Pilot Study

STATE OF NEW YORK: DEPARTMENT OF ENVIRONMENTAL CONSERVATION

In the Matter of the Development and Implementation of a Remedial Investigation, Feasibility Study for an Inactive Hazardous Waste Disposal Site, Under Article 27, Title 13, of the Environmental Conservation Law of the State of New York by

CONKLIN, LTD.
Respondent.

AGREEMENT AND DETERMINATION

INDEX #A7-0163-88-12

WHEREAS,

1. The New York State Department of Environmental Conservation (the "Department") is responsible for enforcement of Article 27, Title 13 of the Environmental Conservation Law of the State of New York ("ECL"), entitled "Inactive Hazardous Waste Disposal Sites".

2. Conklin, Ltd. ("Respondent") a corporation duly organized and existing under the laws of New York State, with offices for the transaction of business at Shanley, Sweeney & Reilly, P.C., The Castle at Ten Thurlow Terrace, Albany, New York 12203, proposes to develop and construct a shopping center on property generally located south of Onondaga Lake and north of Hiawatha Boulevard West between the New York State Barge Canal and Interstate 81 in the City of Syracuse. The proposed shopping center may include all or part of a parcel of property presently owned by Clark Concrete Co., Inc. Environmental sampling and analysis establishes that there are elevated concentrations of certain contaminants in

the soil and groundwater under a portion of the Clark Property ("Site") (Appendix A).

3. Respondent holds an option to purchase the Site and has caused a hydrogeologic investigation to be conducted in its effort to evaluate the Site for future development. Respondent has submitted to the Department a report entitled, "Report on Hydrogeologic Conditions at the Clark Property, Syracuse, New York - Dated September, 1988", which the Department is presently evaluating as part of its effort to determine the full extent of both groundwater and soil contamination.

4. The Site is an inactive hazardous waste disposal site, as that term is defined at ECL Section 27-1301(2) and has been listed in the Registry of Inactive Hazardous Waste Disposal Sites in New York State as Site Number 734048. The Department has classified the Site as a Classification "2" pursuant to ECL Section 27-1305(4)(b).

5. Pursuant to ECL Section 27-1313(3)(a), whenever the Commissioner of Environmental Conservation (the "Commissioner") "finds that hazardous wastes at an inactive hazardous waste disposal site constitute a significant threat to the environment, he may order the owner of such site and/or any person responsible for the disposal of hazardous wastes at such site (i) to develop an inactive hazardous waste disposal site remedial program, subject to the approval of the department, at such site, and (ii) to implement such program within reasonable time limits specified in the

order." Respondent is not the owner of the Site nor is it a person responsible for the disposal of hazardous waste at the Site. Nonetheless, Respondent has voluntarily initiated discussions with the Department regarding the investigation and remediation at the Site.

Respondent agrees that in its capacity as an option holder for the Site, it will undertake a Remedial Investigation/Feasibility Study at the Site.

6. The Department and Respondent agree that the goals of this Agreement and Determination shall be the development and implementation of a Remedial Investigation/Feasibility Study for the Site by Respondent.

7. Respondent, having waived its right to a hearing herein as provided by law, and having consented to the issuance and entry of this Agreement and Determination, agrees to be bound by its terms.

NOW, having considered this matter and being duly advised, IT IS ORDERED THAT:

I. All activities and submittals required by this Agreement and Determination shall address both on-Site and off-Site contamination caused by the disposal of hazardous waste at the Site and shall be in accordance with Requisite Technology. As used in this Agreement and Determination, Requisite Technology means engineering, scientific and construction principles and practices subject to the Department's approval, which (a) are technologically

feasible, and (b) will identify, mitigate and eliminate, to the maximum extent practicable, in a cost effective manner, any present or potential threat to the public health or environment posed by the presence of hazardous waste at the Site and any release or threatened release of hazardous waste at or from the Site.

II. Simultaneously with its signing of this Agreement and Determination, Respondent shall submit to the Department all data within its possession or control regarding environmental conditions on-Site and off-Site, and other information described below, to the extent that such data have not previously been provided to the Department. The data shall include:

a. A brief history and description of the Site, including the types, quantities, physical state, dates of disposal of hazardous waste at the site, and location and names of "responsible parties" as defined in 6 NYCRR §375 - 2(p); and

b. A description of the results of all previous investigations of the Site and areas in the vicinity of the Site as delineated in Appendix B, including copies of all available topographic and property surveys, engineering studies and aerial photographs.

c. The information and data presented by Respondent shall be reviewed in conjunction with material previously submitted by Respondent and the Department will determine whether the investigations conducted and reports

submitted satisfy all of the elements of a "Remedial Investigation" as set forth in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. Section 9601 et seq., as amended ("CERCLA"), the current National Contingency Plan ("NCP") and the USEPA draft guidance document entitled "Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA" dated March 1988, and any subsequent revisions thereto, including Quality Assurance/Quality Control for all data and analysis submitted to the Department.

d. Within 30 days of the effective date of this Agreement and Determination, the Department shall determine whether Respondent has satisfied the requirements of a Remedial Investigation and if the Respondent has satisfied such requirements, the Department shall so notify the Respondent in writing and Respondent shall submit a Feasibility Study in accordance with the applicable provisions of this Agreement and Determination.

e. The Department reserves the right to require a modification and/or an amplification and expansion of the Remedial Investigation and submissions made by Respondent if the Department determines, as a result of reviewing data generated by the Remedial Investigation or as a result of reviewing any other data or facts, that further investigative work is necessary.

III. If the Department determines that Respondent has not satisfied the requirements of a Remedial Investigation,

it shall notify the Respondent in writing, and within 30 days of Respondent's receipt of the notification, Respondent shall submit to the Department a Work Plan for a Remedial Investigation.

The Work Plan shall address all elements of a Remedial Investigation as set forth in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. Sections 9601 et seq., as amended ("CERCLA"), the current National Contingency Plan ("NCP") and the USEPA draft guidance document entitled "Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA" dated March 1988, and any subsequent revisions thereto. The Work Plan shall include a health and safety plan for the protection of persons at and in the vicinity of the Site during the performance of the Remedial Investigation which shall be prepared in accordance with 29 C.F.R. Section 1910 by a certified health and safety professional. A Quality Assurance/Quality Control Plan shall also be included.

IV. The Department shall notify Respondent in writing of its approval or disapproval of the Work Plan within 30 days of its receipt of the Work Plan. If the Department approves the Work Plan, Respondent shall perform the Remedial Investigation in accordance with with the terms of the Approved Work Plan.

If the Department disapproves the Work Plan, the Respondent shall, within 30 days of receiving notice of

disapproval, revise and resubmit the Work Plan, addressing each of the Department's concerns and objections. Within 15 days of receipt of the revised Work Plan, the Department shall approve or disapprove the revised Work Plan in writing. If the Department approves the revised Work Plan, Respondent shall perform the specified work or continue with Respondent's obligations under the Agreement and Determination in accordance with the terms of the approval and under the Department's supervision.

The approved Work Plan or the approved revised Work Plan shall be attached as Appendix C and incorporated into this Agreement and Determination.

If the Department disapproves the Revised Work Plan, for failure of the Respondent to comply with CERCLA, the NCP or the "Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA" dated March 1988, and any subsequent revisions thereto, Respondent shall be in violation of this Agreement and Determination for not having submitted an approvable document in accordance with the terms of this Agreement and Determination.

V. In accordance with the time schedule contained in the approved Work Plan or the approved revised Work Plan, Respondent shall perform the Remedial Investigation and submit a Remedial Investigation Report. During the Remedial Investigation, Respondent shall have on-Site a full time representative who is qualified to inspect the work. The

Report shall include all data generated and all other information obtained during the Remedial Investigation and shall provide all of the assessments and evaluations in accordance with the requirements of CERCLA and the current NCP and the USEPA draft guidance document entitled, "Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA," dated March 1988 and any subsequent revisions thereto, and identify any additional data that must be collected. The Report shall include a certification by Respondent's consultant that all activities that comprised the Remedial Investigation were performed in accordance with the approved Work Plan.

VI. The Department reserves the right to require a modification and/or an amplification and expansion of the Remedial Investigation and Report by Respondent if the Department determines, as a result of reviewing data generated by the Remedial Investigation or as a result of reviewing any other data or facts, that further work is necessary.

VII. Within 30 days of the receipt of the Report, the Department shall determine if the Remedial Investigation was conducted and the Report prepared in accordance with the Work Plan and this Agreement and Determination, and shall notify Respondent in writing of its approval or disapproval of the Report.

If the Department disapproves the Report, the Department shall notify Respondent in writing of the

Department's objections. Respondent shall revise the Report and/or reperform or supplement the Remedial Investigation in accordance with the Department's specific comments and shall submit a revised Report. The maximum period of time within which the Report must be revised or the Remedial Investigation reperformed or supplemented shall be specified by the Department in its notice of disapproval.

Within 30 days after the receipt of the revised Report, the Department shall notify the Respondent in writing of its approval or disapproval of the revised Report.

If the Department disapproves the revised Report, for failure of the Respondent to comply with CERCLA, the NCP or the "Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA" dated March 1988, and any subsequent revisions thereto, Respondent shall be in violation of this Agreement and Determination for not having submitted an approvable document in accordance with the terms of this Agreement and Determination.

The approved Report shall be attached as Appendix D and incorporated into this Agreement and Determination.

VIII. Within 90 days after receipt of the Department's approval of the Report, Respondent shall submit a Feasibility Study evaluating on-Site and off-Site remedial actions to eliminate, to the maximum extent practicable, all health and environmental hazards and potential hazards attributable to the Site. The Feasibility Study shall be

prepared and certified by an engineer licensed to practice by the State of New York, who may be an employee of Respondent, or an individual or member of a firm which is authorized to offer engineering services in accordance with Article 145 of the New York State Education Law.

The Feasibility Study shall be performed in a manner that is consistent with CERCLA, as amended, the current NCP and the USEPA draft guidance document entitled, "Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA," dated March 1988 and any subsequent revisions thereto. The approved Feasibility Study shall be attached as Appendix E and incorporated into this Agreement and Determination.

IX. Within 30 days of the receipt of the Feasibility Study, the Department shall determine if the Feasibility Study was prepared in accordance with this Agreement and Determination, and shall provide written notification of its approval or disapproval.

If the Department disapproves the Feasibility Study, the Department shall notify Respondent in writing of the Department's objections. Within 45 days after receipt of notice of disapproval, Respondent shall revise the Feasibility Study in accordance with the Department's specific comments and submit a revised Feasibility Study.

Within 30 days of the receipt of the revised Feasibility Study, the Department shall notify Respondent in

writing of its approval or disapproval of the revised Feasibility Study.

If the Department disapproves the revised Feasibility Study for failure of the Respondent to comply with CERCLA, the NCP or the "Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA" dated March 1988, and any subsequent revisions thereto, Respondent shall be in violation of this Agreement and Determination for not having submitted an approvable document in accordance with the terms of this Agreement and Determination.

X. Within 30 days after the Department's approval of the Feasibility Study, the Department and Respondent shall solicit public comment on the Remedial Investigation/ Feasibility Study and the recommended remedial program in accordance with CERCLA, the NCP and any relevant Department policy and guidance documents in effect at the time the public comment period is to be initiated. After the close of the public comment period, the Department shall select a final remedial program for the site in a Record of Decision ("ROD").

XI. Upon the signing of this Agreement and Determination by the Department, and subject to the Department's final approval of the work plan for the Vacuum Extraction System ("VES") (which will be attached as Appendix F upon final approval) and subject further to the public review and comment of the VES as deemed appropriate

by the Department, the Respondent shall commence implementation of the approved VES Work Plan, as a pilot study for further use during the implementation of the Feasibility Study. Respondent shall perform the VES in accordance with the terms, conditions and time schedule contained in the VES Work Plan. The Department reserves the right, at any time, to add further terms and conditions for the operation of the pilot study and the Vacuum Extraction System. The Respondent shall immediately cease and discontinue operation of the pilot study and/or the Vacuum Extraction System and/or any component of the study or system upon receiving notice to do so from the Department. Within 30 days of the completion of the VES Work Plan, Respondent shall submit to the Department a VES Report (Appendix G). The VES Report shall include all data generated and all other information obtained during the performance of the VES Work Plan at the Site. The VES Report shall include a certification by Respondent's consultant that all activities that comprised the VES Work Plan were performed in accordance with the VES Work Plan. The Department reserves the right to require a clarification, modification and/or an amplification and expansion of the VES Report by Respondent if the Department determines, as a result of reviewing data generated by the VES Work Plan and VES Report, or as a result of reviewing any other data or facts, that further information is required.

During the performance of the VES Work Plan, Respondent shall have on-Site a full time representative who is qualified to inspect the work.

The VES Report will be reviewed during the Respondent's performance of the Feasibility Study. The use of the VES, as a final remedial measure at the Site, will be evaluated in conjunction with other remedial actions submitted by Respondent during the Feasibility Study. Nothing contained in this Agreement and Determination shall be construed as barring, diminishing, adjudicating or in any way affecting Respondent's duty to perform a Feasibility Study as required by this Agreement and Determination.

XII. The Department shall have the right to obtain split samples, duplicate samples, or both, of all substances and materials sampled by Respondent.

XIII. Respondent shall provide reasonable advance notice to the Department of any field activities to be conducted pursuant to this Agreement and Determination.

XIV. Respondent shall pursue all steps necessary to obtain whatever permits, easements, rights-of-way, rights-of-entry, approvals or authorizations are necessary to perform Respondent's obligations under this Agreement and Determination. In the event that access is denied to the Respondent, in the performance of this Agreement and Determination, the Department may seek to enforce its authority to obtain access. Respondent's failure to obtain access, despite its best efforts, will suspend its

obligations under this Agreement and Determination that are contingent upon such access.

XV. Respondent shall permit any duly designated employee, consultant, contractor or agent of the Department or any State agency to enter upon the Site or areas in the vicinity of the Site as delineated in Appendix B, which may be under the control of Respondent for purposes of inspection, sampling and testing and to assure Respondent's compliance with this Agreement and Determination.

XVI. Respondent shall retain qualified and reputable professional consultants, contractors and laboratories acceptable to the Department to perform the technical, engineering and analytical obligations required by this Agreement and Determination. The experience, capabilities and qualifications of the firms or individuals selected by Respondent shall be submitted to the Department for approval prior to the initiation of any activities for which they will be responsible.

XVII. Respondent shall not suffer any penalty under this Agreement and Determination, or be subject to any proceeding or action, if it cannot comply with any requirements hereof because of an act of God, war, riot, or circumstance beyond its control which prevents compliance with this Agreement and Determination. Respondent shall immediately notify the Department in writing when it obtains knowledge of any such condition and request an appropriate extension or modification of this Agreement and Determination.

XVIII. The unexcused failure of the Respondent to comply with any term of this Agreement and Determination shall constitute a violation of this Agreement and Determination and the ECL. The term "Agreement and Determination", as used in this document, shall have the same meaning and the same force and effect as an "Order on Consent" entered into between the Department and Respondent, and shall be enforceable pursuant to all of the provisions of law applicable to the enforcement of an Order on Consent.

XIX. Nothing contained in this Agreement and Determination shall be construed as barring, diminishing, adjudicating or in any way affecting:

a. the Department's right to bring any action or proceeding against anyone other than Respondent, its directors, officers, employees, servants, agents, successors and assigns;

b. the Department's right to enforce this Agreement and Determination against Respondent, its successors and assigns in the event that Respondent shall fail to satisfy any of the terms hereof;

c. the Department's right to bring any action or proceeding against Respondent, its successors and assigns with respect to areas or resources that may have been affected or contaminated as a result of the release or threatened release of hazardous wastes or constituents at or from the Site or areas in the vicinity of the Site,

including but not limited to claims for natural resources damages; and

d. the Department's right to bring any action or proceeding against any responsible party to compel implementation of an inactive hazardous waste disposal site remedial program for the Site, and to obtain recovery of its costs in connection with the site.

XX. This Agreement and Determination shall not be construed to prohibit the Commissioner or his duly authorized representative from exercising any summary abatement powers.

XXI. Respondent shall indemnify and hold the Department, the State of New York, and their representatives and employees harmless for all claims, suits, actions, damages and costs of every name and description arising out of the fulfillment or attempted fulfillment of this Agreement and Determination by Respondent, its directors, officers, employees, servants, agents, successors or assigns, or resulting from the fulfillment or attempted fulfillment of this Agreement and Determination by Respondent, its directors, officers, employees, servants, agents, successors or assigns.

XXII. The effective date of this Agreement and Determination shall be the date it is signed by the Commissioner or his designee, and the VES Work Plan (Appendix F) is approved and attached to this Agreement and Determination.

