assistance. Please contact the Planning Department at (407)847-1380 with regards to filing an application.

Respectfully,

Judy Strandmark

Judy Strandmark
Zoning Division
Osceola County

cc: File
Planning Department

cc: BCC
Admin
Planning

Notice of Application

The Department of Environmental Regulation announces receipt of an application from Southern Soil Services, Inc., 3640 Thompson Road, Lake Mary, Florida 32746 to construct a mobile soil remediation unit that will evaporate and incinerate petroleum products (fuels and lubicants) from soils contaminated by leaking fuel tanks, spills, etc. The unit will operate in Osceola counties.

The application is being processed at the Department of Environmental Regulation, BAR, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400. 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 Department of Environmental Regulation offices located at:

2600 Blair Stone Road, Tallahassee, FL 32399-2400
160 Governmental Center, Pensacola, FL 32501-5794
4520 Oak Fair Blvd., Tampa, FL 33610-7347
2269 Bay Street, Fort Myers, FL 33901-2896
7825 Baymeadows Way, Suite B200, Jacksonville, FL 32256-7577
1900 S. Congress Ave., Suite A, West Palm Beach, FL 33406

and County offices located at:

621 S. Andrew Ave., Ft. Lauderdale, FL 33301
801 S.W. 3rd Avenue, 2nd Floor, Miami, FL 33130
421 West Church St., Suite 412, Jacksonville, FL 32202-4111
1410 North 21st Street, Tampa, FL 33605
901 E. Evernia Street, West Palm Beach, FL 33402
315 Court Street, Clearwater, FL 34616
1301 Cattleman Road, Bldg. B, Sarasota, FL 43232-6299
2002 E. Michigan Avenue, Orlando, FL 32806

Written comments on this application may be submitted to Mr. Preston Lewis at the Department's Tallahassee address.

State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

For Routing To Other Than The Addressee

To: _____ Location: _____

To: _____ Location: _____

To: _____ Location: _____

From: _____ Date: _____

Interoffice Memorandum

RECEIVED
NOV 12 1991
Division of Air
Resources Management

TO: Steve Smallwood, P.E.
Clair Fancy, P.E.
Barry Andrews, P.E.
Willard Hanks

FROM: W. C. Thomas, P.E.

DATE: November 4, 1991

SUBJECT: Comments concerning draft permit AC49-201051 for Southern Soil Services, Inc. and the soil decontamination policy.

After reviewing Chapter 17-775, the July 19, 1990 policy memorandum regarding soil decontamination units, and draft permit AC49-201051 I have the following comments:

1. The policy memorandum and Technical Evaluation state the used oil which contaminated the soil must be "on-spec", but Specific Condition No. 14 does not mention the "on-spec" limitation.

   Concern - If the "on-spec" limitation is added to Specific Condition No. 14, how would the Department document compliance with the permit/policy, since the limitation is based on a liquid sample and not a soil sample?
   - Should reference to the "on-spec" limitation be deleted from the policy memorandum?

2. Specific Condition No. 14 states the Toxicity Characteristic Leaching Procedure (TCLP) limitations for metals, but the July 19, 1991 memorandum does not include this limitation.

   Concern - Should the TCLP limitation be deleted?
   - Are we expecting the air permitting and compliance staff to be responsible for testing and sampling procedures covered by another program?

Department of Environmental Regulation

Routing and Transmittal Slip

RECEIVED
NOV 12 1991
Division of Air Resources Management

To: (Name, Office, Location)

1. ~~Claire~~ Fancy
2. ~~Air~~
3. ~~Teller~~ 11-13
4. Willard:

Remarks: How do you intend to respond to all of these —

Clair,

Please review, initial and return to Patty for filing.

cc'd: Barry Preston
Willard Hanks

From:	Date
	Phone

3. Specific Condition No. 23 states, the permit requires compliance with any applicable local (county) regulations.

   Concern - Are we expecting the air permitting and compliance staff to be responsible for knowing all local regulations?
   - Would saying instead, "The permit holder may also need to comply with county, municipal, federal, or other state regulations prior to construction." not put any responsibility on the Department?

4. Specific Condition No. 24 requires the local government (city and/or county) and Department District Office to be notified by registered mail at least 3 days prior to moving to the new site.

   Concern - Is this referring to approved local air programs? If yes, wording should be more specific.
   - If the reference is to local governments in general, should this be deleted since documentation of compliance would be difficult?
   - Reference to the Department District Office should state which office the notification should be sent to, otherwise compliance would be any district office.

5. Specific Condition No. 25 should specify the items which the Department is requiring to be contained in the log/records (i.e. pressure drop of baghouse, throughput rates, fuel usage, etc.).

6. How is compliance with the 0.5% sulfur limitation in Specific Condition No. 13 determined? Should any records be required?

7. Should Specific Condition No. 29 also require the testing results for visible emissions, benzene, and the afterburner's destruction efficiency be submitted.

8. Regarding Specific Condition No. 31, should copies of chart recorders, logs, and records also be required to be submitted at least for the day compliance testing was conducted?

9. In general, if the total metals of the soil passing through a soil unit could only increase or remain the same and the goal of the unit was to meet the clean soil criteria (which are the same limits we are placing on the soil going into the unit) why would an operator waste the fuel to treat soil if the incoming soil had higher results than the clean soil criteria?

The Orlando Sentinel

Published Daily
Kissimmee, Osceola County, Florida

RECEIVED

NOV 6 1991

Division of Air
Resources Management

ADVERTISING CHARGE $25.93

State of Florida
COUNTY OF ORANGE } ss.

Before the undersigned authority personally appeared Juanita Rosado, who on oath says that she is the Legal Advertising Representative of The Orlando Sentinel, a Daily newspaper published at Kissimmee, in Osceola County, Florida; that the attached copy of advertisement, being a notice of intent in the matter of Permit AC 49-201051 in the Court, was published in said newspaper in the issues of October 31, 1991

Affiant further says that the said The Orlando Sentinel is a newspaper published at Kissimmee, in said Osceola County, Florida, and that the said newspaper has heretofore been continuously published in said Osceola County, Florida, each Week Day and has been entered as second-class mail matter at the post office in Kissimmee in said Osceola County, Florida, for a period of one year next preceding the first publication of the attached copy of advertisement; and affiant further says that he/she 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 the said newspaper.

Juanita Rosado

Sworn to and subscribed before me this 31st day of October A.D., 1991

Notary Public

Notary Public, State of Florida at Large
My Commission Expires August 28, 1994
Bonded Thru Brown & Brown, Inc.

State of Florida
Department of Environmental Regulation
Notice of Intent to Issue

The Department of Environmental Regulation hereby gives notice of its intent to issue a permit (AC 49-201051) to Southern Soil Services, Inc., 3640 Thompson Road, Lake Mary, Florida 32746, to construct a 10 TPH mobile soil thermal treatment facility with air pollution controlled by a baghouse and afterburner. The facility will operate initially in Osceola County. The facility may operate in other counties in Florida after completion of the public notice requirements for those counties. The regulations do not require a Best Available Control Technology (BACT) or Lowest Achievable Emission Rate (LAER) determination for this project. The facility may emit 1.3 lbs/hr (1.6 TPY) particulate, 0.5 lbs/hr (0.7 TPY) carbon monoxide, 2.1 lbs/hr (2.6 TPY) nitrogen oxides, 7.5 lbs/hr (9.4 TPY) sulfur dioxide, and 10 lbs/hr (12.5 TPY) volatile organic compounds. These emissions will not cause a violation of any ambient air quality standard or Prevention of Significant Deterioration (PSD) increment or create a health hazard. The Department is issuing this Intent to Issue for the reasons stated in the Technical Evaluation and Preliminary Determination.

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 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:
2600 Blair Stone Road, Tallahassee, FL 32399-2400
3319 Maguire Blvd., Suite 232 Orlando, FL 32803-3767
160 Governmental Center, Pensacola, FL 32501-5794
4520 Oak Fair Boulevard, Tampa, FL 33610-7347
2269 Bay Street, Fort Myers, FL 33901-2896
7825 Baymeadows Way, Suite B200, Jacksonville, FL 32256-7577
1900 S. Congress Avenue, Suite A, West Palm Beach, FL 33406
and County offices located at:
621 S. Andrew Ave., Ft. Lauderdale, FL 33301
801 S.W. 3rd Avenue, 2nd Floor, Miami, FL 33130
421 West Church St., Suite 412, Jacksonville, FL 32202-4111
1410 North 21st Street, Tampa, FL 33605
901 E. Evernia Street, West Palm Beach, FL 33402
315 Court Street, Clearwater, FL 34616
1301 Cattleman Road, Bldg. B, Sarasota, FL 43232-6299
2002 E. Michigan Avenue, Orlando, FL 32806

Any person may send written comments on the proposed action to Mr. Preston Lewis at the Department's Tallahassee address. All comments received within 14 days of the publication of this notice will be considered in the Department's final determination.

OS-370 Oct.31 1991

FORM NO. AD-263

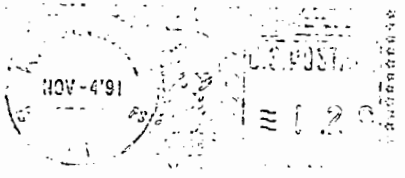
Alan Keene
Southern Soil Services
3640 Thompson Rd.
Lake Mary, Fl. 32746

Fold at line over top of envelope to the right of the return address.

CERTIFIED

P 705 873 216

MAIL



State of Florida
Attn: Patty Adams
Dept. of Environmental Regulations
2600 Blair Stone Rd.
Twin Towers Office Bldg.
Tallahassee, Fl. 32399-2400

COMMISSION
PHYLLIS BUSANSKY
JOE CHILLURA
PAM IORIO
SYLVIA KIMBELL
JAN KAMINIS PLATT
JAMES D. SELVEY
ED TURANCHIK

FAX (813) 272-5157

ENVIRONMENTAL PROTECTION COMMISSION
HILLSBOROUGH COUNTY

ROGER P. STEWART
EXECUTIVE DIRECTOR
ADMINISTRATIVE OFFICES
AND
WATER MANAGEMENT DIVISION
1900 - 9TH AVENUE
TAMPA, FLORIDA 33605
TELEPHONE (813) 272-5960

AIR MANAGEMENT DIVISION
TELEPHONE (813) 272-5530

WASTE MANAGEMENT DIVISION
TELEPHONE (813) 272-5788

ECOSYSTEMS MANAGEMENT DIVISION
TELEPHONE (813) 272-7104

October 31, 1991

Mr. Barry Andrews, P.E.
Division of Air Resources Management
Florida Department of Environmental
Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Re: Intent to Issue Permit - Southern Soil Services, Inc.

Dear Mr. Andrews:

The following is my comments for the above permit No. AC49-201051:

1. I liked the short duration specified in Specific Condition No. 21 during which the source/facility is required to be tested for the air pollutant(s).

2. I would prefer the following details to be included in the Technical Evaluation and in the permit:

   a. NEDS No. for the type(s) emissions
   b. Make and model of the rotary dryer
   c. Make and model of the baghouse

3. I am uncertain about the need for Specific Condition No. 15.

If you have any further questions please call me at SUNCOM 543-5530.

Sincerely,

Bnkalra

Ben Kalra
Air Permit Engineer

bm

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, and 4a & b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece next to the article number.

I also wish to receive the following services (for an extra fee):

1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Mr. Burton A. Keene, Pres
Southern Soil Services
3640 Thompson Rd
Lake Mary, Fl 32746

4a. Article Number
P 617 884 181

4b. Service Type
☐ Registered ☐ Insured
☑ Certified ☐ COD
☐ Express Mail ☐ Return Receipt for Merchandise

7. Date of Delivery
10/28/91

5. Signature (Addressee)
B. Keene

6. Signature (Agent)

8. Addressee's Address (Only if requested and fee is paid)

PS Form 3811, October 1990 *U.S. GPO: 1990—273-861 **DOMESTIC RETURN RECEIPT**

P 617 884 181

Certified Mail Receipt
No Insurance Coverage Provided
Do not use for International Mail
(See Reverse)

UNITED STATES POSTAL SERVICE

Sent to Burton Keene	
Street & No. Southern Soil Serv	
P.O., State & ZIP Code Lake Mary, Fl	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Address of Delivery	
TOTAL Postage & Fees	$
Postmark or Date AC 29-201051 10/25/91	

PS Form **3800**, June 1990

BEST AVAILABLE COPY

Post-it™ routing request pad 7664

ROUTING - REQUEST

Please

- [X] READ
- [ ] HANDLE
- [ ] APPROVE

and

- [ ] FORWARD
- [X] RETURN
- [ ] KEEP OR DISCARD
- [ ] REVIEW WITH ME

To Carol Browner

The preliminary determination which describes the project starts at the tabbed page (over)

Date 12-31-91

From Steve Smallwood

We haven't been giving you the PD because we didn't think you wanted to read all of this. If you would prefer a verbal briefing, Let me know. - Steve

Florida Department of Environmental Regulation

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

Lawton Chiles, Governor

Carol M. Browner, Secretary

October 24, 1991

CERTIFIED MAIL-RETURN RECEIPT REQUESTED

Mr. Burton Alan Keene, President
Southern Soil Services, Inc.
3640 Thompson Road
Lake Mary, Florida 32746

Dear Mr. Keene:

Attached is one copy of the Technical Evaluation and Preliminary Determination and proposed permit to construct a 10 TPH mobile soil thermal treatment facility.

Please submit any written comments you wish to have considered concerning the Department's proposed action to Mr. Preston Lewis of the Bureau of Air Regulation.

Sincerely,

Barry D. Andrews

for C. H. Fancy, P.E.
Chief
Bureau of Air Regulation

CHF/WH/plm

Attachments

c: Thomas Conrardy, BWC
District Air Program Administrators
County Air Program Administrators
John Bottorf, Jr., P.E.

BEFORE THE STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

In the Matter of
Application for Permit by:

Southern Soil Services, Inc.
3640 Thompson Road
Lake Mary, Florida 32746

DER File No. AC 49-201051
Seminole County

_____/

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 in the attached Technical Evaluation and Preliminary Determination.

The applicant, Southern Soil Services, Inc., applied on August 15, 1991, to the Department of Environmental Regulation for a permit to construct a 10 TPH mobile soil thermal treatment facility for operation in Florida.

The Department has permitting jurisdiction under the provisions of Chapter 403, Florida Statutes and Florida Administrative Code (F.A.C.) Chapters 17-2 and 17-4. The project is not exempt from permitting procedures. The Department has determined that a construction permit is required for the proposed work.

Pursuant to Section 403.815, Florida Statutes and 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's Bureau of Air Regulation, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400, 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.

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, 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;

(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 Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

Barry D. Andrews
for C. H. Fancy, P.E., Chief
Bureau of Air Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399
904-488-1344

CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this INTENT TO ISSUE and all copies were mailed by certified mail before the close of business on 10-25-91 to the listed persons.

Clerk Stamp

FILING AND ACKNOWLEDGMENT
FILED, on this date, pursuant to §120.52(11), Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

Kyra Sober
Clerk

10-25-91
Date

Copies furnished to:
Thomas Conrardy, BWC
District Air Program Administrators
County Air Program Administrators
John Bottorf, Jr., P.E.

State of Florida
Department of Environmental Regulation
Notice of Intent to Issue

The Department of Environmental Regulation hereby gives notice of its intent to issue a permit (AC 49-201051) to Southern Soil Services, Inc., 3640 Thompson Road, Lake Mary, Florida 32746, to construct a 10 TPH mobile soil thermal treatment facility with air pollution controlled by a baghouse and afterburner. The facility will operate initially in Osceola County. The facility may operate in other counties in Florida after completion of the public notice requirements for those counties. The regulations do not require a Best Available Control Technology (BACT) or Lowest Achievable Emission Rate (LAER) determination for this project. The facility may emit 1.3 lbs/hr (1.6 TPY) particulate, 0.5 lbs/hr (0.7 TPY) carbon monoxide, 2.1 lbs/hr (2.6 TPY) nitrogen oxides, 7.5 lbs/hr (9.4 TPY) sulfur dioxide, and 10 lbs/hr (12.5 TPY) volatile organic compounds. These emissions will not cause a violation of any ambient air quality standard or Prevention of Significant Deterioration (PSD) increment or create a health hazard. The Department is issuing this Intent to Issue for the reasons stated in the Technical Evaluation and Preliminary Determination.

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 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:

2600 Blair Stone Road, Tallahassee, FL 32399-2400
3319 Maguire Blvd., Suite, 232, Orlando, FL 32803-3767
160 Governmental Center, Pensacola, FL 32501-5794
4520 Oak Fair Boulevard, Tampa, FL 33610-7347
2269 Bay Street, Fort Myers, FL 33901-2896
7825 Baymeadows Way, Suite B200, Jacksonville, FL 32256-7577
1900 S. Congress Avenue, Suite A, West Palm Beach, FL 33406

and County environmental office located at:

621 S. Andrew Ave., Ft. Lauderdale, FL 33301
801 S.W. 3rd Avenue, 2nd Floor, Miami, FL 33130
421 West Church St., Suite 412, Jacksonville, FL 32202-4111
1410 North 21st Street, Tampa, FL 33605
901 E. Evernia Street, West Palm Beach, FL 33402
315 Court Street, Clearwater, FL 34616
1301 Cattleman Road, Bldg. B, Sarasota, FL 43232-6299
2002 E. Michigan Avenue, Orlando, FL 32806

Any person may send written comments on the proposed action to Mr. Preston Lewis at the Department's Tallahassee address. All comments received within 14 days of the publication of this notice will be considered in the Department's final determination.

