MALCOLM PIRNIE

REMEDIAL ACTION WORK PLAN

Former Abalene Pest Control
Moreau, New York

NYSDEC Site Number 546035

Orkin Exterminating Company, Inc.
Atlanta, Georgia

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Prepared by:

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15 Cornell Road
Latham, New York 12110

March 1999
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RECYCLED PAPER

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1.0 INTRODUCTION

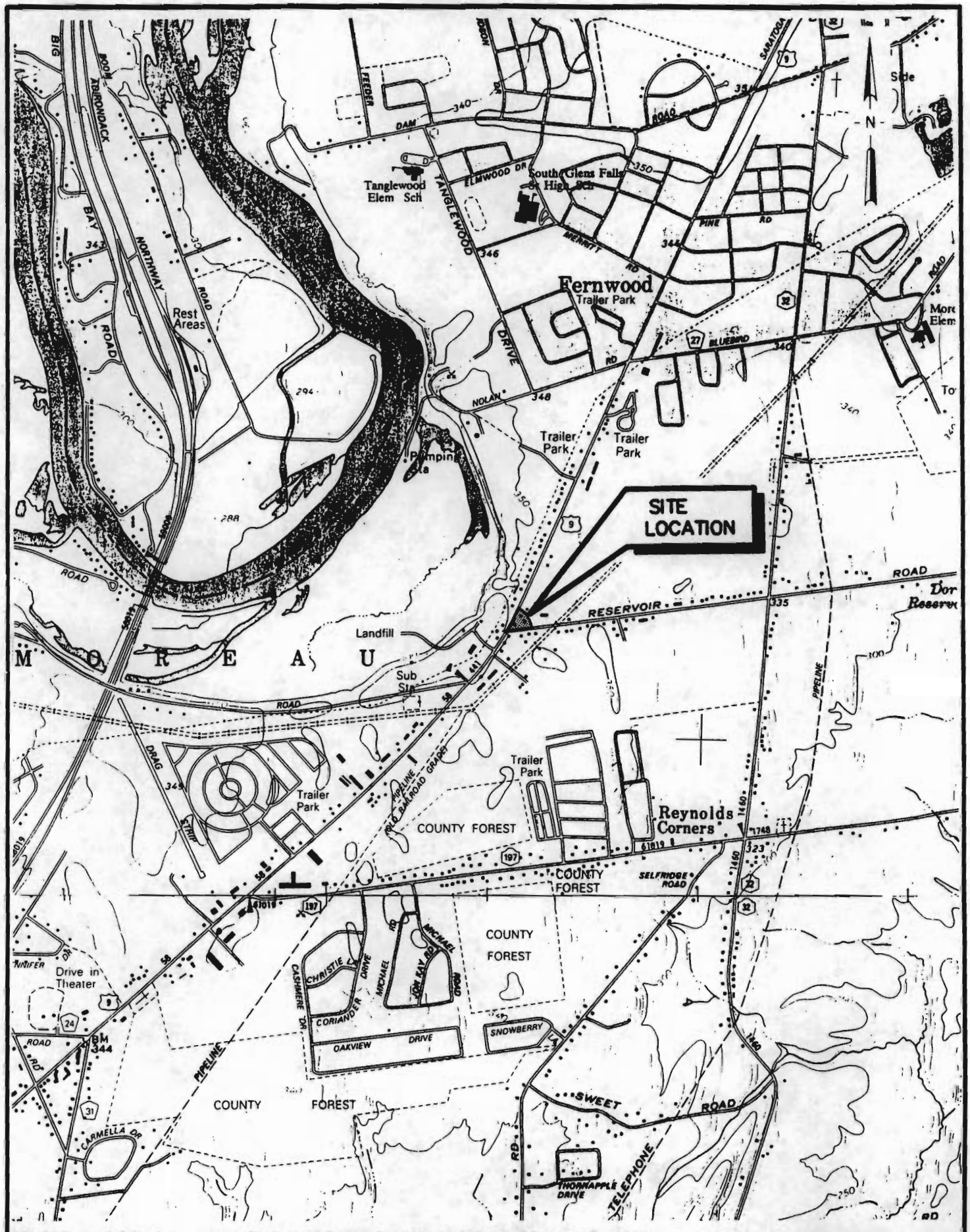
The Remedial Action Work Plan (RAWP) for the former Abalene Pest Control site, owned by Orkin Pest Control (Orkin), in Moreau, New York, has been developed to provide a design of the Remedy set forth in the Record of Decision (ROD) for the site, dated January 1996, and the Consent Order Agreement between the New York State Department of Environmental Conservation (NYSDEC), Walter T. Blank, Abalene Pest Control Service, Inc., and Orkin (Consent Order Agreement). The RAWP describes the manner in which the requirements of the ROD and the Consent Order Agreement will be achieved. The work to be conducted, as outlined in this RAWP, will be implemented in accordance with the Consent Order Agreement. If any site conditions which pose an imminent threat to public health and the environment are discovered during the implementation of this Work Plan, the Consent Order Agreement will be reopened in accordance with Section XVII, Reopener, of the Consent Order Agreement.

1.1 SITE LOCATION

The former Abalene Pest Control site is located at the intersection of Reservoir Road and U.S. Route 9 in the Town of Moreau, Saratoga County, New York (Figure 1-1). The site is approximately 34,000 square feet in size and has an 8-foot high chain-link fence along its perimeter. Within the fenced boundary of the property are three wooden framed buildings (office, storage shed and barn) which were previously used during the formulation and storage of pesticides. Surrounding land use is residential and commercial.

1.2 SITE HISTORY

Abalene Pest Control owned and operated a pesticide formulation and storage facility at the site from 1975 until 1986. On December 31, 1986, Orkin purchased the site and



SOURCE: U.S.G.S. 7.5 MIN. GLENS FALLS QUAD. 199 & GANSVOORT QUAD. 1991

MALCOLM PIRNIE

ABALENE PEST CONTROL
MOREAU, NEW YORK

SITE LOCATION MAP

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FIGURE 1-1

continued its operation for approximately three months. Orkin ceased operations at the site in early 1987.

On March 30, 1987, the NYSDEC discovered that pesticide wastes had been buried in a disposal pit to the on the eastern portion of the property. As an emergency response action, the NYSDEC Region 5 Spill Response hired a contractor to excavate the wastes under the supervision of the NYSDEC.

Subsequent to the NYSDEC's excavation of the pit, Abalene Pest Control hired Swanson Environmental, Inc. (Swanson) which arranged for the proper staging and off-site disposal of the pesticide/herbicide containers, PPE, and sampling equipment.

Swanson also collected and analyzed soil samples. Based on this initial scope of work, Swanson was retained to investigate the extent of pesticide/herbicides in the soil and groundwater. The results of this work were reported by Swanson on October 12, 1987 in the report entitled, "Report on Interim Remedial Action, Soils and Groundwater Investigation."

In May 1987, Swanson was contracted by Orkin to conduct off-site sampling and analysis of several residential water supply wells surrounding the site. Residential wells exhibiting low concentrations of pesticides were fitted with carbon filtration units. In subsequent years, carbon filtration units on additional homes have been added by Orkin at the request of property owners. Maintenance of the carbon filtration units is a continuing activity.

An interim remedial measure (IRM) to address the former waste disposal pit was performed by Fred C. Hart Associates in May 1988. The IRM included double lining the disposal pit with Visqueen and placing the stockpiled soils back in the pit. The backfilled pit was covered with clean sand to create a mound to minimize infiltration in this area and an excavation of a drainage ditch surrounding the pit area to divert surface water flow. A chain link fence was installed surrounding the backfilled pit to secure the area. Crushed stone was placed on the site soils to prevent off-site migration of dust.

The former Abalene Pest Control site is classified by the NYSDEC as a Class 2 - Inactive Hazardous Waste Disposal Site (Site No. 546035). Pursuant to a Consent Order, the NYSDEC required that a Remedial Investigation/Feasibility Study (RI/FS) be undertaken

at the site in order to determine the nature and extent of the identified contamination at the site, define the potential risks and to select an appropriate remedial action. The identified contamination at the site includes pesticides, volatile organic compounds, and selected metals.

The RI was conducted between June 1992 and June 1994 by Malcolm Pirnie, Inc. (Malcolm Pirnie). The RI included investigation of contamination in the air, surface soil, subsurface soil, the former disposal pit, and groundwater. A Health Risk Assessment and Fish and Wildlife Impact Analysis were also performed.

No pesticides were detected in the ambient air. The surface soil sampling identified four locations with concentration of total pesticides greater than 100 parts per million (ppm). The off-site surface soil samples ranged from less than 1 ppm to 27.6 ppm. The pesticide concentrations decreased significantly with increasing depth. The two soil samples collected from between the liners of the former disposal pit contained concentrations of 152 ppm and 126 ppm totals pesticides and the two soil samples collected from 3 feet below the former disposal pit contained concentrations of 1.2 ppm and 19.1 ppm total pesticides.

Several pesticides were detected in groundwater samples from within the shallow groundwater monitoring wells. These pesticides include Lindane, Chlordane, 4,4'-DDE, Heptachlor, and Bromacil. Groundwater standards were exceeded in four samples collected from on-site monitoring wells for Lindane and one sample collected from an on-site monitoring wells for Chlordane. Groundwater analytical results for samples collected from the deep monitoring wells did not indicate the presence of any pesticides/herbicides. Tap water samples were collected from 11 residences surrounding the site. The results of this sampling indicated non-detectable levels of all compounds analyzed for with the exception of the sample collected from the Rourke supply well. Following the initial sampling and prior to the resampling of the Rourke supply well, a new, deeper well was installed to replace the existing well. The analytical results of the new water supply were reported as non-detect.

1.3 WORK PLAN ORGANIZATION

The remainder of the RAWP is organized as follows:

- ***Section 2.0 Remedial Action Objectives*** - Section 2.0 describes the objectives of the remedial activities and summarizes how the remedial alternative will meet the Remedial Action Objectives.

- ***Section 3.0 Confirmation Sampling*** - Section 3.0 presents the confirmation sampling plan for the remedial activities.

- ***Section 4.0 Contingency Plan*** - Section 4.0 presents the contingency plan which will be implemented if the Remedial Action Objectives are not achieved.

- ***Section 5.0 Schedule*** - Section 5.0 presents the remedial action schedule.

- ***Appendix A Remedial Action Project Specifications*** - Appendix A contains the design specifications for the selected remedy, as well as procedures for physical security and posting of the site, quality assurance and control, and health and safety.

- ***Appendix B Long-Term Monitoring and Maintenance Plan*** - Appendix B contains the monitoring and maintenance procedures to be implemented both during and after implementation of the selected remedy.

- ***Appendix C Quality Assurance Project Plan*** - Appendix C presents the Quality Assurance and Quality Control procedures designed to achieve the data quality goals of the Remedial Action.

- ***Appendix D Citizen Participation Plan*** - Appendix D contains the Citizen Participation Plan for the remedial activities in accordance with the New York State Inactive Hazardous Waste Site Citizen Participation Program and 6 NYCRR Part 375.

2.0 REMEDIAL ACTION OBJECTIVES AND SELECTED REMEDY

2.1 REMEDIAL ACTION OBJECTIVES

The Remedial Action Objectives (RAOs) for the site have been established through the remedy selection process outlined in 6NYCRR 375-1.10. The overall goal of the RAOs are to meet the applicable standards, criteria, and guidance (SCGs) and the protection of human health and the environment. The RAOs for the site, as described in the ROD, are as follows:

- Reduce, control, or eliminate the contamination present within the soils/waste at the site; and
- Eliminate the potential for direct human or animal contact with the on-site contaminated soils.

2.2 SELECTED REMEDY

The selected remedy for the site includes all of the elements outlined below:

- Abandonment of the on-site drinking water well(s);
- Building demolition and off-site disposal;
- Fence removal;
- Excavation of off-site soil contaminated with pesticides in excess of Target Concentration Limits (TCLs), which are risk-based concentrations shown to be protective of human health under the possible exposure scenarios at the site;
- Excavation of soil 3 inches deep in a 10 to 15 foot radius around four isolated "hot spots" of elevated surface contamination on-site;
- Underground gasoline storage tank excavation and removal;
- Cleaning and in-place abandonment of septic tanks;

- Excavation and removal of the soil between the liners in the former disposal pit area;
- Placing a geotextile material and 12 inches of topsoil over the northeast portion of the site that includes the disposal pit area;
- Spot excavation 3 inches deep around select locations;
- Site grading and placement of a 6-inch topsoil cap over the entire site; and
- Development of a Maintenance and Monitoring Plan which will address issues including the continued integrity of the topsoil cap and any changes in the status of the site.

Off-site and on-site soils with a concentration greater than 100 ppm of total pesticides will be disposed of in a permitted facility. Excavated soils with a concentration less than 100 ppm of total pesticides will be consolidated and placed under the geotextile material in the northeast portion of the site.

The selected remedy will achieve the RAOs by reducing the pesticide contamination at the site by approximately 93 percent (by mass) through the excavation and off-site disposal of the soils which contain the highest total pesticide concentrations. In addition, the selected remedy provides for the overall protection of human health and the environment by limiting exposure to soils both on and off the property which contain total pesticide concentrations in excess of the risk-based TCLs through either proper on-site soil relocation and capping or off-site disposal at a permitted facility.

The specific means by which the selected remedy will be implemented to achieve the RAOs are described in Appendix A.

3.0 CONFIRMATION SAMPLING

Confirmatory soil samples will be collected during remedial activities to ensure removal of all off-site soils with pesticide levels in excess of the TCLs and to assess whether excavated soils from on-site locations will be disposed on or off the Site. All samples will be collected in accordance with the Quality Assurance Project Plan (QAPP) contained in Appendix C.

3.1 OFF-SITE EXCAVATIONS

As shown in Plate 1, off-site excavations will be conducted at three locations centering on surface soil sample locations WSS-4, WSS-6, and RRSS-2. Each excavation will encompass a 10 foot diameter circle centered on the surface soil sample location with a total depth of 0.5 feet. A total of three confirmation samples will be collected from the sidewalls of each excavation. Each off-site confirmation sample will be analyzed for the analytes listed in Table 3-1 by an analytical laboratory using USEPA Method 8081A under a 48-hour turnaround time. All samples will be collected in accordance with the QAPP contained in Appendix C. Appendix A contains the specifications for off-site soil excavation.

TABLE 3-1

CONFIRMATION SAMPLE ANALYTES

COMPOUND	TARGET CONCENTRATION LEVEL (ppm)
Chlordane	0.47
DDE	1.8
4,4' DDT	1.8
4,4' DDD	2.6

3.2 ON-SITE EXCAVATIONS

A total of eight excavations will be conducted on-site as described below. On-site excavation areas are shown in Plate 1.

- ***Area 1*** - Area 1 encompasses the ROD-specified 20-foot diameter area around both soil boring B-6 and surface soil sample LSS-4. Area 1 also includes immunoassay testing locations at which elevated pesticide concentrations were detected in surface soils.

- ***Area 2*** - Area 2 encompasses a 30-foot diameter tract around soil boring B-9. This excavation area includes both the ROD-specified 20-foot diameter excavation area as well as immunoassay testing locations at which elevated pesticide concentrations were detected in surface soils.

- ***Area 3*** - Area 3 encompasses the on-site portion of the ROD-specified 20-foot diameter around surface soil sample WSS-3. Off-site areas within the 20-foot diameter are not included because immunoassay testing of the surface soils at several locations in this area showed only trace concentrations of pesticides.

- ***Area 4*** - Area 4 is the former disposal pit area. Soil located between the liners of the former disposal pit will be excavated at this location as specified in the ROD.

- ***Area 5*** - Area five encompasses the southern and western sections of the site which border the property boundary as shown in Plate 1. Excavated soil from Area 5 will be placed in the on-site soil relocation area.

- ***Spot Excavations*** - Spot excavations will be conducted at three areas centered around soil borings B-1, B-3, and B-17 as specified in the ROD.

Soil excavated from Areas 1, 2, and 3 will be disposed off-site at a permitted facility. Confirmation sampling will be conducted during remedial activities at these areas to confirm that soils with total pesticide concentrations in excess of 100 ppm do not remain at the bottom or in the sidewalls of the excavation. Confirmation samples will be collected from the bottom and sidewalls of each area at the locations shown in Plate 1. On-site confirmation samples will be analyzed for total pesticides by an analytical laboratory using USEPA Method 8081A under a 48-hour turnaround time. Appendix A contains the design specifications for the on-site remedial activities.

3.3 EXCAVATED SOIL SAMPLING

A total of five composite confirmation samples will be collected from the excavated soil to be relocated in the on-site soil relocation area. Composite samples will be collected from the relocated soil after placement in the soil relocation area, prior to final grading. Each sample will be composited along the entire depth of the relocated soil at each sample location. One composite sample will be collected at the center of the soil relocation area. The remaining samples will be collected at the north, south, east, and west sides of the soil relocation area. All composite samples will be analyzed for total pesticides by an analytical laboratory using USEPA Method 8081A to confirm that all soil relocated on-site will have a total pesticide concentration less than 100 ppm as specified in the ROD. Confirmation composite samples will be collected in accordance with the soil sampling procedures outlined in the QAPP (Appendix C).

3.4 ON-SITE SUPPLY WELL SAMPLING AND ABANDONMENT

The on-site office supply well will be abandoned during remedial activities. The procedure for well abandonment is presented in the Project Specifications (Appendix A). Prior to abandonment, the groundwater in the well will be sampled to document groundwater quality. Groundwater sampling will take place concurrently with the first round of semi-annual monitoring as outlined in the Long Term Monitoring and Maintenance Plan (Appendix B). Groundwater samples will be collected in accordance with the groundwater sampling procedures presented in the QAPP (Appendix C).

If an additional well or well point is discovered in the pit located in the basement of the office building during remedial activities, the well will be sampled and abandoned using the same procedures described above. The procedures for removal of the material in the pit are presented in Project Specifications.

4.0 CONTINGENCY PLAN

The contingency plan identifies the procedures and methods which will be employed if any portion of the remedial action fails to achieve the RAOs.

4.1 OFF-SITE

If analytical laboratory results for off-site confirmation samples indicate that soils containing pesticide concentrations in excess of the TCLs remain at any of the off-site locations after initial excavation, then additional excavation and confirmation sampling will be conducted. The additional excavation/confirmation sampling will be conducted until all soils with pesticide concentrations in excess of the TCLs are removed from the off-site excavation areas.

4.2 ON-SITE

If analytical laboratory results for on-site confirmation samples indicate that soils containing pesticide concentrations in excess of 100 ppm remain at Area 1, 2, or 3 after initial excavation, then additional excavation and confirmation sampling will be conducted. The additional excavation/confirmation sampling will be conducted until soils with pesticide concentrations in excess of 100 ppm are removed from the site for disposal at a permitted facility.

5.0 SCHEDULE

The proposed remedial action schedule is presented in Figure 5-1. As specified in the Consent Order Agreement, the Remedial Action will be implemented within 60 days of NYSDEC approval of the RAWP. Site work is expected to take approximately four weeks to complete.

APPENDIX A

Remedial Action Project Specifications

MALCOLM PIRNIE

Contract Specifications

Former Abalene Pest Control Inactive Hazardous Waste Site Remediation Project

Town of Moreau
Saratoga County, New York

Prepared by:

Malcolm Pirnie, Inc.
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Latham, New York 12110

March 1999
1368016

RECYCLED PAPER

FORMER ABALENE PEST CONTROL
INACTIVE HAZARDOUS WASTE SITE
REMEDIATION PROJECT

TOWN OF MOREAU
SARATOGA COUNTY, NEW YORK

PROJECT MANUAL

MARCH 1999

Daniel J. Loewenstein, P.E.
New York #066594

MALCOLM PIRNIE, INC.

15 Cornell Road
Latham, New York 12110

TOWN OF MOREAU
SARATOGA COUNTY, NEW YORK

FORMER ABALENE PEST CONTROL
INACTIVE HAZARDOUS WASTE SITE
REMEDIATION PROJECT

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TOWN OF MOREAU
SARATOGA COUNTY, NEW YORK

FORMER ABALENE PEST CONTROL
INACTIVE HAZARDOUS WASTE SITE
REMEDIATION PROJECT

NOTICE TO BIDDERS

Sealed bids for the Remediation Project will be received by Malcolm Pirnie, Inc., 15 Cornell Road, Latham, New York 12110, on April 2, 1999 until 4:00 P.M. local time.

Contract Documents may be examined at the Offices of Malcolm Pirnie, Inc., Four 15 Cornell Road, Latham, New York. Additional copies may be obtained at the offices of Malcolm Pirnie, Inc. upon deposit of Fifty Dollars ($50.00) for each set of documents.

Bidders and non-bidders who return full sets of documents in good condition within 30 days of receipt of Bids will receive a full refund. Neither the OWNER, nor the ENGINEER will be responsible for full or partial sets of Contract Documents, including any addenda, obtained from any other source.

Bid security in the form of certified check or bid bond in the amount of five percent of the Bid must accompany each Bid.

The successful Bidder will be required to furnish performance and payment bonds in an amount equal to 100 percent of the Contract Price.

Orkin Exterminating Company, Inc. retains the right to reject any or all Bids, as well as the right to waive all informalities in awarding a contract deemed to be in the best interest of Orkin Exterminating Company, Inc.

ORKIN EXTERMINATING COMPANY, INC.

TOWN OF MOREAU
SARATOGA COUNTY, NEW YORK

FORMER ABALENE PEST CONTROL
INACTIVE HAZARDOUS WASTE SITE
REMEDIATION PROJECT

INSTRUCTIONS TO BIDDERS

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ARTICLE 1 - DEFINED TERMS

1.1 Terms used in these Instructions to Bidders, which are defined in the General and Supplementary Conditions, have the meanings assigned to them in the General and Supplementary Conditions. The term "Successful Bidder" means the Bidder to whom OWNER (on the basis of OWNER'S evaluation as hereinafter provided) makes an award.

ARTICLE 2 - BIDS RECEIVED

2.1 Refer to Notice to Bidders for information on receipt of Bids.

ARTICLE 3 - LOCATION AND DESCRIPTION OF PROJECT

3.1 Refer to Section 01010 for the location and description of the Project.

ARTICLE 4 - COPIES OF BIDDING DOCUMENTS

4.1 Refer to Notice to Bidders for information on examination and procurement of documents.

4.2 Complete sets of Bidding Documents shall be used in preparing Bids; neither OWNER nor ENGINEER assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

4.3 OWNER and ENGINEER in making copies of Bidding Documents available on the above terms do so only for the purpose of obtaining Bids for the Work and do not confer a license or grant for any other use.

ARTICLE 5 - QUALIFICATIONS OF BIDDERS

5.1 Bidders shall be experienced in the kind of Work to be performed, shall have the necessary equipment therefor, and shall possess sufficient capital to properly execute the Work within the time allowed. Bids received from Bidders who have previously failed to complete work within the time required, or who have previously performed similar work in an unsatisfactory manner, may be rejected. A Bid may be rejected if Bidder cannot show that he has the necessary ability, plant and equipment to commence the Work at the time prescribed and thereafter to prosecute and complete the Work at the rate or within the time specified. A Bid may be rejected if Bidder is already obligated for the performance of other work which would delay the commencement, prosecution or completion of the Work.

5.2 As evidence of Bidder's qualifications to perform the Work, Bidder shall complete and submit with his Bid the Bidder's Qualification Statement which is bound in the Project Manual. Low Bidders may be asked to furnish additional data to demonstrate their qualifications.

5.3 The Bid must contain evidence of Bidder's qualification to do business in the state where the Project is located or covenant to obtain such qualification prior to execution of Agreement.

5.4 Not Used.

5.5 Award of the Construction Contract shall be limited to CONTRACTORS with at least three (3) years experience in the Work shown and specified.

ARTICLE 6 - EXAMINATION OF CONTRACT DOCUMENTS AND SITE

6.1 Before submitting a Bid, Bidder shall (a) examine the Contract Documents thoroughly, (b) visit the site to familiarize itself with local conditions that may affect cost, progress, performance or furnishing of the Work, (c) familiarize itself with federal, state and local laws, ordinances, rules and regulations that may affect cost, progress, performance or furnishing of the Work, (d) examine the Contract Documents for other work to be performed on the Project that relates to the Work for which the Bid is to be submitted, (e) study and carefully correlate Bidder's knowledge and observations with the Contract Documents, and (f) notify ENGINEER of any conflict, error, ambiguity or discrepancy in the Contract Documents of which Bidder becomes aware.

6.2 Reference is made to the Supplementary Conditions for the identification of those reports of investigations and tests of subsurface and latent physical conditions at the site or those reports that otherwise may affect cost, progress, performance or furnishing of the Work which have been utilized by ENGINEER in preparation of the Drawings and Specifications. OWNER will make copies of such reports available at the cost (non-refundable) of reproduction to any Bidder requesting them from the ENGINEER. These reports are not intended to constitute any explicit or implicit representation as to the nature of the subsurface and latent physical conditions which may be encountered at the site or to constitute explicit or implicit representations as to any other matter contained in any report. Such reports are not guaranteed as to accuracy or completeness and are not part of the Contract Documents. Before submitting Bid, Bidder will, at its own expense, make such investigations and tests as the Bidder may deem necessary to determine its Bid for performing and furnishing the Work in accordance with the Contract Documents.

6.3 On request, ENGINEER will arrange for a site visit during normal business hours. Health and Safety requirements will be instituted for any Work done within the limits of the site.

6.4 On request, OWNER will provide each Bidder access to the site to conduct such investigations and tests as each Bidder deems necessary for submission of his Bid. Health and Safety requirements will be instituted for any Work done within the limits of the site.

6.5 The lands upon which the Work is to be performed, rights-of-way for access thereto and other lands designated for use by CONTRACTOR in performing the Work are identified in the Supplementary Conditions, General Requirements or Drawings.

6.6 The submission of a Bid will constitute an incontrovertible representation by Bidder that it has complied with every requirement of this Article 6 and that the Contract Documents are sufficient in scope and detail to indicate and convey understanding of all terms and conditions for performing and furnishing the Work.

ARTICLE 7 - INTERPRETATIONS AND ADDENDA

7.1 All questions about the meaning or intent of the Bidding Documents or the Contract Documents shall be submitted to ENGINEER in writing. In order to receive consideration, questions must be received by ENGINEER at least five (5) days prior to the date fixed for the opening of Bids. Any interpretations of questions so raised, which in the opinion of ENGINEER require interpretations, will be issued by Addenda mailed or delivered to all parties recorded by ENGINEER as having received the Bidding and Contract Documents for receipt not later than one (1) day prior to the date fixed for the opening of Bids. The ENGINEER and OWNER will not be responsible for oral interpretations or clarifications which anyone presumes to make on their behalf.

7.2 OWNER may issue such additional Addenda as may be necessary to clarify, correct or change the Bidding Documents or the Contract Documents. Such Addenda, if any, will be issued in the manner and within the time period stated in Paragraph 7.1.

ARTICLE 8 - BID SECURITY

8.1 A Bid must be accompanied by a certified check or Bid Bond in the amount of five percent of the Bidder's maximum Bid price, satisfactory to and payable to the order of the OWNER.

8.2 Bid Bond shall be on a separate form furnished by ENGINEER. An example of the Bid Bond is found in the Project Manual. Bid Bond shall be issued by a surety meeting the requirements of Paragraph 5.1 of the General Conditions.

8.3 The Bid security of the Successful Bidder will be retained until such Bidder has executed the Agreement and furnished the required contract securities, whereupon the Bid security will be returned. If the Successful Bidder fails to execute and deliver the Agreement and furnish the required contract security within ten days of the Notice of

Award, OWNER may annul the Notice of Award and the Bid security of that Bidder will be forfeited to the OWNER as liquidated damages for such failure.

8.4 The Bid security of any Bidder whom OWNER believes to have a reasonable chance of receiving the award may be retained by OWNER until the earlier of the seventh day after the execution of the Agreement by the Successful Bidder or the sixtieth day after the Bid opening. The Bid security of other Bidders will be returned within seven days of the Bid opening.

ARTICLE 9 - CONTRACT TIME

9.1 The Contract time shall be as defined in Article 4 of the Agreement.

ARTICLE 10 - LIQUIDATED DAMAGES

10.1 Provisions for liquidated damages, if any, are set forth in the Agreement.

ARTICLE 11 - SUBSTITUTE MATERIALS AND EQUIPMENT

11.1 Whenever it is indicated in the Drawings or specified in the Specifications that a substitute or "or-equal" item of material or equipment may be furnished or used by CONTRACTOR if acceptable to ENGINEER, application for such acceptance will not be considered by ENGINEER until after the Effective Date of the Agreement. The procedure for submittal of any such application by CONTRACTOR and consideration by ENGINEER is set forth in Paragraph 6.3 of the General Conditions which may be supplemented in the General Requirements.

11.2 Refer to Section 01630 for the period of time after the Effective Date of the Agreement during which the ENGINEER will accept applications for substitute or "or-equal" items of material or equipment.

ARTICLE 12 - SUBCONTRACTORS AND OTHERS

12.1 Not Used

12.2 No CONTRACTOR shall be required to employ any Subcontractor, other person or organization against whom he has reasonable objection.

12.3 No CONTRACTOR shall subcontract greater than forty (40) percent of the dollar value of this Contract. The CONTRACTOR shall not subcontract the portion(s) of the Work for which the CONTRACTOR has demonstrated a minimum three (3) years experience as a factor determining responsibleness for purposes of Award.

ARTICLE 13 - BASIS FOR BIDS

13.1 Where the Bid Form contains items that require alternative bids for materials, equipment or systems, Bidder shall total its Bid using the lowest priced bid for a named alternative under each item.

ARTICLE 14 - PREPARATION OF BID

14.1 A Bid must be made on the Bid Form furnished herein. The Bid Form shall not be altered in any way. The Bid Form shall not be removed from the Project Manual.

14.2 The Bid Form must be completed in ink or by typewriter. Blank spaces in the Bid Form must be filled in correctly where indicated, and the Bidder must state, both in words and numerals, the prices proposed for each and every item of Work. Ditto marks shall not be used.

14.3 A Bid shall be executed as stated below.

A. A Bid by an individual shall show the Bidder's name and official address.

B. A Bid by a partnership must be executed in the partnership name and signed by a partner, whose title must appear under the signature and the official address of the partnership shall be shown below the signature.

C. A Bid by a corporation must be executed in the corporate name by an officer of the corporation and must be accompanied by a certified copy of a resolution of the board of directors authorizing the person signing the Bid to do so on behalf of the corporation. The corporate seal shall be affixed and attested by the secretary or an assistant secretary. The state of incorporation and the official corporate address shall be shown below the signature.

D. All names must be typed or printed below the signature.

E. Contractor's license or registration number shall be entered in the space provided on the Bid Form.

14.4 The Bid shall contain an acknowledgment of the receipt of all Addenda in the space provided on the Bid Form.

14.5 The address and telephone number for communications regarding the Bid shall be shown.

14.6 In addition to the Bid Form. the following listed documents, which are bound in the Project Manual shall be executed in the manner described in Paragraph 14.3 unless another manner is indicated.

A. Bid Security.

B. Bidder's Qualification Statement.

C. Noncollusive Bidding Certification.

D. Letter indicating CONTRACTOR'S proof of insurability to the levels specified in these Contract Documents from the CONTRACTOR'S proposed insurance carrier.

ARTICLE 15 - SUBMISSION OF BID

15.1 Bids shall be submitted at the time and place indicated in the Notice to Bidders.

15.2 Bid shall be enclosed in an opaque sealed envelope plainly marked on the outside with the name and address of the Bidder, its license or registration number if applicable, the name of the Project, and the contract name or number. Bid shall be submitted with Bid security and other required documents.

15.3 If the Bid is sent through the mail or other delivery system, the sealed envelope containing the Bid shall be enclosed in another envelope plainly marked on the outside with the notation "Bid Enclosed". Mailed Bids shall be addressed to: Mr. Daniel J. Loewenstein, P.E., Malcolm Pirnie, Inc., 15 Cornell Road, Latham, New York 12110.

ARTICLE 16 - MODIFICATION OR WITHDRAWAL OF BID

16.1 Withdrawal Prior to Bid Opening:

A. A Bidder may withdraw its Bid before the time fixed for the opening of Bids by communicating his purpose in writing to the OWNER. Upon receipt of such written notice, the unopened Bid will be returned to the Bidder.

16.2 Modification Prior to Bid Opening:

A. If a Bidder wishes to modify its Bid, it must withdraw its initial Bid in the manner specified in Paragraph 16.1.A and submit a new Bid.

ARTICLE 17 - OPENING OF BIDS

17.1 Bids will be opened as indicated in the Notice to Bidders.

17.2 Bids received by mail or otherwise after the time specified for the opening of Bids will not be accepted and will be returned to the Bidder unopened.

ARTICLE 18 - DISQUALIFICATION OF BIDDERS

18.1 More than one Bid for the same Work from an individual, or a firm, partnership, corporation or an association under the same or different names will not be considered. Reasonable grounds for believing that any Bidder is interested in more than one Bid for the Work may be cause for disqualification of that Bidder and the rejection of all Bids in which that Bidder is interested.

ARTICLE 19 - BIDS TO REMAIN SUBJECT TO ACCEPTANCE

19.1 All Bids shall remain subject to acceptance for forty-five days after the day of the Bid opening, but OWNER may, in its sole discretion, release any Bid and return the bid security prior to that date.

ARTICLE 20 - AWARD OF CONTRACT

20.1 OWNER reserves the right to reject all Bids, to waive any and all informalities not involving price, time or changes in the Work, and the right to reject all nonconforming, nonresponsive or conditional Bids.

20.2 OWNER reserves the right to reject any Bid not accompanied by specified documentation and Bid security.

20.3 OWNER reserves the right to reject any Bid if it shows any omissions, alterations of form, additions not called for, conditions or qualifications, or irregularities of any kind.

20.4 OWNER reserves the right to reject any Bid that, in his sole discretion, is considered to be unbalanced or unreasonable as to the amount bid for any lump sum or unit price item.

20.5 In evaluating Bids, discrepancies between words and figures will be resolved in favor of words. Discrepancies in the multiplication of units of work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.

20.6 In evaluating Bids, OWNER will consider the qualifications of Bidders; whether or not the Bids comply with the prescribed requirements; the alternatives, if any; and the lump sum and unit prices, if requested in the Bid Form. It is OWNER'S intent to evaluate each alternative bid in accordance with the methods and criteria set forth in

the Specifications. The low Bidder will be determined on the basis of the selection by the OWNER of the alternative(s) deemed to be in OWNER'S best interest.

20.7 Not Used

20.8 OWNER may conduct such investigation as OWNER deems necessary to assist in the evaluation of any Bid and to establish the responsibility, qualifications and financial ability of the Bidders proposed Subcontractors and other persons and organizations to perform and furnish the Work in accordance with the Contract Documents. OWNER reserves the right to reject the Bid of any Bidder who does not pass any such evaluation to OWNER'S satisfaction.

ARTICLE 21 - CONTRACT SECURITIES

21.1 Performance Bond shall be in the form of Engineers Joint Contract Documents Committee (EJCDC) "Construction Performance Bond", 1910-28A. Payment Bond shall be in the form of EJCDC "Construction Payment Bond", 1910-28B. The amounts of and other requirements for Performance and Payment Bonds are stated in Paragraph 5.1 of the General Conditions. The requirements for delivery of Bonds are stated in Paragraph 2.1 of the General Conditions. Additional requirements may be stated in the Supplementary Conditions.

21.2 The Successful Bidder shall within five (5) days from the date of the Notice of Award deliver to OWNER, for his review and approval, the Performance Bond and the Payment Bond he proposes to furnish at the time of the execution of the Agreement.

ARTICLE 22 - CONTRACTOR'S INSURANCE

22.1 The requirements for CONTRACTOR'S insurance are stated in Article 5 of the General Conditions and in the Supplementary Conditions. The requirements for delivery of certificates of insurance are stated in Paragraph 2.1 of the General Conditions.

22.2 The Successful Bidder shall within five days from the date of the Notice of Award deliver to OWNER, for his review and approval, the required policies of insurance, including worker's compensation and disability benefits coverages as required by Paragraph SC-18.5. Upon approval, the policies will be returned to the Bidder and he shall submit certificates of insurance and proof of worker's compensation and disability benefits coverage to the OWNER as stated in the General and Supplementary Conditions.

ARTICLE 23 - EXECUTION OF AGREEMENT

23.1 The Successful Bidder, or its authorized representative, will be required to attend with the contract securities offered and execute the Agreement within ten days from the date of the Notice of Award.

23.2 The OWNER will prepare the documents, and will identify, in the Notice of Award, the location at which the documents will be executed.

ARTICLE 24 - NOTICE TO PROCEED

24.1 Issuance of the Notice to Proceed shall be as stated in Article 2 of the General Conditions.

ARTICLE 25 - SPECIAL REQUIREMENTS

25.1 Refer to Supplementary Conditions for further Special Requirements.

++ END OF INSTRUCTIONS TO BIDDERS ++

BID FORM

BID FOR:

Former Abalene Pest Control Inactive Hazardous Waste Site
Remediation Project

BID TO:

Orkin Exterminating Company
c/o Malcolm Pirnie, Inc.
15 Cornell Road
Latham, New York 12110
Attention: Daniel J. Loewenstein, P.E.

BID FROM: _____
(Print or Type Name of Bidder)
(/A Corporation/A Partnership/A Limited Liability Company/An Individual/A Joint Venture/[Bidder to strike out inapplicable terms.])

Gentlemen:

1.01 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with OWNER in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the price(s) and within the times indicated in this Bid and in accordance with the Bidding Documents.

