

The electronic version of this file/report should have the file name:

Type of document . Site Number . Year-Month . File *Year-Year* or Report name . pdf

letter. \_\_\_\_\_ . \_\_\_\_\_ - \_\_\_\_ . CorrespondenceFile \_\_\_\_\_ .pdf

example: *letter . Site Number . Year-Month . CorrespondanceFileYear-Year . pdf*

report. HW 932053 . 1993 - 04 . Spec Soil Vapor Extrac Pilot Studies .pdf

example: *report . Site Number . Year-Month . ReportName . pdf*

*if a non-foilage site: add ".nf.pdf" at end of file name*

Project Site numbers will be proceeded by the following:

Municipal Brownfields - B

Superfund - HW

Spills - SP

ERP - E

VCP - V

BCP - C

JP

VOLUME I OF II

**SPECIFICATION FOR  
SOIL VAPOR EXTRACTION PILOT STUDIES**

AT

~~Stauffer Management Company~~  
Niagara Falls Site  
Lewiston, NY

RECEIVED

APR 12 1993

N.Y.S. DEPT. OF  
ENVIRONMENTAL CONSERVATION  
REGION 9

BY: L. A. Freese  
Zeneca Inc.  
Hanby Building, 2nd Floor  
Wilmington, DE 19897

DATE: April 1, 1993

STAUFFER MANAGEMENT COMPANY  
NIAGARA FALLS, LEWISTON, NY  
PILOT TESTING  
OF  
SOIL VAPOR EXTRACTION

TABLE OF CONTENTS

Volume I

CONTENTS

Section I General Conditions

Pages

I.A	General Scope of Work	3
I.B	Terms and Condition for Environmental Scientific, Engineering, and Consulting Services (10/10/92)	2
I.C	Waiver of Liens	1
I.D	Equal Employment Opportunity (Am 9530 Rev. 3/78)	2
I.E	Alcoholic Beverage & Substance Abuse Policy (9870 SMC)	1
I.F	Safety Procedures for Contractors (9299 SMC)	8

Section II Details Of Work

II.A	SVE Pilot Study Work Plan	26
II.B	Tables and Logs	52

Volume II

Section III Appendices

A.	Health And Safety Plan	22
B.	Sampling Plan	19
C.	Quality Assurance Project Plan	41
D.	M.S.D.S.	32

Niagara Falls Site  
Lewiston, NY

**SECTION I**

**GENERAL CONDITIONS**

Niagara Falls Site  
Lewiston, NY

**SECTION I.A**

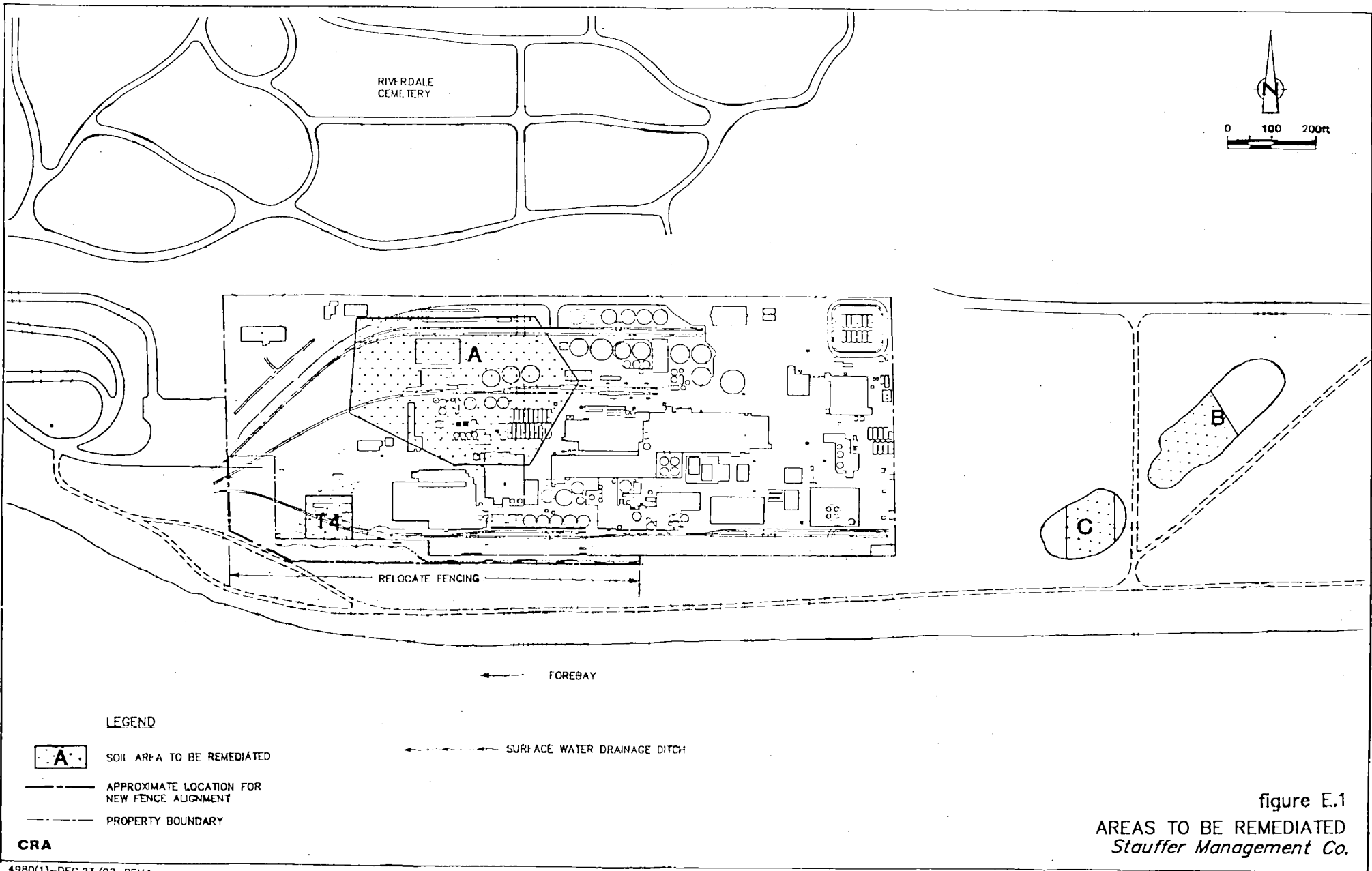
**GENERAL SCOPE OF WORK**

Niagara Falls Site  
Lewiston, NY

**SPECIFICATION FOR PILOT TESTING  
FOR SOIL VAPOR EXTRACTION (SVE) SYSTEM**

**SECTION I.A GENERAL SCOPE OF WORK**

- 1.0 Provide a Health and Safety Plan for the work.
- 2.0 Install a soil vapor extraction pilot system in four areas, A and T-4 on the Stauffer plant site and B and C on New York Power Authority property as shown on Figure E1.
- 3.0 Provide mobile equipment and manpower to perform the pilot studies including all temporary power, water, trailers, etc.
- 4.0 Provide air and soil sampling as called out in the detail specifications.
- 5.0 Provide all raw data collected from the field or laboratory in an orderly tabular form prior to preparing the final report. Final report shall give all data necessary for the final design of the soil vacuum extraction system along with a capital cost estimate for purchase and installation.
- 6.0 Provide waste handling for soil and water residuals.
- 7.0 All areas disturbed by the field pilot studies shall be returned to their original condition except for leaving the wells in place.



**LEGEND**

- A SOIL AREA TO BE REMEDIATED
- APPROXIMATE LOCATION FOR NEW FENCE ALIGNMENT
- PROPERTY BOUNDARY

--- SURFACE WATER DRAINAGE DITCH

**CRA**

figure E.1  
AREAS TO BE REMEDIATED  
*Stauffer Management Co.*

Niagara Falls Site  
Lewiston, NY

SECTION I.B

TERMS AND CONDITIONS FOR ENVIRONMENTAL,  
SCIENTIFIC, ENGINEERING, AND CONSULTING  
SERVICES (10/10/92)



**TERMS AND CONDITIONS FOR  
ENVIRONMENTAL, SCIENTIFIC, ENGINEERING, AND CONSULTING SERVICES**

Terms and Conditions agreed to this date \_\_\_\_\_ between STAUFFER MANAGEMENT COMPANY, hereinafter called "Company," and \_\_\_\_\_ hereinafter called "Consultant," and attached to and made part of Contract No. and/or Purchase Order No. \_\_\_\_\_

**1. Contractual Relationship**

- 1.1. Consultant agrees to provide consulting engineering and professional services and other related services (the "Services") for various projects upon written requests pursuant to purchase orders (the "Purchase Orders") to be issued by Company, or its designee, in accordance with the terms and conditions set forth herein and the scope presented in Consultant's proposal dated \_\_\_\_\_ (the "Proposal"), unless otherwise specified in writing.
- 1.2. Consultant represents that it is fully experienced and properly qualified and licensed as necessary to perform the Work provided in the identified documents relevant to the Work (Contract Documents).
- 1.3. Consultant represents that it knows of no obligations to any third party which will in any way limit or restrict its ability to perform Services for Company.
- 1.4. Any other contractual agreements that Consultant has with Company shall remain in full force and effect unless specifically modified otherwise in writing between the parties.

**2. Conduct of Work**

- 2.1. Consultant shall perform professional and other related services (hereinafter referred to as the "Work") as set forth in the Contract Documents.
- 2.2. Consultant and its subcontractors, employees, agents and invitees shall observe and comply with any and all laws, ordinances, rules and regulations of any and all governmental authorities bearing on the Work and the conduct of the Work, including, but not limited to, the Occupational Safety & Health Act of 1970, as amended, and the Fair Labor Standards Act of 1938, as amended, and Executive Order 11246, as amended (including Equal Opportunity and Nondiscrimination provisions thereof).
- 2.3. Consultant and its subcontractors, their employees, agents and invitees shall observe and comply with any and all rules, regulations and accident prevention programs promulgated by Company for the safe, orderly and efficient conduct of the Work at Company's job site, including Company's policies covering alcoholic beverage and substance abuse and equal employment opportunity.
- 2.4. Company may, from time to time, make changes in the Work and the provisions of these Terms and Conditions shall apply to all such changes.
- 2.5. Consultant agrees to make all of its employees available to Company on reasonable advance notice from Company. The Services shall be provided at any of Company's plant sites, or at such other locations or facilities, as may be designated by Company or agreed upon between the parties hereto.
- 2.6. In the event the Work called for in the Contract Document necessitates the sealing of drawings or other documents by a duly licensed engineer, then Consultant and/or a sufficient number of individual engineers employed by Consultant on the Work shall be licensed as necessary to seal drawings and documents at no additional cost to Company.
- 2.7. Neither party shall be in breach of contract or liable to the other for damages from delays caused by any event beyond its reasonable ability to control, including, but not limited to, Acts of God, fire, flood, accident, strike or other labor trouble, war, and acts of government. The foregoing shall not, however, be considered a waiver of either party's obligations under this Agreement and the party affected by such event shall promptly fulfill its obligations under this contract after the cessation of such event.
- 2.8. Services which Consultant shall undertake for Company hereunder shall be in the capacity of an independent contractor and not as an employee or agent of Company.

**3. Title to the Work**

- 3.1. All reports, plans and specifications or other written data and information supplied to Consultant by Company or prepared by Consultant for Company as part of the Work shall remain or become the property of the Company. Consultant shall not use them or permit them to be used for other work and shall furnish them, along with all copies, to Company upon completion of the Work, or within thirty (30) days after the written request of Company therefore.

**4. Patents/Trade Secrets**

- 4.1. All materials prepared by Consultant for Company, including any components thereof, unless specifically excepted below, shall be regarded as works made for hire by Consultant for Company. All such materials shall become the absolute property of Company upon payment by Company to Consultant. All such materials may be used by Company or any affiliated company without additional compensation to Consultant. In the event any materials prepared by Consultant do not qualify as works made for hire under copyright laws, Consultant agrees to assign all rights and interests to such materials, including copyrights, to Company. Consultant shall place a proper copyright notice on all materials produced under this Agreement. As defined by the copyright laws, Company shall be deemed to be the author of the copyrights, together with all rights of renewal, worldwide, of all materials developed pursuant to this Agreement.
- 4.2. Consultant agrees to assign to Company its interest in all discoveries and inventions conceived or reduced to practice by Consultant's employees alone or jointly with others, during the term of this Agreement, which inventions are either (i) derived from trade secrets or other information of a confidential nature transmitted to Consultant by Company during the term of this Agreement, or (ii) derived from tasks assigned by Company pursuant to this Agreement. Consultant agrees to disclose promptly and fully all discoveries and inventions belonging to Company under this Agreement and to fully assist Company at its expense, to obtain patents thereon in any and all countries. Company shall have the right to apply for patent protection on any of these discoveries and inventions and to prosecute applications for patents through attorneys and agents of its own choosing.
- 4.3. Consultant further agrees that it shall be conclusively presumed that any patent applications within this Agreement related to Company's commercial, developmental or experimental products or Company's trade secrets or confidential information, which may be filed within one year after termination or expiration of the term of this Agreement by Consultant or any of its employees, shall belong to Company, and Consultant further agrees to assign (or obtain the assignment of) the same to Company, as having been conceived or reduced to practice during the term of this Agreement and to fully assist Company, at its expense, to obtain patents thereon in any and all countries.
- 4.4. Consultant agrees that it shall only assign employees to perform consulting services for Company pursuant to this Agreement who have agreed to assign to Company all inventions which are the subject of this paragraph 4, and who have acknowledged this Agreement in writing.
- 4.5. Consultant agrees not to include in its designs, plans, or specifications furnished as part of the Work any methods, processes, equipment or inventions which are covered or claimed by any patent or pending patent application or, which to its knowledge, constitute confidential information or trade secrets and Consultant further agrees to indemnify, defend and save Company (including officers, directors, employees, and agents of Company) harmless from and against all claims, royalties, damages, liabilities, costs and expenses of whatever kind or nature (including, but not limited to, attorneys' fees in any manner resulting from, or claimed to result from, any such inclusion).
- 4.6. The provisions of Article 4.1, shall not apply to designs, plans, or specifications furnished by Company or to any method, process, equipment or invention designated by Company for inclusion in the Work.

**5. Confidential Information**

- 5.1. Consultant shall treat as confidential all information relating to Company's processes, products, compositions, machinery, apparatus or trade secrets or relating to Company's premises or Company's operations or the general business affairs of Company or other information which Consultant may observe or which may be disclosed to it by Company in connection with the Services hereunder, as well as all information developed by Consultant hereunder. Consultant shall not divulge said information to others, including, but not limited to, affiliates of Consultant, for any reason or at any time, except with the prior written consent of Company. Consultant shall not in any way or at any time use said information except as required for the proper performance of the Work. Consultant agrees to restrict access to all information disclosed by Company or developed by Consultant hereunder within Consultant's organization to only such limited group of authorized employees who (i) require such information in connection with Consultant's activities as contemplated by this Agreement and (ii) have agreed with Consultant to maintain the confidential nature of such information. Excluded from the provisions of this Article shall be such portions of the information as:
  - (a) were known to Consultant without restriction of confidentiality prior to their disclosure by Company or observation by Consultant, as demonstrated by competent documentary evidence in Consultant's possession;
  - (b) properly become available to Consultant, under conditions which do not restrict further disclosure, from a third party source who shall not have obtained such information either directly or indirectly from Company or its affiliates; or
  - (c) are at the time of disclosure in the public domain or, after disclosure, come into public domain without fault on the part of Consultant or its employees.
- 5.2. No information relating to the Work shall be released by Consultant for publication, advertising, or any other purpose without the prior written approval of Company.
- 5.3. Consultant shall return to Company all documentation which embodies or reflects any of the information described in Article 5.1, above (including all copies thereof) within 30 days after completion of the Work, or 30 days after the date of Company's written request therefore, except as expressly authorized by Company. Consultant shall not copy any documents furnished to Consultant hereunder.

**6. Employees and Subcontractors**

- 6.1. Consultant shall not subcontract any portion of the Work without prior written approval of Company. No such approval shall relieve Consultant from any of its obligations pursuant to this Agreement and Consultant shall continue to be primarily responsible to Company for all portions of the Work whether or not subcontracted by it.
- 6.2. Consultant shall bind, in a manner acceptable to Company, its employees and subcontractors, if any, to all of the provisions of Articles 2, 3, 4, 5, 7, 11, and 13 hereunder.

7. Indemnification

7.1. Consultant agrees to indemnify, defend, and save Company (including officers, directors, employees, and agents of Company) harmless from and against any and all losses, damages, expenses (including attorney's fees), claims, suits, and liabilities based upon damage to, or destruction of, any property or injury (including death) to any person arising out of or attributable to the performance or to the nonperformance of the Work or to the errors, omissions, or negligent acts by Consultant hereunder (including, but not limited to, Consultant's employees, subcontractors or agents), except for such injuries or damages which are caused solely by the negligence of Company.

8. Insurance

- 8.1. Prior to commencement of the Work, Consultant shall furnish Company insurance certificate(s) evidencing that it maintains the following coverages:
- (a) Worker's Compensation, with minimum statutory limits; Employer's Liability, with minimum limits of \$500,000 each injury/occupational disease.
  - (b) Comprehensive General Liability: Products/Completed Operations, Contractual and Independent Contractors with minimum limits of \$2,000,000 each occurrence, combined single limit, Personal Injury and Property Damage.
  - (c) Comprehensive Automobile Liability, with minimum limits of \$1,000,000 combined single limit, each occurrence, Personal Injury and Property Damage.
  - (d) Engineer's Professional Liability ("Errors and Omissions"), with minimum limits of \$2,000,000 each occurrence/\$2,000,000 aggregate.
  - (e) Engineer's Pollution Liability Insurance with minimum limits of \$2,000,000 each occurrence/\$2,000,000 aggregate.
- 8.2. The Certificate of Comprehensive Liability Insurance shall cite and insure (specifically, or by noting existence of "Blanket Contractual" provisions included on policy) the indemnification provision set forth in Article 7.1. above.
- 8.3. Company shall be named as additional insured on Consultant's Comprehensive General Liability and Comprehensive Automobile Liability insurance policies.
- 8.4. The Certification of Consultant's Professional Liability Insurance shall cite and insure (specifically, or by noting existence of "Blanket Contractual" provisions included on policy) the indemnification provision set forth in Article 7.1. above. This coverage shall be continued for a period of not less than three years from the date of completion of Consultant's services hereunder.
- 8.5. All insurance Certificate(s) shall specify the date(s) when such insurance expires and shall provide further that Company shall be given not less than ten days' written notice before cancellation of or any material change in such insurance. A Renewal Certificate(s) must be furnished to Company not less than ten days prior to the expiration date of any policies noted therein.
- 8.6. Said insurance coverage shall be written by companies satisfactory to Company.
- 8.7. The failure to comply, or the full compliance, with all of the insurance provisions herein shall in no way act to relieve Consultant from its obligation of indemnification to Company provided in Article 7.1.

9. Taxes

- 9.1. Consultant and its subcontractors shall show any applicable sales and/or use taxes separately on all invoices submitted for payment.
- 9.2. All taxes, whether local, state or federal, imposed upon this Agreement or any sums paid hereunder shall be the responsibility of Consultant.

10. Payments

- 10.1. For the Services to be performed hereunder, Company agrees to reimburse Consultant in accordance with the rates and discounts set forth in the Proposal.
- 10.2. Company further agrees to reimburse Consultant for all ordinary and reasonable travel and other expenses incurred upon its behalf when authorized by Company. Such expenses shall be confirmed by appropriate receipts.
- 10.3. Expenses properly chargeable to the Services shall include: Travel and Living Expenses when away from their home office on business connected directly with the project, duplicating and reproduction costs, commercial communications in excess of \$1.00 per item, including Long Distance Telephone, Telecopy, Postage and Shipping Costs, Computer and Record Processing Time and Software, Professional and Technical Subcontractors, Identifiable Drafting and Stenographic Supplies, Expendable Materials, and other items purchased specifically for the project.
- 10.4. Invoices will be submitted on a monthly basis in such detail as prescribed by Company payable within forty-five (45) days thereof ("Payment Date").
- 10.5. The amounts payable to Consultant pursuant to this Article 10 shall be the sole and exclusive amounts payable to Consultant for the performance of Services hereunder.
- 10.6. Payments may be withheld on account of (i) defective work not remedied, (ii) claims filed, (iii) failure of Consultant to make payment properly to any subcontractor or for labor, materials or equipment, (iv) damage to another contractor, (v) unsatisfactory prosecution of the Work by Consultant, or (vi) charges deemed inappropriate by Company.
- 10.7. Proposals for soliciting or quoting work are at the sole expense of Consultant for which there will be no reimbursement by Company.
- 10.8. If the Work includes preparation and submittal of narrative reports to Company, Company will reimburse Consultant only for completion to the satisfaction of Company of two draft submittals and one final copy. Work in this regard by Consultant, required to satisfy Company, is at the discretion of Company. Report work by Consultant which is judged by Company to require more than two draft submittals and a final report, shall be at the expense of Consultant and Consultant shall be subject to backcharging by Company for Company's time and expenses to satisfy Company report requirements, such backcharges being at Company's prevailing rate at the time.

11. Records

- 11.1. Consultant shall without further compensation maintain accurate records of all reimbursable costs, and such records shall be open to inspection and audit by Company within normal business hours during the term of its Agreement and for a period of three years after its conclusion or termination.

12. Term

- 12.1. The initial term of this Agreement shall be for a period of one year commencing as of the date hereof. At the conclusion of such initial term, this Agreement shall automatically renew for an additional one-year term, unless terminated by Company pursuant to Article 15 herein or Consultant gives prior written notice of its intention not to renew at least one hundred twenty (120) days prior to the conclusion of the then current term.

13. Nonwaiver of Default

- 13.1. Any failure by Company at any time, or from time to time, to enforce any of the terms and conditions of this Agreement shall not constitute a waiver of such terms and conditions in any way, or the right of Company at any time to avail itself of such remedies as it may have for any breach of such terms and conditions.

14. Assignment

- 14.1. Consultant shall not assign any of its rights, duties or obligations under this Agreement, except upon the prior written consent of Company, and any attempted assignment by Consultant shall be null, void, and without effect.

15. Termination or Suspension of the Work

- 15.1. Company reserves the right to terminate this Agreement for any reason with or without cause at any time during the term of this Agreement by giving notice to Consultant.
- 15.2. Company reserves the right to temporarily suspend all or any part of the Work at any time with or without cause. In such event, Consultant shall be reimbursed, without markup for profit and overhead, only for such extra out-of-pocket expenses that Consultant actually incurs as a result of such suspension.
- 15.3. Company shall have the right to immediately terminate this Agreement for breach in the event Consultant does not correct any default within 10 days after notice thereof by Company.
- 15.4. Termination or expiration of this Agreement for any reason shall not relieve Consultant of the obligations imposed upon Consultant by the provisions of this Agreement.
- 15.5. In the event Company elects to terminate this Agreement pursuant to Article 12, Article 13, Article 15, or Article 16 hereof, Company shall be liable to Consultant only for any costs incurred and fees for services actually and properly rendered by Consultant prior to the date written notification of termination is received. Company shall retain all rights of ownership as set forth in this Agreement.
- 15.6. Consultant shall not delay, defer or suspend work or any portions thereof for any reason, including contractual and payment disputes, without the specific written direction and authorization of Company.