XXIII. If Respondent desires that any provision of this Agreement and Determination be changed, it shall make timely written application to the Commissioner, setting forth reasonable grounds for the relief sought.

XXIV. A. The Department acknowledges and determines that Respondent is not currently and shall not by reason of this Agreement and Determination and/or activities undertaken pursuant to this Agreement and Determination be determined to be a person responsible (or responsible party) for the disposal of hazardous wastes at the Site under applicable laws and regulations, and shall not be obligated to conduct or cause to be conducted any activities beyond those required by this Agreement and Determination.

B. Notwithstanding any other provision in this Agreement and Determination, the Department specifically reserves its right to sue Respondent for:

1. any claims arising out of any activity attributable to Conklin, its agents, and employees in performing the work required by this Agreement and Determination, which activity is the proximate cause of any damage or threat to the environment or public health at, or in the vicinity of the Site.

2. any claims arising out of the presence of hazardous waste at the Site, or the migration of hazardous waste from the Site, to the extent that such claims could, now or in the future, be brought, based on

Respondent's capacity as anything other than the holder of an option to purchase the Site.

XXV. In the event the Respondent proposes to convey the whole or any part of its ownership interest in the Site, or transfer or convey any option or leasehold interest in the Site, Respondent shall, not fewer than 60 days prior to the proposed conveyance and/or transfer, notify the Department in writing of the identity of the transferee and of the nature and date of the proposed transfer and/or conveyance and shall notify the transferee in writing, with a copy to the Department, of the existence of this Agreement and Determination.

XXVI. All written communications required by this Agreement and Determination shall be transmitted by United States Postal Service, by private courier service, or hand delivered as follows:

A. Communication from Respondent to the Department shall be made as follows:

1. Director, Division of Environmental Enforcement
New York State Department of Environmental Conservation
50 Wolf Road
Albany, New York 12233-5500

2. Director, Division of Hazardous Waste Remediation
New York State Department of Environmental Conservation
50 Wolf Road
Albany, New York 12233-7010

3. Director, Bureau of Environmental
Exposure Investigation
New York State Department of Health
2 University Place
Albany, New York 12203

4. Division of Environmental Enforcement
Albany Field Unit
50 Wolf Road - Room 415
Albany, New York 12233-5501
Attn: Frank V. Bifera, Esq.

5. NYS Department of Environmental
Conservation
615 Erie Boulevard West
Syracuse, New York 13204-2400
Attn: Tom Male

B. Communication to be made from the Department to the Respondent shall be made as follows:

c/o Michael P. Shanley, Esq.
The Clinton Exchange
4 Clinton Square
Syracuse, New York

c/o Jack P. McBurney
Dunn Geoscience Corportion
299 Cherry Hill Road
Parsippany, New Jersey 07054

c/o Bruce Kenan
The Clinton Exchange
4 Clinton Square
Syracuse, New York

c/o Shanley, Sweeney & Reilly
The Castle at Ten Thurlow Terrace
Albany, New York 12203

XXVII. Respondent, its successors and assigns shall be bound by this Agreement and Determination. Nothing herein shall be construed to bind any other entity.

XXVIII. The terms hereof shall constitute the complete and entire Agreement and Determination between Respondent and

the Department concerning the Site. No terms, conditions, understandings or agreements purporting to modify or vary the terms hereof shall be binding unless made in writing and subscribed by the party to be bound. No informal advice, guidance, suggestions or comments by the Department regarding reports, proposals, plans, specifications, schedules or any other submittals shall be construed as relieving Respondent of its obligations to obtain such formal approvals as may be required by this Agreement and Determination.

DATED: Albany, New York
June 27, 1989

THOMAS C. JORLING
Commissioner
New York State Department of
Environmental Conservation

By: Edward O. Sullivan

Edward O. Sullivan
Deputy Commissioner

CONSENT BY RESPONDENT

Respondent hereby consents to the issuing and entering of this Agreement and Determination, waives its right to a hearing herein as provided by law with respect to the provisions of this Agreement and Determination, and agrees to be bound by this Agreement and Determination. Respondent hereby reserves its rights to a hearing as provided by law as to all matters not expressly covered by this Agreement and Determination.

CONKLIN, LTD.

By: Michael P. Stanley

Title: Vice President

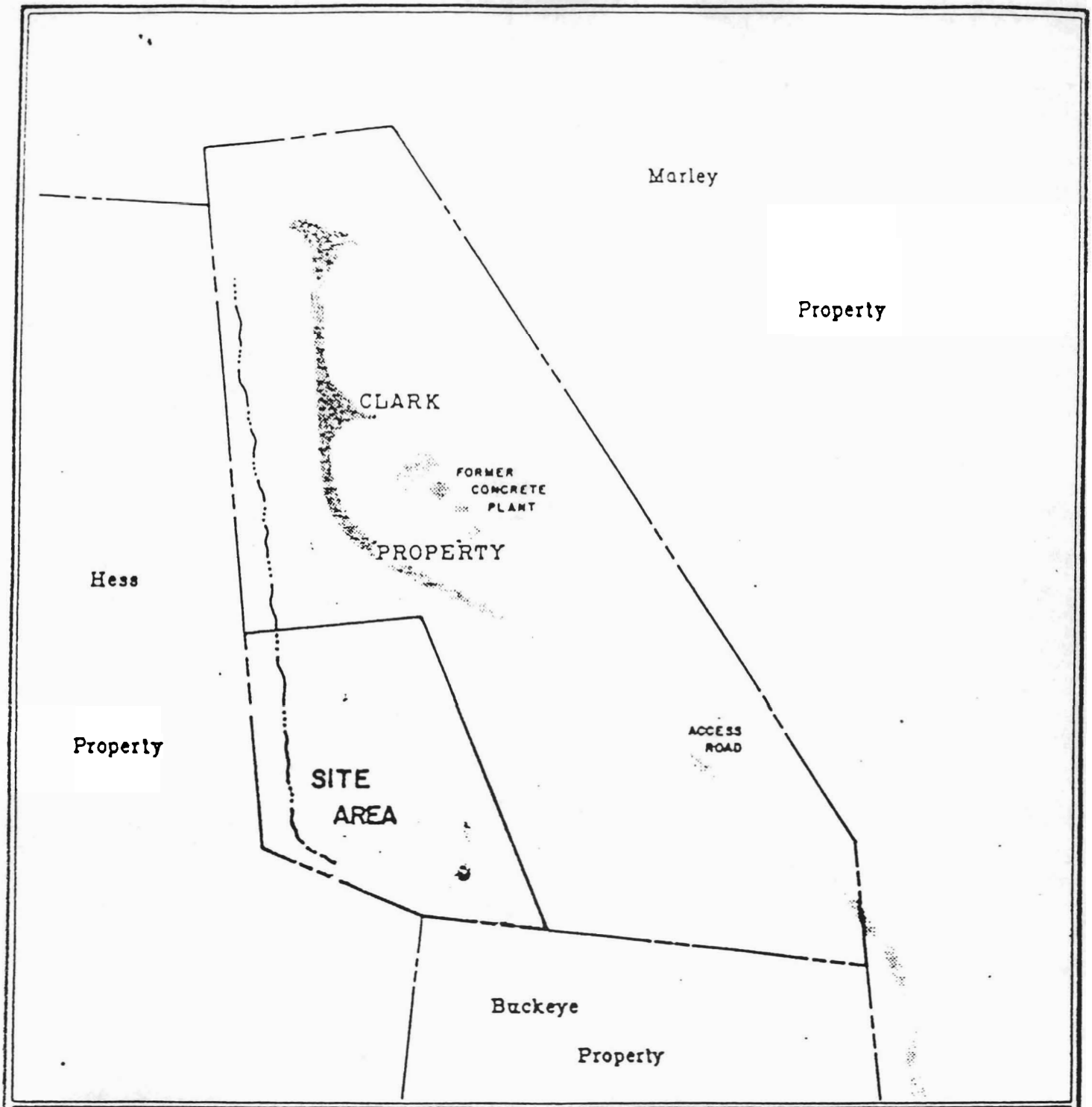
Date: June 26, 1989

STATE OF NEW YORK)
) s.s.:
COUNTY OF Onondaga)

On this 26th day of June, 1989, before me personally came Michael P. Stanley, to me known, who being duly sworn, did depose and say that he resides in Albany, New York; that he is the Vice President of the Conklin, Ltd., the corporation described in and which executed the foregoing instrument; that he knew the seal of said corporation; that the seal affixed to said instrument was such corporate seal; that it was so affixed by the order of the Board of Directors of said corporation, and that he signed his name thereto by like order.

Sandra L. Anderlik
Notary Public

SANDRA L. ANDERLIK
Notary Public State of N.Y.
Qualified in Onon. Co., No. 4967700
My Comm. Expires 4-11-90

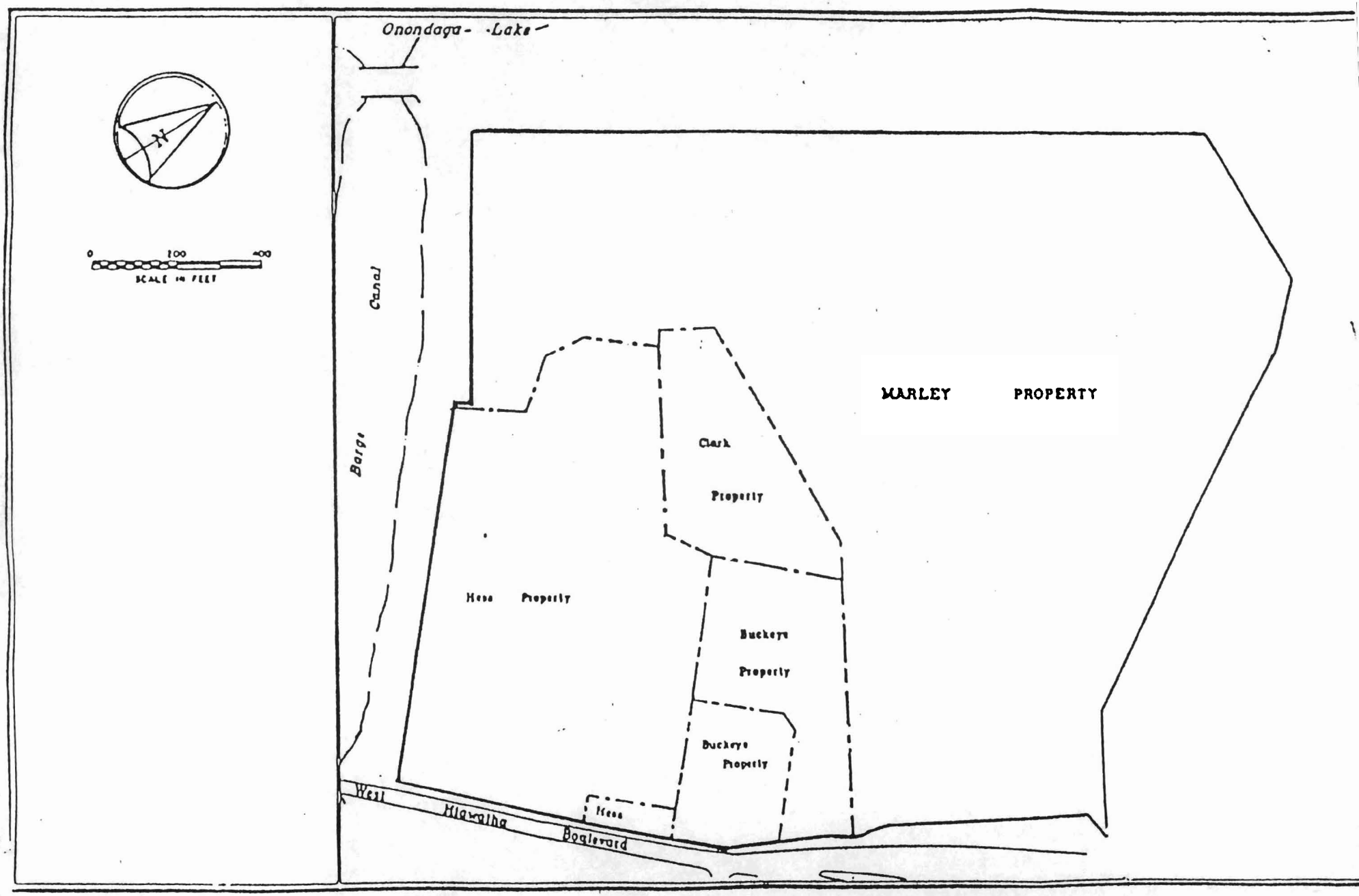


Site of Identified VOC Source Area

NOTES

1987 Monitoring Wells and Soil Samples are taken from C.T. Male Associates, P.C. Drawing #87-578 R, dated 11/30/87

APPENDIX B



* Areas in the vicinity of the site, wherever used in the Agreement and Determination, refers to those properties outlined in this Appendix by the heavy black lines.

STATE OF NEW YORK: DEPARTMENT OF ENVIRONMENTAL CONSERVATION

In the Matter of the Development and Implementation of a Remedial Investigation, Feasibility Study for an Inactive Hazardous Waste Disposal Site, Under Article 27, Title 13, of the Environmental Conservation Law by the State of New York by

CONKLIN, LTD.
Respondent.

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APPENDIX F

VES WORK PLAN

Contents:

1. Dunn Geoscience Corporation's revised Pilot Study Work Plan for proposed Site #734048 (August 1989)

2. Letter of John P. Mcburney to Tom Male (August 31, 1989)

3. Letter of Steven P. Eidt, Sr. Sanitary Engineer, titled Carousel Center - Conklin, Ltd., Terra Vac Engineering Report, dated September 1, 1989

4. NYSDEC terms and conditions for operation of VES Work Plan dated September 1, 1989.

DUNN
GEOSCIENCE CORP.
12 METRO PARK RD. •
ALBANY, NEW YORK 12205
518-458-1313
FAX 518-458-2472

REVISED PILOT STUDY
WORK PLAN
FOR PROPOSED SITE #734048

Syracuse, New York

Prepared for:

SHANLEY, SWEENEY & REILLY, P.C.
Albany, New York

Prepared by:

DUNN GEOSCIENCE CORPORATION
Albany, New York

August 1989

DUNN
GEOSCIENCE CORP.

LINCOLN CENTRE, SUITE 106 •
299 CHERRY HILL ROAD •
PARSIPPANY, N J 07054
201 299-9001
FAX 201 299-0021

August 31, 1989

Mr. Thomas Male
NYS DEC

Dear Mr. Male,

This letter will summarize the operation and emissions of the air side of the Terra-Vac VES System. Terra-Vac has prepared the process monitoring plan to determine rate of removal of VOCs from the soil, capacity loading on carbon, and breakthrough monitoring to govern rate of change of carbon vessels. Terra-Vac will operate a field gas chromatograph (GC) and will use QA/QC procedures based on SW-846. To accomplish this Terra-Vac will monitor gas concentrations at the well head, prior to the primary carbon, between primary and secondary carbon, and at the stack (see Work Plan detail B) on daily basis. Vinyl chloride is the chosen indicator parameter to be particularly watched for in the stack gas (see 6/16/89 memo for TMJ to RB).

On a weekly basis a sample will be collected from the sampling port between the air-water separater and from the sampling port immediately down stream of the secondary carbon (see Work Plan detail B). These two samples will be taken to an off-site laboratory for analysis of volatile organics including:

Vinyl Chloride
Methylene Chloride
1,1 - Dichloroethylene
1,1 - Dichloroethane
1.2 - Trans-Dichloroethylene
1,1,1 - Trichloroethane
Trichloroethylene
Toluene
Ethyl Benzene
Total Xylenes

This monitoring will assure compliance with discharge conditions as they appear in Appendix D of the Work Plan and allow collection of data regarding the removal of contaminants from the subsurface via the vapor extraction portion of the VES.

Sincerely yours,
DUNN GEOSCIENCE CORPORATION

John P. McBurney
Project Manager

cc: T.M. Johnson
J.L. Duncan

JPM\8-31-1

New York State Department of Environmental Conservation
615 Erie Blvd. W., Syracuse, NY 13204-2400

Region 7 Environmental Quality Office
(315) 426-7500

Thomas C. Jorling
Commissioner

September 1, 1989

Dunn Geoscience Engineering Co.
12 Metro Park Road
Albany, NY 12205

Attn: Jeffrey L. Duncan, P.E.
Senior Chemical Engineer

RE: CAROUSEL CENTER - CONKLIN, LTD.
TERRA VAC ENGINEERING REPORT

Dear Mr. Duncan:

We have completed our review of the August 18, 1989 submittal. The report will be acceptable when the items addressed in this letter are agreed to by your counter signature. This letter will then become a part of the Engineering Report and the "Revised Pilot Study Work Plan for Proposed Site #734048".