Technical Evaluation
and
Preliminary Determination

Southern Soil Services, Inc.
Lake Mary, Seminole County, Florida

10 TPH Mobile Soil Thermal Treatment Facility
Osceola County

File No.: AC 49-201051

Department of Environmental Regulation
Division of Air Resources Management
Bureau of Air Regulation

October 24, 1991

I. General Information

A. Applicant

Southern Soil Services, Inc.
3640 Thompson Road
Lake Mary, Florida 32746

B. Request

On August 15, 1991, Southern Soil Services, Inc. submitted an application for a permit to construct a 10 TPH mobile soil thermal treatment facility (rotary kiln with a baghouse and afterburner) which would be operated initially in Osceola County. The application was considered complete on September 10, 1991, when the Department received Bottorf Associates, Inc. September 4, 1991, letter.

C. Project

The applicant is requesting permission to construct a 10 TPH mobile soil thermal treatment facility (SIC 1629) for operation initially in Osceola County. The facility contains a charge chute, rotary dryer, baghouse, afterburner, discharge conveyor, and associated equipment. The facility is to be used to decontaminate soils containing gasoline, No. 2 diesel fuels, and "on-spec" motor oils.

D. Emissions

The facility will emit particulate matter (PM), including lead compounds, volatile organic compounds (VOC), and the products of combustion (SO_2, NO_x, and CO).

A 99% efficient baghouse will be used to control PM emissions. The applicant estimates the maximum particulate matter emissions will be 1.3 lbs/hr. The baghouse will meet the particulate matter emissions standard of 0.08 grain/dscf corrected to 50% excess air (F.A.C. Rule 17-2.600(1)(c)1.) that the Department will impose on this facility. As the facility may operate 2,500 hours per year, the maximum PM emissions from the afterburner stack will be 1.6 TPY.

The VOC evaporates from the contaminated soil in the kiln and passes through the baghouse to the afterburner. The applicant estimates that up to 200 lbs/hr of VOC will enter the afterburner and, after 95% destruction, 10 lbs/hr of VOC will be discharged to the atmosphere. Based on 2,500 hours per year operation, this is equivalent to 12.5 TPY VOC emissions from the afterburner stack.

The facility will burn No. 2 oil (106 GPH) for a maximum heat input of 14.6 MMBtu/hr. The normal products of combustion are produced during the burning of this fuel. Assuming that the

hydrocarbons evaporated from the soil will offset an equal quantity of No. 2 fuel oil, the products of combustion emissions are estimated to be:

Pollutant		CO	NO_x	SO_2
Emissions from 106 GPH No. 2 Oil	lbs/hr	0.5	2.1	7.5
	TPY	0.7	2.6	9.4

At the low emission rates proposed, there should be no visible emissions from this source.

Reasonable precautions will be required to control the unconfined emissions from decontaminated soil. This will involve wetting the dried material, covering storage piles, and hauling of the material in covered trucks.

II. Rule Applicability

The proposed project, construction and operation of a 10 TPH mobile soil thermal treatment facility, is subject to preconstruction review under the provisions of Chapter 403, Florida Statutes, and Chapter 17-2, Florida Administrative Code.

The source may be operated in areas designated nonattainment for particulate matter, ozone, and sulfur dioxide (F.A.C. Rule 17-2.410), unclassifiable for particulate matter and sulfur dioxide (F.A.C. Rule 17-2.430), attainment for all criteria pollutants (F.A.C. Rule 17-2.420), and maintenance for ozone (F.A.C. Rule 17-2.460).

The unit is a minor source (F.A.C Rule 17-2.100) because emissions of any single pollutant are less than 100 TPY. The proposed source is not subject to the preconstruction review requirements of F.A.C. Rule 17-2.500(5) and F.A.C. Rule 17-2.510(4) because permit restrictions will prohibit the unit from emitting 100 TPY of any pollutant.

The source is subject to F.A.C. Rule 17-2.520, which pertains to sources not subject to PSD or nonattainment review. The unit is classified as an incinerator. Allowable particulate matter emissions are limited to 0.08 grains/dscf corrected to 50% excess air (F.A.C. Rule 17-2.600(1)(c)1.) and the emissions cannot cause objectionable odors (F.A.C. Rule 17-2.600(1)(c)2.). Chapter 17-2, F.A.C., does not have an applicable RACT standard for particulate matter, sulfur dioxide or volatile organic compounds (VOC) that would apply to an incinerator. Organic (VOC) emissions will be regulated under F.A.C. Rule 17-2.620, General Pollutant Emission Limiting Standards, which restricts emissions to control by systems deemed necessary by the Department. The Department deems 95% destruction of the VOC air pollutants is a minimum standard for this unit. The discharge of pollutants shall not cause an objectionable odor or an exceedance of an acceptable ambient air concentration (AAC) or risk for toxic pollutants.

The applicant must provide the Department's Bureau of Air Regulation with a list of all counties that the mobile soil thermal treatment facility will be operated in and certified proof of publication of the Notice of Application and Notice of Intent from a newspaper of general circulation in each county on the list (F.A.C. Rule 17-2.220), prior to operating in the counties.

III. Technical Evaluation

This facility is restricted to processing soils contaminated with only virgin petroleum products (gasoline, No. 2 oils, and motor oils) and "on-spec" used oils (motor oils) unless prior approval is obtained to treat other material. It cannot be authorized to treat hazardous material as defined in 40 CFR 261.3 (revised as of July 1, 1990) nor materials that are corrosive, reactive, EP toxic or ignitable.

Chapter 17-775, F.A.C., Soil Thermal Treatment Facilities, regulates some aspects pertaining to the operation of this source. Some of these requirements are incorporated in the air permit. They include soil sampling specifications and pretreatment soil analysis. Also, requirements that the soil be covered with a secured plastic cover until treatment (to minimize fugitive emissions) is included in the proposed permit.

Up to 10 TPH contaminated soil must be reduced to clumps that are a maximum of 2 inches in diameter prior to being fed into the kiln. The soil is heated in the 8.6 MMBtu/hr kiln to evaporate the petroleum products. These vapors flow through a 99% efficient baghouse, which removes the particulate matter, and into proposed 95% (minimum) destruction efficiency 6.0 MMBtu/hr afterburner to burn the petroleum vapors. The afterburner has a minimum design temperature of 1400°F and a minimum residence time of over 0.6 seconds. Higher temperatures and/or residence time may be needed to achieve this destruction efficiency. The minimum allowable afterburner temperature will be based on the compliance test results and included in any permit to operate issued for this source.

The allowable particulate matter standard is 0.08 gr/dscf corrected to 50% excess air (EA). The facility is allowed to emit up to 1.3 lbs/hr. The proposed permit will limit particulate matter emissions to this value.

With 10 TPH of soil containing 1% hydrocarbons being processed, the VOC emissions from the 95% efficient afterburner are estimated to be 10 lbs/hr.

The guidance used by the Department to determine acceptable ambient concentrations (AAC) of hazardous pollutants is based on the following formula:

$$\text{Acceptable Ambient Concentration (AAC)} = \frac{40}{\text{(hrs per week operation)}} \times \frac{1 \times \text{(OEL)}}{\text{Safety factor}}$$

The safety factors are 100 for category A substances and 50 for category B substances.

OEL - Occupational Exposure Level such as ACGIH, OSHA, and NIOSH published standards for toxic materials.

TWA-TLV values are published by the American Conference of Governmental Industrial Hygienists (ACGIH). The values for the pollutants expected to be encountered in the proposed operation are as follows:

Pollutant	OEL (mg/m^3)	AAC (ug/m^3) 8-hr	AAC (ug/m^3) 24-hr
Benzene	3	30	7.2
Toluene	375	3750	900
Ethyl Benzene	435	4350	1044
Xylene	435	4350	1044

Calculations, using the EPA approved Screen - 1.1 Model (updated PTPLU 6 Model) and the stack parameters listed in the application, show that an emission rate of 1 gram/sec will have maximum ambient air impacts of 34.4 ug/m^3 (8-hr avg.) and 19.6 ug/m^3 (24-hr avg.).

If the stack parameters change from 25 feet stack height, 2.0 foot stack diameter, 32.8 feet/second stack gas velocity, and 1400°F stack gas temperature, the impact of the emission will change. The model would need to be rerun with the correct parameters and the following calculations repeated.

The maximum emissions that can occur without exceeding the AAC can be determined by the following relationship:

AAC = Impact of Unit x Emissions.

With this relationship and data, the Department can estimate the maximum emissions of a pollutant from the proposed facility that can occur without exceeding the AAC. Also, by knowing the process weight for the facility (10 TPH), assuming all VOC in the contaminated soil is evaporated in the kiln, and that 95% of this VOC is destroyed by the afterburner, the maximum content of the pollutants in the soil that can exist without the potential to exceed the AAC can be determined. The Department has made these calculations for benzene. The emissions of the other BTEX compounds could be higher without exceeding the AAC. The results are summarized in the following table:

Pollutant	Maximum Emissions grams/second	lbs/hr	Maximum Soil Concentration PPM
Benzene	0.37	2.9	2913

Using a similar procedure, it can be shown that the maximum VOC content of the untreated soil cannot exceed 10,000 PPM when the emissions from the afterburner are 10 lbs/hr VOC.

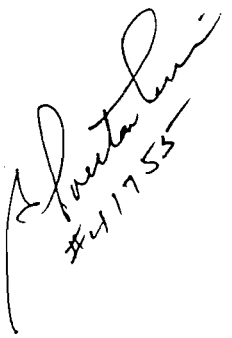
The Department has chosen to regulate benzene and total VOC only for soils contaminated with virgin petroleum products and "on-spec" used oil. For soil contaminated with other petroleum product components and derivatives, the applicant will be required to submit calculations showing the AAC or other concentrations required to protect public health and safety will not be exceeded before the soil can be treated in this unit.

IV. Air Quality Analysis

By restricting the benzene and VOC content of the soil, the Department has reasonable assurance that the operation of the mobile soil thermal treatment facility will not create a health hazard or cause/contribute to an ambient air quality violation.

V. Conclusion

Based on the information provided by Southern Soil Services, Inc., the Department has reasonable assurance that the proposed construction/operation of the 10 TPH soil thermal treatment facility, as described in this evaluation, and subject to the conditions proposed herein, will not cause or contribute to a violation of any air quality standard, PSD increment, or any other technical provision of Chapter 17-2 of the Florida Administrative Code.



Using a similar procedure, it can be shown that the maximum VOC content of the untreated soil cannot exceed 10,000 PPM when the emissions from the afterburner are 10 lbs/hr VOC.

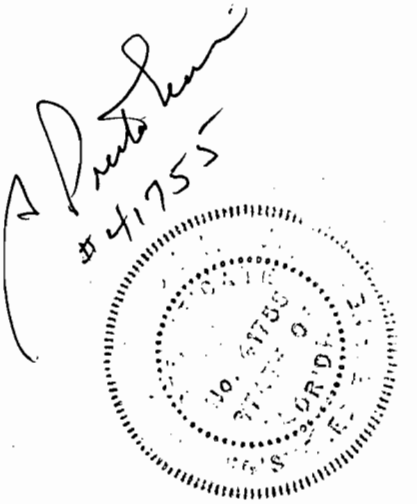
The Department has chosen to regulate benzene and total VOC only for soils contaminated with virgin petroleum products and "on-spec" used oil. For soil contaminated with other petroleum product components and derivatives, the applicant will be required to submit calculations showing the AAC or other concentrations required to protect public health and safety will not be exceeded before the soil can be treated in this unit.

IV. Air Quality Analysis

By restricting the benzene and VOC content of the soil, the Department has reasonable assurance that the operation of the mobile soil thermal treatment facility will not create a health hazard or cause/contribute to an ambient air quality violation.

V. Conclusion

Based on the information provided by Southern Soil Services, Inc., the Department has reasonable assurance that the proposed construction/operation of the 10 TPH soil thermal treatment facility, as described in this evaluation, and subject to the conditions proposed herein, will not cause or contribute to a violation of any air quality standard, PSD increment, or any other technical provision of Chapter 17-2 of the Florida Administrative Code.



Florida Department of Environmental Regulation

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

Lawton Chiles, Governor

Carol M. Browner, Secretary

PERMITTEE:
Southern Soil Services, Inc.
3640 Thompson Road
Lake Mary, Florida 32746

Permit Number: AC 49-201051
Expiration Date: January 1, 1993
County: Mobile Operation
Project: 10 TPH Mobile Soil Thermal Treatment Facility

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Chapters 17-2 and 17-4. 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:

Authorization to construct a 10 TPH mobile soil thermal treatment facility. The main components of the facility are a contaminated soil charge chute, a 4 ft. diameter by 20 ft. long rotary dryer, an 804.25 sq. ft. reverse air cleaning baghouse, a 1.5 ft. diameter by 48 ft. long afterburner having 0.6 seconds retention time at 1400°F, two No. 2 fuel oil burners (8.6 and 6.0 MMBtu/hr), a 6000 CFM exhaust fan, a 2 ft. square by 25 ft. high stack, and associated equipment.

This facility will operate in Osceola County.

The facility may be operated in other counties within the State after satisfactorily completing the public notice requirements (F.A.C. Rule 17-2.220) for the counties and receiving Department authorization to operate at the new location.

The source shall be constructed in accordance with the permit application, plans, documents, amendments and drawings, except as otherwise noted in the General and Specific Conditions.

Attachments are listed below:

1. Application received Aug. 15, 1991.
2. DER letter dated Aug. 28, 1991.
3. Bottorf Assoc. letter dated Sept. 4, 1991.

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth in this permit are "Permit Conditions" and are binding and enforceable pursuant to Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.

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. Neither 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 is not 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, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefore; 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.

GENERAL CONDITIONS:

6. The permittee shall 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 and at a reasonable time, access to the premises, where the permitted activity is located or conducted to:

a. Have access to and copy any records that must be kept under the conditions of the permit;

b. Inspect the facility, equipment, practices, or operations regulated or required under this permit; and

c. Sample or monitor 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 provide the Department with the following information:

a. a description of and cause of non-compliance; and

b. the period of noncompliance, including 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.

GENERAL CONDITIONS:

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 for 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 involving the permitted source arising under the Florida Statutes or Department rules, except where such use is prescribed by Sections 403.73 and 403.111, Florida Statutes. Such evidence shall only be used to the extent it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules.

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 17-4.120 and 17-30.300, F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

12. This permit or a copy thereof shall be kept at the work site of the permitted activity.

13. The permittee shall comply with the following:

a. Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.

b. The permittee shall hold 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

GENERAL CONDITIONS:

continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application for this permit. These materials shall be retained 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 dates analyses were performed;
- the person responsible for performing the analyses;
- the analytical techniques or methods used; and
- the results of such analyses.

14. When requested by the Department, the permittee shall within a reasonable 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 corrected promptly.

SPECIFIC CONDITIONS:

Construction Requirements

1. The construction of this facility shall reasonably conform to the plans and schedule submitted in the application.

2. The stack sampling facilities must comply with F.A.C. Rule 17-2.700(4).

3. The afterburner shall be capable of operating above 1400°F with a 0.6 second retention time and have a minimum VOC destruction efficiency of 95%. A minimum afterburner operation temperature, based on the compliance tests data, will be incorporated into any permit to operate issued for this unit.

SPECIFIC CONDITIONS:

Emission Restrictions

4. Particulate matter emissions from the afterburner stack shall neither exceed 0.08 grains/dscf corrected to 50% excess air nor 1.3 lbs/hr. Visible emissions from the stack shall not exceed 5% opacity.

5. Benzene emissions from the afterburner stack shall not exceed 2.9 lbs/hr. Total VOC emissions shall not exceed 10 lbs/hr. Compliance shall be determined by a material balance using soil analysis, production rate, and the afterburner destruction efficiency.

6. The operation of this facility shall not result in the emissions of air pollutants which cause or contribute to an objectionable odor pursuant to F.A.C. Rule 17-2.600(c)2.

Operation Requirements

7. The facility shall be properly operated and maintained (F.A.C. Rule 17-2.210(2)). No person shall circumvent any pollution control device or allow the emissions of air pollutants without the applicable air pollution control device operating properly (F.A.C. Rule 17-2.240).

8. Reasonable precautions shall be used to minimize unconfined emissions of particulate matter generated by this operation (F.A.C. Rule 17-2.610(3)). For this facility, reasonable precautions shall be defined as wetting the treated soil and keeping the work areas wet where the soil is being removed and treated. The treated soil shall be kept wet until it is disposed of.

9. The unit shall not be operated at a location or in a manner that may create a nuisance. The unit shall only be operated at the site where the soil was contaminated.