16. Completeness/Severability

- 16.1. This Agreement, the Proposal and the Purchase Orders reflect the entire understanding of Consultant and Company with respect to the Services to be performed hereunder, provided, however, that the terms and conditions contained on the reverse side of the Purchase Orders shall be of no force and effect. Terms and conditions proposed by Consultant shall be without force or effect unless expressly agreed to by Company and made part of this Agreement. Any modification of the terms of this Agreement, the Proposal or any of the Purchase Orders shall be ineffective unless in writing and signed by both parties.
- 16.2. In the event that any provisions of this Agreement shall at any time contravene in whole or in part any applicable federal or state law, ruling or regulation, then such provision shall remain in effect only to the extent permitted under law and the remaining provisions thereof shall remain in full force and effect.

17. Governing Law

- 17.1. This Agreement shall be governed by and construed in accordance with the laws of the State of Delaware.

Niagara Falls Site  
Lewiston, NY

SECTION I.C

WAIVER OF LIENS

**STAUFFER MANAGEMENT COMPANY**

WAIVER OF LIENS

Stauffer Contract No. \_\_\_\_\_

Date \_\_\_\_\_, 19\_\_.

**KNOW ALL MEN BY THESE PRESENTS:**

That for and in consideration of the payment of the sum of \_\_\_\_\_  
\_\_\_\_\_ (dollars) (\$ \_\_\_\_\_ ) by Stauffer Management Company  
("Stauffer") the undersigned:

1. Does hereby waive and relinquish any and all claims or rights or lien it may have against any land, buildings, or structures on account of any labor, services, materials, equipment or supplies furnished in connection with the above referenced contract;
2. Does hereby agree to defend, indemnify and save Stauffer harmless from all liens, claims or demands for labor, services, materials, equipment or supplies furnished in connection with the above referenced contract by the undersigned, its subcontractors, suppliers, employees or agents (including, but not limited to, the payment to Stauffer upon demand of all costs and expenses (including attorneys' fees) incurred by Stauffer in the defense, release or settlement of any such lien, claim or demand).

IN WITNESS WHEREOF, the undersigned has caused this WAIVER OF LIEN to be executed by its duly authorized representative on this \_\_\_\_\_  
day of \_\_\_\_\_, 19\_\_.

By: \_\_\_\_\_

Title: \_\_\_\_\_

wolstf

Niagara Falls Site  
Lewiston, NY

SECTION I.D

EQUAL EMPLOYMENT OPPORTUNITY (AM 9530 Rev. 3/78)

# STAUFFER MANAGEMENT COMPANY

## A. EQUAL EMPLOYMENT OPPORTUNITY CLAUSE -

applicable to contracts or orders in excess of \$10,000

1. The supplier will not discriminate against any employee or applicant for employment because of race, color, religion, sex, age, or national origin. The supplier will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, age, or national origin. Such action shall include, but not be limited to the following: employment, upgrading, demotion, or transfer, recruitment or recruitment advertising, layoff or termination, rates of pay or other forms of compensation, the selection for training, including apprenticeship. The supplier agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the provisions of this nondiscrimination clause.
2. The supplier will, in all solicitations or advertisements for employees placed by or on behalf of the supplier, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, age, or national origin.
3. The supplier will send to each labor union or representative of workers with which it has a collective bargaining agreement or other contract of understanding, a notice, advising the labor union or workers' representative of the supplier's commitments under Section 202 of Executive Order 11246, as amended, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
4. The supplier will comply with all provisions of Executive Order 11246, as amended, and of the rules, regulations, and relevant orders of the Secretary of Labor.
5. The supplier certifies that it has filed with the appropriate federal agency all reports due under the applicable filing requirements, including a complete and accurate report on Standard Form 100 (EEO-1) or will file such reports within 30 days after the signing of this agreement or the award of any purchase order, as the case may be, and will continue to file such reports as required.
6. In the event of the supplier's noncompliance with the nondiscrimination clauses of this contract or with any of said rules, regulations or orders, this contract may be canceled, terminated, or suspended in whole or in part and the supplier may be declared ineligible for further government contracts in accordance with procedures authorized in Executive Order 11246, as amended, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246, as amended, or by rule, regulations, or order of the Secretary of Labor on equal employment opportunity or as otherwise provided by law.
7. The supplier will include the provisions of paragraphs 1 through 7 in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to Section 204 of Executive Order 11246, as amended, so that such provisions will be binding upon each subcontractor or vendor. The supplier will take such action with respect to any subcontract or purchase order as the contracting agency may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, however, that in the event the supplier becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the contracting agency, the supplier may request the United States to enter into such litigation to protect the interest of the United States.
8. The supplier certifies that, for orders in excess of \$50,000 or if supplier has 50 or more employees, it has developed and has on file a current written affirmative action compliance program for each of its establishments in accordance with the regulations of the Secretary of Labor promulgated under Executive Order 11246, as amended, or will develop such programs within 120 days after the signing of this agreement. The supplier will also require subcontractors who are not otherwise exempt to establish written affirmative action compliance programs in accordance with Executive Order 11246, as amended.

## B. CERTIFICATION OF NONSEGREGATED FACILITIES -

applicable to contracts or orders in excess of \$10,000

Supplier certifies that it does not and will not maintain or provide for its employees any segregated facilities at any of its establishments, and that it does not and will not permit its employees to perform their services at any location, under its control, where segregated facilities are maintained. The phrase "segregated facilities" includes facilities which are in fact segregated on a basis of race, color, creed, or national origin, because of explicit directive or by habit, local custom or otherwise. Supplier agrees that it will obtain identical certifications from proposed subcontractors prior to the award of subcontracts exceeding \$10,000 which are not exempt from the provisions of the Equal Employment Opportunity Clause.

## C. MINORITY BUSINESS ENTERPRISE

### 1. Utilization of Minority Business Enterprises -

applicable to contracts or orders in excess of \$5,000

- a. It is the policy of the government that minority business enterprises shall have the maximum practicable opportunity to participate in the performance of government contracts.
  - b. The supplier agrees to use its best efforts to carry out this policy in the award of its subcontracts to the fullest extent consistent with the efficient performance of the contract. As used in the contract, the term "Minority Business Enterprise" means a business, at least 50 percent of which is owned by minority group members or, in the case of publicly owned businesses, at least 51 percent of the stock of which is owned by minority group members. For the purposes of this definition, minority group members are Negroes, Spanish-Speaking American persons, American-Orientals, American-Indians, American-Eskimos, and American-Alutians. Suppliers may rely on written representations by subcontractors regarding their status as minority business enterprises in lieu of an independent investigation.
2. Minority Business Enterprises Subcontracting Programs -  
applicable to contracts or orders in excess of \$500,000
    - a. Supplier agrees to establish and conduct a program which will enable minority business enterprises (as defined in the clause entitled "Utilization of Minority Business En-

terprises") to be considered fairly as subcontractors and suppliers under this contract. In this connection the supplier shall:

- i. Designate a liaison officer who will administer the supplier's minority business enterprises program.
  - ii. Provide adequate and timely consideration of the potentialities of known minority business enterprises in all "make-or-buy" decisions.
  - iii. Assure that known minority business enterprises will have an equitable opportunity to compete for subcontracts, particularly by arranging solicitation, time for the preparation of bids, quantities, specifications and delivery schedules so as to facilitate the participation of minority business enterprises.
  - iv. Maintain records showing (1) procedures which have been adopted to comply with the policies set forth in this clause, including the establishment of a source list of minority business enterprises, (2) awards to minority business enterprises on the source list, and (3) specific efforts to identify and award contracts to minority business enterprises.
  - v. Include the Utilization of Minority Business Enterprises Clause in subcontracts which offer substantial minority business enterprises subcontracting opportunities.
  - vi. Cooperate with the contracting officer in any studies and surveys of the supplier's minority business enterprises procedures and practices that the contracting officer may from time to time conduct.
  - vii. Submit periodic reports of subcontracting to known minority business enterprises with respect to the records referred to in Subparagraph iv. above in such form and manner and at such time (not more often than quarterly) as the contracting officer may prescribe.
- b. The supplier further agrees to insert, in any subcontract hereunder which may exceed \$500,000, provisions which shall conform substantially to the language of this clause, including this Paragraph b, and to notify the contracting officer of the names of such subcontractors.

## D. EMPLOYMENT OF VETERANS -

applicable to contracts or orders in excess of \$10,000

1. Subject to the definitions contained in 41 CFR 50-250.2, the supplier to provide special emphasis to the employment of qualified disabled veterans of the Vietnam Era, agrees that all suitable employment openings which exist at the time of the execution of this contract and those which occur during the performance of this contract, including those not generated by this contract and including those occurring at an establishment of the supplier other than the one wherein the contract is being performed but excluding those of independently operated corporate affiliates, shall be offered for listing at an appropriate local office of the State employment service system wherein the opening occurs and to provide such reports to each local office regarding employment openings and hires as may be required. Provided that, if the contract is for less than \$10,000 or if it is with a State or local government, the reports set forth in Paragraphs 3 and 4 of this clause are not required.
2. Listing of employment openings with the employment service system pursuant to this clause shall be made at least concurrently with the use of any other recruitment service or effort and shall involve the normal obligations which attach to the placing of a bona fide job order, including the acceptance of referrals of veterans and nonveterans. The listing of employment openings does not require the hiring of any particular job applicant or from any particular group of job applicants, and nothing herein is intended to relieve the supplier from any requirements in any Executive Orders or regulations regarding nondiscrimination in employment.
3. The reports required by Paragraph 1 of this clause shall include, but not be limited to, periodic reports which shall be filed at least quarterly with the appropriate local office of the State employment service. Such reports shall indicate for each establishment (1) the number of individuals who were hired during the reporting period, (2) the number of those hired who were disabled veterans, and (3) the number who were nondisabled veterans of the Vietnam Era. The supplier shall submit a report within 30 days after the end of each reporting period wherein any performance is made on this contract. The supplier shall maintain copies of the reports submitted until the expiration of 1 year after final payment under the contract, during which time they shall be made available, upon request for examination by any authorized representative of the contracting officer or of the Secretary of Labor.
4. Whenever the supplier becomes contractually bound to the listing provisions of this clause, it shall advise the employment service system in each State wherein it has establishments of the name and location of each such establishment in the State. As long as the supplier is contractually bound to these provisions and has not advised the State system, there is no need to advise the State system of subsequent contracts. The supplier may advise the State system when it is no longer bound by this contract clause.
5. This clause does not apply to the listing of employment openings which occur and are filed outside of the 50 States, the District of Columbia, Puerto Rico, Guam, and the Virgin Islands.
6. This clause does not apply to openings which the supplier proposes to fill from within its own organization or to fill pursuant to a customary and traditional employer-union hiring arrangement. This exclusion does not apply to a particular opening once an employer decides to consider applicants outside of its own organization or employer-union arrangement for that opening.
7. If the supplier does not have a current written affirmative action program pursuant to this section at each of its establishments having 50 or more employees, the undersigned supplier agrees to develop and maintain such programs in accordance with 41 CFR 60-253 at each establishment within 120 days after the receipt of any contract or purchase order in the amount of \$50,000 or more.

**E. AFFIRMATIVE ACTION FOR HANDICAPPED WORKERS -**  
Applicable to contracts or orders in the amount of \$2,500 or more

1. The supplier will not discriminate against any employee or applicant for employment because of physical or mental handicap in regard to any position for which the employee or applicant for employment is qualified. The supplier agrees to take affirmative action to employ, advance in employment and otherwise treat qualified handicapped individuals without discrimination based upon their physical or mental handicap in all employment practices such as the following: employment, upgrading, demotion or transfer, recruitment or recruitment advertising, layoff or termination, rates of pay or other forms of compensation, and selection for training, including apprenticeship.
2. The supplier agrees that, if it has established an internal review procedure and a handicapped individual files a complaint with the supplier under that procedure that it is not complying with the requirements of the Act, it will (1) investigate the complaint and take appropriate action consistent with the requirements of 20 CFR 741.27, and (2) maintain on file for three years the record regarding the complaint and the actions taken.
3. The supplier agrees that, if a handicapped individual files a complaint with the Department of Labor that it has not complied with the requirements of the Act, (1) it will cooperate with the Department in its investigation of the complaint, and (2) it will provide all pertinent information regarding its employment practices with respect to handicapped individuals.
4. The supplier agrees to comply with the rules and regulations of the Secretary of Labor in 20 CFR Ch. VI, Part 741.

5. In the event of the supplier's noncompliance with the requirements of this clause, the supplier may be declared in default and sanctions may be imposed in accordance with 20 CFR Ch. VI, Part 741.
6. This clause shall be included in all subcontracts of \$2,500 or more.
7. The supplier agrees to permit the examination by appropriate contracting agency officials or the Assistant Secretary for Employment Standards or his designee, of pertinent books, documents, papers, and records concerning its employment and advancement of handicapped individuals.
8. The supplier agrees to post in conspicuous places, available to employees and applicants for employment, notices in a form to be prescribed by the Assistant Secretary for Employment Standards, provided by the contracting officer stating supplier's obligation under the law to take affirmative action to employ and advance in employment qualified handicapped employees and applicants for employment and the rights and remedies available.
9. The supplier will notify each labor union or representative of workers with which it has a collective bargaining agreement or other contract understanding that the supplier is bound by the terms of Section 503 of the Rehabilitation Act and is committed to take affirmative action to employ and advance in employment physically and mentally handicapped individuals.
10. If the supplier does not have a current written affirmative action program pursuant to this section at each of its establishments having 50 or more employees, the supplier agrees to develop and maintain such programs in accordance with 41 CFR 60-741 at each establishment within 120 days after the receipt of any contract or purchase order in the amount of \$50,000 or more.

---

FIRM/COMPANY NAME

---

DATE

---

SIGNATURE OF AUTHORIZED REPRESENTATIVE

---

PRINT OR TYPE NAME AND TITLE

Niagara Falls Site  
Lewiston, NY

SECTION I.E

ALCOHOLIC BEVERAGE & SUBSTANCE ABUSE POLICY (9870 SMC)



**STAUFFER MANAGEMENT COMPANY**

**ALCOHOLIC BEVERAGE AND SUBSTANCE ABUSE POLICY**

Contractor/Vendor shall disseminate to its employees, agents and subcontractors the following text of the Stauffer Management Company (referred to as "SMC") Substance Abuse Policy as follows and require such persons and their employees to abide by the terms of such policy:

The SMC is vitally concerned with the safety and well-being of the employees of its contractors. Therefore, it is important for you to be aware of the SMC's policy regarding alcoholic beverages and controlled substances:

The use, possession, sale, transfer, or purchase of alcoholic beverages and controlled substances on the work site is prohibited.

"The work site" means any property or facility under the control of the SMC wherever located, including land, buildings, structures, installations, cars and trucks.

"Controlled substances" means any drug or other ingestible, inhalable, or injectable substance the use, sale or possession of which is prohibited or restricted by law except drugs prescribed for the user by a licensed physician.

"Use" means ingesting, inhaling, or injecting alcoholic beverages or controlled substances either during the time an individual is present on the work site or within such time prior to entering upon or returning to that his or her coordination, visual perception, or reaction time is, or is likely to be, affected by such beverage or substance.

Entry onto the work site constitutes consent to inspection of the individual's person and his or her personal effects upon entering or while remaining present on the work site. Any individual who is found in violation of this Substance Abuse Policy or who refuses to permit inspection is subject to be removed and barred from the work site at the discretion of the SMC.

AGREED TO: \_\_\_\_\_  
Company Name

BY: \_\_\_\_\_

TITLE: \_\_\_\_\_

DATE: \_\_\_\_\_

P.O.#: \_\_\_\_\_

Niagara Falls Site  
Lewiston, NY

SECTION I.F

SAFETY PROCEDURES FOR CONTRACTORS (9299 SMC)

**STAUFFER MANAGEMENT COMPANY**  
**SAFETY PROCEDURES FOR CONTRACTORS**

**I. POLICY**

It is the policy of Stauffer Management Company ("SMC") to provide the safest possible work environment at the site. The SMC expends much time and effort to eliminate hazards and reduce accidents. Contractors must recognize this policy and extend it to all Contractor Personnel by establishing a sound safety program and complying with applicable standards and regulations. In addition, prior to the commencement of any work on SMC property, Contractors shall be responsible for (i) notifying all Contractor Personnel of the rules listed here, (ii) having all Contractor Personnel abide by these rules and (iii) exercising good judgement to avoid accidents and hazards. The Construction Manager will act as liaison between the Contractors and the SMC, and any questions that arise can be answered through him.

IT IS UNDERSTOOD THAT THE CONSTRUCTION MANAGER'S OPINION, ACT OR APPROVAL IN NO WAY RELIEVES CONTRACTORS OF THEIR RESPONSIBILITIES UNDER THESE SAFETY RULES AND SHALL NOT RESULT IN THE SMC ASSUMING ANY LIABILITY EITHER JOINTLY OR SEVERALLY FOR CONTRACTORS' FAILURE TO MEET THEIR RESPONSIBILITIES HEREUNDER.

**II. DEFINITIONS**

"Contractor Personnel" shall mean the Contractor, Subcontractors, and the employees and agents of the Contractor and Subcontractors.

"Construction Manager" shall mean the SMC representative who has responsible charge for the construction, activity or project.

"Safety Supervisor" shall mean the competent person designated by the Contractor to be responsible for safety.

**III. INTRODUCTION**

A. In addition to the rules set forth below, Contractors shall fully comply and insure that all Contractor Personnel comply with all applicable standards of the Occupational Safety and Health Act of 1970, as amended ("OSHA") and all safety codes, laws or ordinances established by any public authority.

**STAUFFER MANAGEMENT COMPANY**

- B. Contractor shall supply the SMC Construction Manager with a copy of any variances issued by OSHA to Contractor or any of his Subcontractors.

**IV. CONTRACTOR'S SAFETY PROGRAM**

- A. Contractor shall designate a Safety Supervisor and, in writing, inform the Construction Manager of the Safety Supervisor's name and where he may be contacted in case of emergency.
- B. The Safety Supervisor shall meet with the Construction Manager or the SMC Safety Representative prior to the commencement of any work to review and discuss safety, fire, medical and other emergency procedures. Contractors shall ensure all Contractor Personnel are instructed as to the appropriate action to take in case of fire, medical and other emergencies.
- C. The Safety Supervisor shall plan, supervise, and report to the Construction Manager on a program for training and instructing of all Contractors' and Subcontractors' personnel in safe practices.
- D. The Safety Supervisor shall insure that weekly formal safety inspections of the site are conducted. He shall report the results of the Safety Inspection in writing to SMC Construction Manager.
- E. The Safety Supervisor shall insure that a weekly meeting with all Superintendents and Foremen (including Subcontractors') with the following agenda is conducted.
  - 1. Review of safety inspection
  - 2. Review of accident cases and "near misses"
  - 3. Remedial actions to correct deficiencies as a result of safety inspections or accident investigations
  - 4. Work activities for coming week which require special safety precautions
  - 5. Training programs
  - 6. Miscellaneous

Additional, unscheduled safety meetings shall be held as needed.

- F. Contractor and Subcontractor shall conduct short "tool box" meetings daily with their crews concerning job specific conditions.
- G. The Contractor shall maintain the OSHA 200 Log, the log of occupational injuries and illness.

## STAUFFER MANAGEMENT COMPANY

H. Contractor shall comply with the OSHA Hazard Communication Standard. Contractor shall inform the SMC of all hazardous materials brought onto the construction site and shall provide the Construction Manager with a copy of the applicable Material Safety Data Sheets as requested.

### V. NEW EMPLOYEES

A. The Safety Supervisor shall insure that all new employees, immediately after they are placed on the payroll, are instructed in the following:

1. The SMC Basic Safety Rules and Site Safety Rules.
2. Proper use of personal protective equipment required for the project.
3. Location of all the potentially hazardous areas and materials at the site.
4. Location of first aid and emergency equipment.
5. Procedure for reporting injuries or unsafe conditions/acts.
6. Emergency alarm system.
7. Safe work permits and areas/jobs where they will be required.
8. Smoking areas.
9. Washing and eating areas.
10. The Drug and Alcohol Abuse Policy.
11. Evacuation Plan.
12. Use, if required, of a respirator for normal, emergency, or evacuation purposes.

**STAUFFER MANAGEMENT COMPANY**

**VI. OWNER'S INVOLVEMENT**

**A. The Construction Manager shall be responsible for the following:**

**Stauffer Management Company**

1. Monitoring the Contractor's compliance to the safety program and the SMC Safety Procedures for Contractors.
  2. Reporting and follow up on safety inspections.
  3. Attending weekly meetings.
  4. Calling special meetings if needed.
  5. Informing Contractor of designated safe work areas/jobs and issuing safe work permits for these areas/jobs.
- B. OSHA Inspections and Citations**
1. Contractor shall inform SMC's Construction Manager of all OSHA inspection's and send him copies of OSHA's inspection report.
- C. Accidents**
1. Contractor shall send the SMC Construction Manager a copy of all accident reports concerning Contractor's and Subcontractor's personnel (OSHA Form 200, Workmen's Compensation, and similar reports, if applicable), and an accident investigation report detailing the cause of the accident and the corrective action taken to prevent a recurrence.
- D. SMC Inspections**
1. The SMC will conduct safety inspections.
  2. The SMC insurance carrier may conduct periodic inspections.

**STAUFFER MANAGEMENT COMPANY**

**E. Drug and Alcohol Abuse Policy**

1. The transportation, possession, sale, distribution or use of alcohol or drugs while on the property of the SMC is prohibited. Contractors shall disseminate to its agents, employees and Subcontractors the text of the Drug and Alcohol Abuse Policy as stated and require such persons and their employees to abide by the terms of such policy.

## STAUFFER MANAGEMENT COMPANY

### BASIC SAFETY RULES

#### 1. SITE SAFETY RULES

When working within the confines of the site, all workers shall become thoroughly familiar with and abide by the site's safety rules.

#### 2. EMERGENCY ALARMS

Workers must become familiar with the meaning of the emergency alarm and/or siren system on the site. The Safety Supervisor will instruct the workers to their meaning and the appropriate action that must be taken in case of an emergency.

#### 3. EMERGENCY EQUIPMENT

Every employee must know the location of all safety showers, eye wash stations, and respiratory equipment when working on the site.

#### 4. FIRE PROTECTION

Every employee shall become familiar with the location of all fire fighting equipment. Employees shall see that the proper fire fighting equipment is readily available, in case of emergency, as the job dictates.

#### 5. HAZARDOUS AREAS

The Safety Supervisor will instruct the workers to the location of all potentially hazardous substances, materials, and atmospheres at the jobsite. Check with him daily. Become aware of wind direction by observing the direction of flags and stack plumes.

#### 6. SAFETY HAZARDS

Any and all unsafe acts or conditions observed by employees shall be reported to their immediate supervisor promptly. Any close-calls shall also be reported.

#### 7. FIRST AID

Employee shall have all injuries treated immediately, by the first aid station regardless of severity.



## STAUFFER MANAGEMENT COMPANY

### 8. ACCIDENTS

All accidents shall be reported immediately to the injured man's supervisor. The accident shall be investigated immediately, the cause determined, and where possible, the remedy applied.