Item #1 At least one (1) soil and groundwater sample must be taken before and after the Pilot test. It must be analyzed for the Target Compound List (TCL) parameters. The groundwater samples prior to treatment should be taken from monitoring well MW-2 using appropriate sampling protocol. The soil sample will be collected from below the static water table at a location between extraction wells VE-1, VE-4, and VE-5 using appropriate sampling protocols for soil.

This sampling will be done in order to determine the effectiveness of the soil clean-up via the vapor extraction system.

Item #2 The following analytical procedures shall be specified for Table 3, Monitoring Plan, Page 10 of the Engineering Report:

Parameter	Method
Napthalene	610
Phenol	604
Purgeable Halocarbon	601
Purgeable Aromatics	602

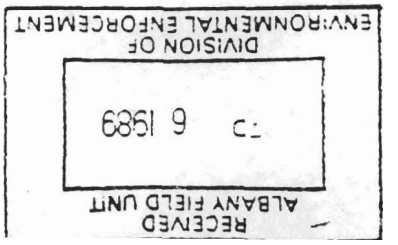
Item #3 A chart recorder shall be included with the flow monitoring device. These charts shall be available for DEC review.

Item #4 The following limits will govern the discharge of the Terra Vac system. Outfall 001 is the outfall of the Terra Vac which discharges into Onondaga Creek (Barge Canal). The exceedance of the limit for any parameter listed below shall constitute sufficient reason for the Department to order the shutdown of the system and cessation of the Pilot Study.

001 Terra Vac Water Discharge

	Discharge Limitations			Minimum Monitoring Requirements	
	Daily Avg.	Daily Max.	Units	Measurement Frequency	Sample Type
Flow	Monitor	Monitor	gpd	Continuous	Recorded
Aluminum, Total	2.0	4.0	mg/l	2/Week	Grab
Iron, Total	2.0	4.0	mg/l	2/Week	Grab
Lead, Total	NA	0.9	lbs/day	2/Week	Grab
Manganese, Total	1.0	2.0	mg/l	2/Week	Grab
Oil & Grease	NA	15	mg/l	2/Week	Grab
Benzene	5	10	ug/l	2/Week	Grab
1,1-Dichlorethane	5	10	ug/l	2/Week	Grab
Ethylbenzene	5	10	ug/l	2/Week	Grab
Methyl Tert Butyl Ether (MTBE)	2.5	5	ug/l	2/Week	Grab
Methylene Chloride	5	10	ug/l	2/Week	Grab
Naphthalene	5	10	ug/l	2/Week	Grab
Phenol, Unchlorinated	.5	NA	lbs/day	2/Week	Grab
Tetrachloroethylene	5	10	ug/l	2/Week	Grab
Toluene	5	10	ug/l	2/Week	Grab
1,2-Trans-Dichloroethylene	5	10	ug/l	2/Week	Grab
1,1,1-Trichloroethane	5	10	ug/l	2/Week	Grab
Trichloroethylene	.5	10	ug/l	2/Week	Grab
Vinyl Chloride	25	50	ug/l	2/Week	Grab
Xylene	5	10	ug/l	2/Week	Grab
Solids, Total Suspended	NA	25	mg/l	2/Week	Grab
pH (Range)	6.0 - 9.0		SU	2/Week	Grab
PCB-1016	NA	ND*	ug/l	5/Month	6-hr.comp.
PCB-1221	NA	ND*	ug/l	5/Month	6-hr.comp.
PCB-1232	NA	ND*	ug/l	5/Month	6-hr.comp
PCB-1242	NA	ND*	ug/l	5/Month	6-hr.comp.
PCB-1248	NA	ND*	ug/l	5/Month	6-hr.comp.
PCB 1254	NA	ND*	ug/l	5/Month	6-hr.comp.
PCB 1260	NA	ND*	ug/l	5/Month	6-hr.comp.
1,2 Cis Dichloroethylene	5	10	ug/l	2/Week	Grab
Chloromethane	5	10	ug/l	2/Week	Grab
Methyl Ethyl Ketone	5	10	ug/l	2/Week	Grab
1,2 Dichloroethane	5	10	ug/l	2/Week	Grab
1,1 Dichloroethylene	5	10	ug/l	2/Week	Grab

* - None Detectable by USEPA Method 608 (.065 ug/l).



Item #5 The cover letter under which all data is submitted shall be signed by a Conklin, Ltd. corporate official and certify the data as accurate and representative.

Item #6 The samples analyzed per the requirements of this pilot test shall be unfiltered.

Please sign the acknowledgement line on the bottom signifying agreement to all the items addressed in this letter and their inclusion in the Engineering Report and Work Plan. One original letter should be returned to Frank Bifera, NYSDEC Division of Environmental Enforcement, Room 415, 50 Wolf Road, Albany, NY 12233-5501 and the other to the writer. This letter will be attached to the Work Plan.

Thank you for your cooperation..

Sincerely,

Steven P. Eidt, P.E.
Sr. Sanitary Engineer

Agreed to by _____

Jeffrey L. Duncan, P.E.
N.Y.S. License No. 063006-1
Dunn Geoscience Engineering Co., P.C.

CC: F. Bifera
M. Shanley
R. Brazell

NYSDEC TERMS AND CONDITIONS FOR OPERATION OF VACUUM EXTRACTION SYSTEM ("VES") - SEPTEMBER 1, 1989

1. The Dunn Geoscience Corporation shall be Conklin, Ltd.'s agent for overall responsibility, oversight and operation of the VES at the Clark Property.

2. All communication regarding the operation of the VES shall go to Dunn Geoscience Corporation.

3. The VES shall be started only upon the issuance of a letter from the Department indicating that the VES may commence operation.

4. Unless sooner discontinued by the Department, for any reason the VES shall operate for a period of 30 days from the date of issuance of the letter commencing operation and for such additional periods as the Department may authorize.

5. The VES shall operate in full compliance with the Conklin, Ltd. Agreement and Determination (Index #A7-0163-884) the Revised Pilot Study dated August, 1989 and all terms and conditions imposed by the Department.

6. No changes, modifications, alterations or adjustments shall be made to the Terra Vac system, its components, and/or its processes without the express written consent of the Department.

7. Dunn Geoscience Corporation shall immediately cease and discontinue operation of the pilot study and/or the Vacuum Extraction System and/or any component of the study or system upon receiving notice to do so from the Department for any reason whatsoever, in the sole discretion of the Department.

Dated: September 1, 1989

Richard Brazell, P.E.
Sr. Sanitary Engineer
NYS Department of
Environmental Conservation

Received and Accepted
Dunn Geoscience Corporation

By: _____ Dated: 5 Sept. 1989

RECEIVED
ALBANY FIELD UNIT
SEP 6 1989

New York State Department of Environmental Conservation
615 Erie Blvd. W., Syracuse, NY 13204-2400

Region 7 Environmental Quality Office
(315) 426-7531

Thomas C. Jorling
Commissioner

October 4, 1989

John P. McBurney
Dunn Geoscience Corporation
Lincoln Center, Suite 106
299 Cherry Hill Road
Parsippany, NJ 07054

Dear Mr. McBurney:

In accordance with the Agreement and Determination Index #A7-0163-88-12, effective September 6, 1989, and under the Terms and Conditions as established in Appendix F, particularly item number 6, you are authorized to make the following modifications to the TERRA-VAC Pilot Study under the following conditions:

1. Installation of a groundwater collection trench, steel sheeting containment wall, and well points between the containment wall and the Hess property line.

2. All soils which are excavated during any construction activity or related activity are to be treated as a hazardous waste. This includes removal, storage, sampling and eventual disposal.

   Prior to removal of any soil from the Clark property an agreement must be in place between Conklin Ltd. and the NYSDEC to perform this activity.

   All soils stored on the Clark property must be stored on plastic sheeting or an appropriate impermeable material and covered by this same material.

   Measures are needed to be taken to limit volatile and particulate emissions, and prevention of runoff from these stackpiles.

3. A revised health and safety plan is to be submitted to address worker safety of those working on the Clark property as well as those workers working adjacent to Clark (Marley property).

   This plan should also address decontamination procedures to be used for all vehicles working on the Clark site or entering the site for the purpose of making deliveries.

John P. McBurney
Dunn Geoscience Corporation
October 4, 1989

4. An air monitoring program needs to be implemented during the construction period.

5. A plan must be submitted to address surface runoff across the site during the construction period.

6. The measures undertaken pursuant to this modification will not diminish or otherwise effect Conklin's duty to perform an RI/FS under the agreement and fully define both onsite and offsite contamination.

7. This modification shall be a Term and Condition of the operation of the TERRA-VAC Pilot Study and shall be attached to appendix F of the agreement. (A7-0163-88-12)

Upon signing this agreement please resubmit to this office four copies.

If you have any questions please call me at (315) 426-7531.

Sincerely,

Richard J. Brazell, P.E.
Sr. Sanitary Engineer

Dated: October 4, 1989

Richard J. Brazell P.E.
Sr. Sanitary Engineer
NYS Department of
Environmental Conservation

Received and Accepted
Dunn Geoscience Corporation
By: John P. McBurney

Dated: October 10, 1989

DUNN GEOSCIENCE
ENGINEERING CO., P.C
12 METRO PARK ROAD
ALBANY, NEW YORK 12205
(518) 458-1313

ENGINEERING REPORT
TERRA VAC PILOT PLANT STUDY
CLARK PROPERTY
SYRACUSE, NEW YORK

PREPARED FOR: SHANLEY, SWEENEY & REILLY
10 THURLOW TERRACE
ALBANY, NEW YORK 12203

PREPARED BY: DUNN GEOSCIENCE ENGINEERING CO., P.C.
12 METRO PARK ROAD
ALBANY, NEW YORK 12205

THIS REPORT IS PREPARED FOR NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION REVIEW FOR PERMITTING PURPOSES ONLY. THE REPORT IS NOT INTENDED FOR THE PURPOSES OF CONSTRUCTION.

JEFFREY L. DUNCAN
NEW YORK STATE PROFESSIONAL ENGINEER
NUMBER: 063006-1

18 August 1989
DATE

INTRODUCTION

The following sections provide detailed information regarding the anticipated contaminant loading, water treatability, and carbon usage during the proposed pumping test and pilot-plant operation of the vacuum extraction system (Terra Vac) at the Clark property. The Clark property is located east of the Barge Canal and south of Onondaga Lake in Syracuse, New York.

A pumping test will be performed prior to the start up of the Terra Vac pilot plant. The proposed pumping test consists of a step test and a 72-hr constant-rate test. The pumping test results will be used to evaluate the hydraulic characteristics of that portion of the Clark site currently with monitoring wells.

The Terra Vac pilot plant for the Clark Property will be operated to remove both groundwater, and volatile organics from above the groundwater. The results of the pilot-plant test will be used to scale up the system, if Terra Vac is applicable to the remediation of the site, to full scale. The groundwater will be pumped from the vacuum extraction wells to lower the water table. A vacuum will be applied to the vacuum extraction wells to remove soil gas from unsaturated soils. The soil gas may contain fine particulates and water. The pumped water may contain fine particulates. The soil gas will pass through a gas-water separator. The water from the gas-water separator and the water from the wells will pass through a solids removal system.

The attached drawing entitled "Terra Vac Pilot Plant; Clark Property; Syracuse, New York" presents a simplified schematic of the system. This drawing is not meant for construction, but is only intended to depict the relationship between the different components of the system.

CONTAMINANT LOADS AND TREATABILITY

The groundwater at the Clark property site is contaminated with chlorinated organics and aromatic hydrocarbons. The results of the Clark property site investigation were previously submitted ("Report on Hydrogeologic Conditions at the Clark Property", September 1988). The compounds and their respective

concentration expected in the groundwater feed to the Terra Vac pilot plant are shown in Table 1.

TABLE 1
ESTIMATED PILOT PLANT FEED QUALITY
CLARK PROPERTY; SYRACUSE, NEW YORK

Compound	Conc.(ppb)
Vinyl Chloride	4,750
Methylene Chloride	420
1,1-Dichloroethylene	400
1,1-Dichloroethane	2,100
cis 1,2-Dichloroethylene	32,500
1,2-Dichloroethane	50
1,1,1-Trichloroethane	19,000
Trichloroethylene	115,000
Tetrachloroethylene	180
Toluene	40,000

This composition is based on a composite of water removed from the monitoring wells prior to the start of the treatability testing.

The compounds present are generally removable from water using granular activated carbon (GAC) treatment. Calgon Carbon Corporation (Calgon) was contracted by Dunn to perform a treatability study on the composite sample. The study provided treatability data for each compound. The results are discussed in a Calgon report entitled "Accelerated Column Test (ACT) for the Removal of Chlorinated Organic Compounds and Toluene from Groundwater", dated March 9, 1989. Applicable portions of this report are included in Appendix A of this document. The test results indicate that GAC is a viable treatment alternative. Carbon usage during the pumping and pilot-plant tests has been estimated, and is presented later in this document.

SOLIDS AND METALS

The Terra Vac System will be set-up to handle solids produced by the wells. Calgon has performed analysis of samples from the site and determined that suspended solids removal may be required prior to aqueous-phase carbon treatment. The Terra Vac system will be equipped with a settling tank and a 10 micron filter to remove particulate matter. Analytical data for metals, with the exception of iron, was not collected during the ACT.

The purpose of the pilot test is to determine the operating parameters for the process. Solids and dissolved metals may lower the efficiency of carbon adsorption. The carbon may need to be changed at a higher frequency. The pilot plant will be monitored to evaluate the site-specific operating conditions via sampling and analysis.

CARBON USAGE CALCULATION

The purpose of this calculation is to determine the carbon-usage rates during the pumping tests and operation of the proposed vacuum extraction system pilot plant at the Clark property. The carbon-usage rates have been estimated using the anticipated pumping rates during the proposed pumping test and pilot plant operation, data provided from Calgon's ACT performed during February 1989, and a feed composition equal to that presented in Table 1.

Calgon estimated the carbon-usage rate to be 495 lbs/day under the following conditions:

- a flow rate of 60 gpm,
- a feed composition as presented in Table 1, and
- a carbon bed residence time of 30 min.

Anticipated Pumping Rates

The groundwater is anticipated to be pumped at differing rates and durations during the pumping and pilot tests. These rates and durations were determined using a mathematical simulation of a pumping test in the existing vacuum extraction wells. Appendix B contains a brief summary of the model used.

The model was used to estimate the pumping rates from five existing vacuum extraction wells. These wells (VE-1, 2, 3, 4, & 5) were previously installed on-site. Existing vacuum extraction wells VE-2 and VE-3 were installed to 14 feet and 10 feet, respectively. The three existing deep vacuum extraction wells (VE-1, VE-4 and VE-5) were each installed to a depth of approximately 28 feet. Flow rates from each well were adjusted in the model to maximize the groundwater drawdown rate without causing the simulation to generate a water level below the bottom of three existing deep extraction wells. An attempt was made during the simulation to maintain the groundwater level 8 to 10 ft above the base of the deep extraction wells.

The input variables [hydraulic conductivity (5 x 10^{-3} cm/s), aquifer thickness (20 ft.), and specific yield (0.15)] used to characterize the aquifer in which the pumping rates were assessed, were based on welltest results provided in the September 1988 report on the hydrogeologic investigation of the Clark property.

The effects of pumping these five wells were simulated with the analytical model according to the following conditions:

- The shallow wells were pumped until the simulated groundwater elevation was below their respective bases.
- The pumping rate was diminished over time in each of the deep wells in order to maintain the designed drawdown of 15 feet.

Based on the results of the analytical model and the limitations thereof, the pumping rates for the duration of the pilot study were estimated. The estimates are presented in Table 2.

Prior to full scale pumping for the pilot study, a step-rate pumping test will be performed to confirm the pumping rates shown in Table 2 for the pilot plant test and to determine hydraulic characteristics of the subsurface. Extraction well VE-1 will be pumped using 4 steps of 100 minutes each (10, 20, 30 and 50 gpm) to yield a total withdrawal of approximately 11,000 gallons of groundwater.

The pumped water will be treated using the aqueous-phase activated carbon units which are part of the Terra Vac pilot plant system. The treated water will be

stored in the storage tank until the VES system is started. A vacuum will not be drawn on the extraction wells during the step-rate pumping test.