10. Untreated soil removed from the ground shall be stored under waterproof covers to control unconfined emissions.

11. This unit shall be allowed to operate 10 hours per day, 5 days per week, but not more than 2,500 hours per year.

12. Maximum soil charging rate to the unit shall not exceed 10 TPH. The soil entering the kiln cannot be larger than 2 inches in diameter. The permittee shall have means to determine the feed or production rate on site.

SPECIFIC CONDITIONS:

13. Only No. 2 oil with a maximum of 0.5% sulfur shall be used as fuel for the kiln and afterburner. Maximum permitted fuel consumption is 14.6 MMBtu/hr (106 GPH No. 2).

14. Only soils contaminated with gasoline, No. 2 type oils, and motor oils shall be treated in this unit unless otherwise approved by the Bureau of Air Regulation.

Hazardous waste as defined in 40 CFR 261.3 shall not be processed by this unit.

Metals in the untreated soil shall not exceed the following:

	Maximum Concentration	
Metals	TCLP(mg/L)	Total(mg/Kg)
Arsenic	5.0	55
Barium	100.0	2750
Cadmium	1.0	55
Chromium	5.0	275
Lead	5.0	77
Mercury	0.2	17
Selenium	1.0	165
Silver	5.0	165

The quantity of Volatile Organic Aromatics (VOA) constituent in the soil shall not have the potential to exceed the acceptable ambient air concentration or the VOC emission limit for this unit (see Specific Conditions Nos. 5, 17, and 27).

To show compliance with this condition, the permittee shall analyze composite samples of the contaminated soil (see Specific Condition No. 16) by the EPA SW 846 Methods, Test Method for Evaluating Solid Waste Physical/Chemical, for VOA (EPA Method 5030/8020), TRPH (EPA draft Method 9073), and Metals (EPA Method 1311, 3050, 6010, 7040, 7041, 7060, 7061, 7080, 7130, 7131, 7190, 7191, 7420, 7421, 7471, and 7760). All soil samples taken at the remediation site and exiting the dryer shall be stored in a sealed glass container immediately upon sampling.

15. The permittee may request, in writing, permission to treat "off-spec" material. The request shall include the history of the site to be treated, an analysis of the contaminants suspected to be

SPECIFIC CONDITIONS:

in the soil, an estimate of the emissions from the unit while processing the soil, and calculations showing that the ambient air impact from the unit will not exceed the acceptable ambient air concentration for any toxic pollutant. The Department will approve or deny each request in writing, after a public notice for the specific project, on a case-by-case basis.

16. Sampling and analysis of the contaminated soil at each site, based on the procedures prescribed in SW-846, shall be conducted prior to remediation. Minimum number of composite samples for analysis at each site prior to remediation shall be as follows:

Soil Quantity ($yards^3$)	No. of Composite Samples
Less than 100	1
100 to 500	3
500 to 1000	5
Each additional 500 yds	1 additional sample

17. Unless the Department has determined other concentrations are required to protect public health and safety, predicted ambient air impact of any toxic pollutant, as determined by the PTPLU 6 model or other DARM approved models, shall not exceed the concentration calculated by the following formula:

$$AAC = \frac{40}{X} \cdot \frac{1}{\text{safety factor}} \cdot (OEL)$$

where,

AAC = acceptable ambient concentration

Safety Factor = 100 for category A substances and
50 for category B substances

X = 40 or the hours/week of actual operation, whichever is larger

OEL - Occupational exposure level such as the TWA-TLV published by the ACGIH, OSHA, and NIOSH published standards for toxic materials.

TWA-TLV is the threshold limit value (8 hrs/day, 40 hrs/wk) maximum exposure concentration considered safe for workers by the ACGIH.

SPECIFIC CONDITIONS:

Data in the application shows that, for continuous operation, an emission of 1 gram/sec will have a maximum ambient impact of 34.4 ug/m^3 (8 hr. avg) and 19.6 ug/m^3 (24 hr. impact). If the stack parameters are different than the values listed in the application, the permittee must determine and use the actual impact factor calculated by the EPA Approved Screen - 1.1 Model.

$$\text{Maximum Allowable Emissions (g/sec)} = \frac{\text{AAC}}{\text{Impact of 1 g/s emission}}$$

18. Pressure drop across the baghouse shall be recorded hourly and temperature of the afterburner shall be recorded continuously during operations. The instruments used to obtain these measurements shall be properly calibrated, maintained, and in operation any time the unit is in service.

Compliance Requirements

19. This unit shall be tested at a process weight rate of 9 to 10 TPH. All compliance tests shall meet the requirements listed in F.A.C. Rule 17-2.700. The unit shall not operate above the maximum permitted rate of 10 TPH.

20. When the Department, after investigation, has good reason (such as complaints, increased visible emissions, or questionable maintenance of control equipment) to believe that any applicable emission standard contained in Chapter 17-2, F.A.C., or in this permit is being violated, it may require the owner or operator of the unit to conduct compliance tests which identify the nature and quantity of pollutant emissions from the source and to provide a report on the results of said tests to the Department.

21. The exhaust stack for this process must be tested concurrently for particulate matter and visible emissions by EPA Methods 5 and 9 pursuant to 40 CFR 60, Appendix A, revised as of July 1, 1990, within 5 days after placing the unit in commercial operation under this permit and annually thereafter. Operation at each subsequent site requires an EPA Method 9 test to be performed within 3 days of placing the unit in service.

22. The unit destruction efficiency, benzene, and VOC emissions shall be established by a material balance using a Method 18, or 25 test (40 CFR 60, Appendix A, revised as of July 1, 1990) and soil analysis before and after treatment or other methods as approved by the Department.

SPECIFIC CONDITIONS:

Administrative Requirements

23. The permittee shall furnish the available information listed in Specific Condition No. 24 prior to operating the mobile soil thermal treatment facility at its initial site. This permit requires compliance with any applicable local (county) regulations. This may include requirements for county operation permits and additional restrictions on the operation of this unit.

24. The permittee shall notify the BAR, local government (city and/or county), and Department district office by registered mail at least 3 days prior to moving to the new site. The notification shall provide the permit number of the unit, a copy of the last stack test results, the date of the proposed move, the new site for the unit, and the location and contamination levels of the soil to be treated. The Department shall notify the permittee of any new air pollutant emission conditions the unit must meet after the receipt of the relocation notice.

25. The permittee shall maintain a log that shows the facility's operation time during the preceeding 12 months. All required records must be available for inspection at the job site for the unit within 3 working days of a request by the Department.

26. The BAR shall be notified in writing at least 15 days in advance of any annual compliance test to be conducted on this facility.

27. Any analysis required by Specific Condition No. 16 which indicates a violation of any condition in this permit shall be reported within 5 days of receiving the analytical test report to the District office. An average concentration of benzene above 2,913 ppm in the soil or total hydrocarbons above 10,000 ppm is a potential violation of this permit. The soil may be decontaminated by operating at less than the 10 TPH production rate, or by other means, with prior approval from the Department district office. The permittee must propose the method of compliance with this permit.

28. Records shall be kept by the permittee on the location, date, time, and number of samples taken for each composite sample. Soil analysis results shall be available for Department inspection during the clean up of the site and for 3 years thereafter.

SPECIFIC CONDITIONS:

29. Stack test results from PM and VOC shall be submitted to the Department within 45 days of the test.

30. The permittee, for good cause, may request that this construction permit be extended. Such a request shall be submitted to the BAR prior to 60 days before the expiration of the permit (F.A.C. Rule 17-4.090).

31. An application for an operation permit must be submitted to the BAR at least 90 days prior to the expiration date of this construction permit or within 45 days after completion of compliance testing, whichever occurs first. To properly apply for an operation permit, the applicant shall submit the appropriate application form, fee, certification that construction was completed noting any deviations from the conditions in the construction permit, and compliance test reports as required by this permit (F.A.C. Rule 17-4.220).

Issued this _____ day
of _____, 1991

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

_____
Carol M. Browner, Secretary

Post-it™ routing request pad 7664
BRAND

ROUTING - REQUEST

Please

- [x] ~~READ~~ FYI
- [ ] HANDLE
- [ ] APPROVE

and

- [ ] FORWARD
- [x] RETURN
- [ ] KEEP OR DISCARD
- [ ] REVIEW WITH ME

To Carol Browner — This is the draft permit that was available for public comment Do NOT SIGN

Date 12-31-91

From Steve Smallwood

Florida Department of Environmental Regulation

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

Lawton Chiles, Governor

Carol M. Browner, Secretary

PERMITTEE:
Southern Soil Services, Inc.
3640 Thompson Road
Lake Mary, Florida 32746

Permit Number: AC 49-201051
Expiration Date: January 1, 1993
County: Mobile Operation
Project: 10 TPH Mobile Soil Thermal Treatment Facility

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Chapters 17-2 and 17-4. 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:

Authorization to construct a 10 TPH mobile soil thermal treatment facility. The main components of the facility are a contaminated soil charge chute, a 4 ft. diameter by 20 ft. long rotary dryer, an 804.25 sq. ft. reverse air cleaning baghouse, a 1.5 ft. diameter by 48 ft. long afterburner having 0.6 seconds retention time at 1400°F, two No. 2 fuel oil burners (8.6 and 6.0 MMBtu/hr), a 6000 CFM exhaust fan, a 2 ft. square by 25 ft. high stack, and associated equipment.

This facility will operate in Osceola County.

The facility may be operated in other counties within the State after satisfactorily completing the public notice requirements (F.A.C. Rule 17-2.220) for the counties and receiving Department authorization to operate at the new location.

The source shall be constructed in accordance with the permit application, plans, documents, amendments and drawings, except as otherwise noted in the General and Specific Conditions.

Attachments are listed below:

1. Application received Aug. 15, 1991.
2. DER letter dated Aug. 28, 1991.
3. Bottorf Assoc. letter dated Sept. 4, 1991.

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth in this permit are "Permit Conditions" and are binding and enforceable pursuant to Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.

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. Neither 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 is not 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, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefore; 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.

GENERAL CONDITIONS:

6. The permittee shall 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 and at a reasonable time, access to the premises, where the permitted activity is located or conducted to:

a. Have access to and copy any records that must be kept under the conditions of the permit;

b. Inspect the facility, equipment, practices, or operations regulated or required under this permit; and

c. Sample or monitor 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 provide the Department with the following information:

a. a description of and cause of non-compliance; and

b. the period of noncompliance, including 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.

GENERAL CONDITIONS:

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 for 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 involving the permitted source arising under the Florida Statutes or Department rules, except where such use is prescribed by Sections 403.73 and 403.111, Florida Statutes. Such evidence shall only be used to the extent it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules.

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 17-4.120 and 17-30.300, F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

12. This permit or a copy thereof shall be kept at the work site of the permitted activity.

13. The permittee shall comply with the following:

a. Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.

b. The permittee shall hold 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

GENERAL CONDITIONS:

continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application for this permit. These materials shall be retained 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 dates analyses were performed;
- the person responsible for performing the analyses;
- the analytical techniques or methods used; and
- the results of such analyses.

14. When requested by the Department, the permittee shall within a reasonable 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 corrected promptly.

SPECIFIC CONDITIONS:

Construction Requirements

1. The construction of this facility shall reasonably conform to the plans and schedule submitted in the application.

2. The stack sampling facilities must comply with F.A.C. Rule 17-2.700(4).

3. The afterburner shall be capable of operating above 1400°F with a 0.6 second retention time and have a minimum VOC destruction efficiency of 95%. A minimum afterburner operation temperature, based on the compliance tests data, will be incorporated into any permit to operate issued for this unit.

SPECIFIC CONDITIONS:

Emission Restrictions

4. Particulate matter emissions from the afterburner stack shall neither exceed 0.08 grains/dscf corrected to 50% excess air nor 1.3 lbs/hr. Visible emissions from the stack shall not exceed 5% opacity.

5. Benzene emissions from the afterburner stack shall not exceed 2.9 lbs/hr. Total VOC emissions shall not exceed 10 lbs/hr. Compliance shall be determined by a material balance using soil analysis, production rate, and the afterburner destruction efficiency.

6. The operation of this facility shall not result in the emissions of air pollutants which cause or contribute to an objectionable odor pursuant to F.A.C. Rule 17-2.600(c)2.

Operation Requirements

7. The facility shall be properly operated and maintained (F.A.C. Rule 17-2.210(2)). No person shall circumvent any pollution control device or allow the emissions of air pollutants without the applicable air pollution control device operating properly (F.A.C. Rule 17-2.240).

8. Reasonable precautions shall be used to minimize unconfined emissions of particulate matter generated by this operation (F.A.C. Rule 17-2.610(3)). For this facility, reasonable precautions shall be defined as wetting the treated soil and keeping the work areas wet where the soil is being removed and treated. The treated soil shall be kept wet until it is disposed of.

9. The unit shall not be operated at a location or in a manner that may create a nuisance. The unit shall only be operated at the site where the soil was contaminated.

10. Untreated soil removed from the ground shall be stored under waterproof covers to control unconfined emissions.

11. This unit shall be allowed to operate 10 hours per day, 5 days per week, but not more than 2,500 hours per year.

12. Maximum soil charging rate to the unit shall not exceed 10 TPH. The soil entering the kiln cannot be larger than 2 inches in diameter. The permittee shall have means to determine the feed or production rate on site.

SPECIFIC CONDITIONS:

13. Only No. 2 oil with a maximum of 0.5% sulfur shall be used as fuel for the kiln and afterburner. Maximum permitted fuel consumption is 14.6 MMBtu/hr (106 GPH No. 2).

14. Only soils contaminated with gasoline, No. 2 type oils, and motor oils shall be treated in this unit unless otherwise approved by the Bureau of Air Regulation.

Hazardous waste as defined in 40 CFR 261.3 shall not be processed by this unit.

Metals in the untreated soil shall not exceed the following:

Metals	Maximum Concentration TCLP(mg/L)	Total(mg/Kg)
Arsenic	5.0	55
Barium	100.0	2750
Cadmium	1.0	55
Chromium	5.0	275
Lead	5.0	77
Mercury	0.2	17
Selenium	1.0	165
Silver	5.0	165

The quantity of Volatile Organic Aromatics (VOA) constituent in the soil shall not have the potential to exceed the acceptable ambient air concentration or the VOC emission limit for this unit (see Specific Conditions Nos. 5, 17, and 27).

To show compliance with this condition, the permittee shall analyze composite samples of the contaminated soil (see Specific Condition No. 16) by the EPA SW 846 Methods, Test Method for Evaluating Solid Waste Physical/Chemical, for VOA (EPA Method 5030/8020), TRPH (EPA draft Method 9073), and Metals (EPA Method 1311, 3050, 6010, 7040, 7041, 7060, 7061, 7080, 7130, 7131, 7190, 7191, 7420, 7421, 7471, and 7760). All soil samples taken at the remediation site and exiting the dryer shall be stored in a sealed glass container immediately upon sampling.

15. The permittee may request, in writing, permission to treat "off-spec" material. The request shall include the history of the site to be treated, an analysis of the contaminants suspected to be

SPECIFIC CONDITIONS:

in the soil, an estimate of the emissions from the unit while processing the soil, and calculations showing that the ambient air impact from the unit will not exceed the acceptable ambient air concentration for any toxic pollutant. The Department will approve or deny each request in writing, after a public notice for the specific project, on a case-by-case basis.

16. Sampling and analysis of the contaminated soil at each site, based on the procedures prescribed in SW-846, shall be conducted prior to remediation. Minimum number of composite samples for analysis at each site prior to remediation shall be as follows:

Soil Quantity ($yards^3$)	No. of Composite Samples
Less than 100	1
100 to 500	3
500 to 1000	5
Each additional 500 yds	1 additional sample

17. Unless the Department has determined other concentrations are required to protect public health and safety, predicted ambient air impact of any toxic pollutant, as determined by the PTPLU 6 model or other DARM approved models, shall not exceed the concentration calculated by the following formula:

$$AAC = \frac{40}{X} \cdot \frac{1}{\text{safety factor}} \cdot (OEL)$$

where,

AAC = acceptable ambient concentration

Safety Factor = 100 for category A substances and
50 for category B substances

X = 40 or the hours/week of actual operation, whichever is larger

OEL - Occupational exposure level such as the TWA-TLV published by the ACGIH, OSHA, and NIOSH published standards for toxic materials.

TWA-TLV is the threshold limit value (8 hrs/day, 40 hrs/wk) maximum exposure concentration considered safe for workers by the ACGIH.

SPECIFIC CONDITIONS:

Data in the application shows that, for continuous operation, an emission of 1 gram/sec will have a maximum ambient impact of 34.4 ug/m^3 (8 hr. avg) and 19.6 ug/m^3 (24 hr. impact). If the stack parameters are different than the values listed in the application, the permittee must determine and use the actual impact factor calculated by the EPA Approved Screen - 1.1 Model.

$$\text{Maximum Allowable Emissions (g/sec)} = \frac{\text{AAC}}{\text{Impact of 1 g/s emission}}$$

18. Pressure drop across the baghouse shall be recorded hourly and temperature of the afterburner shall be recorded continuously during operations. The instruments used to obtain these measurements shall be properly calibrated, maintained, and in operation any time the unit is in service.