2.01 Bidder accepts all of the terms and conditions of the Advertisement or Invitation to Bid and Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for the time period set forth in the Instruction to Bidders. Bidder will sign the Agreement and will furnish the required contract security, and other required documents within the time periods set forth in the Bidding Documents.

3.01 In submitting this Bid, Bidder represents, as set forth in the Agreement, that:

A. Bidder has examined and carefully studied the Bidding Documents, the other related data identified in the Bidding Documents, if any, and the following Addenda receipt of all of which is hereby acknowledged.

Addendum No.	Date Received	Addendum No.	Date Received

B. Bidder has visited the Site and become familiar with and is satisfied as to the general, local and Site conditions that may affect cost, progress, and performance for the Work.

C. Bidder is familiar with and is satisfied as to all federal, state and local Laws and Regulations that may affect cost, progress and performance of the Work.

D. Bidder has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities) which have been identified in the Supplementary Conditions as provided in paragraph 4.02 of the General Conditions, and (2) reports and drawings of a Hazardous Environmental Condition identified at the Site, if any, which have been identified in the Supplementary Conditions as provided in paragraph 4.06 of the General Conditions.

E. Bidder has obtained and carefully studied (or assumes responsibility for having done so) all examinations, investigations, explorations, tests, studies and data concerning conditions (surface, subsurface and Underground Facilities) at or contiguous to the Site which may effect cost, progress or performance of the Work or which relate to any aspect of the means, methods, techniques, sequences and procedures of construction to be employed by Bidder, including applying the specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents to be employed by Bidder, and safety precautions and programs incident thereto.

F. Bidder does not consider that any further examinations, investigations, explorations, tests, studies or data are necessary for the determination of this Bid for performance of the Work at the price(s) and within the times and in accordance with the other terms and conditions of the Bidding Documents.

G. Bidder is aware of the general nature of work to be performed by OWNER and others at the Site that relates to the Work as indicated in the Bidding Documents.

H. Bidder has correlated the information known to Bidder, information and observations obtained from visits to the Site, reports and drawings identified in the Bidding Documents and all additional examinations, investigations, explorations, tests, studies and data with the Bidding Documents.

I. Bidder has given ENGINEER written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and the written resolution thereof by ENGINEER is acceptable to Bidder.

J. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work for which this Bid is submitted.

4.01 Bidder further represents that this Bid is genuine and is not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any agreement or rules of any group, association, organization or corporation; Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid; Bidder has not solicited or induced any individual or entity to refrain from bidding; Bidder has not sought by collusion to obtain for itself any advantage over any other Bidder or over OWNER; and that no person or persons acting in any official capacity for the OWNER are directly or indirectly interested in this Bid, or in any portion of the profit thereof.

5.01 Bidder will complete the Work in accordance with the Contract Documents for:

DESCRIPTION	ESTIMATED QUANTITIES	COMPUTED TOTALS
ITEM 1. Site Preparation, the lump sum price of _____ Dollars and _____ Cents ($)	Lump Sum	$_____
ITEM 2. Well Abandonment, the lump sum price of _____ Dollars and _____ Cents ($)	Lump Sum	$_____
ITEM 3. Tank Abandonment:		
ITEM 3A. Petroleum Storage Tank, the lump sum price of _____ Dollars and _____ Cents ($)	Lump Sum	$_____
ITEM 3B. Septic Tank Abandonment, the lump sum price of _____ Dollars and _____ Cents ($)	Lump Sum	$_____

DESCRIPTION	ESTIMATED QUANTITIES	COMPUTED TOTALS
ITEM 4. Building Demolition, the lump sum price of _____ Dollars and _____ Cents ($)	Lump Sum	$_____
ITEM 5. Concrete Scarification, the lump sum price of _____ Dollars and _____ Cents ($)	Lump Sum	$_____
ITEM 6. Contaminated Soil:		
ITEM 6A. Contaminated Soil Excavation and On-site Placement, the lump sum price of _____ Dollars and _____ Cents ($)	Lump Sum	$_____
ITEM 6B. Contaminated Soil Excavation and Off-site Disposal, the lump sum price of _____ Dollars and _____ Cents ($)	Lump Sum	$_____
ITEM 7. Site Grading and Restoration, the lump sum price of _____ Dollars and _____ Cents ($)	Lump Sum	$_____
ITEM 8. Additional Off-site General Fill, the unit price of _____ Dollars and _____ Cents ($) Per cubic yard	100 c.y.	$_____
ITEM 9. Additional Topsoil, the unit price of _____ Dollars and _____ Cents ($) Per cubic yard	10 c.y.	$_____

DESCRIPTION	ESTIMATED QUANTITIES	COMPUTED TOTALS
ITEM 10. Contaminated Soil:		
ITEM 10A. Petroleum Contaminated Soil, the unit price of _____ Dollars and _____ Cents ($) Per ton	20 tons	$_____
ITEM 10B. Additional Contaminated Soil Excavation and On-site Placement, the unit price of _____ Dollars and _____ Cents ($) Per cubic yard	20 c.y.	$_____
ITEM 10C. Additional Contaminated Soil Excavation and Off-site Placement, the unit price of _____ Dollars and _____ Cents ($) Per ton	30 tons	$_____
ITEM 11. Waste Disposal:		
ITEM 11A. Additional Petroleum Contaminated Free Product, the unit price of _____ Dollars and _____ Cents ($) Per gallon	50 gallons	$_____
ITEM 11B. Additional Septic Tank Free Product and Sludge, the unit price of _____ Dollars and _____ Cents ($) Per gallon	200 gallons	$_____
ITEM 11C. Additional Waste Materials, the unit price of _____ Dollars and _____ Cents ($) Per 55 gallon drum	2 drums	$_____
Total (This total is for convenience in comparing Bids and is not an official part of this Bid)		$_____

(Amount to be shown in both words and numbers. In case of discrepancy, amount shown in words will govern.)

ITEM PLI. Pollution Liability Insurance,
the lump sum price of

_____ Dollars
and _____ Cents
($) Lump Sum $_____

☐ Pollution Liability Insurance not available, 3 letters indicating non-availability are enclosed.

(This item is not to be calculated in the base bid for the project. After bids are opened, the OWNER will determine if Pollution Liability Insurance will be required. If so determined, the CONTRACTOR shall be paid separately at the actual documented cost, included above as Item PLI above, to obtain this insurance. If CONTRACTOR is unable to provide Pollution Liability Insurance which meets the minimum required limits as specified in Section 01025 - Measurement and Payment, then the CONTRACTOR shall submit with its bid 3 letters indicating the non-availability of such insurance and shall indicate this by checking the box above.)

Unit prices have been computed in accordance with paragraph 11.03.B of the General Conditions.

Bidder acknowledges that estimated quantities of items of Unit Price Work are not guaranteed and final payment will be based on actual quantities of Unit Price Work performed as provided in the Contract Documents.

6.01 Bidder agrees that the Work will be substantially complete and completed and ready for final payment in accordance with Paragraph 14.07.B of the General Conditions on or before the dates or within the number of calendar days indicated in the Agreement.

6.02 Bidder accepts the provisions of the Agreement as to liquidated and special damages in the event of failure to complete the Work within the times specified above.

7.01 The following documents are attached to and made a condition of this Bid:

A. Required Bid security in the form of Certified check or Bid Bond.

B. Required Bidder Qualifications Statement with supporting data.

C. A tabulation of Subcontractors, Suppliers and other individuals and entities required to be identified in this Bid.

8.01 The terms used in this Bid will have the meanings indicated in the Instructions to Bidders and the General Conditions and Supplementary Conditions.

Respectfully submitted on _____, 19__.

If Bidder is:
An Individual

By_____
(Individual's Signature)

_____
(Printed or Typed Name of Individual)

Doing business as_____

License or Registration Number:_____

Business Address:_____

_____

Phone No.:_____FAX No.:_____

Partnership

By_____
(Firm Name)

_____
(General Partner's Signature)

_____
(Printed or Typed Name of General Partner)
(Attach evidence of authority to sign.)

License or Registration Number:_____

Business Address:_____

_____

Phone No.:_____FAX No._____

A Corporation

By_____
(Corporation Name)

_____
(State of Incorporation)

By_____
(Signature of Officer Authorized to Sign)

_____
(Printed or Typed Name and Title of Officer Authorized to Sign)
(Attach evidence of authority to sign.)

(CORPORATE SEAL)

Attest_____
(Secretary)

License or Registration Number:_____

Business Address:_____

_____

Phone No.:_____FAX No._____

Limited Liability Company

By_____
(Firm Name)

_____
(State of Formation)

By_____
(Signature of Member/Authorized to Sign)

_____
(Printed or Typed Name and Title of Member Authorized to Sign)
(Attach evidence of authority to sign.)

License or Registration Number:_____

Business Address:_____

_____

Phone No.:_____FAX No._____

A Joint Venture

Joint Venture Name:_____

By_____
(Signature)

_____ _____
(Printed or Typed Name) (Title)

_____
(Address)

By_____
(Signature)

_____ _____
(Printed or Typed Name) (Title)

_____
(Address)

Phone and FAX number and address for receipt of communications to joint venture:

_____

_____

_____

(Each joint venturer must sign. The manner of signing for each individual, partnership, corporation or limited liability company that is a party to the joint venture shall be in the manner indicated above).

+ + END OF BID FORM + +

BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we _____

_____

(Insert Name, or Legal Title, of Bidder)

of _____

(Insert Address of Bidder)

as Principal, hereinafter called the Principal, and _____

_____

(Insert Name, or Legal Title, of Surety)

of _____

(Insert Address of Surety)

a corporation duly organized under the laws of the State of _____

as Surety, hereinafter called the Surety, are firmly bound unto ORKIN EXTERMINATING COMPANY, INC. as Obligee, hereinafter called the Obligee, in the penal sum of _____ Dollars.

(Surety to Insert Amount)

for the payment of which sum well and truly to be made, the said Principal and the said Surety bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has submitted a bid for THE FORMER ABALENE PEST CONTROL INACTIVE HAZARDOUS WASTE SITE REMEDIATION PROJECT.

NOW, THEREFORE, if the Obligee shall accept the Bid of the Principal and the Principal shall enter into a Contract with the Obligee in accordance with the terms of such Bid, and give such Bond or Bonds as may be specified in the Bidding or Contract Documents with good and sufficient surety acceptable to the Obligee, or in the event of the failure of the Principal to enter such Contract and give such Bond or Bonds, if the Principal shall pay to the Obligee the penal amount of this bond, then this obligation shall be null and void, otherwise to remain in full force and effect.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety shall not be impaired or affected in any way by any extension of the time within which the Obligee may accept the Bid of the Principal and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, on this _____ day of _____, 19__.

----------(Individual Principal)----------

By _____
(Individual's Signature)

_____
(Printed or Typed Name of Individual)

Doing business as _____

_____

----------(Partnership Principal)----------

By _____
(Firm Name)

_____
(Partner's Signature)

_____
(Printed or Typed Name of Partner)

----------(Corporate Principal)----------

By _____
(Corporation Name)

_____
(State of Incorporation)

By _____
(Signature of Officer Authorized to Sign)

_____

(Printed or Typed Name and Title of Officer Authorized to Sign)

(CORPORATE
SEAL)

Attest_____

(Secretary)

----------(Joint Venture Principals)----------

By_____

(Signature)

_____

(Printed or Typed Name)

By_____

(Signature)

_____

(Printed or Typed Name)

(Each joint venturer must sign. The manner of signing for each individual, partnership and corporation that is a party to the joint venture should be in the manner indicated above).

----------(Corporate Surety)----------

By_____

(Corporation Name)

By_____

(Signature of Officer or Attorney-in-Fact*)

_____

(Printed or Typed Name and Title of Officer, or Name of
Attorney-In-Fact*)

(CORPORATE
SEAL)

Attest _____
(Secretary)

* Attach certified and effective dated copy of power of attorney showing authority of attorney-in-fact to execute in behalf of corporation.

BIDDER'S QUALIFICATION STATEMENT

(Completion of this statement is required in advance of consideration for award of contract.)

SUBMITTED TO:

Orkin Exterminating Company, Inc.
c/o Malcolm Pirnie, Inc.
15 Cornell Road
Latham, NY 12110
Attn: Mr. Daniel J. Loewenstein, P.E.

SUBMITTED FOR:

Former Abalene Pest Control Inactive Hazardous Waste Site Remediation Project

SUBMITTED BY:

Name: _____

(Print or Type Name of Bidder)
(/A Corporation/A Partnership/An Individual/A Joint Venture/
[Bidder to strike out inapplicable terms.])

Address: _____

_____

Gentlemen:

The undersigned certifies under oath the truth and correctness of all statements and of all answers to questions made hereinafter.

(Note: Attach Separate Sheets as Required)

1.0 How many years has your organization been in business as a contractor? _____

2.0 How many years has your organization been in business under its present name? _____

3.0 If a corporation, answer the following:
3.1 Date of incorporation:
3.2 State of incorporation:
3.3 President's name:
3.4 Vice president's name(s):

3.5 Secretary's or Clerk's name:
3.6 Treasurer's name:

4.0 If individual or partnership, answer the following:
4.1 Date of organization:
4.2 Name and address of all partners. (State whether general or limited partnership.):

5.0 If other than corporation or partnership, describe organization and name principals:

6.0 Do you plan to subcontract any part of this project? _____ If so, give details.

7.0 Has any construction contract to which you have been a party been terminated by the owner; have you ever terminated work on a project prior to its completion for any reason; has any surety which issued a performance bond on your behalf ever completed the work in its own name or financed such completion on your behalf; has any surety expended any monies in connection with a contract for which they furnished a bond on your behalf? If the answer to any portion of this question is "yes", please furnish details of all such occurrences including name of owner, architect or engineer, and surety, and name and date of project.

8.0 Has any officer or partner of your organization ever been an officer or partner of another organization that had any construction contract terminated by the owner; terminated work on a project prior to its completion for any reason; had any surety which issued a performance bond complete the work in its own name or financed such completion; or had any surety expend any monies in connection with a contract for which they furnished a bond? If the answer to any portion of this question is "yes", please furnish details of all such occurrences including name of owner, architect or engineer, and surety, and name and date of project.

9.0 List name of project, owner, architect or engineer, contract amount, percent complete and scheduled completion of the major construction projects your organization has in progress on this date.

10.0 List name of project, owner, architect or engineer, contract amount, date of completion and percent of work with own forces of the major projects of the same general nature as this project which your organization has completed in the past five years.

11.0 List name, address and telephone number of a reference for each project listed under Items 9.0 and 10.0, above.

12.0 List name and construction experience of the principal individuals of your organization.

13.0 List the states and categories of construction in which your organization is legally qualified to do business.

14.0 List name, address and telephone number of an individual who represents each of the following and whom OWNER may contact for a financial reference:

14.1 A surety:

14.2 A bank:

14.3 A major material supplier:

15.0 Dated at _____, this _____ day of _____, 19__.

_____
(Print or Type Name of Bidder)

By _____

_____
(Title)

(Seal, if corporation)

----------(Affidavit for Individual)----------

_____ being duly sworn, deposes and says that:
a) the financial statement, taken from his/her books, is a true and accurate statement of his/her financial condition as of the date thereof; and b) all of the foregoing qualification information is true, complete, and accurate.

----------(Affidavit for Partnership)----------

_____ being duly sworn, deposes and says that:
a) he/she is a member of the partnership of _____;
b) he/she is familiar with the books of said partnership showing its financial condition; c) the financial statement, taken from the books of said partnership, is a true and accurate statement of the financial condition of the partnership as of the date thereof; and d) all of the foregoing qualification information is true, complete, and accurate.

----------(Affidavit for Corporation)----------

_____ being duly sworn, deposes and says that: a) he/she is _____ of _____;
(Full name of Corporation)
b) he/she is familiar with the books of said corporation showing its financial condition; c) the financial statement, taken from the books of said corporation, is a true and accurate statement of the financial condition of said corporation as of the date thereof; and d) that all of the foregoing qualification information is true, complete, and accurate.

----------(Acknowledgment)----------

_____ being duly sworn, deposes and says
that he/she is _____ of _____;
(Name of Bidder)
that he/she is duly authorized to make the foregoing affidavit and that he/she makes it on behalf of
( ) himself/herself; ( ) said partnership; ( ) said corporation.

Sworn to before me this _____ day of _____, 19__, in the County of _____, State of _____.

_____
(Notary Public)

My commission expires _____

(Seal)

TOWN OF MOREAU
SARATOGA COUNTY, NEW YORK

FORMER ABALENE PEST CONTROL
INACTIVE HAZARDOUS WASTE SITE
REMEDIATION PROJECT

AGREEMENT

THIS AGREEMENT is dated as of the _____ day of _____ in the year _____, by and between the Orkin Exterminating Company, Inc. (hereinafter called OWNER) and _____
(hereinafter called CONTRACTOR).

WITNESSETH: OWNER and CONTRACTOR, in consideration of the mutual covenants hereinafter set forth, agree as follows:

ARTICLE 1 - WORK

1.01 CONTRACTOR shall at its own cost and expense furnish all labor, services, tools, materials, equipment and incidentals necessary to complete all Work as specified or indicated in the Contract Documents to construct the Site Remediation Project. The Work is generally described in Section 01010 of the General Requirements.

1.02 The Project for which the Work under the Contract Documents may be the whole or only a part is generally described as follows:

Demolition and off-site disposal of existing buildings, excavation and off-site disposal of contaminated soil, scarification and disposal of concrete material, excavation and grading of soil, abandonment of septic tanks, abandonment of wells, underground petroleum storage tank decommissioning and removal, topsoil and seeding of site.

ARTICLE 2 - ENGINEER

2.01 The Project has been designed by Malcolm Pirnie Inc., 15 Cornell Road, Latham, New York 12110, who is hereinafter called ENGINEER and who is to act as OWNER's representative, assume all duties and responsibilities and have the rights and authority assigned to ENGINEER in the Contract Documents in connection with completion of the Work in accordance with the Contract Documents.

ARTICLE 3 - CONTRACT TIMES

3.01 Time of the Essence

A. All time limits for Milestones, if any, Substantial Completion and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract.

3.02 Dates for Substantial Completion and Final Payment

A. The Work will be substantially completed on or before June 30, 1999 and completed and ready for final payment in accordance with paragraph 14.07 of the General Conditions on or before July 16, 1999.

ARTICLE 4 - LIQUIDATED AND SPECIAL DAMAGES

4.01 Liquidated Damages

A. OWNER and CONTRACTOR recognize that time is of the essence of this Agreement and OWNER will suffer financial loss, apart from the costs described in paragraph 4.02.A, if the Work is not substantially completed within the time specified in Article 3 for Substantial Completion, plus any extensions thereof allowed in accordance with Article 12 of the General Conditions. OWNER and CONTRACTOR also recognize the delays, expense and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by OWNER if the Work is not substantially completed on time. Accordingly, instead of requiring any such proof, OWNER and CONTRACTOR agree that as liquidated damages for delay (but not as a penalty) CONTRACTOR shall pay OWNER $500.00 for each day that expires after the time specified in Article 3 for Substantial Completion (adjusted for any changes thereof made in accordance with Article 12 of the General Conditions) until the Work is substantially complete.

4.02 Special Damages:

A. In addition to the amount provided for liquidated damages, CONTRACTOR shall pay OWNER the actual costs reasonably incurred by OWNER for engineering and inspection forces employed for the Work for each day that expires after the date specified in Article 3 for Substantial Completion (adjusted for any changes thereof made in accordance with Article 12 of the General Conditions) until the Work is substantially complete.

B. After Substantial Completion, if CONTRACTOR shall neglect, refuse or fail to complete the remaining Work within the Contract Time or any proper extension thereof granted by OWNER, CONTRACTOR shall pay OWNER the actual costs reasonably incurred by OWNER for engineering and inspection forces employed for the Work for each day that expires after the time specified in Article 3 for Work to

be completed and ready for final payment (adjusted for any extensions thereof made in accordance with Article 12 of the General Conditions) until the Work is completed and ready for final payment.

4.03 OWNER may deduct liquidated damages and special damages as determined by the provisions of this Article 4 from progress payments due CONTRACTOR under this Agreement.

ARTICLE 5 - CONTRACT PRICE

5.01 OWNER shall pay CONTRACTOR, in current funds, for completion of the Work in accordance with the Contract Documents the prices stated in CONTRACTOR's Bid, which Bid is attached hereto and identified as Exhibit 1 of this Agreement. As provided in paragraph 11.03 of the General Conditions, estimated quantities are not guaranteed, and determinations of actual quantities and classifications are to be made by ENGINEER as provided in paragraph 9.08 of the General Conditions. Unit prices have been computed as provided in paragraph 11.03 of the General Conditions.

ARTICLE 6 - PAYMENT PROCEDURES

6.01 Submittal and Processing of Payments

A. CONTRACTOR shall submit Applications for Payment in accordance with Article 14 of the General Conditions. Applications for Payment will be processed as provided in the General Conditions.

6.02 Progress Payments; Retainage

A. OWNER shall make monthly progress payments on account of the Contract Price on the basis of CONTRACTOR's Applications for Payment as recommended by ENGINEER. CONTRACTOR's Applications for Payment will be due on the last day of the month. All progress payments will be on the basis of the progress of the Work measured by the schedule of values provided for in paragraph 2.07.A of the General Conditions (and in the case of Unit Price Work, based on the number of units completed) or, in the event there is no schedule of values, as provided in the General Requirements. A progress payment will not be made whenever the value of the Work completed since the last previous progress payment is less than $5,000.00.

1. Prior to Substantial Completion

a. Progress payments will be made in the amount of 90 percent of the Work completed, (with the balance being retainage), less the aggregate of payments previously made and less such amounts as ENGINEER shall

determine, or OWNER may withhold, in accordance with paragraph 14.02 of the General Conditions; and

b. 90 percent of the cost of materials and equipment not incorporated in the Work but suitably stored (with the balance being retainage).

2. Upon Substantial Completion, OWNER shall pay an amount sufficient to increase total payments to CONTRACTOR to 100 percent of the Work completed, less such amounts as ENGINEER shall determine in accordance with paragraph 14.02.B.5 of the General Conditions and less 200 percent of ENGINEER's estimate of the value of Work to be completed or corrected as shown on the tentative list of items to be completed or corrected attached to the certificate of Substantial Completion.

6.03 Final Payment:

A. Upon final completion and acceptance of the Work in accordance with paragraph 14.07 of the General Conditions, OWNER shall pay the remainder of the Contract Price as recommended by ENGINEER as provided in said paragraph 14.07.

ARTICLE 7 - INTEREST

7.01 All moneys not paid when due hereunder shall bear interest at the maximum rate allowed by law.

ARTICLE 8 - CONTRACTOR'S REPRESENTATIONS

8.01 As part of the inducement for OWNER to enter into this Agreement CONTRACTOR makes the following representations:

A. CONTRACTOR has examined and carefully studied the Contract Documents and the other related data identified in the Bidding Documents.

B. CONTRACTOR has visited the Site and become familiar with and is satisfied as to the general, local and Site conditions that may affect cost, progress, and performance for the Work.

C. CONTRACTOR is familiar with and is satisfied as to all federal, state and local Laws and Regulations that may affect cost, progress and performance of the Work.

D. CONTRACTOR has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities) which have been identified in the Supplementary Conditions as provided in paragraph 4.02 of the General Conditions, and (2) reports and drawings of a Hazardous Environmental Condition identified at

the Site, if any, which have been identified in the Supplementary Conditions as provided in paragraph 4.06 of the General Conditions.

E. CONTRACTOR has obtained and carefully studied (or assumes responsibility for having done so) examinations, investigations, explorations, tests, studies and data concerning conditions (surface, subsurface and Underground Facilities) at or contiguous to the Site which may effect cost, progress or performance of the Work or which relate to any aspect of the means, methods, techniques, sequences and procedures of construction to be employed by CONTRACTOR, including applying the specific means, methods, techniques, sequences, and procedures of construction expressly required by the Contract Documents to be employed by CONTRACTOR, and safety precautions and programs incident thereto.

F. CONTRACTOR does not consider that any further examinations, investigations, explorations, tests, studies or data are necessary for the performance of the Work at the Contract Price, within the Contract Times and in accordance with the other terms and conditions of the Contract Documents.

G. CONTRACTOR is aware of the general nature of work to be performed by OWNER and others at the Site that relates to the Work as indicated in the Contract Documents.

H. CONTRACTOR has correlated the information known to CONTRACTOR, information and observations obtained from visits to the Site, reports and drawings identified in the Contract Documents and all additional examinations, investigations, explorations, tests, studies and data with the Contract Documents.

I. CONTRACTOR has given ENGINEER written notice of all conflicts, errors, ambiguities, or discrepancies that CONTRACTOR has discovered in the Contract Documents and the written resolution thereof by ENGINEER is acceptable to CONTRACTOR.

J. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work.

ARTICLE 9 - CONTRACT DOCUMENTS

9.01 The Contract Documents consist of the following:

A. This Agreement (9 pages).

B. Performance Bond (_____ pages).

C. Payment Bond (_____ pages).

D. Other Bonds:

1._____ (_____ pages).

E. General Conditions (37 pages).

F. Supplementary Conditions (15 pages).

G. Specifications, as listed in the table of contents of the Project Manual.

H. The Drawings comprising a set entitled "Former Abalene Pest Control Inactive Hazardous Waste Site Remediation Project," dated March 1999 and including the following:

Title Sheet
Sheets numbered 1 through 3, inclusive.

I. Addenda consisting of Numbers____ to ____, inclusive.

J. Exhibits to the Agreement enumerated as follows:

1. Exhibit 1, CONTRACTOR'S Bid (_____ pages).

K. The following, which may be delivered or issued on or after the Effective Date of the Agreement, and are not attached hereto:

1. Notice to Proceed
2. Written Amendments
3. Work Change Directives
4. Change Order(s)

9.02 The documents listed in paragraph 9.01 above are attached to this Agreement (except as expressly noted otherwise above). Documents not attached are incorporated by reference. There are no Contract Documents other than those listed in this Article 9.

9.03 The Contract Documents may only be amended, modified or supplemented as provided in paragraph 3.04 of the General Conditions.

ARTICLE 10 - MISCELLANEOUS

10.01 Terms

A. Terms used in this Agreement will have the meanings indicated in the General Conditions.

10.02 Assignment of Contract

A. No assignment by a party hereto of any rights under or interests in the Contract will be binding on another party hereto without the written consent of the party sought to be bound; and, specifically but without limitation, moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

10.03 Successors and Assigns

A. OWNER and CONTRACTOR each binds itself, its partners, successors, assigns and legal representatives to the other party hereto, its partners, successors, assigns and legal representatives in respect to all covenants, agreements and obligations contained in the Contract Documents.

10.04 Severability

A. Any provision or part of the Contract Document, held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon OWNER and CONTRACTOR, who agree that the Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

10.05 Waiver

A. The waiver by the OWNER of any breach or violation of any term, covenant, or condition of this Agreement or of any Law or Regulation shall not be deemed to be a waiver of any other term, covenant, condition, or Law or Regulation or of any subsequent breach or violation of the same or of any other term, covenant, condition, or Law or Regulation. The subsequent payment of any monies or fee by the OWNER which may become due hereunder shall not be deemed to be a waiver of any preceding breach or violation by CONTRACTOR of any term, covenant, condition of this Agreement or of any applicable Law or Regulation.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement on the day and year first written above.

This Agreement will be effective on _____, 19____.

OWNER: _____ CONTRACTOR: _____

By: _____ By: _____

Title: _____ Title: _____

[CORPORATE SEAL] [CORPORATE SEAL]

Attest _____ Attest _____

Address for giving notices

_____

_____

(If OWNER is a corporation, partnership, or limited liability company, attach evidence of authority to sign) (If OWNER is a public body, attach evidence of authority to sign and resolution or other documents authorizing execution of Agreement.)

Address for giving notices

_____

_____

License No. _____
(where applicable)

Agent for service of process:

_____

(If CONTRACTOR is a corporation, partnership, or limited liability company, attach evidence of authority to sign.)

Designated Representative:

Name: _____

Title: _____

Address: _____

Phone No.: _____

Fax No.: _____

Designated Representative:

Name: _____

Title: _____

Address: _____

Phone No.: _____

Fax No.: _____

+ + END OF AGREEMENT + +

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GENERAL CONDITIONS

ARTICLE 1 - DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

A. Wherever used in the Contract Documents and printed with initial or all capital letters, the terms listed below will have the meanings indicated which are applicable to both the singular and plural thereof.

1. *Addenda*--Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the Contract Documents.

2. *Agreement*--The written instrument which is evidence of the agreement between OWNER and CONTRACTOR covering the Work.

3. *Application for Payment*--The form acceptable to ENGINEER which is to be used by CONTRACTOR during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.

4. *Asbestos*--Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.

5. *Bid*--The offer or proposal of a bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

6. *Bidding Documents*--The Bidding Requirements and the proposed Contract Documents (including all Addenda issued prior to receipt of Bids).

7. *Bidding Requirements*--The Advertisement or Invitation to Bid, Instructions to Bidders, Bid security form, if any, and the Bid form with any supplements.

8. *Bonds*--Performance and payment bonds and other instruments of security.

9. *Change Order*--A document recommended by ENGINEER which is signed by CONTRACTOR and OWNER and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, issued on or after the Effective Date of the Agreement.

10. *Claim*--A demand or assertion by OWNER or CONTRACTOR seeking an adjustment of Contract Price or Contract Times, or both, or other relief with respect to the terms of the Contract. A demand for money or services by a third party is not a Claim.

11. *Contract*--The entire and integrated written agreement between the OWNER and CONTRACTOR concerning the Work. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.

12. *Contract Documents*--The Contract Documents establish the rights and obligations of the parties and include the Agreement, Addenda (which pertain to the Contract Documents), CONTRACTOR's Bid (including documentation accompanying the Bid and any post Bid documentation submitted prior to the Notice of Award) when attached as an exhibit to the Agreement, the Notice to Proceed, the Bonds, these General Conditions, the Supplementary Conditions, the Specifications and the Drawings as the same are more specifically identified in the Agreement, together with all Written Amendments, Change Orders, Work Change Directives, Field Orders, and ENGINEER's written interpretations and clarifications issued on or after the Effective Date of the Agreement. Approved Shop Drawings and the reports and drawings of subsurface and physical conditions are not Contract Documents. Only printed or hard copies of the items listed in this paragraph are Contract Documents. Files in electronic media format of text, data, graphics, and the like that may be furnished by OWNER to CONTRACTOR are not Contract Documents.

13. *Contract Price*--The moneys payable by OWNER to CONTRACTOR for completion of the Work in accordance with the Contract Documents as stated in the Agreement (subject to the provisions of paragraph 11.03 in the case of Unit Price Work).

14. *Contract Times*--The number of days or the dates stated in the Agreement to: (i) achieve Substantial Completion; and (ii) complete the Work so that it is ready for final payment as evidenced by ENGINEER's written recommendation of final payment.

15. *CONTRACTOR*--The individual or entity with whom OWNER has entered into the Agreement.

16. *Cost of the Work*--See paragraph 11.01.A for definition.

17. *Drawings*--That part of the Contract Documents prepared or approved by ENGINEER which graphically shows the scope, extent, and character of the Work to be performed by CONTRACTOR. Shop Drawings and other CONTRACTOR submittals are not Drawings as so defined.

18. *Effective Date of the Agreement*--The date indicated in the Agreement on which it becomes effective, but if no such date is indicated, it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.

19. *ENGINEER*--The individual or entity named as such in the Agreement.

20. *ENGINEER's Consultant*--An individual or entity having a contract with ENGINEER to furnish services as ENGINEER's independent professional associate or consultant with respect to the Project and who is identified as such in the Supplementary Conditions.

21. *Field Order*--A written order issued by ENGINEER which requires minor changes in the Work but which does not involve a change in the Contract Price or the Contract Times.

22. *General Requirements*--Sections of Division 1 of the Specifications. The General Requirements pertain to all sections of the Specifications.

23. *Hazardous Environmental Condition*--The presence at the Site of Asbestos, PCBs, Petroleum, Hazardous Waste, or Radioactive Material in such quantities or circumstances that may present a substantial danger to persons or property exposed thereto in connection with the Work.

24. *Hazardous Waste*--The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.

25. *Laws and Regulations; Laws or Regulations*--Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

26. *Liens*--Charges, security interests, or encumbrances upon Project funds, real property, or personal property.

27. *Milestone*--A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all the Work.

28. *Notice of Award*--The written notice by OWNER to the apparent successful bidder stating that upon timely compliance by the apparent successful bidder with the conditions precedent listed therein, OWNER will sign and deliver the Agreement.

29. *Notice to Proceed*--A written notice given by OWNER to CONTRACTOR fixing the date on which the Contract Times will commence to run and on which CONTRACTOR shall start to perform the Work under the Contract Documents.

30. *OWNER*--The individual, entity, public body, or authority with whom CONTRACTOR has entered into the Agreement and for whom the Work is to be performed.

31. *Partial Utilization*--Use by OWNER of a substantially completed part of the Work for the purpose for which it is intended (or a related purpose) prior to Substantial Completion of all the Work.

32. *PCBs*--Polychlorinated biphenyls.

33. *Petroleum*--Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Waste and crude oils.

34. *Project*--The total construction of which the Work to be performed under the Contract Documents may be the whole, or a part as may be indicated elsewhere in the Contract Documents.

35. *Project Manual*--The bound documentary information prepared for bidding and constructing the Work. A listing of the contents of the Project Manual, which may be bound in one or more volumes, is contained in the table(s) of contents.

36. *Radioactive Material*--Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.

37. *Resident Project Representative*--The authorized representative of ENGINEER who may be assigned to the Site or any part thereof.

38. *Samples*--Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.

39. *Shop Drawings*--All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for CONTRACTOR and submitted by CONTRACTOR to illustrate some portion of the Work.

40. *Site*--Lands or areas indicated in the Contract Documents as being furnished by OWNER upon which the Work is to be performed, including rights-of-way and easements for access thereto, and such other lands furnished by OWNER which are designated for the use of CONTRACTOR.

41. *Specifications*--That part of the Contract Documents consisting of written technical descriptions of materials, equipment, systems, standards, and workmanship as applied to the Work and certain administrative details applicable thereto.

42. *Subcontractor*--An individual or entity having a direct contract with CONTRACTOR or with any other Subcontractor for the performance of a part of the Work at the Site.

43. *Substantial Completion*--The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of ENGINEER, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms "substantially complete" and "substantially completed" as applied to all or part of the Work refer to Substantial Completion thereof.

44. *Supplementary Conditions*--That part of the Contract Documents which amends or supplements these General Conditions.

45. *Supplier*--A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with CONTRACTOR or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by CONTRACTOR or any Subcontractor.

46. *Underground Facilities*--All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.

47. *Unit Price Work*--Work to be paid for on the basis of unit prices.

48. *Work*--The entire completed construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction, and furnishing, installing, and incorporating all materials and equipment into such construction, all as required by the Contract Documents.

49. *Work Change Directive*--A written statement to CONTRACTOR issued on or after the Effective Date of the Agreement and signed by OWNER and recommended by ENGINEER ordering an addition, deletion, or revision in the Work, or responding to differing or unforeseen subsurface or physical conditions under which the Work is to be performed or to emergencies. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the change ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times.

50. *Written Amendment*--A written statement modifying the Contract Documents, signed by OWNER and CONTRACTOR on or after the Effective Date of the Agreement and normally dealing with the nonengineering or nontechnical rather than strictly construction-related aspects of the Contract Documents.

1.02 *Terminology*

A. *Intent of Certain Terms or Adjectives*

1. Whenever in the Contract Documents the terms "as ordered," "as directed," "as required," "as allowed," "as approved," or terms of like effect or import are used, or the adjectives "reasonable," "suitable," "acceptable," "proper," "satisfactory," or adjectives of like effect or import are used to describe an action or determination of ENGINEER as to the Work, it is intended that such action or determination will be solely to evaluate, in general, the completed Work for compliance with the requirements of and information in the Contract Documents and conformance with the design concept of the completed Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective shall not be effective to assign to ENGINEER any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of paragraph 9.10 or any other provision of the Contract Documents.

B. *Day*

1. The word "day" shall constitute a calendar day of 24 hours measured from midnight to the next midnight.

C. *Defective*

1. The word "defective," when modifying the word "Work," refers to Work that is unsatisfactory, faulty, or

deficient in that it does not conform to the Contract Documents or does not meet the requirements of any inspection, reference standard, test, or approval referred to in the Contract Documents, or has been damaged prior to ENGINEER's recommendation of final payment (unless responsibility for the protection thereof has been assumed by OWNER at Substantial Completion in accordance with paragraph 14.04 or 14.05).

D. *Furnish, Install, Perform, Provide*

1. The word "furnish," when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.

2. The word "install," when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.

3. The words "perform" or "provide," when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.

4. When "furnish," "install," "perform," or "provide" is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of CONTRACTOR, "provide" is implied.

E. Unless stated otherwise in the Contract Documents, words or phrases which have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2 - PRELIMINARY MATTERS

2.01 *Delivery of Bonds*

A. When CONTRACTOR delivers the executed Agreements to OWNER, CONTRACTOR shall also deliver to OWNER such Bonds as CONTRACTOR may be required to furnish.

2.02 *Copies of Documents*

A. OWNER shall furnish to CONTRACTOR up to ten copies of the Contract Documents. Additional copies will be furnished upon request at the cost of reproduction.

2.03 *Commencement of Contract Times; Notice to Proceed*

A. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Agreement or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Agreement. In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Agreement, whichever date is earlier.