TABLE 2

Pumping Rate for Each Well (gpm)

Terra Vac Pilot-Plant Test

Clark Property; Syracuse, New York

Time Since Pumping Began (Days)[1]	VE-1	VE-2	VE-3	VE-4	VE-5	Total Pumping Rate (gpm)
0	30	25	25	30	30	140
2 hrs	30	25	pump off	30	30	115
10 hrs	30	pump off	--	30	30	90
1	20	--	--	20	20	60
5	15	--	--	15	15	45
14+	10	--	--	10	10	30

The higher rates (greater than 10 gpm) are required to lower the water table to allow soil vacuuming. The 10 gpm flow rate is necessary to maintain the artificial vadose zone during the pilot test.

Estimated Carbon Use During Pumping and Pilot Tests

The carbon-usage rates associated with the anticipated pumping rates have been estimated. The rates are estimated based on the following assumptions:

- o the influent composition throughout the pilot-plant test duration will be similar to the composition used for the ACT (Table 1);
- o the shorter contact time for the first 24 hrs of the pumping test due to a higher flow rate than used by Calgon in their design basis will not adversely affect the overall carbon usage;
- o the carbon usage rate is linearly dependent on the mass feed rate of organics; and,

1 Unless otherwise noted.

- the carbon-usage rate for the representative feed composition with a 30 min residence time is 495 lb/d.

The following carbon-usage rates during the step-rate pumping test are estimated:

100 min at 10 gpm

$$\frac{10\text{gpm}}{60\text{gpm}} \times (495\text{lb/d}) \times \frac{1\text{ day}}{24\text{ hr}} \times \frac{1\text{ hr}}{60\text{ min}} \times 100\text{ min} = 6\text{ lb}$$

100 min at 20 gpm

$$\frac{20\text{gpm}}{60\text{gpm}} \times (495\text{lb/d}) \times \frac{1\text{ day}}{24\text{ hr}} \times \frac{1\text{ hr}}{60\text{ min}} \times 100\text{ min} = 12\text{ lb}$$

100 min at 30 gpm

$$\frac{30\text{gpm}}{60\text{gpm}} \times (495\text{lb/d}) \times \frac{1\text{ day}}{24\text{ hr}} \times \frac{1\text{ hr}}{60\text{ min}} \times 100\text{ min} = 17\text{ lb}$$

100 min at 50 gpm

$$\frac{50\text{gpm}}{60\text{gpm}} \times (495\text{lb/d}) \times \frac{1\text{ day}}{24\text{ hr}} \times \frac{1\text{ hr}}{60\text{min}} \times 100\text{ min} = 30\text{ lb}$$

Estimated Step-Rate Pumping Test Carbon Use: 65 lb

The following carbon-usage rates during the pilot plant test are estimated:

0-2 hr at 140 gpm

$$\frac{140\text{ gpm}}{60\text{ gpm}} \times (495\text{ lb/day}) \times \frac{1\text{ day}}{24\text{ hr}} \times 2\text{ hr} = 100\text{ lb}$$

2-10 hr at 115 gpm

$$\frac{115\text{ gpm}}{60\text{ gpm}} \times (495\text{ lb/day}) \times \frac{1\text{ day}}{24\text{ hr}} \times 8\text{ hr} = 320\text{ lb}$$

10-24 hr at 90 gpm

$$\frac{90\text{ gpm}}{60\text{ gpm}} \times 495\text{ lb/day} \times \frac{1\text{ day}}{24\text{ hr}} \times 14\text{ hr} = 430\text{ lb}$$

day 1 to day 5 at 60 gpm

$$495\text{ lb/day} \times 4\text{ days} = 1980\text{ lb}$$

day 5 to day 14 at 45 gpm

45 gpm / 60 gpm	x 495 lb/day x	9 days =	3,340 lb

day 14 to day 30 at 30 gpm

30 gpm / 60 gpm	x 495 lb/day x	16 days =	3,960 lb

Estimated Pilot Plant Carbon Use:	10,130 lb
Estimated Project -Total Carbon Use:	10,195 lb

The total amount of carbon to be used during the pump tests and VES pilot test is approximately 10,000 lbs. The Terra Vac pilot plant will be equipped with ten primary and secondary carbon canisters of 1,000 lbs each. The primary canisters will be operated in parallel. The effluent from each primary canister will be the influent to one secondary canister. Therefore, it is estimated that the useful life of the carbon in the primary canisters will be spent at the end of the pilot-plant test. The carbon in the secondary canisters will be provided as a back up to maintain acceptable effluent quality from the pilot plant during the test.

It is not anticipated to require changeout of the carbon canisters during the duration of the pumping test and pilot-plant test (30 d).

DURATION OF PILOT PLANT OPERATIONS

The pilot-plant and pumping tests will be run long enough to develop sufficient data to determine if the objectives of the study have been achieved. Nominally, these tests are estimated to last a cumulative period of 30 days. During this period, an estimated 1,767,600 gal of groundwater will have been withdrawn from beneath the Clark property, treated, and discharged.

The test duration may be different than the 30 days. A decision tree (attached) will be used to provide a means to determine when the pilot-plant test is complete.

OPERATIONS MONITORING

Discharge Monitoring

Monitoring of the liquid stream as it passes through the Terra Vac system will be performed during the pilot study. Samples will be collected to evaluate the quality of the discharge from the Terra Vac Pilot Plant. In addition, on a less frequent basis, the feed to the treatment system and a representative sample of the water between the primary and secondary carbon units will be collected. Table 3 presents the sample frequency and the sample analyses to be performed during the pilot plant test. Each sample will be collected as a grab sample at the respective location (except for PCB analysis which will be a 6 hour composite) and will be submitted to a New York State DEC Certified Laboratory for organic and inorganic analysis. The discharge flow will be continuously monitored and recorded. The analyses will be requested on a rapid turnaround basis (less than one week). The results will be available to NYSDEC Region 7 and the Onondaga County Health Department at the site upon receipt. A copy of the results will be sent to the NYSDEC Region 7 and the Ononadaga County Health Department within one business day of the data receipt. The results will be certified by the laboratory manager and will be sent under cover signed by a Conklin Ltd. corporate official.

Carbon Usage Monitoring

Breakthrough of the primary activated carbon canister will be monitored using analytical results for 1,1-DCA (l,l-Dichloroethane). 1,1-DCA was chosen as the breakthrough monitor because Calgon determined, during the ACT, that 1,1-DCA was the first constituent to be detected in the test column effluent which has a NYS DOC imposed daily maximum discharge limit of 10ug/l and was monitored during the ACT.

Only one compound (MTBE) has a lower daily maximum discharge limitation (5ug/l). This compound was not analyzed for during the site investigation. Therefore, MTBE analysis in between the primary and secondary carbon canisters will also be monitored.

According to the results from the ACT, vinyl chloride was the first substance to break through. The daily maximum discharge limit for this substance is at least five times higher than the other regulated substances. Therefore, this substance is not proposed for breakthrough determination. However, it will be monitored in the treatment system effluent. The effluent concentration will be checked against the daily maximum discharge limitation. If the vinyl chloride concentration in the system effluent exceeds 50ug/l of the daily maximum discharge limit for three consecutive sampling periods before 1,1-DCA or MTBE is detected in the water discharging from the primary carbon canister, breakthrough will be determined to have occurred.

If breakthrough, as determined by detecting 1,1-DCA or MTBE in the discharge from the primary carbon units or by finding vinyl chloride in excess of 50% of its daily maximum concentration in the system effluent during three consecutive sampling events, occurs during the pilot plant test, the primary carbon units will be removed from service, the secondary units will become the primary units, and new carbon canisters will be put in service as secondary units.

WASTE DISPOSAL

All carbon will be taken off-site after completion of the pilot-plant test to be regenerated, or for disposal in accordance with local, state, and federal regulations.

All water generated during the pumping tests and pilot plant operation will be discharged to surface water (the Barge Canal) after treatment.

All solids which have settled in the settling tank will be disposed of off-site in accordance with local, state, and federal regulations.

TABLE 3

TERRA VAC PILOT PLANT

CLARK PROPERTY, SYRACUSE, NEW YORK

MONITORING PLAN

PARAMETER	FREQUENCY[1]			ANALYTICAL PROCEDURE[2]
LOCATION:	1	2	3[3]	
pH	1	1	2	150.1[4]
Aluminum	1	1	2	6010
Iron	1	1	2	6010
Lead	1	1	2	6010
Manganese	1	1	2	6010
Total Suspended Solids	1	1	2	160.2
Oil and Grease	1	1	2	413.2
Naphthalene	1	1	2	610 or 625
Phenol	1	1	2	604 or 625
PCBs	1	1	5/mo[5]	608
Purgeable Halocarbon	1	1	2	601 or 624
Purgeable Aromatics[6]	1	1	2	602 or 624
MTBE[7]	1	1	2	624[8]
2-butanone	1	1	2	624

Notes:

1. Frequency numbers indicate the number of samples collected per week during the duration of the pilot test for analysis unless otherwise indicated.

2. 1xx and 4xx series analyses from Methods for Chemical Analysis of Water and Wastes EPA 600/4-79-020

   6xx series analyses from Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater EPA 600/4-82-057

   6xxx series analyses from Test Methods for Evaluating Solid Waste SW-846

3. Location 1 is the inlet to the activated carbon treatment system.

Location 2 is one sample from the transfer line from a primary carbon canister to its corresponding secondary carbon canister.

Location 3 is a sample from the treatment system discharge after the storage tank.

4. This measurement will be performed in the field using a calibrated pH meter.

5. This sample will be a 6-hour composite comprised of equal-volume grab samples collected once per hour during the 6-hour period.

6. Modified to include calibration for xylenes.

7. Methyl Tertiary Butyl Ether.

8. Forward library search for MTBE.

- DO NOT REMOVE -
CLARK

ADDENDUM:

Approved Interim Remediation Plan

Site #734048

Field Health and Safety Plan

This Field Health and Safety Plan is part of the Approved Interim Remediation Plan. It includes two (2) parts: 1) The Field Health and Safety Plan approved by the Department for the Pilot Study at Site #734048 (Attachment A); and 2) Modifications to that plan determined necessary by DUNN to address potential concerns associated with site activities (Attachment B).

ATTACHMENT "A"

Pilot Study Health and Safety Plan

PILOT STUDY

FIELD HEALTH AND SAFETY PLAN

1.0 INTRODUCTION

This Field Health and Safety Plan (FHSP) has been developed to identify hazardous conditions known or suspected to be present on the site and ensure that they do not adversely impact the health or safety of personnel conducting field activities at the site. It is applicable to all Dunn Geoscience Corporation (Dunn) personnel who visit the site and is intended to ensure that the procedures used during these field activities are protective of human health and safety and of the environment outside of the work areas. This plan incorporates by reference the applicable requirements of the Occupational Safety and Health Administration in 29 CFR Parts 1910 and 1926.

The requirements and guidelines in this FHSP are based on a review of all available information and an evaluation of potential hazards. They have been developed to minimize the potential for exposures of field personnel. These requirements can be modified by the Project Manager, the Corporate Health and Safety Officer (CHSO), or the Site Health and Safety Officer (SHSO) in response to additional information regarding the potential for exposure to hazards.

All field personnel working at the site will be required to familiarize themselves with this FHSP and abide by its requirements. Adherence to this FHSP will minimize the possibility that personnel at the site and the public will be injured or exposed to health hazards. Information on potential health, safety and environmental hazards is discussed in conjunction with appropriate protective measures including assignment of responsibility, personal protective equipment requirements, work practices, and emergency response procedures.

In general, subcontractors are responsible for complying with all regulations and client policies applicable to the work they are performing. Subcontractors must develop their own FHSP's which must be at least as stringent as this one. With Dunn's permission, a subcontractor may adopt this FHSP.

Dunn personnel can and must stop work by a subcontractor who is observed to not be following required health and safety procedures.

This FHSP is specifically intended for those personnel who will be conducting activities within the defined scope of work in specified areas of the site. Future actions that may be conducted at this site may necessitate the modification of task-specific health and safety requirements. The entry of unauthorized personnel into a restricted area will be prohibited.

2.0 DESIGNATION OF RESPONSIBILITIES

The responsibility for implementing this FHSP is shared by the Project Manager, the CHSO and the SHSO. The Project Manager will recommend policy on all safety matters including work practices, training and response actions, and will provide the necessary resources to conduct activities safely. Responsibility for proper implementation of this FHSP lies jointly with the Project Manager and the SHSO.

The CHSO has overall responsibility for developing safety procedures and training programs, maintaining a high level of safety awareness; ensuring compliance with applicable federal and state health and safety regulations; determining appropriate protection including the selection of protective equipment, maintenance schedules and monitoring protocols; and maintaining close communication with the SHSO and field personnel. The CHSO is the final decision point for determination of health and safety policies and protocols.

The SHSO is responsible for establishing operating standards and coordinating all safety and technical activities occurring at the site, with guidance from the CHSO. Specifically, the SHSO is responsible for:

- Assuring that a complete copy of this FHSP is at the site prior to the start of field activities and that all workers are familiar with it.
- Conducting training and briefing sessions.

- o Ensuring the availability, use, and proper maintenance of personal protective, decontamination, and other health or safety equipment.
- o Maintaining a high level of safety awareness among team members and communicating pertinent matters to them promptly.
- o Assuring that all field activities are performed in a manner consistent with Company policy and this FHSP.
- o Monitoring for dangerous conditions during field activities.
- o Assuring proper decontamination of personnel and equipment.
- o Coordinating with emergency response personnel and medical support facilities.
- o Initiating immediate corrective actions in the event of an emergency or unsafe condition.
- o Notifying the Project Manager and CHSO promptly of any emergency, unsafe condition, problem encountered, or exception to the requirements in this FHSP.
- o Recommending improved health and safety measures to the CHSO.

The SHSO has the authority to:

- o Suspend field activities or otherwise limit exposures if the health or safety of any person appears to be endangered.
- o Notify Company or subcontractor personnel to alter work practices that are deemed not properly protective of human health or the environment.
- o Suspend an individual from field activities for infraction of the requirements in this FHSP.

However, the presence of the SHSO shall in no way relieve any person or company of its obligations to comply with the requirements of this Plan and all applicable federal, state and local laws and regulations.

The key element in the responsibility for health and safety is the individual field team member. Each must be familiar with and conform to the safety protocols prescribed in this FHSP, and communicate any relevant experience or observations to provide valuable inputs to improving overall safety.

3.0 SCOPE OF WORK

Specific tasks covered by this FHSP may be found in the appendices addressing Drilling, Trenching etc.

4.0 SITE-SPECIFIC HEALTH AND SAFETY CONCERNS

Site History

Historical Data

Historical information available regarding the site suggests that it had been used by a concrete manufacturing firm at one time. The site survey has revealed no buried metals, containers or vessels containing pockets of chemicals.

Site Concerns

The following are summaries of constituents detected at the site.

- Chlorinated Hydrocarbons — Methylene Chloride, Trichloroethylene, 1,1,1 Trichloroethane (also called Methylchloroform), 1,2 Trans dichloroethylene, 1, 1 dichloroethane, Vinyl chloride
- Organic Hydrocarbons (Acetone, Toluene, Xylenes)

No safety hazards were identified other than those normally associated with on site testing and therefore well-known to the personnel involved. Use of the specified personal protective equipment will minimize the risks.

If field measurements or observations indicate that a potential exposure is greater than the protection afforded by the equipment specified in this Plan, the exposure will be reduced or the degree of personal protection will be increased to provide adequate protection.

5.0 SITE-SPECIFIC HEALTH AND SAFETY REQUIREMENTS

Key Personnel

The key personnel in this study responsible for various aspects of the Health and Safety Plan are as follows:

A. Project Advisor - D. R. Alexander
B. Project Manager - J. P. McBurney
C. On-Site Coordinator - to be designated on a task specific basis
D. Project Health and Safety Office - Mark E. Falerios
E. Corporate Health and Safety Officer - D. R. Alexander/M. E. Falerios

Training

The Project Manager, SHSO and all personnel working at the site will receive training at least meeting the requirements established by the Occupational Safety and Health Administration in 29 CFR 1910.120.

Persons will be briefed by the Project Manager or SHSO as to the potential hazards which may be encountered. Topics will include:

- Availability of this FHSP and the nature of its contents.
- General site hazards and specific hazards in the work areas including those attributable to the chemicals present.
- Selection, use, testing, and care of body, head, eye, hand, foot and respiratory protection to be worn, along with the limitations of each.
- The demarcation system that will be used to identify restricted-access, decontamination, and contamination-free zones.

- o Decontamination procedures for personal protective and other equipment.
- o Emergency alarm systems and other forms of notification, and evacuation routes to be followed.
- o Prohibitions on smoking and carrying of tobacco products, eating, drinking, and open fires (except by permit) in the work area.
- o Methods to obtain outside emergency assistance and medical attention.
- o Site specific health, safety, and emergency response requirements.