Compliance Requirements

19. This unit shall be tested at a process weight rate of 9 to 10 TPH. All compliance tests shall meet the requirements listed in F.A.C. Rule 17-2.700. The unit shall not operate above the maximum permitted rate of 10 TPH.

20. When the Department, after investigation, has good reason (such as complaints, increased visible emissions, or questionable maintenance of control equipment) to believe that any applicable emission standard contained in Chapter 17-2, F.A.C., or in this permit is being violated, it may require the owner or operator of the unit to conduct compliance tests which identify the nature and quantity of pollutant emissions from the source and to provide a report on the results of said tests to the Department.

21. The exhaust stack for this process must be tested concurrently for particulate matter and visible emissions by EPA Methods 5 and 9 pursuant to 40 CFR 60, Appendix A, revised as of July 1, 1990, within 5 days after placing the unit in commercial operation under this permit and annually thereafter. Operation at each subsequent site requires an EPA Method 9 test to be performed within 3 days of placing the unit in service.

22. The unit destruction efficiency, benzene, and VOC emissions shall be established by a material balance using a Method 18, or 25 test (40 CFR 60, Appendix A, revised as of July 1, 1990) and soil analysis before and after treatment or other methods as approved by the Department.

SPECIFIC CONDITIONS:

Administrative Requirements

23. The permittee shall furnish the available information listed in Specific Condition No. 24 prior to operating the mobile soil thermal treatment facility at its initial site. This permit requires compliance with any applicable local (county) regulations. This may include requirements for county operation permits and additional restrictions on the operation of this unit.

24. The permittee shall notify the BAR, local government (city and/or county), and Department district office by registered mail at least 3 days prior to moving to the new site. The notification shall provide the permit number of the unit, a copy of the last stack test results, the date of the proposed move, the new site for the unit, and the location and contamination levels of the soil to be treated. The Department shall notify the permittee of any new air pollutant emission conditions the unit must meet after the receipt of the relocation notice.

25. The permittee shall maintain a log that shows the facility's operation time during the preceeding 12 months. All required records must be available for inspection at the job site for the unit within 3 working days of a request by the Department.

26. The BAR shall be notified in writing at least 15 days in advance of any annual compliance test to be conducted on this facility.

27. Any analysis required by Specific Condition No. 16 which indicates a violation of any condition in this permit shall be reported within 5 days of receiving the analytical test report to the District office. An average concentration of benzene above 2,913 ppm in the soil or total hydrocarbons above 10,000 ppm is a potential violation of this permit. The soil may be decontaminated by operating at less than the 10 TPH production rate, or by other means, with prior approval from the Department district office. The permittee must propose the method of compliance with this permit.

28. Records shall be kept by the permittee on the location, date, time, and number of samples taken for each composite sample. Soil analysis results shall be available for Department inspection during the clean up of the site and for 3 years thereafter.

SPECIFIC CONDITIONS:

29. Stack test results from PM and VOC shall be submitted to the Department within 45 days of the test.

30. The permittee, for good cause, may request that this construction permit be extended. Such a request shall be submitted to the BAR prior to 60 days before the expiration of the permit (F.A.C. Rule 17-4.090).

31. An application for an operation permit must be submitted to the BAR at least 90 days prior to the expiration date of this construction permit or within 45 days after completion of compliance testing, whichever occurs first. To properly apply for an operation permit, the applicant shall submit the appropriate application form, fee, certification that construction was completed noting any deviations from the conditions in the construction permit, and compliance test reports as required by this permit (F.A.C. Rule 17-4.220).

Issued this _____ day
of _____, 1991

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

_____
Carol M. Browner, Secretary

Post-it™routing request pad 7664
BRAND

ROUTING - REQUEST

Please
- ☐ READ — To C. Brown
- ☐ HANDLE
- ☐ APPROVE — DO NOT SIGN
and
- ☐ FORWARD
- ☐ RETURN — This version.
- ☐ KEEP OR DISCARD
- ☐ REVIEW WITH ME

Date _____ From _____

STATE OF FLORIDA
DEPARTMENT OF HEALTH AND REHABILITATIVE SERVICES

ESE - PBCPHU

October 1, 1991

C. H. Fancy
Chief, Bureau of Air Quality Management
Florida Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, FL 32301-8241

Re: Construction Permit for Southern Soil Services, Inc.
10TPH Mobile Soil Remediation Unit

Dear Mr. Fancy:

The Palm Beach County Public Health Unit received the above referenced application/request on September 17, 1991, and offers the following comments:

Please include the 15 day prior notification requirement to the local programs in the specific conditions. Palm Beach County will also require such facilities to obtain an annual license to operate an air pollution source in this county. The conditions for securing a license would be:

- A valid FDER construction or operation air permit
- A letter of approval from the Palm Beach County Public Health Unit
- Payment of the licensing fee ($100.00)

Thank you for the opportunity to comment on this application.

Sincerely,

For the Division Director
Environmental Science and Engineering

Jeffery F. Koerner
Engineer II, PBCPHU

FJG/JFK/lh
cc: W. Hanks

The Orlando Sentinel

Published Daily
Kissimmee, Osceola County, Florida

ADVERTISING CHARGE $8.66

State of Florida } SS.
COUNTY OF ORANGE }

Before the undersigned authority personally appeared

Noemi R. Lucero, who on oath says that she is the Legal Advertising Representative of The Orlando Sentinel, a Daily newspaper published at Kissimmee, in Osceola County, Florida; that the attached copy of advertisement, being a notice of application in the matter of Southern Soil Services, Inc.

in the Court, was published in said newspaper in the issues of

September 26, 1991

Affiant further says that the said The Orlando Sentinel is a newspaper published at Kissimmee, in said Osceola County, Florida, and that the said newspaper has heretofore been continuously published in said Osceola County, Florida, each Week Day and has been entered as second-class mail matter at the post office in Kissimmee in said Osceola County, Florida, for a period of one year next preceding the first publication of the attached copy of advertisement; and affiant further says that he/she 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 the said newspaper.

Noemi R. Lucero

Sworn to and subscribed before me this 26th day of September A.D., 19 91

Notary Public, State of Florida at Large
My Commission Expires May 29, 1995
Bonded Thru Brown & Brown, Inc.

Notary Public

NOTICE OF APPLICATION

The Department of Environmental Regulation announces receipt of an application for permit from Southern Soil Services, Inc., 3640 Thompson Road, Lake Mary, Florida 32746 to construct a mobile soilremediation unit that will evaporate and incinerate petroleum products (fuels and lubicants) from soils contaminated by leaking fuel tanks, spills, etc. The unit will operate in OSCEOLA Counties.

The application is being processed at the Department of Environmental Regulation, BAR, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400. 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 Department of Environmental Regulation offices located at:

- 2600 Blair Stone Road, Tallahassee, FL 32399-2400
- 160 Governmental Center, Pensacola, FL 32501-5794
- 4520 Oak Fair Blvd., Tampa, FL 33610-7347
- 2269 Bay Street, Fort Myers, FL 33901-2896
- 7825 Baymeadows Way, Suite B200, Jacksonville, FL 32256-7577
- 1900 S. Congress Ave., Suite A, West Palm Beach, FL 33406

and County offices located at:

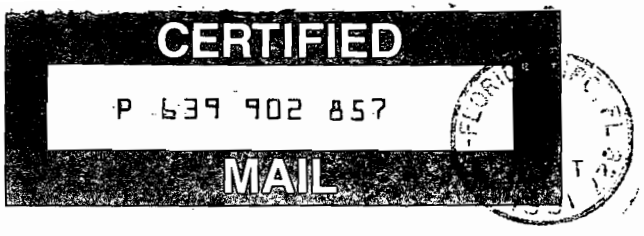
- 621 S. Andrew Ave., Ft. Lauderdale, FL 33301
- 801 S.W. 3rd Avenue, 2nd Floor, Miami, FL 33130
- 421 West Church St., Suite 412, Jacksonville, FL 32202-4111
- 1410 North 21st Street, Tampa, FL 33605
- 901 E. Evernia Street, West Palm Beach, FL 33402
- 315 Court Street, Clearwater, FL 34616
- 1301 Cattleman Road, Bldg. B, Sarasota, FL 43232-6299
- 2002 E. Michigan Avenue, Orlando, FL 32806

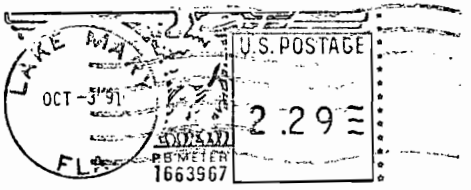
Written comments on this application may be submitted to Mr. Preston Lewis at the Department's Tallahassee address.

OS-634 Sept.26,1991

FORM NO. AD-263

ALAN KEENE
SOUTHERN SOIL SERVICES
3640 THOMPSON RD
LK MARY, FL. 32746





STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
2600 BLAIR STONE ROAD
TWIN TOWERS OFFICE BUILDING
TALLAHASSEE, FLORIDA 32399-2400

ATTN. PATTY ADAMS

SENDER: Complete items 1 and 2 when additional services are desired, and complete items 3 and 4.

Put your address in the "RETURN TO" Space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for additional service(s) requested.

1. ☐ Show to whom delivered, date, and addressee's address. *(Extra charge)* 2. ☐ Restricted Delivery *(Extra charge)*

3. Article Addressed to:
Mr. Burton A. Keene, Pres.
Southern Soil Service, Inc.
3640 Thompson Rd
Lake Mary, Fl
32746

4. Article Number
P 832 538 959

Type of Service:
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail

Always obtain signature of addressee or agent and DATE DELIVERED.

5. Signature – Addressee
X

6. Signature – Agent
X

7. Date of Delivery
9/23/91

8. Addressee's Address *(ONLY if requested and fee paid)*

PS Form **3811**, Mar. 1987 ★ U.S.G.P.O. 1987-178-268 **DOMESTIC RETURN RECEIPT**

P 832 538 959

Certified Mail Receipt
No Insurance Coverage Provided
Do not use for International Mail
(See Reverse)

UNITED STATES POSTAL SERVICE

Sent to Burton Keene	
Street & No. S. Soil Serv. Inc.	
P.O., State & ZIP Code Lake Mary, Fl	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Address of Delivery	
TOTAL Postage & Fees	$
Postmark or Date 9-19-91	

AC 49-201051

PS Form **3800**, June 1990

Florida Department of Environmental Regulation

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

Lawton Chiles, Governor

Carol M. Browner, Secretary

September 17, 1991

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Burton Alan Keene, President
Southern Soil Services, Inc.
3640 Thompson Road
Lake Mary, Florida 32746

Dear Mr. Keene:

Re: File No. AC 49-201051, 10 TPH Mobile Soil Remediation Unit

Applicants for permits to construct soil remediation units are required to publish a Notice of Application on submittal of a complete application for permit to construct. Your application is considered to be substantially complete. Your Notice of Application is enclosed. Note that you must list each county you plan to operate in on the blank line in the Notice. You must publish the Notice in a newspaper having circulation in each county you intend to operate in and provide the Bureau of Air Regulation (BAR) with proof of each publication. You will also be required to publish a Notice of Intent to Issue in the same newspapers should the Department approve your application. Any construction permit issued will limit you to operating in these counties. To operate in any other county, you will have to satisfy the public notice requirements for that county and have your permit amended to authorize operation in that county. The public will have an opportunity to comment or petition for an administrative hearing in response to any public notice for your unit.

If you have any questions on this matter, please write to me or call Willard Hanks at 904-488-1344.

Sincerely,

C. H. Fancy, P.E.
Chief
Bureau of Air Regulation

CHF/WH/plm

c: District Air Program Administrators
County Air Program Administrators
John Bottorf, P.E.

Notice of Application

The Department of Environmental Regulation announces receipt of an application for permit from Southern Soil Services, Inc., 3640 Thompson Road, Lake Mary, Florida 32746 to construct a mobile soil remediation unit that will evaporate and incinerate petroleum products (fuels and lubicants) from soils contaminated by leaking fuel tanks, spills, etc. The unit will operate in _____

_____

_____

counties.

The application is being processed at the Department of Environmental Regulation, BAR, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400. 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 Department of Environmental Regulation offices located at:

2600 Blair Stone Road, Tallahassee, FL 32399-2400
160 Governmental Center, Pensacola, FL 32501-5794
4520 Oak Fair Blvd., Tampa, FL 33610-7347
2269 Bay Street, Fort Myers, FL 33901-2896
7825 Baymeadows Way, Suite B200, Jacksonville, FL 32256-7577
1900 S. Congress Ave., Suite A, West Palm Beach, FL 33406

and County offices located at:

621 S. Andrew Ave., Ft. Lauderdale, FL 33301
801 S.W. 3rd Avenue, 2nd Floor, Miami, FL 33130
421 West Church St., Suite 412, Jacksonville, FL 32202-4111
1410 North 21st Street, Tampa, FL 33605
901 E. Evernia Street, West Palm Beach, FL 33402
315 Court Street, Clearwater, FL 34616
1301 Cattleman Road, Bldg. B, Sarasota, FL 43232-6299
2002 E. Michigan Avenue, Orlando, FL 32806

Written comments on this application may be submitted to Mr. Preston Lewis at the Department's Tallahassee address.

BOTTORF Associates inc.

CONSULTING ENGINEERS — ANALYTICAL LABORATORY

6729 EDGEWATER COMMERCE PARKWAY • ORLANDO, FLORIDA 32810-4278 • (407) 298-0846 • FAX (407) 299-7053

September 4, 1991

Project No. 1117

C. H. Fancy, P.E.
Chief
Bureau of Air Regulation
Florida Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Subject: Osceola County - AP
Southern Soil Services, Inc.
10 TPH Mobile Soil
Remediation Unit

Dear Mr. Fancy,

We are in receipt of your August 28, 1991 letter requesting additional information to complete the referenced application. The information is provided in the order requested.

1. This unit is most likely to be operated in Osceola County. The applicant is aware that additional public notices to be published will be required prior to operating outside of this county.

2. This mobile soil remediation plant will be capable of meeting the particulate emission standard of 0.08 grains/dscf corrected to 50% excess air.

3. The exhaust volumes contained in the calculations provided with the application are biased on the high side. We have enclosed some additional calculations that are based on actual stack test data and we believe they are more realistic. As you can see, these calculations show that a residence time of 0.646 seconds at 1400°F can be obtained with the afterburner provided. Efficiency testing performed in the past on afterburners designed for 0.5 seconds at 1400°F have demonstrated that a 95% VOC destruction can be achieved. If necessary however, the temperature in this afterburner can be elevated to 1600°F and higher, to reach the required efficiency of 95%.

4. Soil exiting the dryer will be re-wetted with water spray nozzles to minimize fugitive dust emissions. This measure will minimize fugitive emissions, as the dried material exits the dryer as well, as from the front-end loader, as it moves and dumps the treated soil.

5. The maximum retention time and temperature of the soil in the rotary kiln will be 10 minutes at 500°F. The unit will treat the soil with one pass through the dryer. The dryer is equipped with an adjustable pitch, so if soil contaminated with a heavy oil is being treated and a longer retention time is necessary to meet the clean soil standard, a retention time of 15 minutes or longer could be achieved.

BOTTORF Associates inc.
6729 EDGEWATER COMMERCE PARKWAY • ORLANDO, FLORIDA 32810-4278

G. H. Fancy, P.E.
Chief
Bureau of Air Regulation
Florida Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

In addition to providing the additional information requested, we are requesting an alternate sampling procedure (ASP) to use EPA Method 25A in place of EPA Method 25, because we feel it is a more reliable test method, giving accurate results. EPA Method 25 will bias emission rates high, especially on the exit end of the afterburner, making it hard to demonstrate the required 95% reduction.

We trust this information is sufficient to complete the referenced application.

If you have additional questions, please call Roger Caldwell at 407/298-0846.

Sincerely,

John W. Bottorf, Jr., P.E.

JWB/ms

Cy: Burton Alan Keene
T. Hanks

SOUTHERN SOIL SERVICES, INC.

10 TPH MOBILE SOIL REMEDIATION PLANT

1. VOLUME OF AIR TO BAGHOUSE:
   250 ACFM/TON OF SOIL @ 300°F.
   250 ACFM X 10 TPH = 2,500 ACFM @ 300°F.

2. BAGHOUSE AIR TO CLOTH RATIO (ATC):
   ATC = 2,500 ACFM/804.25 SQ. FT. = 3.11:1.

3. HEAT REQUIRED IN AFTERBURNER:
   Q = M X CP X [T2 - T1].
   V = 2,500 ACFM @ 300°F = 2,500 X 60 = 150,000 ACFH.
   M = 150,000 ACFH/13.7 CF PER POUND = 10,949 LBS/HR.
   CP = 0.241 BTU/LB/°R.
   T1 = 300 + 460 = 760°R.
   T2 = 1,400 + 460 = 1,860°R.
   Q = 10,949 X .241 X [1,860 - 760] = 2,902,580 BTU/HR.