2.04 *Starting the Work*

A. CONTRACTOR shall start to perform the Work on the date when the Contract Times commence to run. No Work shall be done at the Site prior to the date on which the Contract Times commence to run.

2.05 *Before Starting Construction*

A. *CONTRACTOR's Review of Contract Documents:* Before undertaking each part of the Work, CONTRACTOR shall carefully study and compare the Contract Documents and check and verify pertinent figures therein and all applicable field measurements. CONTRACTOR shall promptly report in writing to ENGINEER any conflict, error, ambiguity, or discrepancy which CONTRACTOR may discover and shall obtain a written interpretation or clarification from ENGINEER before proceeding with any Work affected thereby; however, CONTRACTOR shall not be liable to OWNER or ENGINEER for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless CONTRACTOR knew or reasonably should have known thereof.

B. *Preliminary Schedules:* Within ten days after the Effective Date of the Agreement (unless otherwise specified in the General Requirements), CONTRACTOR shall submit to ENGINEER for its timely review:

1. a preliminary progress schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract Documents;

2. a preliminary schedule of Shop Drawing and Sample submittals which will list each required submittal and the times for submitting, reviewing, and processing such submittal; and

3. a preliminary schedule of values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

C. *Evidence of Insurance:* Before any Work at the Site is started, CONTRACTOR and OWNER shall each deliver to the other, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance which either of them or any additional insured may reasonably request) which CONTRACTOR and OWNER respectively are required to purchase and maintain in accordance with Article 5.

2.06 *Preconstruction Conference*

A. Within 20 days after the Contract Times start to run, but before any Work at the Site is started, a conference attended by CONTRACTOR, ENGINEER, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in paragraph 2.05.B, procedures for handling Shop Drawings and other submittals, processing Applications for Payment, and maintaining required records.

2.07 *Initial Acceptance of Schedules*

A. Unless otherwise provided in the Contract Documents, at least ten days before submission of the first Application for Payment a conference attended by CONTRACTOR, ENGINEER, and others as appropriate will be held to review for acceptability to ENGINEER, as provided below, the schedules submitted in accordance with paragraph 2.05.B. CONTRACTOR shall have an additional ten days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to CONTRACTOR until acceptable schedules are submitted to ENGINEER.

1. The progress schedule will be acceptable to ENGINEER if it provides an orderly progression of the Work to completion within any specified Milestones and the Contract Times. Such acceptance will not impose on ENGINEER responsibility for the progress schedule, for sequencing, scheduling, or progress of the Work nor interfere with or relieve CONTRACTOR from CONTRACTOR's full responsibility therefor.

2. CONTRACTOR's schedule of Shop Drawing and Sample submittals will be acceptable to ENGINEER if it provides a workable arrangement for reviewing and processing the required submittals.

3. CONTRACTOR's schedule of values will be acceptable to ENGINEER as to form and substance if it provides a reasonable allocation of the Contract Price to component parts of the Work.

ARTICLE 3 - CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

3.01 *Intent*

A. The Contract Documents are complementary; what is called for by one is as binding as if called for by all.

B. It is the intent of the Contract Documents to describe a functionally complete Project (or part thereof) to be constructed in accordance with the Contract Documents. Any labor, documentation, services, materials, or equipment that may reasonably be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the intended result will be provided whether or not specifically called for at no additional cost to OWNER.

C. Clarifications and interpretations of the Contract Documents shall be issued by ENGINEER as provided in Article 9.

3.02 *Reference Standards*

A. *Standards, Specifications, Codes, Laws, and Regulations*

1. Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard, specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.

2. No provision of any such standard, specification, manual or code, or any instruction of a Supplier shall be effective to change the duties or responsibilities of OWNER, CONTRACTOR, or ENGINEER, or any of their subcontractors, consultants, agents, or employees from those set forth in the Contract Documents, nor shall any such provision or instruction be effective to assign to OWNER, ENGINEER, or any of ENGINEER's Consultants, agents, or employees any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

3.03 *Reporting and Resolving Discrepancies*

A. *Reporting Discrepancies*

1. If, during the performance of the Work, CONTRACTOR discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents or between the Contract Documents and any provision of any Law or Regulation applicable to the performance of the Work or of

any standard, specification, manual or code, or of any instruction of any Supplier, CONTRACTOR shall report it to ENGINEER in writing at once. CONTRACTOR shall not proceed with the Work affected thereby (except in an emergency as required by paragraph 6.16.A) until an amendment or supplement to the Contract Documents has been issued by one of the methods indicated in paragraph 3.04; provided, however, that CONTRACTOR shall not be liable to OWNER or ENGINEER for failure to report any such conflict, error, ambiguity, or discrepancy unless CONTRACTOR knew or reasonably should have known thereof.

B. *Resolving Discrepancies*

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between the provisions of the Contract Documents and:

a. the provisions of any standard, specification, manual, code, or instruction (whether or not specifically incorporated by reference in the Contract Documents); or

b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Amending and Supplementing Contract Documents*

A. The Contract Documents may be amended to provide for additions, deletions, and revisions in the Work or to modify the terms and conditions thereof in one or more of the following ways: (i) a Written Amendment; (ii) a Change Order; or (iii) a Work Change Directive.

B. The requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, by one or more of the following ways: (i) a Field Order; (ii) ENGINEER's approval of a Shop Drawing or Sample; or (iii) ENGINEER's written interpretation or clarification.

3.05 *Reuse of Documents*

A. CONTRACTOR and any Subcontractor or Supplier or other individual or entity performing or furnishing any of the Work under a direct or indirect contract with OWNER: (i) shall not have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of ENGINEER or ENGINEER's Consultant, including electronic media editions; and (ii) shall not reuse any of such Drawings, Specifications, other documents, or copies on extensions of the Project or any other project without written consent of OWNER and ENGINEER and specific written verification or adaption by ENGINEER. This prohibition will survive final payment, completion, and acceptance of the Work, or termination or completion of the Contract. Nothing herein shall preclude CONTRACTOR from retaining copies of the Contract Documents for record purposes.

ARTICLE 4 - AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; REFERENCE POINTS

4.01 *Availability of Lands*

A. OWNER shall furnish the Site. OWNER shall notify CONTRACTOR of any encumbrances or restrictions not of general application but specifically related to use of the Site with which CONTRACTOR must comply in performing the Work. OWNER will obtain in a timely manner and pay for easements for permanent structures or permanent changes in existing facilities. If CONTRACTOR and OWNER are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, as a result of any delay in OWNER's furnishing the Site, CONTRACTOR may make a Claim therefor as provided in paragraph 10.05.

B. CONTRACTOR shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

4.02 *Subsurface and Physical Conditions*

A. *Reports and Drawings:* The Supplementary Conditions identify:

1. those reports of explorations and tests of subsurface conditions at or contiguous to the Site that ENGINEER has used in preparing the Contract Documents; and

2. those drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities) that ENGINEER has used in preparing the Contract Documents.

B. *Limited Reliance by CONTRACTOR on Technical Data Authorized:* CONTRACTOR may rely upon the general accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," CONTRACTOR may not rely upon or make any Claim against OWNER, ENGINEER, or any of ENGINEER's Consultants with respect to:

1. the completeness of such reports and drawings for CONTRACTOR's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by CONTRACTOR, and safety precautions and programs incident thereto; or

2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or

3. any CONTRACTOR interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions, or information.

4.03 *Differing Subsurface or Physical Conditions*

A. *Notice:* If CONTRACTOR believes that any subsurface or physical condition at or contiguous to the Site that is uncovered or revealed either:

1. is of such a nature as to establish that any "technical data" on which CONTRACTOR is entitled to rely as provided in paragraph 4.02 is materially inaccurate; or

2. is of such a nature as to require a change in the Contract Documents; or

3. differs materially from that shown or indicated in the Contract Documents; or

4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then CONTRACTOR shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by paragraph 6.16.A), notify OWNER and ENGINEER in writing about such condition. CONTRACTOR shall not further disturb such condition or perform any Work in connection therewith (except as aforesaid) until receipt of written order to do so.

B. *ENGINEER's Review:* After receipt of written notice as required by paragraph 4.03.A, ENGINEER will promptly review the pertinent condition, determine the necessity of OWNER's obtaining additional exploration or tests with respect thereto, and advise OWNER in writing (with a copy to CONTRACTOR) of ENGINEER's findings and conclusions.

C. *Possible Price and Times Adjustments*

1. The Contract Price or the Contract Times, or both, will be equitably adjusted to the extent that the existence of such differing subsurface or physical condition causes an increase or decrease in CONTRACTOR's cost of, or time required for, performance of the Work; subject, however, to the following:

a. such condition must meet any one or more of the categories described in paragraph 4.03.A; and

b. with respect to Work that is paid for on a Unit Price Basis, any adjustment in Contract Price will be subject to the provisions of paragraphs 9.08 and 11.03.

2. CONTRACTOR shall not be entitled to any adjustment in the Contract Price or Contract Times if:

a. CONTRACTOR knew of the existence of such conditions at the time CONTRACTOR made a final commitment to OWNER in respect of Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract; or

b. the existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for CONTRACTOR prior to CONTRACTOR's making such final commitment; or

c. CONTRACTOR failed to give the written notice within the time and as required by paragraph 4.03.A.

3. If OWNER and CONTRACTOR are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, a Claim may be made therefor as provided in paragraph 10.05. However, OWNER, ENGINEER, and ENGINEER's Consultants shall not be liable to CONTRACTOR for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by CONTRACTOR on or in connection with any other project or anticipated project.

4.04 *Underground Facilities*

A. *Shown or Indicated:* The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the Site is based on information and data furnished to OWNER or ENGINEER by the owners of such Underground Facilities, including OWNER, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:

1. OWNER and ENGINEER shall not be responsible for the accuracy or completeness of any such information or data; and

2. the cost of all of the following will be included in the Contract Price, and CONTRACTOR shall have full responsibility for:

a. reviewing and checking all such information and data,

b. locating all Underground Facilities shown or indicated in the Contract Documents,

c. coordination of the Work with the owners of such Underground Facilities, including OWNER, during construction, and

d. the safety and protection of all such Underground Facilities and repairing any damage thereto resulting from the Work.

B. *Not Shown or Indicated:*

1. If an Underground Facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated or not shown or indicated with reasonable accuracy in the Contract Documents, CONTRACTOR shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by paragraph 6.16.A), identify the owner of such Underground Facility and give written notice to that owner and to OWNER and ENGINEER. ENGINEER will promptly review the Underground Facility and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the consequences of the existence or location of the Underground Facility. During such time, CONTRACTOR shall be responsible for the safety and protection of the underground facility.

2. If ENGINEER concludes that a change in the Contract Documents is required, a Work Change Directive or a Change Order will be issued to reflect and document such consequences. An equitable adjustment shall be made in the Contract Price or Contract Times, or both, to the extent that they are attributable to the existence or location of any Underground Facility that was not shown or indicated or not shown with reasonable accuracy in the Contract Documents and that CONTRACTOR did not know of and could not reasonably have been expected to be aware of or to have anticipated. If OWNER and CONTRACTOR are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment in Contract Price or Contract Times, OWNER or CONTRACTOR may make a Claim therefor as provided in paragraph 10.05.

4.05 *Reference Points*

A. OWNER shall provide engineering surveys to establish reference points for construction which in ENGINEER's judgment are necessary to enable CONTRACTOR to proceed with the Work. CONTRACTOR shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of OWNER. CONTRACTOR shall report to ENGINEER whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

4.06 *Hazardous Environmental Condition at Site*

A. *Reports and Drawings*: Reference is made to the Supplementary Conditions for the identification of those reports and drawings relating to a Hazardous Environmental Condition identified at the Site, if any, that have been utilized by the ENGINEER in the preparation of the Contract Documents.

B. *Limited Reliance by CONTRACTOR on Technical Data Authorized*: CONTRACTOR may rely upon the general accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data", CONTRACTOR may not rely upon or make any Claim against OWNER, ENGINEER or any of ENGINEER's Consultants with respect to:

1. the completeness of such reports and drawings for CONTRACTOR's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by CONTRACTOR and safety precautions and programs incident thereto; or

2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or

3. any CONTRACTOR interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions or information.

C. CONTRACTOR shall not be responsible for any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work. CONTRACTOR shall be responsible for a Hazardous Environmental Condition created with any materials brought to the Site by CONTRACTOR, Subcontractors, Suppliers, or anyone else for whom CONTRACTOR is responsible.

D. If CONTRACTOR encounters a Hazardous Environmental Condition or if CONTRACTOR or anyone for

whom CONTRACTOR is responsible creates a Hazardous Environmental Condition, CONTRACTOR shall immediately: (i) secure or otherwise isolate such condition; (ii) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by paragraph 6.16); and (iii) notify OWNER and ENGINEER (and promptly thereafter confirm such notice in writing). OWNER shall promptly consult with ENGINEER concerning the necessity for OWNER to retain a qualified expert to evaluate such condition or take corrective action, if any.

E. CONTRACTOR shall not be required to resume Work in connection with such condition or in any affected area until after OWNER has obtained any required permits related thereto and delivered to CONTRACTOR written notice: (i) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work; or (ii) specifying any special conditions under which such Work may be resumed safely. If OWNER and CONTRACTOR cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by CONTRACTOR, either party may make a Claim therefor as provided in paragraph 10.05.

F. If, after receipt of such written notice, CONTRACTOR does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then OWNER may order the portion of the Work that is in the area affected by such condition to be deleted from the Work. If OWNER and CONTRACTOR cannot agree as to entitlement to or on the amount or extent, if any, of an adjustment in Contract Price or Contract Times as a result of deleting such portion of the Work, then either party may make a Claim therefor as provided in paragraph 10.05. OWNER may have such deleted portion of the Work performed by OWNER's own forces or others in accordance with Article 7.

G. To the fullest extent permitted by Laws and Regulations, CONTRACTOR shall indemnify and hold harmless OWNER, ENGINEER, ENGINEER's Consultants, and the officers, directors, partners, employees, agents, other consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition created by CONTRACTOR or by anyone for whom CONTRACTOR is responsible. Nothing in this paragraph 4:06.G shall obligate CONTRACTOR to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

H. The provisions of paragraphs 4.02, 4.03, and 4.04 are not intended to apply to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 5 - BONDS AND INSURANCE

5.01 *Performance, Payment, and Other Bonds*

A. CONTRACTOR shall furnish performance and payment Bonds, each in an amount at least equal to the Contract Price as security for the faithful performance and payment of all CONTRACTOR's obligations under the Contract Documents. These Bonds shall remain in effect at least until one year after the date when final payment becomes due, except as provided otherwise by Laws or Regulations or by the Contract Documents. CONTRACTOR shall also furnish such other Bonds as are required by the Contract Documents.

B. All Bonds shall be in the form prescribed by the Contract Documents, except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. All Bonds signed by an agent must be accompanied by a certified copy of such agent's authority to act.

C. If the surety on any Bond furnished by CONTRACTOR is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of paragraph 5.01.B, CONTRACTOR shall within 20 days thereafter substitute another Bond and surety, both of which shall comply with the requirements of paragraphs 5.01.B and 5.02.

5.02. *Licensed Sureties and Insurers*

A. All Bonds and insurance required by the Contract Documents to be purchased and maintained by OWNER or CONTRACTOR shall be obtained from surety or insurance companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue Bonds or insurance policies for the limits and coverages so required. Such surety and insurance companies shall also meet such additional requirements and qualifications as may be provided in the Supplementary Conditions.

5.03 *Certificates of Insurance*

A. CONTRACTOR shall deliver to OWNER, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by OWNER or any other additional insured) which CONTRACTOR is required to purchase and maintain. OWNER shall deliver to CONTRACTOR, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance

requested by CONTRACTOR or any other additional insured) which OWNER is required to purchase and maintain.

5.04 *CONTRACTOR's Liability Insurance*

A. CONTRACTOR shall purchase and maintain such liability and other insurance as is appropriate for the Work being performed and as will provide protection from claims set forth below which may arise out of or result from CONTRACTOR's performance of the Work and CONTRACTOR's other obligations under the Contract Documents, whether it is to be performed by CONTRACTOR, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable:

1. claims under workers' compensation, disability benefits, and other similar employee benefit acts;

2. claims for damages because of bodily injury, occupational sickness or disease, or death of CONTRACTOR's employees;

3. claims for damages because of bodily injury, sickness or disease, or death of any person other than CONTRACTOR's employees;

4. claims for damages insured by reasonably available personal injury liability coverage which are sustained: (i) by any person as a result of an offense directly or indirectly related to the employment of such person by CONTRACTOR, or (ii) by any other person for any other reason;

5. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom; and

6. claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.

B. The policies of insurance so required by this paragraph 5.04 to be purchased and maintained shall:

1. with respect to insurance required by paragraphs 5.04.A.3 through 5.04.A.6 inclusive, include as additional insureds (subject to any customary exclusion in respect of professional liability) OWNER, ENGINEER, ENGINEER's Consultants, and any other individuals or entities identified in the Supplementary Conditions, all of whom shall be listed as additional insureds, and include coverage for the respective officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of all such additional insureds, and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby;

2. include at least the specific coverages and be written for not less than the limits of liability provided in the Supplementary Conditions or required by Laws or Regulations, whichever is greater;

3. include completed operations insurance;

4. include contractual liability insurance covering CONTRACTOR's indemnity obligations under paragraphs 6.11 and 6.20;

5. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed or renewal refused until at least thirty days prior written notice has been given to OWNER and CONTRACTOR and to each other additional insured identified in the Supplementary Conditions to whom a certificate of insurance has been issued (and the certificates of insurance furnished by the CONTRACTOR pursuant to paragraph 5.03 will so provide);

6. remain in effect at least until final payment and at all times thereafter when CONTRACTOR may be correcting, removing, or replacing defective Work in accordance with paragraph 13.07; and

7. with respect to completed operations insurance, and any insurance coverage written on a claims-made basis, remain in effect for at least two years after final payment (and CONTRACTOR shall furnish OWNER and each other additional insured identified in the Supplementary Conditions, to whom a certificate of insurance has been issued, evidence satisfactory to OWNER and any such additional insured of continuation of such insurance at final payment and one year thereafter).

5.05 *OWNER's Liability Insurance*

A. In addition to the insurance required to be provided by CONTRACTOR under paragraph 5.04, OWNER, at OWNER's option, may purchase and maintain at OWNER's expense OWNER's own liability insurance as will protect OWNER against claims which may arise from operations under the Contract Documents.

5.06 *Property Insurance (See Supplementary Conditions)*

5.07 (Not Used)

5.08 (Not Used)

5.09 (Not Used)

5.10 *Acceptance of Bonds and Insurance; Option to Replace*

A. If either OWNER or CONTRACTOR has any objection to the coverage afforded by or other provisions of the Bonds or insurance required to be purchased and maintained by the other party in accordance with Article 5 on the basis of non-conformance with the Contract Documents, the objecting party shall so notify the other party in writing within 10 days after receipt of the certificates (or other evidence requested) required by paragraph 2.05.C. OWNER and CONTRACTOR shall each provide to the other such additional information in respect of insurance provided as the other may reasonably request. If either party does not purchase or maintain all of the Bonds and insurance required of such party by the Contract Documents, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage. Without prejudice to any other right or remedy, the other party may elect to obtain equivalent Bonds or insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and a Change Order shall be issued to adjust the Contract Price accordingly.

ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES

6.01 *Supervision and Superintendence*

A. CONTRACTOR shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. CONTRACTOR shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction, but CONTRACTOR shall not be responsible for the negligence of OWNER or ENGINEER in the design or specification of a specific means, method, technique, sequence, or procedure of construction which is shown or indicated in and expressly required by the Contract Documents. CONTRACTOR shall be responsible to see that the completed Work complies accurately with the Contract Documents.

B. At all times during the progress of the Work, CONTRACTOR shall assign a competent resident superintendent thereto who shall not be replaced without written notice to OWNER and ENGINEER except under extraordinary circumstances. The superintendent will be CONTRACTOR's representative at the Site and shall have authority to act on behalf of CONTRACTOR. All communications given to or received from the superintendent shall be binding on CONTRACTOR.

6.02 *Labor; Working Hours*

A. CONTRACTOR shall provide competent, suitably qualified personnel to survey, lay out, and construct the Work as required by the Contract Documents. CONTRACTOR shall at all times maintain good discipline and order at the Site.

B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours, and CONTRACTOR will not permit overtime work or the performance of Work on Saturday, Sunday, or any legal holiday without OWNER's written consent (which will not be unreasonably withheld) given after prior written notice to ENGINEER.

6.03 *Services, Materials, and Equipment*

A. Unless otherwise specified in the General Requirements, CONTRACTOR shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start-up, and completion of the Work.

B. All materials and equipment incorporated into the Work shall be as specified or, if not specified, shall be of good quality and new, except as otherwise provided in the Contract Documents. All warranties and guarantees specifically called for by the Specifications shall expressly run to the benefit of OWNER. If required by ENGINEER, CONTRACTOR shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

6.04 *Progress Schedule*

A. CONTRACTOR shall adhere to the progress schedule established in accordance with paragraph 2.07 as it may be adjusted from time to time as provided below.

1. CONTRACTOR shall submit to ENGINEER for acceptance (to the extent indicated in paragraph 2.07) proposed adjustments in the progress schedule that will not result in changing the Contract Times (or Milestones). Such adjustments will conform generally to the progress schedule then in effect and additionally will comply with any provisions of the General Requirements applicable thereto.

2. Proposed adjustments in the progress schedule that will change the Contract Times (or Milestones) shall be submitted in accordance with the requirements of Article 12. Such adjustments may only be made by a Change Order or Written Amendment in accordance with Article 12.

6.05 *Substitutes and "Or-Equals"*

A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the specification or description is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or-equal" item or no substitution is permitted, other items of material or equipment or material or equipment of other Suppliers may be submitted to ENGINEER for review under the circumstances described below.

1. *"Or-Equal" Items:* If, in ENGINEER's sole discretion, an item of material or equipment proposed by CONTRACTOR is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by ENGINEER as an "or-equal" item, in which case review and approval of the proposed item may, in ENGINEER's sole discretion, be accomplished without compliance with some or all of the requirements for approval of proposed substitute items. For the purposes of this paragraph 6.05.A.1, a proposed item of material or equipment will be considered functionally equal to an item so named if:

a. In the exercise of reasonable judgment ENGINEER determines that: (i) it is at least equal in quality, durability, appearance, strength, and design characteristics; (ii) it will reliably perform at least equally well the function imposed by the design concept of the completed Project as a functioning whole; and CONTRACTOR;

b. Certifies that: (i) there is no increase in cost to the OWNER; and (ii) it will conform substantially, even with deviations, to the detailed requirements of the item named in the Contract Documents.

2. *Substitute Items*

a. If, in ENGINEER's sole discretion, an item of material or equipment proposed by CONTRACTOR does not qualify as an "or-equal" item under paragraph 6.05.A.1, it will be considered a proposed substitute item.

b. CONTRACTOR shall submit sufficient information as provided below to allow ENGINEER to determine that the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefor. Requests for review of proposed substitute items of material or equipment will not be accepted by ENGINEER from anyone other than CONTRACTOR.

c. The procedure for review by ENGINEER will be as set forth in paragraph 6.05.A.2.d, as supplemented in the General Requirements and as ENGINEER may decide is appropriate under the circumstances.

d. CONTRACTOR shall first make written application to ENGINEER for review of a proposed substitute item of material or equipment that CONTRACTOR seeks to furnish or use. The application shall certify that the proposed substitute item will perform adequately the functions and achieve the results called for by the general design, be similar in substance to that specified, and be suited to the same use as that specified. The application will state the extent, if any, to which the use of the proposed substitute item will prejudice CONTRACTOR's achievement of Substantial Completion on time, whether or not use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with OWNER for work on the Project) to adapt the design to the proposed substitute item and whether or not incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty. All variations of the proposed substitute item from that specified will be identified in the application, and available engineering, sales, maintenance, repair, and replacement services will be indicated. The application will also contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including costs of redesign and claims of other contractors affected by any resulting change, all of which will be considered by ENGINEER in evaluating the proposed substitute item. ENGINEER may require CONTRACTOR to furnish additional data about the proposed substitute item.

B. *Substitute Construction Methods or Procedures:* If a specific means, method, technique, sequence, or procedure of construction is shown or indicated in and expressly required by the Contract Documents, CONTRACTOR may furnish or utilize a substitute means, method, technique, sequence, or procedure of construction approved by ENGINEER. CONTRACTOR shall submit sufficient information to allow ENGINEER, in ENGINEER's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents. The procedure for review by ENGINEER will be similar to that provided in subparagraph 6.05.A.2.

C. *Engineer's Evaluation:* ENGINEER will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to paragraphs 6.05.A and 6.05.B. ENGINEER will be the sole judge of acceptability. No "or-equal" or substitute will be ordered, installed or utilized until ENGINEER's review is complete, which will be evidenced by either a Change Order for a substitute or an approved Shop

Drawing for an "or equal." ENGINEER will advise CONTRACTOR in writing of any negative determination.

D. *Special Guarantee:* OWNER may require CONTRACTOR to furnish at CONTRACTOR's expense a special performance guarantee or other surety with respect to any substitute.

E. *ENGINEER's Cost Reimbursement:* ENGINEER will record time required by ENGINEER and ENGINEER's Consultants in evaluating substitute proposed or submitted by CONTRACTOR pursuant to paragraphs 6.05.A.2 and 6.05.B and in making changes in the Contract Documents (or in the provisions of any other direct contract with OWNER for work on the Project) occasioned thereby. Whether or not ENGINEER approves a substitute item so proposed or submitted by CONTRACTOR, CONTRACTOR shall reimburse OWNER for the charges of ENGINEER and ENGINEER's Consultants for evaluating each such proposed substitute.

F. *CONTRACTOR's Expense:* CONTRACTOR shall provide all data in support of any proposed substitute or "or-equal" at CONTRACTOR's expense.

6.06 *Concerning Subcontractors, Suppliers, and Others*

A. CONTRACTOR shall not employ any Subcontractor, Supplier, or other individual or entity (including those acceptable to OWNER as indicated in paragraph 6.06.B), whether initially or as a replacement, against whom OWNER may have reasonable objection. CONTRACTOR shall not be required to employ any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against whom CONTRACTOR has reasonable objection.

B. If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, or other individuals or entities to be submitted to OWNER in advance for acceptance by OWNER by a specified date prior to the Effective Date of the Agreement, and if CONTRACTOR has submitted a list thereof in accordance with the Supplementary Conditions, OWNER's acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the Bidding Documents or the Contract Documents) of any such Subcontractor, Supplier, or other individual or entity so identified may be revoked on the basis of reasonable objection after due investigation. CONTRACTOR shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity, and the Contract Price will be adjusted by the difference in the cost occasioned by such replacement, and an appropriate Change Order will be issued or Written Amendment signed. No acceptance by OWNER of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of any right of OWNER or ENGINEER to reject defective Work.

C. CONTRACTOR shall be fully responsible to OWNER and ENGINEER for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as CONTRACTOR is responsible for CONTRACTOR's own acts and omissions. Nothing in the Contract Documents shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between OWNER or ENGINEER and any such Subcontractor, Supplier or other individual or entity, nor shall it create any obligation on the part of OWNER or ENGINEER to pay or to see to the payment of any moneys due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.

D. CONTRACTOR shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work under a direct or indirect contract with CONTRACTOR.

E. CONTRACTOR shall require all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work to communicate with ENGINEER through CONTRACTOR.

F. The divisions and sections of the Specifications and the identifications of any Drawings shall not control CONTRACTOR in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.

G. All Work performed for CONTRACTOR by a Subcontractor or Supplier will be pursuant to an appropriate agreement between CONTRACTOR and the Subcontractor or Supplier which specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of OWNER and ENGINEER. Whenever any such agreement is with a Subcontractor or Supplier who is listed as an additional insured on the property insurance provided in paragraph 5.06, the agreement between the CONTRACTOR and the Subcontractor or Supplier will contain provisions whereby the Subcontractor or Supplier waives all rights against OWNER, CONTRACTOR, ENGINEER, ENGINEER's Consultants, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or additional insureds (and the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them) for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work. If the insurers on any such policies require separate waiver forms to be signed by any Subcontractor or Supplier, CONTRACTOR will obtain the same.

6.07 *Patent Fees and Royalties*

A. CONTRACTOR shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if to the actual knowledge of OWNER or ENGINEER its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by OWNER in the Contract Documents. To the fullest extent permitted by Laws and Regulations, CONTRACTOR shall indemnify and hold harmless OWNER, ENGINEER, ENGINEER's Consultants, and the officers, directors, partners, employees or agents, and other consultants of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

6.08 *Permits*

A. Unless otherwise provided in the Supplementary Conditions, CONTRACTOR shall obtain and pay for all construction permits and licenses. OWNER shall assist CONTRACTOR, when necessary, in obtaining such permits and licenses. CONTRACTOR shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of opening of Bids, or, if there are no Bids, on the Effective Date of the Agreement. CONTRACTOR shall pay all charges of utility owners for connections to the Work, and OWNER shall pay all charges of such utility owners for capital costs related thereto, such as plant investment fees.

6.09 *Laws and Regulations*

A. CONTRACTOR shall give all notices and comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither OWNER nor ENGINEER shall be responsible for monitoring CONTRACTOR's compliance with any Laws or Regulations.

B. If CONTRACTOR performs any Work knowing or having reason to know that it is contrary to Laws or Regulations, CONTRACTOR shall bear all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work; however, it shall not be CONTRACTOR's primary responsibility to make certain that the Specifications and Drawings are in accordance with Laws and Regulations, but this shall not relieve CONTRACTOR of CONTRACTOR's obligations under paragraph 3.03.

C. Changes in Laws or Regulations not known at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids) having an effect on the cost or time of performance of the Work may be the subject of an adjustment in Contract Price or Contract Times. If OWNER and CONTRACTOR are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in paragraph 10.05.

6.10 *Taxes*

A. CONTRACTOR shall pay all sales, consumer, use, and other similar taxes required to be paid by CONTRACTOR in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

6.11 *Use of Site and Other Areas*

A. *Limitation on Use of Site and Other Areas*

1. CONTRACTOR shall confine construction equipment, the storage of materials and equipment, and the operations of workers to the Site and other areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and other areas with construction equipment or other materials or equipment. CONTRACTOR shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof, or of any adjacent land or areas resulting from the performance of the Work.

2. Should any claim be made by any such owner or occupant because of the performance of the Work, CONTRACTOR shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law.

3. To the fullest extent permitted by Laws and Regulations, CONTRACTOR shall indemnify and hold harmless OWNER, ENGINEER, ENGINEER's Consultant, and the officers, directors, partners, employees, agents, and other consultants of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against OWNER, ENGINEER, or any other party indemnified hereunder to the extent caused by or based upon CONTRACTOR's performance of the Work.

B. *Removal of Debris During Performance of the Work:* During the progress of the Work CONTRACTOR shall keep the Site and other areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.

C. *Cleaning:* Prior to Substantial Completion of the Work, CONTRACTOR shall clean the Site and make it ready for utilization by OWNER. At the completion of the Work CONTRACTOR shall remove from the Site all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.

D. *Loading Structures:* CONTRACTOR shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall CONTRACTOR subject any part of the Work or adjacent property to stresses or pressures that will endanger it.

6.12 *Record Documents*

A. CONTRACTOR shall maintain in a safe place at the Site one record copy of all Drawings, Specifications, Addenda, Written Amendments, Change Orders, Work Change Directives, Field Orders, and written interpretations and clarifications in good order and annotated to show changes made during construction. These record documents, together with all approved Samples and a counterpart of all approved Shop Drawings, will be available to ENGINEER for reference. Upon completion of the Work, these record documents, Samples, and Shop Drawings will be delivered to ENGINEER for OWNER.

6.13 *Safety and Protection*

A. CONTRACTOR shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. CONTRACTOR shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:

1. all persons on the Site or who may be affected by the Work;

2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and

3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.

B. CONTRACTOR shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. CONTRACTOR shall notify owners of adjacent property and of Underground Facilities and other utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property. All damage, injury, or loss to any property referred to in paragraph 6.13.A.2 or 6.13.A.3 caused, directly or indirectly, in whole or in part, by CONTRACTOR, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by CONTRACTOR (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of OWNER or ENGINEER or ENGINEER's Consultant, or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of CONTRACTOR or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them). CONTRACTOR's duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed and ENGINEER has issued a notice to OWNER and CONTRACTOR in accordance with paragraph 14.07.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

6.14 *Safety Representative*

A. CONTRACTOR shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

6.15 *Hazard Communication Programs*

A. CONTRACTOR shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

6.16 *Emergencies*

A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, CONTRACTOR is obligated to act to prevent threatened damage, injury, or loss. CONTRACTOR shall give ENGINEER prompt written notice if CONTRACTOR believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If ENGINEER determines that a change in the Contract Documents is required because of the action taken by CONTRACTOR in response to such an emergency, a Work Change Directive or Change Order will be issued.

6.17 *Shop Drawings and Samples*

A. CONTRACTOR shall submit Shop Drawings to ENGINEER for review and approval in accordance with the acceptable schedule of Shop Drawings and Sample submittals. All submittals will be identified as ENGINEER may require and in the number of copies specified in the General Requirements. The data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show ENGINEER the services, materials, and equipment CONTRACTOR proposes to provide and to enable ENGINEER to review the information for the limited purposes required by paragraph 6.17.E.

B. CONTRACTOR shall also submit Samples to ENGINEER for review and approval in accordance with the acceptable schedule of Shop Drawings and Sample submittals. Each Sample will be identified clearly as to material, Supplier, pertinent data such as catalog numbers, and the use for which intended and otherwise as ENGINEER may require to enable ENGINEER to review the submittal for the limited purposes required by paragraph 6.17.E. The numbers of each Sample to be submitted will be as specified in the Specifications.

C. Where a Shop Drawing or Sample is required by the Contract Documents or the schedule of Shop Drawings and Sample submittals acceptable to ENGINEER as required by paragraph 2.07, any related Work performed prior to ENGINEER's review and approval of the pertinent submittal will be at the sole expense and responsibility of CONTRACTOR.

D. *Submittal Procedures*

1. Before submitting each Shop Drawing or Sample, CONTRACTOR shall have determined and verified:

a. all field measurements, quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;

b. all materials with respect to intended use, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work;

c. all information relative to means, methods, techniques, sequences, and procedures of construction and safety precautions and programs incident thereto; and

d. CONTRACTOR shall also have reviewed and coordinated each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents.

2. Each submittal shall bear a stamp or specific written indication that CONTRACTOR has satisfied CONTRACTOR's obligations under the Contract Documents with respect to CONTRACTOR's review and approval of that submittal.

3. At the time of each submittal, CONTRACTOR shall give ENGINEER specific written notice of such variations, if any, that the Shop Drawing or Sample submitted may have from the requirements of the Contract Documents, such notice to be in a written communication separate from the submittal; and, in addition, shall cause a specific notation to be made on each Shop Drawing and Sample submitted to ENGINEER for review and approval of each such variation.

E. *ENGINEER's Review*

1. ENGINEER will timely review and approve Shop Drawings and Samples in accordance with the schedule of Shop Drawings and Sample submittals acceptable to ENGINEER. ENGINEER's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.

2. ENGINEER's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction (except where a particular means, method, technique, sequence, or procedure of construction is specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

3. ENGINEER's review and approval of Shop Drawings or Samples shall not relieve CONTRACTOR from responsibility for any variation from the requirements of the Contract Documents unless CONTRACTOR has in writing called ENGINEER's attention to each such variation at the time of each submittal as required by paragraph 6.17.D.3 and ENGINEER has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample approval; nor will any approval by ENGINEER relieve CONTRACTOR from responsibility for complying with the requirements of paragraph 6.17.D.1.

F. *Resubmittal Procedures:*

1. CONTRACTOR shall make corrections required by ENGINEER and shall return the required number of corrected copies of Shop Drawings and submit as required new Samples for review and approval. CONTRACTOR shall

direct specific attention in writing to revisions other than the corrections called for by ENGINEER on previous submittals.

6.18 *Continuing the Work*

A. CONTRACTOR shall carry on the Work and adhere to the progress schedule during all disputes or disagreements with OWNER. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as permitted by paragraph 15.04 or as OWNER and CONTRACTOR may otherwise agree in writing.

6.19 *CONTRACTOR's General Warranty and Guarantee*

A. CONTRACTOR warrants and guarantees to OWNER, ENGINEER, and ENGINEER's Consultants that all Work will be in accordance with the Contract Documents and will not be defective. CONTRACTOR's warranty and guarantee hereunder excludes defects or damage caused by:

1. abuse, modification, or improper maintenance or operation by persons other than CONTRACTOR, Subcontractors, Suppliers, or any other individual or entity for whom CONTRACTOR is responsible; or

2. normal wear and tear under normal usage.

B. CONTRACTOR's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of CONTRACTOR's obligation to perform the Work in accordance with the Contract Documents:

1. observations by ENGINEER;

2. recommendation by ENGINEER or payment by OWNER of any progress or final payment;

3. the issuance of a certificate of Substantial Completion by ENGINEER or any payment related thereto by OWNER;

4. use or occupancy of the Work or any part thereof by OWNER;

5. any acceptance by OWNER or any failure to do so;

6. any review and approval of a Shop Drawing or Sample submittal or the issuance of a notice of acceptability by ENGINEER;

7. any inspection, test, or approval by others; or

8. any correction of defective Work by OWNER.