### 9. SAFETY HATS

Approved protective helmets shall be worn at all times within the site area. No exceptions.

### 10. FOOT PROTECTION

Approved foot protection shall be used as required by the job.

### 11. RESPIRATORY PROTECTION

If respirators have been issued, they must be carried on the employee at all times.

### 12. EYE PROTECTION

Approved safety glasses with side shields or goggles shall be worn at all times by all employees and all visitors. Conventional frame glasses with safety lenses glasses may be worn when protected by approved safety goggles.

### 13. CLOTHING

Full length sleeves are recommended on all jobs.

### 14. CONDUCT

Practical jokes, fighting or horseplay will not be tolerated at the construction site.

### 15. PARKING

Park in designated areas only. Do not take your personal vehicle into the construction site. Observe all traffic signs, especially, speed limits.

**STAUFFER MANAGEMENT COMPANY**

16. DRUG AND ALCOHOL ABUSE POLICY

The possession, use, sale or distribution of substances of abuse or drug paraphernalia by employees while on duty or while off duty and on company property is prohibited. The possession, use, sale or distribution of alcoholic beverages is similarly prohibited. Furthermore, no employee shall report to work while in an impaired condition; such impairment may be due to substance abuse as well as substances prescribed by a licensed practitioner.

17. FIREARMS

Possession of firearms, or other weapons, at the jobsite is prohibited.

18. SMOKING

Smoking is permitted in designated areas only.

19. COMPRESSED AIR

Compressed air shall not be used to clean clothing or people. Horseplay by blowing air at another person is prohibited.

20. MOBILE EQUIPMENT

Employees shall not ride on trucks, or any construction equipment unless they have express permission, and then, only when seats with seat belts are provided.

21. HOISTING EQUIPMENT

Employees shall not ride any load being raised nor shall they stand under same.

I HAVE READ THE ABOVE AND AGREE TO ABIDE THEM. I FULLY UNDERSTAND THAT

FAILURE TO COMPLY WILL RESULT IN TERMINATION.

SIGNED: \_\_\_\_\_

DATE: \_\_\_\_\_

Niagara Falls Site  
Lewiston, NY

**SECTION II**

**DETAILS OF WORK**

**SECTION II.A**

**SVE PILOT STUDY WORK PLAN**

TABLE OF CONTENTS

	<u>Page</u>
E.1.0 INTRODUCTION .....	E-1
E.2.0 SOIL VAPOR EXTRACTION (SVE) PILOT STUDY.....	E-2
E.2.1 DESCRIPTION OF SOIL VAPOR EXTRACTION AS A REMEDIAL TECHNOLOGY .....	E-2
E.2.1.1 General.....	E-2
E.2.1.2 Site-Specific Application.....	E-4
E.2.2 TEST OBJECTIVES OF THE SOIL VAPOR EXTRACTION PILOT STUDY.....	E-5
E.2.3 SOIL VAPOR EXTRACTION PILOT STUDY DESIGN AND SCOPE OF WORK .....	E-5
E.2.3.1 Site Location for Performing.....	E-6
Pilot-Scale SVE Treatability Study.....	E-6
E.2.3.2 Proposed Layout of SVE Test System .....	E-7
E.2.3.3 Operating and Maintenance Procedures for Pilot-Scale Soil Vacuum Extraction System.....	E-13
E.2.4 SOIL VAPOR EXTRACTION SYSTEM EQUIPMENT AND MATERIALS.....	E-15
E.3.0 SAMPLING AND ANALYSIS FOR SOIL VAPOR EXTRACTION PILOT STUDIES .....	E-18
E.4.0 DATA MANAGEMENT.....	E-20
E.5.0 DATA ANALYSIS AND INTERPRETATION FOR THE SOIL VAPOR EXTRACTION PILOT STUDIES .....	E-21
E.5.1 GENERAL.....	E-21
E.5.2 SOIL VAPOR EXTRACTION DATA ANALYSIS AND INTERPRETATION .....	E-21
E.6.0 HEALTH AND SAFETY.....	E-23
E.7.0 RESIDUALS MANAGEMENT.....	E-24
E.8.0 REPORTING .....	E-25

LIST OF FIGURES

		<u>Following Page</u>
FIGURE E.1	AREAS REQUIRING REMEDIATION	E-1
FIGURE E.2	LAYOUT OF BOREHOLES AND SVE PILOT SYSTEM	E-8
FIGURE E.3	SOIL VAPOR EXTRACTION WELL	E-9
FIGURE E.4	VACUUM MONITORING PROBE CLUSTER	E-10
FIGURE E.5	SOIL VAPOR EXTRACTION PROCESS SCHEMATIC	E-12

LIST OF TABLES

TABLE E.1	SAMPLING AND ANALYSIS SUMMARY SOIL VAPOR EXTRACTION STUDY	E-18
-----------	--	------

LIST OF PLANS

PLAN E.1	ADDITIONAL DATA COLLECTION BOREHOLE LOCATIONS	
----------	--	--

### E.1.0 INTRODUCTION

Presented herein are the procedures and protocols that will be implemented to conduct the Soil Vapor Extraction (SVE) Pilot Study during the design data collection phase of the Remedial Design for the Site. Procedures and protocols outlined in the SVE Work Plan will be performed in conjunction with those presented in the Health and Safety Plan (Appendix A), Sampling Plan (Appendix B) and the QAPP (Appendix C).

The SVE Pilot Study will involve the installation of one extraction well and four vapor/pressure monitoring probe cluster wells in each of the four areas of the Site identified as requiring remediation. These areas (Areas A, B, C and T-4) are shown on Figure E.1.

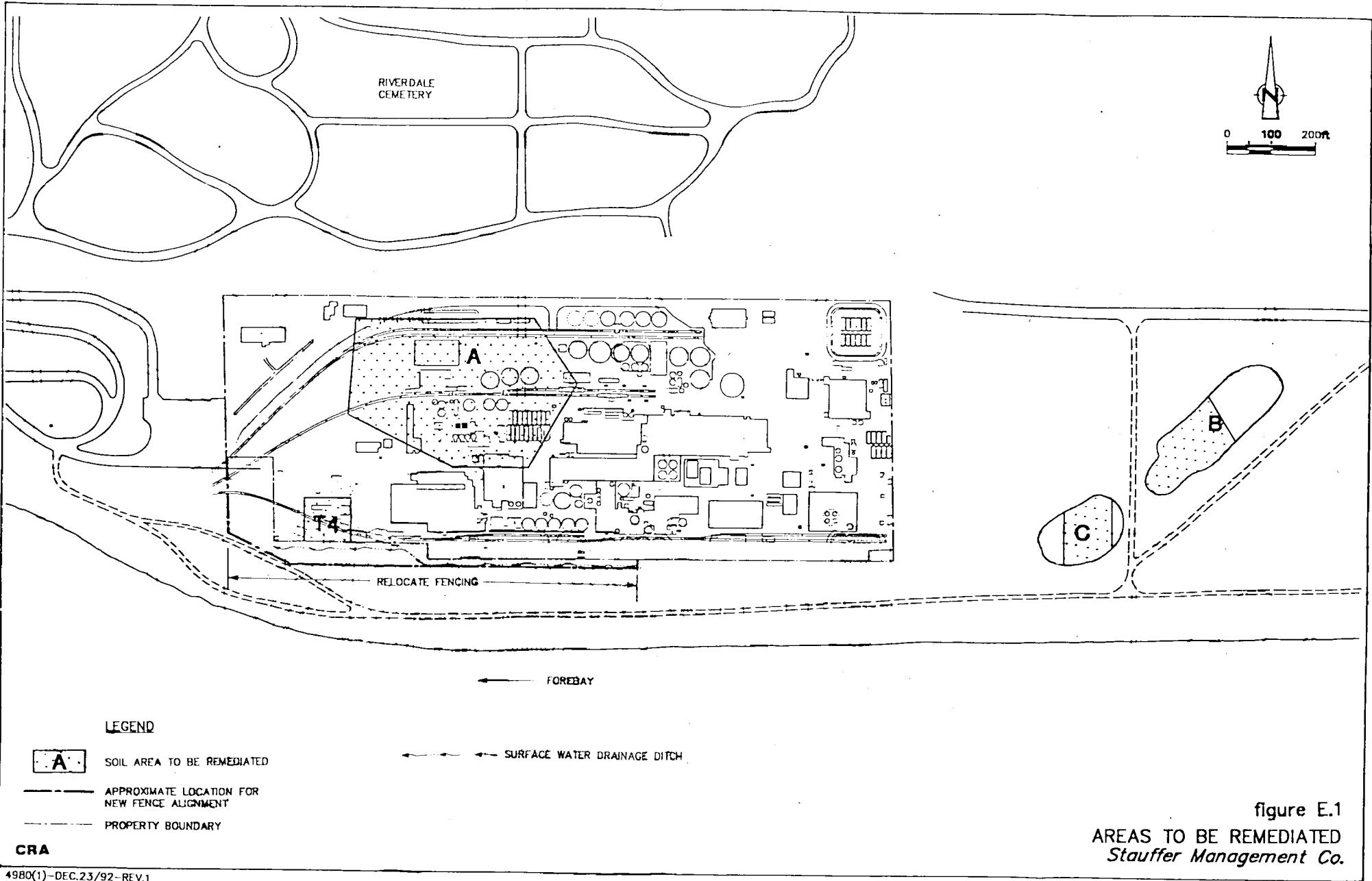


figure E.1  
 AREAS TO BE REMEDIATED  
 Stauffer Management Co.



## E.2.0 SOIL VAPOR EXTRACTION (SVE) PILOT STUDY

### E.2.1 DESCRIPTION OF SOIL VAPOR EXTRACTION AS A REMEDIAL TECHNOLOGY

#### E.2.1.1 General

Soil vapor extraction (SVE) is a technique used to remove volatile organic compounds from the vadose or unsaturated soil zone by establishment of a pressure gradient using vapor extraction wells installed in the contaminant zone. The extraction wells can be used alone or in conjunction with air injection wells that either passively take in atmospheric air or actively use forced air injection. Advective and diffusive transport mechanisms move volatile compounds in the vapor phase from the soil to the screened extraction wells. The contaminants in the vapor phase which are drawn out of the extraction well can then be treated as required.

The feasibility of the SVE process is dependent on Site-specific conditions. Contaminant mass removal is largely a function of VOC strippability and soil air permeability. The strippability of a particular VOC is a function of its vapor pressure and phase distribution coefficients. The process is best suited for use on VOCs in permeable, well drained soils with low organic carbon content. Factors such as stratigraphy and soil heterogeneities influence the flow of air as well as the location and concentration of contaminants. These factors will have a pronounced effect on the design of the SVE system.

After the area to be treated has been defined, the extraction wells can be strategically installed such that airflow within the contaminated soil zone is maximized. The vapor extraction wells usually consist of screened pipe placed in a permeable packing. The top few feet of the well is grouted to prevent short circuited airflow from the surface. Vacuum pumps or blowers induce negative pressure in the extraction wells and induce subsurface airflow to the wells.

As the air travels through the soil, it passes through a series of pores providing the least resistance. Air that passes through pores containing contaminated vapor will remove the contaminants from the soil. As this process continues, a concentration gradient will develop and VOCs will move via gas diffusion from lower permeability soils to higher permeability soils.

The airflow draws contaminated vapors and entrained water (if present due to moisture conditions or high water table conditions) from the extraction wells to a vapor-liquid separator. In this unit, the liquid is separated and contained for treatment and vapor is advanced to a vapor treatment unit. Monitoring probes can be installed to measure the soil vapor concentrations and sampling ports can be installed in the system at many stages after extraction from the well.

The vapors are typically treated using carbon adsorption, thermal destruction, or condensation. Carbon adsorption is the most

common method and can be used to accommodate a wide range of VOC concentrations and airflow rates. Thermal destruction is also effective for a wide range of compounds. Condensation by refrigeration can be used to separate VOCs from the air. This method is most effective for high concentrations of vapors but becomes less effective as the cleanup progresses and vapor concentrations drop. When properly operated, SVE systems have demonstrated their ability for safe, continuous operation with minimal attention. Equipment used in the process can be either mobile or field constructed. Once the equipment has been mobilized and wells and probes installed, full-scale operations can usually be underway in a matter of weeks.

#### E.2.1.2 Site-Specific Application

Soil vapor extraction systems will be installed in four areas of the Stauffer Plant Site (Areas A, B, C and T-4) as shown on Figure E.1. The SVE systems will remove VOCs from the unsaturated overburden soil zone which is generally less than twenty feet thick at the plant Site and landfill areas. The air permeability of the overburden Site soil is expected to be relatively low, and therefore careful attention to the design and spacing of the well is required.

## E.2.2 TEST OBJECTIVES OF THE SOIL VAPOR EXTRACTION PILOT STUDY

The objectives of the SVE pilot study are to determine the Site-specific air flow rates, soil air permeability, air flow distribution profiles, extraction well radius of influence, equilibrium soil vapor concentrations and contaminant removal rates. This information will be used to gauge the effectiveness of soil vapor extraction technology and to complete the final design of the full-scale system.

## E.2.3 SOIL VAPOR EXTRACTION PILOT STUDY DESIGN AND SCOPE OF WORK

The SVE pilot study will consist of a one short duration standard test in each of the four areas (A, B, C and T-4). Each test will be conducted using one 15-foot deep 4-inch diameter PVC extraction well and four vapor/pressure monitoring probe cluster wells. Mobile equipment will be delivered to the Site for conducting the pilot-scale treatability study. The mobile equipment will include: vacuum pump; moisture separator; one vapor phase carbon canister; and associated piping, valves, gauges, instruments and ancillary equipment.

SVE pilot tests will be conducted and monitored for a period of two to four weeks. Monitoring will include measuring: extraction well air flow and vacuum readings; vacuum readings at the four vacuum

monitoring probe cluster wells; inlet and outlet air temperatures; FID readings of the exhaust vapor and soil gas; and barometer readings. In addition, four air samples will be collected and analyzed for VOCs using the methods described in the Sampling Plan presented in Appendix B. Spent carbon from the treatment of SVE system vapor discharge will be staged on Site pending final characterization and disposal.

Soil samples will be collected via soil borings in Areas A, B, C and T4 prior to each pilot test. It is estimated that 36 samples (plus QA/QC) in total will be taken from the four areas. These samples will be analyzed for the SSPL VOCs. The methods for collecting the samples from the soil borings are discussed in the Sampling Plan (Appendix B).

#### E.2.3.1 Site Location for Performing Pilot-Scale SVE Treatability Study

SVE pilot tests will be conducted in Areas A, B, C and T-4 of the Site. In Area A the test will be conducted in the northwest corner of the area, in the approximate center of the area delineated by boreholes BH5, BH6, BH8 and BH9. In Area B the test will be conducted near borehole BH31. In Area C the test will be conducted near borehole BH30. In Area T-4 the test will be conducted in the center of the area.

### E.2.3.2 Proposed Layout of SVE Test System

#### a) Soil Boring Investigation

Two phases of drilling, soil sampling and analysis will be conducted in Areas A, B, C and T-4 of the Site as part of the SVE pilot study.

The purpose of the first phase drilling and sampling program is to collect soil samples for chemical analysis to establish baseline VOC concentrations in the soil. During the first phase, samples will also be collected to further delineate the limits of the soil remediation areas and quantify the chemical mass in these areas. This program is described in detail in Section E.3.0.

The purpose of the second phase drilling and sampling program is to replicate (to the extent possible) the first phase sampling in the immediate area of the SVE pilot test to obtain and compare analytical results of soil samples collected after the SVE test has been completed. Comparison of these data will be used to estimate the effectiveness of the SVE test in removing VOCs in a limited time frame and evaluate the overall feasibility of vapor extraction as a viable remedial technology for accomplishing and attaining target cleanup levels for soil.

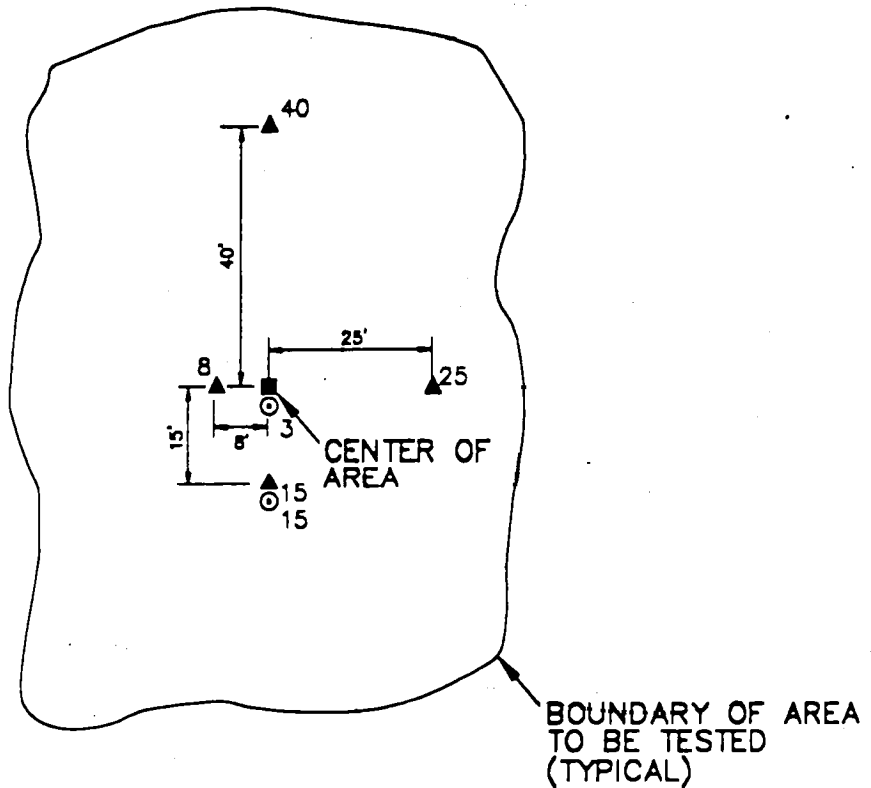
Initially, each of the four pilot study areas will receive five boreholes. One for the SVE test well and four for the monitoring probe clusters.

The locations of each borehole within a pilot test area are shown on Figure E.2. During installation, continuous soil sampling will be conducted at two-foot intervals and each sample will be screened using a PID or FID to measure organic vapors. Organic vapors will be measured from each split spoon sample and from the headspace of containerized samples. The borings will extend to the groundwater table or bedrock; whichever is encountered first. Three soils samples will be collected from each of the SVE test well boreholes, one from each third of the borehole depth (e.g. 0 - 5 feet, 5 - 10 feet and 10 - 15 feet) for a total of 12 samples. One sample will also be collected from each SVE well borehole and submitted for bulk density and grain size analysis. One soil sample will also be collected from each of the monitoring probe cluster boreholes in each pilot test area (16 samples). These samples will be collected from the interval with the highest organic vapor reading. All samples will be analyzed for SSPL and VOC parameters.

After completion of the SVE pilot test in each area, an additional two boreholes will be installed in each test area; one immediately adjacent to the SVE test well and the other immediately adjacent to the monitoring probe cluster 15 feet from the SVE test well. Both borings will be within five feet of the original borings. One sample will be collected from each borehole from the depth exhibiting the highest organic vapor reading as observed in the corresponding pre-test boreholes (8 samples). All samples will be analyzed for SSPL VOC parameters.

**LEGEND**

- PROPOSED SOIL BORING/SOIL VAPOR EXTRACTION WELL
- ▲ PROPOSED VACUUM MONITORING PROBE CLUSTER
- ⊙ PROPOSED SOIL BORING (POST SVE TESTING)  
(AREAS A,B,C AND T-4)



NOTE:

- 1) THE SVE WELLS WILL BE PLACED NEAR BORING BH5 (AREA A), BH31 (AREA B), BH30 (AREA C) AND THE CENTER OF AREA T-4.
- 2) THE NUMBERS REPRESENT THE DISTANCE IN FEET FROM THE SVE WELL
- 3) THE CONFIGURATION OF THE VACUUM MONITORING PROBE CLUSTERS MAY VARY

figure E.2

TYPICAL LAYOUT OF BOREHOLES AND SVE PILOT SYSTEM  
RD DATA COLLECTION PROGRAM  
*Stauffer Management Co.*

**CRA**



In total, 36 soil samples will be collected and analyzed during the pilot test program.

The layout of the boreholes, SVE well and vacuum monitoring probe clusters is shown on Figure E.2.

b) Vapor Extraction Well Installations

A 4-inch diameter vapor extraction well will be installed within the pilot study area to a depth of approximately 20 feet below ground surface (BGS), to bedrock or to the groundwater table; whichever is first encountered. A nominal 10-inch diameter borehole will be required to properly construct and install the well. The vapor extraction well will consist of 4-inch diameter flush joint threaded Schedule 40 PVC casing and factory slotted well screen (see Figure E.3). The well screen will be approximately 10 feet in length and consist of 0.02-inch (20 slot) factory slotted openings.

After the well is installed, a filter pack consisting of a uniformly sized clean coarse sand will be placed around the screen. A filter collar of 60 mesh silica sand will extend one foot above the well screen. A bentonite seal, at least one foot thick, will be placed above the well screen on top of the filter pack. The remainder of the annulus will be backfilled to ground surface with a cement/bentonite grout mixture.

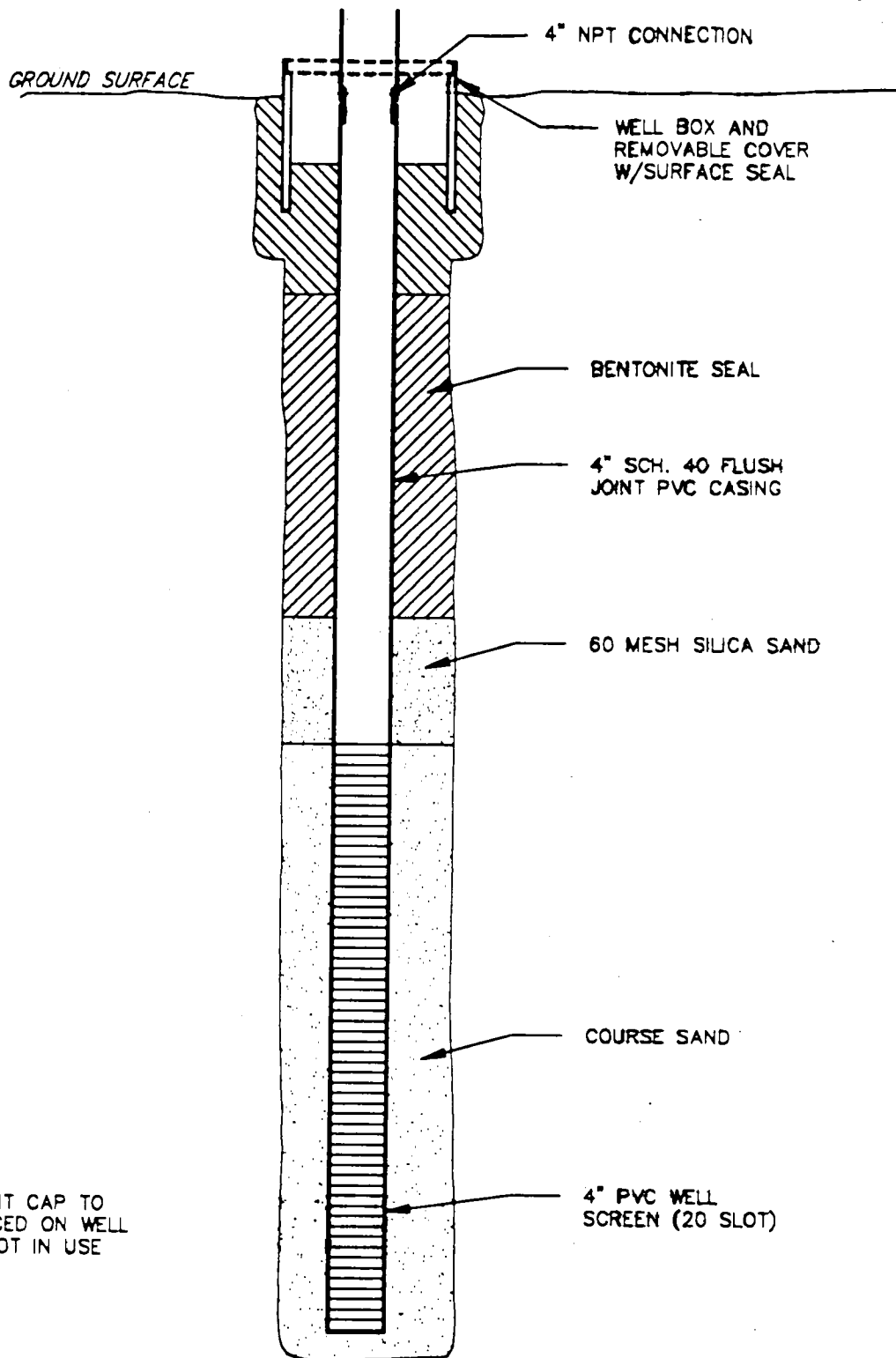


figure E.3  
 SOIL VAPOR EXTRACTION WELL  
 RD DATA COLLECTION PROGRAM  
 Stauffer Management Co.