Air Monitoring

No immediately dangerous to life or health exposures are expected to be encountered. Specific monitoring for selected materials will be performed to assure adequacy of protective measures. If HNU analysis of breathing zone air indicates readings of 5 ppm or greater of volatile organic compounds, half mask or full-face respirators equipped with organic vapor cartridges should be worn. An explosimeter will also be used to monitor explosive gases, as appropriate.

If air monitoring results exceed 50 ppm of volatile organic compounds, work should be halted until Level B protection or alternate controls will be adopted to reduce emissions to below 50 ppm.

Note: Solvent vapors may concentrate in trenches under certain conditions (e.g. narrow, deep trenches which prevent adequate air movement). If these conditions are present, the area should be tested prior to allowing entry of personnel. (See confined space entry procedures in Appendices).

Personal Protective Equipment:

Table 1 indicates the general levels of personal protective equipment (PPE) that will be used on-site.

Table 1

Protection Levels

	C	Modified C	D
Air-purifying respirator	Yes	(1)	(1)
Chemical-resistant disposable coveralls	Yes	Yes	No
Chemical-resistant outer gloves	Yes	Yes	Yes
Disposable inner gloves	Yes	(2)	No
Overboots (chemically resistant)	Yes	Yes	Yes
Leather shoes/boots or safety shoes	Yes	Yes	Yes
Safety glasses, goggles, or face shield	Yes	Yes	Yes
Hard hat	Yes	Yes	Yes
Coveralls	(2)	(2)	(2)

(1) Required if a steady-state HNU reading in the breathing zone exceeds 5 ppm above the background readings. If site specific information includes likely exposure to highly toxic particulates, 1/2 mask respirators equipped with combination organic vapor - high efficiency filter cartridges will be required. Otherwise optional at the discretion of the employee and SHSO.

(2) Optional at the discretion of the employee and SHSO depending on site specific conditions.

Table 2 lists the chemicals and chemical classes of concern on the site, along with the specific protection level and PPE materials of construction for each.

Table 2

Task-Specific PPE

Task(s)	Chemical(s) of Concern	PPE Level	Respirator* Cartridge Type	Gloves & Boots	Coveralls
Direct Contact with contaminated soil of water (Trench entry, handling of removed soils) etc	Halogenated and aromatic solvents	C	Org. vapor/ high efficiency filters	Viton rubber	Tyvek
Site Visit	None	D	N/A	Viton rubber	N/A
Activity with no direct soil or contact (e.g. removal of volatile organics from soil by air vacuuming), etc	Halogenated and aromatic solvents	Modified C	Org. vapor/ high efficiency filters	Viton rubber	N/A

* Upon detection of organic vapors (HNU) or generation of dusts bearing toxic particulates. Unless the SHSO directs otherwise, when respirators are used, the cartridges should be changed after eight hours of use, or at the end of each shift, or when any indication of breakthrough or excess resistance to breathing is detected.

Other Protective Equipment

A first aid kit, portable eyewash, and vehicle will be kept in close proximity to the site. A fire extinguisher rated 20A-B-C (or higher) will be kept in the immediate vicinity of any trenching or drilling equipment.

Decontamination Procedures

To minimize the movement of contaminants from the work areas to other areas, a decontamination station will be established in a designated contaminant reduction zone at one edge of where activities occur. This station will consist at a minimum of a plastic-covered table with decontamination supplies and a plastic-covered seat. Galvanized or plastic tubs will be used to hold detergent solution and rinse water. Walkways and the area under the decontamination tubs will be plastic covered.

The following steps must be taken to decontaminate personnel leaving a work area:

- Place equipment and sample containers that must be decontaminated on a plastic drop cloth.
- Place disposable supplies and equipment in a labeled drum.
- Scrub non-disposable gloves and outer boots (if used) with a brush in detergent water, then rinse in clear water.
- Remove disposable protective garments and place in a appropriately labeled drum.
- Remove respirator (if worn).
- Wash hands and face thoroughly.

Personnel must take the following steps to decontaminate equipment and sample containers leaving a Level A, B, or C work area:

- Don protective equipment.
- Wash reusable equipment in detergent solution and/or an appropriate solvent, or steam clean.

- o Dry sample containers with paper towels (if necessary) and place on a clean drop cloth.
- o Remove and discard used respirator cartridges. Wash respirators in fresh detergent water, rinse in clear water, and disinfect with isopropanol. Store in a closed plastic bag, away from sources of contamination.
- o Dispose of or launder clothing before reuse (or place in appropriately labeled impervious containers for transport to laundry or disposal).

The following steps will be required to clean up following completion of work:

- o Dispose of all washing and rinsing solutions into designated containers or an approved wastewater treatment system.
- o Place all solid waste materials into (disposable gloves and garments, tape, plastic drop cloths, etc.) into appropriately labeled drums or other impervious containers for disposal.

6.0 EMERGENCY PROCEDURES

The following standard emergency procedures will be implemented on-site as necessary. The SHSO will be notified of any on-site emergency and be responsible for ensuring that the appropriate procedures are followed and the CHSO and Project Manager are notified. A first aid kit, eye wash unit, and fire extinguisher will be readily available to field personnel.

Notification

Direct verbal notification will be used in an emergency to alert all personnel to leave a work area immediately.

The following standard hand signals will also be used as necessary:

Hand gripping throat	Can't breathe/Out of air
Grip partner's wrist	Leave area immediately - No debate!

Hands on top of head	Need assistance
Thumbs up	Yes/Okay
Thumbs down	No/A problem

Personnel Injury

If anyone within a work area cannot leave the restricted area without assistance, due to chemical exposure, all site personnel will assemble in the decontamination area. After donning appropriate protective equipment as determined by the SHSO, a rescue team will enter the area to assist or remove the injured person. The SHSO will evaluate the nature of the injury, and the affected person will be decontaminated to the extent feasible prior to movement. Appropriate first aid will be initiated, and if required contact will be made for an ambulance and with the designated medical facility. No person will reenter the work area until the cause of the injury or symptoms is determined.

Fire/Explosion

Upon notification of a fire beyond the incipient stage or an explosion anywhere on the site, the fire department will be alerted and all personnel moved to a safe distance.

Heat Stress

Any person who experiences signs of distress will be instructed to stop work immediately. Medical attention will be sought if there is any doubt that prompt, full recovery will result. Symptoms of distress include muscle cramps; pale and clammy or hot, dry and flushed skin; confusion, disorientation and incoherent speech; nausea; and convulsions.

Personal Protective Equipment Failure

If any worker experiences a failure or alteration of protective equipment that affects the protection factor (e.g., torn protective suit, odor inside

respirator), that person (and his/her partner) will immediately leave the work area. Re-entry will not be permitted until the equipment has been repaired or replaced and the cause of the problem is known.

Other Equipment Failure

If any other equipment at the work area fails to operate properly, the Project Manager and/or SHSO will be notified and will then determine the effect of this failure on continuing operations. If it is determined that the failure affects the safety of personnel (e.g., failure of monitoring equipment) or prevents completion of the planned tasks, all personnel will leave the work area until appropriate corrective actions have been taken.

Site Control

The work area will be segregated into three work zones based upon monitoring data, the nature of work to be performed and topography. The on site coordinator will establish the following areas with consultation of the project health and safety coordinator and project team lead:

1. Exclusion Zone - This will be the actual work zone involved with contaminated soil disturbance. An outer boundary will be established and clearly marked. The area of the exclusion zone will be established based on onsite work conditions, exposure monitoring, etc.

    a. Access to the exclusion zone will be limited to those employees who have the requisite training, protective equipment and responsibilities for work in this area. A log of employees who enter the exclusion zone shall be maintained.

    b. The area of exclusion zone will be changed as necessary depending on the site coordinators judgement regarding work conditions, air sampling, etc.

2. Contamination Reduction Zone (CRZ) - An area between the actual work zone (exclusion zone) and support zone will be established to facilitate employee and equipment decontamination, protective equipment storage and supply, and employee rest areas (wash and toilet facilities, liquids, benches, etc:).

    a. The location of the CRZ will be established in an area offering minimal contamination and will be subject to charge based on the site coordinators judgment considering work conditions, air monitoring etc.

3. Support Zone - An area free of contamination will be identified and clearly marked where administrative and other support functions (not requiring entrance to the exclusion or contamination reduction zone) can be performed. The actual siting of the support zone will be established by the project leader and site coordinator considering distance from exclusion zone, visibility, accessibility, freedom of cross contamination from the exclusion zone, air monitoring data etc.

Security measures will be established by the site coordinator in conjunction with other project team members to control access to the site and prevent unauthorized access during working and non-working hours.

Emergency Services

Emergency Service	Telephone Number
Fire Department	(315) 471-1161
Police Department	(315) 425-6111
Ambulance	(315) 471-0102
Hospital/Emergency Care Facility	(315) 424-5111
Poison Control Center	(800) 282-3171
or	(315) 476-4766
Chemical Emergency Advice (CHEMTREC)	(800) 424-9300

Directions to St. Joseph's Hospital

- On leaving site through main gate make a left onto W. Hiawatha Blvd.,
- continue approximately 1/2 mile - cross over Route 81,
- Make right onto North Salina Street,
- continue on Salina (veers Right) for approximately 1 mile,
- At intersection of Prospect and Salina continue straight onto Prospect Avenue,
- Follow Prospect Street 2 blocks to St. Joseph Hospital

A sketch showing site evacuation routes and a map showing the preferred route to the nearest emergency health care facility are attached.

7.0 APPENDICES

General Field Safety Rules
Drilling Safety Concerns

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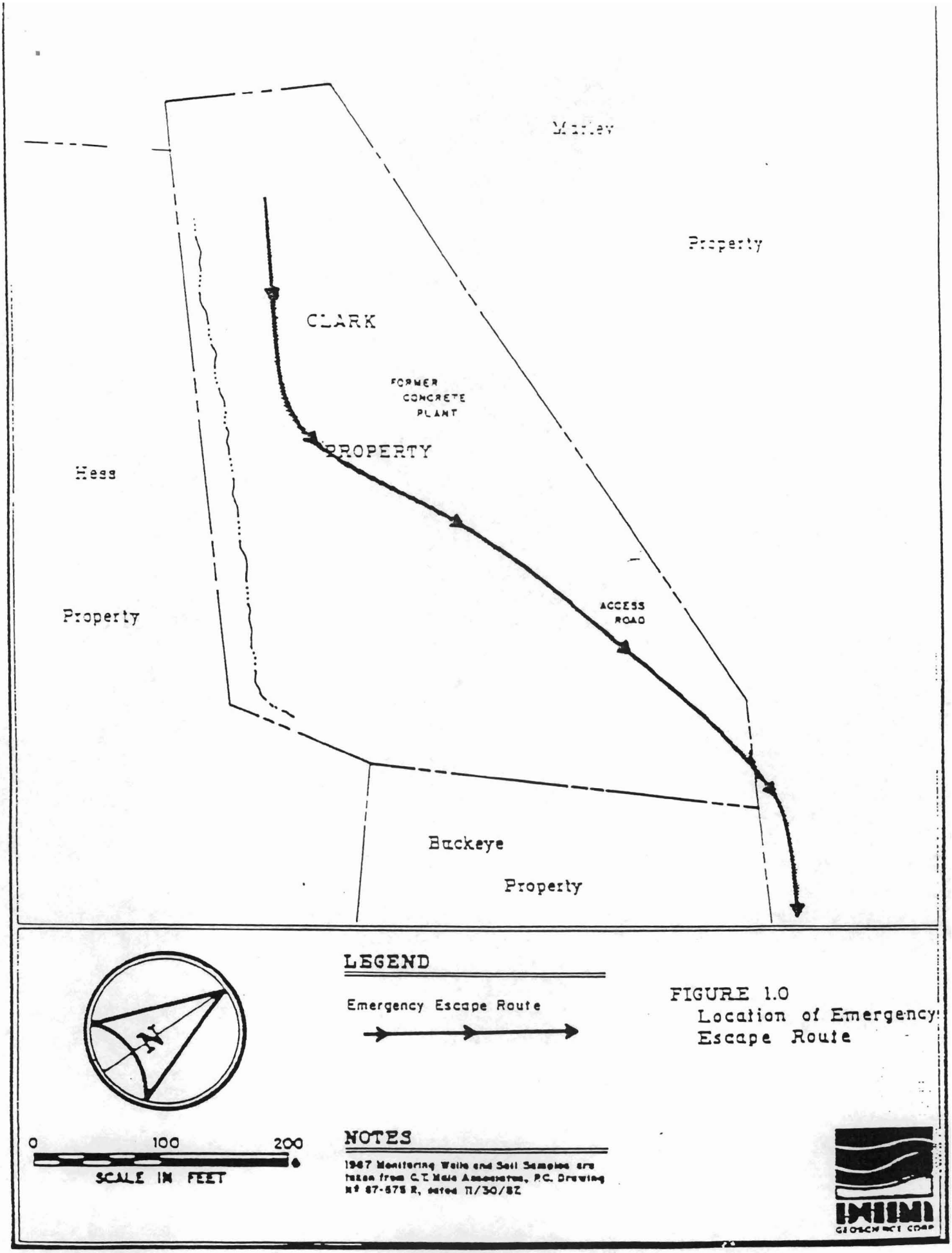


FIGURE 1.0
Location of Emergency Escape Route

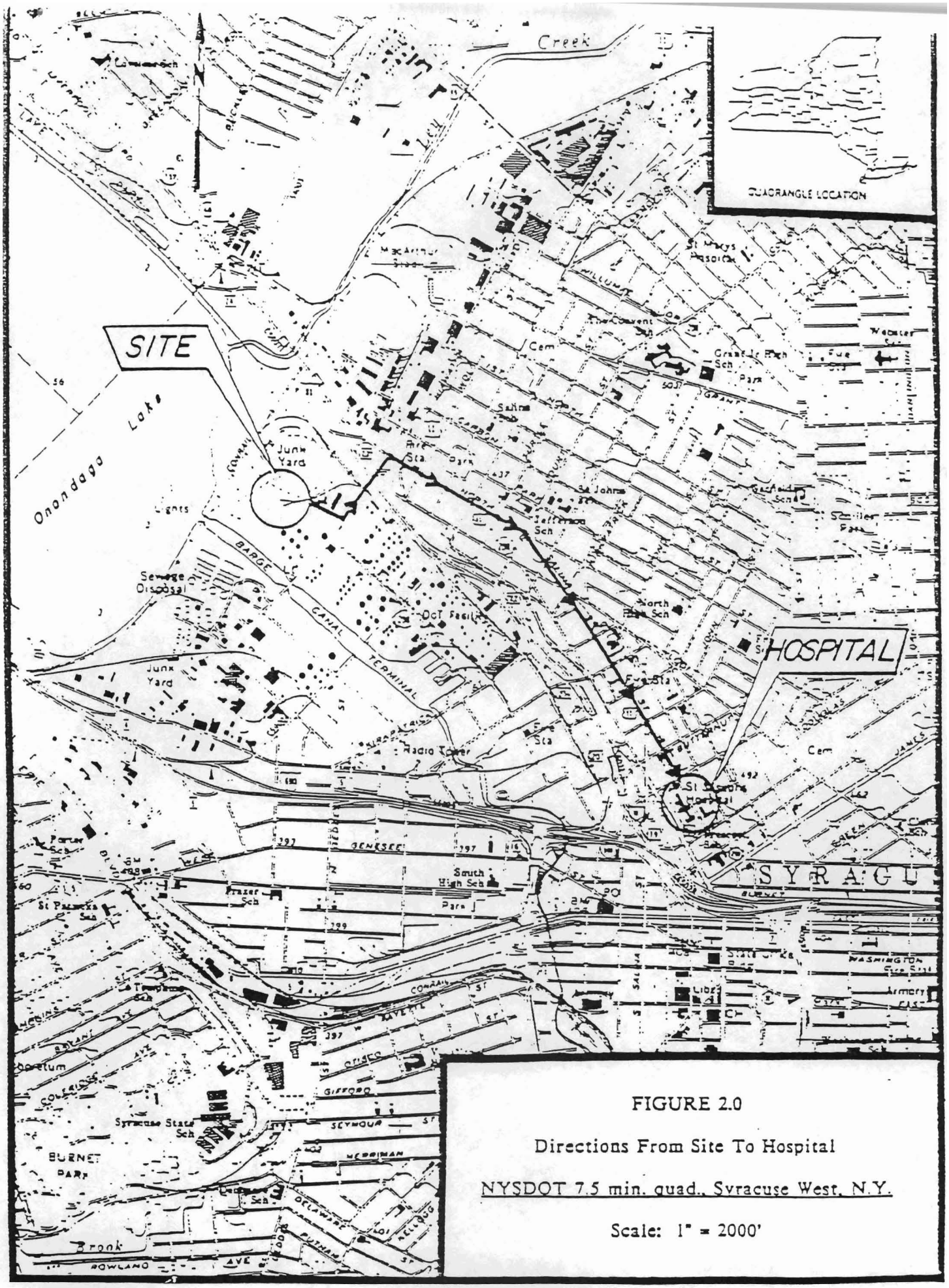


FIGURE 2.0

Directions From Site To Hospital

NYSDOT 7.5 min. quad., Syracuse West, N.Y.