6.20 *Indemnification*

A. To the fullest extent permitted by Laws and Regulations, CONTRACTOR shall indemnify and hold harmless OWNER, ENGINEER, ENGINEER's Consultants, and the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage:

1. is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of real or personal property (other than the Work itself), including the loss of use resulting therefrom; and

2. is caused in whole or in part by any act or omission of CONTRACTOR, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable, regardless of whether or not caused in part by an individual or entity indemnified hereunder or whether liability is imposed upon such indemnified party by Laws or Regulations.

B. In any and all claims against OWNER or ENGINEER or any of their respective consultants, agents, officers, directors, partners, or employees by any employee (or the survivor or personal representative of such employee) of CONTRACTOR, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under paragraph 6.20.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for CONTRACTOR or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

C. The indemnification obligations of CONTRACTOR under paragraph 6.20.A shall not be limited in any way by the amount or types of insurance provided by CONTRACTOR under Article 5 of the General Conditions.

D. The indemnification obligations of CONTRACTOR under paragraph 6.20.A shall not extend to the sole negligence or willful misconduct of OWNER, ENGINEER or ENGINEER's Consultants or to the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them.

ARTICLE 7 - OTHER WORK

7.01 *Related Work at Site*

A. OWNER may perform other work related to the Project at the Site by OWNER's employees, or let other direct contracts therefor, or have other work performed by utility owners. If such other work is not noted in the Contract Documents, then:

1. written notice thereof will be given to CONTRACTOR prior to starting any such other work; and

2. if OWNER and CONTRACTOR are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times that should be allowed as a result of such other work, a Claim may be made therefor as provided in paragraph 10.05.

B. CONTRACTOR shall afford each other contractor who is a party to such a direct contract and each utility owner (and OWNER, if OWNER is performing the other work with OWNER's employees) proper and safe access to the Site and a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work and shall properly coordinate the Work with theirs. Unless otherwise provided in the Contract Documents, CONTRACTOR shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. CONTRACTOR shall not endanger any work of others by cutting, excavating, or otherwise altering their work and will only cut or alter their work with the written consent of ENGINEER and the others whose work will be affected. The duties and responsibilities of CONTRACTOR under this paragraph are for the benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of CONTRACTOR in said direct contracts between OWNER and such utility owners and other contractors.

C. If the proper execution or results of any part of CONTRACTOR's Work depends upon work performed by others under this Article 7, CONTRACTOR shall inspect such other work and promptly report to ENGINEER in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of CONTRACTOR's Work. CONTRACTOR's failure to so report will constitute an acceptance of such other work as fit and proper for integration with CONTRACTOR's Work except for latent - defects and deficiencies in such other work.

ARTICLE 8 - OWNER'S RESPONSIBILITIES

8.01 *Communications to Contractor*

A. Except as otherwise provided in these General Conditions, OWNER shall issue all communications to CONTRACTOR through ENGINEER.

8.02 *Replacement of ENGINEER*

A. In case of termination of the employment of ENGINEER, OWNER shall appoint an engineer to whom CONTRACTOR makes no reasonable objection, whose status under the Contract Documents shall be that of the former ENGINEER.

8.03 *Furnish Data*

A. OWNER shall promptly furnish the data required of OWNER under the Contract Documents.

8.04 *Pay Promptly When Due*

A. OWNER shall make payments to CONTRACTOR promptly when they are due as provided in paragraphs 14.02.C and 14.07.C.

8.05 *Lands and Easements; Reports and Tests*

A. OWNER's duties in respect of providing lands and easements and providing engineering surveys to establish reference points are set forth in paragraphs 4.01 and 4.05. Paragraph 4.02 refers to OWNER's identifying and making available to CONTRACTOR copies of reports of explorations and tests of subsurface conditions and drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site that have been utilized by ENGINEER in preparing the Contract Documents.

8.06 *Insurance*

A. OWNER's responsibilities, if any, in respect to purchasing and maintaining liability and property insurance are set forth in Article 5.

8.07 *Change Orders*

A. OWNER is obligated to execute Change Orders as indicated in paragraph 10.03.

8.08. *Inspections, Tests, and Approvals*

A. OWNER's responsibility in respect to certain inspections, tests, and approvals is set forth in paragraph 13.03.B.

8.09 *Limitations on OWNER's Responsibilities*

A. The OWNER shall not supervise, direct, or have control or authority over, nor be responsible for, CONTRACTOR's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of CONTRACTOR to comply with Laws and Regulations applicable to the performance of the Work. OWNER will not be responsible for CONTRACTOR's failure to perform the Work in accordance with the Contract Documents.

8.10 *Undisclosed Hazardous Environmental Condition*

A. OWNER's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in paragraph 4.06.

8.11 *Evidence of Financial Arrangements*

A. If and to the extent OWNER has agreed to furnish CONTRACTOR reasonable evidence that financial arrangements have been made to satisfy OWNER's obligations under the Contract Documents, OWNER's responsibility in respect thereof will be as set forth in the Supplementary Conditions.

ARTICLE 9 - ENGINEER'S STATUS DURING CONSTRUCTION

9.01 *OWNER'S Representative*

A. ENGINEER will be OWNER's representative during the construction period. The duties and responsibilities and the limitations of authority of ENGINEER as OWNER's representative during construction are set forth in the Contract Documents and will not be changed without written consent of OWNER and ENGINEER.

9.02 *Visits to Site*

A. ENGINEER will make visits to the Site at intervals appropriate to the various stages of construction as ENGINEER deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of CONTRACTOR's executed Work. Based on information obtained during such visits and observations, ENGINEER, for the benefit of OWNER, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. ENGINEER will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. ENGINEER's efforts will be directed toward providing for OWNER a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, ENGINEER will keep OWNER informed of the progress of the Work and will endeavor to guard OWNER against defective Work.

B. ENGINEER's visits and observations are subject to all the limitations on ENGINEER's authority and responsibility set forth in paragraph 9.10, and particularly, but without limitation, during or as a result of ENGINEER's visits or observations of CONTRACTOR's Work ENGINEER will not supervise, direct, control, or have authority over or be responsible for CONTRACTOR's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of CONTRACTOR to comply with Laws and Regulations applicable to the performance of the Work.

9.03 *Project Representative*

A. If OWNER and ENGINEER agree, ENGINEER will furnish a Resident Project Representative to assist ENGINEER in providing more extensive observation of the Work. The responsibilities and authority and limitations thereon of any such Resident Project Representative and assistants will be as provided in paragraph 9.10 and in the Supplementary Conditions. If OWNER designates another representative or agent to represent OWNER at the Site who is not ENGINEER's Consultant, agent or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

9.04 *Clarifications and Interpretations*

A. ENGINEER will issue with reasonable promptness such written clarifications or interpretations of the requirements of the Contract Documents as ENGINEER may determine necessary, which shall be consistent with the intent of and reasonably inferable from the Contract Documents. Such written clarifications and interpretations will be binding on OWNER and CONTRACTOR. If OWNER and CONTRACTOR are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a written clarification or interpretation, a Claim may be made therefor as provided in paragraph 10.05.

9.05 *Authorized Variations in Work*

A. ENGINEER may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. These may be accomplished by a Field Order and will be binding on OWNER and also on CONTRACTOR, who shall perform the Work involved promptly. If OWNER and CONTRACTOR are unable to agree on entitlement to or on the amount or extent, if any, of any

adjustment in the Contract Price or Contract Times, or both, as a result of a Field Order, a Claim may be made therefor as provided in paragraph 10.05.

9.06 *Rejecting Defective Work*

A. ENGINEER will have authority to disapprove or reject Work which ENGINEER believes to be defective, or that ENGINEER believes will not produce a completed Project that conforms to the Contract Documents or that will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. ENGINEER will also have authority to require special inspection or testing of the Work as provided in paragraph 13.04, whether or not the Work is fabricated, installed, or completed.

9.07 *Shop Drawings, Change Orders and Payments*

A. In connection with ENGINEER's authority as to Shop Drawings and Samples, see paragraph 6.17.

B. In connection with ENGINEER's authority as to Change Orders, see Articles 10, 11, and 12.

C. In connection with ENGINEER's authority as to Applications for Payment, see Article 14.

9.08 *Determinations for Unit Price Work*

A. ENGINEER will determine the actual quantities and classifications of Unit Price Work performed by CONTRACTOR. ENGINEER will review with CONTRACTOR the ENGINEER's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). ENGINEER's written decision thereon will be final and binding (except as modified by ENGINEER to reflect changed factual conditions or more accurate data) upon OWNER and CONTRACTOR, subject to the provisions of paragraph 10.05.

9.09 *Decisions on Requirements of Contract Documents and Acceptability of Work*

A. ENGINEER will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. Claims, disputes and other matters relating to the acceptability of the Work, the quantities and classifications of Unit Price Work, the interpretation of the requirements of the Contract Documents pertaining to the performance of the Work, and Claims seeking changes in the Contract Price or Contract Times will be referred initially to ENGINEER in writing, in accordance with the provisions of paragraph 10.05, with a request for a formal decision.

B. When functioning as interpreter and judge under this paragraph 9.09, ENGINEER will not show partiality to OWNER or CONTRACTOR and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity. The rendering of a decision by ENGINEER pursuant to this paragraph 9.09 with respect to any such Claim, dispute, or other matter (except any which have been waived by the making or acceptance of final payment as provided in paragraph 14.07) will be a condition precedent to any exercise by OWNER or CONTRACTOR of such rights or remedies as either may otherwise have under the Contract Documents or by Laws or Regulations in respect of any such Claim, dispute, or other matter.

9.10 *Limitations on ENGINEER's Authority and Responsibilities*

A. Neither ENGINEER's authority or responsibility under this Article 9 or under any other provision of the Contract Documents nor any decision made by ENGINEER in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by ENGINEER shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by ENGINEER to CONTRACTOR, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

B. ENGINEER will not supervise, direct, control, or have authority over or be responsible for CONTRACTOR's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of CONTRACTOR to comply with Laws and Regulations applicable to the performance of the Work. ENGINEER will not be responsible for CONTRACTOR's failure to perform the Work in accordance with the Contract Documents.

C. ENGINEER will not be responsible for the acts or omissions of CONTRACTOR or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.

D. ENGINEER's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, Bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by paragraph 14.07.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals that the results certified indicate compliance with, the Contract Documents.

E. The limitations upon authority and responsibility set forth in this paragraph 9.10 shall also apply to ENGINEER's Consultants, Resident Project Representative, and assistants.

ARTICLE 10 - CHANGES IN THE WORK; CLAIMS

10.01 *Authorized Changes in the Work*

A. Without invalidating the Agreement and without notice to any surety, OWNER may, at any time or from time to time, order additions, deletions, or revisions in the Work by a Written Amendment, a Change Order, or a Work Change Directive. Upon receipt of any such document, CONTRACTOR shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).

B. If OWNER and CONTRACTOR are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a Work Change Directive, a Claim may be made therefor as provided in paragraph 10.05.

10.02 *Unauthorized Changes in the Work*

A. CONTRACTOR shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents as amended, modified, or supplemented as provided in paragraph 3.04, except in the case of an emergency as provided in paragraph 6.16 or in the case of uncovering Work as provided in paragraph 13.04.B.

10.03 *Execution of Change Orders*

A. OWNER and CONTRACTOR shall execute appropriate Change Orders recommended by ENGINEER (or Written Amendments) covering:

1. changes in the Work which are: (i) ordered by OWNER pursuant to paragraph 10.01.A, (ii) required because of acceptance of defective Work under paragraph 13.08.A or OWNER's correction of defective Work under paragraph 13.09, or (iii) agreed to by the parties;

2. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive; and

3. changes in the Contract Price or Contract Times which embody the substance of any written decision rendered by ENGINEER pursuant to paragraph 10.05; provided that, in lieu of executing any such Change Order, an appeal may be taken from any such decision in accordance with the provisions of the Contract Documents and applicable Laws and Regulations, but during any such appeal, CONTRACTOR shall carry on the Work and adhere to the progress schedule as provided in paragraph 6.18.A.

10.04 *Notification to Surety*

A. If notice of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times) is required by the provisions of any Bond to be given to a surety, the giving of any such notice will be CONTRACTOR's responsibility. The amount of each applicable Bond will be adjusted to reflect the effect of any such change.

10.05 *Claims and Disputes*

A. *Notice:* Written notice stating the general nature of each Claim, dispute, or other matter shall be delivered by the claimant to ENGINEER and the other party to the Contract promptly (but in no event later than 20 days) after the start of the event giving rise thereto. Notice of the amount or extent of the Claim, dispute, or other matter with supporting data shall be delivered to the ENGINEER and the other party to the Contract within 45 days after the start of such event (unless ENGINEER allows additional time for claimant to submit additional or more accurate data in support of such Claim, dispute, or other matter). A Claim for an adjustment in Contract Price shall be prepared in accordance with the provisions of paragraph 12.01.B. A Claim for an adjustment in Contract Time shall be prepared in accordance with the provisions of paragraph 12.02.B. Each Claim shall be accompanied by claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant believes it is entitled as a result of said event. The opposing party shall submit any response to ENGINEER and the claimant within 30 days after receipt of the claimant's last submittal (unless ENGINEER allows additional time).

B. *ENGINEER's Decision:* ENGINEER will render a formal decision in writing within 30 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any. ENGINEER's written decision on such Claim, dispute, or other matter will be final and binding upon OWNER and CONTRACTOR unless:

1. an appeal from ENGINEER's decision is taken within the time limits and in accordance with the dispute resolution procedures set forth in Article 16; or

2. if no such dispute resolution procedures have been set forth in Article 16, a written notice of intention to appeal from ENGINEER's written decision is delivered by OWNER or CONTRACTOR to the other and to ENGINEER within 30 days after the date of such decision, and a formal proceeding is instituted by the appealing party in a forum of competent jurisdiction, within 60 days after the date of such decision or within 60 days after Substantial Completion, whichever is later (unless otherwise agreed in writing by OWNER and CONTRACTOR), to exercise such rights or remedies as the appealing party may have with respect to such Claim,

dispute, or other matter in accordance with applicable Laws and Regulations.

C. If ENGINEER does not render a formal decision in writing within the time stated in paragraph 10.05.B, a decision denying the Claim in its entirety shall be deemed to have been issued 31 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any.

D. No Claim for an adjustment in Contract Price or Contract Times (or Milestones) will be valid if not submitted in accordance with this paragraph 10.05.

ARTICLE 11 - COST OF THE WORK; CASH ALLOWANCES; UNIT PRICE WORK

11.01 *Cost of the Work*

A. *Costs Included:* The term Cost of the Work means the sum of all costs necessarily incurred and paid by CONTRACTOR in the proper performance of the Work. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, the costs to be reimbursed to CONTRACTOR will be only those additional or incremental costs required because of the change in the Work or because of the event giving rise to the Claim. Except as otherwise may be agreed to in writing by OWNER, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall include only the following items, and shall not include any of the costs itemized in paragraph 11.01.B.

1. Payroll costs for employees in the direct employ of CONTRACTOR in the performance of the Work under schedules of job classifications agreed upon by OWNER and CONTRACTOR. Such employees shall include without limitation superintendents, foremen, and other personnel employed full time at the Site. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by OWNER.

2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to CONTRACTOR unless OWNER deposits funds with CONTRACTOR with which to make payments, in which case the cash discounts shall accrue to OWNER. All trade discounts, rebates and refunds and returns from sale of surplus materials and equipment shall accrue to OWNER, and CONTRACTOR shall make provisions so that they may be obtained.

3. Payments made by CONTRACTOR to Subcontractors for Work performed by Subcontractors. If required by OWNER, CONTRACTOR shall obtain competitive bids from subcontractors acceptable to OWNER and CONTRACTOR and shall deliver such bids to OWNER, who will then determine, with the advice of ENGINEER, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as CONTRACTOR's Cost of the Work and fee as provided in this paragraph 11.01.

4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.

5. Supplemental costs including the following:

a. The proportion of necessary transportation, travel, and subsistence expenses of CONTRACTOR's employees incurred in discharge of duties connected with the Work.

b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of CONTRACTOR.

c. Rentals of all construction equipment and machinery, and the parts thereof whether rented from CONTRACTOR or others in accordance with rental agreements approved by OWNER with the advice of ENGINEER, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.

d. Sales, consumer, use, and other similar taxes related to the Work, and for which CONTRACTOR is liable, imposed by Laws and Regulations.

e. Deposits lost for causes other than negligence of CONTRACTOR, any Subcontractor, or anyone

directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.

f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by CONTRACTOR in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with paragraph 5.06.D), provided such losses and damages have resulted from causes other than the negligence of CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of OWNER. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining CONTRACTOR's fee.

g. The cost of utilities, fuel, and sanitary facilities at the Site.

h. Minor expenses such as telegrams, long distance telephone calls, telephone service at the Site, expressage, and similar petty cash items in connection with the Work.

i. When the Cost of the Work is used to determine the value of a Change Order or of a Claim, the cost of premiums for additional Bonds and insurance required because of the changes in the Work or caused by the event giving rise to the Claim.

j. When all the Work is performed on the basis of cost-plus, the costs of premiums for all Bonds and insurance CONTRACTOR is required by the Contract Documents to purchase and maintain.

B. *Costs Excluded:* The term Cost of the Work shall not include any of the following items:

1. Payroll costs and other compensation of CONTRACTOR's officers, executives, principals (of partnerships and sole proprietorships), general managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expediters, timekeepers, clerks, and other personnel employed by CONTRACTOR, whether at the Site or in CONTRACTOR's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in paragraph 11.01.A.1 or specifically covered by paragraph 11.01.A.4, all of which are to be considered administrative costs covered by the CONTRACTOR's fee.

2. Expenses of CONTRACTOR's principal and branch offices other than CONTRACTOR's office at the Site.

3. Any part of CONTRACTOR's capital expenses, including interest on CONTRACTOR's capital employed for the Work and charges against CONTRACTOR for delinquent payments.

4. Costs due to the negligence of CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.

5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in paragraphs 11.01.A and 11.01.B.

C. *CONTRACTOR's Fee:* When all the Work is performed on the basis of cost-plus, CONTRACTOR's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, CONTRACTOR's fee shall be determined as set forth in paragraph 12.01.C.

D. *Documentation:* Whenever the Cost of the Work for any purpose is to be determined pursuant to paragraphs 11.01.A and 11.01.B, CONTRACTOR will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to ENGINEER an itemized cost breakdown together with supporting data.

11.02 *Cash Allowances*

A. It is understood that CONTRACTOR has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums as may be acceptable to OWNER and ENGINEER. CONTRACTOR agrees that:

1. the allowances include the cost to CONTRACTOR (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and

2. CONTRACTOR's costs for unloading and handling on the Site, labor, installation costs, overhead, profit, and other expenses contemplated for the allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.

B. Prior to final payment, an appropriate Change Order will be issued as recommended by ENGINEER to reflect actual amounts due CONTRACTOR on account of Work covered by

allowances, and the Contract Price shall be correspondingly adjusted.

11.03 *Unit Price Work*

A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by CONTRACTOR will be made by ENGINEER subject to the provisions of paragraph 9.08.

B. Each unit price will be deemed to include an amount considered by CONTRACTOR to be adequate to cover CONTRACTOR's overhead and profit for each separately identified item.

C. For provisions for an adjustment of a unit price for an increase or decrease in the quantity of Unit Price Work, if any, see General Requirements Section 01025, Measurement and Payment.

ARTICLE 12 - CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES

12.01 *Change of Contract Price*

A. The Contract Price may only be changed by a Change Order or by a Written Amendment. Any Claim for an adjustment in the Contract Price shall be based on written notice submitted by the party making the claim to the ENGINEER and the other party to the Contract in accordance with the provisions of paragraph 10.05.

B. The value of any Work covered by a Change Order or of any Claim for an adjustment in the Contract Price will be determined as follows:

1. where the Work involved is covered by unit prices contained in the Contract Documents, by application of such unit prices to the quantities of the items involved (subject to the provisions of paragraph 11.03); or

2. where the Work involved is not covered by unit prices contained in the Contract Documents, by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with paragraph 12.01.C.2); or

3. where the Work involved is not covered by unit prices contained in the Contract Documents and agreement to a lump sum is not reached under paragraph 12.01.B.2, on the basis of the Cost of the Work (determined as provided in paragraph 11.01) plus a CONTRACTOR's fee for overhead and profit (determined as provided in paragraph 12.01.C).

C. *CONTRACTOR's Fee:* The CONTRACTOR's fee for overhead and profit shall be determined as follows:

1. a mutually acceptable fixed fee; or

2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:

a. for costs incurred under paragraphs 11.01.A.1 and 11.01.A.2, the CONTRACTOR's fee shall be 15 percent;

b. for costs incurred under paragraph 11.01.A.3, the CONTRACTOR's fee shall be five percent;

c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of paragraph 12.01.C.2.a is that the Subcontractor who actually performs the Work, at whatever tier, will be paid a fee of 15 percent of the costs incurred by such Subcontractor under paragraphs 11.01.A.1 and 11.01.A.2 and that any higher tier Subcontractor and CONTRACTOR will each be paid a fee of five percent of the amount paid to the next lower tier Subcontractor;

d. no fee shall be payable on the basis of costs itemized under paragraphs 11.01.A.4, 11.01.A.5, and 11.01.B;

e. the amount of credit to be allowed by CONTRACTOR to OWNER for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in CONTRACTOR's fee by an amount equal to five percent of such net decrease; and

f. when both additions and credits are involved in any one change, the adjustment in CONTRACTOR's fee shall be computed on the basis of the net change in accordance with paragraphs 12.01.C.2.a through 12.01.C.2.e, inclusive.

12.02 *Change of Contract Times*

A. The Contract Times (or Milestones) may only be changed by a Change Order or by a Written Amendment. Any Claim for an adjustment in the Contract Times (or Milestones) shall be based on written notice submitted by the party making

the claim to the ENGINEER and the other party to the Contract in accordance with the provisions of paragraph 10.05.

B. Any adjustment of the Contract Times (or Milestones) covered by a Change Order or of any Claim for an adjustment in the Contract Times (or Milestones) will be determined in accordance with the provisions of this Article 12.

12.03 *Delays Beyond CONTRACTOR's Control*

A. Where CONTRACTOR is prevented from completing any part of the Work within the Contract Times (or Milestones) due to delay beyond the control of CONTRACTOR, the Contract Times (or Milestones) will be extended in an amount equal to the time lost due to such delay if a Claim is made therefor as provided in paragraph 12.02.A. Delays beyond the control of CONTRACTOR shall include, but not be limited to, acts or neglect by OWNER, acts or neglect of utility owners or other contractors performing other work as contemplated by Article 7, fires, floods, epidemics, abnormal weather conditions, or acts of God.

12.04 *Delays Within CONTRACTOR's Control*

A. The Contract Times (or Milestones) will not be extended due to delays within the control of CONTRACTOR. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of CONTRACTOR.

12.05 *Delays Beyond OWNER's and CONTRACTOR's Control*

A. Where CONTRACTOR is prevented from completing any part of the Work within the Contract Times (or Milestones) due to delay beyond the control of both OWNER and CONTRACTOR, an extension of the Contract Times (or Milestones) in an amount equal to the time lost due to such delay shall be CONTRACTOR's sole and exclusive remedy for such delay.

12.06 *Delay Damages*

A. In no event shall OWNER or ENGINEER be liable to CONTRACTOR, any Subcontractor, any Supplier, or any other person or organization, or to any surety for or employee or agent of any of them, for damages arising out of or resulting from:

1. delays caused by or within the control of CONTRACTOR; or

2. delays beyond the control of both OWNER and CONTRACTOR including but not limited to fires, floods, epidemics, abnormal weather conditions, acts of God, or acts or neglect by utility owners or other contractors performing other work as contemplated by Article 7.

B. Nothing in this paragraph 12.06 bars a change in Contract Price pursuant to this Article 12 to compensate CONTRACTOR due to delay, interference, or disruption directly attributable to actions or inactions of OWNER or anyone for whom OWNER is responsible.

ARTICLE 13 - TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

13.01 *Notice of Defects*

A. Prompt notice of all defective Work of which OWNER or ENGINEER has actual knowledge will be given to CONTRACTOR. All defective Work may be rejected, corrected, or accepted as provided in this Article 13.

13.02 *Access to Work*

A. OWNER, ENGINEER, ENGINEER's Consultants, other representatives and personnel of OWNER, independent testing laboratories, and governmental agencies with jurisdictional interests will have access to the Site and the Work at reasonable times for their observation, inspecting, and testing. CONTRACTOR shall provide them proper and safe conditions for such access and advise them of CONTRACTOR's Site safety procedures and programs so that they may comply therewith as applicable.

13.03 *Tests and Inspections*

A. CONTRACTOR shall give ENGINEER timely notice of readiness of the Work for all required inspections, tests, or approvals and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.

B. OWNER shall employ and pay for the services of an independent testing laboratory to perform all inspections, tests, or approvals required by the Contract Documents except:

1. for inspections, tests, or approvals covered by paragraphs 13.03.C and 13.03.D below;

2. that costs incurred in connection with tests or inspections conducted pursuant to paragraph 13.04.B shall be paid as provided in said paragraph 13.04.B; and

3. as otherwise specifically provided in the Contract Documents.

C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, CONTRACTOR shall assume full responsibility for arranging and obtaining such

inspections, tests, or approvals, pay all costs in connection therewith, and furnish ENGINEER the required certificates of inspection or approval.

D. CONTRACTOR shall be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests, or approvals required for OWNER's and ENGINEER's acceptance of materials or equipment to be incorporated in the Work; or acceptance of materials, mix designs, or equipment submitted for approval prior to CONTRACTOR's purchase thereof for incorporation in the Work. Such inspections, tests, or approvals shall be performed by organizations acceptable to OWNER and ENGINEER.

E. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by CONTRACTOR without written concurrence of ENGINEER, it must, if requested by ENGINEER, be uncovered for observation.

F. Uncovering Work as provided in paragraph 13.03.E shall be at CONTRACTOR's expense unless CONTRACTOR has given ENGINEER timely notice of CONTRACTOR's intention to cover the same and ENGINEER has not acted with reasonable promptness in response to such notice.

13.04 *Uncovering Work*

A. If any Work is covered contrary to the written request of ENGINEER, it must, if requested by ENGINEER, be uncovered for ENGINEER's observation and replaced at CONTRACTOR's expense.

B. If ENGINEER considers it necessary or advisable that covered Work be observed by ENGINEER or inspected or tested by others, CONTRACTOR, at ENGINEER's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as ENGINEER may require, that portion of the Work in question, furnishing all necessary labor, material, and equipment. If it is found that such Work is defective, CONTRACTOR shall pay all Claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and OWNER shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount thereof, OWNER may make a Claim therefor as provided in paragraph 10.05. If, however, such Work is not found to be defective, CONTRACTOR shall be allowed an increase in the Contract Price or an extension of the Contract Times (or Milestones), or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, CONTRACTOR may make a Claim therefor as provided in paragraph 10.05.

13.05 *OWNER May Stop the Work*

A. If the Work is defective, or CONTRACTOR fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, OWNER may order CONTRACTOR to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of OWNER to stop the Work shall not give rise to any duty on the part of OWNER to exercise this right for the benefit of CONTRACTOR, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

13.06 *Correction or Removal of Defective Work*

A. CONTRACTOR shall correct all defective Work, whether or not fabricated, installed, or completed, or, if the Work has been rejected by ENGINEER, remove it from the Project and replace it with Work that is not defective. CONTRACTOR shall pay all Claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or removal (including but not limited to all costs of repair or replacement of work of others).

13.07 *Correction Period*

A. If within one year after the date of Substantial Completion or such longer period of time as may be prescribed by Laws or Regulations or by the terms of any applicable special guarantee required by the Contract Documents or by any specific provision of the Contract Documents, any Work is found to be defective, or if the repair of any damages to the land or areas made available for CONTRACTOR's use by OWNER or permitted by Laws and Regulations as contemplated in paragraph 6.11.A is found to be defective, CONTRACTOR shall promptly, without cost to OWNER and in accordance with OWNER's written instructions: (i) repair such defective land or areas, or (ii) correct such defective Work or, if the defective Work has been rejected by OWNER, remove it from the Project and replace it with Work that is not defective, and (iii) satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others or other land or areas resulting therefrom. If CONTRACTOR does not promptly comply with the terms of such instructions, or in an emergency where delay would cause serious risk of loss or damage, OWNER may have the defective Work corrected or repaired or may have the rejected Work removed and replaced, and all Claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others) will be paid by CONTRACTOR.

B. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications or by Written Amendment.

C. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this paragraph 13.07, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

D. CONTRACTOR's obligations under this paragraph 13.07 are in addition to any other obligation or warranty. The provisions of this paragraph 13.07 shall not be construed as a substitute for or a waiver of the provisions of any applicable statute of limitation or repose.

13.08 *Acceptance of Defective Work*

A. If, instead of requiring correction or removal and replacement of defective Work, OWNER (and, prior to ENGINEER's recommendation of final payment, ENGINEER) prefers to accept it, OWNER may do so. CONTRACTOR shall pay all Claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) attributable to OWNER's evaluation of and determination to accept such defective Work (such costs to be approved by ENGINEER as to reasonableness) and the diminished value of the Work to the extent not otherwise paid by CONTRACTOR pursuant to this sentence. If any such acceptance occurs prior to ENGINEER's recommendation of final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work, and OWNER shall be entitled to an appropriate decrease in the Contract Price, reflecting the diminished value of Work so accepted. If the parties are unable to agree as to the amount thereof, OWNER may make a Claim therefor as provided in paragraph 10.05. If the acceptance occurs after such recommendation, an appropriate amount will be paid by CONTRACTOR to OWNER.

13.09 *OWNER May Correct Defective Work*

A. If CONTRACTOR fails within a reasonable time after written notice from ENGINEER to correct defective Work or to remove and replace rejected Work as required by ENGINEER in accordance with paragraph 13.06.A, or if CONTRACTOR fails to perform the Work in accordance with the Contract Documents, or if CONTRACTOR fails to comply with any other provision of the Contract Documents, OWNER may, after seven days written notice to CONTRACTOR, correct and remedy any such deficiency.

B. In exercising the rights and remedies under this paragraph, OWNER shall proceed expeditiously. In connection with such corrective and remedial action, OWNER may exclude CONTRACTOR from all or part of the Site, take possession of all or part of the Work and suspend CONTRACTOR's services related thereto, take possession of CONTRACTOR's tools, appliances, construction equipment and machinery at the Site, and incorporate in the Work all materials and equipment stored at the Site or for which OWNER has paid CONTRACTOR but which are stored elsewhere. CONTRACTOR shall allow OWNER, OWNER's representatives, agents and employees, OWNER's other contractors, and ENGINEER and ENGINEER's Consultants access to the Site to enable OWNER to exercise the rights and remedies under this paragraph.

C. All Claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred or sustained by OWNER in exercising the rights and remedies under this paragraph 13.09 will be charged against CONTRACTOR, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and OWNER shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount of the adjustment, OWNER may make a Claim therefor as provided in paragraph 10.05. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of CONTRACTOR's defective Work.

D. CONTRACTOR shall not be allowed an extension of the Contract Times (or Milestones) because of any delay in the performance of the Work attributable to the exercise by OWNER of OWNER's rights and remedies under this paragraph 13.09.

ARTICLE 14 - PAYMENTS TO CONTRACTOR AND COMPLETION

14.01 *Schedule of Values*

A. The schedule of values established as provided in paragraph 2.07.A will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to ENGINEER. Progress payments on account of Unit Price Work will be based on the number of units completed.

14.02 *Progress Payments*

A. *Applications for Payments*

1. At least 10 days before the date established for each progress payment (but not more often than once a month), CONTRACTOR shall submit to ENGINEER for review an Application for Payment filled out and signed by

CONTRACTOR covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that OWNER has received the materials and equipment free and clear of all Liens and evidence that the materials and equipment are covered by appropriate property insurance and other arrangements to protect OWNER's interest therein, all of which must be satisfactory to OWNER.

2. Beginning with the second Application for Payment, each Application shall include an affidavit of CONTRACTOR stating that all previous progress payments received on account of the Work have been applied on account to discharge CONTRACTOR's legitimate obligations associated with prior Applications for Payment.

3. The amount of retainage with respect to pro-gress payments will be as stipulated in the Agreement.

B. *Review of Applications*

1. ENGINEER will, within 10 days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to OWNER or return the Application to CONTRACTOR indicating in writing ENGINEER's reasons for refusing to recommend payment. In the latter case, CONTRACTOR may make the necessary corrections and resubmit the Application.

2. ENGINEER's recommendation of any payment requested in an Application for Payment will constitute a representation by ENGINEER to OWNER, based on ENGINEER's observations on the Site of the executed Work as an experienced and qualified design professional and on ENGINEER's review of the Application for Payment and the accompanying data and schedules, that to the best of ENGINEER's knowledge, information and belief:

a. the Work has progressed to the point indicated;

b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, to the results of any subsequent tests called for in the Contract Documents, to a final determination of quantities and classifications for Unit Price Work under paragraph 9.08, and to any other qualifications stated in the recommendation); and

c. the conditions precedent to CONTRACTOR's being entitled to such payment appear to have been fulfilled in so far as it is ENGINEER's responsibility to observe the Work.

3. By recommending any such payment ENGINEER will not thereby be deemed to have represented that: (i) inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to ENGINEER in the Contract Documents; or (ii) that there may not be other matters or issues between the parties that might entitle CONTRACTOR to be paid additionally by OWNER or entitle OWNER to withhold payment to CONTRACTOR.

4. Neither ENGINEER's review of CONTRACTOR's Work for the purposes of recommending payments nor ENGINEER's recommendation of any payment, including final payment, will impose responsibility on ENGINEER to supervise, direct, or control the Work or for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for CONTRACTOR's failure to comply with Laws and Regulations applicable to CONTRACTOR's performance of the Work. Additionally, said review or recommendation will not impose responsibility on ENGINEER to make any examination to ascertain how or for what purposes CONTRACTOR has used the moneys paid on account of the Contract Price, or to determine that title to any of the Work, materials, or equipment has passed to OWNER free and clear of any Liens.

5. ENGINEER may refuse to recommend the whole or any part of any payment if, in ENGINEER's opinion, it would be incorrect to make the representations to OWNER referred to in paragraph 14.02.B.2. ENGINEER may also refuse to recommend any such payment or, because of subsequently discovered evidence or the results of subsequent inspections or tests, revise or revoke any such payment recommendation previously made, to such extent as may be necessary in ENGINEER's opinion to protect OWNER from loss because:

a. the Work is defective, or completed Work has been damaged, requiring correction or replacement;

b. the Contract Price has been reduced by Written Amendment or Change Orders;

c. OWNER has been required to correct defective Work or complete Work in accordance with paragraph 13.09; or

d. ENGINEER has actual knowledge of the occurrence of any of the events enumerated in paragraph 15.02.A.

C. *Payment Becomes Due*

1. Thirty days after presentation of the Application for Payment to OWNER with ENGINEER's recommendation, the amount recommended will (subject to the provisions of paragraph 14.02.D) become due, and when due will be paid by OWNER to CONTRACTOR.

D. *Reduction in Payment*

1. OWNER may refuse to make payment of the full amount recommended by ENGINEER because:

a. claims have been made against OWNER on account of CONTRACTOR's performance or furnishing of the Work;

b. liens have been filed in connection with the Work, except where CONTRACTOR has delivered a specific Bond satisfactory to OWNER to secure the satisfaction and discharge of such Liens;

c. there are other items entitling OWNER to a set-off against the amount recommended; or

d. OWNER has actual knowledge of the occurrence of any of the events enumerated in paragraphs 14.02.B.5.a through 14.02.B.5.c or paragraph 15.02.A.

2. If OWNER refuses to make payment of the full amount recommended by ENGINEER, OWNER must give CONTRACTOR immediate written notice (with a copy to ENGINEER) stating the reasons for such action and promptly pay CONTRACTOR any amount remaining after deduction of the amount so withheld. OWNER shall promptly pay CONTRACTOR the amount so withheld, or any adjustment thereto agreed to by OWNER and CONTRACTOR, when CONTRACTOR corrects to OWNER's satisfaction the reasons for such action.

3. If it is subsequently determined that OWNER's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by paragraph 14.02.C.1.

14.03 *CONTRACTOR's Warranty of Title*

A. CONTRACTOR warrants and guarantees that title to all Work, materials, and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to OWNER no later than the time of payment free and clear of all Liens.

14.04 *Substantial Completion*

A. When CONTRACTOR considers the entire Work ready for its intended use CONTRACTOR shall notify OWNER and ENGINEER in writing that the entire Work is substantially complete (except for items specifically listed by CONTRACTOR as incomplete) and request that ENGINEER issue a certificate of Substantial Completion. Promptly thereafter, OWNER, CONTRACTOR, and ENGINEER shall make an inspection of the Work to determine the status of completion. If ENGINEER does not consider the Work substantially complete, ENGINEER will notify CONTRACTOR in writing giving the reasons therefor. If ENGINEER considers the Work substantially complete, ENGINEER will prepare and deliver to OWNER a tentative certificate of Substantial Completion which shall fix the date of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed or corrected before final payment. OWNER shall have seven days after receipt of the tentative certificate during which to make written objection to ENGINEER as to any provisions of the certificate or attached list. If, after considering such objections, ENGINEER concludes that the Work is not substantially complete, ENGINEER will within 14 days after submission of the tentative certificate to OWNER notify CONTRACTOR in writing, stating the reasons therefor. If, after consideration of OWNER's objections, ENGINEER considers the Work substantially complete, ENGINEER will within said 14 days execute and deliver to OWNER and CONTRACTOR a definitive certificate of Substantial Completion (with a revised tentative list of items to be completed or corrected) reflecting such changes from the tentative certificate as ENGINEER believes justified after consideration of any objections from OWNER. At the time of delivery of the tentative certificate of Substantial Completion ENGINEER will deliver to OWNER and CONTRACTOR a written recommendation as to division of responsibilities pending final payment between OWNER and CONTRACTOR with respect to security, operation, safety, and protection of the Work, maintenance, heat, utilities, insurance, and warranties and guarantees. Unless OWNER and CONTRACTOR agree otherwise in writing and so inform ENGINEER in writing prior to ENGINEER's issuing the definitive certificate of Substantial Completion, ENGINEER's aforesaid recommendation will be binding on OWNER and CONTRACTOR until final payment.