   FUEL: #2 FUEL OIL.
   HEAT VALUE: 138,000 BTU/GAL.
   2,902,580 BTU/HR/138,000 BTU/GAL. = 21 GAL/HR.

4. HEAT REQUIRED FOR SOIL DRYER: (FOR SOIL WITH 8% MOISTURE AND 450°F OUTLET TEMPERATURE) IS 333,000 BTU/TON.
   10 TPH X .333 MMBTU/TON = 3.33 MMBTU/HR.

   FUEL: #2 FUEL OIL.
   HEAT VALUE: 138,000 BTU/GAL.
   3,330,000 BTU/HR/138,000 BTU/GAL. = 24 GAL/HR.

5. VOLUME OF AIR EXITING AFTERBURNER:
   2,500 ACFM @ 300°F X [1,860/760] = 6,118.4 ACFM @ 1,400°F.
   PLUS EXHAUST FROM AFTERBURNER.
   10,360 WSCF/MMBTU X 2.9 X [1,860/528] = 105,837 ACFH @ 1,400°F.
   105,837 ACFH/60 MIN. = 1,764 ACFM @ 1,400°F.

   TOTAL EXHAUST VOLUME = 6,118 + 1,764 = 7,882 ACFM @ 1,400°F.

6. RESIDENCE TIME IN AFTERBURNER:
   7,882 ACFM/60 SECONDS = 131.37 ACFS.
   AFTERBURNER CHAMBER = 84.82 CU. FT.
   RESIDENCE TIME = 84.82 CU.FT./131.37 ACFS = 0.646 SECONDS.

09-16-91
10:36:56

*** SCREEN-1.1 MODEL RUN ***
*** VERSION DATED 88300 ***

southern soil services

SIMPLE TERRAIN INPUTS:

SOURCE TYPE	=	POINT
EMISSION RATE (G/S)	=	1.000
STACK HEIGHT (M)	=	7.62
STK INSIDE DIAM (M)	=	.69
STK EXIT VELOCITY (M/S)	=	10.00
STK GAS EXIT TEMP (K)	=	1033.30
AMBIENT AIR TEMP (K)	=	293.00
RECEPTOR HEIGHT (M)	=	.00
IOPT (1=URB,2=RUR)	=	2
BUILDING HEIGHT (M)	=	.00
MIN HORIZ BLDG DIM (M)	=	.00
MAX HORIZ BLDG DIM (M)	=	.00

BUOY. FLUX = 8.36 M**4/S**3; MOM. FLUX = 3.38 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN AUTOMATED DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
1.	.0000	0	.0	.0	.0	.0	.0	.0	
100.	25.08	3	10.0	10.0	3200.0	17.5	12.6	7.7	NO
200.	48.49	4	20.0	20.0	5000.0	11.5	15.6	8.6	NO
300.	41.94	4	10.0	10.0	3200.0	17.5	22.8	12.5	NO
400.	36.80	4	10.0	10.0	3200.0	17.5	29.6	15.6	NO
500.	32.20	4	8.0	8.0	2560.0	20.4	36.3	18.7	NO
600.	28.70	4	5.0	5.0	1600.0	28.7	43.1	22.0	NO
700.	26.52	4	5.0	5.0	1600.0	28.7	49.6	24.8	NO
800.	24.21	4	4.0	4.0	1280.0	34.0	56.1	27.8	NO
900.	22.50	4	4.0	4.0	1280.0	34.0	62.3	30.4	NO
1000.	20.72	4	4.0	4.0	1280.0	34.0	68.5	33.0	NO

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 1. M:

183.	49.09	4	20.0	20.0	5000.0	11.5	14.5	8.0	NO

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

1 hr max impact 1 g/s emission = 49.1 ug/m³

8 " = 34.4 "

24 " = 19.6 "

annual " = 4.9 "

NTL BZ = 30 ug/m³ (8 hr)
= 7.2 (24 hr)
= 0.12 (annual)

AAC = I x E

$E_{(8hr)} = 30 \frac{ug}{m^3} \frac{m^3}{34.4 ug} \frac{g}{s} = 0.87 \frac{g}{s} \quad \frac{lb}{454 g} \times 2000 \frac{lbs}{hr} = 6.9 \text{ lbs/hr}$

VOC INTO AB = $6.9 \frac{\text{lbs OUT}}{hr} \left[\frac{100 \text{ lbs IN}}{5 \text{ lbs OUT}} \right] = 138.3 \text{ lbs/hr BZ IN SOIL}$

$PPM_{BZ\ SOIL} = \frac{138.3 \times 10^6}{10 \times 2000} = 6915 \text{ PPM}$

$E_{(24hr)} = \frac{7.2}{19.6} = 0.37 \frac{g}{s} \sim 2.9 \text{ lbs/hr}$

2500 HR/yr OPS
USE THIS STD

VOC INTO AB = $2.9 (100/5) = 58.3 \text{ lbs/hr}$

$PPM_{SOIL} = 58.3 \times 10^6 / 20,000 = 2913 \text{ PPM BZ}$

$E_{(annual)} = \frac{0.12}{4.9} = 0.024 \frac{g}{s} \sim 0.19 \text{ lbs/hr}$

VOC INTO AB = $(0.19)(100/5) = 3.88 \text{ lbs/hr}$

$PPM_{SOIL} = 3.88 \times 10^6 / 20,000 = 194 \text{ PPM}$

MAX VOC IN SOIL = $10 \frac{\text{lb VOC OUT}}{hr} (100/5) = 200 \text{ lb/hr IN}$

$PPM_{SOIL} = \frac{200 \times 10^6}{20,000} = 10,000 \text{ PPM}$

✓

SENDER: Complete items 1 and 2 when additional services are desired, and complete items 3 and 4.

Put your address in the "RETURN TO" Space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for additional service(s) requested.

1. ☐ Show to whom delivered, date, and addressee's address. *(Extra charge)* 2. ☐ Restricted Delivery *(Extra charge)*

3. Article Addressed to:
Mr. Burton A. Keene, Pres.
Southern Soil Serv., Inc.
3640 Thompson Rd.
Lake Mary, Fl
32746

4. Article Number
P 832 538 940

Type of Service:
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail

Always obtain signature of addressee or agent and DATE DELIVERED.

5. Signature – Addressee
X Burton A. Keene

6. Signature – Agent
X

7. Date of Delivery
8/30/91

8. Addressee's Address *(ONLY if requested and fee paid)*

PS Form **3811**, Mar. 1987 ★ U.S.G.P.O. 1987-178-268 **DOMESTIC RETURN RECEIPT**

P 832 538 940

Certified Mail Receipt
No Insurance Coverage Provided
Do not use for International Mail
(See Reverse)

UNITED STATES POSTAL SERVICE

Sent to Burton A. Keene	
Street & No. South. Soil Serv. Inc	
P.O., State & ZIP Code Lake Mary, Fl	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Address of Delivery	
TOTAL Postage & Fees	$
Postmark or Date 8-27-91	

10 TPH MSRL

PS Form **3800**, June 1990

Florida Department of Environmental Regulation

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

Lawton Chiles, Governor

Carol M. Browner, Secretary

August 28, 1991

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Burton Alan Keene, President
Southern Soil Services, Inc.
3640 Thompson Road
Lake Mary, Florida 32746

Dear Mr. Keene:

Re: 10 TPH Mobile Soil Remediation Unit

The Department has made a preliminary review of your application for permit to construct a 10 TPH mobile soil remediation unit. Before this application can be processed, the Department will need the following information:

1. What counties will this unit be operated in?

2. Mobile soil remediation units must meet a particulate matter emissions standard of 0.08 grains/dscf corrected to 50% excess air. What is the design particulate matter emissions from the proposed unit in grains/dscf @ 50% EA?

3. Afterburners on soil remediation units must have a minimum VOC destruction efficiency of 95%. At 1400°F operation temperature, literature implies that a retention time greater than 0.32 seconds is needed for the afterburner to consistently achieve 95% VOC destruction efficiency. Please have your engineer provide the Department with a copy of the calculations used to determine the destruction efficiency of the proposed afterburner.

4. Fugitive dust emissions can be a problem with these operations. Please provide a description of the precautions that will be taken to minimize fugitive dust emissions from the handling and disposal of the treated soil. This should include the dried material from the dryer, the payloader moving and dumping of the treated soil, and any other part of the operation that involves handling material after it has passed through the dryer.

5. What is the maximum retention time and temperature of the soil in the rotary kiln? Will more than one pass of the soil through the dryer be required to complete treatment?

We will resume processing the application after the requested information is received. If you have any questions on this matter, please write to me or call Willard Hanks at 904-488-1344.

Sincerely,

C. H. Fancy, P.E.
Chief
Bureau of Air Regulation

CHF/WH/plm

c: Charles Collins, Central Dist.
John Bottorf, P.E.

08-21-91
14:10:55

*** SCREEN-1.1 MODEL RUN ***
*** DRAFT VERSION XXXXX ***

southern soil services, inc.

9-16-91
reduced to 10 m/s on revision.

SIMPLE TERRAIN INPUTS:

SOURCE TYPE	=	POINT
EMISSION RATE (G/S)	=	1.000
STACK HEIGHT (M)	=	7.62
STK INSIDE DIAM (M)	=	.69
STK EXIT VELOCITY (M/S)	=	20.54
STK GAS EXIT TEMP (K)	=	1033.00
AMBIENT AIR TEMP (K)	=	293.00
RECEPTOR HEIGHT (M)	=	.00
IOPT (1=URB,2=RUR)	=	2
BUILDING HEIGHT (M)	=	.00
MIN HORIZ BLDG DIM (M)	=	.00
MAX HORIZ BLDG DIM (M)	=	.00

BUOY. FLUX = 17.07 M**4/S**3; MOM. FLUX = 14.16 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN AUTOMATED DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
1.	.0000	0	.0	.0	.0	.0	.0	.0	
100.	1.651	4	20.0	20.0	5000.0	16.0	8.3	4.8	NO
200.	21.84	4	20.0	20.0	5000.0	16.0	15.7	8.7	NO
300.	24.57	4	20.0	20.0	5000.0	16.0	22.8	12.4	NO
400.	21.14	4	15.0	15.0	4800.0	19.4	29.7	15.6	NO
500.	18.50	4	10.0	10.0	3200.0	25.6	36.5	19.0	NO
600.	17.02	4	10.0	10.0	3200.0	25.6	43.0	21.8	NO
700.	15.50	4	8.0	8.0	2560.0	30.1	49.6	24.9	NO
800.	14.20	4	8.0	8.0	2560.0	30.1	55.9	27.5	NO
900.	12.88	4	8.0	8.0	2560.0	30.1	62.2	30.2	NO
1000.	11.87	4	5.0	5.0	1600.0	43.6	68.9	33.7	NO
MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 1. M:									
265.	25.14	4	20.0	20.0	5000.0	16.0	20.4	11.2	NO

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	25.14	265.	0.

****
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
****

BOTTORF Associates inc.

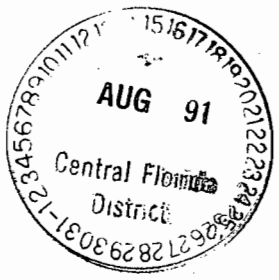
CONSULTING ENGINEERS — ANALYTICAL LABORATORY

LETTER OF TRANSMITTAL

DATE: August 13, 1991

TO: Air Resources Management
Central District
Florida Dept. of Environmental Reg.
3319 Maguire Blvd., Suite 232
Orlando, Florida 32803-3767

JOB NO. 1117



We are forwarding to you

___ Attached	___ Delivered by		
___ Tracings	___ Shop Drawings	X Applications	___ Sketch
___ Prints	___ Proposal	___ Copy of Letter	___ Other
___ Specifications	___ Report	___ Catalog Cut Sheet	

Copies	Dated	Description
4	8/13/91	Application to Construct Air Pollution Sources, Southern Soil Services, Inc., Mobile Soil Remediation Plant, Osceola County, with check #334 in the amount of $1,000.00 for permit fees.

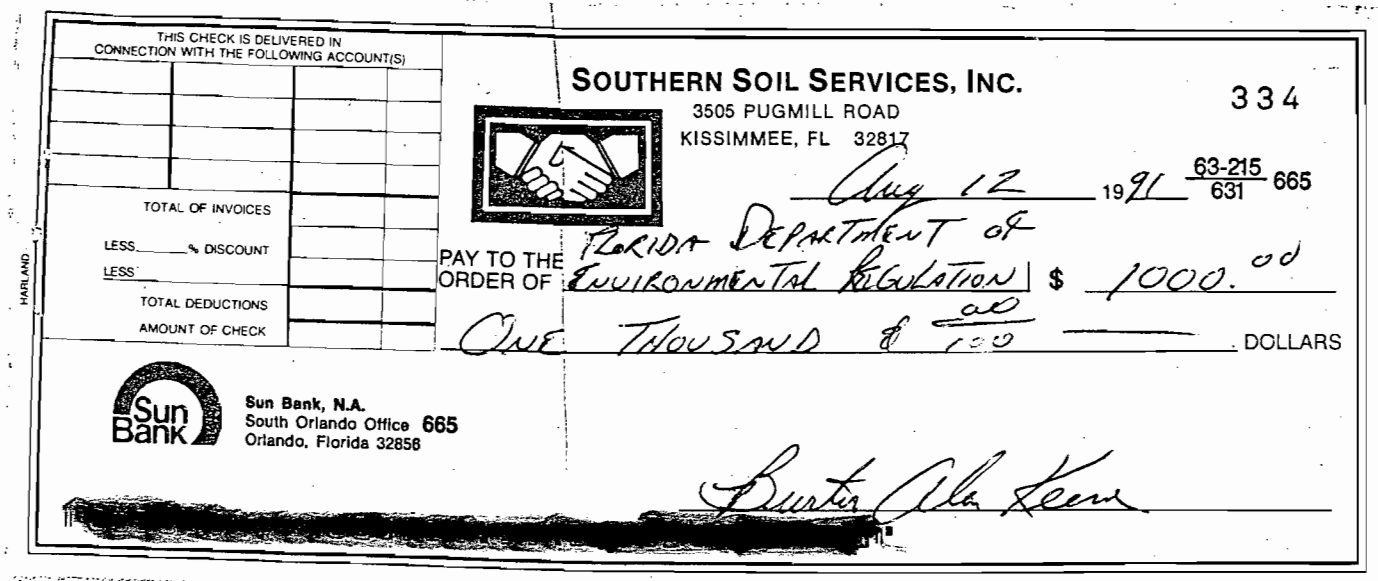
These are transmitted:

___ For Your Use	___ No Exceptions Taken	___ For Review
X As Required	___ Make Corrections Noted	___ For Return
___ As Requested	___ Amend & Resubmit	___ Other
___ For Your Signature	___ Rejected-See Remarks	

Cy: Burton Alan Keene, President

By: Roger T. Caldwell

Roger T. Caldwell, Vice President
Environmental Division



THIS CHECK IS DELIVERED IN CONNECTION WITH THE FOLLOWING ACCOUNT(S)

TOTAL OF INVOICES

LESS ____ % DISCOUNT

LESS

TOTAL DEDUCTIONS

AMOUNT OF CHECK

SOUTHERN SOIL SERVICES, INC.
3505 PUGMILL ROAD
KISSIMMEE, FL 32817

334

Aug 12 1991 63-215/631 665

PAY TO THE ORDER OF Florida Department of Environmental Regulation $ 1000.00

One Thousand & 00/100 DOLLARS

Sun Bank

Sun Bank, N.A.
South Orlando Office 665
Orlando, Florida 32858

Burton Alan Keen

HARLAND

Department of Environmental Regulation

Routing and Transmittal Slip

To: (Name, Office, Location)

1. Willard Hanks
2. Bureau of Air Regulation
3.
4.

Remarks:

Please process this mobile unit. I kept one copy for our file.

RECEIVED

AUG 20 1991

Division of Air Resources Management

From: [signature]

Date 8/15/91

Phone

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

RECEIPT FOR APPLICATION FEES AND MISCELLANEOUS REVENUE

176533

Received from Southern Soil Services, Inc Date 08/15/91

Address 3505 Pugmill Rd. Kissimmee, FL 3[illegible] Dollars $ 1,000.00

Applicant Name & Address

Source of Revenue Same

Revenue Code 001031 CK 334 Application Number AC49 201051

By [signature]

$1,000 pd
8-15-91

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

ST. JOHNS RIVER DISTRICT
3319 MAGUIRE BOULEVARD
SUITE 232
ORLANDO, FLORIDA 32803

AC 49-201051

BOB GRAHAM
GOVERNOR
VICTORIA J. TSCHINKEL
SECRETARY
ALEX SENKEVICH
DISTRICT MANAGER

AUG 91
Central Florida District

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: MOBILE SOIL REMEDIATION PLANT [X] New[1] [ ] Existing[1]

APPLICATION TYPE: [X] Construction [ ] Operation [ ] Modification

COMPANY NAME: SOUTHERN SOIL SERVICES, INC. COUNTY: OSCEOLA

Identify the specific emission point source(s) addressed in this application (i.e. Lime Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas Fired) MOBILE SOIL REMEDIATION PLANT W/BAGHOUSE AND AFTERBURNER

SOURCE LOCATION: Street 3505 PUG MILL ROAD * City KISSSIMMEE

UTM: East 17-457.52 KM North 3127.810 KM

Latitude 28 ° 16' 44 "N Longitude 81 ° 25 ' 58 "W

APPLICANT NAME AND TITLE: BURTON ALAN KEENE, PRESIDENT

APPLICANT ADDRESS: 3640 THOMPSON RD., LAKE MARY, FLORIDA 32746

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of SOUTHERN SOIL SERVICES, INC.