Scale: 1" = 2000'

FIELD SAFETY

GENERAL SAFETY RULES

1. Field Service personnel should maintain communications with their office counterparts. Periodic phone calls may be warranted to assure no mishaps have occurred.

2. The location and phone numbers of the nearest emergency care facility and local fire and police department should be determined and readily available to field service employees prior to site access.

3. During initial site characterization potential hazards arising from unstable topography, presence of water, construction debris, plants, insects or animals should be identified and measures taken to avoid them.

4. Access to remote locations warrants careful consideration of protective clothing and/or first aid supplies to prevent and/or address insect or animal bites/strips etc. Proper first aid supplies and use of a buddy system are especially important for employees who have known allergies (e.g. sensitivity to bee stings).

4. Dunn Geoscience employees who are at a customer's facility will be expected to adhere to the plant or facility safety and health rules in addition to the health and safety plan for the project. Where there are conflicts between the facility rules and the Dunn Geoscience's health and safety plan, the project manager and corporate health and safety officer should be contacted for resolution of inconsistencies. Wherever possible, the two plans should be reviewed prior to site access to identify and resolve any conflicts.

DRILLING - GENERAL HEALTH AND SAFETY CONCERNS

1. Work around heavy equipment has potential for trauma due to contact with overhead objects, cables etc. Minimum protection for protection from these hazards includes safety shoes, hard hats and safety glasses.

2. Special precautions may be necessary to assure the drilling is performed in an area free of underground objects including power or gas lines (generally less than 4 feet deep). Precautionary measures include a thorough review of plans and careful siting of the rig. Depending on the thoroughness of available information, non destructive geotechnical testing surveys for the presence of buried objects may be necessary.

3. Care must be taken in the positioning of drilling and or other heavy equipment such that it is unstable or blocks emergency access/site evacuation routes.

4. Equipment operators and field personnel should be familiar with the proper selection and operation of fire extinguishing equipment. Fully charged and inspected fire extinguishers should be immediately available at the drilling site. Contingency plans should be adopted to assure safe and timely evacuation and recruitment of outside assistance.

5. Field service personnel should be alert to the potential for exposure to noise levels in excess of 90 dBA. Hearing protection should be available if work patterns will require sustained exposure (> 1 hour) to noise.

6. NIOSH has recently declared that diesel exhaust fumes should be considered carcinogenic. Unnecessary exposure to diesel exhaust fumes should be avoided by positioning (upwind, etc.) or respiratory protection (organic vapor cartridges with filters for dust and mist) where avoidance of exposure is impossible.

7. Chemically impervious protective clothing and/or respiratory protection should be provided (or made available) consistent with anticipated contaminated soil/water contact and/or emissions.

ATTACHMENT "B"

Field Health and Safety Plan

FIELD HEALTH AND SAFETY PLAN
Site #734048

3.0 SCOPE OF WORK

Specific tasks covered by this FHSP may include, but are not limited to:

- o Performing inspections to characterize environmental or other hazards.
- o Collecting soil samples using a drilling rig, excavation equipment, or hand tools.
- o Conducting non-intrusive inspections and instrument surveys.
- o Excavating earthen materials, fill, debris, etc.
- o Remediating areas where hazardous substances are, or may be present.
- o Decontaminating personnel and equipment.
- o Performing tasks considered immediately dangerous to life and health (IDLH) such as, entry to confined spaces.

4.0 SITE-SPECIFIC HEALTH AND SAFETY CONCERNS

Site History and Setting

1. Available historical information indicates that the Clark property site was previously a concrete manufacturing firm. A site investigation has revealed no buried metals, containers or vessels containing pockets of chemicals.

2. The site monitoring collected December 1989 has found the following chemicals to be present in soil at varying depths:

	MAXIMUM LEVELS
Trichloroethylene	(to 1601 ppm)
1,1,1 Trichloroethane	(to 631 ppm)
Toluene	(to 948 ppm)
Xylenes	(to 77 ppm)
Acetone	(to 150 ppm)
Ethyl Benzene	(to 6 ppm)

Suspect Chemicals

Table 1 lists those substances which are known or suspected to be present at the site at concentrations of concern for human health, and Table 2 lists any published permissible exposure limits for those substances.

Field measurements or observation devices will be utilized to indicate if a potential exposure greater than the protection afforded by the requirements in this Plan is present. This monitoring will detect expected and unexpected materials of potentially hazardous nature. Detection of hazardous material will result in specified procedures dictated in this FHSP.

Table 1

VOCs Known or Suspected To Be Present

Substance	Known to be Present or Suspected	In Which Media	Known/Expected Maximum Concentration Range	Quality and Quantity of Available Data*
Trichloroethylene	Known	Soil	(to 1601 ppm)	1
1,1,1 Trichloroethane	Known	Soil	(to 631 ppm)	1
Toluene	Known	Soil	(to 948 ppm)	1
Xylenes	Known	Soil	(to 77 ppm)	1
Acetone	Known	Soil	(to 150 ppm)	1

* Level (1) - Considerable data available and substantial level of comfort data is reliable and adequately characterizes expected site conditions.

Level (2) - Limited data or data of uncertain representativeness

Level (3) - No data, or data not considered representative

Table 2

Published Airborne Exposure Limits (ppm) For
Substances Known or Suspected To Be Present

SUBSTANCE	OSHA PEL/STEL	ACGIH TLV/STEL	IDLH	CARCINOGEN
Trichloroethylene	50/200	50/200	1000	Suspect
1,1,1 Trichloroethane	350/450	350/450	1000	Suspect
Toluene	100	100/500	2000	
Xylenes	100/150	100/150	10,000	No
Acetone	100/150	750/1000	20,000	Suspect

Notes:

"Carcinogen" means a substance identified as a suspect or confirmed human carcinogen in one or more of the following documents:

- National Toxicology Program (NTP) Annual Report on Carcinogens
- International Agency for Research on Cancer (IARC) Monographs
- OSHA regulations on Occupational Health and Environmental Control at 29 CFR 1910, Subpart Z.

Definitions of PEL, REL, STEL, TLV and IDLH are on the next page.

5.0 SITE-SPECIFIC HEALTH AND SAFETY REQUIREMENTS

Key Personnel

Project Manager -

Tom Johnson (518) 458-1313

Corporate Health and Safety Officer -

Mark Falerios (201) 299-9001

Home: (201) 538-9709

Site Health and Safety Officer -

Senior Dunn Representative on the Site

Regional Office Manager -

Dave King (518) 458-1313

5.2 Air Monitoring

5.2.1 Air Emission - Monitoring

The planned excavation activities also increase the potential for generation of emissions of airborne chemicals. An on-site monitoring program and feasible emission suppression strategies will be implemented to closely monitor and control emissions.

The following chemicals are those most likely to be present (based on the December 1989 Soil Monitoring data) in airborne emissions as a result of excavation activities:

Trichloroethylene, Toluene, 1,1,1 Trichloroethane and Xylene

Real-time exposure monitoring will be conducted rather than indirect monitoring methods because real-time monitoring allows for exposure intervention and control.

Indirect monitoring may be more accurate but is not useful as a preventative tool due to the time lag between sample collection and analysis.

Real-time monitoring of employee breathing zones at the source of emissions will be performed using a photoionization detector (PID) calibrated according to manufacturer's specifications. Calibrations will include appropriate instrument adjustments to enable accurate detection of Trichloroethylene.

Proposed work site action levels include protective equipment upgrades at work zone exposures of 5 ppm above background (Level C) and 50 ppm above background (Level B). The threshold limit values for the parameters of concern are shown on Table 4.

5.2.2 Perimeter Monitoring

Prior to the initiation of excavation for the foundation, background concentrations will be established. Detection of work zone concentrations at greater than 5 ppm above background will trigger property perimeter monitoring using the photoionization detector. Detection of property perimeter readings 5 ppm above background will activate investigation and implementation of emission control measures (e.g. ground cover, vapor suppression foams, temporary work stoppage) until these perimeter levels decrease to below 5 ppm above background. In addition, work zone levels greater that 5 ppm above background will trigger monitoring using a portable gas chromatograph for vinyl chloride and benzene to assure emissions remain below threshold limit values as shown on the following table.

Concentrations of site chemicals have historically been well below their respective TLV's when PID measurements are less than 50 ppm above background; a 5 ppm above background threshold (PID monitoring) will provide more than adequate health and safety protection from contaminants known or suspected to be present.

THRESHOLD LIMIT VALUES

COMPOUND	THRESHOLD LIMIT VALUE
1,1,1 Trichloroethane	350 ppm
Trichloroethylene	50 ppm
Toluene	100 ppm
Xylene	100 ppm
Acetone	750 ppm
Vinyl Chloride	1 ppm
Benzene	1 ppm/5 ppm (STEL)

5.3 Personal Protective Equipment:

The following procedures should be followed when donning protective equipment:

- Inspect equipment to ensure it is in good condition.
- Don protective suit and gather suit around waist.
- Put on outer boots over feet of the suit and tape at boot/suit junction.
- Don inner gloves.
- Don top half of protective suit and seal (as necessary).
- Don respiratory protection (if necessary).
- Don outer gloves and tape at glove/suit junction (as necessary).
- Have assistant check all closures and observe wearer to ensure fit and durability of protective gear.

Table 3 indicates the general levels of personal protective equipment (PPE) that will be used on-site. Site and task specific levels of PPE assigned according to the chemicals of concern are listed in Table 4 below.

Table 3

Protection Levels

	B	C	D
Air-purifying respirator	No	Yes	No
Chemical-resistant disposable coveralls	Yes	Yes	(1)
Chemical-resistant outer gloves	Yes	Yes	(1)
Disposable inner gloves	Yes	Yes	No
Overboots (chemically resistant)	Yes	Yes	(1)
Leather shoes/boots or safety shoes	Yes	Yes	Yes
Safety glasses, goggles, or face shield	No	Yes	Yes
Hard hat	Yes	Yes	(1)
Coveralls	(1)	(1)	(1)

(1) Optional at the discretion of the employee and SHSO depending on site specific conditions.

Level C respiratory protection is to be full-face-piece or half-face-piece NIOSH - approved air purifying respirators equipped with organic vapor cartridges and/or high efficiency particulate filters.

Level B respiratory protection is to be supplied air or SCBA.

Table 4 lists the chemicals and chemical classes of concern on the site, along with the specific protection level and PPE materials of construction for each.

Table 4

Task-Specific PPE

Task(s)	Chemicals of of Concern	PPE Level	Cartridge Type	Gloves	Coveralls
General field surveys (No direct chemical contact)	Volatile Organics	D	----------	Viton or North Silver Shield	Optional
Well drilling or handling of contaminated soils or sludges (direct skin contact possible)	" "	D/C*	Organic Vapor Cartridges (if HNU readings > 5 ppm)	Viton or Silver Shield	Tyvek, Polycoated-Tyvek or Sararex-Tyvek
Well sampling - pump tests etc. (whole body direct skin contact not likely)	" "	D/C	" "	Viton or Silver Shield	
Trenching/ Excavation Entry (Direct Skin contact likely)	" "	C/B**	No	Viton or Silver Shield	" "

* If Levels of Volatile Organics as determined by HNu (or equivalent are greater than 5 ppm above background).

** If Levels of Volatile Organics as determined by HNu (or equivalent are greater than 50 ppm above background).

Unless the SHSO directs otherwise, when air purifying respirators are used, the cartridges should be changed after eight hours of use, or at the end of each shift, or when any indication of breakthrough or excess resistance to breathing is detected.

6.0 SITE CONTROL

3. Support Zone - An area away from known contamination will be identified and clearly marked where administrative and other support functions (not requiring entrance to the exclusion or contamination reduction zone) can be performed. The actual siting of the support zone will be established by the project leader and site coordinator considering distance from exclusion zone, visibility, accessibility, freedom of cross contamination from the exclusion zone, air monitoring data, etc.

Security measures will be established by the site coordinator in conjunction with other project team members to control access to the site and prevent unauthorized access during working and non-working hours.

7.0 EMERGENCY ACTION PLAN

The following standard emergency procedures will be implemented as necessary. The SHSO will be notified of any on-site emergency and be responsible for ensuring that the appropriate procedures are followed and the CHSO and Project Manager are notified. A first aid kit, eye wash unit, and fire extinguisher will be readily available to field personnel.

Notification

Upon notification, employees will proceed to a designated assembly area for further instruction. The Buddy System will be used to help account for proper evacuation of personnel.

A hand operated horn will alert personnel to evacuate the restricted area. If at any time two horn blasts are heard, all personnel are to immediately evacuate the restricted area.

The following standard hand signals will also be used as necessary:

Hand gripping throat	Can't breath/Out of air
Grip partner's wrist	Leave area immediately - No debate!
Hands on top of head	Need assistance
Thumbs up	Yes/Okay
Thumbs down	No/A problem

Personnel Injury

If anyone within a restricted area and cannot leave the restricted area without assistance, all site personnel will assemble in the decontamination area. After donning appropriate

protective equipment as determined by the SHSO, a rescue team will enter the area as necessary to assist or remove the person. (If entry requires the use of P.P.E. for I.D.L.H. Environments (S.C.B.A. or Equivalent), similarly equipped support personnel shall be on hand to lend assistance as necessary). The SHSO will evaluate the nature of the injury, and the affected person will be decontaminated to the extent feasible prior to movement. Appropriate first aid will be initiated, and if required, contact will be made for an ambulance and with the designated medical facility. No person will reenter the work area until the cause of the injury or symptoms is determined.

Fire/Explosion

Upon the occurrence of a fire beyond the incipient stage or an explosion anywhere on the site, the fire department will be alerted and all personnel moved to a safe distance.

Personal Protective Equipment Failure

Any worker in a Level A, B or C area who experiences a failure or alteration of protective equipment that affects the protection factor (e.g. torn protective suit, odor inside respirator), that person (and his/her buddy, if in a regulated area) will immediately leave the work area. Re-entry will not be permitted until the equipment has been repaired or replaced and the cause of the problem is known.

Other Equipment Failure

If any other equipment at the work site fails to operate properly, the Project Manager and/or SHSO will be notified and will then determine the effect of this failure on continuing operations. If it is determined that the failure affects the safety of personnel (e.g. failure of monitoring equipment) or prevents completion of the planned tasks, all personnel will leave the work area until appropriated corrective actions have been taken.

Off-site Emergency Response

Emergency response requiring actions beyond evacuation of personnel from the work area will be handled by notification of off-site emergency response agencies. Phone numbers for these agencies and other support services are listed below:

Emergency Services

Emergency Service	Telephone Number
Fire Department	(315) 471-1161
Police Department	(315) 425-6111
Ambulance	(315) 471-0102
Hospital/Emergency Care Facility - St. Joseph's Hospital	(315) 424-5111
Poison Control Center	(800) 282-3171 or (315) 476-4766
Chemical Emergency Advice (CHEMTREC)	(800) 424-9300

Directions to St. Joseph's Hospital:

- On leaving site through main gate, make a left onto W. Hiawatha Blvd.,
- Continue approximately 1/2 mile - cross over Route 81,
- Make a right onto North Salina Street,
- Continue on Salina (veers right) for approximately 1 mile,
- At intersection of Prospect and Salina, continue straight onto Prospect Avenue,
- Follow Prospect Street 2 blocks to St. Joseph's Hospital

8.0 APPENDICES

Trench/Test Pit Excavation Concerns
Confined Space Entry

TRENCH OR TEST PIT DIGGING

Trench or test pit digging can be expected to present hazards in addition to those encountered during general field work or drilling. Added control measures to be considered include the following:

1. Equipment should be carefully positioned with respect to the presence of known submerged objects.

   a. Where possible, power to underground electrical lines should be turned off (and locked out) while excavation activities are in process or until the area is secure from entrance of personnel.

   b. Known gas (or chemical) lines adjacent to the immediate excavation site should also be secured (valves turned off and locked out) while excavation is underway or access by outside personnel possible. Where possible, it is desirable to purge these lines of their contents prior to start of excavation.

2. Digging should be at a controlled rate under careful observation of a watch person who has clear communication with the equipment operator. The watch person should be alert to notice the presence of (unknown) buried objects by visual inspection or metal detection surveyance of the immediate excavation area.