B. OWNER shall have the right to exclude CONTRACTOR from the Site after the date of Substantial Completion, but OWNER shall allow CONTRACTOR reasonable access to complete or correct items on the tentative list.

14.05 *Partial Utilization*

A. Use by OWNER at OWNER's option of any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which OWNER, ENGINEER, and CONTRACTOR agree constitutes a separately functioning and usable part of the Work that can be used by OWNER for its intended purpose without significant interference with CONTRACTOR's performance of the remainder of the Work, may be accomplished prior to

Substantial Completion of all the Work subject to the following conditions.

1. OWNER at any time may request CONTRACTOR in writing to permit OWNER to use any such part of the Work which OWNER believes to be ready for its intended use and substantially complete. If CONTRACTOR agrees that such part of the Work is substantially complete, CONTRACTOR will certify to OWNER and ENGINEER that such part of the Work is substantially complete and request ENGINEER to issue a certificate of Substantial Completion for that part of the Work. CONTRACTOR at any time may notify OWNER and ENGINEER in writing that CONTRACTOR considers any such part of the Work ready for its intended use and substantially complete and request ENGINEER to issue a certificate of Substantial Completion for that part of the Work. Within a reasonable time after either such request, OWNER, CONTRACTOR, and ENGINEER shall make an inspection of that part of the Work to determine its status of completion. If ENGINEER does not consider that part of the Work to be substantially complete, ENGINEER will notify OWNER and CONTRACTOR in writing giving the reasons therefor. If ENGINEER considers that part of the Work to be substantially complete, the provisions of paragraph 14.04 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.

2. No occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of the Supplementary Conditions regarding property insurance.

14.06 *Final Inspection*

A. Upon written notice from CONTRACTOR that the entire Work or an agreed portion thereof is complete, ENGINEER will promptly make a final inspection with OWNER and CONTRACTOR and will notify CONTRACTOR in writing of all particulars in which this inspection reveals that the Work is incomplete or defective. CONTRACTOR shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

14.07 *Final Payment*

A. *Application for Payment*

1. After CONTRACTOR has, in the opinion of ENGINEER, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, Bonds, certificates or other evidence of insurance certificates of inspection, marked-up record documents (as provided in paragraph 6.12), and other documents, CONTRACTOR may make application for final payment following the procedure for progress payments.

2. The final Application for Payment shall be accompanied (except as previously delivered) by: (i) all documentation called for in the Contract Documents, including but not limited to the evidence of insurance required by subparagraph 5.04.B.7; (ii) consent of the surety, if any, to final payment; and (iii) complete and legally effective releases or waivers (satisfactory to OWNER) of all Lien rights arising out of or Liens filed in connection with the Work.

3. In lieu of the releases or waivers of Liens specified in paragraph 14.07.A.2 and as approved by OWNER, CONTRACTOR may furnish receipts or releases in full and an affidavit of CONTRACTOR that: (i) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (ii) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which OWNER or OWNER's property might in any way be responsible have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, CONTRACTOR may furnish a Bond or other collateral satisfactory to OWNER to indemnify OWNER against any Lien.

B. *Review of Application and Acceptance*

1. If, on the basis of ENGINEER's observation of the Work during construction and final inspection, and ENGINEER's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, ENGINEER is satisfied that the Work has been completed and CONTRACTOR's other obligations under the Contract Documents have been fulfilled, ENGINEER will, within 10 days after receipt of the final Application for Payment, indicate in writing ENGINEER's recommendation of payment and present the Application for Payment to OWNER for payment. At the same time ENGINEER will also give written notice to OWNER and CONTRACTOR that the Work is acceptable subject to the provisions of paragraph 14.09. Otherwise, ENGINEER will return the Application for Payment to CONTRACTOR, indicating in writing the reasons for refusing to recommend final payment, in which case CONTRACTOR shall make the necessary corrections and resubmit the Application for Payment.

C. *Payment Becomes Due*

1. Thirty days after the presentation to OWNER of the Application for Payment and accompanying documentation, the amount recommended by ENGINEER will become due and, when due, will be paid by OWNER to CONTRACTOR.

14.08 *Final Completion Delayed*

A. If, through no fault of CONTRACTOR, final completion of the Work is significantly delayed, and if ENGINEER so confirms, OWNER shall, upon receipt of CONTRACTOR's final Application for Payment and recommendation of ENGINEER, and without terminating the Agreement, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance to be held by OWNER for Work not fully completed or corrected is less than the retainage stipulated in the Agreement, and if Bonds have been furnished as required in paragraph 5.01, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by CONTRACTOR to ENGINEER with the Application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

14.09 *Waiver of Claims*

A. The making and acceptance of final payment will constitute:

1. a waiver of all Claims by OWNER against CONTRACTOR, except Claims arising from unsettled Liens, from defective Work appearing after final inspection pursuant to paragraph 14.06, from failure to comply with the Contract Documents or the terms of any special guarantees specified therein, or from CONTRACTOR's continuing obligations under the Contract Documents; and

2. a waiver of all Claims by CONTRACTOR against OWNER other than those previously made in writing which are still unsettled.

ARTICLE 15 - SUSPENSION OF WORK AND TERMINATION

15.01 *OWNER May Suspend Work*

A. At any time and without cause, OWNER may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by notice in writing to CONTRACTOR and ENGINEER which will fix the date on which Work will be resumed. CONTRACTOR shall resume the Work on the date so fixed. CONTRACTOR shall be allowed an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension if CONTRACTOR makes a Claim therefor as provided in paragraph 10.05.

15.02 *OWNER May Terminate for Cause*

A. The occurrence of any one or more of the following events will justify termination for cause:

1. CONTRACTOR's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the progress schedule established under paragraph 2.07 as adjusted from time to time pursuant to paragraph 6.04);

2. CONTRACTOR's disregard of Laws or Regulations of any public body having jurisdiction;

3. CONTRACTOR's disregard of the authority of ENGINEER; or

4. CONTRACTOR's violation in any substantial way of any provisions of the Contract Documents.

B. If one or more of the events identified in paragraph 15.02.A occur, OWNER may, after giving CONTRACTOR (and the surety, if any) seven days written notice, terminate the services of CONTRACTOR, exclude CONTRACTOR from the Site, and take possession of the Work and of all CONTRACTOR's tools, appliances, construction equipment, and machinery at the Site, and use the same to the full extent they could be used by CONTRACTOR (without liability to CONTRACTOR for trespass or conversion), incorporate in the Work all materials and equipment stored at the Site or for which OWNER has paid CONTRACTOR but which are stored elsewhere, and finish the Work as OWNER may deem expedient. In such case, CONTRACTOR shall not be entitled to receive any further payment until the Work is finished. If the unpaid balance of the Contract Price exceeds all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by OWNER arising out of or relating to completing the Work, such excess will be paid to CONTRACTOR. If such claims, costs, losses, and damages exceed such unpaid balance, CONTRACTOR shall pay the difference to OWNER. Such claims, costs, losses, and damages incurred by OWNER will be reviewed by ENGINEER as to their reasonableness and, when so approved by ENGINEER, incorporated in a Change Order. When exercising any rights or remedies under this paragraph OWNER shall not be required to obtain the lowest price for the Work performed.

C. Where CONTRACTOR's services have been so terminated by OWNER, the termination will not affect any rights or remedies of OWNER against CONTRACTOR then existing or which may thereafter accrue. Any retention or payment of moneys due CONTRACTOR by OWNER will not release CONTRACTOR from liability.

15.03 *OWNER May Terminate For Convenience*

A. Upon seven days written notice to CONTRACTOR and ENGINEER, OWNER may, without cause and without prejudice to any other right or remedy of OWNER, elect to terminate the

Contract. In such case, CONTRACTOR shall be paid (without duplication of any items):

1. for completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;

2. for expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses;

3. for all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred in settlement of terminated contracts with Subcontractors, Suppliers, and others; and

4. for reasonable expenses directly attributable to termination.

B. CONTRACTOR shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

15.04 *CONTRACTOR May Stop Work or Terminate*

A. If, through no act or fault of CONTRACTOR, the Work is suspended for more than 90 consecutive days by OWNER or under an order of court or other public authority, or ENGINEER fails to act on any Application for Payment within 30 days after it is submitted, or OWNER fails for 30 days to pay CONTRACTOR any sum finally determined to be due, then CONTRACTOR may, upon seven days written notice to OWNER and ENGINEER, and provided OWNER or ENGINEER do not remedy such suspension or failure within that time, terminate the Contract and recover from OWNER payment on the same terms as provided in paragraph 15.03. In lieu of terminating the Contract and without prejudice to any other right or remedy, if ENGINEER has failed to act on an Application for Payment within 30 days after it is submitted, or OWNER has failed for 30 days to pay CONTRACTOR any sum finally determined to be due, CONTRACTOR may, seven days after written notice to OWNER and ENGINEER, stop the Work until payment is made of all such amounts due CONTRACTOR, including interest thereon. The provisions of this paragraph 15.04 are not intended to preclude CONTRACTOR from making a Claim under paragraph 10.05 for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to CONTRACTOR's stopping the Work as permitted by this paragraph.

ARTICLE 16 - DISPUTE RESOLUTION

16.01 *Methods and Procedures*

A. Dispute resolution methods and procedures, if any, shall be as set forth in the Supplementary Conditions. If no method and procedure has been set forth, and subject to the provisions of paragraphs 9.09 and 10.05, OWNER and CONTRACTOR may exercise such rights or remedies as either may otherwise have under the Contract Documents or by Laws or Regulations in respect of any dispute.

ARTICLE 17 - MISCELLANEOUS

17.01 *Giving Notice*

A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended, or if delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

17.02 *Computation of Times*

A. When any period of time is referred to in the Contract Documents by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

17.03 *Cumulative Remedies*

A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract Documents, and the provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

17.04 *Survival of Obligations*

A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract Documents, as well as all continuing obligations indicated in the Contract Documents, will survive final payment, completion, and acceptance of the Work or termination or completion of the Agreement.

17.05 *Controlling Law*

A. This Contract is to be governed by the law of the state in which the Project is located.

17.06 *Headings*

A. The Article and paragraph headings are inserted for convenience only and do not constitute part of these General Conditions.

++ END OF GENERAL CONDITIONS ++

SUPPLEMENTARY CONDITIONS

SCOPE

These Supplementary Conditions amend or supplement the General Conditions. All provisions of the General Conditions which are not so amended or supplemented remain in full force and effect.

The terms used in these Supplementary Conditions which are defined in the General Conditions have the meanings assigned to them in the General Conditions.

SC-1.01.A.51 Add a new definition immediately following paragraph 1.01.A.50, which is to read as follows:

SC-1.01.A.51 *Consulting Engineer:* The firm of Malcolm Pirnie, Inc., and its duly authorized agents, such agents acting within the scope of the particular duties entrusted to them.

SC-4.02 Add a new paragraph immediately after paragraph 4.02.B which is to read as follows:

SC-4.02.C In the preparation of the Drawings and Specifications, ENGINEER and ENGINEER's Consultant have relied upon:

1. The following report of explorations and tests of subsurface conditions at the Site.
   a. Abalene/Orkin Inactive Hazardous Waste Site, Site Number 5-46-035 Moreau, Saratoga County, New York. Record of Decision, NYSDEC Department of Hazardous Waste Remediation, January 1996.
   b. Abalene Pest Control Feasibility Study Report, Malcolm Pirnie, Inc., June 1995.
   c. A copy of the above reports are available for review at the office of Malcolm Pirnie, Inc., 15 Cornell Road, Latham, New York 12110 upon 48 hours' notice to Mr. Daniel J. Loewenstein, P.E.

SC-5.04 Add a new Paragraph immediately after Paragraph 5.04.B, which is to read as follows:

SC-5.04.C The limits of liability for the insurance required by paragraph 5.04 shall provide coverage for not less than the following amounts, or greater where required by law:

1. For workers' compensation, and related coverage under paragraphs 5.04.A.1. and 5.04.A.2.:

a. New York State: Statutory Benefits

b. Employers' Liability

Each Accident	$100,000.00
Disease - Policy Limit	$500,000.00
Disease - Each Employee	$100,000.00
NYS Disability Benefits	Statutory Benefits
Applicable Federal Liability (E.g., Longshoremen's)	

2. For Comprehensive General Liability insurance under paragraphs 5.04.A.3 through 5.04.A.5 and paragraph 5.04.B (including Premises-Operations, Independent Contractor's Protection, Products and Completed Operations, Broad Form Property Damage, Contractual Liability):

a. Single Limit Occurrence Form with Limits not less than:

Each Occurrence	$1,000,000.00
Aggregate - Personal Injury	$1,000,000.00
Aggregate - Products/ Completed Operations	$1,000,000.00
General Aggregate	$3,000,000.00

b. The policy shall include Products and Completed Operations Coverage, which shall be maintained and evidenced for at least two years after completion of the contract.

c. Property Damage liability insurance shall provide coverage for:
Explosion:
Collapse:
Underground:

d. Personal injury liability shall be included with Employment Exclusion deleted.

e. The policy shall include Contractual Liability covering all obligations imposed on the CONTRACTOR under paragraphs 6.20.A, 6.20.B, 6.20.C and 6.20.D - Indemnification, of General Conditions.

3. Business and Auto Policy - see Paragraph 5.04.A.6 of the General Conditions and covering all Owned, Hired and Non-Owned Vehicles, with limits not less than:

a. Bodily Injury & Property Damage:

Combined Each Accident	$1,000,000.00

b. The policy shall include

P.I.P. or "No Fault" Benefits	
Each Person	$ 50,000.00
Uninsured Motorist	
Each Accident	$ 20,000.00

4. Umbrella Excess Liability - Occurrence Form with Limits not less than:

Each Occurrence	$5,000,000.00
Aggregate	$5,000,000.00
Maximum Retention	$ 25,000.00

Any restrictions in Umbrella eliminating coverages including Primary Auto and General Liability, must be brought to the attention of the County Attorney's office and the Executive Director's office.

SC-5.06 Add new paragraphs immediately after paragraph 5.05 which are to read as follows:

SC-5.06. *Property Insurance*

A. CONTRACTOR shall purchase and maintain property insurance upon the Work at the Site in the amount of the full replacement cost of the Work. This insurance shall:

1. include the interests of OWNER, CONTRACTOR, Subcontractors, ENGINEER, ENGINEER's Consultants, and any other individuals or entities identified herein, and the officers, directors, partners, employees, agents and other consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as an insured or additional insured.
2. be written on a Builder's Risk "all-risk" or open peril or special causes of loss policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: flood or water damage, fire, lightning, extended coverage, theft, vandalism and malicious mischief, earthquake, collapse, debris removal, and demolition occasioned by enforcement of Laws and Regulations, and water damage.
3. include expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects);
4. cover materials and equipment stored at the Site or at another location that was agreed to in writing by OWNER prior to being incorporated in the Work, provided that such materials and equipment have been included in an Application for Payment recommended by ENGINEER;

5. allow for partial utilization of the Work by OWNER;
6. include testing and start-up; and
7. be maintained in effect until final payment is made unless otherwise agreed to in writing by OWNER, CONTRACTOR and ENGINEER with 30 days written notice to each other additional insured to whom a certificate of insurance has been issued.

SC-5.07. *Waiver of Rights*

A. OWNER and CONTRACTOR intend that all policies purchased in accordance with paragraph SC-5.06 will protect OWNER, CONTRACTOR, Subcontractors, ENGINEER, ENGINEER's Consultants and all other individuals or entities identified in paragraph SC-5.06 to be listed as insureds or additional insureds (and the officers, directors, partners, employees, agents and other consultants and subcontractors of each and any of them) in such policies and will provide primary coverage for all losses and damages caused by the perils or causes of loss covered thereby. All such policies shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any of the insureds or additional insureds thereunder. OWNER and CONTRACTOR waive all rights against each other and their respective officers, directors, partners, employees, agents and other consultants and subcontractors of each and any of them for all losses and damages caused by, arising out of or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Subcontractors, ENGINEER, ENGINEER's Consultants and all other individuals or entities identified in paragraph SC-5.06 to be listed as insureds or additional insureds (and the officers, directors, partners, employees, agents and other consultants and subcontractors of each and any of them) under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by OWNER as trustee or otherwise payable under any policy so issued.

B. OWNER waives all rights against CONTRACTOR, Subcontractors, ENGINEER, ENGINEER's Consultants and the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them for loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by OWNER during partial utilization pursuant to paragraph 14.05, after Substantial Completion pursuant to paragraph 14.04 or after final payment pursuant to paragraph 14.07.

C. Any insurance policy maintained by OWNER covering any loss, damage or consequential loss referred to in paragraph SC-5.07.B shall contain provisions to the effect that in the event of payment of any such loss, damage or consequential loss, the insurers will have no rights of recovery against CONTRACTOR, Subcontractors, ENGINEER, ENGINEER's Consultants and the officers, directors, partners, employees, agents and other consultants and subcontractors of each and any of them.

SC-5.08. *Receipt and Application of Insurance Proceeds*

A. Any insured loss under the policies of insurance required by paragraph SC-5.06 will be adjusted with OWNER and made payable to OWNER as fiduciary for the insureds, as their interests may appear, subject to the requirements of any applicable mortgage clause and of paragraph SC-5.08.B. OWNER shall deposit in a separate account any money so received and shall distribute it in accordance with such agreement as the parties in interest may reach. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the moneys so received applied on account thereof and the Work and the cost thereof covered by an appropriate Change Order or Written Amendment.

B. OWNER as fiduciary shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within 15 days after the occurrence of loss to OWNER's exercise of this power. If such objection be made, OWNER as fiduciary shall make settlement with the insurers in accordance with such agreement as the parties in interest may reach. If no such agreement among the parties in interest is reached,

2) Assist in obtaining from OWNER additional details or information, when required for proper execution of the Work.

d. Shop Drawings and Samples:
   1) Record date of receipt of Shop Drawings and Samples, which are received at the Site.
   2) Receive Samples which are furnished at the Site by CONTRACTOR, and notify ENGINEER of availability of Samples for examination.
   3) Advise ENGINEER and CONTRACTOR of the commencement of any Work requiring a Shop Drawing or Sample if the submittal has not been approved by ENGINEER.

e. Review of Work, Rejection of Defective Work, Inspections and Tests:
   1) Conduct observations of the Work in progress on the Site to assist ENGINEER in determining if the Work is in general proceeding in accordance with the Contract Documents.
   2) Report to ENGINEER whenever RPR believes that any Work is unsatisfactory, faulty or defective or does not conform to the Contract Documents, or has been damaged, or does not meet the requirements of any inspection, test or approval required to be made; and advise ENGINEER of Work that RPR believes should be corrected or rejected or should be uncovered for observation, or requires special testing, inspection or approval.
   3) Verify that tests, equipment and systems startups and operating and maintenance training are conducted in the presence of appropriate personnel, and that CONTRACTOR maintains adequate records thereof; and observe, record and report to ENGINEER appropriate details relative to the test procedures and startups.
   4) Accompany visiting inspectors representing public or other agencies having jurisdiction over the Project, record the results of these inspections and report to ENGINEER.

f. Interpretation of Contract Documents: Report to ENGINEER when clarifications and interpretations of the Contract Documents are needed and transmit to CONTRACTOR clarifications and interpretations as issued by ENGINEER.

g. Modifications: Consider and evaluate CONTRACTOR's suggestions for modifications in Drawings or Specifications and report with RPR's recommendations to ENGINEER. Transmit to CONTRACTOR decisions as issued by ENGINEER.

h. Records:
   1) Maintain at the Site orderly files for correspondence, reports of job conferences, Shop Drawings and Samples,

and reproductions of original Contract Documents including all Addenda, Change Orders, Field Orders, additional Drawings issued subsequent to the execution of the Agreement. ENGINEER's clarifications and interpretations of the Contract Documents, progress reports, and other Project related documents.

2) Keep a record, recording CONTRACTOR hours on the Site, weather conditions, data relative to questions on Change Orders or changed conditions, list of visitors to the Site, daily activities, decisions, observations in general, and specific observations in more detail as in the case of observing test procedures; and send copies to ENGINEER.

3) Record names, addresses and telephone numbers of all CONTRACTORS, subcontractors and major suppliers of materials and equipment.

i. Reports:

1) Furnish ENGINEER periodic reports as required of progress of the Work and of CONTRACTOR's compliance with the progress schedule and schedule of Shop Drawing and Sample submittals.

2) Consult with ENGINEER in advance of scheduled major tests, inspections or start of important phases of the Work.

3) Draft proposed Change Orders, obtaining backup material from CONTRACTOR and recommend to ENGINEER Change Orders and Field Orders.

4) Report immediately to ENGINEER and OWNER upon the occurrence of any accident.

j. Payment Requests: Review applications for payment with CONTRACTOR for compliance with the established procedure for their submission and submit recommendations to ENGINEER, noting particularly the relationship of the payment requested to the schedule of values, Work completed and materials and equipment delivered at the site but not incorporated in the Work.

k. Certificates, Maintenance and Operation Manuals: During the course of the Work, verify that certificates, maintenance and operation manuals and other data required to be assembled and furnished by CONTRACTOR are applicable to the items actually installed and in accordance with the Contract Documents, and have this material delivered to ENGINEER for review and forwarding to OWNER prior to final payment for the Work.

l. Completion:

1) Before ENGINEER issues a Certificate of Substantial Completion, submit to CONTRACTOR a list of observed items requiring completion or correction.

2) Conduct final inspection in the company of ENGINEER, OWNER and CONTRACTOR and prepare a final list of items to be completed or corrected.
3) Observe that all items on final list have been completed or corrected and make recommendations to ENGINEER concerning acceptance.

2. Limitations of Authority of RPR:

RPR shall not:

a. Authorize any deviation from the Contract Documents or substitution of materials or equipment, unless authorized by ENGINEER.
b. Exceed limitations of ENGINEER's authority as set forth in the Agreement or the Contract Documents.
c. Undertake any of the responsibilities of CONTRACTOR, subcontractors or CONTRACTOR's superintendent.
d. Advise on, issue directions relative to or assume control over any aspect of the means, methods, techniques, sequences or procedures of construction unless such advice or directions are specifically required by the Contract Documents.
e. Advise on, issue directions regarding or assume control over safety precautions and programs in connection with the Work.
f. Accept Shop Drawing or Sample submittals from anyone other than CONTRACTOR.
g. Authorized OWNER to occupy the Project in whole or in part.
h. Participate in specialized field or laboratory tests or inspections conducted by others except as specifically authorized by ENGINEER.

SC-16.01 Add new paragraphs immediately after paragraph 16.01.A which are to read as follows:

SC-16.01.B OWNER and CONTRACTOR agree that they shall submit any and all unsettled Claims or counterclaims, disputes, or other matters in question between them arising out of or relating to the Contract Documents or the breach thereof to mediation by The American Arbitration Association under the Construction Industry Mediation Rules of the American Arbitration Association prior to either of them initiating against the other a demand for arbitration pursuant to paragraphs SC-16.01.C through SC-16.01.H, unless delay in initiating arbitration would irrevocably prejudice one of the parties. The 30-day time limit within which to file a demand for arbitration as provided in paragraphs SC-16.01.D and SC-16.01.E shall be suspended with respect to a dispute submitted to mediation within that time limit and shall remain suspended until 10 days after the termination of the mediation. The mediator of any dispute submitted to mediation under this agreement shall not serve as arbitrator of such dispute unless otherwise agreed.

SC-16.01.C All Claims or counter claims, disputes, or other matters in question between OWNER and CONTRACTOR arising out of or relating to the Contract Documents or the breach thereof (except for Claims which have been waived by the making or acceptance of final payment as provided by paragraph 14.09) not resolved under the provisions of paragraph SC-16.01.B will be decided by binding arbitration in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association then obtaining, subject to the limitations of paragraphs SC-16.01.C through SC-16.01.H. This agreement to arbitrate and any other agreement or consent to arbitrate entered into will be specifically enforceable under the prevailing law of any court having jurisdiction.

SC-16.01.D No demand for arbitration of any Claim or counter claim, dispute, or other matter that is required to be referred to ENGINEER initially for decision in accordance with paragraph 9.09 will be made until the earlier of: (i) the date on which ENGINEER has rendered a written decision, or (ii) the thirty-first day after the parties have presented their final evidence to ENGINEER if a written decision has not been rendered by ENGINEER before that date. No demand for arbitration of any such Claim or counter claim, dispute, or other matter will be made later than 30 days after the date on which ENGINEER has rendered a written decision in respect thereof in accordance with paragraph 10.05; and the failure to demand arbitration within said 30 day period will result in ENGINEER's decision being final and binding upon OWNER and CONTRACTOR. If ENGINEER renders a decision after arbitration proceedings have been initiated, such decision may be entered as evidence but will not supersede the arbitration proceedings, except where the decision is acceptable to the parties concerned.

SC-16.01.E Notice of the demand for arbitration will be filed in writing with the other party to the Contract and with the selected arbitrator, and a copy will be sent to ENGINEER for information. The demand for arbitration will be made within the 30-day period specified in Paragraph SC-16.01.D. and in all other cases within a reasonable time after the Claim or counter claim, dispute, or other matter in question has arisen, and in no event shall any such demand be made after the date when institution of legal or equitable proceedings based on such Claim or counter claim, dispute, or other matter in question would be barred by the applicable statute of limitations.

SC-16.01.F Except as provided in paragraph SC-16.01.G, no arbitration arising out of or relating to the Contract Documents shall include by consolidation, joinder or in any other manner any other individual or entity (including ENGINEER, ENGINEER's Consultants and the officers, directors, partners, employees, agents, or other consul-

tants or subcontractors of each and any of them) who is not party to this Contract unless:

1. the inclusion of such other individual or entity is necessary if complete relief is to be afforded among those who are already parties to the arbitration; and
2. such other individual or entity is substantially involved in a question of law or fact which is common to those who are already parties to the arbitration and which will arise in such proceedings, and
3. the written consent of the other individual or entity sought to be included and of OWNER and CONTRACTOR has been obtained for such inclusion, which consent shall make specific reference to this paragraph; but no such consent shall constitute consent to arbitration of any dispute not specifically described in such consent or to arbitration with any party not specifically identified in such consent.

SC-16.01.G Notwithstanding paragraph SC-16.01.F, if a Claim or counter claim, dispute, or other matter in question between OWNER and CONTRACTOR involves the Work of a Subcontractor, either OWNER or CONTRACTOR may join such Subcontractor as a party to the arbitration between OWNER and CONTRACTOR hereunder. CONTRACTOR shall include in all subcontracts required by paragraph 6.06.G a specific provision whereby the Subcontractor consents to being joined in an arbitration between OWNER and CONTRACTOR involving the Work of such Subcontractor. Nothing in this paragraph SC-16.01.G nor in the provision of such subcontract consenting to joinder shall create any claim, right or cause of action in favor of Subcontractor and against OWNER, ENGINEER or ENGINEER's Consultants that does not otherwise exist.

SC-16.01.H The award rendered by the arbitrators will be final, judgment may be entered upon it in any court having jurisdiction thereof, and will not be subject to modification or appeal.

ARTICLE SC-18 - STATUTORY REQUIREMENTS

SC-18.01 This Article contains portions of certain Laws or Regulations which, by provision of Law or Regulations, are required to be included in the Contract Documents. The material included in this Article may not be complete or current. CONTRACTOR's obligation to comply with all Laws and Regulations applicable to the Work is set forth in paragraph 6.09 of the General Conditions.

SC-18.2 Non-Discrimination in Employment:

A. During the performance of this contract, CONTRACTOR agrees as follows:
   1. CONTRACTOR will not discriminate against any employee or applicant for employment because of race, creed, color, or national origin, and will take

affirmative action to insure that they are afforded equal employment opportunities without discrimination because of race, creed, color or national origin. Such action shall be taken with reference but not limited to: recruitment, employment, job assignment, promotion, upgrading, demotion, transfer, layoff or termination, rates of pay or other forms of compensation, and selection for training or retraining, including apprenticeship and on-the-job training.

2. CONTRACTOR will send to each labor union or representative of workers with which he has or is bound by a collective bargaining or other agreement or understanding, a notice, to be provided by the State Commission for Human Rights, advising such labor union or representative of the CONTRACTOR'S agreement under clauses 1. through 8. hereinafter called "non-discrimination clauses". If the CONTRACTOR was directed to do so by the OWNER as part of the Bid or negotiation of this contract, CONTRACTOR shall request labor union or representative to furnish him with a written statement that such labor union or representative will not discriminate because of race, creed, color or national origin and that such labor union or representative either will affirmatively cooperate within the limits of its legal and contractual authority, in the implementation of the policy and provisions of these non-discrimination clauses or that it consents and agrees that recruitment, employment, and the terms and conditions of employment under this contract shall be in accordance with the purposes and provisions of these non-discrimination clauses. If such labor union or representative fails or refuses to comply with such a request, that it furnish such a statement, CONTRACTOR shall promptly notify the State Commission for Human Rights of such failure or refusal.
3. CONTRACTOR will post and keep posted in conspicuous places, available to employees and applicants for employment, notices to be provided by the State Commission for Human Rights setting forth the substance of the provisions of clauses 1. through 2. and such provisions of the State's Laws against discrimination as the State Commission for Human Rights shall determine.
4. CONTRACTOR will state, in all solicitations or advertisements for employees placed by or on behalf of CONTRACTOR, that all qualified applicants will be afforded equal employment opportunities without discrimination because of race, creed, color or national origin.
5. CONTRACTOR will comply with the provisions of the Executive Law, Human Rights Law, Article 15, will furnish all information and reports deemed necessary by the State Commission for Human Rights under these non-discrimination clauses and such sections of the Executive Law, and will permit access to his books, records and accounts by the State Commission for Human Rights, the Attorney General, District Commissioner of Housing and Community Renewal and the Industrial Commission for purposes of investigation to ascertain compliance with these non-discrimination clauses of the Executive Law, Human Rights Law, Article 15.
6. This contract may be forthwith canceled, terminated or suspended, in whole or in part, by the OWNER upon the basis of a finding made by the State Commission for Human Rights that CONTRACTOR has not complied with these non-discrimination clauses, and CONTRACTOR may be declared ineligible for future contracts made by or on behalf of the State or a public

authority or agency of the State or housing authority, or an urban renewal agency, or contracts requiring the approval of the Commissioner of Housing and Community Renewal, until he has satisfied the State Commission for Human Rights after conciliation efforts by the Commission have failed to achieve compliance with these non-discrimination clauses and after a verified complaint has been filed with the Commission, notice thereof has been given to CONTRACTOR and an opportunity has been afforded him to be heard publicly before three members of the Commission. Such sanctions may be imposed and remedies invoked independently of or in addition to sanctions and remedies otherwise provided by law.

7. If this contract is canceled or terminated under clause 6., in addition to other rights of the OWNER provided in this contract upon its breach by CONTRACTOR, CONTRACTOR will hold the OWNER harmless against any additional expenses or costs incurred by the OWNER in completing the Work or in purchasing the services, materials, equipment or supplies contemplated by this contract, and the OWNER may withhold payments from CONTRACTOR in an amount sufficient for this purpose and recourse may be had against the surety on the Performance Bond if necessary.

8. CONTRACTOR will include the provisions of clauses 1. through 2. in every subcontract or purchase order altered only to reflect the proper identity of the parties in such a manner that such provisions will be binding upon each Subcontractor or vendor as to operations to be performed within the State of New York. CONTRACTOR will take such actions in enforcing such provisions of such subcontract or purchase order as the OWNER may direct, including sanctions or remedies for non-compliance. If CONTRACTOR becomes involved in or is threatened with litigation with a Subcontractor or vendor as a result of such direction by the OWNER, the CONTRACTOR shall promptly so notify the Attorney General, requesting him to intervene and to protect the interest of the State of New York.

++ END OF DOCUMENT ++

SECTION 01010

SUMMARY OF WORK

1.1 LOCATION AND DESCRIPTION OF WORK

A. In general, the work under this contract consists of, but is not limited to, remediation of the Former Abalene Pest Control Inactive Hazardous Waste Site. Work for the remediation includes, but is not limited to the following: demolition and off-site disposal of existing structures, excavation and off-site disposal of contaminated soils, excavation and regrading of on-site soils, scarification of concrete and disposal of material, abandonment and removal of petroleum underground storage tank, abandonment of septic tanks, abandonment of wells and topsoil and seeding of site.

B. The Work shall take place at the Former Abalene Pest Control Inactive Hazardous Waste Site, located at the corner of Route 9 and Reservoir Road, Town of Moreau, Saratoga County, New York, as shown on the Contract Drawings. The Former Abalene Pest Control Inactive Hazardous Waste Site is a Class II Site which is listed on the New York State List of Inactive Hazardous Waste Sites.

C. The summary of the Work described in this Section is an overall summary of the responsibilities of the CONTRACTOR and his relation to the OWNER. It does not supersede specific requirements of other Contract Documents and does not in any way limit the responsibility of the Contractor to perform all Work and furnish the required materials, equipment, labor and means as shown or required by the Contract Documents.

D. Materials, equipment, labor, etc. obviously a part of the Work and necessary for the proper operation and installation of same, although not specifically indicated in the Contract Documents, shall be provided as if called for in detail without additional cost to the OWNER.

1.2 JOB CONDITIONS

A. The Former Abalene Pest Control Inactive Hazardous Waste Site is classified by the New York State Department of Environmental Conservation as a Class II inactive hazardous waste site. This Contract includes the excavation and disposal of pesticide contaminated soils. The CONTRACTOR assumes the risk of possible physical hazards such as slippery conditions, sloping ground, encountering hazardous wastes and hazardous gases. Contaminants of concern which may be encountered during construction are identified in Section 01460 of these specifications.

B. Information regarding site conditions is intended to assist the CONTRACTOR in preparing his bid. The ENGINEER does not guarantee its accuracy or that it is necessarily indicative of conditions to be encountered. CONTRACTOR shall satisfy himself regarding all local conditions affecting his work by personal investigation and

neither the information on local geology, nor that derived from maps or drawings, nor from the ENGINEER, OWNER or their agents or employees, shall act to relieve CONTRACTOR of any responsibility hereunder or from fulfilling all of the terms and requirements of the Contract Specifications.

1.3 CONTRACTS

A. The Work shall be constructed under one prime contract.

1.4 CONTRACTOR'S USE OF PREMISES

A. CONTRACTOR'S use of the premises shall be confined to the areas defined by the limit of work line as shown on the Contract Drawings.

B. CONTRACTOR shall:
   1. Assume full responsibility for protection and safekeeping of products stored on or off premises.
   2. Move stored products that interfere with the operations of OWNER or other contractor.
   3. Obtain and pay for all additional storage or work areas required for his operations.

1.5 CODES AND STANDARDS

A. CONTRACTOR shall conform to, comply with, and abide by any and all applicable laws which pertain to or in any way affect the Work to be done by the CONTRACTOR. CONTRACTOR shall also comply with any and all instructions and regulations of the OWNER pertaining thereto, including any applicable law and instructions regarding signs, advertising, fire and/or smoke.

B. CONTRACTOR shall at his own expense obtain all permits, certifications and licenses required of him by applicable law for the execution of the Work.

C. Where provisions of the pertinent codes, standards or regulations conflict with this Specification, the more stringent provision shall govern.

1.6 SAFETY REGULATIONS

A. CONTRACTOR shall comply with the requirements and standards of all federal, state and local laws, ordinances, codes, rules and regulations governing safety and health. Protection shall be afforded to all persons having access to the site. Nothing in any paragraphs of these Contract Documents shall be construed as relieving the CONTRACTOR from full responsibility for safe work practices at all times.

B. The CONTRACTOR shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the work. The CONTRACTOR shall take all necessary precautions for the safety of, and shall

provide the necessary protection, training as stipulated under 29 CFR 1910.120 and equipment to prevent damage, injury or loss to:

1. All employees on the work site and other persons who may be affected thereby.
2. All the work and all materials or equipment to be incorporated therein, whether in storage on or off the site.
3. Other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

C. The CONTRACTOR shall comply with all applicable laws for the safety of persons or property or to protect them from damage, injury or loss; and shall erect and maintain all necessary safeguards for such safety and protection.

D. The CONTRACTOR shall designate a responsible member of his organization at the site whose duty shall be the prevention of accidents.

E. In emergencies affecting the safety or protection of persons or the work or property at the site or adjacent thereto, the CONTRACTOR, without special instruction or authorization from ENGINEER or OWNER, is obligated to act to prevent threatened damage, injury or loss. The CONTRACTOR shall give ENGINEER prompt written notice of any significant changes in the Work or deviations from the Contract Documents caused thereby as required by the Contract Documents.