CRA

A 4-inch NPT coupling will be attached to the top of the well casing. A surface-mounted protective well cover will be placed around the top of the well head. The protective cover shall be positioned to provide a nominal 1-inch clearance between the top of the well casing and the bottom of the bolt-down coverplate of the surface-mounted protective well cover. The protective well cover will be set in concrete to form a watertight seal around the well head. A cement apron will be placed around and shaped to slope away from the protective casing to allow for drainage away from the well.

c) Vacuum Monitoring Probe Cluster Wells Installation

Four vacuum monitoring probe cluster (VMPC) wells will be installed to measure the vertical and horizontal distribution of air flow within the overburden soils during the SVE pilot study. The VMPC wells will be installed at radial distances of approximately 8, 15, 25, and 40 feet away from the extraction well. Each well cluster will be comprised of two to three individual vacuum monitoring probes depending upon the depth of overburden. These probes would be vertically spaced at approximately 5-foot depth intervals. Each probe will consist of a 1-foot section of 1-inch diameter Schedule 40 PVC slotted pipe (see Figure E.4). The top of each section of one-inch pipe will be properly fitted with a reducer coupling, a nominal 1/4-inch NPT threaded nipple, clamps, and an adequate length of Teflon tubing to extend from the top of the screen to the ground surface.

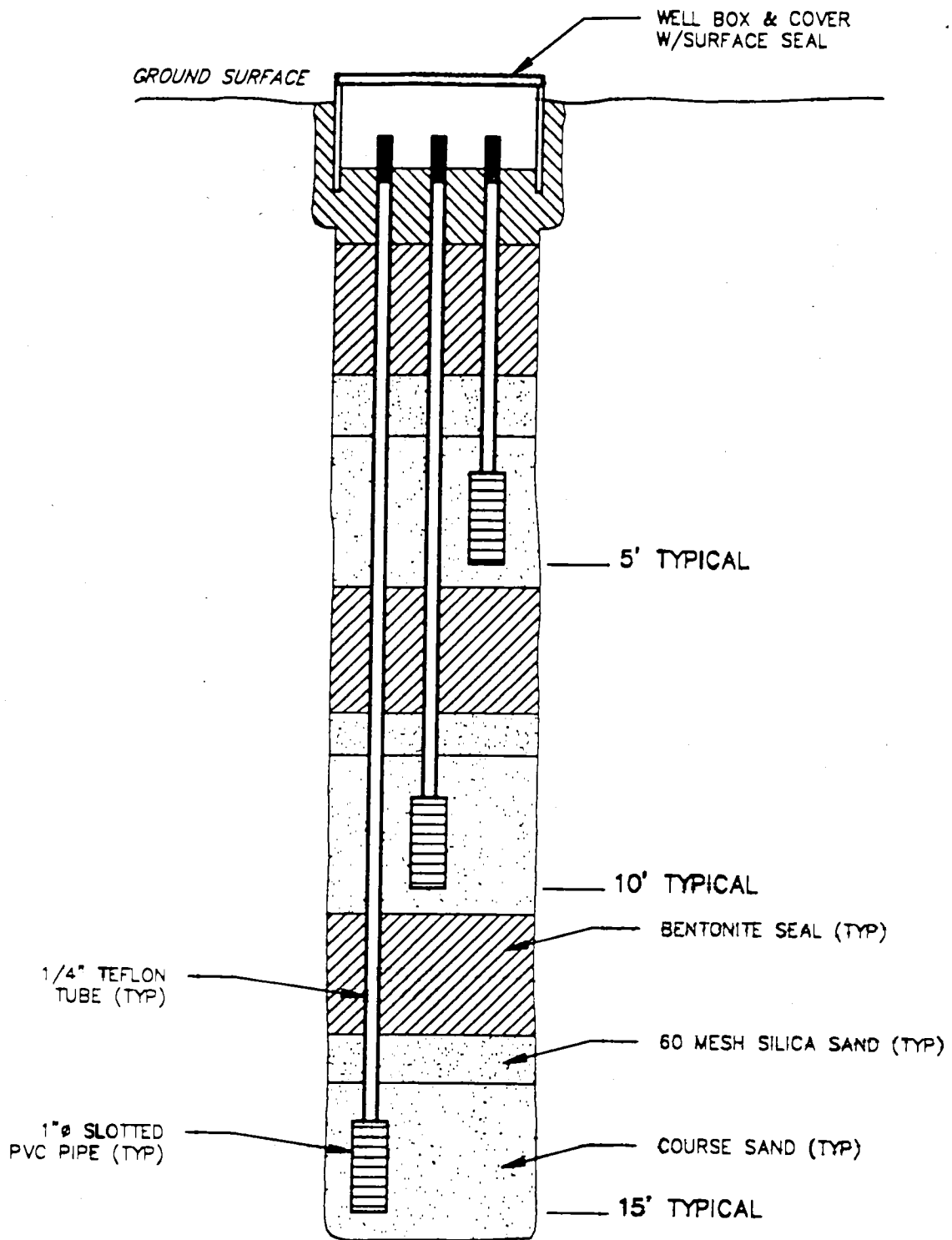


figure E.4  
 VACUUM MONITORING PROBE CLUSTER  
 RD DATA COLLECTION PROGRAM  
 Stauffer Management Co.

CRA

The vacuum monitoring probes will be installed at the specified depths discussed above. These depths are based on the assumption that the bedrock or groundwater is encountered at 20 feet BGS. The actual depth intervals for the VMPC wells will be determined in the field in accordance with field conditions. A nominal 10-inch diameter borehole will be drilled for construction of each VMPC well. The deepest probe will be placed in the borehole from 16 feet to 19 feet below ground surface, or immediately above the groundwater surface. A filter pack consisting of a uniformly sized coarse sand will be placed around each VMPC screen and to at least one foot above and below the probe screen. A hydrated bentonite seal at least 1 foot thick will be placed above the sand pack. The intermediate probe will be installed by the same procedure at the 9-foot to 14-foot interval (BGS) within the borehole and the shallow probe will be installed within the 3-foot to 8-foot interval. Each Teflon tube extending to the surface from the respective monitoring screen interval will be labelled to clearly identify the depth of the probe. The top of each tube will be equipped with a stainless steel fitting compatible with a 1/4-inch NPT threaded nipple. A 1/4-inch NPT nipple and vacuum gauge transducer will be attached to these fittings to monitor vacuum response during the pilot study. These fittings will be sealed with plugs when not in use. The remaining annular space for each VMPC well borehole will be backfilled to ground surface using a cement/bentonite grout.

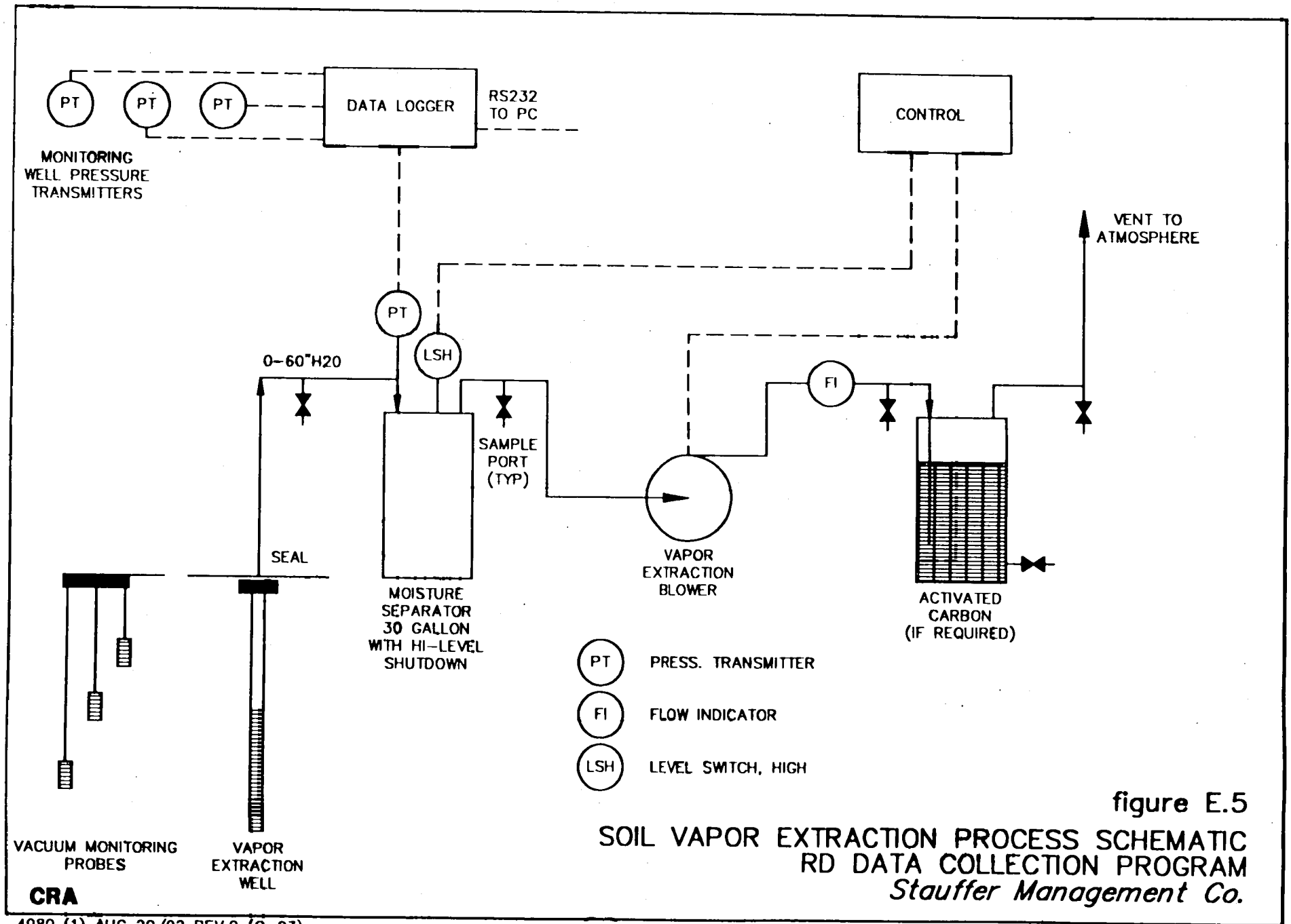
A surface-mounted protective well cover will be placed around the top of the VMPC well head. The protective well cover will be set in

concrete to form a watertight seal around the well head. A cement apron will be placed around and shaped to slope away from the protective casing to allow for drainage away from the well.

d) Mobile Soil Vapor Extraction Pilot Equipment

Mobile soil vapor extraction pilot equipment capable of generating a suitable range of air flow rates will be provided for the duration of the pilot study. A flow rate per well of 15 scfm at 60 inches of water vacuum has been calculated for the Site using equations derived for radial compressible flow to a vertical well. The assumed air flow permeability is 1 (Darcy) based on currently available boring log information. The flow rate calculations and equipment sizing will be revised, if necessary, based on information obtained during soil boring activities conducted as part of this pilot study and based on the variable flow rate testing conducted at the start of the test period.

This mobile unit will be equipped with a vacuum pump; moisture separator; one vapor carbon canister and piping (suction or discharge side), valves, gauges, instruments (i.e. barometer), and ancillary equipment, as needed. Based on air flow rates of up to 100 scfm, single phase 240 volt (and 40 amp) power will be required in the area where the mobile trailer is located. Water vapor collected in the moisture separator will be returned to the ground surface at the area of the SVE well after the pilot tests are completed. Spent carbon from the treatment of off-gas will be staged on Site. Figure E.5 illustrates a



conceptual layout of the proposed SVE pilot unit. The actual design and construction will be in accordance with field conditions.

**E.2.3.3 Operating and Maintenance Procedures  
for Pilot-Scale Soil Vacuum Extraction System**

It is assumed that each SVE pilot study will be operated for a period of two to four weeks. This period was determined based on the presumption that steady state conditions for airflow through the overburden soils are reached within a few days time. Initially, the unit will be operated for short durations at various flowrates for purposes of selecting the appropriate flowrate for the remainder of the test. The test will be operated at the selected flowrate during the remainder of the first phase of the test. During the second phase of the pilot tests, the air flow rate will be lowered or stepped down, approximately 25 to 50 percent, and the change in vacuum distribution and VOC removal rate will be monitored. The systems will be operated at the lower flow rate for the remainder of the tests.

The vacuum response at each of the monitoring probes, the extraction well air flow rate and applied vacuum, the air temperature, relative vapor hydrocarbon concentrations (flame ionization detector (FID)) and barometric pressure will be monitored during the test period. These parameters will be measured in accordance with the following schedule:



- at 15-minute intervals for the first eight hours after initial startup of the system;
- daily (at 24-hour intervals) for the next four days following initial startup;
- weekly (at 7-day intervals) beginning one week after initial startup (if required); and
- at 1-hour intervals for the first eight hours after lowering the air flow rate.

Air samples will be collected from the soil vapor blower discharge line. The line will be tapped and a manually operated gas cock will be threaded into the line. A vacuum pump will be used to divert air flow from the line to the sampling equipment. The gas cock of the sample pump will then be connected to the sample portal of the field FID (OVA) for direct VOC measurement in the field.

Air samples will also be collected for laboratory analysis for VOCs in accordance with Method TO-14. Method TO-14 was used for the well gas sampling program, as described in Section 2.5, in November 1992. The results from this sampling will be used to determine the applicability of this method for sampling during SVE pilot testing. A total of 20 air samples (five from each of the four tests) will be collected for laboratory analysis in accordance with the following schedule:

- at initial startup of the SVE system;
- eight hours after initial startup of the SVE system;
- after an estimated equivalent of one pore volume of air has been extracted from the pilot zone (estimated 24 hours);

- prior to adjusting air flow rate or shutting down a test run;
- an additional sample eight hours after lowering the air flow rate.

#### E.2.4 SOIL VAPOR EXTRACTION SYSTEM EQUIPMENT AND MATERIALS

The SVE system to be used for performing the pilot study tests consists of an integrated arrangement of portable equipment. The main features of the system include:

- explosion proof vapor extraction blower to maintain constant flow during pilot tests;
- continuous data logging of eight pressure points with the ability to download data to a PC and calculate log slopes for permeability calculations;
- 30-gallon moisture separator with high level shutdown switch; and
- 55-gallon carbon canisters for treatment of off-gas.

A description of each of these components of the SVE system is provided as follows:

a) Vapor Extraction Blower

An explosion proof blower mounted in a frame, similar to a portable generator, with built-in flowmeter.

b) Control Box

This unit will connect to an electrical power supply and distribute the power to the required equipment and also provides intrinsically safe supply to a high-level switch on separator.

c) Moisture Separator

A 30-gallon drum with intrinsically safe high-level float switch with tap for inlet pressure transmitter.

d) Vapor Treatment Carbon Canister

Upon review of soil data from the supplemental soil sampling program the sizing and number of carbon canisters will be determined.

e) Data Logger

A data logger will be provided, as required, to collect time/pressure data. A typical data logger is the Lakewood four to eight point data logger. This specific logger is IBM compatible, and data can be graphed and slopes calculated to provide accurate Darcy data.

f) Pressure Transmitters

Pressure transmitters will be connected to the data logger and to some of the pressure monitoring probes to provide pressure data measurements at predetermined time intervals. A typical pressure transmitter is the Dwyer 604 Model, with appropriate pressure ranges. The pressure transmitters will be calibrated in accordance with manufacturer's specifications.

g) Hoses, Piping, Fittings, Gauges and Wires

PVC Schedule 40 piping and fittings, lightweight, flexible vacuum hose with quick-connect fittings, tubing and supplies, and connection cords, pressure gauges and flowmeters of the appropriate ranges, other accessories, as needed.

### E.3.0 **SAMPLING AND ANALYSIS FOR SOIL VAPOR EXTRACTION PILOT STUDIES**

Table E.1 contains a sampling and analysis summary for the soil vapor extraction pilot study including the pre-SVE test boring program which is described below.

Prior to conducting the SVE pilot test, additional data will be collected to further delineate the limits of the soil remediation areas and to quantify the chemical mass in these areas. The program involves the installation of 15 perimeter boreholes to refine the limits of Areas A (9 boreholes), B (3 boreholes), and T-4 (3 boreholes). Based on the review of existing data, additional boreholes are not required for Area C. Three interior boreholes will be installed within Area A to assist in the quantification of the chemical mass in this area. The boreholes installed for the SVE pilot test wells will also be used to assist in the quantification of chemical mass in each of the areas. The locations of the boreholes are shown on Plan E.1.

All boreholes will extend to the groundwater table or bedrock; whichever is encountered first. Soil samples will be collected in 2-foot intervals continuously to the final borehole depth. Each sample will be field screened using a PID or FID to measure organic vapors. A portion of each sample will also be placed in a glass jar and headspace readings will be obtained using a PID or FID.

TABLE E.1

Revised March 17, 1993

SAMPLING AND ANALYSIS SUMMARY  
SOIL VAPOR EXTRACTION STUDY

<i>Sample Type</i>	<i>Location</i>	<i>Matrix</i>	<i>Number of Samples(1)</i>	<i>Analyses</i>	<i>Method</i>
Additional Data	Perimeter Boreholes	soil	15	SSPL VOC	SW846-8240
Collection Boreholes	Interior Boreholes	soil	9	SSPL VOC	SW846-8240
Pre-Test Boreholes	Central Borehole	soil	12	SSPL VOC	SW846-8240
	Outer Boreholes	soil	16	SSPL VOC	SW846-8240
		soil	4	Bulk Density	Weight & Volume ASTM D422
		soil	4	Grain Size Distribution	
Post-Test Boreholes	Central Borehole	soil	4	SSPL VOC	SW846-8240
	Outer Borehole	soil	4	SSPL VOC	SW846-8240
SVE Off-Gas	SVE Unit	gas	20	SSPL VOC	TO-14

## Notes:

- (1) Total of four pilot tests.
- (2) QA/QC samples for both the soil and gas matrices will be collected in accordance with the QAPP (Appendix C).

Three soil samples for chemical analyses will be collected from each of the interior boreholes used for quantification of chemical mass. The samples will be analyzed for SSPL VOCs. One sample will be selected from each third of the borehole depth (e.g. 0-5 ft, 5-10 ft, 10-15 ft). All soil samples will be collected using the protocols presented in Appendix B (Sampling Plan).

Based on the results of the organic vapor screening from samples for each perimeter borehole, a decision will be made as to whether an additional borehole is required to further define the soil remediation areas. If the organic vapor readings are relatively low in the original boring, another boring may be drilled closer to the center of the soil remediation area. If the organic vapor readings are relatively high in the original boring, another boring will be drilled further outside the soil remediation area. This process will be repeated until the soil remediation areas are sufficiently defined. One soil sample will be submitted from the first perimeter borehole at each location exhibiting relatively low organic vapor readings (total of 15 samples). The actual sample interval will be the interval exhibiting the highest potential for chemical presence based upon organic vapor screening.

At the on-set of this program, soil samples from the first three (3) of the perimeter soil borings and the first interior soil boring will be analyzed using a rapid (24 hour) turnaround. The organic vapor screening level for the remainder of the perimeter boreholes will be based upon a review of the data for the boreholes installed during the Site Investigation and also on data obtained from the rapid turnaround samples.

Sample collection, packaging and shipping, as well as methods of analysis for the pilot SVE study will be performed in conformance with the Sampling Plan (Appendix B) and QAPP (Appendix C).

#### E.4.0 DATA MANAGEMENT

Data management refers to the procedures for recording observations and raw data in the field or laboratory, including the use of bound notebooks, data collection sheets, and photographs. Data management for the performance of the SVE pilot study will conform with the guidelines outlined in the QAPP (Appendix C).



## E.5.0 DATA ANALYSIS AND INTERPRETATION FOR THE SOIL VAPOR EXTRACTION PILOT STUDIES

### E.5.1 GENERAL

Raw data collected from the SVE pilot testing will be reviewed (tabulation and validation) and analyzed and presented (tabular or graphical) in conformance with guidelines outlined in the QAPP (Appendix C). The assessment of the soil vapor extraction data will take into account the duration of each test to simulate the actual duration required for operation of a full-scale system.

### E.5.2 SOIL VAPOR EXTRACTION DATA ANALYSIS AND INTERPRETATION

SVE pilot data will provide input to, and support for, numerical simulation exercises. In these numerical simulations, energy equations for vapor flow in porous media and mass transfer equations are used to size and locate extraction wells and to size mechanical equipment, including vapor treatment, for full-scale project implementation.

Equations governing flow in porous media state that induced vacuum varies logarithmically with distance from the extraction well and linearly with amount of vacuum applied. The mobile soil vapor extraction system data logger will collect pressure data over time from

various points in the system. Pressure distribution data will be plotted as a function of time on a logarithmic scale. The calculated slope of the data equals the soil permeability to vapor flow.

Raw FID and laboratory analytical data for VOCs will be presented in tabular form. Vapor readings taken at the start of the testing are representative of equilibrium vapor concentrations in the soil matrix, while readings taken after one pore volume of vapor has been removed are indicative of the longer term expected removal rates. Vapor concentrations and mass removal rates can be plotted as a function of time to establish a trend over the short duration tests. In addition, the reduction in vapor concentration over time as a function of air volume per unit mass of contamination can be plotted and compared with theoretical calculations for VOC removal based on gas laws. Interpretation of mass removal rate data as a function of varying air flow rates will allow for an assessment of the degree to which gas diffusion transport mechanisms influence full-scale design criteria and remediation time frame.