3. Significant surface area of ground is exposed to the atmosphere as part of the trenching process. This may increase vapor exposures from volatile contaminants. Provisions should be made for air monitoring to trigger appropriate protective actions including temporary work stoppage. Use of vapor emissions controls or suppressants or use of personal protective equipment may be necessary.

4. Trenches or pits greater than 4 feet deep should be considered confined spaces which may contain concentrated vapors, gases or oxygen deficient atmospheres. Large scale shallow excavations (e.g. areas) should not be considered confined spaces as sufficient ventilation is present to control

emissions. These areas must be checked to assure non-explosive, non-hazardous atmospheres before allowing entry and periodically (or continuously) thereafter. See confined space entry procedures for greater details regarding control measures considerations.

5. OSHA provisions regarding shoring and sloping of trench sides (29 CFR 1926) may apply.

6. Pits or trenches should be inspected daily for evidence of cracks, slides or scaling. Inspection should be more frequent if it is raining.

7. Heavy equipment should be kept away from the sides of trenches or pits.

8. Means of egress (e.g., steps, ladders) should be readily available (within 25') of employees working in pits or other excavations from which rapid exit is difficult.

9. Excavations, mud pits, etc., must be protected with barricades or covers. Temporary pits/trenches should be backfilled upon completion of work.

CONFINED SPACE ENTRY PROGRAM

Purpose

Confined spaces are potential sources of immediately dangerous to life and health environments which must be treated with special caution. A confined space is any area where toxic, flammable or oxygen deficient (<19.5%) atmospheres could develop or where entrance and escape routes are difficult due to the size of openings etc. Examples of equipment related confined spaces include tanks, vessels, hoppers, boilers, chimneys and baghouses. Other structures such as underground tunnels and pits or trenches greater than 4 feet in depth should be considered confined spaces.

The most common causes of confined-space related mishaps are improper training of employees who must enter confined spaces or observers who must watch the entry and trigger evacuation or render first aid assistance. Detailed procedures and good communication systems are necessary for safe confined space related work.

General Procedures

The following are recommended procedures to be utilized, where applicable, in work involving confined space entry. Site specific procedures will be documented in the form of a permit system which is described later. Any proposed variation in procedures from those described below, must be reviewed and approved by the corporate health and safety officer.

1. The confined space must be physically isolated from all supply, vent or exit lines or other connections which introduce chemicals or gases to the confined area. Physical isolation includes disconnection and blanking of chemical or gas lines and closing and locking of water or steam line valves.

2. Sources of electrical power to the confined space must be locked out or otherwise disconnected (e.g. pulling of fuses) and so tagged to prevent accidental actuation during the entry.

3. Chemicals in the confined space must be removed and the space cleaned of residues by washing, purging with water or other appropriate inert agent, where possible.

4. The atmosphere within the confined space must be tested for the presence of flammables, toxic materials and oxygen deficiency using properly calibrated equipment prior to entry. Frequent (approximately every 15 minutes) or continuous (where feasible) monitoring of the atmosphere must be performed throughout the duration of the entry.

   Entry shall not be allowed (or will be suspended) if airborne levels of toxics exceed exposure limits (established in consultation with the health and safety manager), or if flammables exceed 10% of the LEL above background or if oxygen deficient conditions (< 19.5%) are noted.

5. Entry into enclosed vessels will require provision of fresh air using a forced draft supply introduced so as to thoroughly purge the confined space (i.e. no "dead air" spaces) throughout the duration of entry. Provision of air to other confined space structures is desirable, where feasible. Manholes or other vessel openings will be secured in the open position to facilitate air movement.

6. Illumination to confined spaces must be provided using explosion proof, low voltage (< 24 volt) lighting supplies. Only properly grounded tools with perfect electrical connections will be allowed in confined spaces. In locations where flammable atmospheres could develop or flammable residues are present, the space must be isolated from all sources of ignition.

7. Respiratory protection for confined space entry must be selected (in consultation with the safety and health manager) based upon anticipated hazards including toxic chemicals with poor warning properties or potential oxygen deficient atmospheres.

8. Personnel who must enter confined spaces should be equipped with life lines, harnesses or wristlets. Wristlets are preferred where removal of the individual is complicated by tight access or small openings (e.g. manholes).

9. Where ladders are necessary for entry to confined areas, they must be made secure at the top and remain in place throughout the entry. Any ladders used for entry must be in good condition, properly positioned (approximately 1/4 of the climbing height away from the wall at the base) and equipped with non-slip feet.

10. Entry shall be under the continuous watch of a designated observer who is knowledgeable in the use of emergency rescue equipment and has immediate access to communication equipment, alarms or other means to summon emergency assistance including personnel trained in appropriate first aid procedures. The observer shall be alert to developing signs of hazardous exposure or conditions, and be in constant communication with the personnel inside.

    a. The observer will not enter the confined space, but will initiate evacuation or trigger emergency rescue should the need arise.

11. Emergency equipment necessary to effect emergency rescue including, life lines, positive pressure self contained breathing apparatus, and fire extinguishers (where flammability is a concern) must be immediately available at the confined space entry site.

12. Sufficient standby personnel shall be immediately available to effect emergency rescue and render first aid.

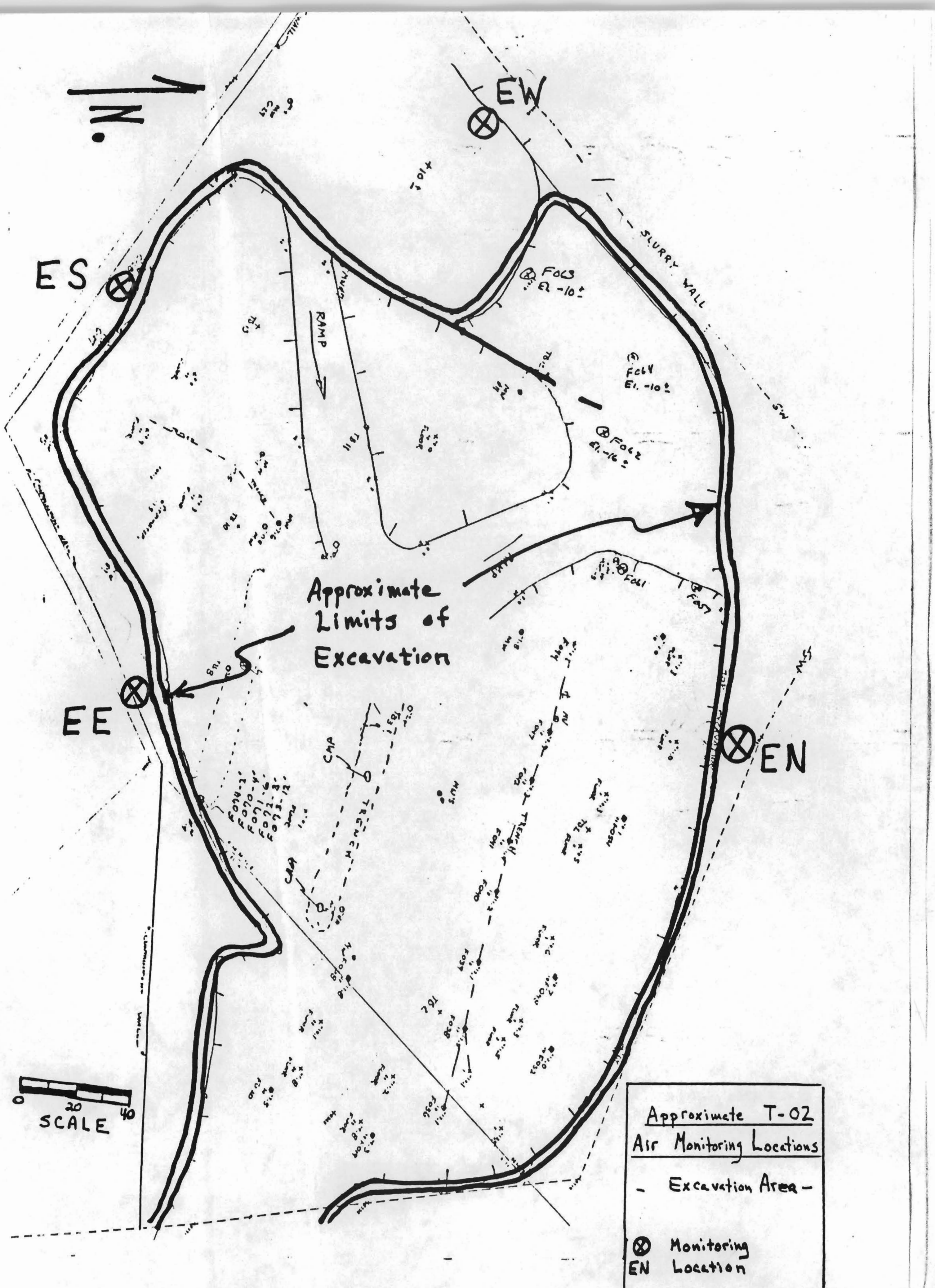
13. The occurrence of an injury, a spill or fire in the confined space, or job interruption for more than one hour, shall void the current confined space entry permit.

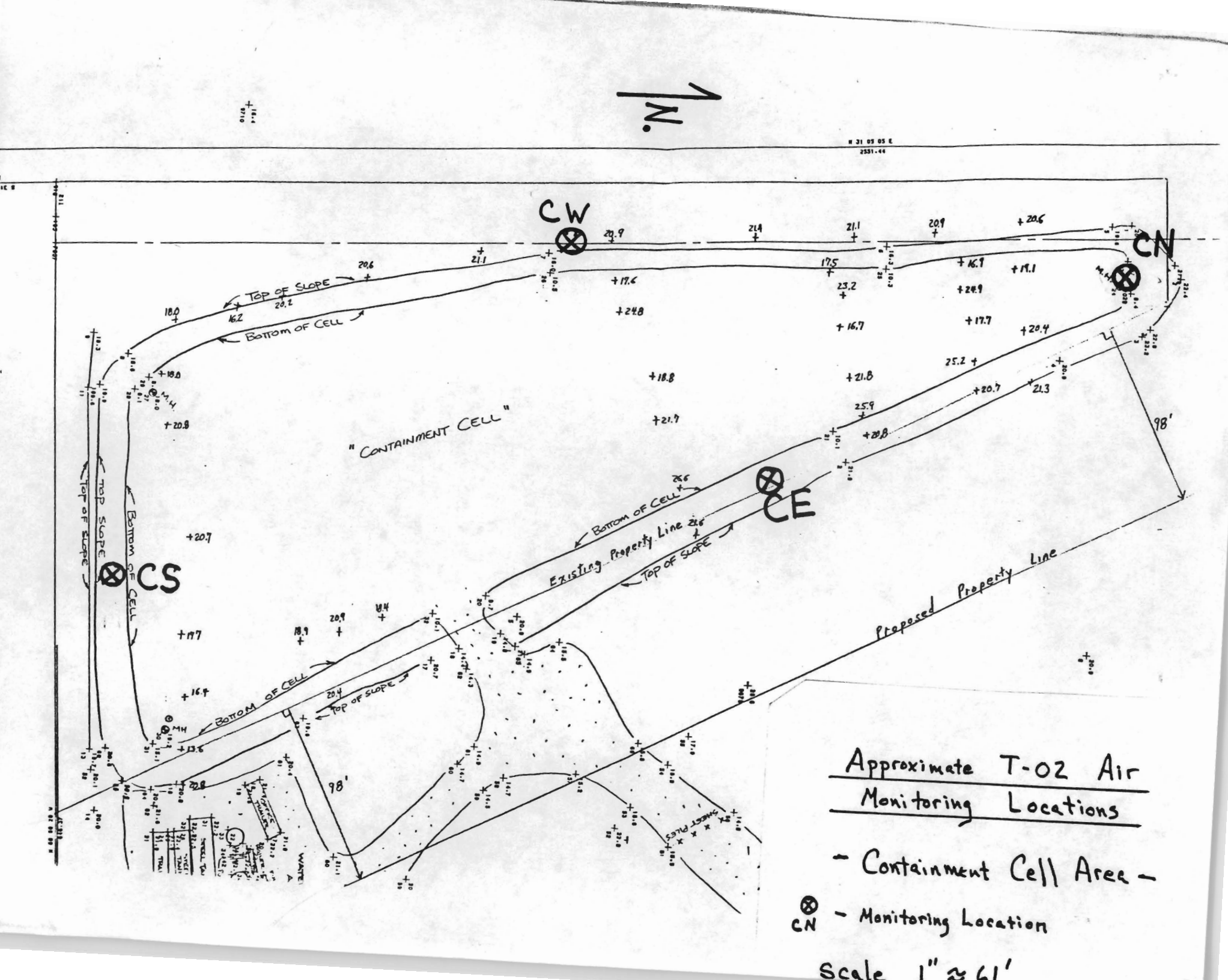
Authorization Procedure

A authorization procedure for confined space entry is necessary to assure adequate support personnel and supplies are present and proper procedures are followed. Completed authorizations shall be signed by employees who perform the entry, designated observers and the project manager's on site delegate.

Authorizations should be considered valid for one shift only. The authorization shall be immediately available at the job site. Completed authorizations shall be retained as part of project documentation.

The authorization will contain site specific details regarding hazards anticipated and precautions to be used during the entry.


N
EW
ES
EE
EN
SLURRY WALL
RAMP
F063 El. -10±
F064 El. -10±
F062 El. -16±
F061
Approximate Limits of Excavation
TRENCH
SCALE
0
20
40
Approximate T-02
Air Monitoring Locations
- Excavation Area -
Monitoring Location


N.
CW
CN
CS
CE
"CONTAINMENT CELL"
TOP OF SLOPE
BOTTOM OF CELL
EXISTING PROPERTY LINE
PROPOSED PROPERTY LINE
98'
98'
Approximate T-02 Air Monitoring Locations
- Containment Cell Area -
CN - Monitoring Location
Scale 1" ≈ 61'

NIGHT SHIFT
6/19/90
Stuart Levitch

EXISTING CB
SLURRY WALL

TEST PIT
ANALYTICAL - PASS
ANALYTICAL - FAIL
A - 1' DEPTH
B - 2' DEPTH
C - 3' DEPTH
D - 4' DEPTH

LOVE TAN

2108

211

PHASE II SHEETING

PHASE I SHEETING LEFT IN PLACE

REMOVE EXISTING PIPING

-10-

TOE OF SLOPE (EL. -3.0±)

BUILDING FACE

BASEMENT WALL

HAUL ROAD

HAUL ROAD

HAUL ROAD

Edge

PHASE I SHEETING RELOCATED

3:1

2:1

20' (TYP.)

-16-

-14-

-12-

-10-

-8-

TOP OF EXCAVATION

REMOVE PIPING

1:1.5 SIDE SLOPE

N DIKE

2103

PHASE I SHEETING LEFT IN PLACE

TP8 C

TP6 C 20

TP5 C 21

TP7 C

TP3 B&C

TP4 A, B&C

TP2 B&C

TP1 C&D

APPROVED INTERIM REMEDIATION PLAN

1.0 Introduction

This Approved Interim Remediation Plan (Approved Plan) for Site #734048 has been prepared for the New York State Department of Environmental Conservation (the "Department") to detail the procedures to be followed in implementing the proposed plan, covering in detail the excavation protocols and procedures, the transportation, storage and treatment of VOC contaminated soils and the design and construction of a storage/treatment area and the measures to collect and treat VOC-contaminated groundwater ("the Approved Interim Remediation Plan").

The Approved Plan is comprised of two distinct phases.

Phase 1 will consist of excavation of VOC-contaminated soils in the impacted area followed by transport and storage of such soils in the containment/treatment structure located in the southwestern corner of the site; and the installation and operation of a soil gas extraction system or other appropriate treatment technology to remediate such soils.

Phase 2 will consist of the collection and treatment of groundwater remaining below the building foundation to remove contaminants prior to discharge, as necessary.

Phase 1 and 2 are described below in Sections 2.0 through 5.0 of the Approved Plan.

2.0 Excavation Plan

Excavation will proceed with track-mounted backhoes located in the area to be excavated as shown on the attached Site Layout plan. If stockpiling of VOC contaminated soil is necessary, they will be located on the identified contaminated area. Such soil will be placed on, and covered with polyethylene sheeting until they are to be loaded and transported to the containment/treatment system. The excavated soil will be loaded onto 15 cubic yard dump trucks which will then

proceed to the contained haul road. They will travel on the contained haul road up to the containment structure. The excavation contractor will have supervisory personnel monitoring the flow of traffic. No vehicles will leave the work area except as in accordance with the provisions of the Approved Plan.

Upon reaching the containment structure, excavated soils will be unloaded into the structure and spread with wide-track bulldozers and/or track-mounted backhoes.