++ END OF SECTION ++

SECTION 01025

MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.1 DESCRIPTION

A. The items listed below beginning with Article 1.4, refer to and are the same pay items listed in the Bid Form. They constitute all of the pay items for the completion of the Work. No direct or separate payment will be made for providing miscellaneous temporary or accessory works, plant, services, CONTRACTOR'S field offices, layout surveys, sanitary requirements, testing, safety devices, approval and record drawings, water supplies, power, maintaining traffic, removal of waste, watchmen, bonds, insurance, and all other requirements of the General Conditions, Supplementary Conditions, and the General Requirements. Compensation for all such services, things and materials shall be included in the prices stipulated for the lump sum and extra work unit price pay items listed herein.

B. Each lump sum and extra work unit bid price will be deemed to include an amount considered by CONTRACTOR to be adequate to cover CONTRACTOR'S overhead and profit for each separately identified item.

1.2 ENGINEER'S ESTIMATE OF QUANTITIES

A. ENGINEER'S estimated quantities for extra work unit price pay items, as listed in the Bid Form, are approximate only and are included solely for the purpose of comparison of Bids. OWNER does not expressly or by implication agree that the nature of the materials encountered below the surface of the ground or the actual quantities of material encountered or required will correspond therewith and reserves the right to increase or decrease any quantity or to eliminate any quantity as OWNER may deem necessary. CONTRACTOR will not be entitled to any adjustment in a unit bid price as a result of any change in an estimated quantity and agrees to accept the aforesaid unit bid prices as complete and total compensation for any additions caused by changes or alterations in the Work ordered by OWNER.

1.3 RELATED PROVISIONS

A. Payments to CONTRACTOR: Refer to General Conditions and Agreement.

B. Changes in Contract Price: General Conditions.

C. Schedule of Values: Section 01026.

1.4 CONTRACT NO. 1 - GENERAL

A. Item 1 - Site Preparation.
   1. Measurement and Payment: The lump sum bid for Item 1 shall be full compensation for furnishing tools, materials, equipment and supervision required to complete site preparation activities specified or shown on the drawings and/or specified and not specifically included for payment under other items of the Contract. More specifically, Item 1 includes but is not limited to: fence demolition; site clearing and grubbing; removal and hazardous waste disposal of miscellaneous contaminated shelving and carbon from the well pit in the office building, shelving in the shed building, pesticide and herbicide samples in the barn, and waste material in the pit located in the barn (CONTRACTOR shall assume cost to remove and stage all hazardous waste materials prior to overpacking to allow efficient packing of drums); emptying and cleaning of drums stored in the barn and on office porch (for purposes of the bid the CONTRACTOR shall assume 180 drums total with 88 drums empty and 92 drums full of soil); off-site disposal of the emptied drums; site environmental controls; temporary facilities; mobilization; and health and safety costs. Also included are any costs associated with permits, disposal fees, and waste characterization. CONTRACTOR shall stage all miscellaneous hazardous waste prior to filling of drums to allow ENGINEER to inventory all materials and allow for efficient packing of drums.

B. Item 2 - Well Abandonment.
   1. Measurement and Payment: The lump sum bid for Item 2 shall be full compensation for furnishing tools, materials, equipment, and supervision required to complete the abandonment of the office well as identified on the drawings and specified and not specifically included for payment under the other items of the Contract. More specifically, Item 2 includes but is not limited to: removal and disposal of protective casing and pressure grouting of bore hole.

C. Item 3 - Tank Abandonment.
   1. Item 3A - Petroleum Storage Tank Abandonment:
      a. Measurement and Payment: The lump sum bid for Item 3A shall be full compensation for furnishing all labor, materials, tools, equipment and supervision to complete the underground storage tank abandonment as shown and specified and not specifically included for payment under the other items of the Contract. More specifically Item 3A includes but is not limited to: the removal and disposal of any liquid and sludge present in the tank, the excavation and stockpiling of soils required to remove the tank, the removal of the tank and appurtenances, the thorough cleaning and decommissioning of the tank, the transportation and off-site disposal of the tank and appurtenances, and the backfill of the excavation with clean excavated soils. Item 3A shall also include any associated costs involved with permits, environmental, and health and safety issues involved with the tank abandonment.

2. Item 3B - Septic Tank Abandonment:
   a. Measurement and Payment: The lump sum bid for Item 3B shall be full compensation for furnishing all labor, materials, tools, equipment and supervision to complete the septic tank abandonment as shown and specified and not specifically included for payment under the other items of the Contract. More specifically Item 3B includes but is not limited to: the removal and hazardous waste disposal of any liquid and sludge present in the tanks, the excavation and stockpiling of soils required to access the tank, the backfill of the tanks with flowable fill, the backfill and restoration of excavated soils. Item 3B shall also include any costs associated with permits, disposal fees, waste characterization and health and safety.

D. Item 4 - Building Demolition and Disposal.
   1. Measurement and Payment: The lump sum bid for Item 4 shall be full compensation for furnishing all labor, materials, tools, equipment and supervision to demolish and dispose of buildings and associated debris as shown and specified and not specifically included for payment under the other items of the Contract. Specifically, Item 4 includes but is not limited to: the demolition of three existing structures including all associated debris above existing grade and foundation walls in the former office building to 3 feet below existing grade, transport and disposal of the debris at an approved Construction and Demolition (C&D) landfill facility, and any costs associated with permits, disposal fees, waste characterization, and health and safety.

E. Item 5 - Concrete Scarification and Disposal.
   1. Measurement and Payment: The lump sum bid for Item 5 shall be full compensation for furnishing all labor, materials, tools, equipment and supervision to scarify existing concrete slabs and floors and dispose of the debris as shown and specified and not specifically included for payment under the other items of the Contract. More specifically, Item 5 includes but is not limited to: scarification of the concrete slab in the barn and office building basement floor, transportation and disposal of the concrete debris generated at an approved hazardous waste Treatment, Storage and Disposal (TSD) Facility, and any costs associated with permits, disposal fees, waste characterization, and health and safety.

F. Item 6 - Contaminated Soil Excavation and Disposal.
   1. Item 6A - Contaminated Soil Excavation and On-site Placement:
      a. Measurement and Payment: The lump sum bid for Item 6A shall be full compensation for furnishing all labor, materials, tools, equipment and supervision to excavate, transport, place and compact contaminated soil as shown and specified and not specifically included for payment under other items. More specifically, Item 6A includes but is not limited to: excavation of identified soils, transportation of soils to designated locations on-site, placement of soils and compaction of soils. Also included are any costs associated with permits and health and safety.

2. Item 6B - Contaminated Soil Excavation and Off-site Disposal:
    a. Measurement and Payment: The lump sum bid for Item 6B shall be full compensation for furnishing all labor, materials, tools, equipment and supervision to excavate, transport, treat and dispose of contaminated soil as shown and specified and not specifically included for payment under other items. Payment shall be made upon CONTRACTOR providing a Certificate of Destruction or complete manifest. More specifically, Item 6B includes but is not limited to: excavation, transportation, treatment, and disposal of contaminated soils at an approved hazardous waste Treatment, Storage and Disposal (TSD) Facility. The treatment of the contaminated soils shall consist of thermal destruction of the contaminants. Also included are any costs associated with permits, disposal fees, waste characterization, and health and safety.

G. Item 7 - Site Grading and Restoration.
    1. Measurement and Payment: The lump sum bid for Item 7 shall be full compensation for furnishing all labor, materials, tools, equipment and supervision to complete site grading and restoration activities not specified or shown on the drawings and specified and not specifically included for payment under other items of the Contract. More specifically, Item 7 includes but is not limited to: site grading, furnishing and placement of the topsoil layer, seeding of the topsoil layer, and installation of site drainage features and demobilization.

H. Item 8 - Additional Off-site General Fill.
    1. Measurement: Additional off-site general fill will be measured for payment on the basis of the computed number of cubic yards placed within the limits shown, specified or ordered by the ENGINEER. The quantity of additional off-site general fill will be determined from in-place measurements.
    2. Payment: The unit price bid per cubic yard for Item 8 will be full compensation for providing all labor, tools, materials, equipment and supervision required to furnish and install all additional off-site general fill as shown and specified and not specifically included under other items or contracts.

I. Item 9 - Additional Topsoil.
    1. Measurement: The quantity to be paid for under Item 9 shall be the actual number of cubic yards of additional topsoil furnished and installed as measured in place to the lines ordered by the ENGINEER which are beyond the lines shown on the drawings for like material.
    2. Payment: The unit price bid per cubic yard for Item 9 shall constitute full compensation for furnishing all labor, tools, equipment, materials, and supervision required to furnish and install additional topsoil as ordered by the ENGINEER.

J. Item 10 - Contaminated Soil.
    1. Item 10A - Petroleum Contaminated Soil:
        a. Measurement: The unit price for petroleum contaminated soil will be measured on the basis of the following:

1) To the lines and grades as ordered by the ENGINEER.
2) The actual tons of petroleum contaminated soil excavated and disposed of in an approved manner as measured by scale records.

b. Payment: The unit price per ton for Item 10A will be full compensation for providing all labor, tools, materials, equipment, supervision, permits, tipping fees, waste characterization, and health and safety required for petroleum contaminated soil excavation and disposal as shown and specified and not specifically included under other items.

2. Item 10B - Additional Contaminated Soil Excavation and On-site Placement:
   a. Measurement: The unit price for additional contaminated soil excavation and on-site placement will be measured on an in-place cubic yard basis to the lines and grades as ordered by the ENGINEER.
   b. Payment: The unit price per cubic yard for Item 10B will be full compensation for providing all labor, tools, materials, equipment and supervision required for additional contaminated soil excavation and on-site placement as shown and specified and not specifically included under other items.
3. Item 10C - Additional Contaminated Soil Excavation and Off-site Disposal:
   a. Measurement: The unit price for additional contaminated soil excavation and off-site disposal will be measured on the basis of the following:
      1) To the lines and grades as ordered by the ENGINEER.
      2) The actual tons of contaminated soil excavated and disposed of in an approved manner as measured by scale records.
   b. Payment: The unit price per ton for Item 10C will be full compensation for providing all labor, tools, materials, equipment and supervision required for additional contaminated soil excavation and off-site disposal as shown and specified and not specifically included under other items. Payment shall be made upon CONTRACTOR providing a Certificate of Destruction or complete manifest.

K. Item 11 - Waste Disposal.
1. Item 11A - Additional Petroleum Contaminated Free Product:
   a. Measurement: The unit price for additional petroleum contaminated free product will be measured on a per gallon basis in the event that the quantity of free product present varies from the estimated quantity specified.
   b. Payment: The unit price per gallon for Item 11A will be full compensation for providing all labor, tools, materials, equipment supervision and product disposal fees required for additional petroleum contaminated free product as shown and specified and not specifically included under other items.
2. Item 11B - Additional Septic Tank Free Product and Sludge:
   a. Measurement: The unit price for additional septic tank free product and sludge will be measured on a per gallon basis in the event that the quantity of free product present varies from the estimated quantity specified.
   b. Payment: The unit price per gallon for Item 11B will be full compensation for providing all labor, tools, materials, equipment, supervision and product disposal fees (as hazardous waste) required for additional septic tank free

product as shown and specified and not specifically included under other items.

3. Item 11C - Additional Waste Material:
   a. Measurement: The unit price for additional hazardous waste materials will be measured on the basis of the following:
      1) To the lines and grades as ordered by the ENGINEER.
      2) The actual number of 55-gallon drums filled, treated and disposed of as hazardous waste in an approved manner.
   b. Payment: The unit price per 55-gallon drum for Item 11C will be full compensation for providing all labor, tools, materials, equipment, supervision and disposal fees required for additional hazardous waste materials as shown and specified and not specifically included under other items.

L. Item PLI - Pollution Liability Insurance:
   1. Measurement: The quantity to be paid for under Item PLI shall be the actual documented cost of Pollution Liability Insurance in an amount not less than $1,000,000 per claim. The OWNER and ENGINEER shall be named on such policies as additional insureds. Claims-made policies shall have a one (1) year tail beyond the date of substantial completion. If CONTRACTOR obtains liability insurance with coverage in the amount indicated in this Item PLI, without a pollution liability exclusion clause, then a copy of this policy must be submitted with the executed agreement.

      If CONTRACTOR cannot obtain pollution liability insurance coverage, the following documentation is required: written confirmation by CONTRACTOR of at least three (3) attempts to obtain pollution liability insurance and a copy of the rejection letters from at least three (3) insurance carriers.

   2. Payment: The lump sum price for Item PLI shall constitute full compensation for obtaining the Pollution Liability Insurance specified above. This item is not to be calculated in the total bid for Contract No. 1G - General.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

++ END OF SECTION ++

SECTION 01026

SCHEDULE OF VALUES

1.1 GENERAL

A. The Schedule of Values is an itemized list that establishes the value or cost of each part of the Work. It shall be used as the basis for preparing progress payments and may be used as a basis for negotiations concerning additional work or credits which may arise during the construction. Quantities and unit prices may be included in the schedule when approved by or required by the ENGINEER.

1.2 PREPARATION

A. Schedule shall show breakdown of labor, materials equipment and other costs used in preparation of the Bid.

B. Costs shall be in sufficient detail to indicate separate amounts for each Section of the Specifications.

C. CONTRACTOR may include an item for bond, insurance, temporary facilities and job mobilization. This item will be included for payment at a rate of 25 percent per month for the first four months. This item is included in Item 1 of the Measurement and Payment Specification Section 01025.

D. Schedule of Values shall be prepared on 8-1/2-inch by 11-inch white paper.

E. Use Table of Contents of the Specifications as basis for Schedule format and identify each item with number and title in the Table of Contents. List sub-items of major products or systems as appropriate or when requested by ENGINEER.

F. When requested by ENGINEER, support values with data that will substantiate their correctness.

G. The sum of the individual values shown on the Schedule of Values must equal the total Contract Price.

H. Each item shall include a directly proportional amount of the CONTRACTOR'S overhead and profit.

I. Schedule shall show the purchase and delivery costs for materials and equipment that the CONTRACTOR anticipates he shall request payment for prior to their installation.

1.3 SUBMITTAL

A. Submit two (2) copies of Schedule to ENGINEER for approval at least 20 days prior to submitting first application for a progress payment. After review by ENGINEER, revise and resubmit Schedule as required until it is approved.

++ END OF SECTION ++

SECTION 01040

COORDINATION

1.1 GENERAL

A. As more fully set forth in Article 6 of the General Conditions, CONTRACTOR shall be solely responsible for coordination of all of the Work. He shall supervise, direct and cooperate fully with all Subcontractors, manufacturers, fabricators, suppliers, distributors, installers, testing agencies and all others whose services, materials or equipment are required to ensure completion of the Work within the Contract Time.

B. As more fully set forth in Article 7 of the General Conditions, CONTRACTOR shall cooperate with and coordinate his Work with the work of any other contractor, utility service company or OWNER's employees performing additional work related to the Project at the site.

C. CONTRACTOR shall not be responsible for damage done by contractors not under his jurisdiction. He will not be liable for any such loss or damage unless it is through the negligence of the CONTRACTOR.

D. CONTRACTOR shall also coordinate his Work with the work of others to assure compliance with schedules.

E. CONTRACTOR shall attend and participate in all project coordination or progress meetings and report on the progress of all Work and compliance with schedules.

++ END OF SECTION ++

SECTION 01050

FIELD ENGINEERING AND SURVEY DATA

1.1 GENERAL

A. CONTRACTOR shall:
   1. Develop and make all detail surveys and measurements needed for construction including slope stakes, batter boards, and all other working lines and elevations. CONTRACTOR shall supply miscellaneous survey equipment, in good working order, for the Work.
   2. Maintain a transit and level on the site at all times and provide a skilled instrument man available whenever necessary for horizontal and vertical control of the Work.
   3. Provide all materials required for bench marks, control points, batter boards, grade stakes, and other items.
   4. Be solely responsible for all locations, dimensions and levels. No data other than written orders of the ENGINEER shall justify departure from the dimensions and levels required by the Drawings. Notify OWNER, in writing of any differences in actual and indicated measurements before commencing any of the Work.
   5. Safeguard all points, stakes, grade marks, monuments and bench marks made or established on the Work, re-establish same if disturbed and rectify all Work improperly installed because of not maintaining, not protecting or removing without authorization such established points, stakes, marks and monuments.
   6. When requested by ENGINEER, provide such facilities and assistance as may be necessary for ENGINEER to check line and grade points placed by CONTRACTOR. CONTRACTOR shall do no excavation or embankment Work until all cross-sectioning and preliminary topography Work necessary for determining pay quantities has been completed and checked by ENGINEER.
   7. Assist ENGINEER with obtaining samples and locating borings and testpits, and not impede the taking of samples, borings and testpits.
   8. Provide any materials and skilled labor required to cross-section borrow areas and/or stockpiles of general and/or select fill and calculate volumes for purposes of QA/QC material testing, pay quantities, etc.

1.2 CONTRACTOR'S FOREMAN

A. CONTRACTOR shall employ and retain at the site of the Work a foreman capable of performing all tasks required of the CONTRACTOR. Tasks included are:
   1. Daily reports of Project activity to be submitted to the ENGINEER with all pertinent information pertaining to the Project as follows:
      a. Numbers of employees,
      b. Subcontractor employees,
      c. Breakdown of employees by trade,
      d. Major equipment and materials installed,
      e. Major construction equipment utilized,
      f. Location of all areas in which construction was done,
      g. Materials and equipment received.

2. Provide all surveying equipment required including transit, level, stakes and required surveying support equipment. Provide survey grids and control information (tied into existing site grid system) on a bi-weekly basis or as directed by the ENGINEER.
3. Furnish all required lines and grades for construction operations. Check all formwork, reinforcing, inserts, structural steel, bolts, sleeves, piping, geomembrane, other materials and equipment.
4. Maintain field office files and drawings, record drawings, and coordinate services with Subcontractors. Prepare layout and coordination drawings for construction operations.
5. Check and coordinate Work for conflicts and interferences and immediately advise ENGINEER of all discrepancies noted.
6. Cooperate with ENGINEER in field inspections as required.

1.3 RECORDS

A. Maintain a complete, accurate log of all control and survey Work as it progresses. Notes of all measurements and calculations made while surveying and laying out the Work shall be neat and legible.

B. On completion of the project, CONTRACTOR's surveyor shall prepare a certified survey showing all dimensions, locations, angles, elevations of construction and deviations from Contract Documents.

1.4 SUBMITTALS

A. Submit name and address of CONTRACTOR'S surveyor and CONTRACTOR'S foreman to ENGINEER.

B. On request of ENGINEER, submit documentation to verify accuracy of Work.

C. When requested by ENGINEER, submit certificate signed by CONTRACTOR'S foreman or CONTRACTOR'S surveyor certifying that elevations and locations of Work are in conformance with Contract Documents. Explain all deviations.

D. One (1) copy of all notes and a set of reproducible marked-up drawings indicating the as-constructed project shall be furnished to each the ENGINEER and the OWNER with other records upon final completion.

E. CONTRACTOR shall make available to the ENGINEER any survey notes in the form of raw and reduced notes generated during the course of Work. Notes shall be made available upon request of the ENGINEER.

++ END OF SECTION ++

SECTION 01061

OPERATIONS IN HIGHWAY RIGHTS-OF-WAY

PART 1 - GENERAL

1.1 SCOPE

A. CONTRACTOR shall obtain all necessary permits, arrange all inspections required by the state and pay all charges. He shall conform with all applicable State Highway Department rules and regulations.

B. Work may be installed by the open cut method, however, traffic flow shall be maintained. A minimum of two lanes of traffic shall be kept flowing.

C. CONTRACTOR shall take all means necessary to prevent accidents. Sufficient flagmen, barricades, lights, signs and all other precautions necessary shall be furnished to provide safe conditions.

D. Work shall be located as shown, and CONTRACTOR shall install materials, pipe, fittings, and adapters that are required to implement crossings of existing pipe lines, utilities or other structures. A supply of pipe fittings, adapters and short lengths shall be on hand to expedite the crossings.

E. Pavement: When backfill is stabilized in accordance with State Highway Department requirements and these Specifications, CONTRACTOR shall replace the street pavement and base with pavement of similar type and equal thickness to the pavement which was removed. This pavement and base shall be constructed in complete accordance with the requirements of the State Highway Department.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

++ END OF SECTION ++

SECTION 01091

REFERENCE STANDARDS

1.1 GENERAL

A. When a reference standard is specified, comply with requirements and recommendations stated in that standard, except when they are modified by the Contract Documents, or when applicable laws, ordinances, rules, regulations or codes establish stricter standards. The latest provisions of applicable standards shall apply to the Work, unless otherwise specified. Reference standards include, but are not necessarily limited to, the following:

1. American Association of State Highway and Transportation Officials.
2. American Concrete Institute.
3. American Institute of Steel Construction.
4. American Iron and Steel Institute.
5. American National Standards Institute.
6. American Society of Mechanical Engineers.
7. American Society for Testing and Materials.
8. American Water Works Association.
9. American Welding Society.
10. Concrete Reinforcing Steel Institute.
11. Factory Mutual Association.
12. Federal Specifications.
13. Institute of Electrical and Electronics Engineers.
14. National Electrical Manufacturer's Association.
15. National Sanitation Foundation.
16. New York State Department of Transportation Standard Specifications.
17. National Fire Protection Association.
18. Underwriters' Laboratories, Inc.
19. Geosynthetic Research Institute
20. United States Department of Transportation Federal Highway Administration
21. All other applicable standards listed in the Specifications, and the standards of utility service companies, where applicable.

++ END OF SECTION ++

SECTION 01091

REFERENCE STANDARDS

1.1 GENERAL

A. When a reference standard is specified, comply with requirements and recommendations stated in that standard, except when they are modified by the Contract Documents, or when applicable laws, ordinances, rules, regulations or codes establish stricter standards. The latest provisions of applicable standards shall apply to the Work, unless otherwise specified. Reference standards include, but are not necessarily limited to, the following:

1. American Association of State Highway and Transportation Officials.
2. American Concrete Institute.
3. American Institute of Steel Construction.
4. American Iron and Steel Institute.
5. American National Standards Institute.
6. American Society of Mechanical Engineers.
7. American Society for Testing and Materials.
8. American Water Works Association.
9. American Welding Society.
10. Concrete Reinforcing Steel Institute.
11. Factory Mutual Association.
12. Federal Specifications.
13. Institute of Electrical and Electronics Engineers.
14. National Electrical Manufacturer's Association.
15. National Sanitation Foundation.
16. New York State Department of Transportation Standard Specifications.
17. National Fire Protection Association.
18. Underwriters' Laboratories, Inc.
19. Geosynthetic Research Institute
20. United States Department of Transportation Federal Highway Administration
21. All other applicable standards listed in the Specifications, and the standards of utility service companies, where applicable.

++ END OF SECTION ++

SECTION 01092

ABBREVIATIONS AND SYMBOLS

1.1 ABBREVIATIONS

A. Common abbreviations which may be found in the Specifications are:

alternating current	a-c	maximum	max
ante meridiem	a.m.	mercury	Hg
ampere	A	milligram	mg
average	avg	milligrams per liter	mg/l
		milliliter	ml
biochemical oxygen demand	BOD	millimeter	mm
		million gallon	mil
brake horsepower	bhp	million gallons per day	mgd
British thermal unit	Btu	minimum	min
Centigrade	C	net positive suction head	npsh
company	Co	number	No.
cubic inch	cu in	National Pipe Threads	NPT
cubic foot	cu ft		
cubic yard	cu yd		
cubic feet per minute	cfm		
cubic feet per second	cfs	ounce	oz
		outside diameter	OD
decibel	db	parts per million	ppm
degree Centigrade (or Celsius) (say)	20°C	plus or minus	(±)
		post meridiem	p.m.
degree Fahrenheit (say)	68°F	pound	lb
diameter	diam	pounds per square foot	psf
direct current	d-c	pounds per square inch	psi
dollars	$	pounds per square inch absolute	psia
each	ea	pounds per square inch gage	psig
efficiency	eff		
Fahrenheit	F	revolutions per minute	rpm
feet	ft		
feet per hour	fph		
feet per minute	fpm	second	sec
feet per second	fps	specific gravity	sp gr
figure	Fig.	square	sq
flange	flg	square foot	sq ft

foot-pound	ft-lb	square inch	sq in
		square yard	sq yd
gallon	gal	standard	std
gallons per minute	gpm	standard cubic feet per minute	scfm
gallons per second	gps		
gram	g		
Hertz	Hz	total dynamic head	TDH
hour	hr		
horsepower	hp	totally-enclosed-fan-cooled	tefc
inch	in.	volt	V
inch-pound	in.-lb		
inside diameter	ID		
kilovolt-ampere	kva		
kilowatt	kw		
killowatt-hour	kwh		
linear foot	lin ft		
liter	l		

1.2 ORGANIZATION ABBREVIATIONS

A. Abbreviations of organizations which may be used in these Specifications are:

ACI	American Concrete Institute
ACSM	American Congress on Survey and Mapping
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
ANSI	American National Standards Institute
ASTM	American Society for Testing and Materials
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers
AWWA	American Water Works Association
AWS	American Welding Society
DIPRA	Ductile Iron Pipe Research Association
CRSI	Concrete Reinforcing Steel Institute
EPA	Environmental Protection Agency
FM	Factory Mutual
IEEE	Institute of Electrical and Electronic Engineers
NEC	National Electric Code
NEMA	National Electrical Manufacturers Association

NFPA	National Fire Protection Association
NSF	National Sanitation Foundation
OSHA	Occupational Safety and Health Act
PCI	Precast Concrete Institute
SSPC	Steel Structures Painting Council
UL	Underwriters Laboratories, Inc.
USGS	United States Geological Survey
GRI	Geosynthetic Research Institute

1.3 LEGEND

A. Legends of symbols used are shown on the Drawings, and in general, use of symbols is confined to the Drawings.

++ END OF SECTION ++

SECTION 01101

SPECIAL CONSTRUCTION CONDITIONS

PART 1 - GENERAL

1.1 DESCRIPTION

CONTRACTOR is advised that construction shall be substantially complete by June 30, 1999.

A. Other Critical Milestone Dates:
   1. The petroleum storage tank removal and decommissioning, petroleum contaminated soil removal and disposal, and associated work shall be completed prior to May 31, 1999.
   2. Failure to complete this work prior to this date will result in special liquidated damages of $500 per day for each day beyond the milestone date that expires and the work is not complete.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

+ + END OF SECTION + +

SECTION 01210

PRE-CONSTRUCTION CONFERENCE

1.1 GENERAL

A. Date, Time and Location: Conference will be held after execution of the Contract and before construction is started at the site. ENGINEER will fix the date, time and location of the meeting in accordance with requirements of the General Conditions.

B. ENGINEER shall prepare agenda, preside at meeting, and prepare and distribute minutes of proceedings to all parties.

C. CONTRACTOR shall provide data required, contribute appropriate items for discussion, and be prepared to discuss all items on agenda.

1.2 REQUIRED ATTENDANCE

A. CONTRACTOR and major Subcontractors.

B. OWNER'S representative.

C. ENGINEER.

D. Representatives of government agencies having any degree of control or responsibility, if available.

1.3 AGENDA

A. Agenda will include, but will not necessarily be limited to, the following:
   1. Designation of responsible personnel.
   2. Subcontractors.
   3. Coordination with other contractors.
   4. Coordination with OWNER'S operations.
   5. Construction schedule.
   6. Processing of Shop Drawings.
   7. Processing of field decisions and Change Orders.
   8. Requirements for copies of Contract Documents.
   9. Insurance in force.
   10. Schedule of Values.
   11. Schedule of Payments.
   12. Use of premises.
   13. CONTRACTOR responsibility for safety and first aid procedures.

14. Security.
15. Housekeeping.
16. Field Offices.
17. Record Drawings.

++ END OF SECTION ++

SECTION 01220

PROGRESS MEETINGS

1.1 GENERAL

A. Date and Time:
   1. Regular Meetings: Bi-weekly or as agreed upon by ENGINEER and CONTRACTOR.
   2. Other Meetings: A special meeting will be held when and if a major construction problem or deficiency is present or likely to occur. At a minimum, the meeting shall be attended by the CONTRACTOR, subcontractor, if applicable, ENGINEER and OWNER'S representative if required. The purpose of these meetings will be to define and resolve the construction problem (s) encountered or recurring construction deficiencies in the following manners:
      a. Define and discuss the problem or deficiencies;
      b. Review alternative solutions;
      c. Implement a plan to resolve the problem or deficiency.

B. Place: ENGINEER'S office or other mutually agreed upon location.

C. ENGINEER shall prepare agenda, preside at meetings, and prepare and distribute minutes of proceedings to all parties.

D. CONTRACTOR shall provide data required and be prepared to discuss all items on agenda.

1.2 MINIMUM ATTENDANCE

A. CONTRACTOR.
   1. When needed for the discussion of a particular agenda item, CONTRACTOR shall require representatives of Subcontractors or suppliers to attend a meeting.

B. ENGINEER.

C. OWNER'S representative, if required.

D. Others as appropriate.

E. Representatives present for each party shall be authorized to act on their behalf.

1.3 AGENDA

A. Agenda will include, but will not necessarily be limited to, the following:
   1. Progress since last meeting.
   2. Planned progress for next period.
   3. Problems, conflicts and observations.
   4. Change Orders.
   5. Status of Shop Drawings.
   6. Quality standards and control.
   7. Schedules, including off-site fabrication and delivery schedules. Corrective measures required.
   8. Coordination between parties.
   9. Other business.

++ END OF SECTION ++

SECTION 01310

CONSTRUCTION SCHEDULE

1.1 GENERAL

A. In order to assure completion of the Work within the time stipulated, all activities of the CONTRACTOR will be scheduled and monitored by use of scheduling software. Examples of an acceptable schedule include a Gantt Chart or Critical Path Method Chart.

B. The CONTRACTOR shall submit 8 copies of the schedule for approval at least 20 days prior to submitting first application for a progress payment but not later than 30 days after the date of execution of Agreement.

C. The schedule shall be detailed in nature and shall include the calendar dates of start and completion of each task and of tie-ins to existing facilities, if any. The schedule shall show all activities in detail, and shall include for each activity its number, description and duration. Both the initial and subsequent submissions shall be time scaled.

D. In the preparation of the schedule, the CONTRACTOR shall take into consideration Shop Drawing submittal and approval time, the delivery times of equipment and materials, Subcontractors' work, availability and abilities of workmen, weather conditions, any restrictions in operations at the Work site, material sampling and Q.C. testing, and all other items that may affect completion of the Work within the time requirements of the Contract Documents.

E. If the schedule as submitted by the CONTRACTOR is not sufficiently detailed, contains errors, or is unrealistic, it will be rejected in writing, and the CONTRACTOR shall submit an appropriately revised schedule within 7 days of the date of the notice of rejection. The procedure will be repeated as often as may be necessary until the schedule is found acceptable and approved by the ENGINEER.

F. Pending approval of the construction schedule, no progress payment will be made, except in such amounts as may be approved by the ENGINEER for materials received at the Project site as provided in the General Conditions.

1.2 REVISION OF SCHEDULE

A. The schedule shall be revised and resubmitted with each payment request during the project to reflect departures and changes from the previous schedule. If departures and changes during the previous period are of such minor nature that no useful purpose is served by revising the schedule, the ENGINEER may waive this requirement.

B. The CONTRACTOR shall furnish 8 copies of the revised schedule and the accompanying computer printout to the ENGINEER within 15 days from the date its preparation is directed.

++ END OF SECTION ++

SECTION 01340

SHOP DRAWING PROCEDURES

1.1 GENERAL

A. Shop Drawing procedures shall conform to requirements of General Conditions and as described in this Section.

1.2 PROCEDURE

A. Submit Shop Drawings to: Malcolm Pirnie, Inc., Consulting Environmental Engineers, 15 Cornell Road, Latham, Albany, NY 12110.

B. A letter of transmittal shall accompany each submittal. If data for more than one Section of the Specifications is submitted, a separate transmittal letter shall accompany the data submitted for each Section. A form shall be provided to the CONTRACTOR for all Shop Drawing submittals.

C. At the beginning of each letter of transmittal provide a reference heading indicating the following:
   1. OWNER'S Name: Orkin Exterminating Company, Inc.
   2. Project Name: Former Abalene Pest Control Inactive Hazardous Waste Site Remediation Project
   3. Transmittal No. _____
   4. Section No. _____

D. If a Shop Drawing deviates from the requirements of the Contract Documents, CONTRACTOR shall specifically note each variation in his letter of transmittal.

E. All Shop Drawings submitted for approval shall have a title block with complete identifying information satisfactory to ENGINEER.

F. All Shop Drawings submitted shall bear the stamp of approval and signature of CONTRACTOR as evidence that they have been reviewed by CONTRACTOR. Submittals without this stamp of approval will not be reviewed by ENGINEER and will be returned to CONTRACTOR. CONTRACTOR'S stamp shall contain the following minimum information:

   Project Name: _____

   CONTRACTOR'S Name: _____

   Date: _____

----------Reference----------

Item: _____

Specifications:

Section: _____

Page No.: _____

Para. No.: _____

Drawing No.: _____ of _____

Location: _____

Submittal No.: _____

Approved By: _____

G. A number shall be assigned to each submittal by CONTRACTOR starting with No. 1 and thence numbered consecutively. Resubmittals shall be identified by the original submittal number followed by the suffix "A" for the first resubmittal, the suffix "B" for the second resubmittal, etc.

H. Shop drawing submittals shall be of a scale and size sufficient to show clearly all necessary details of construction, layout, and components. Shop drawing submittals shall have clearly marked the size, model number, options, etc. of the product or material submitted.

I. CONTRACTOR shall initially submit to ENGINEER a minimum of 6 copies of all submittals that are on 8-1/2-inch by 11-inch or smaller sheets, and one unfolded sepia and 2 prints made from that sepia for all submittals on sheets larger than 8-1/2-inch by 11-inch. The Resident Project Representative shall receive one copy only of each submittals which will be stamped "Preliminary - Not For Construction."

J. After ENGINEER completes his review, Shop Drawings will be marked with one of the following notations:
   1. Approved
   2. Approved as Corrected
   3. Revise and Resubmit
   4. Not Approved

K. If a submittal is acceptable, it will be marked "Approved" or "Approved as Corrected". Two (2) prints or copies of the submittal will be returned to CONTRACTOR.

L. Upon return of a submittal marked "Approved" or "Approved as Corrected", CONTRACTOR may order, ship or fabricate the materials included on the submittal, provided it is in accordance with the corrections indicated.

M. If a Shop Drawing marked "Approved as Corrected" has extensive corrections or corrections affecting other drawings or Work, ENGINEER may require that CONTRACTOR make the corrections indicated thereon and resubmit the Shop Drawings for record purposes. Such drawings will have the notation, "Approved as Corrected - Resubmit."

N. If a submittal is unacceptable, 2 copies will be returned to CONTRACTOR with one of the following notations:
   1. "Revise and Resubmit"
   2. "Not Approved"

O. Upon return of a submittal marked "Revise and Resubmit", CONTRACTOR shall make the corrections indicated and repeat the initial approval procedure. The "Not Approved" notation is used to indicate material or equipment that is not acceptable. Upon return of a submittal so marked, CONTRACTOR shall repeat the initial approval procedure utilizing acceptable material or equipment.

P. Any related Work performed or equipment installed without an "Approved" or "Approved as Corrected" Shop Drawing will be at the sole responsibility of the CONTRACTOR.

Q. Shop Drawings shall be submitted well in advance of the need for the material or equipment for construction and with ample allowance for the time required to make delivery of material or equipment after data covering such is approved. CONTRACTOR shall assume the risk for all materials or equipment which are fabricated or delivered prior to the approval of Shop Drawings. Materials or equipment will not be included in periodic progress payments until approval thereof has been obtained in the specified manner.

R. ENGINEER will review and process all submittals within 10 days of receipt and return the Shop Drawings to CONTRACTOR.

S. It is CONTRACTOR'S responsibility to review submittals made by his suppliers and Subcontractors before transmitting them to ENGINEER to assure proper coordination of the Work and to determine that each submittal is in accordance with his desires and that there is sufficient information about materials and equipment for ENGINEER to determine compliance with the Contract Documents. Incomplete or inadequate submittals will be returned for revision without review.

T. CONTRACTOR shall furnish required submittals with complete information and accuracy in order to achieve required approval of an item within two submittals. All costs to ENGINEER involved with subsequent submittals of Shop Drawings, Samples or other items requiring approval, will be backcharged to CONTRACTOR, at the rate of 3.0 times direct technical labor cost, by deducting such costs from payments due CONTRACTOR for Work completed. In the event that CONTRACTOR requests a substitution for a previously approved item, all of ENGINEER'S costs in the

reviewing and approval of the substitution will be backcharged to CONTRACTOR unless the need for such substitution is beyond the control of CONTRACTOR.

++ END OF SECTION ++

SECTION 01341

SAMPLES

1.1 GENERAL

A. The submittal of Samples shall conform to the requirements of the General Conditions and to procedures described in this Section.

1.2 PROCEDURE

A. CONTRACTOR shall review, approve, and submit all Samples promptly. Samples shall be identified with correct reference to Specification Section, page, article and paragraph number, and Drawing No. when applicable. Samples shall clearly illustrate functional characteristics of the product and all related parts and attachments, and full range of color, texture, pattern and material. Samples shall be furnished so as not to delay fabrication, allowing the ENGINEER reasonable time for the consideration of the Samples submitted.

B. CONTRACTOR shall submit at least three Samples of each item required for the ENGINEER'S approval. Two of the Samples shall be delivered to the ENGINEER'S home office unless otherwise authorized by the ENGINEER. One Sample shall be delivered to the ENGINEER'S field office. If the CONTRACTOR requires a Sample for his use he shall notify the ENGINEER in writing.