I certify that the statements made in this application for a CONSTRUCTION permit are true, correct and complete to the best of my knowledge and belief. Further, I agree to maintain and operate the pollution control source and pollution control facilities in such a manner as to comply with the provision of Chapter 403, Florida Statutes, and all the rules and regulations of the department and revisions thereof. I also understand that a permit, if granted by the department, will be non-transferable and I will promptly notify the department upon sale or legal transfer of the permitted establishment.

*Attach letter of authorization

Signed: Burton Alan Keene

BURTON ALAN KEENE, PRESIDENT
Name and Title (Please Type)

Date: 8/12/91 Telephone No. 407/933-8414

B. PROFESSIONAL ENGINEER REGISTERED IN FLORIDA (where required by Chapter 471, F.S.)

This is to certify that the engineering features of this pollution control project have been designed/examined by me and found to be in conformity with modern engineering principles applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgment, that

[1] See Florida Administrative Code Rule 17-2.100(57) and (104)

* PLANT WILL BE LOCATED AT THIS ADDRESS FOR INITIAL START-UP AND COMPLIANCE TESTING ONLY. IT WILL NOT OPERATE HERE NORMALLY, BECAUSE IT IS DESIGNED TO RELOCATE AND OPERATE AT THE CONTAMINATED SITES.

the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the department. It is also agreed that the undersigned will furnish, if authorized by the owner, the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

Signed _____

JOHN W. BOTTORF, JR., P.E.
Name (Please Type)

BOTTORF & ASSOCIATES, INC.
Company Name (Please Type)

6729 EDGEWATER COMMERCE PARKWAY, FLORIDA 32810-4278
Mailing Address (Please Type)

Florida Registration No. 13089 Date: 8/13/91 Telephone No. 407/298-0846

SECTION II: GENERAL PROJECT INFORMATION

A. Describe the nature and extent of the project. Refer to pollution control equipment, and expected improvements in source performance as a result of installation. State whether the project will result in full compliance. Attach additional sheet if necessary.

THIS PROJECT IS FOR THE CONSTRUCTION OF A MOBILE SOIL REMEDIATION PLANT. PARTICULATE EMISSIONS WILL BE CONTROLLED WITH A REVERSE AIR TYPE BAGHOUSE. VOC EMISSIONS WILL BE CONTROLLED WITH A DIRECT FLAME AFTER-BURNER. THIS PROJECT SHOULD RESULT IN FULL COMPLIANCE WITH CHAPTER 17-2 F.A.C.

B. Schedule of project covered in this application (Construction Permit Application Only)

Start of Construction AFTER PERMIT ISSUANCE Completion of Construction 6 MONTHS AFTER START

C. Costs of pollution control system(s): (Note: Show breakdown of estimated costs only for individual components/units of the project serving pollution control purposes. Information on actual costs shall be furnished with the application for operation permit.)

BAGHOUSE $19,000

AFTERBURNER 10,000

D. Indicate any previous DER permits, orders and notices associated with the emission point, including permit issuance and expiration dates.

NONE

E. Requested permitted equipment operating time: hrs/day 10 ; days/wk 5 ; wks/yr 50 ;

if power plant, hrs/yr_____; if seasonal, describe:_____

F. If this is a new source or major modification, answer the following questions. (Yes or No)

1. Is this source in a non-attainment area for a particular pollutant? NO

   a. If yes, has "offset" been applied? _____

   b. If yes, has "Lowest Achievable Emission Rate" been applied? _____

   c. If yes, list non-attainment pollutants. _____

2. Does best available control technology (BACT) apply to this source? If yes, see Section VI. NO

3. Does the State "Prevention of Significant Deterioriation" (PSD) requirement apply to this source? If yes, see Sections VI and VII. NO

4. Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source? NO

5. Do "National Emission Standards for Hazardous Air Pollutants" (NESHAP) apply to this source? NO

H. Do "Reasonably Available Control Technology" (RACT) requirements apply to this source? NO

   a. If yes, for what pollutants?_____

   b. If yes, in addition to the information required in this form, any information requested in Rule 17-2.650 must be submitted.

Attach all supportive information related to any answer of "Yes". Attach any justification for any answer of "No" that might be considered questionable.

SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

A. Raw Materials and Chemicals Used in your Process, if applicable:

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		
PETROLEUM CONTAMINATED SOIL	PARTICULATE	0.0062	20,000	
	VOC	0.1		

B. Process Rate, if applicable: (See Section V, Item 1)

1. Total Process Input Rate (lbs/hr): 20,000

2. Product Weight (lbs/hr): 20,000

C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)

Name of Contaminant	Emission[1]		Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/yr	T/yr	
PARTICULATE	1.27	1.59	------	.04GDSCF	317,500	159	
SO_2	7.49	9.36	------	------	18,725	9.36	
CO	0.53	0.66	------	------	1,325	0.66	
NOX	2.11	2.64	------	------	5,275	2.64	
VOC	10.0	12.5	------	------	5,000,000	250	
BENZENE	0.3	0.38	------	------	15,000	7.5	

[1]See Section V, Item 2.

[2]Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, E. (1) - 0.1 pounds per million BTU heat input)

[3]Calculated from operating rate and applicable standard.

[4]Emission, if source operated without control (See Section V, Item 3).

D. Control Devices: (See Section V, Item 4)

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles Size Collected (in microns) (If applicable)	Basis for Efficiency (Section V Item 5)
BAGHOUSE		99%	.15 AND LARGER	AP40
ONE OF A KIND				
SOUTHERN SOIL SERVICES				
AFTERBURNER		95%	N/A	AP40
ONE OF A KIND				
SOUTHERN SOIL SERVICES				

E. Fuels

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	
DRYER #2 FUEL OIL	40	62	8.56
AFTERBURNER #2 FUEL OIL	37.46	43.5	6.00

*Units: Natural Gas--MMCF/hr; Fuel Oils--gallons/hr; Coal, wood, refuse, other--lbs/hr.

Fuel Analysis:

Percent Sulfur: 0.5 Percent Ash: NEGLIGIBLE

Density: 6.83 lbs/gal Typical Percent Nitrogen: NEGLIGIBLE

Heat Capacity: 20,205 BTU/lb 138,000 BTU/gal

Other Fuel Contaminants (which may cause air pollution): N/A

F. If applicable, indicate the percent of fuel used for space heating.

Annual Average _____ Maximum _____

G. Indicate liquid or solid wastes generated and method of disposal.

USED BAGS WILL BE DISPOSED OF AT SANITARY LANDFILL.

H. Emission Stack Geometry and Flow Characteristics (Provide data for each stack):

Stack Height: 25 ft. Stack Diameter: 2' X 2' ft.

Gas Flow Rate: 16,176 ACFM 3,716 DSCFM Gas Exit Temperature: 1400 °F.

Water Vapor Content: 25.6 % Velocity: 67.4 FPS

SECTION IV: INCINERATOR INFORMATION

Type of Waste	Type 0 (Plastics)	Type I (Rubbish)	Type II (Refuse)	Type III (Garbage)	Type IV (Pathological)	Type V (Liq.& Gas By-prod.)	Type VI (Solid By-prod.)
Actual lb/hr Incinerated							
Uncontrolled (lbs/hr)							

Description of Waste _____

Total Weight Incinerated (lbs/hr) _____ Design Capacity (lbs/hr) _____

Approximate Number of Hours of Operation per day _____ day/wk _____ wks/yr. _____

Manufacturer _____

Date Constructed _____ Model No. _____

	Volume $(ft)^3$	Heat Release (BTU/hr)	Fuel		Temperature (°F)
			Type	BTU/hr	
Primary Chamber					
Secondary Chamber					

Stack Height: _____ ft. Stack Diamter: _____ Stack Temp. _____

Gas Flow Rate: _____ ACFM _____ DSCFM* Velocity: _____ FPS

*If 50 or more tons per day design capacity, submit the emissions rate in grains per standard cubic foot dry gas corrected to 50% excess air.

Type of pollution control device: [ ] Cyclone [ ] Wet Scrubber [ ] Afterburner

[ ] Other (specify) _____

Brief description of operating characteristics of control devices: _____

_____

_____

_____

_____

Ultimate disposal of any effluent other than that emitted from the stack (scrubber water, ash, etc.):

_____

_____

_____

_____

NOTE: Items 2, 3, 4, 6, 7, 8, and 10 in Section V must be included where applicable.

SECTION V: SUPPLEMENTAL REQUIREMENTS

Please provide the following supplements where required for this application.

1. Total process input rate and product weight -- show derivation [Rule 17-2.100(127)]

2. To a construction application, attach basis of emission estimate (e.g., design calculations, design drawings, pertinent manufacturer's test data, etc.) and attach proposed methods (e.g., FR Part 60 Methods 1, 2, 3, 4, 5) to show proof of compliance with applicable standards. To an operation application, attach test results or methods used to show proof of compliance. Information provided when applying for an operation permit from a construction permit shall be indicative of the time at which the test was made.

3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).

4. With construction permit application, include design details for all air pollution control systems (e.g., for baghouse include cloth to air ratio; for scrubber include cross-section sketch, design pressure drop, etc.)

5. With construction permit application, attach derivation of control device(s) efficiency. Include test or design data. Items 2, 3 and 5 should be consistent: actual emissions = potential (1-efficiency).

6. An 8 1/2" x 11" flow diagram which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained.

7. An 8 1/2" x 11" plot plan showing the location of the establishment, and points of airborne emissions, in relation to the surrounding area, residences and other permanent structures and roadways (Example: Copy of relevant portion of USGS topographic map).

8. An 8 1/2" x 11" plot plan of facility showing the location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.

9. The appropriate application fee in accordance with Rule 17-4.05. The check should be made payable to the Department of Environmental Regulation.

10. With an application for operation permit, attach a Certificate of Completion of Construction indicating that the source was constructed as shown in the construction permit.

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY

A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source?

[ ] Yes [ ] No

Contaminant	Rate or Concentration

B. Has EPA declared the best available control technology for this class of sources (If yes, attach copy)

[ ] Yes [ ] No

Contaminant	Rate or Concentration

C. What emission levels do you propose as best available control technology?

Contaminant	Rate or Concentration

D. Describe the existing control and treatment technology (if any).

1. Control Device/System:
2. Operating Principles:
3. Efficiency:*
4. Capital Costs:

*Explain method of determining

5. Useful Life:

6. Operating Costs:

7. Energy:

8. Maintenance Cost:

9. Emissions:

Contaminant	Rate or Concentration

10. Stack Parameters

a. Height: ft.

b. Diameter: ft.

c. Flow Rate: ACFM

d. Temperature: °F.

e. Velocity: FPS

E. Describe the control and treatment technology available (As many types as applicable, use additional pages if necessary).

1.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capitsl Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

2.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

[1]Explain method of determining efficiency.
[2]Energy to be reported in units of electrical power - KWH design rate.

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

3.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

4.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Costs:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

F. Describe the control technology selected:

1. Control Device:

2. Efficiency:[1]

3. Capital Cost:

4. Useful Life:

5. Operating Cost:

6. Energy:[2]

7. Maintenance Cost:

8. Manufacturer:

9. Other locations where employed on similar processes:

a. (1) Company:

(2) Mailing Address:

(3) City:

(4) State:

[1]Explain method of determining efficiency.
[2]Energy to be reported in units of electrical power - KWH design rate.

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

b. (1) Company:

(2) Mailing Address:

(3) City: (4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

10. Reason for selection and description of systems:

[1]Applicant must provide this information when available. Should this information not be available, applicant must state the reason(s) why.

SECTION VII - PREVENTION OF SIGNIFICANT DETERIORATION

A. Company Monitored Data

1. _____no. sites _____ TSP _____( ) SO^2* _____ Wind spd/dir

Period of Monitoring _____/____/____ to _____/____/____
month day year month day year

Other data recorded _____

Attach all data or statistical summaries to this application.

*Specify bubbler (B) or continuous (C).

2. Instrumentation, Field and Laboratory

a. Was instrumentation EPA referenced or its equivalent? [ ] Yes [ ] No

b. Was instrumentation calibrated in accordance with Department procedures?

[ ] Yes [ ] No [ ] Unknown

B. Meteorological Data Used for Air Quality Modeling

1. _____ Year(s) of data from _____/_____/_____ to _____/_____/_____
month day year month day year

2. Surface data obtained from (location)_____

3. Upper air (mixing height) data obtained from (location)_____

4. Stability wind rose (STAR) data obtained from (location)_____

C. Computer Models Used

1. _____ Modified? If yes, attach description.

2. _____ Modified? If yes, attach description.

3. _____ Modified? If yes, attach description.

4. _____ Modified? If yes, attach description.

Attach copies of all final model runs showing input data, receptor locations, and principle output tables.

D. Applicants Maximum Allowable Emission Data

Pollutant	Emission Rate
TSP	_____ grams/sec
SO^2	_____ grams/sec

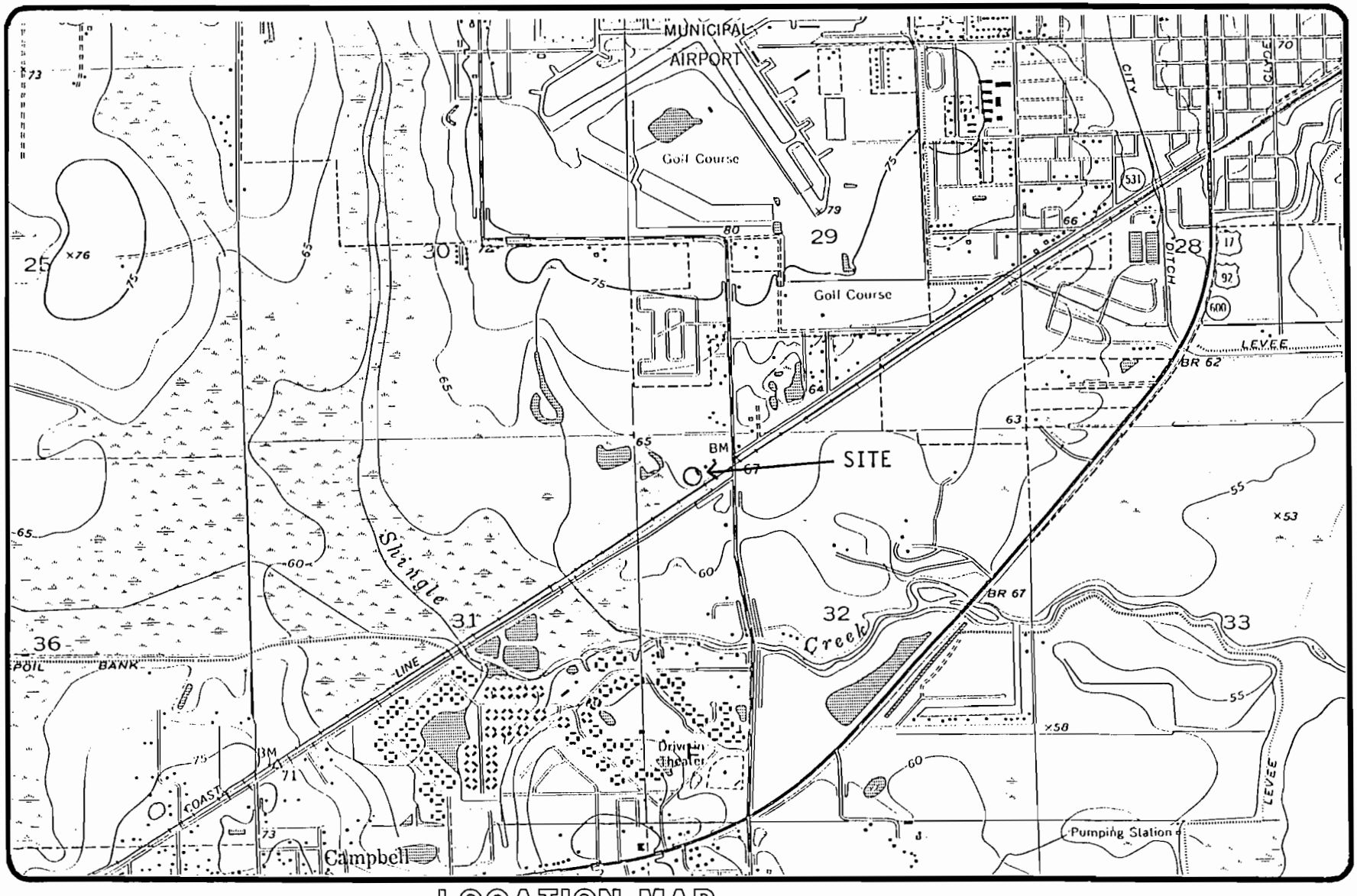
E. Emission Data Used in Modeling

Attach list of emission sources. Emission data required is source name, description of point source (on NEDS point number), UTM coordinates, stack data, allowable emissions, and normal operating time.