Raw soil VOC data, collected from laboratory analyses of selected soil samples taken during drilling operations, will be presented.

**E.6.0 HEALTH AND SAFETY**

Work related to the SVE pilot testing will be performed in accordance with the RD Health and Safety Plan (Appendix A).

**E.7.0 RESIDUALS MANAGEMENT**

Residuals resulting or potentially resulting from the performance of the SVE tests include drill cuttings, spent carbon and water collected in the moisture separator. All wastes will be managed in accordance with the protocols presented in Section 6.0 of the RD Work Plan. The spent carbon will be staged on Site for future disposal.

## 6.0 WASTE HANDLING

The following sections present the waste handling procedures that will be implemented during the design data collection phase of the remedial design, construction/implementation of the remedial systems and operation of the remedial systems.

### 6.1 DESIGN DATA COLLECTION PHASE

#### 6.1.1 Soils

Soils generated by the installation of wells and boreholes will be placed back into the borehole to the extent possible. Excess soils will be placed in 55-gallon drums, characterized and disposed of off Site at an appropriate disposal facility.

#### 6.1.2 Groundwater

##### 6.1.2.1 Well Development and Purge Waters

Well development and purge waters will be contained in 55-gallon drums or hazmat tankers, characterized and treated either on Site or at an appropriate off-Site treatment facility.

E.8.0 **REPORTING**

Results of the SVE testing will be reported in the form of a technical memorandum. In addition to presenting an evaluation of effectiveness of the technology based on pilot study results, this technical memorandum will also include information regarding the general feasibility of the technology.

**SECTION II.B**

**TABLES AND LOGS**

TABLE OF CONTENTS

Table 1	In Situ Hydraulic Conductivity Estimates	1 Page
Table 2	Summary of Groundwater Elevations	2 Pages
Table 3	Summary of On Site SSPL VOC Analytical Results	4 Pages
Table 4	Soil Analytical Results VOC Compounds	2 Pages
Table 5	Soil Analytical Results BNA Compounds	3 Pages
Table 6	Summary of Organic Compounds Detected - Soil	1 Page
Fig. 10	Boring Logs	39 Pages



TABLE 1

## IN SITU HYDRAULIC CONDUCTIVITY ESTIMATES

<i>Well Designation</i>	<i>Monitored Interval</i>	<i>Hydraulic Conductivity</i>
OW5-89	Lockport/Rochester	$1.8 \times 10^{-5}$ cm/sec
OW7-89	Overburden	$3.6 \times 10^{-5}$ cm/sec
OW1-89	Rochester	$3.9 \times 10^{-8}$ cm/s
OW3-89	Rochester	$1.9 \times 10^{-5}$ cm/s
OW4-89	Irondequoit/Reynales	$2.0 \times 10^{-7}$ cm/s

TABLE 2

## SUMMARY OF GROUNDWATER ELEVATIONS (1989-1990)

WELL NO.	Measuring Point Elevation (ft. AMSL)	Bottom of Well Elevation (ft. AMSL)	Elevation (ft. AMSL)			
			11/28/89	4/2/90	4/17/90	4/27/90
B-01	578.88	449.5	-	-	477.706	472.80
B-02	569.84	460.9	-	-	-	530.20
GPG-51	579.19	294.7	-	-	DRY	DRY
IR-3	586.61	295.7	-	-	-	460.96
IR-49	587.22	428.5	-	-	-	458.41
IR-51	578.99	434.9	-	-	-	463.44
LR-2	594.53	505.5	554.60	559.17	560.18	559.79
LR-48	586.85	510.4	552.53	557.86	557.90	557.71
LR-49	588.01	508.6	554.55	558.87	560.01	559.38
LR-50	589.46	512.9	558.24	561.22	562.51	561.68
LR-51	579.15	512.4	551.78	555.85	556.64	556.41
OW1-89	614.07	472.4	-	491.26*	501.65*	507.79
OW2-89	614.60	424.3	-	**	**	**
OW3-89	591.80	461.7	-	536.18	533.45	535.12
OW4-89	592.26	423.7	-	439.14	442.46	443.84
OW5-89	609.25	505.4	-	558.50	558.31	559.09
OW6-89	587.87	328.4	-	329.60	329.82	329.94
OW7-89	600.24	584.3	-	594.08	594.12	594.42
OW8-91	575.55	564.4	-	-	-	-
OW9-91	574.90	560.4	-	-	-	-
OW10-91	573.69	559.8	-	-	-	-
R-49	587.53	467.4	-	-	-	526.86
R-51	578.78	456.4	-	-	-	518.11
W-1	618.49	587.1	591.76	592.86	593.54	593.08
W-2A	617.33	505.2	599.07	605.50	606.38	606.19
W-2B	617.33	564.4	593.80	597.92	598.28	598.90
W-2C	617.19	602.3	602.73	611.25	611.99	611.88
W-3A	619.54	557.4	DRY	DRY	DRY	DRY
W-3C	619.11	577	592.77	596.72	596.86	597.97
W-3D	619.48	599.8	603.87	601.46	601.51	602.01
W-4	619.78	596.8	598.21	598.21	598.35	598.78
W-5A	619.81	582.7	591.78	594.51	594.61	595.83
W-5B	619.75	592.9	DRY	595.53	595.85	596.38
W-5C	619.82	598.7	603.05	602.99	603.30	602.98
W-6	619.93	600.6	603.66	602.94	603.36	603.11
W-7A	618.59	582.4	586.27	587.39	587.73	587.73
W-7B	618.83	554.4	557.17	558.66	558.78	559.84
W-7C	618.86	597.4	606.28	601.61	601.70	605.20
W-8A	617.97	590.0	593.76	DRY	DRY	DRY
W-9A	616.97	560.4	563.40	563.42	563.55	563.41

TABLE 2

## SUMMARY OF GROUNDWATER ELEVATIONS (1989-1990)

WELL NO.	Measuring Point Elevation (ft. AMSL)	Bottom of Well Elevation (ft. AMSL)	Elevation (ft. AMSL)			
			11/28/89	4/2/90	4/17/90	4/27/90
W-9B	617.06	578.3	584.30	584.69	584.79	584.88
W-9C	617.27	587.9	589.82	DRY	DRY	DRY
W-11	614.42	580.2	584.53	583.76	584.00	583.78
W-12	616.59	581.9	589.38	592.07	592.09	593.07
W-13	613.58	590.0	596.27	599.27	601.20	600.44
W-14	614.85	585.9	590.30	592.46	594.45	588.63
W-15A	612.89	554.0	561.74	562.46	563.09	562.93
W-15B	613.22	576.3	583.19	583.06	583.57	583.08
W-15C	612.99	591.6	595.23	595.26	595.21	595.21
W-16	601.57	569.6	578.60	577.91	578.09	577.78
W-17	602.36	573.4	585.62	587.23	587.31	587.54
W-18A	602.53	573.2	587.19	587.02	587.18	587.24
W-19A	597.41	556	558.54	558.58	558.63	558.64
W-19B	596.57	510.3	552.81	559.08	558.22	558.98
W-19D	595.49	567.7	575.25	578.14	583.24	582.62
W-20	593.75	564.9	576.88	576.38	577.58	577.09
W-22A	592.24	567.8	568.42	570.19	570.96	570.51
W-23A	594.70	533.6	556.04	570.83	561.75	561.36
W-23B	594.67	550.8	556.20	560.87	561.82	561.44
W-23C	594.89	571.8	575.48	578.40	578.49	578.47
W-29A	617.52	558.8	560.33	560.88	561.10	560.75
W-29B	617.09	521.6	548.52	557.54	558.94	556.53
W-34	616.86	471.3	-	-	-	524.56
W-48E	587.70	545.8	553.34	558.43	558.88	558.52

Note: - not measured  
 \*\* non-operational  
 \* water level may not be at static level due to slow post-development recovery

**TABLE 3**

**SUMMARY OF ON-SITE SOIL ANALYTICAL RESULTS  
SSPL (1) VOLATILE ORGANIC COMPOUNDS - ppb**

<b>Location:</b>	<b>BH1</b>		<b>BH2</b>	<b>BH3</b>	<b>BH4</b>	<b>BH5</b>	<b>BH6</b>		<b>BH7</b>
<b>Depth:</b>	<b>4' - 6'</b>	<b>10' - 12'</b>	<b>4' - 6'</b>	<b>2' - 4'</b>	<b>1' - 3'</b>	<b>2' - 4'</b>	<b>2' - 4'</b>	<b>8' - 10'</b>	<b>8' - 10'</b>
<b>Parameter (ppb)</b>									
Carbon Disulfide	<5	<5	<5	<5	<5	<620	<620	<620	<5
Carbon Tetrachloride	<5	<5	<5	<5	<5	280J	7,000	360J	<5
Chloroform	<5	<5	<5	<5	<5	460J	2,100	<620	<5
Methylene Chloride	<5	<5	<5	<5	<5	<620	<620	<620	<5
Trichloroethene	<5	<5	<5	<5	<5	5,800	<620	<620	<5
Benzene	<5	<5	<5	<5	<5	<620	<620	<620	<5
Toluene	<5	<5	<5	<5	<5	<620	<620	<620	<5
Tetrachloroethene	<5	<5	<5	<5	<5	7,100	<620	1,200	<5

**Notes:**

(1) SSPL - Site Specific Parameter List.

J - Detected, but below quantitation limit, quantitation suspect.

B - Compound detected in method blank associated with this sample.

S - Estimated due to outlying surrogate recoveries.

**TABLE 3**

**SUMMARY OF ON-SITE SOIL ANALYTICAL RESULTS  
SSPL (1) VOLATILE ORGANIC COMPOUNDS - ppb**

<i>Location:</i>	<b>BH8</b>		<b>BH9</b>		<b>BH10</b>	<b>BH11</b>	<b>BH12</b>	<b>BH13</b>	<b>BH14</b>	<b>BH15</b>
<i>Depth:</i>	<u>6' - 8'</u>	<u>12' - 12.8'</u>	<u>8' - 10'</u>	<u>14' - 15'</u>	<u>6' - 8'</u>	<u>4' - 6'</u>	<u>8' - 9.2'</u>	<u>5.5' - 7.0'</u>	<u>7' - 9'</u>	<u>2.5' - 4.5'</u>
<i>Parameter (ppb)</i>										
Carbon Disulfide	<1,200	<1,200	<1,200	<50	<5	<5	<5	<5	<5/<5	<5
Carbon Tetrachloride	37,000	32,000	23,000	1,200	<5	<5	<5	<5	<5/<5	<5
Chloroform	500J	2,000	3,000	330	<5	<5	<5	<5	<5/<5	<5
Methylene Chloride	<1,200	<1,200	<1,200	<180B	<5	<5	<5	<5	<5/<5	<5
Trichloroethene	<1,200	<1,200	2000	170	<5	<5	<5	<5	<5/<5	<5
Benzene	<1,200	<1,200	<1,200	24J	<5	<5	<5	<5	<5/<5	<5
Toluene	<1,200	<1,200	<1,200	<50	<5	<5	<5	<5	<5/<5	<5
Tetrachloroethene	<1,200	<1,200	<1,200	60	<5	<5	4J	<5	<5/<5	<5

Notes:

(1) SSPL - Site Specific Parameter List.

J - Detected, but below quantitation limit, quantitation suspect.

**TABLE 3**

**SUMMARY OF ON-SITE SOIL ANALYTICAL RESULTS  
SSPL (1) VOLATILE ORGANIC COMPOUNDS - ppb**

<i>Location:</i>	<u>BH16</u>	<u>BH17</u>	<u>BH18</u>	<u>BH19</u>	<u>BH20</u>		<u>BH21</u>	<u>BH23</u>	<u>BH24</u>	
<i>Depth:</i>	4' - 6'	5' - 7'	7' - 8.6'	4' - 5.7'	5' - 7'	7' - 7.3'	4' - 6'	4' - 6'	4' - 6'	6' - 8'
<i>Parameter (ppb)</i>										
Carbon Disulfide	<5	<5	<5/<5	<5	<5	7	<5	<5	<5	<5
Carbon Tetrachloride	<5	<5	<5/<5	<5	100	52	<5	<5	<5	<5
Chloroform	<5	<5	<5/<5	<5	19	9	<5	<5	<5	<5
Methylene Chloride	<5	<5	<5/<5	<5	<5	<5	<5	<5	<5	<5
Trichloroethene	<5	<5	<5/<5	<5	<5	<5	<5	<5	<5	<5
Benzene	<5	<5	<5/<5	<5	<5	<5	<5	<5	<5	<5
Toluene	<5	<5	<5/<5	<5	<5	<5	<5	<5	<5	<5
Tetrachloroethene	<5	<5	<5/<5	<5	17	20	<5	3J	<5	<5

Notes:

(1) SSPL - Site Specific Parameter List.

J - Detected, but below quantitation limit, quantitation suspect.

**TABLE 3**

**SUMMARY OF ON-SITE SOIL ANALYTICAL RESULTS  
SSPL (1) VOLATILE ORGANIC COMPOUNDS - ppb**

<b>Location:</b>	<b>BH25</b>	<b>BH26</b>	<b>BH27</b>		<b>BH27A</b>
<b>Depth:</b>	<b>1.7' - 2.4'</b>	<b>6' - 8'</b>	<b>0' - 2'</b>	<b>4' - 5.2'</b>	<b>8' - 10'</b>
<b>Parameter (ppb)</b>					
Carbon Disulfide	<5	<5	<630	<610	<5/<5
Carbon Tetrachloride	<5	<5	<630	<610	<5/<5
Chloroform	<5	<5	<630	<610	<5/<5
Methylene Chloride	<5	<5	<630	<610	<5/<5
Trichloroethene	<5	<5	<630	<610	<5/<5
Benzene	<5	<5	<630	<610	<5/<5
Toluene	<5	<5	930	<610	<5/<5
Tetrachloroethene	<5	<5	550J	13,000	<5/<5

**Notes:**

(1) SSPL - Site Specific Parameter List.

J - Detected, but below quantitation limit, quantitation suspect.

TABLE 4

SOIL ANALYTICAL RESULTS  
TCL (1) VOLATILE ORGANIC COMPOUNDS - ppb

	BH13	BH22	BH28A	BH29	BH30	BH31	Rinsate Blank	Drill Water
<b>Borehole Location:</b>	BH13	BH22	BH28A	BH29	BH30	BH31		
<b>Depth:</b>	4' - 5-5'	3.5' - 5'	5' - 7'	3.5' - 5'	10' - 12'	4' - 6'	--	--
<b>Sample Designation:</b>	2365-PS-19	2365-PS-36	2365-SS-49	2365-SS-54	2365-SS-61	BH31-2365-88/ BH34-2365-88	BH32R	DW-2365-SS-057
<b>Sample Date:</b>	8/31/89	9/6/89	9/11/89	9/11/89	11/15/89	12/11/89	12/11/89	11/13/89
<b>Compound (ppb)</b>								
Acetone	110	70	<50	50	<40,000	<4,000/18,000	73	<50
Benzene	<5	<5	<5	<5	<4,000	<500/<1,000	>6	<6
Bromodichloromethane	<5	<5	<5	<5	<4,000	<500/<1,000	>6	4J
Bromoform	<5	<5	<5	<5	<4,000	<500/<1,000	>6	<5
Bromomethane	<10	<10	<10	<10	<8,000	<1,000/<5,000	>30	<10
2-Butanone	<50	<50	<50	<50	<40,000	<1,000/<10,000	<60	<50
Carbon Disulfide	<5	<5	<5	<5	<4,000J	12,000J/34,000	<6	<5
Carbon Tetrachloride	<5	<5	<5	<5	<4,000	3,000J/3,000	<6	<5
Chlorobenzene	<5	<5	<5	<5	<4,000J	<500/<1,000	<6	<5
Chloroethane	<10	<10	<10	<10	<8,000	<1,000/<5,000	<30	<10
Chloroform	<5	<5	<5	<5	<4,000J	<500J/2,000	<6	10
Chloromethane	<10	<10	<10	<10	<8,000	<1,000/<5,000	<30	<10
Dibromochloromethane	<5	<5	<5	<5	<4,000	<500/<1,000	<6	<5
1,1-Dichloroethane	<5	<5	<5	<5	<4,000	<500/<1,000	8	<5
1,2-Dichloroethane	<5	<5	<5	<5	<4,000	<500/<1,000	<6	<5
1,1-Dichloroethene	<5	<5	<5	<5	<4,000	<500/<1,000	<6	<5
1,2-Dichloroethene (Total)	<5	<5	<5	<5	<4,000	<500/<1,000	<6	<5
1,2-Dichloropropane	<5	<5	<5	<5	<4,000	<500/<1,000	<6	<5
cis-1,3-Dichloropropene	<5	<5	<5	<5	<4,000	<500/<1,000	<6	<5
trans-1,3-Dichloropropene	<5	<5	<5	<5	<4,000	<500/<1,000	<6	<5

## Notes:

(1) TCL - Target Compound List.

J - Detected, but below quantitation limit, quantitation suspect.



TABLE 4

SOIL ANALYTICAL RESULTS  
TCL (1) VOLATILE ORGANIC COMPOUNDS - ppb

Borehole Location:	BH13	BH22	BH28A	BH29	BH30	BH31	Rinse Blank	Drill Water
Depth:	4' - 5-5'	3.5' - 5'	5' - 7'	3.5' - 5'	104' - 12'	4' - 6'	--	--
Sample Designation:	2365-PS-19	2365-PS-36	2365-SS-49	2365-SS-54	2365-SS-61	BH31-2365-88/ BH34-2365-88	BH32R	DW-2365-SS-057
Sample Date:	8/31/89	9/6/89	9/11/89	9/11/89	11/15/89	12/11/89	12/11/89	11/13/89
Compound (ppb)								
Ethylbenzene	<5	<5	<5	<5	3,000J	<500/<1,000	<6	<5
2-hexanone	<50	<50	<50	<50	<40,000	<1,000/<10,000	<60	<50
Methylene Chloride	<5	<5	<5	<5	10000	<500/<1,000	<6	<5
4-Methyl-2-Pentanone	<50	<50	<50	<50	<40,000	<1,000/<10,000	<60	<50
Styrene	<5	<5	<5	<5	<4,000	<500/<1,000	<6	<5
1,1,2,2-Tetrachloroethane	11	<5	<5	<5	<4,000	<500/<1,000	<6	<5
Tetrachloroethene	<5	<5	4J	<5	130000	<500/<1,000	<6	<5
Toluene	<5	<5	<5	<5	<4,000	<500/<1,000	<6	<5
1,1,1-Trichloroethane	<5	<5	<5	<5	<4,000	<500/<1,000	<6	<5
1,1,2-Trichloroethane	<5	<5	<5	<5	<4,000	<500/<1,000	<6	<5
Trichloroethene	<5	<5	2J	<5	4000	<500/<1,000	7	<5
Vinyl Acetate	<50	<50	<50	<50	<40,000	<1,000/<10,000	<60	<50
Vinyl Chloride	<10	<10	<10	<10	<8,000	<1,000/<5,000	<30	<10
Total Xylenes	<5	<5	<5	<5	19000	<500/<1,000	<6	<5

## Notes:

(1) TCL - Target Compound List.

J - Detected, but below quantitation limit, quantitation suspect.

TABLE 5

SOIL ANALYTICAL RESULTS  
TCL (1) BASE/NEUTRAL/ACID EXTRACTABLE COMPOUNDS - ppb

Borehole Location:	BH13	BH22	BH28A	BH29	BH30	BH31	Rinsate Blank	Drill Water
Depth:	4' - 5-5'	3.5' - 5'	5' - 7'	3.5' - 5'	10' - 12'	4' - 6'	--	--
Sample Designation:	2365-PS-20	2365-PS-36	2365-SS-50	2365-SS-55	2365-SS-61	BH31-2365-88/ BH34-2365-88	BH32R	DW-2365-SS-057
Sample Date:	8/31/89	9/6/89	9/11/89	9/11/89	11/15/89	12/11/89	12/11/89	11/13/89
Compound (ppb)								
Acenaphthene	<660	<660	<660	<660	<8,300	<6,700/<660	<10	<10
Acenaphthylene	<660	<660	<660	<660	<8,300	<6,700/<660	<10	<10
Anthracene	<660	<660	<660	<660	<8,300	<6,700/<660	<10	<10
Benzoic Acid	<1,300	<3,300	<3,300	<3,300	<42,000	<34,000/<3,300	<50	<50
Benzo(a)Anthracene	<660	<660	<660	<660	<8,300	<6,700/<660	<10	<10
Benzo(b)Fluoranthene	<660	<660	300J	<660	<8,300	<6,700/<660	<10	<10
Benzo(k)Fluoranthene	<660	<660	300J	<660	<8,300	<6,700/<660	<10	<10
Benzo(g,h,i)Perylene	<660	<660	<660	<660	<8,300	<6,700/<660	<10	<10
Benzo(a)Pyrene	<660	<660	<660	<660	<8,300	<6,700/<660	<10	<10
Benzyl Alcohol	<1,300	<1,300	<1,300	<1,300	<8,300	<6,700/<660	<10	<10
Bis(2-Chloroethoxy)Methane	<660	<660	<660	<660	<8,300	<6,700/<660	<10	<10
Bis(2-Chloroethyl)Ether	<660	<660	<660	<660	<8,300	<6,700/<660	<10	<10
Bis(2-Chloroisopropyl)Ether	<660	<660	<660	<660	<8,300	900J/900	<10	<10
Bis(2-Ethylhexyl)Phthalate	<660	400J	700J	1400	<8,300	<6,700/<660	<10	<10
4-Bromophenyl Phenyl Ether	<660	<660	<660	<660	<8,300	<6,700/<660	<10	<10
Butyl Benzyl Phthalate	<660	<660	<660	<660	<8,300	<6,700/<660	<10	<10
4-Chloroaniline	<1,300	<1,300	<1,300	<1,300	<8,300	<6,700/<660	<10	2J
2-Chloronaphthalene	<660	<660	<660	<660	<8,300	<6,700/<660	<10	<10
4-Chlorophenyl Phenyl Ether	<660	<660	<660	<660	<8,300	<6,700/<660	<10	<10
4-Chloro-3-Methylphenol	<1,300	<660	<660	<660	<8,300	<6,700/<660	<10	<10
2-Chlorophenol	<660	<660	<660	<660	<8,300	<6,700/<660	<10	<10
Chrysene	<660	<660	400J	<660	<8,300	<6,700/<660	<10	<10
Dibenzo(a,h)Anthracene	<660	<660	<660	<660	<8,300	<6,700/<660	<10	<10
Dibenzofuran	<660	<660	300J	<660	<8,300	<6,700/<660	<10	<10

Notes:

(1) TCL - Target Compound List.

J - Detected, but below quantitation limit; quantitation suspect.

B - Compound detected in method blank associated with this sample.