C. Submission of Samples shall conform to the following:
   1. Submit Samples to: Malcolm Pirnie, Inc., Consulting Environmental Engineers, 15 Cornell Road, Latham, NY 12110. Submit additional copy to the Resident Project Representative at the ENGINEER's field office.
   2. A letter of transmittal shall accompany each submittal. If data for more than one Section of the Specifications is submitted, a separate transmittal letter shall accompany the data submitted for each Section.
   3. At the beginning of each letter of transmittal provide a reference heading indicating the following:
      1. OWNER'S Name: Orkin Exterminating Company, Inc.
      2. Project Name: Former Abalene Pest Control Inactive Hazardous Waste Site
      3. Transmittal No. _____
      4. Section No. _____
   4. If a Sample deviates from the requirements of the Contract Documents, CONTRACTOR shall specifically note each variation in his letter of transmittal.
   5. A number shall be assigned to each submittal by CONTRACTOR starting with No. 1 and thence numbered consecutively. Resubmittals shall be identified by the original submittal number followed by the suffix "A" for the first resubmittal, the suffix "B" for the second resubmittal, etc.

D. The CONTRACTOR shall make all corrections required and shall resubmit the required number of new Samples until approved.

E. Any related Work performed without an "Approved" Sample will be at the sole responsibility of the CONTRACTOR.

F. Samples shall be submitted well in advance of the need for the material for construction and with ample allowance for the time required to make delivery of material after data covering such is approved. CONTRACTOR shall assume the risk for all materials which are fabricated or delivered prior to the approval of Samples. Materials will not be included in periodic progress payments until approval thereof has been obtained in the specified manner.

G. ENGINEER will review and process all submittals promptly, but a reasonable time should be allowed for this, for the Samples being resubmitted, and for time required to report the approved Samples to CONTRACTOR.

H. CONTRACTOR shall furnish required submittals with complete information and accuracy in order to achieve required approval of an item within two submittals. All costs to ENGINEER involved with subsequent submittals of Samples or other items requiring approval, will be backcharged to CONTRACTOR, at the rate of 3.0 times direct technical labor cost, by deducting such costs from payments due CONTRACTOR for Work completed. In the event that CONTRACTOR requests a substitution for a previously approved item, all of ENGINEER'S costs in the reviewing and approval of the substitution will be backcharged to CONTRACTOR unless the need for such substitution is beyond the control of CONTRACTOR.

1.3 SAMPLES FOR TESTS

A. CONTRACTOR shall furnish such Samples of material as may be required for examination and test. All Samples of materials for tests shall be taken according to standard methods and as required by the Contract Documents.

++ END OF SECTION ++

SECTION 01411

TESTING LABORATORY SERVICES FURNISHED BY CONTRACTOR

1.1 GENERAL

A. CONTRACTOR shall employ and pay for an independent testing laboratory to perform the specified services. Laboratory selected shall be subject to approval by the ENGINEER.

B. Inspection, sampling and testing shall be as specified in the individual Sections. These include but are not limited to:
   1. Soils Compaction, Section 02220.
   2. Select Fill, Section 02230.

1.2 QUALIFICATIONS OF LABORATORY

A. Where applicable, meet "Recommended Requirements for Independent Laboratory Qualification", latest edition, published by American Council of Independent Laboratories and the basic requirements of ASTM E 329, "Standards of Recommended Practice for Inspection and Testing Agencies for Concrete and Steel as Used in Construction". Laboratory shall be authorized to operate in the state in which Project is located.

B. Submit copy of report of inspection of facilities made by Materials Reference Laboratory of National Bureau of Standards during most recent tour of inspection; with memorandum of remedies of any deficiencies reported by inspection.

C. Testing Equipment:
   1. Calibrated at maximum 12 month intervals by devices of accuracy traceable to either National Bureau of Standards or accepted values of natural physical constants.
   2. Submit copy of certificate of calibration, made by accredited calibration agency.

1.3 LABORATORY DUTIES

A. Cooperate with ENGINEER and provide qualified personnel promptly on notice.

B. Perform specified inspections, sampling and testing of materials and methods of construction; comply with applicable standards; ascertain compliance with requirements of Contract Documents.

C. Promptly notify ENGINEER and CONTRACTOR, of irregularities or deficiencies of Work, which are observed during performance of services.

D. Promptly submit 5 copies of reports of inspections and tests to ENGINEER, including:
   1. Date issued.
   2. Project title and number.
   3. Testing laboratory name and address.
   4. Name and signature of inspector.
   5. Date of inspection or sampling.
   6. Record of temperature and weather.
   7. Date of test.
   8. Identification of product and Specification Section.
   9. Location in Project.
   10. Type of inspection or test.
   11. Results of tests and observations regarding compliance with Contract Documents.

E. Perform additional tests and services as required to assure compliance with the Contract Documents.

1.4 CONTRACTOR'S COORDINATION WITH LABORATORY

A. Cooperate with laboratory personnel, provide access to Work and to manufacturer's operations.

B. Provide to laboratory, representative samples of materials to be tested, in required quantities.

C. Furnish labor and facilities:
   1. To provide access to Work to be tested.
   2. To obtain and handle samples at the site.
   3. To facilitate inspections and tests.
   4. For laboratory's exclusive use for storage and curing of test samples.
   5. Forms for preparing concrete test beams and cylinders.

D. Notify laboratory and ENGINEER sufficiently in advance of operations to allow for assignment of personnel and scheduling of tests.

E. Arrange with laboratory and pay for, additional samples and tests required for CONTRACTOR'S convenience.

1.5 PRODUCT TEST REPORTS

A. Furnish copies of product test reports where required by the Specifications or requested by ENGINEER.

++ END OF SECTION ++

SECTION 01460

HEALTH AND SAFETY PROCEDURES

1. GENERAL:

1.1 Site Description. The Former Abalene Pest Control Inactive Hazardous Waste Site is an approximate 0.5-acre parcel containing former office and pesticide storage facilities. The Former Abalene Pest Control Inactive Hazardous Waste Site was placed on the New York State List of Inactive Hazardous Waste Sites by the New York State Department of Environmental Conservation (NYSDEC) (I.D. No. 5-46-035) (Class 2). The site is located in Saratoga County, New York. The site is located along Route 9, Town of Moreau, at the corner of Reservoir Road and Route 9.

1.2 Scope. This Health and Safety Specification refers only to the remediation work planned for the remediation site. For informational purposes only, results of previous environmental sampling at the site are included at the end of this section.

1.3 Health and Safety Requirements. Health and Safety procedures shall be required of the CONTRACTOR due to the potentially hazardous conditions at the Site.

1.3.1 The CONTRACTOR's plans for implementing these procedures shall be submitted to the ENGINEER.

1.3.2 The CONTRACTOR shall implement, maintain and enforce these procedures at all times prior to and during all phases of the work.

1.4 Definitions and Descriptions of Requirements. The following definitions shall apply to all work of this Contract.

1.4.1 On-site Personnel. Includes representatives of the Owner, Engineer, and any designated State and Federal representatives.

1.4.2 CONTRACTOR Personnel. Includes all CONTRACTOR employees, representatives and subcontractor employees and representatives.

1.4.3 Visitor. All other personnel on-site with exception of the On-site Personnel and CONTRACTOR Personnel.

1.4.4 Safety and Health Personnel.

1.4.4.1 Safety Officer/Industrial Hygienist. The CONTRACTOR's employee or Subcontractor with overall responsibility for the preparation, implementation and enforcement of the Site Health and Safety Plan. The Safety Officer shall be a Certified Industrial Hygienist (American Board of Industrial Hygiene) with a minimum of three years of specialized experience on sites with hazardous wastes or hazardous materials with hazards

similar to those anticipated on this project. This person shall also have demonstrable expertise in air monitoring techniques and development of respiratory protection programs for working in potentially toxic atmospheres. The Safety Officer shall have a broad working knowledge of State and Federal occupational safety and health regulations and formal educational training in occupational safety and health. The name, qualifications and work experience of the Safety Officer shall be submitted to the ENGINEER prior to the development of the Health and Safety Plan.

1.4.4.2 Safety and Health Specialist/Industrial Hygiene Technician. The CONTRACTOR's or subcontractor's employee with functional responsibility for implementation and enforcement of the Site Health and Safety Plan. The Safety and Health Specialist shall have authority to stop work any time unsafe work conditions are determined. The Safety and Health Specialist shall complete a daily diary of activities with Health and Safety relevance including references to maintenance and calibration of Health and Safety equipment. The Safety and Health Specialist/Industrial Hygiene Technician shall have a minimum of six months working experience on sites with hazardous wastes or hazardous materials with hazards similar to those anticipated on this project, and shall have a sound working knowledge of State and Federal occupational safety and health regulations. In addition the Safety and Health Specialist/Industrial Hygiene Technician shall have specialized training in personal and respiratory protective equipment program implementation and in the proper use of air monitoring instruments, air sampling methods and procedures. The Safety and Health Specialist/Industrial Hygiene Technician shall have current certification in first aid and CPR as provided by a recognized approved organization such as the American Red Cross or the American Heart Association. Name, qualifications and work experience shall be submitted to the ENGINEER prior to commencement of work at the Site.

1.4.5 Project Manager. The CONTRACTOR's employee responsible for conducting the work and for assuring that the work is conducted in accordance with the requirements of the Contract Documents. The Project Manager shall be site-familiar with the management and day-to-day activities of hazardous sits.

1.4.6 Custodian. The CONTRACTOR's employee or subcontractor responsible for keeping all health and safety equipment clean and all facilities properly equipped and maintained.

1.4.7 Security Officer. The CONTRACTOR's employee responsible for maintaining the security of the Site.

1.4.8 Site. The Site shall be the Support Zone, Contamination Reduction Zone, Exclusion Zone and any access roads and parking areas within the limits of the Contract as shown on the drawings.

1.4.9 Monitoring. Indicates use of direct or indirect reading field instrumentation to provide information regarding the levels of gases, vapors and particulates which are being released during remedial action. Monitoring shall be conducted to evaluate both employee exposure to airborne toxic materials as well as the off-site migration of airborne

contaminants. A list of the chemicals detected in at the site are attached as Tables 1 and 2 at the end of this section.

1.4.10 Physician. A licensed physician who is Board Certified in Occupational Medicine by the American Board of Preventive Medicine, with experience in the practice of occupational medicine.

1.4.11 First Aid Technician. The CONTRACTOR shall have at least one certified First Aid Technician on the Site at all times. This person may perform other duties, but shall be immediately available to render first aid when needed. The First Aid individual should be certified in "Multi-Media First Aid" and CPR by the American Red Cross or equivalent.

1.4.12 Work Zones. Work zones shall be established and communicated to all employees by Safety Officer. The zones include:

Exclusion Zone ("Work Zone"): Area where contamination may be present. All personnel entering the Exclusion Zone shall wear the prescribed level of personal protective equipment.

Support Zone: Area of the Site which is considered non-contaminated or "clean". Support equipment is located in this zone. Personnel may wear normal work clothes within this zone. Any potentially contaminated clothing, equipment, and samples shall remain in the Contamination Reduction Zone until decontaminated.

Contamination Reduction Zone: The transition zone between Exclusion and Support Zones. Zone where decontamination of personnel and equipment takes place.

1.4.13 Attendant. Individual stationed outside a confined space (i.e., manhole) and who monitors the authorized entrants inside.

1.4.14 Authorized Entrant. Employee who is authorized by the employer to enter a confined space.

1.4.15 Entry. The act of intentionally passing through an opening into a confined space (i.e., When the entrants face breaks the plane of the opening).

1.4.16 Entry Permit. The written document established by the CONTRACTOR containing hazard identification, evaluation of the confined space and the individuals involved with the confined space entry.

1.4.17 Hazardous Atmosphere. An atmosphere which exposes employees to a risk of injury, illness or death. Including but not limited to:

1.4.17.1 A flammable gas in excess of 10 percent of the lower explosive limit (LEL).

1.4.17.2 An airborne combustible dust at a concentration that obscures vision at five feet or less.

1.4.17.3 Atmospheric oxygen concentrations less than 19.5 percent OR greater than 22 percent.

1.4.17.4 An atmospheric concentration of any substance listed in 29 CFR Part 1910 Subpart Z, which could result in employee exposure beyond permissible limits.

1.4.17.5 Any atmospheric condition recognized as immediately dangerous to life or health.

1.4.18 Permit Required Confined Spaces (Confined Space). An enclosed space which:

- is configured to so that an employee can bodily enter;
- has restricted means of entry and egress;
- is not designed for continuous occupancy; and/or
- has a known potential to present a serious safety or health hazard.

1.5 Regulatory Requirements and Applicable Publications.

1.5.1 Occupational Safety and Health Administration (OSHA) Standards. Title 29, Code of Federal Regulations, Parts 1910, 1917, 1918 and 1926 (29 CFR 1910, 1917, 1918 and 1926), NYSDEC Technical and Administrative Guidance Memorandum Number 4031 Action Levels.

1.5.2 Applicable Publications.

1.5.2.1 NIOSH/OSHA/USCG/EPA "Occupational Safety and Health Guidance Manual for Hazardous Site Activities", October 1985, DHHS (NIOSH) Publ. No. 85-115.

1.5.2.2 EPA "Standard Operating Safety Guides", July 1988.

1.5.2.3 NIOSH "Criteria for a Recommended Standard - Working in Confined Spaces" (#80-106).

1.5.2.4 NIOSH "Guide to Safety in Confined Spaces" (#87-113).

2. HEALTH AND SAFETY PLAN:

2.1 General.

2.1.1 The CONTRACTOR via the Safety Officer shall be responsible for development and implementation of a site specific Health and Safety Plan consistent with the requirements listed in paragraph 1.5.1. Health and Safety Plan shall include the development of a "Community Health and Safety Plan" which meets the requirements, guidance of the New York State Department of Health.

2.1.2 The Health and Safety Plan shall be submitted to the ENGINEER within 14 days of the Notice to Proceed. The CONTRACTOR may mobilize to the site upon receipt of Notice to Proceed but shall not conduct any intrusive work until the Health and Safety Plan has been reviewed, comments prepared, comments responded to, and comments accepted.

2.1.3 Determination of the appropriate level of worker safety equipment and procedures shall be made by the CONTRACTOR via the Safety Officer as a result of review of existing data, the initial Site survey and continued safety and health monitoring performed by CONTRACTOR's Safety and Health Specialist.

2.1.4 No on-site construction shall begin until the Health and Safety Plan is deemed suitable by the New York State Department of Environmental Conservation and the New York State Department of Health.

2.1.5 Determination of the appropriate level of worker safety equipment and procedures shall be made by the CONTRACTOR via the Safety Officer as a result of review of existing data, the initial Site survey and continued safety and health monitoring performed by CONTRACTOR's Safety Officer.

2.1.6 Levels of Protection.

2.1.6.1 Determination of the actual level of protection while work is being performed based on the action levels at the Site shall be made by the CONTRACTOR via the Safety and Health Specialist in conformance with these specifications and the Site Specific Health and Safety Plan.

2.1.7 Should any unforeseen or site specific safety related factor, hazard, or condition become evident during the performance of work at this Site, it shall be the CONTRACTOR's responsibility to bring such to the attention of the ENGINEER both verbally and in writing as quickly as possible. In the interim, the CONTRACTOR shall take prudent action to establish and maintain safe working conditions and to safeguard employees, the public and the environment.

2.2 Confined Space Entry. The CONTRACTOR shall develop and comply with a detailed, site specific confined space entry permit (see Section 1.4 - Definitions), to address potentially hazardous conditions associated with entry to work in and egress from confined spaces by all CONTRACTOR and Subcontractor employees or representatives. This permit shall be consistent with all applicable State and Federal requirements including Occupational Safety and Health Administration (OSHA) Proposed Standard 29 CFR 1910.146 - Permit Required Confined Spaces Standard and the National Institute for Occupational Safety and Health (NIOSH) Criteria for a Recommended Standard - Working in Confined Spaces (#80-106) and the NIOSH Guide to Safety in Confined Spaces (#87-113).

3. TRAINING:

3.1 The CONTRACTOR shall certify that all CONTRACTOR personnel entering areas of the Site other than the Support Zone (once established) for the purpose of performing or supervising work, for health, safety, security, or administrative purposes, for maintenance, or for any other Site related function, have received appropriate health and safety training in accordance with 29 CFR 1910 and 1926. Documentation of all such training shall be submitted to the ENGINEER before any employees will be allowed on-site.

4. MEDICAL SURVEILLANCE:

4.1 The CONTRACTOR shall utilize the services of an occupational physician (as defined in paragraph 1.4.10) to provide the minimum medical examinations and surveillance specified herein. The name of the physician and evidence of examination of all CONTRACTOR Personnel shall be provided to the ENGINEER prior to assigning these personnel to work on-site.

4.2 Medical Surveillance Protocol. Medical surveillance protocol is the physician's responsibility but shall meet the requirements of OSHA standard 29 CFR 1910.120 for all personnel.

5. WORK ZONES:

5.1 The CONTRACTOR shall clearly lay out and identify all applicable zones identified in the Site Health and Safety Plan in the field. The CONTRACTOR shall limit equipment, operations and personnel in the Zones as described in USEPA standard operating safety guides.

6. ENVIRONMENTAL AND PERSONNEL MONITORING:

6.1 Air. The CONTRACTOR shall design, develop and implement an air monitoring program as specified in paragraph: AIR MONITORING PROGRAM to assure that Site workers or off-site receptors will not be exposed to harmful levels of airborne toxic chemicals in either the vapor or particulate form, or to explosive atmospheres. At a minimum, the CONTRACTOR's Air Monitoring Program shall provide multi-stage detection and identification of contaminants.

6.2 Heat Stress. The climate combined with the requirements for personal protective equipment may create heat stress. The CONTRACTOR shall design, develop and implement a program of heat stress monitoring and a program to alleviate heat stress.

7. AIR MONITORING PROGRAM:

7.1 The CONTRACTOR shall furnish and maintain air monitoring equipment to include: an explosimeter, respirable airborne dust monitor, and organic vapor monitor (photoionization detector or flame ionization detector), and all necessary calibration/audit equipment and supplies. All equipment shall be intrinsically safe.

7.2 The CONTRACTOR shall perform air monitoring for organic vapors, dust, and level of explosive vapors, prior to commencement of work in order to establish baseline conditions. Monitoring shall be provided during active on-site operations at four perimeter air monitoring locations.

7.3 The CONTRACTOR shall provide air monitoring for dust using a respirable airborne dust monitor (MIE Miniram or equivalent) at the designated perimeter stations. Monitored levels in excess of the action level established by the Safety Officer/Industrial Hygienist shall require mitigative action to lower dust levels. In addition, CONTRACTOR shall comply with the requirements of the NYSDEC, Division of Technical and Administrative Guidance Memorandum Fugitive Dust Suppression and Particulate Monitoring Program at Inactive Hazardous Waste Sites, TAGM-HWR-89-40311, included as Appendix A. Additionally, during periods of building demolition, soil excavation and related activities. Ambient air sampling shall be performed for organochlorine pesticides at a frequency of one sample per week at each sampling point as shown on the figure and in accordance to USEPA Method TO-4 , included in Appendix B.

7.4 The CONTRACTOR shall provide air monitoring for volatile organic compounds with a photoionization detector or a flame ionization detector and an explosimeter. Monitored levels in excess of the action levels established by the Safety Officer/Industrial Hygienist shall require upgrades in levels of protection.

7.5 Monitoring for organic vapor concentrations will consist of measurements taken at each of the four perimeter air monitoring stations at the locations designated according to wind direction.

7.6 Any departures from general background shall be considered by the Safety and Health Specialist who will determine when operations should be shut down, levels of protection upgraded, and/or emergency response/contingency plans initiated.

7.7 On-site monitoring frequency for organic vapor concentrations shall be conducted during on-site waste handling activities and for all other items consistent with the CONTRACTOR's Health and Safety plan to limit personnel exposure. Air monitoring at each perimeter air monitoring station shall be performed a minimum of once every four (4) hours.

7.8 Data.

7.8.1 A data sheet shall be developed and implemented by the Safety Officer/Industrial Hygienist upon which to record the air monitoring data information.

7.8.2 These results shall be given verbally to the ENGINEER following each Site scan and documented in writing and submitted to the ENGINEER at the end of each work day.

8. PERSONAL SAFETY EQUIPMENT AND PROTECTIVE CLOTHING:

8.1 The CONTRACTOR shall provide all on-site personnel with appropriate personal safety equipment and protective clothing. The CONTRACTOR shall ensure that all safety equipment is used properly and protective clothing is kept clean and well maintained. The certified Industrial Hygienist shall establish "action levels" at which the specified minimum levels of protection are either upgraded or downgraded based upon air monitoring results and direct contact potential. Protocols for formally changing the level of protection and the communication network for doing so shall be described in the Health and Safety Plan.

8.2 Programs for respiratory protection shall conform to OSHA 1910.134 and ANSI 288.2-1980. A written respiratory protection program addressing site-specific respirator usage shall be submitted as part of the Health and Safety Plan for review.

8.3 Power equipment and machinery may generate excessive noise levels (in excess of 85 decibels). Proper ear protection shall be provided by the CONTRACTOR and will be used in accordance with OSHA 29 CFR 1926.52.

9. DECONTAMINATION:

9.1 Equipment Decontamination.

9.1.1. The CONTRACTOR shall ensure that all equipment that has come into contact with a potentially hazardous work area, or exposed or subjected to exposure to potentially hazardous chemicals, vapors, liquids, or contaminated soils be decontaminated in accordance with the measures established by the Site Health and Safety Plan. A detailed discussion of the equipment decontamination protocols to be followed on-site shall be submitted as part of the Site Health and Safety Plan.

9.2 Personnel Hygiene and Decontamination.

9.2.1 The CONTRACTOR shall ensure that all CONTRACTOR personnel performing or supervising remedial work within a potentially hazardous work area, or exposed or subject to exposure to potentially hazardous chemical vapors, liquids, or contaminated solids, observe and adhere to personnel hygiene measures as established by the Industrial Hygienist in the CONTRACTOR's Health and Safety Plan. A detailed discussion of personnel decontamination protocols to be followed on-site shall be submitted as part of the Health and Safety Plan.

10. EMERGENCY EQUIPMENT AND FIRST AID REQUIREMENTS:

10.1 The CONTRACTOR shall provide an approved emergency eye wash unit in accordance with ANSI Standard Z358.1.

10.2 At least one "industrial" first aid kit shall be provided and maintained fully stocked at an easily accessible uncontaminated location.

10.3 The CONTRACTOR shall have at least one certified First Aid Technician on the Site at all times. This person may perform other duties, but must be immediately available to render first aid when needed. Certification shall be by the American Red Cross or other approved agency.

10.4 A dry chemical fire extinguisher shall be provided by the CONTRACTOR.

10.5 On-site telephone equipment shall be available.

11. EMERGENCY RESPONSE AND CONTINGENCY PLANNING:

11.1 The CONTRACTOR shall develop and submit as part of the Site Health and Safety Plan, an emergency response and contingency plans for off-site and on-site emergencies as specified in OSHA 29 CFR 1910.120(l).

11.2 In the event of an emergency associated with remedial action, the CONTRACTOR shall without delay: take diligent action to remove or otherwise minimize the cause of the emergency; alert the ENGINEER; and institute whatever measures might be necessary to prevent any repetition of any conditions or actions leading to, or resulting in, the emergency.

11.3 In the event that an accident or some other incident such as an explosion, a theft of any hazardous material, or accidental exposure occurs during the course of the project, the ENGINEER shall be telephoned immediately and receive a written notification by the end of the shift.

11.4 Emergency Medical Care.

11.4.1 The CONTRACTOR shall pre-arrange for emergency medical care services at a nearby medical facility and establish emergency routes and protocols. A detailed discussion of the Emergency Medical Care shall be included as part of the Site Health and Safety Plan.

12. INSPECTION:

12.1 The CONTRACTOR shall perform daily safety inspections of the job site and the work in progress to ensure compliance with the occupational health and safety requirements of the contract.

13. LOGS, REPORTS AND RECORDKEEPING:

13.1 The CONTRACTOR shall maintain logs and reports covering the implementation of the Health and Safety Plan and the Air Monitoring Program. The format shall be developed by the CONTRACTOR to include training logs, daily logs, weekly reports and a phase out report. The logs and reports shall be signed by the CONTRACTOR's Industrial Hygienist. All logs shall be submitted to the ENGINEER on an as completed basis.

13.2 Employer Obligation. The CONTRACTOR should be aware that Federal laws such as OSHA (29 CFR 1910) require chemical exposure records and/or medical records be maintained by the employer for a specified length of time (30 years) after the termination of the job.

14. COMMUNICATIONS:

14.1 The CONTRACTOR shall provide on-site telephone equipment.

14.2 Emergency numbers, including police, fire, ambulance, hospital and poison control center shall be prominently posted.

++ END OF SECTION ++

Callouts for attached tables:

TABLE 1

TABLE 2

SECTION 01500

TEMPORARY CONSTRUCTION FACILITIES

1.1 GENERAL

A. CONTRACTOR shall be responsible for all temporary construction facilities required for the Work. CONTRACTOR shall make all arrangements with utility service companies for temporary services and shall pay all costs associated therewith.

B. Temporary construction facilities include:
   1. Water.
   2. Electricity and Lighting.
   3. Telephone.
   4. Heat, Weather Protection and Ventilation.
   5. Sanitary and First Aid Facilities.

C. CONTRACTOR shall abide by all rules and regulations of the utility service company or authority having jurisdiction.

D. For work in confined areas, CONTRACTOR shall abide by applicable OSHA regulations, 29 CFR 1910.146

E. Provide all materials, equipment and power required for temporary electricity and lighting. Include continuous power for construction site offices. Provide all outlets with circuit breaker protection and comply with ground fault protection requirements of NEC.

F. Suitably enclosed chemical or self-contained toilets shall be provided for the use of the persons employed on the Work. Toilets shall be located near the Work site and secluded from observation insofar as possible. Toilets shall be serviced at regular intervals, kept clean and supplied throughout the course of the Work.

G. CONTRACTOR shall furnish and maintain a safe drinking water supply readily available to all workers.

H. CONTRACTOR shall be responsible for all utility service costs until the Work is substantially complete. Included are all fuel, power, light, heat and other utility services necessary for execution, completion, testing and initial operation of the Work.

I. CONTRACTOR shall:
   1. Maintain and operate systems to assure continuous service.
   2. Modify and extend systems as Work progress requires.
   3. Completely remove temporary materials and equipment when their use is no longer required.

4. Clean and repair damage caused by temporary installations or use of temporary facilities.
5. Restore existing facilities used for temporary services to specified or to original condition.

++ END OF SECTION ++

SECTION 01540

SECURITY

1.1 GENERAL

A. CONTRACTOR shall safely guard all Work, materials, equipment and property from loss, theft, damage and vandalism. CONTRACTOR'S duty to safely guard property shall include the OWNER'S property and other private property from injury or loss in connection with the performance of the Contract.

B. He shall employ watchmen as needed to provide the required security and prevent unauthorized entry.

C. CONTRACTOR may make no claim against the OWNER for damage resulting from trespass.

D. Party responsible for security shall make good all damage to property of OWNER and others arising from failure to provide adequate security.

E. Maintain security program throughout construction until completion of Remedial Action precludes need for CONTRACTOR'S security program.

1.2 FENCING

A. Prior to commencing with any remedial construction activities, CONTRACTOR shall install and maintain temporary construction fencing at the limit of work areas located at on-site and off-site remedial activities until completion of remedial activities.

B. Temporary construction fencing shall consist of plastic type construction fencing, orange colored, 36-inches in height.

1.3 POSTING

A. CONTRACTOR shall install and maintain posting until completion of remedial activities.

B. Signs shall be placed at a minimum of 25-foot spacing along the temporary fencing.

C. Signs shall read, "Authorized Personnel Only" in a minimum of 3-inch high lettering, red in color. Signs shall have a white background.

+ + END OF SECTION + +

SECTION 01541

PROTECTION OF THE WORK AND PROPERTY

1.1 GENERAL

A. CONTRACTOR shall be responsible for taking all precautions, providing all programs, and taking all actions necessary to protect the Work and all public and private property and facilities from damage as specified in the General Conditions and herein.

B. In order to prevent damage, injury or loss, CONTRACTOR'S actions shall include, but not be limited to, the following:
   1. Store apparatus, materials, supplies, and equipment in an orderly, safe manner that will not unduly interfere with the progress of the Work or the Work of any other contractor or utility service company.
   2. Provide suitable storage facilities for all materials which are subject to injury by exposure to weather, theft, breakage, or otherwise.
   3. Place upon the Work or any part thereof only such loads as are consistent with the safety of that portion of the Work.
   4. Clean up frequently all refuse, rubbish, scrap materials, and debris caused by his operations, to the end that at all times the site of the Work shall present a safe, orderly and workmanlike appearance.
   5. Provide barricades and guard rails around openings, for scaffolding, for temporary stairs and ramps, around excavations, elevated walkways and other hazardous areas.

C. CONTRACTOR shall not, except after written consent from proper parties, enter or occupy with men, tools, materials or equipment, privately-owned land except on easements provided herein.

D. CONTRACTOR shall assume full responsibility for the preservation of all public and private property or facility on or adjacent to the site. If any direct or indirect damage is done by or on account of any act, omission, neglect or misconduct in the execution of the Work by the CONTRACTOR, it shall be restored by the CONTRACTOR, at his expense, to a condition equal to that existing before the damage was done.

E. CONTRACTOR shall not disturb, damage, or alter any trees, shrubs, landforms, vegetation, outside of the limit of disturbance shown on the drawings. CONTRACTOR shall erect temporary snow-fencing, (orange colored plastic type) to delineate the limit of disturbance.

1.2 BARRICADES AND WARNING SIGNALS

A. Where Work is performed on or adjacent to any roadway, right-of-way, or public place, CONTRACTOR shall furnish and erect barricades, fences, lights, warning signs, and danger signals, shall provide watchmen, and shall take other precautionary measures for the protection of persons or property and of the Work. Barricades shall be painted to be visible at night. From sunset to sunrise, the CONTRACTOR shall furnish and maintain at least one light at each barricade. Sufficient barricades shall be erected to keep vehicles from being driven on or into Work under construction. CONTRACTOR shall furnish watchmen in sufficient numbers to protect the Work. The CONTRACTOR'S responsibility for the maintenance of barricades, signs, lights, and for providing watchmen shall continue until the Project is accepted by OWNER.

1.3 TREE AND PLANT PROTECTION

A. CONTRACTOR shall protect existing trees, shrubs and plants on or adjacent to the site that are shown or designated to remain in place against unnecessary cutting, breaking or skinning of trunk, branches, bark or roots.

B. Materials or equipment shall not be stored or parked within the drip line.

C. Temporary fences or barricades shall be installed to protect trees and plants in areas subject to traffic.

D. Fires shall not be permitted under or adjacent to trees and plants.

E. Within the limits of the Work, water trees and plants that are to remain, in order to maintain their health during construction operations.

F. Cover all exposed roots with burlap that shall be kept continuously wet. Cover all exposed roots with earth as soon as possible. Protect root systems from mechanical damage and damage by erosion, flooding, run-off or noxious materials in solution.

G. If branches or trunks are damaged, prune branches immediately and protect the cut or damaged areas with emulsified asphalt compounded specifically for horticultural use in a manner approved by the ENGINEER.

H. All damaged trees and plants that die or suffer permanent injury shall be removed when ordered by the ENGINEER and replaced by a specimen of equal or better quality.

I. Coordinate Work in this Section with requirements of Division 2.

1.4 PROTECTION OF EXISTING STRUCTURES

A. Underground Structures:
   1. Underground structures are defined to include, but not be limited to, all sewer, water, gas, and other piping, and manholes, chambers, electrical conduits, tunnels and other existing subsurface work located within or adjacent to the Contract limits.
   2. All underground structures except sewers, electric and telephone service connections, known to ENGINEER, are shown on the Drawings. This information is shown for the assistance of CONTRACTOR in accordance with the best information available, but is not guaranteed to be correct or complete.
   3. CONTRACTOR shall explore ahead of his trenching and excavation Work and shall uncover all obstructing underground structures sufficiently to determine their location, to prevent damage to them and to prevent interruption to the services which such structures provide. If CONTRACTOR damages an underground structure, he shall restore it to original condition at his expense.
   4. Necessary changes in the location of the Work may be made by ENGINEER, to avoid unanticipated underground structures.
   5. If permanent relocation of an underground structure or other is required and is not otherwise provided for in the Contract Documents, ENGINEER will direct CONTRACTOR in writing to perform the Work, which shall be paid for under the provisions of Article 11 of the General Conditions.

B. Surface Structures:
   1. Surface structures are defined as all existing buildings, structures and other facilities above the ground surface. Included with such structures are their foundations or any extension below the surface. Surface structures include, but are not limited to, buildings, tanks, walls, bridges, roads, dams, channels, open drainage, piping, poles, wires, posts, signs, markers, curbs, walks and all other facilities that are visible above the ground surface.

C. Protection of Underground and Surface Structures:
   1. CONTRACTOR shall sustain in their places and protect from direct or indirect injury all underground and surface structures located within or adjacent to the Work area. Such sustaining and supporting shall be done carefully and as required by the party owning or controlling such structure. Before proceeding with the work of sustaining and supporting such structure, CONTRACTOR shall satisfy the ENGINEER that the methods and procedures to be used have been approved by the party owning same.
   2. CONTRACTOR shall assume all risks attending the presence or proximity of all underground and surface structures within or adjacent to the Work area. CONTRACTOR shall be responsible for all damage and expense for direct or indirect injury caused by his work to any structure. CONTRACTOR shall repair immediately all damage caused by his work, to the satisfaction of the owner of the damaged structure.

D. All other existing surface facilities, including but not limited to, guard rails, posts, guard cables, signs, poles, markers, and curbs which are temporarily removed to facilitate installation of the Work shall be replaced and restored to their original condition at CONTRACTOR'S expense.

1.5 PROTECTION OF INSTALLED PRODUCTS AND LANDSCAPING

A. Provide protection of installed products to prevent damage from subsequent operations. Remove protection facilities when no longer needed, prior to completion of Work.

B. Control traffic to prevent damage to equipment, materials, and surfaces.

C. Provide coverings to protect equipment and materials form damage.
   1. Cover projections, wall corners, and jambs, sills and soffits of openings, in areas used for traffic and for passage of products in subsequent work.

D. Prohibit traffic of any kind across planted lawn and landscaped areas.

+ + END OF SECTION + +

SECTION 01550

ACCESS ROADS AND PARKING AREAS

1.1 GENERAL

A. CONTRACTOR shall provide all temporary construction roads, walks, and parking areas required during the construction and for use of emergency vehicles. Temporary roads and parking areas shall be designed and maintained by the CONTRACTOR so as to be fully usable in all weather conditions.

B. CONTRACTOR shall prevent interference with traffic and the OWNER'S operations on existing roads. He shall indemnify and save harmless the OWNER from any expenses caused by CONTRACTOR'S operations over these roads.

C. Roadways damaged by CONTRACTOR shall be restored to their original condition by the CONTRACTOR subject to approval of the OWNER or ENGINEER.

D. Temporary roads, walks, and parking areas shall be removed by the CONTRACTOR prior to final acceptance and the ground returned to its original condition, unless otherwise required by the Contract Documents.

+ + END OF SECTION + +

SECTION 01560

ENVIRONMENTAL CONTROLS

1.1 GENERAL

A. CONTRACTOR shall provide and maintain methods, equipment, and temporary construction, as necessary to provide controls over environmental conditions at the construction site and adjacent areas. Remove physical evidence of temporary facilities at completion of Work.

B. CONTRACTOR shall comply with all laws, rules, regulations, ordinances and requirements of the State of New York, USEPA, NYSDEC, and other governing authorities pertaining to noise control, dust control, soil erosion and sediment control, pollution control and all other environmental controls, protection and restoration.

C. All costs incurred in complying with the laws, rules, regulations, ordinances and requirements of the governing authorities pertaining to environmental controls, protection and restoration shall be included in the prices bid for this Contract, and at no additional cost to the OWNER.

D. CONTRACTOR shall conform to the requirements pertaining to environmental protection, restoration and erosion and sediment control as shown on the Drawings and specified in other Divisions and Sections of these Contract Documents.

E. CONTRACTOR shall comply with the provisions of the State Pollution Discharge Elimination System General Permit for Storm Water Discharges from Construction Activities, Permit Number GP-93-06.

1.2 NOISE CONTROL

A. CONTRACTOR'S vehicles and equipment shall be such as to minimize noise to the greatest degree practicable. Noise levels shall conform to the latest OSHA standards, other federal regulations, and state and local regulations, and in no case will noise levels be permitted which interfere with the work of the OWNER or others.

B. All construction equipment powered by an internal combustion engine shall be equipped with a properly maintained muffler.

C. Air compressors shall be operated in accordance with the manufacturer's instructions for proper noise abatement.

D. Air-powered equipment shall be fitted with pneumatic exhaust silencers.

E. Stationary equipment powered by an internal combustion engine shall not be operated within 150 feet of noise sensitive sites without temporary noise barriers placed between the equipment and the noise sensitive sites. Noise sensitive sites shall include residential buildings, motels, hotels, schools, churches, hospitals, nursing homes, libraries and public recreation areas. Temporary noise barriers shall be constructed of plywood or tongue and groove boards with a noise absorbent treatment on the interior surface (facing the equipment).