F. Attach all other information supportive to the PSD review.

G. Discuss the social and economic impact of the selected technology versus other spplicable technologies (i.e., jobs, payroll, production, taxes, energy, etc.). Include assessment of the environmental impact of the sources.

H. Attach scientific, engineering, and technical material, reports, publications, journals, and other competent relevant information describing the theory and application of the requested best available control technology.



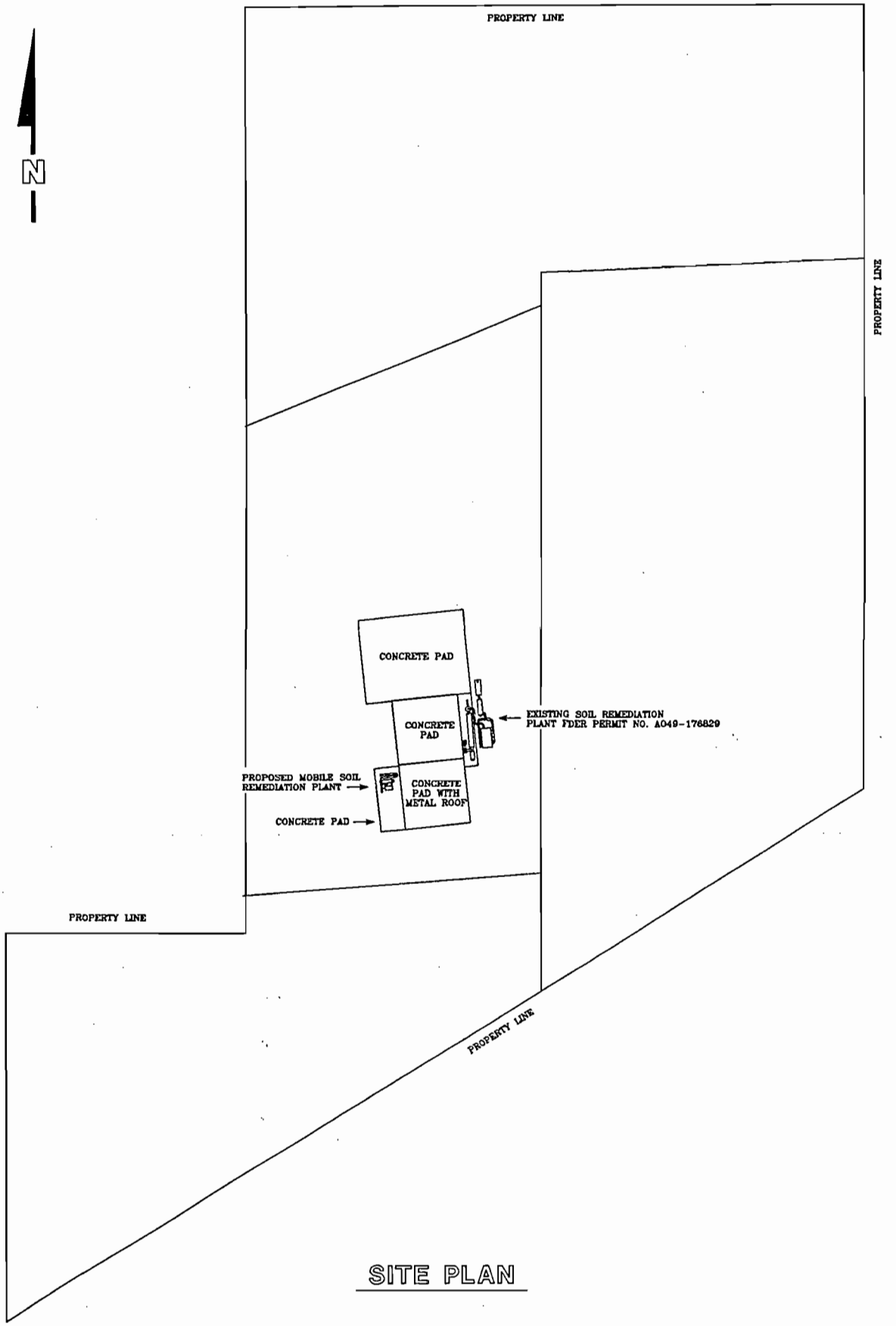
LOCATION MAP

BOTTORF ASSOCIATES INC.
CONSULTING ENGINEERS–ANALYTICAL LABORATORY
6729 EDGEWATER COMMERCE PARKWAY ORLANDO FLORIDA 32810-4278
PHONE: (407) 298-0846

SOUTHERN SOIL SERVICES, INC.
KISSIMMEE, OSCEOLA COUNTY, FLORIDA

DATE:	REVISION:

DRAWN BY: USGS	DATE:	1117
REVIEWED BY: RTC	VERSION: 10/388	
SCALE: 1:24,000	FILENAME: MAPBRDR	PROJECT NO.

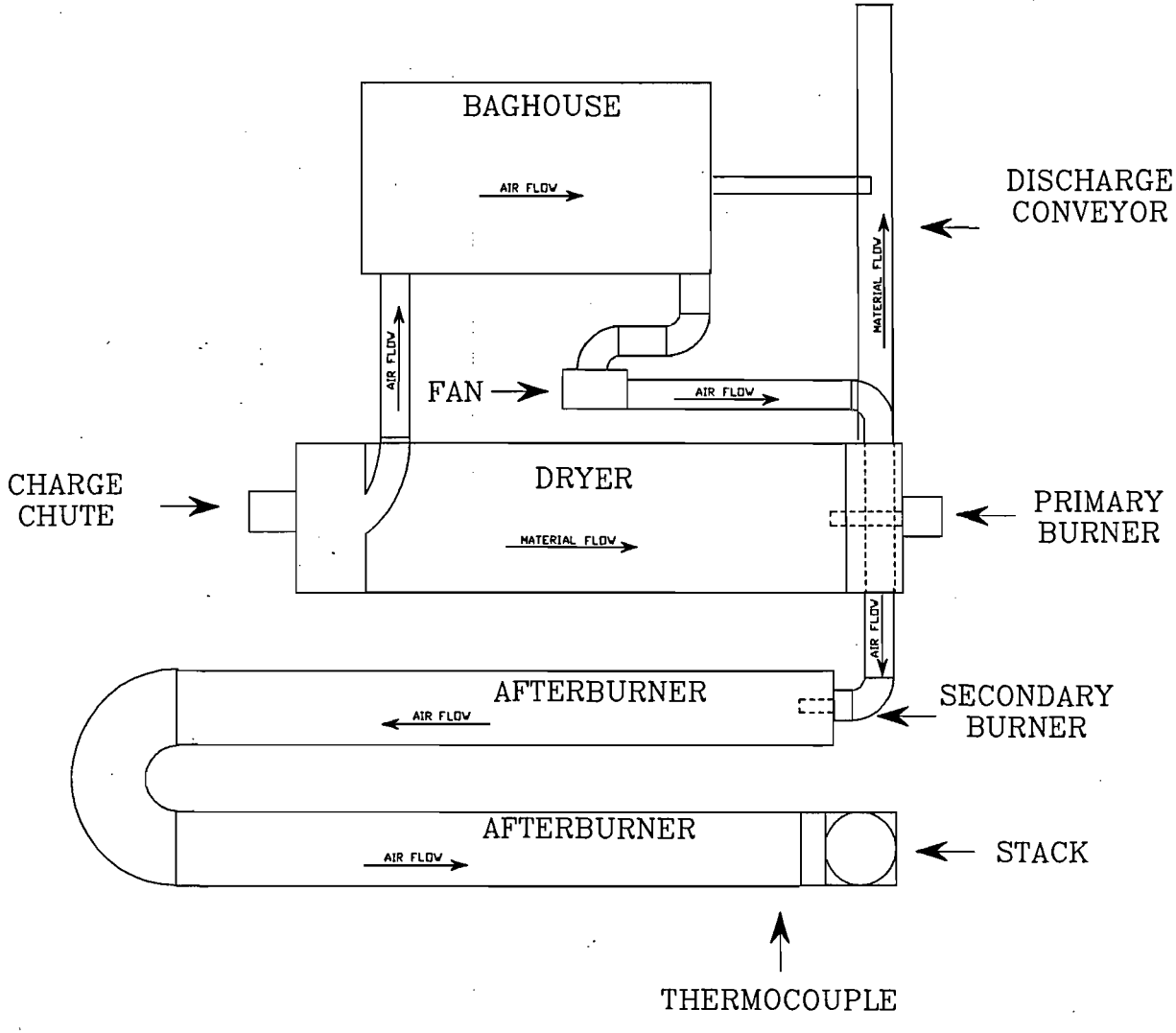


SITE PLAN

BOTTORF ASSOCIATES INC.
CONSULTING ENGINEERS—ANALYTICAL LABORATORY
6729 EDGEWATER COMMERCE PARKWAY ORLANDO, FLORIDA 32810-4278
PHONE: (407) 296-8846

SOUTHERN SOIL SERVICES, INC.
MOBILE SOIL REMEDIATION PLANT
KISSIMMEE, OSCEOLA COUNTY, FLORIDA

DRAWN BY: KDB	DATE: 8/13/91	1107-7
REVIEWED BY: ETC	VERSION: 10/388	
SCALE: 1" = 225'	FILENAME: SITE1107	PROJECT NO.



FLOW DIAGRAM

BOTTORF ASSOCIATES INC.
CONSULTING ENGINEERS–ANALYTICAL LABORATORY
6729 EDGEWATER COMMERCE PARKWAY ORLANDO, FLORIDA 32810-4279
PHONE: (407) 298-0846

SOUTHERN SOIL SERVICES, INC.
MOBILE SOIL REMEDIATION PLANT
KISSIMMEE, OSCEOLA COUNTY, FLORIDA

DATE:	REVISION:

DRAWN BY:	KDB	DATE: 8/12/91	1117-4
REVIEWED BY:	RTC	VERSION: 10/388	
SCALE:	No Scale	FILENAME: FLOW1117	PROJECT NO.

08-09-91
15:52:19

*** SCREEN-1.1 MODEL RUN ***
*** DRAFT VERSION XXXXX ***

SOUTHERN SOIL SERVICES MOBIL UNIT BENZENE MODEL

SIMPLE TERRAIN INPUTS:

SOURCE TYPE	=	POINT
EMISSION RATE (G/S)	=	.3800E-01
STACK HEIGHT (M)	=	7.62
STK INSIDE DIAM (M)	=	.69
STK EXIT VELOCITY (M/S)	=	20.54
STK GAS EXIT TEMP (K)	=	1033.00
AMBIENT AIR TEMP (K)	=	293.00
RECEPTOR HEIGHT (M)	=	.00
IOPT (1=URB,2=RUR)	=	2
BUILDING HEIGHT (M)	=	.00
MIN HORIZ BLDG DIM (M)	=	.00
MAX HORIZ BLDG DIM (M)	=	.00

BUOY. FLUX = 17.17 M**4/S**3; MOM. FLUX = 14.24 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN AUTOMATED DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
1.	.0000	0	.0	.0	.0	.0	.0	.0	
100.	.6121E-01	4	20.0	20.0	5000.0	16.0	8.3	4.8	NO
200.	.8235	4	20.0	20.0	5000.0	16.0	15.7	8.7	NO
300.	.9300	4	20.0	20.0	5000.0	16.0	22.8	12.4	NO
400.	.8002	4	15.0	15.0	4800.0	19.5	29.7	15.7	NO
500.	.6991	4	10.0	10.0	3200.0	25.7	36.5	19.0	NO
600.	.6442	4	10.0	10.0	3200.0	25.7	43.0	21.8	NO
700.	.5861	4	8.0	8.0	2560.0	30.2	49.6	24.9	NO
800.	.5376	4	8.0	8.0	2560.0	30.2	55.9	27.5	NO
900.	.4878	4	8.0	8.0	2560.0	30.2	62.2	30.2	NO
1000.	.4483	4	5.0	5.0	1600.0	43.8	68.9	33.7	NO
MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 1. M:									
265.	.9507	4	20.0	20.0	5000.0	16.0	20.4	11.2	NO

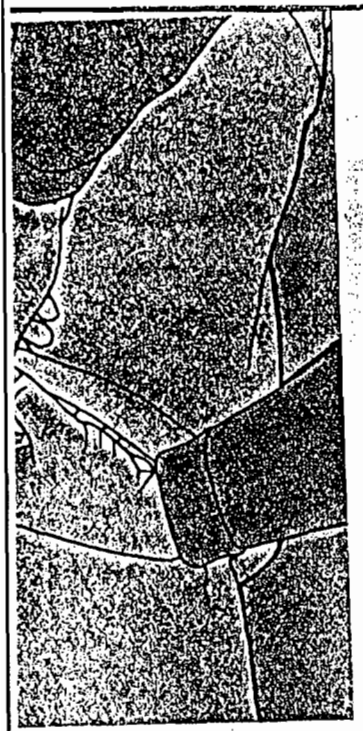
DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

MAX. 24 HR. CONC. 0.38 ug/M³

NTL 24HR 7.2 ug/M³

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)



le Rings

ied Bags for ectors

ensive knowledge in nstruction, BHA has e's Sheet Metal Inc. to bag design specifica- usive manufacturer for upply the proprietary suits your application. both Clar-Tex® and gs. Cageless Clar-Tex bags brasion and increase bag r the Gemini, a bag within n has more cloth area, ur unit's filter capacity. igns incorporate patented s, allowing you to remove

Fabric Characteristics & Suitability

	Polypropylene	Polyester	Acrylic	Fiberglass*	Nomex®	Ryton®	P-84®	Teflon®
Temp. °F	170	275	275	500	375	350	500	500
Abrasion	Excellent	Excellent	Good	Fair	Excellent	Good	Fair	Good
Energy Absorption	Good	Excellent	Good	Fair	Good	Good	Good	Good
Filtration Properties	Good	Excellent	Good	Fair	Excellent	Excellent	Excellent	Fair
Moist Heat	Excellent	Poor	Excellent	Excellent	Good	Good	Good	Excellent
Alkalines	Excellent	Good	Fair	Fair	Good	Good	Fair	Excellent
Mineral Acids	Excellent	Fair	Good	Poor**	Poor	Excellent	Good	Excellent
Oxygen (10% +)	Excellent	Excellent	Excellent	Excellent	Excellent	Poor	Excellent	Excellent
Relative Cost	x	x	xx	xxx	xxxx	xxxxxx	xxxxxx	xxxxxxxx

* Sensitive bag-to-cage fit

** Fair with acid resistant finishes

NOTE: Combinations of variables alter the resistance of the fiber to the specified performance ratings, ie. time, temperature, and gas stream chemistry.

Fabric Finishes (non-fiberglass)

Finish Type	Finish Purpose	Available For
Singe	Recommended for improved cake release	Polyester, polypropylene, acrylic, Nomex, Ryton, P-84 (felts)
Glaze	Provides short-term improvements for cake release (may impede airflow)	Polyester, polypropylene (felts)
Silicone	Aids initial cake development and provides limited cake release	Polyester (felt and woven)
Flame Retardant	Retards combustibility (not flame-proof) initially	Polyester, polypropylene (felt and woven)
Acrylic Coatings (Latex base)	Improvement in filtration efficiency and cake release (may impede flow in certain applications)	Polyester (felt)
PTFE Treatments	For capture of fine particulate, improved filtration efficiency, cake release	Nomex, polyester, acrylic (felt)
Acid Resistant	Acid resistance and some water retardance	Nomex (felt)

Fiberglass Finishes

Fiberglass	Finish Purpose	Applications
Silicone, Graphite	Protects glass yarns from abrasion, adds lubricity	For non-acidic conditions, primarily

TABLE 1.3-1. UNCONTROLLED EMISSION FACTORS FOR FUEL OIL COMBUSTION

EMISSION FACTOR RATING: A

Boiler Type[a]	Particulate[b] Matter		Sulfur Dioxide[c]		Sulfur Trioxide		Carbon Monoxide[d]		Nitrogen Oxide[e]		Volatile Organics[f] Nonmethane		Methane	
	$kg/10^3$ l	$lb/10^3$ gal	$kg/10^3$ l	$lb/10^3$ gal	$kg/10^3$ l	$lb/10^3$ gal	$kg/10^3$ l	$lb/10^3$ gal	$kg/10^3$ l	$lb/10^3$ gal	$kg/10^3$ l	$lb/10^3$ gal	$kg/10^3$ l	$lb/10^3$ gal
Utility Boilers														
Residual Oil	g	g	19S	157S	0.34S[h]	2.9S[h]	0.6	5	8.0 (12.6)(5)[i]	67 (105)(42)[i]	0.09	0.76	0.03	0.28
Industrial Boilers														
Residual Oil	g	g	19S	157S	0.24S	2S	0.6	5	6.6[j]	55[j]	0.034	0.28	0.12	1.0
Distillate Oil	0.24	2	17S	142S	0.24S	2S	0.6	5	2.4	20	0.024	0.2	0.006	0.052
Commercial Boilers														
Residual Oil	g	g	19S	157S	0.24S	2S	0.6	5	6.6	55	0.14	1.13	0.057	0.475
Distillate Oil	0.24	2	17S	142S	0.24S	2S	0.6	5	2.4	20	0.04	0.34	0.026	0.216
Residential Furnaces														
Distillate Oil	0.3	2.5	17S	142S	0.24S	2S	0.6	5	2.2	18	0.085	0.713	0.214	1.78

[a] Boilers can be approximately classified according to their gross (higher) heat rate as shown below:
Utility (power plant) boilers: $>106 \times 10^9$ J/hr ($>100 \times 10^6$ Btu/hr)
Industrial boilers: 10.6×10^9 to 106×10^9 J/hr (10×10^6 to 100×10^6 Btu/hr)
Commercial boilers: 0.5×10^9 to 10.6×10^9 J/hr (0.5×10^6 to 10×10^6 Btu/hr)
Residential furnaces: $<0.5 \times 10^9$ J/hr ($<0.5 \times 10^6$ Btu/hr)

[b] References 3-7 and 24-25. Particulate matter is defined in this section as that material collected by EPA Method 5 (front half catch).