Excavation will proceed to the depth of the lowered groundwater table (approximately 15 to 17 feet). At this point, localized dewatering using slit trenches and collector sumps will be utilized to drain out the excess groundwater prior to excavation. This will act to minimize spillage and treat the maximum amount of contaminated groundwater as is practicable. Excavation will proceed until levels of VOC contamination in the unexcavated soil comply with the criteria established in the Approved Plan as described in Section 2.1. The area will then be backfilled to construction grade as necessary and permanent underdrains will be installed. Prior to the installation of the underdrains, plans providing details of the groundwater collection system will be submitted to the Department for review and approval.

Upon completion of excavation, the haul road will be removed and VOC contaminated soil (as described in Section 2.1) above the liner, if any, will be placed in the containment structure. The structure will then be covered with an impermeable polyethylene liner and secured along the perimeter.

2.1 Excavation Criteria

Soil will be excavated from the impacted area to a minimum depth of 13 feet which is the requirement for the installation of the foundation. Additional vertical excavation will be completed until sampling and analysis of soil samples collected from the base of excavation utilizing portable field gas chromatograph

soil analyzed does not exceed 5 ppm and no single volatile organic parameter exceeds 1 ppm ("uncontaminated soil"). Analyses by GC will include the parameters at the site which have been identified in the greatest concentrations in the soil. These include trans-1,2-dichloroethene, cis-1,2-dichloroethene, benzene, trichloroethene, toluene, tetrachloroethene, m&p xylenes and o-xylenes.

The approximate area of excavation is shown on the attached site layout plan. The actual area of excavation will be determined utilizing the criteria described in the above paragraph. Based on available analytical results, excavation in most of the impacted area will not be necessary beyond ± 18-20 feet below grade. However, in some areas, excavation may be as deep as ± 23 feet below grade. The actual depth will depend on the field GC results.

2.2 Dewatering

Dunn anticipates that it will be necessary to further dewater the proposed excavation area if excavation is necessary below ± 15-20 feet below grade. The natural water table has been lowered to that depth during the Pilot Study. This has been achieved by the installation of a sheetpile and/or a slurry wall around the impacted area and continuous withdrawal and treatment of groundwater. Additional sheetpiling and/or slurry wall will be installed if determined appropriate. Excavation below this depth may require localized dewatering via a trenching and/or well point system. In the event that groundwater is encountered and collected during the excavation, the water will be pumped and treated through the existing water treatment system and discharged using the system approved by the Department during the vacuum extraction pilot test (see letter dated January 16, 1990 from the Department to Dunn Geoscience Corporation).

2.3 Health/Safety

Excavation will proceed in accordance with the requirements outlined in the Field Health and Safety Plan prepared by Dunn Geoscience Corporation included in this Plan. This plan consists of the Field Health and Safety Plan approved by the Department for the Pilot Study and an addendum prepared by Dunn to address the site activities to be undertaken.

In accordance with Section 5.2 of the attached addendum to the site Field Health and Safety Plan, monitoring of air emissions and perimeter monitoring will be conducted to control fugitive emissions.

As outlined in the Department's approval of modifications to the Pilot Study dated October 4, 1989, appropriate control measures (e.g., ground cover, temporary work stoppage) will be implemented to ensure that air emissions are minimized and any potential threat to workers or the public are minimized or eliminated.

3.0 Transportation of Excavated Soil

If the analyzed VOC concentrations exceed the established criteria described in Section 2.1, the contaminated soil will be transferred into dump trucks and transported to the containment/treatment structure. The roadway is designed and will be constructed and lined such that any spillage can be contained and collected.

To ensure that there is no risk of contaminating the area outside the excavation or treatment areas, the procedures and steps described in Section 2.1 for loading and unloading contaminated soil will be followed. Additionally, a contained roadway corridor has been designed by O'Brien & Gere Technical Services which will protect underlying uncontaminated soil as described in Section 3.1.

Movement of trucks will be limited to only between the area of excavation and the containment/treatment structure. These two areas will be connected by a roadway wide enough for the safe and efficient passage of two trucks side by side simultaneously (± 25-30 feet) as shown on the attached Site Layout plan. Additionally, measures will be taken to prevent soils from spilling or leaking from the trucks traveling to and from the structure.

Any uncontaminated soil will be excavated as needed to construct the building foundation and to establish the grades necessary for development of the shopping center and will be taken to an off-site area of common ownership. Current plans call for the use of uncontaminated soil in which VOCs have been detected to be limited to use as fill material in an area of common ownership and covered with an asphalt or other impermeable cover.

3.1 Roadway Design

A two-lane roadway corridor will be constructed between the excavation area and the containment/treatment structure. At each end of the roadway there will be a single lane loop to allow trucks to safely enter the loading and unloading zones and maneuver through the roadway corridor. The road itself would consist of the following layers in ascending order as shown on the attached access road drawing.

- Compacted native soils
- Geotextile fabric
- ± 12 inches of crushed stone
- ± 2 inches of sand
- 30 mil HDPE liner
- ± 9 inches of suitable native soil
- Geotextile fabric
- ± 3 inches run-o-crushed stone

The design provides for a 2 foot berm on either side of the road to prevent materials from leaving the contained roadway. This berm will prevent any uncontrolled migration of contaminated soils in the event of a spill. Moreover, the roadway has been sloped so that any such spilled soils (or water) will be controlled. The HDPE liner will extend beneath the entire road and up and over the sides of the side berms. The liner will also extend a sufficient number of feet in each direction beyond the roadway edge to prevent potential contamination of adjacent soil in the event of spillage. In addition to protecting underlying soils from becoming contaminated, the liner will contain any spills which may occur, preventing both vertical and lateral migration.

In the event that significant spillage of contaminated soils occurs on the roadway, suitable equipment will be used to easily remove such soils from the roadway. Such soils will then be transported and placed in the containment/treatment structure.

Upon completion of excavation activities, all soils contaminated with VOCs located on the roadway above the liner will be removed and placed in the containment/treatment structure.

This procedure will ensure that there is no spreading of contamination and that there is no contamination in contact with previously uncontaminated areas.

Trucks transporting the soil from the excavation area will be covered to prevent dispersal of the soil and to minimize air emissions while en route to the containment/treatment structure. Truck movements will be limited to the roadway and areas of loading and unloading.

Prior to leaving the work area (i.e., excavation area, contained roadway and containment/treatment structure), all equipment will be decontaminated in accordance with the procedures established by the Department in its October 4, 1989 letter approving modifications to the Pilot Study. Specifically, equipment leaving the work area must first pass through the decontamination area. Attached is a drawing of a typical decontamination pad. This structure is designed to contain any potentially contaminated water from the decontamination process. Such water will flow through the drain/sump where it will then be pumped to the NYSDEC approved water treatment system prior to discharge.

Decontamination procedures will consist of removal of significant accumulations of soil prior to entering the decontamination pad area. The equipment will then be washed with a high pressure water spray to remove residual soil. Particular attention will be paid to areas such as tracks,] blades and buckets where materials tend to accumulate. Once the equipment has been sufficiently decontaminated, it will exit the opposite (clean) side of the decontamination area.

4.0 Containment/Treatment Structure

Contaminated soil excavated from the impacted area will be transported using previously described methods to a containment/treatment structure as described by O'Brien & Gere Technical Services. A plan view and cross sectional drawings of the structure are attached. The structure will be located on the Carousel Center Site and is expected to be located in the southwest corner of the site as shown on the attached Site Layout Plan. It will be designed as described below or as otherwise determined appropriate and in cooperation with the Department.

4.1 Design

The structure will consist of large, earthen berms (approximately 20 feet in height) which will be consolidated and compacted to maximize their structural integrity and impermeability. The structure will be a double-lined facility utilizing 60 mil HDPE liners separated by a leak detection layer as shown on the Site Layout Plan and the attached detailed drawings. The structure will be roughly triangular in shape with sides of approximately 600 feet by 350 feet by 700 feet. The floor of the structure will slope to a continuous drainage pipe/trench. The essential elements of the structure, in ascending order, are as follows:

- Graded and compacted native soil
- Secondary 60 mil HDPE liner
- Sand, gravel (6± inches) or drainage net leak detection layer
- Primary 60 mil HDPE liner
- ± 3 inches of sand drainage layer
- Geotextile fabric
- ± 9 inches of #2 crushed stone
- Filter fabric

Contaminated soil will be placed above the filter fabric and eventually covered with a 20 mil HDPE liner or compacted clay. The liner will be anchored utilizing tires or other appropriate methods or materials. The top of the facility will be sloped toward the side berm. A 4 inch perforated pipe will be placed along the toe of this top slope to collect surface drainage and control erosion. Water from this surface drainage pipe will be routed away from the structure and the work area.

The use of the earthen berm as containment structure sidewalls, together with a flexible impervious liner, is an ideal compliment to current site conditions. The berms act to spread the load of sidewall over a larger area (decreasing the likelihood of settlement), and the flexible impermeable liner will accommodate shifts or settling of the subgrade. The design (wide earthen beams, together with a solid working surface topped with an impervious flexible liner) will accommodate potential subgrade movement and will simultaneously meet the requirements of an effective containment/treatment structure.

4.2 Water Collection

Soil placed in the structure will be allowed to drain off any excess moisture through an underdrain or water collection system. Furthermore, the structure is designed to accommodate a soil gas extraction system which will minimize and/or eliminate the possibility of vapor releases. When the structure is filled, present plans are to install and operate a soil gas extraction system to remove VOC contaminants from the soils in the structure.

The upper layer of 2 inch crushed stone and the sand drainage layer overlying the primary 60 mil HDPE liner will facilitate drainage of soils placed in the structure toward the drainage collection pipe. Water which collects in the drainage pipe will flow by gravity to the facility sump. The sump will house a pump of appropriate size and specifications to sufficiently evacuate water from the sump. Water which collects in the sump will be pumped to the NYSDEC approved water treatment system prior to discharge.

The drainage layer between the primary and secondary 60 mil HDPE liners will serve as a leak detection layer. In the unlikely event that water passes through the primary liner, it would then flow by gravity to the drainage trench. This drainage layer is isolated within the trench by the primary and secondary liners, as well. Any water accumulating in the trench will flow by gravity to an isolated portion of the sump which will be fitted with a perforated concrete vault specifically for leak detection. A 3 inch access pipe will penetrate the concrete vault for monitoring, if necessary.

In the event that VOC contaminants are detected in the leak detection sump, additional samples will be collected. If additional sampling determines that VOC contaminated water has actually entered the leak detection system, monitoring wells downgradient of the structure will be installed, as required by the Department, in the uppermost water-bearing unit, as appropriate.

5.0 Phase 2

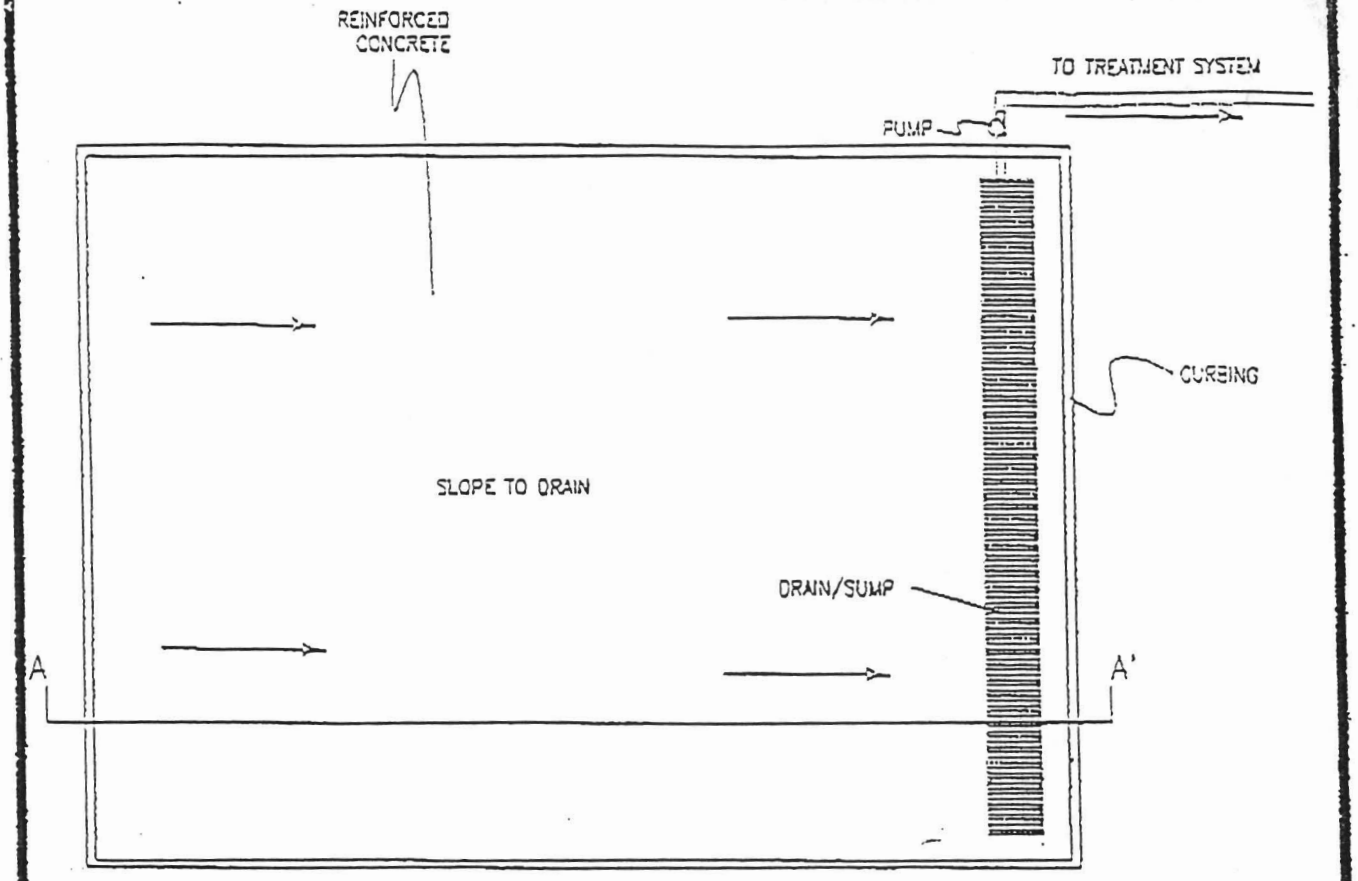
Once the excavated soils are isolated and contained, a detailed study will be undertaken to evaluate available treatment technologies and to select a preferred treatment technology to be implemented. Upon selection of a permanent remedy, this study will be submitted to the Department for its review and approval. A soil gas extraction system or other appropriate remediation technology will be incorporated into this Interim Remedial Plan. Any uncontaminated soil (as described in Section 2.1) in the structure will be handled in accordance with the procedures detailed in Section 3.0.

Prior to construction of the building foundation, plans providing details of the groundwater collection and treatment system to be incorporated into the foundation design will be submitted to the Department for its review and approval. Conceptual details are included in the Supplemental Feasibility Study prepared by Dunn Geoscience Corporation dated February, 1990 at Sections 2.0-Foundation Construction and 4.0-Groundwater Controls and Treatment.

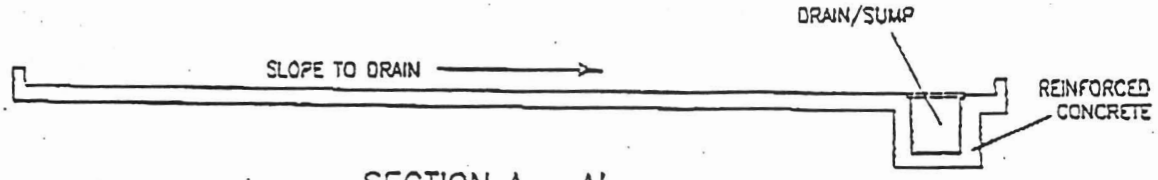
PROJECTED SEQUENCE/TIMELINE

Activity	Projected Completion Date
Fill/Grade Subbase Area	3/6/90
Construct Berms	3/6/90
Install Haul Road	3/5/90
Install Decontamination Pads	3/5/90
Install Containment Structure Drain Troughs	3/5/90
Prepare Subbase for Liner	3/19/90
Install Liners in Structure	3/20/90
Install Drains in Structure	3/22/90
Localized Dewatering	3/25/90
Excavation	3/28/90
Install/Operate Soil Gas Extraction	-----

NOTE: This projected sequence/timeline has been prepared for this document. Actual sequence and timing of construction may be different than shown.



DECONTAMINATION PAD
(PLAN VIEW)



SECTION A – A'

TYPICAL DECONTAMINATION PAD