TABLE 5

SOIL ANALYTICAL RESULTS  
TCL (1) BASE/NEUTRAL/ACID EXTRACTABLE COMPOUNDS - ppb

Borehole Location:	BH13	BH22	BH28A	BH29	BH30	BH31	Rinsate Blank	Drill Water
Depth:	4' - 5-5'	3.5' - 5'	5' - 7'	3.5' - 5'	10' - 12'	4' - 6'	--	--
Sample Designation:	2365-PS-20	2365-PS-36	2365-SS-50	2365-SS-55	2365-SS-61	BH31-2365-88/ BH34-2365-88	BH32R	DW-2365-SS-057
Sample Date:	8/31/89	9/6/89	9/11/89	9/11/89	11/15/89	12/11/89	12/11/89	11/13/89
Compound (ppb)								
Di-n-Butyl Phthalate	<660	<660	200J	200JB	<8,300	<6,700/3,500B	<10	3J
1,2-Dichlorobenzene	<660	<660	<660	<660	<8,300	<6,700/<660	<10	<10
1,3-Dichlorobenzene	<660	<660	<660	<660	<8,300	<6,700/<660	<10	<10
1,4-Dichlorobenzene	<660	<660	<660	<660	<8,300	<6,700/<660	<10	<10
3,3'-Dichlorobenzidine	<1,300	<1,300	<1,300	<1,300	<42,000	<34,000/<3,300	<50	<50
2,4-Dichlorophenol	<660	<660	<660	<660	<8,300	<6,700/<660	<10	<10
Diethyl Phthalate	<660	200JB	<660	100JB	<8,300	<6,700/<660	6J	<10
2,4-Dimethylphenol	<660	<3,300	<660	<660	<8,300	<6,700/<660	<10	<10
Dimethyl Phthalate	<660	<660	<660	<660	<8,300	<6,700/<660	<10	<10
2,4-Dinitrophenol	<3,300	<3,300	<3,300	<3,300	<42,000	<34,000/<3,300	<50	<10
2,4-Dinitrotoluene	<660	<660	<660	<660	<8,300	<6,700/<660	<10	<10
2,6-Dinitrotoluene	<660	<660	<660	<660	<8,300	<6,700/<660	<10	<10
Di-n-Octyl Phthalate	<660	<660	<660	<660	<8,300	<6,700/<660	<10	<10
Fluoranthene	<660	<660	300J	<660	<8,300	<6,700/<660	<10	<10
Fluorene	<660	<660	<660	<660	<8,300	<6,700/<660	<10	<10
Hexachlorobenzene	<660	<660	<660	<660	<8,300	<6,700/600J	<10	<10
Hexachlorobutadiene	<660	<660	<660	<660	1,000J	<6,700/<660	<10	<10
Hexachlorocyclopentadiene	<660	<660	<660	<660	<8,300	<6,700/<660	<10	<10
Hexachloroethane	<660	<660	<660	<660	16,000	<6,700/<660	<10	<10
Indeno(1,2,3-cd)Pyrene	<660	<660	<660	<660	<8,300	<6,700/<660	<10	<10
Isophorone	<660	<660	<660	<660	<8,300	<6,700/<660	<10	<10
2-Methyl-4,6-Dinitrophenol	<3,300	<3,300	<3,300	<3,300	<42,000	<34,000/<3,300	<50	<50
2-Methylphenol	<660	<660	<660	<660	<8,300	<6,700/<660	<10	<10
4-Methylphenol	<660	<660	<660	<660	<8,300	<6,700/<660	<10	<10

Notes:

(1) TCL - Target Compound List.

J - Detected, but below quantitation limit; quantitation suspect.

B - Compound detected in method blank associated with this sample.

TABLE 5

SOIL ANALYTICAL RESULTS  
TCL (I) BASE/NEUTRAL/ACID EXTRACTABLE COMPOUNDS - ppb

Borehole Location:	BH13	BH22	BH28A	BH29	BH30	BH31	Rinsate Blank	Drill Water
Depth:	4' - 5-5'	3.5' - 5'	5' - 7'	3.5' - 5'	10' - 12'	4' - 6'	--	--
Sample Designation:	2365-PS-20	2365-PS-36	2365-SS-50	2365-SS-55	2365-SS-61	BH31-2365-88/ BH34-2365-88	BH32R	DW-2365-SS-057
Sample Date:	8/31/89	9/6/89	9/11/89	9/11/89	11/15/89	12/11/89	12/11/89	11/13/89
Compound (ppb)								
2-Methylnaphthalene	<660	<660	1,000J	<660	<8,300	<6,700/300J	<10	<10
Naphthalene	<660	<660	1,000J	<660	800J	<6,700/200J	<10	<10
Nitrobenzene	<660	<660	<660	<660	<8,300	<6,700/<660	<10	<10
2-Nitrophenol	<660	<660	<660	<660	<8,300	<6,700/<660	<10	<10
4-Nitrophenol	<3,300	<3,300	<3,300	<3,300	<42,000	<34,300/<3,300	<50	<50
2-Nitroaniline	<3,300	<3,300	<3,300	<3,300	<42,000	<34,300/<3,300	<50	<50
3-Nitroaniline	<3,300	<3,300	<3,300	<3,300	<42,000	<34,300/<3,300	<50	<50
4-Nitroaniline	<3,300	<3,300	<3,300	<3,300	<42,000	<34,300/<3,300	<50	<50
N-Nitrosodiphenylamine	<660	<660	<660	<660	<8,300	<6,700/<660	<10	<10
N-Nitrosodi-n-Propylamine	<660	<660	<660	<660	<8,300	<6,700/<660	<10	<10
Pentachlorophenol	<3,300	<3,300	<3,300	<3,300	<42,000	<34,300/<3,300	<50	<50
Phenanthrene	<660	<660	700J	<660	<8,300	<6,700/100J	<10	<10
Phenol	<660	<660	<660	<660	<8,300	<6,700/1,300	<10	<10
Pyrene	<660	<660	400J	<660	<8,300	<6,700/<660	<10	<10
1,2,4-Trichlorobenzene	<660	<660	<660	<660	<8,300	<6,700/<660	<10	<10
2,4,5-Trichlorophenol	100J	100J	100J	100J	<42,000	<6,700/<660	<10	<50
2,4,6-Trichlorophenol	<660	<660	<660	<660	<8,300	<6,700/<660	<10	<10

## Notes:

(1) TCL - Target Compound List.

J - Detected, but below quantitation limit; quantitation suspect.

B - Compound detected in method blank associated with this sample.

**TABLE 6**

**SUMMARY OF ORGANIC COMPOUNDS  
DETECTED IN SOIL SAMPLES**

<i>Parameter</i>	<i>No. Detections/ No. Samples</i>	<i>Maximum Concentration (ppm)</i>
<b>VOCs</b>		
Acetone	5/6	18
Carbon Disulfide	6/54	34
Carbon Tetrachloride	13/54	37
Chloroform	13/54	3
Methylene Chloride	2/54	10
Trichloroethene	7/58	5.8
Benzene	3/52	0.0024J
Toluene	3/52	0.93
Tetrachloroethene	18/58	130
<b>BNAs</b>		
Diethyl phthalate	2/6	0.2JB
2,4,5-Trichlorophenol	4/6	0.1J
Bis(2 ethyl hexyl) phthalate	3/6	1.4
Benzo(b)fluoranthene	1/6	0.3J
Benzo(k)fluoroanthene	1/6	0.3J
Chrysene	1/6	0.4J
Dibenzofuran	1/6	0.3J
Di-n-butyl phthalate	2/6	0.2J
Fluoranthene	1/6	0.3J
2-Methylnaphthalene	1/6	1J
Naphthalene	1/6	1J
Phenanthrene	1/6	0.7J
Pyrene	1/6	0.4J
Hexachloroethane	1/6	16
Hexachlorobutadiene	1/6	1J
Phenol	1/6	1.3

# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-1)

PROJECT NAME: STAUFFER

HOLE DESIGNATION: BH-1

PROJECT NO.: 2365

DATE COMPLETED: AUGUST 24, 1989

CLIENT: ICI AMERICAS

DRILLING METHOD: 3 1/4" ID HSA

LOCATION: N1146032.8 E379074.5

CRA SUPERVISOR: P. SMITH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	DEPTH CLAY	WATER LEVEL
	GROUND SURFACE	586.6					
2.5	Augers advanced to 2.0 ft. BGS thru asphalt and concrete  SILT, some clay, trace fine sand, trace brick and tile, firm, brown gray, moist, (ML)-FILL	584.6					
5.0	SILT, some clay and fine sand, stiff, brown gray and light brown mottled, wet, (ML)-NATIVE No recovery	582.6 580.6		1SS 2SS	X		5 13
7.5		578.6 578.1		3SS	X		45
10.0	SILT, trace fine sand, stiff, red brown, wet, (ML) Coarse to fine SAND, some silt and clay, trace fine sand, medium dense, red brown, moist, (SM)-TILL Same, except wet	576.6		4SS 5SS	X		12 122
12.5	END OF HOLE • 12.8 FT. BGS	573.8		6SS	X		100/ 4
15.0	NOTES: 1. At completion, water level was 9.6 ft. BGS; borehole collapsed to 9.9 ft. BGS with augers pulled. 2. At completion, borehole was grouted to ground surface. 3. 2SS and 5SS were collected for chemical analysis.						
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

FIGURE 10

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS



WATER FOUND



STATIC WATER LEVEL



## STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-2)

PROJECT NAME: STAUFFER  
 PROJECT NO.: 2365  
 CLIENT: ICI AMERICAS  
 LOCATION: N1146103.4 E379225.6

HOLE DESIGNATION: BH-2  
 DATE COMPLETED: AUGUST 24, 1989  
 DRILLING METHOD: 3 1/4" ID HSA  
 CRA SUPERVISOR: P. SMITH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	DEPTH FEET	VALUE
	GROUND SURFACE	590.6					
	Coarse to fine SAND, some fine gravel, trace silt, trace slog, firm, dark gray, dry, (SP)-FILL	588.6		1SS	X		11
2.5	SILT, some fine sand and clay, very stiff, light red brown mottled, dry, (ML)-NATIVE Same, except dry to moist	586.6		2SS	X		30
5.0		584.6		3SS	X		45
7.5	SILT, trace clay, hard, red brown, moist, (ML)	582.6		4SS	X		114
10.0	SILT, some coarse to fine sand, trace fine gravel, medium dense, red brown, moist, (SC)-TILL Same, except without fine gravel	580.6		5SS	X		22
12.5	END OF HOLE ● 12.0 FT. BGS	578.6		6SS	X		115
15.0	NOTES: 1. Borehole dry at completion. 2. At completion, borehole was grouted to ground surface. 3. 3SS was collected for chemical analysis.						
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

FIGURE 10

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS ○

WATER FOUND

Σ

STATIC WATER LEVEL

▽

## STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-1)

PROJECT NAME: STAUFFER

HOLE DESIGNATION: BH-1

PROJECT NO.: 2365

DATE COMPLETED: AUGUST 24, 1989

CLIENT: ICI AMERICAS

DRILLING METHOD: 3 1/4" ID HSA

LOCATION: N1146032.8 E379074.5

CRA SUPERVISOR: P. SMITH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUM REF	STATE	DEP CLT	VAL LUE
	GROUND SURFACE	586.6					
	Augers advanced to 2.0 ft. BGS thru asphalt and concrete						
2.5	SILT, some clay, trace fine sand, trace brick and tile, firm, brown gray, moist, (ML)-FILL	584.6		1SS	X		5
5.0	SILT, some clay and fine sand, stiff, brown gray and light brown mottled, wet, (ML)-NATIVE No recovery	582.6 580.6		2SS	X		13
7.5				3SS	X		45
	SILT, trace fine sand, stiff, red brown, wet, (ML)	578.6 578.1		4SS	X		12
10.0	Coarse to fine SAND, some silt and clay, trace fine sand, medium dense, red brown, moist, (SM)-TILL Same, except wet	576.6		5SS	X		122
12.5	END OF HOLE @ 12.8 FT. BGS	573.8		6SS	X		100/ 4
15.0	NOTES: 1. At completion, water level was 9.6 ft. BGS; borehole collapsed to 9.9 ft. BGS with augers pulled. 2. At completion, borehole was grouted to ground surface. 3. 2SS and 5SS were collected for chemical analysis.						
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

FIGURE 10

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS



WATER FOUND



STATIC WATER LEVEL





## STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-2)

PROJECT NAME: STAUFFER

HOLE DESIGNATION: BH-2

PROJECT NO.: 2365

DATE COMPLETED: AUGUST 24, 1989

CLIENT: ICI AMERICAS

DRILLING METHOD: 3 1/4" ID HSA

LOCATION: N1146103.4 E379225.6

CRA SUPERVISOR: P. SMITH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	DEPTH CLIT	VALUE
	GROUND SURFACE	590.6					
2.5	Coarse to fine SAND, some fine gravel, trace silt, trace slag, firm, dark gray, dry, (SP)-FILL	588.6		1SS	X		11
	SILT, some fine sand and clay, very stiff, light red brown mottled, dry, (ML)-NATIVE Same, except dry to moist	586.6		2SS	X		30
5.0		584.6		3SS	X		45
7.5	SILT, trace clay, hard, red brown, moist. (ML)	582.6		4SS	X		114
10.0	SILT, some coarse to fine sand, trace fine gravel, medium dense, red brown, moist, (SC)-TILL Same, except without fine gravel	580.6		5SS	X		22
12.5	END OF HOLE ● 12.0 FT. BGS	578.6		6SS	X		115
15.0	NOTES: 1. Borehole dry at completion. 2. At completion, borehole was grouted to ground surface. 3. 3SS was collected for chemical analysis.						
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

FIGURE 10

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS



WATER FOUND



STATIC WATER LEVEL



## STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-3)

PROJECT NAME: STAUFFER  
 PROJECT NO.: 2365  
 CLIENT: ICI AMERICAS  
 LOCATION: N1146220.6 E379243.7

HOLE DESIGNATION: BH-3  
 DATE COMPLETED: AUGUST 25, 1989  
 DRILLING METHOD: 3 1/4" ID HSA  
 CRA SUPERVISOR: P. SMITH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	DEPTH CL. IT	VALUE
	GROUND SURFACE	592.3					
2.5	SILT, some coarse to fine sand and gravel, trace roots, trace slag, medium dense, brown and gray, dry, (SM)-FILL	590.3 589.8		1SS	X		14
	SILT, some fine sand and clay, very stiff, brown, dry, (ML)	588.3		2SS	X		18
5.0	SILT, some clay, trace fine sand, very stiff, brown, moist, (CL)	586.3		3SS	X		22
	SILT, some fine sand and clay, very stiff, red brown and gray mottled, dry, (ML)	586.3		4SS	X		41
7.5	Same, except moist	584.1		5SS	X		26
	SILT, some fine sand, trace clay, very stiff, red brown, moist to wet, (ML)-NATIVE	582.3		6SS	X		14
10.0	Same, except some clay	579.6 578.8		6SS	X		18
12.5	SILT, some coarse to fine sand, trace clay and fine gravel, medium dense, red brown, moist, (SM)-TILL						
15.0	END OF HOLE @ 13.5 FT. BGS						
17.5	NOTES: 1. Borehole dry at completion. 2. At completion, borehole was grouted to ground surface. 3. 2SS was collected for chemical analysis.						
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

FIGURE 10

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE  
 CHEMICAL ANALYSIS   WATER FOUND X STATIC WATER LEVEL ▽

# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-4)

PROJECT NAME: STAUFFER  
 PROJECT NO.: 2365  
 CLIENT: ICI AMERICAS  
 LOCATION: N1146310.9 E378266.4

HOLE DESIGNATION: BH-4  
 DATE COMPLETED: AUGUST 25, 1989  
 DRILLING METHOD: 3 1/4" ID HSA  
 CRA SUPERVISOR: P. SMITH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	DEPTH CLAY	VALUE
	GROUND SURFACE	591.8					
2.5	Augers advanced to 1.0 ft. through asphalt and stone CLAY, some silt, stiff, red brown, dry to moist, (CL)-NATIVE	590.8		1SS	X		14
5.0	SILT, some clay, very stiff, light red brown mottled, dry, (CL)	588.8		2SS	X		20
7.5	SILT, some fine sand, trace clay, hard, red brown, moist to wet, (ML) Same, except very stiff	586.8		3SS	X		32
10.0		584.8		4SS	X		19
12.5	SILT, some coarse to fine sand and clay, medium dense, red brown, moist, (SM)-TILL Same, except trace coarse to fine gravel	581.8		5SS	X		20
12.5	END OF HOLE @ 12.3 FT. BGS	580.8 579.5		6SS	X		114/ 9
15.0	NOTES: 1. At completion, borehole was grouted to ground surface. 2. 1SS was collected for chemical analysis.						
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

FIGURE 10

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE  
 CHEMICAL ANALYSIS ○ WATER FOUND ∇ STATIC WATER LEVEL ▼

## STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-5)

PROJECT NAME: STAUFFER

HOLE DESIGNATION: BH-5

PROJECT NO.: 2365

DATE COMPLETED: AUGUST 28, 1989

CLIENT: ICI AMERICAS

DRILLING METHOD: 3 1/4" ID HSA

LOCATION: N1146216.6 E379450.5

CRA SUPERVISOR: P. SMITH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	DEPTH	VALUE
	GROUND SURFACE	594.7					
2.5	Coarse to fine SAND, some silt, trace wood, slag, cement, medium dense, gray brown, dry, (SM)-FILL	592.7		1SS	X		17
	SLAG, some silt and sand, trace brick, medium dense, red brown to black, moist, (SM)	590.7		2SS	X		28
5.0	SILT, some clay, trace slag, trace white crystalline material, stiff, dark gray brown moist, (ML)	588.7		3SS	X		12
7.5	SILT, some clay, trace coarse sand and fine gravel, medium dense, red brown mottled, moist, (SC)-NATIVE	584.7		4SS	X		19
10.0	SILT, some coarse to fine sand and gravel, trace clay, medium dense, red brown, moist to dry, (SM)	582.7		5SS	X		15
12.5	Same, except very dense	581.4		6SS	X		27
15.0	Fine SAND, some silt, trace clay, very dense, gray brown, moist to wet, (SW) No recovery	580.7		7SS	X		52
	END OF HOLE ● 14.4 FT. BGS	580.3		8SS	X		60/5
17.5	NOTES: 1. Borehole dry at completion. 2. At completion, borehole was grouted to ground surface. 3. 2SS was collected for chemical analysis.						
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

FIGURE 10

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS



WATER FOUND



STATIC WATER LEVEL



## STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-6)

PROJECT NAME: STAUFFER  
 PROJECT NO.: 2365  
 CLIENT: ICI AMERICAS  
 LOCATION: N1146075.4 E379458.6

HOLE DESIGNATION: BH-6  
 DATE COMPLETED: AUGUST 28, 1989  
 DRILLING METHOD: 3 1/4" ID HSA  
 CRA SUPERVISOR: P. SMITH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	DEPTH CL. IT	W VALUE
	GROUND SURFACE	595.2					
2.5	Coarse to fine SAND, some silt, trace coarse to fine gravel, brick, vegetation, dense, brown and gray, dry to moist, (SM)-FILL	593.2		1SS	X		30
	Fine SAND, some black tar substance, medium dense, brown to black, moist, (SM)	591.2		2SS	X		22
5.0	WOOD, some coarse to fine sand, extremely dense, brown gray, moist	589.2		3SS	X		100/ 5
7.5	SILT, some coarse to fine sand, trace clay and fine gravel, dense, gray red brown, moist, (SM)-NATIVE, TILL Same, except medium dense	587.2		4SS	X		34
10.0	No recovery	585.2		5SS	X		12
12.5	END OF HOLE @ 11.7 FT. BGS	583.5		6SS	X		7
15.0	NOTES: 1. Borehole dry at completion. 2. At completion, borehole was grouted to ground surface. 3. 2SS collected for chemical analysis.						
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

FIGURE 10

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE  
 CHEMICAL ANALYSIS   WATER FOUND  STATIC WATER LEVEL

# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-7)

PROJECT NAME: STAUFFER  
 PROJECT NO.: 2365  
 CLIENT: ICI AMERICAS  
 LOCATION: N1145950.9 E379406.3

HOLE DESIGNATION: BH-7  
 DATE COMPLETED: AUGUST 28, 1989  
 DRILLING METHOD: 3 1/4" ID HSA  
 CRA SUPERVISOR: P. SMITH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	DEPTH CLAY	VALUE
	GROUND SURFACE	595.6					
2.5	SILT, some fine gravel, very dense, light brown, dry (GM)-FILL No recovery	593.6		1SS	X		50
		591.6		2SS	X		50/1
5.0	SILT, some fine sand, trace clay, trace root structures, very stiff, mottled red brown on light gray, dry, (ML)-NATIVE	589.6		3SS	X		21
7.5	Same, without root structures, hard, red brown	587.6		4SS	X		95/10
	SILT, trace coarse sand, very dense, red brown, moist, (SM)-TILL	586.3		5SS	X		53
10.0	SILT, some coarse to fine gravel, trace clay, very dense, red brown, moist, (GM)	584.3		6SS	X		111/9
12.5	END OF HOLE • 11.3 FT. BGS						
15.0	NOTES: 1. Borehole dry at completion. 2. At completion, borehole was grouted to ground surface. 3. 5SS collected for chemical analysis. 4. Stratigraphy from 0.0 to 4.0 ft. BGS taken from initial borehole 3 ft. south. Borehole moved due to obstruction.						
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

FIGURE 10

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE  
 CHEMICAL ANALYSIS ○ WATER FOUND ∇ STATIC WATER LEVEL ▼

## STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-8)

PROJECT NAME: STAUFFER

HOLE DESIGNATION: BH-8

PROJECT NO.: 2365

DATE COMPLETED: AUGUST 28, 1989

CLIENT: ICI AMERICAS

DRILLING METHOD: 3 1/4" ID HSA

LOCATION: N1146106.0 E378598.6

CRA SUPERVISOR: P. SMITH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				DEPT	STATE	DEPTH	VALUE
	GROUND SURFACE	597.3					
	GRAVEL, some brick and cinders, very dense, gray red and black, dry, (GP)-FILL	595.3		1SS	X		76
2.5	SILT, some fine sand, trace clay, dense, brown, dry to moist, (ML)-NATIVE Same, except brown to red brown	593.3		2SS	X		41
5.0	Some, except extremely dense with slight chemical odor	591.3		3SS	X		35
7.5	Some, except very dense	589.3		4SS	X		98/ 9
10.0	SILT, some fine sand with interbedded clayey silt, trace fine gravel, very dense, red brown, moist to wet, (ML)-TILL Same, with some coarse to fine sand	588.3		5SS	X		53
12.5	Same, except extremely dense, wet	587.3 585.3		6SS 7SS	X X		56 100/ 4
	END OF HOLE ● 12.8 FT. BGS	583.3					
15.0	NOTES: 1. Borehole dry at completion. 2. At completion, borehole was grouted to ground surface. 3. 4SS and 7SS collected for chemical analysis.						
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