[c] References 1-5. S indicates that the weight % of sulfur in the oil should be multiplied by the value given.

[d] References 3-5 and 8-10. Carbon monoxide emissions may increase by factors of 10 to 100 if the unit is improperly operated or not well maintained.

[e] Expressed as NO_2. References 1-5, 8-11, 17 and 26. Test results indicate that at least 95% by weight of NO_x is NO for all boiler types except residential furnaces, where about 75% is NO.

[f] References 18-21. Volatile organic compound emissions are generally negligible unless boiler is improperly operated or not well maintained, in which case emissions may increase by several orders of magnitude.

[g] Particulate emission factors for residual oil combustion are, on average, a function of fuel oil grade and sulfur content:
Grade 6 oil: $1.25(S) + 0.38$ kg/10^3 liter [$10(S) + 3$ lb/10^3 gal] where S is the weight % of sulfur in the oil. This relationship is based on 81 individual tests and has a correlation coefficient of 0.65.
Grade 5 oil: 1.25 kg/10^3 liter (10 lb/10^3 gal)
Grade 4 oil: 0.88 kg/10^3 liter (7 lb/10^3 gal)

[h] Reference 25.

[i] Use 5 kg/10^3 liters (42 lb/10^3 gal) for tangentially fired boilers, 12.6 kg/10^3 liters (105 lb/10^3gal) for vertical fired boilers, and 8.0 kg/10^3 liters (67 lb/10^3 gal) for all others, at full load and normal (>15%) excess air. Several combustion modifications can be employed for NO_x reduction: (1) limited excess air can reduce NO_x emissions 5-20%, (2) staged combustion 20-40%, (3) using low NO_x burners 20-50%, and (4) ammonia injection can reduce NO_x emissions 40-70% but may increase emissions of ammonia. Combinations of these modifications have been employed for further reductions in certain boilers. See Reference 23 for a discussion of these and other NO_x reducing techniques and their operational and environmental impacts.

[j] Nitrogen oxides emissions from residual oil combustion in industrial and commercial boilers are strongly related to fuel nitrogen content, estimated more accurately by the empirical relationship:
kg $NO_2/10^3$ liters $= 2.75 + 50(N)^2$ [lb $NO_2/10^3$gal $= 22 + 400(N)^2$] where N is the weight % of nitrogen in the oil. For residual oils having high (>0.5 weight %) nitrogen content, use 15 kg $NO_2/10^3$ liter (120 lb $NO_2/10^3$gal) as an emission factor.

SOUTHERN SOIL SERVICES, INC.

MOBILE SOIL REMEDIATION PLANT

EMISSION RATE CALCULATIONS

BASED ON THE FOLLOWING:

1. 10 TPH SOIL TO THE DRYER MAXIMUM.
2. 105.5 GAL/HR. #2 FUEL OIL MAXIMUM, WITH 0.5% SULFUR MAXIMUM.
3. 10,000 PPM TOTAL VOC IN SOIL MAXIMUM.
4. 300 PPM BENZENE IN SOIL MAXIMUM.
5. .04 GDSCF PARTICULATE MAXIMUM.
6. AP42 TABLE 1.3-1 FOR FUEL RELATED EMISSIONS.
7. MATERIAL BALANCE FOR VOC AND BENZENE EMISSIONS.
9. AFTERBURNER DESTRUCTION EFFICIENCY OF 95% MINIMUM.
9. 2500 HRS/YR. OPERATING TIME.

$$\text{PARTICULATE} = (3{,}716\ \text{DSCFM})(.04\ \text{GDSCF})\left(\frac{1\ \text{LB.}}{7000\ \text{GR.}}\right)\left(\frac{60\ \text{MIN.}}{1\ \text{HOUR}}\right) = 1.27\ \text{LBS/HR.}$$

$$(1.27\ \text{LBS/HR.})\left(\frac{2500\ \text{HRS/YR.}}{2000\ \text{LBS/TON}}\right) = 1.59\ \text{TONS/YR.}$$

$$SO_2 = 142(.5)\left(\frac{105.5\ \text{GAL/HR}}{1000}.\right) = 7.49\ \text{LBS/HR.}$$

$$(7.49\ \text{LBS/HR.})\left(\frac{2500\ \text{HRS/YR.}}{2000\ \text{LBS/TON}}\right) = 9.36\ \text{TONS/YR.}$$

$$\text{CO} = (5\ \text{LBS/1000 GAL.})\left(\frac{105.5\ \text{GAL/HR.}}{1000}\right) = 0.53\ \text{LBS/HR.}$$

$$(.53\ \text{LBS/HR.})\left(\frac{2500\ \text{HRS/YR.}}{2000\ \text{LBS/TON}}\right) = 0.66\ \text{TONS/YR.}$$

$$\text{NOX} = (20\ \text{LBS/1000 GAL.})\left(\frac{105.5\ \text{GAL/HR}}{1000}.\right) = 2.11\ \text{LBS/HR.}$$

$$(2.11\ \text{LBS/HR.})\left(\frac{2500\ \text{HRS/YR.}}{2000\ \text{LBS/TON}}\right) = 2.64\ \text{TONS/YR.}$$

$$\text{VOC} = (10\ \text{TPH})(2000\ \text{LBS/TON})\left(\frac{10{,}000\ \text{PPM}}{1{,}000{,}000}\right)(1-.95) = 10\ \text{LBS/HR.}$$

$$(10\ \text{LBS/HR.})\left(\frac{2500\ \text{HRS/YR.}}{2000\ \text{LBS/TON}}\right) = 12.5\ \text{TONS/YR.}$$

$$\text{BENZENE} = (10\ \text{TPH})(2000\ \text{LBS/TON})\left(\frac{300\ \text{PPM}}{1{,}000{,}000}\right)(1-.95) = 0.3\ \text{LBS/HR.}$$

$$(0.3\ \text{LBS/HR.})\left(\frac{2500\ \text{HRS/YR.}}{2000\ \text{LBS/TON}}\right) = 0.38\ \text{TONS/YR.}$$

SOUTHERN SOIL SERVICES, INC.

MOBILE SOIL REMEDIATION PLANT

PLANT COMPONENT DIMENSIONS

A. DRYER - 20 FT. LONG, 4 FT. DIAMETER, 16 FLIGHTS, 6" DEEP, RUN FULL LENGTH OF DRYER. DRYER IS VARIABLE SPEED AND PITCH.

B. EXHAUST FAN POWERED OFF DRYER DRIVE, ALSO VARIABLE SPEED (4000 CFM-6000 CFM).

C. BAGHOUSE - REVERSE AIR CLEANING SYSTEM, 144 BAGS 4" IN DIAMETER, 72 BAGS ARE 6 FT. LONG, 36 BAGS ARE 5 FT. LONG AND 36 BAGS ARE 4 FT. LONG. TOTAL CLOTH AREA OF 804.25 SQ.FT. BAG MATERIAL IS ACRYLIC. BAGHOUSE OF DUSTEX DESIGN.

D. PRIMARY BURNER - 8.56 MMBTU/HR., GENCO WHISPER FLAME. FUEL - #2 DIESEL.

E. SECOND BURNER - 6.0 MMBTU/HR., GENCO WHISPER FLAME. FUEL - #2 DIESEL.

F. AIR DUCTS - FROM AFTERBURNER TO BAGHOUSE AND FROM BAGHOUSE TO AFTERBURNER ARE 15" SQUARE.

G. AFTERBURNER - MODIFIED DUCT TYPE, 48 FT. TOTAL LENGTH, 18" ID REFRACTORY LINED. TOTAL VOLUME OF 84.82 $FT.^3$.

H. EXHAUST STACK - 25' HIGH, 24" SQUARE.

SOUTHERN SOIL SERVICES, INC.

10 TONS/HR. MOBILE SOIL TREATMENT PLANT

Calculation #1: Process Combustion Air Requirements

Air Requirements for Main Burner (at 10% over theoretical):

62 Gal/hr X 115 lb/Gal = 7130 lb/hr

Oxygen for Main Burner: 7130 lb/hr X

$$\frac{385\ ft^3}{29\ lb}\text{(Air)} \times 21\% \times \frac{32\ lb}{385\ ft^3}\text{(O2)} = 1652\ lb/hr$$

Air Requirements @50% Excess Air:

7130 lb/hr X 140% = 9982 lb/hr

Calculation # 2: Volume of Process Gas

Volume Dry Gas: 300 F = 9982 lb/hr X

$$\frac{385\ ft^3}{29\ lb\ (Air)} \times \frac{760}{3600\ sec} \times \frac{1\ hr}{528\ R} \times R = 53\ ft^3/sec$$

Volume of Moisture formed during Combustion:

62 gal/hr X 8.6 lb/gal = 533.2 lb/hr

Weight of Moisture from Soil: Assume: 8 percent

10 ton/hr X 2000 lb/ton X 8.00% = 1600 lb/hr

Total Process Moisture: 2133.2 lb/hr

Volume of Process Moisture: 2133.2 lb/hr X

$$\frac{385\ ft^3}{18\ lb\ (H2O)} \times \frac{1\ hr}{3600\ sec} \times \frac{760\ R}{528\ R} = 18.24\ ft^3/sec$$

Total Volume:

From Dry Gas Volume		53.0 ft3/s
From Mositure Volume	+	18.24 ft3/s
		71.24 ft3/sec
	X	60 min/hr
Process acfm:		4274.58 ft3/min

BAGHOUSE AIR TO CLOTH (ATC) RATIO:

$$\frac{4274.58\ ACFM}{804.25\ SQ.FT.\ CLOTH} = 5.31:1$$

Calculation #3: Key Parameter Concentrations in Process Gas

Oxygen Concentration in Combustion Gasses:

Available O2 from incoming Air: 9982 lb/hr X

$$\frac{385\ \text{ft3}}{29\ \text{lb}}\text{(Air)} \times 21.00\% \times \frac{32}{385}\text{(O2)} = 2313\ \text{lbs/hr}$$

Less that used for Combustion: Calculation #2: -1652 lbs/hr

Leaves residual oxygen in gas stream: 661 lbs/hr

"Inert" Gas (CO2,N2 ..) = Calculation #2: 9982 lb/hr
From previous line --661 lb/hr

9321 lb/hr

Convert lbs of O2 to volume: 661 lbs/hr X

$$\frac{385\ \text{ft3}}{32\ \text{lb}}\text{(Aver)} \times \frac{760\ \text{R}}{528\ \text{R}} \times \frac{1\ \text{hr}}{3600\ \text{sec}} = 3.18\ \text{ft3/sec}$$

$$\text{Concentration of O2 in Dry Gas} = \frac{3.18\ \text{ft3/sec}}{53.0\ \text{ft3 (fm Calc \#3)}} = 6.0\%\ \text{O2}$$

Moisture Concentration in Combustion Gasses =

$$\frac{18.24\ \text{ft3/sec}}{71.24\ \text{ft3/sec}}\ \text{Calculation \#3: Total Moisture Vol.} = 25.6\%\ \text{H20}$$

Calculation #4: Afterburner Requirements

Heat in Process Gas: 32 F to 300 F

Dry Gas:	9982 lb/hr	X	64.6	BTU/lb =	.645	E+06 MBTU
Water:	2133.2 lb/hr	X	268	BTU/lb =	.572	E+06 MBTU
Total Heat in Process Gas:					1.217	E+06 MBTU

Afterburner Heat Requirements: 300 F to 1400 F

Dry Gas:	9982 lb/hr	X	282.7	BTU/lb =	2.82	E+06 MBTU
Water:	2133.2 lb/hr	X	1100	BTU/lb =	2.35	E+06 MBTU
Total Heat Required of Afterburner:					5.17	E+06 MBTU

Fuel for Afterburner: (AVERAGE)

$$\frac{5{,}170{,}000 \text{ BTU}}{138{,}000 \text{ BTU/gal}} = 37.46 \text{ gal/hr}$$

USE 6 MMBTU/HR. BURNER FOR MAXIMUM:

$$\frac{6{,}000{,}000}{138{,}000} = 43.5 \text{ GAL/HR.}$$

Calculation #5: Afterburner Combustion Air

Assume: 10000 ppm Contamination in Soil

VOC loading from Process = (Assuming 10 tons/hr)

10 t/hr X 2000 lb/t X 0.01 % = 200 lb/hr

VOC = gasoline $\frac{200 \text{ lb/hr}}{6.63 \text{ lb/gal gasoline}}$ = 30 gal/hr

Air Required for Voc Combustion =

30 gal/hr X 115 lb air/gal of fuel = 3450 lb/hr

Oxygen for VOC Combustion = 3450 lb/hr X

$\frac{385 \text{ ft3}}{29 \text{ lb}}$ X 21.00% O2 X $\frac{32 \text{ lb}}{385 \text{ ft3}}$ = 799 lb/hr

Air Required for Afterburner = Max or Used? Used =

37.46 gal/hr (Calc. #5) X 115 lb = 4308 lb/hr

50 % Ex Air = 4308 lb/hr X 140.00% = 6031.2 lb/hr

Weight of Excess air =

6031.2 lb/hr
-4308.0 lb/hr
1723.2 lb/hr

Oxygen for Afterburner = 4308 lb/hr X

$\frac{385 \text{ ft3}}{29 \text{ lb}}$(AIR) X 21.00% X $\frac{32 \text{ lb}}{385 \text{ ft3}}$(O2) = 998 lb/hr

Afterburner System Oxygen = from VOC 799 lb/hr
for Afterburner 998 lb/hr
1797 lb/hr

Air fm Atom Air= 998 lb/hr X 40.00% = - 399.2 lb/hr
1398 lb/hr

Oxygen carryover from Bag house = - 661 lb/hr

Oxygen Needed as Make up = 737 lb/hr

Expressed as Needed Make up Air = 737 lb/hr X

$\frac{385 \text{ ft3}}{32 \text{ lb}}$(O2) / 21.00% X $\frac{29 \text{ lb}}{385 \text{ ft3}}$(Air) = 3180 lb/hr

Plus Excess air @ 1723 lb/hr

Total Make up air = 4903 lb/hr

Calculation #6: Exaust Gas Composition

Assume: 115 lb/gal of fuel is Dry Gas
Assume: 8.6 lb/gal of fuel is Moisture

AB Moisture = 37.46 gal/hr X 8.6 lb/hr = 322.2 lb/hr
Plus Moisture from Process = 2133.2 lb/hr
Total System Moisture = 2455.4 lb/hr

AB Dry Gas = 37.46 gal/hr X 115 lb/gal = 4308 lb/hr
Plus Inert Gas from Process (calc. 4) = 9321 lb/hr
Plus Make up Air for Voc's (Calc. 6) = 4903 lb/hr
Total System Dry Gas = 18532 lb/hr

Volume Dry Gas = 18532 lb/hr X

$$\frac{385 \text{ ft3}}{32 \text{ lb}} \times \frac{1 \text{ hr}}{3600 \text{ sec}} \times \frac{1860 \text{ R}}{528 \text{ R}}(T) = 218.2 \text{ ft3/sec}$$

Volume Moisture = 2455.4 lb/hr X

$$\frac{385 \text{ ft3}}{18 \text{ lb}(H2O)} \times \frac{1 \text{ hr}}{3600 \text{ sec}} \times \frac{1860 \text{ R}}{528 \text{ R}}(T) = 51.4 \text{ ft3/sec}$$

Total Volume = 269.6 ft3/sec

acfm = 269.6 ft3/s X 60 s/min = 16,176 ft3/min

AFTERBURNER RESIDENCE TIME:

$$\frac{84.82 \text{ FT}^3 \text{ CHAMBER}}{269.6 \text{ FT}^3/\text{SEC.}} = 0.315 \text{ SEC.}$$