FIGURE 10

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS



WATER FOUND



STATIC WATER LEVEL



## STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-8)

PROJECT NAME: STAUFFER

HOLE DESIGNATION: BH-9

PROJECT NO.: 2365

DATE COMPLETED: AUGUST 29, 1989

CLIENT: ICI AMERICAS

DRILLING METHOD: 3 1/4" ID HSA

LOCATION: N1146215.9 E379617.2

CRA SUPERVISOR: P. SMITH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUM R	STATE	DISP CL-T	VAL UE
	GROUND SURFACE	597.4					
2.5	Coarse to fine gravel, some coarse to fine sand and silt, trace slag, dense, gray to brown, dry, (GM)-FILL	595.4		1SS	X		46
	FIBER, some coarse to fine sand, medium dense white and brown, dry	593.4		2SS	X		16
5.0	SILT, some clay, trace fine sand, hard, mottled red brown and gray, moist, (CL) Same, with slight chemical odor	591.4		3SS	X		69
7.5				4SS	X		34
10.0	SILT, some fine sand, interbedded with clayey silt, very stiff, red brown, moist, (ML)	587.4		5SS	X		38
		585.9		6SS	X		24
12.5	Coarse to fine SAND, medium dense, red brown wet, (GW)	585.7		7SS	X		60
	Coarse to fine SAND, some clay and silt, medium dense, red brown, moist to wet, (SC)- TILL	585.4		8SS	X		40/6
15.0	SILT, some coarse to fine gravel, trace coarse to fine sand and clay, very dense, gray brown, moist to wet, (GM)	582.4					
17.5	END OF HOLE ● 15 FT. BGS						
20.0	NOTES: 1. At completion, a 2.0" ID observation well was installed to 13.0 ft. BGS. 2. Stratigraphy from 6.0 to 8.0 ft. BGS taken from adjacent borehole. 3. 5SS and 8SS collected for chemical analysis. 4. At completion, water level was 9.4 ft. BGS.						
22.5							
25.0							
27.5							
30.0							
32.5							

FIGURE 10

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

WATER FOUND



STATIC WATER LEVEL





## STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-10)

PROJECT NAME: STAUFFER  
 PROJECT NO.: 2365  
 CLIENT: ICI AMERICAS  
 LOCATION: N1146315.2 E379619.8

HOLE DESIGNATION: BH-10  
 DATE COMPLETED: AUGUST 30, 1989  
 DRILLING METHOD: 3 1/4" ID HSA  
 CRA SUPERVISOR: P. SMITH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				DEPTH IN FEET	STATE	DEPTH IN FEET	W VALUE
	GROUND SURFACE	597.4					
2.5	Coarse to fine GRAVEL, trace coarse to fine sand, extremely dense, gray, dry, (GW)-FILL SILT, some fine sand, extremely dense, red brown, dry, (ML)-NATIVE No recovery	596.4		1SS	X		160
	Same, except dense, moist	595.4 593.4		2SS	X		82
5.0		591.4		3SS	X		38
7.5	SILT, coarse to fine sand, trace clay, extremely dense, red brown, moist, (SM)-TILL Same, except some coarse to fine gravel, dense	589.4		4SS	X		136
10.0	Same, except very dense, moist to wet	587.4		5SS	X		42
12.5	SILT, some clay, trace coarse sand, red brown, moist	584.9 584.4		6SS	X		66
	SILT, some fine sand, red brown, moist	583.7		7SS	X		78
15.0	SILT, some coarse to fine sand, trace clay, red brown, moist	583.4 582.6		8SS	X		50/ 4
17.5	SILT, some coarse to fine sand, trace coarse to fine gravel and clay, gray brown, moist to wet						
	END OF HOLE @ 14.8 FT. BGS						
20.0	NOTES: 1. Borehole dry at completion. 2. At completion, borehole was grouted to ground surface. 3. 4SS collected for chemical analysis.						
22.5							
25.0							
27.5							
30.0							
32.5							

FIGURE 10

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE  
 CHEMICAL ANALYSIS   WATER FOUND  STATIC WATER LEVEL

# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-11)

PROJECT NAME: STAUFFER  
 PROJECT NO.: 2365  
 CLIENT: ICI AMERICAS  
 LOCATION: N1146312.2 E379832.1

HOLE DESIGNATION: BH-11  
 DATE COMPLETED: AUGUST 31, 1989  
 DRILLING METHOD: 3 1/4" ID HSA  
 CRA SUPERVISOR: P. SMITH


DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	DEPTH CLAY	WATER LEVEL
	GROUND SURFACE	601.7					
2.5	Augers advanced through asphalt and cement to 2.0 ft. BGS SILT, some clay, trace fine sand, hard, brown mottled, dry to moist, (ML)-FILL	599.7	 <p>6.5" BOREHOLE CEMENT/BENTONITE GROUT</p>	1SS	X		31
5.0	SILT, some fine sand, trace clay with interbedded fine sand, very dense, red brown, dry to moist, (SM)-NATIVE	597.7		2SS	X		63
7.5	SILT and CLAY, some coarse to fine sand, trace fine gravel, very dense, red brown, moist, (SC)-TILL	594.7 593.7		3SS	X		63
10.0	SILT, some coarse to fine sand, trace coarse to fine gravel with interbedded clayey silt, extremely dense, red brown, moist, (SM) Same, except dry to moist without clayey silt lenses	591.7 591.4		4SS	X		133
12.5	END OF HOLE @ 10.3 FT. BGS			5SS	X		100/ 3
15.0	NOTES: 1. Borehole dry at completion. 2. At completion, borehole was grouted to ground surface. 3. 3SS collected for chemical analysis.						
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

FIGURE 10

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE  
 CHEMICAL ANALYSIS   WATER FOUND  STATIC WATER LEVEL

## STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-12)

PROJECT NAME: STAUFFER  
 PROJECT NO.: 2365  
 CLIENT: ICI AMERICAS  
 LOCATION: N1146197.6 E379818.9

HOLE DESIGNATION: BH-12  
 DATE COMPLETED: AUGUST 31, 1989  
 DRILLING METHOD: 3 1/4" ID HSA  
 CRA SUPERVISOR: P. SMITH


DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	DEPTH CL. IT	VALUE
	GROUND SURFACE	600.2					
2.5	Fine SAND, some silt and fine gravel, medium dense, gray, dry, (SM)-FILL ----- Yellow crystals, possible sulphur	598.6 598.2	 <p style="margin-left: 20px;">← 6.5" BOREHOLE</p> <p style="margin-left: 20px;">← CEMENT/BENTONITE GROUT</p>	1SS	X		10
5.0	SILT, some clay and fine sand, very stiff, red brown and gray mottled, dry, (CL)-NATIVE Same, except dry to moist	596.2		2SS	X		24
7.5	SILT, some coarse to fine sand, trace coarse to fine gravel, extremely dense, red brown, moist to wet, (SM)-TILL	594.2		3SS	X		29
	SILT, some coarse to fine sand, trace coarse to fine gravel, extremely dense, red brown, moist, (SM)-TILL	592.2		4SS	X		100/ 5
10.0	SILT, some coarse to fine gravel and sand, extremely dense, red brown, moist, (GM)	592.2		5SS	X		100/ 5
10.0	END OF HOLE @ 10.0 FT. BGS	590.2					
12.5	NOTES: 1. Borehole dry at completion. 2. At completion, borehole was grouted to ground surface. 3. 5SS collected for chemical analysis. 4. Augers advanced to refusal						
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

FIGURE 10

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE  
 CHEMICAL ANALYSIS ○ WATER FOUND ∇ STATIC WATER LEVEL ▼

# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-13)

PROJECT NAME: STAUFFER

HOLE DESIGNATION: BH-13

PROJECT NO.: 2365

DATE COMPLETED: AUGUST 31, 1989

CLIENT: ICI AMERICAS

DRILLING METHOD: 3 1/4" ID HSA

LOCATION: N1146078.7 E379822.9

CRA SUPERVISOR: P. SMITH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	DEPTH CLIT	VALUE
	GROUND SURFACE	600.6					
	Coarse to fine SAND, some brick, very dense, gray and red, dry, (SM)-FILL	598.6		1SS	X		77
2.5	Coarse to fine SAND, some silt, trace coarse to fine gravel and brick, dense, gray, moist (SM)	596.6		2SS	X		39
5.0	SILT, some coarse to fine sand and clay, dark gray and brown, moist, (SC) Same, except extremely dense with strong chemical odor	595.1 594.6 594.1		3SS	X	●	14
7.5	Fine SAND, some silt, extremely dense, brown, NATIVE	593.6		4SS	X		93
	SILT, some clay, hard, brown, strong chemical odor			5SS	X		20
10.0	SILT, some coarse to fine sand, trace clay and fine gravel, medium dense, red brown, moist, strong chemical odor, (SM)-TILL Same, except very dense	591.6 590.6		6SS	X		70
12.5	Coarse to fine GRAVEL, some fractured bedrock, gray, moist, (GP) END OF HOLE ● 11.0 FT. BGS	589.6					
15.0	NOTES: 1. Borehole dry at completion. 2. At completion, borehole was grouted to ground surface. 3. 3SS and 4SS were collected with a 3" split spoon for chemical analysis.						
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

FIGURE 10

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE  
 CHEMICAL ANALYSIS ○ WATER FOUND ∇ STATIC WATER LEVEL ▼

# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-14)

PROJECT NAME: STAUFFER  
 PROJECT NO.: 2365  
 CLIENT: ICI AMERICAS  
 LOCATION: N1146291.9 E380044.8

HOLE DESIGNATION: BH-14  
 DATE COMPLETED: AUGUST 31, 1989  
 DRILLING METHOD: 3 1/4" ID HSA  
 CRA SUPERVISOR: P. SMITH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	DEPTH CLAY	VALUE
	GROUND SURFACE	605.2					
2.5	SILT, some fine sand, stiff, brown, dry to moist, (ML)-NATIVE Same, except hard	604.2 602.2		1SS	X		14
5.0				2SS	X		54
7.5	Same, except trace clay and fine gravel, (CL)	598.2		3SS	X		37
10.0	Fine SAND, some coarse to fine gravel, trace silt and clay, extremely dense, red brown, moist, (SW)-TILL	595.7		4SS	X		80/ 11
12.5				5SS	X		150
15.0	END OF HOLE @ 13.5 FT. BGS	591.7		6SS	X		100/ 4
17.5	NOTES: 1. Borehole dry at completion. 2. At completion, borehole was grouted to ground surface. 3. 4SS collected for chemical analysis.						
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

FIGURE 10

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE  
 CHEMICAL ANALYSIS   WATER FOUND  STATIC WATER LEVEL

# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-15)

PROJECT NAME: STAUFFER  
 PROJECT NO.: 2365  
 CLIENT: ICI AMERICAS  
 LOCATION: N1146225.4 E380004.6

HOLE DESIGNATION: BH-15  
 DATE COMPLETED: SEPTEMBER 1, 1989  
 DRILLING METHOD: 3 1/4" ID HSA  
 CRA SUPERVISOR: P. SMITH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	DEPTH CL-IT	VALUE
	GROUND SURFACE	602.0					
2.5	Augers advanced from 0.0 to 2.5 ft. BGS through brick, gravel and rubble	599.5					
	CINDERS, some coarse to fine sand and wood, dense, black, moist, (SM)-FILL	598.2		(1SS)	X		30
5.0	SILT, some fine sand and clay, very stiff, red brown, moist, (ML)-NATIVE Same, except hard, mottled, moist to wet	597.5		2SS	X		46
	Medium to fine SAND, some silt and clay, trace gravel, extremely dense, red brown, moist to wet, (SM)-TILL	595.5		3SS	X		100/2
7.5	END OF HOLE ● 7.9 FT. BGS	594.1					
10.0	NOTES: 1. At completion, borehole was grouted to ground surface. 2. 1SS collected for chemical analysis. 3. Borehole dry at completion.						
12.5							
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

FIGURE 10

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS ○ WATER FOUND ∑ STATIC WATER LEVEL ▼

## STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-16)

PROJECT NAME: STAUFFER  
 PROJECT NO.: 2365  
 CLIENT: ICI AMERICAS  
 LOCATION: N1146076.7 E380058.9

HOLE DESIGNATION: BH-16  
 DATE COMPLETED: SEPTEMBER 1, 1989  
 DRILLING METHOD: 3 1/4" ID HSA  
 CRA SUPERVISOR: P. SMITH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				DEPTH IN FEET	STATE	DE- SCRIPT- ION	W- VALUE
	GROUND SURFACE	601.8					
	SILT, some fine sand, trace ash and slag, hard, brown mottled, dry, (ML)-FILL	600.3		1SS	X		30
2.5	Coarse to fine GRAVEL, some glass and porcelain, hard, light gray, dry, (ML)	599.8		2SS	X		38
5.0	SILT, some fine sand, trace black dessication, cracks and vegetation, hard, light gray and red brown mottled, dry, (ML)	597.8		3SS	X		33
7.5	SILT, some clay, trace clay and vegetation with interbedded fine sand, hard, red brown, (CL)-NATIVE	596.3		4SS	X		79
10.0	Medium to fine SAND, some silt and clay and fine gravel with interbedded silty clay, very dense, red brown, moist, (SC)-TILL	593.0					
12.5	END OF HOLE • 8.8 FT. BGS						
15.0	NOTES: 1. Borehole dry at completion.						
17.5	2. At completion, borehole was grouted to ground surface.						
20.0	3. 3SS collected for chemical analysis.						
22.5							
25.0							
27.5							
30.0							
32.5							

FIGURE 10

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS ○
 WATER FOUND 
 STATIC WATER LEVEL

# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-17)

PROJECT NAME: STAUFFER

HOLE DESIGNATION: BH-17

PROJECT NO.: 2365

DATE COMPLETED: SEPTEMBER 5, 1989

CLIENT: ICI AMERICAS

DRILLING METHOD: 3 1/4" ID HSA

LOCATION: N1146300.6 E380195.7

CRA SUPERVISOR: P. SMITH

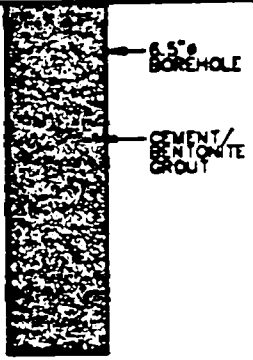
DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				DEPTH	STATE	DEP CLIT	W VALUE
	GROUND SURFACE	607.1					
2.5	Augers advanced to 3.0 ft. BGS. through asphalt, stone and slag		 <p style="font-size: small;">6.5" BOREHOLE CEMENT/BENTONITE GROUT</p>				
5.0	SILT, some fine sand, trace clay and fine gravel, medium dense, red brown to brown mottled, dry to moist, (SM)-NATIVE. TILL Same, with interbedded silty fine sand	604.1 602.1		1SS <u>2SS</u>	X X		22 31
7.5	Medium to fine SAND, some silt, trace coarse to fine gravel and clay, extremely dense, red brown, moist, (SM)	600.1		3SS	X		50/ 4
10.0	END OF HOLE ● 8.7 FT. BGS	598.4					
12.5	NOTES: 1. Borehole dry at completion. 2. At completion, borehole was grouted to ground surface. 3. 2SS collected for chemical analysis.						
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

FIGURE 10

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE  
 CHEMICAL ANALYSIS ○ WATER FOUND ∇ STATIC WATER LEVEL ▼



# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-16)

PROJECT NAME: STAUFFER  
 PROJECT NO.: 2365  
 CLIENT: ICI AMERICAS  
 LOCATION: N1146301.5 E380359.6

HOLE DESIGNATION: BH-18  
 DATE COMPLETED: SEPTEMBER 5, 1989  
 DRILLING METHOD: 3 1/4" ID HSA  
 CRA SUPERVISOR: P. SMITH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUM BY DATE	STATE	DEP CL ITY	VAL UE
	GROUND SURFACE	608.9					
2.5	Augers advanced to 1.0 ft. BGS, through asphalt and gravel CLAY, some silt and sand, very stiff, light brown to gray mottled, dry to moist, (CL)-FILL	607.9		1SS	X		17
5.0	SILT, some sand and clay, trace vegetation, very stiff, light to dark gray mottled, rust stained, dry, (ML) Same, except hard	605.9		2SS	X		25
7.5	Fine SAND, some silt, very dense, light brown, dry, (SM)-NATIVE	603.9		3SS	X		50
	Fine SAND, some silt and clay, trace vegetation, trace fine gravel, very stiff, light to dark brown, dry, (ML)	602.9		4SS	X		16
	END OF HOLE ● 8.7 FT. BGS	601.9					
10.0	NOTES: 1. Borehole dry at completion. 2. At completion, borehole was grouted to ground surface. 3. 4SS collected for chemical analysis.	600.2					
12.5							
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

FIGURE 10

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE  
 CHEMICAL ANALYSIS ○ WATER FOUND ∇ STATIC WATER LEVEL ▼

## STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-10)

PROJECT NAME: STAUFFER

HOLE DESIGNATION: BH-19

PROJECT NO.: 2365

DATE COMPLETED: SEPTEMBER 5, 1989

CLIENT: ICI AMERICAS

DRILLING METHOD: 3 1/4" ID HSA

LOCATION: N1146325.3 E380588.2

CRA SUPERVISOR: P. SMITH

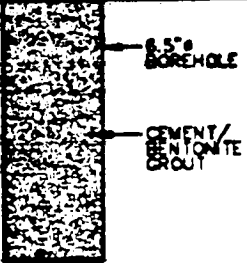
DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				RIEDEL NUMBER	STATE	US EPL IT	N V A L U E
	GROUND SURFACE	611.0					
2.5	Fine SAND, some silt, trace fine gravel and vegetation, light brown to brown, dry, (SM)-NATIVE	609.4		1SS	X		18
	SILT, some clay and fine sand, brown, dry, (ML)	609.0		2SS	X		51
5.0	SILT, some clay, trace vegetation, dry, brown and light gray mottled, dry, (ML)	607.6		3SS	X		84
	Fine SAND, some silt, trace fine gravel, red brown, dry, (SM)-TILL						
7.5	Same, except moist END OF HOLE ● 6.7 FT. BGS	604.3 604.3					
10.0	NOTES: 1. Borehole dry at completion. 2. At completion, borehole was grouted to ground surface. 3. 3SS collected for chemical analysis.						
12.5							
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

FIGURE 10

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS



WATER FOUND



STATIC WATER LEVEL



# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-20)

PROJECT NAME: STAUFFER  
 PROJECT NO.: 2365  
 CLIENT: ICI AMERICAS  
 LOCATION: N1146083.1 E380184.6

HOLE DESIGNATION: BH-20  
 DATE COMPLETED: SEPTEMBER 6, 1989  
 DRILLING METHOD: 3 1/4" ID HSA  
 CRA SUPERVISOR: P. SMITH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	DATE	DEPTH CLY	VALUE
	GROUND SURFACE	605.9					
2.5	Augers advanced to 1.5 ft. BGS. through cement obstruction Coarse to fine GRAVEL, some silt and sand, medium dense, brown and gray, dry to moist, (GM)-FILL No recovery	604.4		1SS	X		12
5.0	Same, except gray, moist Gray SAND and GRAVEL, dry	602.4 600.9		2SS	X		4
7.5	Coarse to fine SAND, some silt, trace clay, red brown, dry to moist, (SM)-NATIVE. TILL END OF HOLE ● 7.3 FT. BGS	599.9 598.7 598.6		(3SS)	X		15
				(4SS)	X		100/4
10.0	NOTES: 1. Borehole dry at completion. 2. At completion, borehole was grouted to ground surface. 3. 3SS and 4SS collected for chemical analysis.						
12.5							
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

FIGURE 10

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE  
 CHEMICAL ANALYSIS   WATER FOUND  STATIC WATER LEVEL

# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-21)

PROJECT NAME: STAUFFER  
 PROJECT NO.: 2365  
 CLIENT: ICI AMERICAS  
 LOCATION: N1146075.6 E380363.5

HOLE DESIGNATION: BH-21  
 DATE COMPLETED: SEPTEMBER 6, 1989  
 DRILLING METHOD: 3 1/4" ID HSA  
 CRA SUPERVISOR: P. SMITH

DEPTH ft. BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft. AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	DEPTH CL. Y	VALUE
	GROUND SURFACE	610.3					
2.5	SILT, some medium to fine sand, trace vegetation, loose, brown, dry, (SM)-FILL Coarse to fine SAND, some fine gravel, loose, gray, dry, (SP) No recovery	609.3		1SS	X		8
		608.3		2SS	X		16
5.0	Medium to fine SAND, some silt and clay, red brown, dry, (SC)-NATIVE, TILL Same, except trace fine gravel, moist	606.3		3SS	X		19
7.5		604.3		4SS	X		116
10.0		600.1		5SS	X		100/ 3
	END OF HOLE @ 10.2 FT. BGS						
12.5	NOTES: 1. Borehole dry at completion. 2. At completion, borehole was grouted to ground surface. 3. 3SS collected for chemical analysis.						
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

FIGURE 10

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE  
 CHEMICAL ANALYSIS   WATER FOUND  STATIC WATER LEVEL

## STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-24)

PROJECT NAME: STAUFFER

HOLE DESIGNATION: BH-24

PROJECT NO.: 2365

DATE COMPLETED: SEPTEMBER 7, 1989

CLIENT: ICI AMERICAS

DRILLING METHOD: 3 1/4" ID HSA

LOCATION: N1145861.2 E380338.7

CRA SUPERVISOR: S. SURPRENANT

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	DEPTH CLAY	VALUE
	GROUND SURFACE	610.0					
2.5	Coarse to fine GRAVEL, some silt, trace brick and slag, medium dense, gray brown, dry. (GM)-FILL	608.0		1SS	X		11
	SILT, some clay, stiff, gray brown, dry. (ML)-NATIVE	606.0		2SS	X		15
5.0	Same, except very stiff, red brown, dry to moist	604.0		(3SS)	X		30
	Same, except trace clay	603.0		(4SS)	X		31
7.5	Fine SAND, some silt, trace clay and fine gravel, medium dense, red brown, dry to moist	600.2		5SS	X		33
10.0	END OF HOLE • 9.8 FT. BGS						
12.5	NOTES: 1. At completion, borehole was grouted to ground surface. 2. 3SS and 4SS collected for chemical analysis. 3. Borehole dry at completion.						
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

FIGURE 10

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS



WATER FOUND



STATIC WATER LEVEL



## STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-26)

PROJECT NAME: STAUFFER

HOLE DESIGNATION: BH-26

PROJECT NO.: 2365

DATE COMPLETED: SEPTEMBER 8, 1989

CLIENT: ICI AMERICAS

DRILLING METHOD: 3 1/4" ID HSA

LOCATION: N1145874.9 E380176.7

CRA SUPERVISOR: P. SMITH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft BGS	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	DEPTH CLAY	W VALUE
	GROUND SURFACE	608.2					
2.5	BRICK, some coarse to fine sand and gravel, trace cinders, dense, dark gray and orange, dry, (GM)-FILL			1SS	X		41
	No recovery	604.2		2SS	X		33
5.0		602.2		3SS	X		32
7.5	SILT, some fine sand and clay, hard, brown, dry to moist, (ML)-NATIVE	600.2		4SS	X		41
	No recovery	599.6		5SS	X		100/0
	END OF HOLE ● 8.6 FT. BGS						
10.0	NOTES: 1. At completion, borehole was grouted to ground surface.						
	2. 4SS collected for chemical analysis.						
	3. Borehole dry at completion.						
12.5							
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

FIGURE 10

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS



WATER FOUND



STATIC WATER LEVEL



# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-27)

PROJECT NAME: STAUFFER

HOLE DESIGNATION: BH-27A

PROJECT NO.: 2365

DATE COMPLETED: SEPTEMBER 8, 1989

CLIENT: ICI AMERICAS

DRILLING METHOD: 3 1/4" ID HSA

LOCATION: N1145866.1 E380031.8

CRA SUPERVISOR: S. SURPRENANT

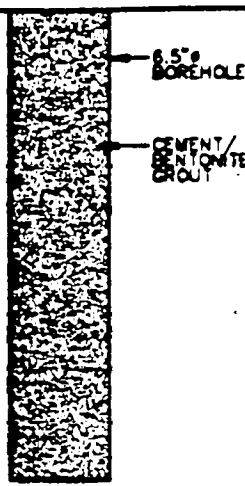
DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUM REF	STA TE	DEP CL IT	W V A L U E
	GROUND SURFACE	606.2					
2.5	Augered to 4.0 ft BGS (refer to BH-27 for stratigraphy in upper 4 ft of column)		 <p style="font-size: small;">3.5" BOREHOLE CEMENT/BENTONITE GROUT</p>				
5.0	SILT, some coarse to fine sand and clay, trace cinders, loose, red brown, moist, (SM)-fill	602.2		1SS	X		6
7.5				2SS	X		3
	Fine SAND, some silt, trace fine gravel, very loose, red brown, moist, (SM)	598.4					
		597.4		3SS	X		4
10.0	SILT, trace glass and cinders, soft, black, moist, (ML)	596.4					
		596.2		4SS	X		24
12.5	Fine SAND, some silt, trace fine gravel, loose, red brown, moist, (SM)-NATIVE Same, with trace clay and coarse gravel, medium dense No recovery	594.2		5SS	X		100/1
		594.1					
	END OF HOLE @ 12.1 FT. BGS						
15.0	NOTES: 1. At completion, borehole was grouted to ground surface.						
	2. 3SS collected for chemical analysis.						
17.5	3. BH-27A is a continuation of BH-27.						
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

FIGURE 10

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS



WATER FOUND



STATIC WATER LEVEL



## STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-28)

PROJECT NAME: STAUFFER  
 PROJECT NO.: 2365  
 CLIENT: ICI AMERICAS  
 LOCATION: N1145758.6 E380127.1

HOLE DESIGNATION: BH-28  
 DATE COMPLETED: SEPTEMBER 8, 1989  
 DRILLING METHOD: 3 1/4" ID HSA  
 CRA SUPERVISOR: P. SMITH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	DEPTH CLIT	W VALUE
	GROUND SURFACE	605.9					
2.5	Coarse to fine GRAVEL, some sand, slag and brick, dense, gray to black, dry, (GM)-FILL Same, except medium dense	603.9		1SS	X		43
	Same, except extremely dense, moist	602.4		2SS	X		27
3.0	Same, except loose, moist to wet	600.9		3SS	X		50/4
	Same, with some metal slag	599.4		4SS	X		5
7.5	Same, without metal slag, wet	597.9		5SS	X		7
		596.5		6SS	X		50/4
10.0	END OF HOLE ● 9.4 FT. BGS NOTES: 1. At completion, borehole was grouted to ground surface. 2. No samples collected for chemical analysis. 3. Borehole dry at completion.						
12.5							
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

FIGURE 10

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

○ CHEMICAL ANALYSIS      ○ WATER FOUND      ∇ STATIC WATER LEVEL      ∇



# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-28)

PROJECT NAME: STAUFFER

HOLE DESIGNATION: BH-28A

PROJECT NO.: 2365

DATE COMPLETED: SEPTEMBER 11, 1989

CLIENT: ICI AMERICAS

DRILLING METHOD: 3 1/4" ID HSA

LOCATION: N1145758.6 E380098.6

CRA SUPERVISOR: P. SMITH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	DEP CL ITY	W V A L U E
	GROUND SURFACE	605.9					
2.5	SILT, trace clay, slag and coarse to fine gravel, very stiff, brown, dry to moist. (ML)-FILL			1SS	X		19
	Same, with some clay, stiff	602.4		2SS	X		23
5.0				3SS	X		13
	SILT, some medium to fine sand and clay, trace fine gravel, loose, brown, moist to wet. (SM)-TILL	600.1		4SS	X		5
7.5	Same, except very dense No recovery	598.9		5SS	X		59
		596.9		6SS	X		50/0
10.0	END OF HOLE ● 9.3 FT. BGS	596.6					
12.5	NOTES: 1. At completion, borehole was grouted to ground surface. 2. 4SS collected for chemical analysis. 3. Borehole dry at completion.						
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

FIGURE 10

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS



WATER FOUND



STATIC WATER LEVEL



# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-30)

PROJECT NAME: STAUFFER

HOLE DESIGNATION: BH-29

PROJECT NO.: 2365

DATE COMPLETED: SEPTEMBER 11, 1989

CLIENT: ICI AMERICAS

DRILLING METHOD: 3 1/4" ID HSA

LOCATION: N1145758.6 E379812.4

CRA SUPERVISOR: P. SMITH

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft BGS	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	DEPTH CLIT	VALUE
	GROUND SURFACE	602.9					
2.5	Coarse to fine SAND, some silt, trace coarse to fine gravel, trace brick and slag, extremely dense, gray and brown, dry, (SM)-FILL	600.9		1SS	X		77
	SILT, some clay-like compound, trace clay, hard, gray to black, moist	599.1		2SS	X		32
5.0	CLAY, some silt, trace fine sand, very stiff, mottled brown and gray, moist, (CL)-NATIVE	597.9		3SS	X	●	26
	SILT, some clay and fine sand, very stiff, red brown, moist, (ML)	595.9		4SS	X		30
7.5	Fine SAND, some silt, trace clay and fine gravel, extremely dense, red brown, moist, (SM)-TILL	593.4		5SS	X		100/ 4
10.0	Same, with trace coarse to fine gravel	591.4		6SS	X		77
12.5	Same, except dense	589.3		7SS	X		49
15.0	END OF HOLE ● 13.6 FT. BGS						
17.5	NOTES: 1. At completion, borehole was grouted to ground surface. 2. 3SS collected for chemical analysis and split with State DEC.						
20.0	3. 3SS and 4SS sampled with 3-inch split spoon. 4. Borehole dry at completion.						
22.5							
25.0							
27.5							
30.0							
32.5							

FIGURE 10

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS ○

WATER FOUND

∇

STATIC WATER LEVEL

∇

## STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-31)

PROJECT NAME: STAUFFER  
 PROJECT NO.: 2365  
 CLIENT: ICI AMERICAS  
 LOCATION: N1145747.8 E381047.6

HOLE DESIGNATION: BH-30  
 DATE COMPLETED: NOVEMBER 15, 1989  
 DRILLING METHOD: 4 1/4" ID HSA  
 CRA SUPERVISOR: S. SURPRENANT

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	OS CL ITY	VALUE
	GROUND SURFACE	620.0					
	SILT, some coarse to fine gravel, trace fine sand, very loose, red brown, moist, (GM)-FIL	618.0		1SS	X		3
2.5	Fine SAND, trace coarse to fine gravel, silt and clay, medium dense, red brown, moist, (SP) Same, except dense, dry	616.0		2SS	X		16
5.0	Some, with trace slag, medium dense	614.0		3SS	X		42
7.5		612.0		4SS	X		13
10.0	SILT and fine SAND, some slag, trace coarse to fine gravel, loose, black and brown, moist, (SM)	610.0		5SS	X		7
12.5	Fine SAND, some slag and coarse to fine gravel, trace silt, clay and cloth, medium dense, mottled black and brown, dry to moist (SP) Same, without slag and cloth, loose, yellow	608.0		6SS	X		10
15.0	Fine SAND, trace coarse to fine gravel, very loose, gray, moist, (SP)	606.0		7SS	X		5
17.5	Fine SAND, some silt, trace coarse to fine gravel, loose, red brown, wet, (SM)	604.0		8SS	X		2
	CLAY and SILT, soft, brown, dry to moist moist (CL)-NATIVE	602.7		9SS	X		4
	END OF HOLE @ 18.5 FT. BGS NOTES: 1. 6SS collected for chemical analysis. 2. At completion, borehole was grouted to ground surface. 3. Borehole dry at completion.	601.5					
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

FIGURE 10

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE  
 CHEMICAL ANALYSIS   WATER FOUND X STATIC WATER LEVEL ▽

# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-38)

PROJECT NAME: STAUFFER

HOLE DESIGNATION: BH-31

PROJECT NO.: 2365

DATE COMPLETED: DECEMBER 11, 1989

CLIENT: ICI AMERICAS

DRILLING METHOD: 3 1/4" ID HSA

LOCATION: N1145929.2 E381268.1

CRA SUPERVISOR: P. VOLPE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	DEPL-IT	VALUE
	GROUND SURFACE	621.5					
2.5	SILT, some sand and gravel, loose, red brown dry, (ML)-FILL Same, except dry to moist			1SS	X		7
5.0	Same, except some slag, medium dense, moist to wet			2SS	X		7
7.5	Fine SAND, some silt, clay and gravel, trace slag, medium dense, red brown, dry to moist, (SM)	615.5		3SS	X	○	13
10.0	Fine SAND, some gravel and slag, loose, black and yellow, dry, (SP)	613.5		4SS	X		13
12.5	CLAY and SILT, some sand, trace gravel, stiff, red brown, dry to moist, (ML)-NATIVE	611.5		5SS	X		9
15.0	END OF HOLE ● 14 FT. BGS	607.5		6SS	X		8
17.5	NOTES: 1. Borehole dry at completion. 2. At completion, borehole was grouted to ground surface. 3. 3SS collected for chemical analysis.			7SS	X		9
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

FIGURE 10

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS ○ WATER FOUND ∑ STATIC WATER LEVEL ▼

## STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-39)

PROJECT NAME: STAUFFER

HOLE DESIGNATION: BH-32

PROJECT NO.: 2365

DATE COMPLETED: DECEMBER 11, 1989

CLIENT: ICI AMERICAS

DRILLING METHOD: 3 1/4" ID HSA

LOCATION: N1146012.1 E381372.7

CRA SUPERVISOR: P. VOLPE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	DEPTH CLIT	VALU E
	GROUND SURFACE	623.6					
	SILT, some gravel and fine sand, loose, red brown, dry to moist, (ML)-FILL						
2.5	Fine SAND, some silt and slog, medium dense, black and red brown, dry to moist, (SM)	621.6		1SS	X		5
				2SS	X		7
5.0	CLAY and SILT, some fine sand, red brown, very stiff, moist, (ML)	619.6		3SS	X		5
				4SS	X		11
7.5	CLAY, some silt, red brown, very stiff, moist, (CL)-NATIVE	617.6	5SS	X		28	
10.0	END OF HOLE ● 10 FT. BGS	613.6					
	NOTES: 1. Borehole dry at completion.						
12.5	2. At completion, borehole was grouted to ground surface.						
	3. 4SS collected for chemical analysis.						
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

FIGURE 10

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

GRAIN SIZE ANALYSIS ○

WATER FOUND ∇

STATIC WATER LEVEL ▽

## STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-53)

PROJECT NAME: STAUFFER  
 PROJECT NO.: 2365  
 CLIENT: ICI AMERICAS  
 LOCATION: SMALL LANDFILL, NORTH

HOLE DESIGNATION: BH-34  
 DATE COMPLETED: MARCH 5, 1991  
 DRILLING METHOD: 2 1/4" ID HSA  
 CRA SUPERVISOR: A. KISEL

DEPTH (ft BGS)	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION (ft AMSL)	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	W VALUE	H VALUE (ppm)
	GROUND SURFACE	620.2					
2.5	ML-SILT(FILL), trace clay, trace sand and fine gravel, soft, red brown, moist	618.2		1SS	X	2	2.2
	CL/ML-SILT and CLAY, trace fine gravel, firm, red brown, moist Wood (4.0 ft. BGS)			2SS	X	5	4
5.0	SW/GW-SAND and GRAVEL, fine, trace brick, medium dense, black brown, moist Same, except becomes coarse to fine, trace wood, fiber, cloth, flyash, slag, cinder, loose, dry	615.7		3SS	X	12	3
7.5	Same, with trace sulphur, medium dense, brown, moist			4SS	X	8	2
10.0	Same, except fine, trace medium to coarse subrounded gravel, black, moist	609.5		5SS	X	13	
12.5	SW-SAND, fine, trace medium to coarse subrounded gravel, black, moist Same, except medium dense, wet			6SS	X	5	7
15.0	GM-GRAVEL, some silt and fine sand, red brown, moist	605.3		7SS	O	15	6.5
17.5	END OF HOLE ● 16.3 FT. BGS	603.9		8SS	O	17	0
20.0	NOTES: 1. At completion borehole was grouted to ground surface. 2. Samples for chemical analysis collected from 7SS and 8SS.			9SS	Z	>100	3
22.5							
25.0							
27.5							
30.0							
32.5							

FIGURE 10

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE  
 CHEMICAL ANALYSIS ○ WATER FOUND Z STATIC WATER LEVEL ▼

## STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-94)

PROJECT NAME: STAUFFER

HOLE DESIGNATION: BH-35

PROJECT NO.: 2365

DATE COMPLETED: MARCH 6, 1991

CLIENT: ICI AMERICAS

DRILLING METHOD: 2 1/4" ID HSA

LOCATION: SMALL LANDFILL, SOUTHWEST

CRA SUPERVISOR: A. KISEL

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				DEPTH ft BGS	STATE	W VALUE	M UN (ppm)
	GROUND SURFACE	616.7					
2.5	ML-SILT(FILL), some clay, trace fine gravel, trace roots, firm, red brown, moist Same, except becoming stiff, no roots			1SS	X	5	0.4
	Same, except becomes firm			2SS	X	10	1.2
5.0	Same, except trace brick, dense			3SS	X	5	3
7.5	ML-SILT(NATIVE), laminated, trace fine sand, red brown, moist Same, except no sand	609.7		4SS	X	16	8
10.0	SW-SAND(TILL), fine, little fine to coarse subrounded and subangular gravel, trace silt, dense, red brown, moist Becomes extremely dense	606.7		5SS	X	36	8
12.5				6SS	X	41	2
15.0	SM/ML-SAND and SILT, fine, little fine to coarse gravel, extremely dense, red brown, moist	602.7		7SS	X	90	0.8
	END OF HOLE ● 15.2 FT. BGS	601.5		8SS	X	100	0.2
17.5	NOTES: 1. Auger refusal at 15.2 ft. BGS. 2. At completion borehole was grouted to ground surface. 3. Samples for chemical analysis collected from 4SS (6.0 to 7.0 ft. BGS only) and 8SS.						
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

FIGURE 10

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS ○ WATER FOUND ◡ STATIC WATER LEVEL ▼

## STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-85)

PROJECT NAME: STAUFFER

HOLE DESIGNATION: BH-36

PROJECT NO.: 2365

DATE COMPLETED: MARCH 6, 1991

CLIENT: ICI AMERICAS

DRILLING METHOD: 2 1/4" ID HSA

LOCATION: LARGE LANDFILL, SOUTH

CRA SUPERVISOR: A. KISEL


DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				DEPTH FT BGS	STATE	W VALUE	H L E N
	GROUND SURFACE	623.7					
2.5	SM/ML-SAND and SILT, fine, trace fine gravel, loose, red brown, moist  Becomes medium dense			1SS	X	4	1
				2SS	X	6	5
5.0	SW/GW-SAND and GRAVEL, trace slag, clay, wood, glass, cardboard, brick, black brown and yellow, moist Becomes dense	618.3		3SS	X	12	6
7.5	SC-SAND, fine to coarse, some clay, slag, coal, brick, loose, red brown and black, dry to moist	615.1		4SS	X	32	8
10.0	GM-GRAVEL, some silt and sand, very loose, gray, black, moist, trace to little orange crystalline material and white translucent material	613.7		5SS	X	6	0.6
12.5	SM/ML-SAND and SILT, little clay, trace fine to medium subrounded gravel, trace slag, loose, black and olive gray, moist to wet No recovery	611.7		6SS	X	3	0.2
				7SS	X	6	0.2
15.0	END OF HOLE @ 14.5 FT. BGS NOTES: 1. Auger refusal at 14.5 ft. BGS. 2. At completion borehole was grouted to ground surface. 3. Samples for chemical analysis collected from 4SS and 7SS.	608.6		8SS	X	>100	
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

FIGURE 10

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS



WATER FOUND



STATIC WATER LEVEL





## STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-96)

PROJECT NAME: STAUFFER  
 PROJECT NO.: 2365  
 CLIENT: ICI AMERICAS  
 LOCATION: LARGE LANDFILL, SOUTH CENTRAL

HOLE DESIGNATION: BH-37  
 DATE COMPLETED: MARCH 6, 1991  
 DRILLING METHOD: 2 1/4" ID HSA  
 CRA SUPERVISOR: A. KISEL

DEPTH (ft BGS)	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION (ft AMSL)	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	W VALUE	W U (ppm)
	GROUND SURFACE	620.4					
2.5	ML-SILT(FILL), some clay, trace fine to coarse gravel, roots, soft, red brown, moist to wet ML-SILT, some fine sand, trace slag, loose, red brown, moist Same, except trace fine sand and gravel			1SS	X	3	0.8
				2SS	X	8	0.8
5.0	Becomes medium dense			3SS	X	7	1
7.5	ML-SILT, trace clay, trace slag and wood, very stiff, red brown, gray, moist			4SS	X	17	4.2
		610.7		5SS	X	27	
10.0	CL/ML-CLAY and SILT(NATIVE), laminated, red brown, gray, dry to moist Becomes hard			6SS	X	38	0.2
12.5	SW-SAND(TILL), fine, some fine to coarse subrounded and subangular gravel, extremely dense, red brown, dry to moist Becomes very dense	608.4		7SS	X	134	0.2
15.0				8SS	X	64	0.4
17.5	END OF HOLE ● 17.1 FT. BGS NOTES: 1. Auger refusal at 17.1 ft. BGS. 2. At completion borehole was grouted to ground surface. 3. Samples for chemical analysis collected from 4SS and 8SS.	603.3					
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

FIGURE 10

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE  
 CHEMICAL ANALYSIS ○ WATER FOUND ◊ STATIC WATER LEVEL ▼

## STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-92)

PROJECT NAME: STAUFFER

HOLE DESIGNATION: BH-33

PROJECT NO.: 2365

DATE COMPLETED: MARCH 5, 1991

CLIENT: ICI AMERICAS

DRILLING METHOD: 2 1/4" ID HSA

LOCATION: SMALL LANDFILL, SOUTHEAST

CRA SUPERVISOR: A. KISEL

DEPTH (ft BGS)	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION (ft AMSL)	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	VALUE	UNITS (ppm)
	GROUND SURFACE	621.4					
2.5	ML-SILT(FILL), some fine sand, trace gravel and clay, loose, red brown, moist	619.4		1SS	X	5	0
	ML/CL-SILT and CLAY, some fine gravel, firm, red brown, moist Some, except stiff			2SS	X	8	0.8
5.0	Same, except very stiff			3SS	X	13	0.3
7.5				4SS	X	26	0
	SW-SAND, very loose, black, moist	613.4		5SS	X	<1	5
10.0	GW-GRAVEL, coarse to fine, some coarse to fine sand, very loose, gray, moist	611.4		6SS	X	2	7
12.5	Same, except some wood, some fine to medium gravel, extremely dense, brown, moist			7SS	X	>100	15
15.0	Same, except medium to fine rounded to subrounded gravel, little fine sand and silt, gray, brown, wet	606.0		8SS	X	>100	0.2
17.5	END OF HOLE @ 15.4 FT. BGS NOTES: 1. At completion borehole was grouted to ground surface. 2. Samples for chemical analysis collected from 5SS and 8SS.						
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

FIGURE 10

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS



WATER FOUND



STATIC WATER LEVEL



## STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-97)

PROJECT NAME: STAUFFER  
 PROJECT NO.: 2365  
 CLIENT: ICI AMERICAS  
 LOCATION: LARGE LANDFILL, NORTH CENTRAL

HOLE DESIGNATION: BH-38  
 DATE COMPLETED: MARCH 7, 1991  
 DRILLING METHOD: 2 1/4" ID HSA  
 CRA SUPERVISOR: A. KISEL

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	VALUE	UNITS
	GROUND SURFACE	624.5					
2.5	ML/CL-SILT and CLAY(FILL), trace fine sand, trace roots, firm, red brown, moist Same, except some fine sand, trace fine gravel, stiff			1SS	X	5	0.6
	Same, except trace slag			2SS	X	9	3
5.0				3SS	X	8	0.4
7.5	SW-SAND, trace fine to coarse gravel, trace silt, loose, red brown, moist Same, except black, no silt	618.5		4SS	X	7	0.2
10.0	ML-SILT, little clay, yellow brown, moist Becomes red brown	615.3		5SS	X	8	0.2
12.5	SW-SAND(TILL), some fine gravel, red brown, dry to moist No recovery	614.0		6SS	X	20	0.4
15.0	SW-SAND, some gravel, some silty clay layers, very dense, red brown, dry to moist Same, except trace fine gravel, extremely dense	610.5		7SS	X	20	
17.5	No recovery			8SS	X	58	0
20.0	END OF HOLE @ 18.4 FT. BGS NOTES: 1. Auger refusal at 18.4 ft. BGS. 2. At completion borehole was grouted to ground surface. 3. Samples for chemical analysis collected from 2SS and 8SS.	606.1		9SS	X	>100	0

FIGURE 10

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE  
 CHEMICAL ANALYSIS ○ WATER FOUND ∇ STATIC WATER LEVEL ▼

## STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-58)

PROJECT NAME: STAUFFER  
 PROJECT NO.: 2365  
 CLIENT: ICI AMERICAS  
 LOCATION: LARGE LANDFILL, NORTHEAST

HOLE DESIGNATION: BH-39  
 DATE COMPLETED: MARCH 7, 1991  
 DRILLING METHOD: 2 1/4" ID HSA  
 CRA SUPERVISOR: A. KISEL

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	W VALUE	W U
	GROUND SURFACE	623.5					
2.5	ML-SILT(FILL), some clay and fine sand, trace fine gravel, very soft, red brown, moist Same, with trace wood, stiff Same, except no wood, very soft			1SS	X	2	0.8
				2SS	X	14	0
5.0				3SS	X	2	4
		617.5		4SS	X	12	0
7.5	SM-SAND, some coarse to fine gravel, some silt, trace clay, loose, red brown, moist to wet			5SS	X	32	0
	ML-SILT, dense, brown, red brown and gray Same, with some clay, moist Becomes hard	615.5		6SS	X	40	3
10.0		611.4		7SS	X	33	0
12.5		610.2		8SS	X	>100	0
15.0	SM-SAND(TILL), medium to coarse, some fine to coarse subrounded to subangular gravel, red brown, moist to wet Becomes extremely dense	607.8					
17.5	END OF HOLE @ 15.7 FT. BGS NOTES: 1. Auger refusal at 15.7 ft. BGS. 2. At completion borehole was grouted to ground surface. 3. Samples for chemical analysis collected from 3SS and 8SS.						
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

FIGURE 10

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

GRAIN SIZE ANALYSIS ○ WATER FOUND ∇ STATIC WATER LEVEL ▼

RECEIVED

APR 12 1993

N.Y.S. DEPT. OF  
ENVIRONMENTAL CONSERVATION  
REGION 9