1.3 WATER CONTROL

A. CONTRACTOR shall provide methods to control water to prevent damage to the Work, the site, or adjoining properties.
   1. Control fill, grading and ditching to direct water away from excavations, pits, tunnels and other construction areas; direct drainage to proper runoff courses so as to prevent any erosion, damage or nuisance.

B. CONTRACTOR shall provide, operate and maintain equipment and facilities of adequate size to control surface water.

C. CONTRACTOR shall dispose of drainage water in a manner to prevent flooding, erosion, or other damage to any portion of the site or to adjoining areas and in conformance with all environmental requirements.

1.4 POLLUTION CONTROL

A. CONTRACTOR shall provide methods, means and facilities required to prevent contamination of soil, water or atmosphere by the discharge of noxious substances from construction operations.

B. CONTRACTOR shall take special measures to prevent harmful substances from entering public water.
   1. Prevent disposal of wastes, effluents, chemicals, or other such substances adjacent to streams, or in sanitary or storm sewers.
   2. Disposal of materials in wetlands or surface waters is prohibited.

C. All CONTRACTOR'S equipment used during construction shall conform to all current federal, state and local laws and regulations.

1.5 EROSION CONTROL

A. CONTRACTOR shall plan and execute construction and earthwork by methods to control surface drainage from cuts and fills, and from borrow and waste disposal areas, to prevent erosion and sedimentation.
   1. Hold the areas of bare soil exposed at one time to a minimum.
   2. Provide temporary control measures such as berms dikes and drains.

B. CONTRACTOR shall construct fills and waste areas by selective placement to eliminate surface silts or clays which will erode.

C. CONTRACTOR shall periodically inspect earthwork to detect any evidence of the start of erosion, and shall apply corrective measures as required to control erosion. CONTRACTOR shall provide all labor, materials and equipment to install sediment control fencing to the limits shown on the Drawings.

1.6 DUST CONTROL

A. CONTRACTOR shall provide methods to control dust generated by construction activities as directed by the ENGINEER.

B. Dust control methods shall utilize water as dust control. In no instance shall chemical controls (i.e., calcium chloride, etc.) be employed for dust control.

C. Dust control measures shall include dust both generated on-site and/or off-site as a result of construction activities.

D. Dust monitoring shall be performed in accordance with Section 01460, Health and Safety Procedures.

++ END OF SECTION ++

SECTION 01630

SUBSTITUTIONS

1.1 GENERAL

A. Requests for review of a substitution shall conform to the requirements of Article 6.05 of the General Conditions and shall contain complete data substantiating compliance of proposed substitution with Contract Documents.

1.2 CONTRACTOR'S OPTIONS

A. For materials or equipment (hereinafter products) specified only by reference standard, select product meeting that standard, by any manufacturer, fabricator, supplier or distributor (hereinafter manufacturer). To the maximum extent possible, provide products of the same generic kind from a single source.

B. For products specified by naming several products or manufacturers, select any one of the products or manufacturers named which complies with Specifications.

C. For products specified by naming one or more products or manufacturers and stating "or equal", submit a request for a substitution for any product or manufacturer which is not specifically named.

D. For products specified by naming only one product or manufacturer and followed by words indicating that no substitution is permitted, there is no option and no substitution will be allowed.

E. Where more than one choice is available as a CONTRACTOR'S option, select product which is compatible with other products already selected or specified.

1.3 SUBSTITUTIONS

A. During a period of thirty (30) days after date of commencement of Contract Time, ENGINEER will consider written requests from CONTRACTOR for substitution of products or manufacturers, and construction methods (if specified).
   1. After end of specified period, requests will be considered only in case of unavailability of product or other conditions beyond control of CONTRACTOR.

B. Submit six (6) copies of request for substitution. Submit separate request for each substitution. In addition to requirements set forth in Article 6.05 of General Conditions, include in request the following:

1. For products or manufacturers:
   a. Product identification, including manufacturer's name and address.
   b. Manufacturer's literature with product description, performance and test data, and reference standards.
   c. Samples, if appropriate.
   d. Name and address of similar projects on which product was used, and date of installation.
2. For construction methods (if specified):
   a. Detailed description of proposed method.
   b. Drawings illustrating method.
3. Such other data as the ENGINEER may require to establish that the proposed substitution is equal to the product, manufacturer or method specified.

C. In making request for substitution, CONTRACTOR represents that:
1. CONTRACTOR has investigated proposed substitution, and determined that it is equal to or superior in all respects to the product, manufacturer or method specified.
2. CONTRACTOR will provide the same or better warranties or bonds for proposed substitution as for product, manufacturer or method specified.
3. CONTRACTOR waives all claims for additional costs or extension of time related to proposed substitution that subsequently may become apparent.

D. Proposed substitutions will not be accepted if:
1. Acceptance will require substantial revision of Contract Documents.
2. They will change design concepts or Specifications.
3. They will delay completion of the Work, or the work of other contractors.
4. They are indicated or implied on a Shop Drawing and are not accompanied by a formal request for substitution from CONTRACTOR.

E. If the ENGINEER determines that a proposed substitute is not equal to that specified, CONTRACTOR shall furnish the product, manufacturer or method specified at no additional cost to OWNER.

F. Approval of a substitution will not relieve CONTRACTOR from the requirement for submission of Shop Drawings as set forth in the Contract Documents.

++ END OF SECTION ++

SECTION 01720

RECORD DOCUMENTS

1.1 GENERAL

A. CONTRACTOR shall maintain and provide the ENGINEER with record documents as specified below, except where otherwise specified or modified in Divisions 2-16.

B. Maintenance of Documents:
   1. Contractor shall maintain on-site in clean, dry, legible condition complete sets of the following: Drawings, Specifications, Addenda, approved Shop Drawings, Samples, Change Orders, other modifications of Contract Documents, test records, survey data, Field Orders, and all other documents pertinent to CONTRACTOR'S Work.
   2. Make documents available at all times for inspection by ENGINEER and OWNER.
   3. Record documents shall not be used for any other purpose and shall not be removed from the site without ENGINEER'S approval.

C. Recording:
   1. Label each document "PROJECT RECORD" in 2-inch high printed letters.
   2. Keep record documents current.
   3. Do not permanently conceal any Work until required information has been recorded.
   4. Drawings: Legibly mark to record actual construction including:
      a. Depths of various elements of foundation in relation to datum.
      b. Horizontal and vertical location of underground utilities and appurtenances referenced to permanent surface improvements.
      c. Location of internal utilities and appurtenances concealed in construction referenced to visible and accessible features of structure.
      d. Field changes of dimensions and details.
      e. Changes made by Change Order or Field Order.
      f. Details not on original Drawings.
   5. Specifications and Addenda: Legibly mark up each Section to record:
      a. Manufacturer, trade name, catalog number, and supplier of each product and item of equipment actually installed.
      b. Changes made by Change Order or Field Order.
      c. Other matters not originally specified.

D. Submittal:

1. Upon Substantial Completion of the Work, deliver record documents to ENGINEER. Final payment will not be made until satisfactory record documents are received by ENGINEER.
2. Accompany submittal with transmittal letter containing:
   a. Date.
   b. Project title and number.
   c. CONTRACTOR'S name and address.
   d. Title and number of each record document.
   e. Certification that each document as submitted is complete and accurate.
   f. Signature of CONTRACTOR, or his authorized representative.

++ END OF SECTION ++

SECTION 02012

ABANDONMENT OF OFFICE WELL

PART 1 - GENERAL

1.1 GENERAL

A. Scope: CONTRACTOR shall furnish all labor, materials, equipment, and incidentals required to abandon and seal designated existing office well at the site.

B. Monitoring Wells to be abandoned are shown on Contract Drawings.

C. Related Sections:
   1. Section 02220, Excavation and Backfill.

1.2 QUALITY ASSURANCE

A. CONTRACTOR shall retain a well driller experienced in the installation and abandonment of wells to perform all well abandonment work. Submit name and qualifications of well driller for approval by the ENGINEER.

B. Permits and Regulations:
   1. CONTRACTOR shall perform well abandonment work in compliance with the applicable requirements of governing authorities and the specifications stated here-in.

C. Reference Standards:
   1. Occupational Safety and Health Act, OSHA.

1.3 SUBMITTALS

A. Shop Drawings: Submit for approval the following items:
   1. Proposed sealing material and method of emplacement.

1.4 JOB CONDITIONS

A. Subsurface Information: Office well is a 6-inch well, 196 feet deep, cased to a depth of 136 feet. Static water level in well is 55 feet below ground surface.

PART 2 - PRODUCTS

2.1 GROUT MATERIALS

A. The well bore shall be filled and sealed with neat-cement grout.
   1. Neat-cement grout shall consist of a mixture of API spec. 10, Class G cement (or Class B similar to ASTM C150 Type II) and water in the ratio of 0.67 cu ft (5.0 gal [19.0 L]) of water per 94 lb (42.6 kg) sack of cement weighing approximately 117 lb/cu ft (1880 kg/m^{-3}). A maximum of six percent (6%), by weight, dry bentonite may be added. The neat-cement grout shall be thoroughly mixed and free of lumps.

PART 3 - EXECUTION

3.1 INSPECTION

A. ENGINEER shall be notified three (3) days prior to abandonment and sealing of existing groundwater monitoring wells.

3.2 ABANDONMENT AND SEALING

A. CONTRACTOR shall measure the depth of the monitoring well from the top of the casing to the nearest 0.10 of a foot prior to work. This depth will be compared to existing well records to ensure against the presence of any obstruction that will interfere with abandonment. The CONTRACTOR shall measure the depth to the static water level from the top of the casing to the nearest 0.01 of a foot prior to work.

B. CONTRACTOR shall remove the above-grade or flush-mount protective casing around the well and shall break up concrete pad in which the protective casing is set.

C. CONTRACTOR shall excavate to a depth of approximately two (2) feet around each well. The well casing will then be cut at approximately two (2) feet below pre-existing grade. The excavated soil shall be stock-piled adjacent to each well and will be used to back-fill the hole following the completion of grouting activities.

D. The well bore shall be filled and sealed with neat-cement grout. A tremie pipe shall be lowered to the bottom of the well and raised slowly as the grout material is introduced. The tremie pipe shall be kept full continuously from start to finish of the grouting procedure, and the discharge end of the tremie pipe shall be continuously submerged in the grout until the zone to be grouted is completed filled.

E. The top of the grout material shall be terminated two (2) feet below the ground surface. At least 48 hours following the last grouting procedure, the upper two (2) feet shall be backfilled with general fill and the soils previously excavated from the well head and compacted to avoid settlement. Any concrete, and well casing

materials generated as part of the abandonment process will be disposed of as C & D debris by the Contractor.

F. CONTRACTOR shall inspect the abandoned well bore 24 to 48 hours following grouting and document if any settlement of the grout has occurred. If the grout has settled in excess of one (1) foot, the CONTRACTOR shall place additional grout as described above until the original grout elevation is maintained at two (2) feet below grade.

3.3 RECORDS OF ABANDONMENT PROCEDURES

A. CONTRACTOR shall maintain complete, accurate records of the entire abandonment procedure to provide detailed records for possible future reference and to demonstrate to the governing state or local agency that the monitoring well was properly sealed. Information to be recorded shall include, but not necessarily be limited to:
   1. The procedure used to decommission the well, including the length of casing removed.
   2. Depths sealed: The depth of each layer of all sealing and backfilling materials shall be recorded.
   3. Material quantities: The quantity of sealing materials used shall be recorded. Measurements of static water levels and depths shall be recorded.

B. CONTRACTOR shall submit six (6) copies of the monitoring well abandonment records for each well to ENGINEER within ten (10) days of completion of sealing Work.

++ END OF SECTION ++

SECTION 02050

DEMOLITIONS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:
   1. CONTRACTOR shall provide all labor, materials, equipment and incidentals as shown, specified and required for demolitions, removal and disposal Work.
   2. Included, but not limited to, are demolition and disposal of existing structures, concrete scarification and disposal, concrete slabs and foundations demolition, contaminated soil excavation and disposal, and fence demolition.
   3. Demolitions and removals which may be specified under other Sections shall conform to requirements of this Section.

B. Related Sections:
   1. Section 01010, Summary of Work.
   2. Section 02110, Clearing.
   3. Section 02220, Excavation and Backfill.

1.2 SUBMITTALS

A. Schedule: Submit for approval proposed methods, equipment, and operating sequences.

B. Written certification of proper transport and disposal of demolition debris and contaminated soil shall be submitted to the ENGINEER within ten (10) working days after disposal.

C. Laboratory Reports for all waste characterization testing shall be submitted to the OWNER and ENGINEER within three (3) working days of receipt by Contractor.

1.3 JOB CONDITIONS

A. Protection:
   1. Perform all demolition and removal Work to prevent damage or injury to structures, occupants thereof and adjacent features which might result from falling debris or other causes, and so as not to interfere with the use, and free and safe passage to and from adjacent structures.
   2. Closing or obstructing of roadways and passageways adjacent to the Work by the placement or storage of materials will not be permitted, and all operations shall be conducted with a minimum interference to traffic on these ways.
   3. Erect and maintain barriers and other necessary protective devices.

4. Repair damage to facilities to remain, or to any property belonging to the OWNER or occupants of the facilities.

B. Scheduling:
   1. Carry out operations so as to avoid interference with OWNER'S operations and Work in the existing facilities.

C. Notification:
   1. At least 48 hours prior to commencement of a demolition or removal, notify ENGINEER in writing of proposed schedule therefor. OWNER will inspect the existing equipment and mark for identification those items which are to remain the property of the OWNER. Do not start removals without the permission of the ENGINEER.

D. Explosives:
   1. Do not bring explosives on site.

PART 2 - PRODUCTS

(Part 2 omitted this Section)

PART 3 - EXECUTION

3.1 GENERAL

A. All materials and equipment removed from existing Work, shall become the property of CONTRACTOR, except for those which OWNER has identified and marked for his use. All materials and equipment marked by the OWNER to remain his shall be carefully removed by the CONTRACTOR, so as not to be damaged, and shall be cleaned and stored on or adjacent to the site in a protected place specified by the ENGINEER or loaded onto trucks provided by the OWNER.

B. CONTRACTOR shall dispose of all demolition materials, equipment, debris, and all other items not marked by the OWNER to remain as his, as specified.

C. Pollution Controls: Use water sprinkling, temporary enclosures, and other suitable methods to limit the amount of dust and dirt rising and scattering in the air to the lowest practical level. Comply with governing regulations pertaining to environmental protection.
   1. Do not use water when it may create hazardous or objectionable conditions such as ice, flooding, and pollution.
   2. Clean adjacent structures, facilities, and improvements of dust, dirt, and debris caused by demolition operations. Return adjacent areas to conditions existing prior to the start of the Work.

3. The use of sedimentation controls shall be required to prevent the transport of sediments to the surrounding lands.

D. Contractor and subcontractors shall conduct all demolition and disposal activities in accordance with the approved Health and Safety Plan.

3.2 STRUCTURES

A. Structures specified or as shown on the Contract Drawings shall be demolished and disposed of at permitted and approved disposal facilities as construction and demolition (C&D) debris unless otherwise identified on the Contract Drawings. Items identified to be disposed of as hazardous waste will be disposed of as a hazardous waste at a permitted and approved treatment, storage, and disposal (TSD) facility. CONTRACTOR will be responsible for all fees associated with material disposal.

B. CONTRACTOR shall dispose of any and all debris resulting from demolition of structures.

C. CONTRACTOR shall be responsible for any fees required for demolition and disposal of debris, including but not limited to: permits, disposal fees, waste characterization testing, etc.

D. CONTRACTOR shall comply with applicable State and/or Local Regulations, obtain required permits, and give proper notice to appropriate agencies prior to commencing with any demolition activities without any additional expense to the OWNER.

E. CONTRACTOR shall remove all asbestos containing building materials prior to demolition and dispose of in accordance to approved methods. Results of the asbestos survey are included in Appendix C.

3.3 CONCRETE SCARIFICATION

A. CONTRACTOR shall utilize mechanical scarification equipment to remove a minimum of 0.6 cm of the concrete surfaces as shown on the Contract Drawings.

B. CONTRACTOR shall employ dust control measures during scarification to control dust generation.

C. CONTRACTOR shall dispose of debris generated during scarification operations at a approved hazardous waste treatment, disposal, and storage (TSD) facility. CONTRACTOR will be responsible for all fees associated with material disposal.

3.4 CONCRETE SLABS

A. Upon completion of scarification Work, CONTRACTOR shall demolish concrete slabs and foundations as shown and dispose of debris within the former office basement.

B. CONTRACTOR shall backfill former office foundation in a manner to prevent voids within the backfill.

3.5 CONTAMINATED SOIL

A. CONTRACTOR shall excavate and dispose of contaminated soil from locations specified or as shown on Contract Drawings. A boring of the former pit is included in Appendix D. In addition, CONTRACTOR shall dispose of shed slab with hazardous contaminated soil.

B. CONTRACTOR shall employ proper controls during excavation, transport, and disposal of contaminated soil to prevent migration of contaminants and/or exposure of the public to contaminants.

C. CONTRACTOR shall comply with applicable Federal, State, and Local Regulations, obtain required permits, and give proper notice to appropriate agencies prior to commencing with excavation and disposal activities without additional expense to the OWNER.

D. CONTRACTOR shall be responsible for any fees associated with excavation and disposal of contaminated soil, including but not limited to: permits, treatment fees, disposal fees, waste characterization fees, etc.

E. Contaminated soils shall be disposed of at an approved Treatment, Storage, Disposal (TSD) Facility in accordance with Federal and State Regulations. CONTRACTOR shall be responsible for fees associated with disposal of the treated soil. For purposes of the Bid, the CONTRACTOR shall assume contaminated soil shall be disposed of at:

Safety-Kleen, Ltd.
AKA Laidlaw Environmental Services (SARNIA), Ltd.
RR #1 (Telfer Sideroad)
Corunna, ON NGN1GO

CONTRACTOR shall contract with the following waste management and transportation firm for disposal at the TSD facility:

ECDC Environment. L.C.
115 Cloverdale Circle
Tinton Fall, NJ 07724
ATTN: David Ardito
Phone (732) 389-6554

3.6 FENCING

A. CONTRACTOR shall remove existing fencing as shown on the Contract Drawings.

3.7 CLEAN-UP

A. CONTRACTOR shall dispose of all debris resulting from the demolition operations as it accumulates. Upon completion of the Work, all materials, equipment, waste, and debris of every sort shall be removed and premises shall be left, clean, neat and orderly.

++ END OF SECTION ++

SECTION 02052

REMOVAL AND DISPOSAL OF TANK AND ASSOCIATED CONTAMINATED SOILS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:
   1. All labor, materials, services, and equipment necessary for the removal and disposal of one petroleum underground storage tank and appurtenances in accordance with the specifications outlined herein.
   2. All labor, materials, services and equipment necessary for the removal and disposal of soils contaminated with petroleum hydrocarbons from the tank excavations as specified herein.
   3. Backfill and compaction of excavations, and restoration of surfaces as specified herein.

B. Related Sections:
   1. Section 01010, Summary of Work.
   2. Division 2, Site Work.

1.2 QUALITY ASSURANCE

A. Applicable Codes, Standards, and Specifications
   1. National Fire Prevention Association, Volume 30, "Flammable and Combustible Liquids Code"
   2. National Fire Protection Association, Volume 327, "Cleaning or Safeguarding Small Tanks and Containers"
   3. American Petroleum Institute, AP1-2015, "Cleaning Petroleum Storage Tanks"
   4. American Petroleum Institute, AP1-2015A, "A Guide for Controlling the Lead Hazard Associated with Tank Entry and Cleaning"
   5. American National Standards Institute, ANSI-Z28.2 "Standard Practices for Respiratory Protection"
   6. National Institute for Occupational Safety and Health, NIOSH, "Working in Confined Space"
   7. Identification and Listing of Hazardous Wastes, 6NYCRR Part 366
   8. New York Hazardous Waste Management Regulations, 6NYCRR, Part 365
   9. New York Waste Transporter Permit Regulations, 6NYCRR Part 364
   10. State of New York Fire Code
   11. New York State Petroleum Bulk Storage Regulations, Parts 612-614
   12. New York State Solid Waste Management Regulations

1.3 SUBMITTALS

A. Copies of all necessary permits and certifications of waste haulers and disposal facilities must be submitted to the ENGINEER before commencing disposal activities.

B. Written certification of proper transport and final disposal of the tanks, contaminated soils and any liquids or sludges found in the tanks shall be submitted to the ENGINEER within ten (10) working days after disposal.

C. Laboratory reports for all environmental testing shall be submitted to the OWNER and ENGINEER within three working days of receipt by CONTRACTOR.

PART 2 - PRODUCTS

(Part 2 omitted this section)

PART 3 - EXECUTION

3.1 TANK REMOVAL

A. Prior to removal of the tanks, the CONTRACTOR shall remove all free liquid product. A preliminary site survey conducted by the ENGINEER indicated that approximately 50 gallons (total) of free liquid product and water remain in the tank. The CONTRACTOR shall remove residual liquids and any sludges or solids from the tanks and connecting lines. All materials shall be stored in a manner conforming to pertinent environmental regulations and fire codes prior to disposal.

B. Prior to the commencement of tank removal activities, the tanks shall be gas freed, cleaned and then tested for the presence of flammable vapors in accordance with NFPA Volume 327 and all other applicable regulations.

C. The CONTRACTOR shall excavate the tanks, removing soil as necessary for removal of the tanks. This soil shall be stockpiled for use as backfill unless determined to be contaminated by the ENGINEER. If determined to be contaminated, the soil shall be stockpiled in an environmentally sound manner on a 6 mil polyethylene liner with watertight perimeter berms and a 6 mil polyethylene cover prior to removal to a solid waste management facility permitted to receive wastes of this type. Transport of such materials shall be completed by a permitted solid waste transporter as specified. The CONTRACTOR shall take care to avoid uncontrolled drainage or spilling from tank or piping during removal. The CONTRACTOR shall be solely responsible for the discharge of product to the environment during project activities and for the remediation of such discharges and their resulting effects.

D. The CONTRACTOR shall disconnect piping at all tank openings. All pipes and tank appurtenances shall be removed and disposed unless otherwise specified by the ENGINEER.

E. Once the tanks are removed, the ENGINEER shall inspect the excavation for contamination. Should contamination be present, as determined by the ENGINEER, the CONTRACTOR shall remove and dispose of the contaminated soil as specified.

F. Upon completion of removal of contaminated material or if no contamination is present, as determined by the ENGINEER, the CONTRACTOR shall complete the removal of tank-related appurtenances and then backfill the excavation and restore the surface as specified.

3.2 TANK DISPOSAL

A. After being rendered gas free, the tanks shall be thoroughly cleaned and rendered unfit for further use by the CONTRACTOR. This shall be done by making a sufficient number (as determined by the ENGINEER) of holes or openings in the tanks or by other acceptable methods as approved by the ENGINEER. The ENGINEER shall inspect the tanks prior to disposal.

B. The CONTRACTOR shall then dispose of the tanks, following approval by the ENGINEER, at a scrap metal salvage yard or a solid waste management facility permitted to receive wastes of this type. Transport shall be by a permitted transporter.

C. The CONTRACTOR shall follow the guidelines published in API-2015 and 1604 for safe handling, transportation, and disposal of the tanks.

3.3 DISPOSAL OF CONTAMINATED SOIL

A. The CONTRACTOR shall dispose of the contaminated soil at a solid waste management facility permitted to receive wastes of this type. Transport shall be by a permitted solid waste transporter.

3.4 DISPOSAL OF APPURTENANT EQUIPMENT

A. The pumps and associated piping shall be removed and disposed of at a scrap metal salvage yard or a facility permitted to receive and dispose of wastes of this type.

B. Removed asphalt, debris and other materials which are unsuitable for use as backfill shall be removed and disposed of by the CONTRACTOR at a facility permitted to receive wastes of this type.

3.5 DISPOSAL OF LIQUIDS

A. The CONTRACTOR shall remove and dispose of all free product, sludges, tank bottoms, residuals, wash waters, and cleaning waters in a manner consistent with all applicable waste disposal regulations. It shall be the responsibility of the CONTRACTOR to perform any sampling and analyses required to characterize any free liquids or solids as hazardous or non-hazardous in conformance with all applicable State waste disposal regulations, prior to disposal.

3.6 BACKFILL

A. Prior to backfill of the excavation, the ENGINEER shall obtain soil samples of the visually clean soil at the bottom of the excavation. A 6 mil liner of polyethylene sheeting shall be installed over the bottom and all faces of the excavation prior to backfilling. The excavation shall then be backfilled by the CONTRACTOR unless directed, by the ENGINEER, that the excavation remain open. If the excavation is to remain open, the CONTRACTOR shall be responsible for maintaining the structural stability of the excavation to ensure the integrity of the surrounding area. The CONTRACTOR shall be responsible for securing the excavation to prevent injury to facility personnel or other persons until the time the ENGINEER directs the excavation to be backfilled.

B. All excavations shall be backfilled and compacted to original grade in preparation for restoration of the surface.

C. Backfill material shall consist of stockpiled excavated materials which have been determined, by the ENGINEER, to be not contaminated. Additional backfill material as required shall be General Fill as specified in Section 02230, Select Fill.

D. Backfill under all areas shall be placed in uniform lifts not exceeding 12 inches in depth and compacted by mechanical means. Backfill shall be compacted in accordance with Section 02220, Excavation and Backfill. To assure adequate compaction, the CONTRACTOR shall provide for in-place density testing of all backfilled areas.

E. Any settlement occurring in backfilled excavations within one year of the completion of work shall be refilled by the CONTRACTOR and compacted as directed by the OWNER.

++ END OF SECTION ++

SECTION 02053

SEPTIC TANK ABANDONMENT

PART 1 - GENERAL

1.1 GENERAL

A. Scope: CONTRACTOR shall furnish all labor, materials, equipment, and incidentals required to abandon and fill existing septic tanks as specified herein.

B. Septic tanks are shown on Contract Drawings.

C. Related Sections:
   1. Section 02200, Sections on Sitework.

1.2 QUALITY ASSURANCE

A. CONTRACTOR shall dispose of any liquid wastes present in septic tanks as hazardous wastes at an approved treatment, storage and disposal (TSD) facility.

B. Permits and Regulations:
   1. CONTRACTOR shall perform septic tank abandonment work in compliance with the applicable requirements of governing authorities having jurisdiction.

1.3 SUBMITTALS

Shop Drawings: Submit for approval the following items:

A. Liquid removal method.

B. Copies of all necessary permits and certifications of waste haulers and disposal facilities must be submitted to ENGINEER prior to commencing with abandonment work.

C. Written certification of proper transport, treatment and final disposal of sludge and liquid wastes generated from septic tank cleaning shall be submitted to the ENGINEER within ten (10) working days after disposal.

D. Laboratory Reports for all environmental testing shall be submitted to the OWNER and ENGINEER within three working days of receipt by CONTRACTOR.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 TANK CLEANING

A. Prior to abandonment of the septic tanks, the CONTRACTOR shall remove all free liquid product. For bidding purposes, CONTRACTOR shall assume 300 gallons (total) of residual liquid and sludge material. The CONTRACTOR shall remove residual liquids and sludges or solids from the tanks.

B. CONTRACTOR shall dispose of all liquid and sludges collected at an approved treatment, storage and disposal (TSD) facility in accordance with applicable regulations.

C. CONTRACTOR shall then clean tanks using high pressure washing equipment, collect, and dispose of cleaning water at the TSD facility.

D. CONTRACTOR shall obtain all necessary permits, fees, etc. as required for cleaning and disposal of septic tank contents.

3.2 TANK ABANDONMENT

A. CONTRACTOR shall abandon septic tanks with flowable fill as specified in Section 02230, Select Fill.

B. Any consolidation of the fill that occurs shall be refilled by the CONTRACTOR.

C. CONTRACTOR shall assume volume of septic tanks total 1,500 gallons for purposes of estimating quantity of flowable fill required to fill tanks.

++ END OF SECTION ++

SECTION 02110

CLEARING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope: CONTRACTOR shall furnish all labor, materials, equipment and incidentals required to perform all clearing and grubbing as shown and specified.

B. Related Work Specified Elsewhere:
   1. Section 02220, Excavation and Backfill.
   2. Section 02921, Topsoil.
   3. Section 02930, Turf.

1.2 QUALITY ASSURANCE

A. Codes and Standards: State and local laws and code requirements shall govern the hauling and disposal of trees, shrubs, stumps, roots, rubbish, debris and other matter.

1.3 JOB CONDITIONS

A. Protection:
   1. Roads, parking lots, adjacent property and other works and structures shall be protected throughout the entire project. CONTRACTOR shall return to original condition, satisfactory to the ENGINEER, damaged facilities caused by the CONTRACTOR'S operations.
   2. Trees, shrubs and grassed areas which are to remain shall be protected by fences, barricades, wrapping or other methods as shown, specified or approved by the ENGINEER. Equipment, stockpiles, etc. shall not be permitted within tree branch spread. Trees shall not be removed without approval of the ENGINEER unless shown or specified.
   3. All Work shall be conducted within the limit of Work as shown. No disturbance shall occur outside these limits.

1.4 GUARANTEE

A. CONTRACTOR shall guarantee that Work performed under this Section will not permanently damage trees, shrubs, turf or plants designated to remain, or other adjacent work or facilities. If damage resulting from CONTRACTOR'S operations appears during the period up to 12 months after completion of the project he shall replace damaged items at no expense to OWNER.

PART 2 - PRODUCTS

(Part 2 omitted this Section)

PART 3 - EXECUTION

3.1 CLEARING AND GRUBBING

A. Limits of clearing shall be all areas within the limit of waste lines except as otherwise shown. CONTRACTOR is advised that any disturbance beyond these limits may be cause for stopping all work. CONTRACTOR shall be liable for any and all claims, costs, and damages resulting from work stoppage.

B. CONTRACTOR shall cut and chip all trees and brush and dispose of material off-site.

C. Stumps and roots shall be disposed of off-site.

D. Burning on site shall not be permitted.

E. Trees and shrubs shall be trimmed when doing so will avoid removal or damage. Trimmed or damaged trees shall be treated and repaired by persons with experience in this specialty who are approved by ENGINEER. Trees and shrubs intended to remain which are damaged beyond repair or removed, shall be replaced by the CONTRACTOR.

F. Control air pollution caused by dust and dirt, and comply with governing regulations.

+ + END OF SECTION + +

SECTION 02220

EXCAVATION AND BACKFILL

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:
   1. CONTRACTOR shall provide all labor, materials, equipment and incidentals required to perform all excavating, backfilling and grading of earth materials and waste as shown and specified.
   2. All necessary preparation of subgrade is included.
   3. No classification of excavated materials will be made. Excavation includes all materials regardless of type, character, composition, moisture, or condition thereof.
   4. All temporary means needed to maintain the site and trenches in a continuously dewatered condition are included.
   5. All necessary earthwork and grading required to repair displaced and eroded soil materials on subgrade, gas vent layer, barrier protection and vegetative layer prior to final acceptance is included.
   6. All temporary means needed to prevent discharge of sediment to water courses because of dewatering systems or erosion are included.
   7. All necessary grading and fill placement work to prepare the subgrade for the cap system is included.
   8. All necessary earthwork required to load and transport off-site soil materials is included.
   9. All necessary earthwork required to unload, place, compact and grade all on-site and off-site soils is included.

B. Related Work Specified Elsewhere:
   1. Section 02110, Clearing.
   2. Section 02230, Select Fill.
   3. Section 02272, Geosynthetics.
   4. Section 02921, Topsoil.
   5. Section 02930, Turf.

C. CONTRACTOR shall provide ENGINEER with access to the borrow pit or material source, upon request, for the purpose of assuring material source operations and obtaining samples.

1.2 QUALITY ASSURANCE

A. Tests:
   1. The services of a qualified testing laboratory shall be engaged by the CONTRACTOR to evaluate materials and determine acceptability of the fill as specified in Section 02230, Select Fill. The laboratory shall be acceptable to the ENGINEER.

B. Permits and Regulations:
   1. CONTRACTOR shall obtain permits as required by local, state and federal agencies for discharging water from excavations to rivers and streams.
   2. CONTRACTOR shall perform excavation work in compliance with applicable requirements of governing authorities having jurisdiction.

C. Reference Standards: Comply with applicable provisions and recommendations of the following except as otherwise shown or specified.
   1. ASTM A 36, Structural Steel.
   2. ASTM A 328, Steel Sheet Piling.
   3. ASTM D 422, Particle-Size Analysis of Soils.
   4. ASTM D 698, Moisture-Density Relations of Soils, using 5.5 lb (2.5 kg) Rammer and 12-in. (304.8 mm) Drop.
   5. ASTM D 1556, Density of Soil in Place by the Sand-Cone Method.
   6. ASTM D 2922, Density of Soil and Soil Aggregate in Place by Nuclear Methods.

1.3 SUBMITTALS

A. Shop Drawings:
   1. CONTRACTOR shall also prepare drawings detailing the following special construction procedures which may be necessary for completion of this contract:
      a. Sheeting and bracing;
      b. Dewatering system;
      c. Cofferdams;
      d. Protection methods anticipated; and
      e. Underpinning.
   2. The Shop Drawings shall be prepared by a registered professional engineer recognized as expert in the specialty involved. Also submit for approval calculations and all other pertinent information. However, CONTRACTOR will be responsible for designing, installing and operating the system as required to accomplish satisfactory sheeting, bracing, protection, underpinning and dewatering.

B. Test Reports - Borrow, Backfill, and Grading:
   1. Submit copies of soil analysis and flowable fill mix design directly to ENGINEER from the testing service or material supplier, with copy to the CONTRACTOR as required in other sections of Division 2.

C. Submit samples of all select fill materials required.

D. Submit a site dewatering and environmental control plan detailing type and locations of erosion control materials to be installed, methods of monitoring controls and the contingency plan to be implemented to ensure proper sediment and run-off control on-site and off-site.

E. Submit copy of mining permit, borrow source name and location map for all proposed materials.

1.4 JOB CONDITIONS

A. The work consists of remediating an inactive hazardous waste site containing pesticide contaminants.

B. Existing Structures: Shown on the Drawings are certain surface and underground structures adjacent to the Work. This information has been obtained from existing records. It is not guaranteed to be correct or complete and is shown for the convenience of the CONTRACTOR. CONTRACTOR shall explore ahead of the required excavation to determine the exact location of all structures. They shall be supported and protected from injury by the CONTRACTOR. If they are broken or injured, they shall be restored immediately by the CONTRACTOR at no additional cost to the OWNER.

C. Existing Utilities: Locate existing underground utilities in the areas of Work. If utilities are to remain in place, provide adequate means of protection during earthwork operations.
   1. Should uncharted or incorrectly charted piping or other utilities be encountered during excavation, consult the ENGINEER immediately for directions as to procedure. Cooperate with OWNER and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of utility owner at no additional cost to the OWNER.
   2. Do not interrupt existing utilities serving facilities occupied and used by OWNER or others, except when permitted in writing by ENGINEER and then only after acceptable temporary utility services have been provided.
   3. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies for shut-off of services if lines are active.

D. Use of Explosives: The use of explosives shall not be permitted.

E. Protection of Persons and Property: Barricade open excavations occurring as part of this Work and post with warning lights. Operate warning lights during hours from dusk to dawn each day and as otherwise required.
   1. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations.

2. Consult ENGINEER and obtain his approval before removing, trimming, or disturbing trees, shrubs, plants, fences, rails, walks, structures or other facilities that are encountered on the line of the excavation.
3. The CONTRACTOR shall exercise due care not to injure trees, other than those he is permitted to cut or trim, within or adjacent to the line of the trenches. No trees may be cut without the written permission of the ENGINEER, the municipal authority having jurisdiction or the property owner. The CONTRACTOR shall protect trees with boards, burlap, padding, or other protective material as may be required to avoid injury.

F. Dust Control: CONTRACTOR shall conduct all of his operations and maintain the area of his activities, including sweeping and sprinkling of roadways, so as to minimize creation and dispersion of dust. Calcium chloride or other additives shall not be used to control dust problems.

PART 2 - PRODUCTS

2.1 GENERAL

A. Materials shall meet the specifications of other Division 2 sections.

PART 3 - EXECUTION

3.1 INSPECTION

A. ENGINEER will examine the areas and conditions under which excavating, filling, and grading are to be performed and notify the CONTRACTOR of conditions he may find that are detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions have been corrected in a manner acceptable to the ENGINEER.

3.2 SITE PREPARATION

A. Site preparation shall be as specified in Section 02110, Clearing.

3.3 TEST PITS

A. CONTRACTOR shall excavate and backfill, in advance of construction, test pits to determine conditions or limits of waste. The CONTRACTOR shall perform all work required in connection with excavating, stockpiling, maintaining, sheeting, shoring, backfilling for the test pits.

3.4 EXCAVATION

A. CONTRACTOR shall perform all excavation required to complete the Work as shown and specified. Excavations shall include earth, sand, clay, gravel, hardpan, boulders not requiring drilling and blasting to remove, decomposed rock, pavements, rubbish and all other materials within the excavation limits, as shown or directed by ENGINEER, based on conformation testing.

B. The CONTRACTOR shall perform all excavation required to provide earth materials from off-site sources. All off-site borrow sources shall have valid, current mining permits and shall meet the approval of the ENGINEER. Laboratory testing of off-site borrow shall be as specified under other sections these specification.

C. Stability of Excavations: Slope sides of excavations to comply with codes and ordinances of agencies having jurisdiction. Shore and brace where sloping is not possible either because of space restrictions or stability of material excavated.
   1. Maintain sides and slopes of excavations in a safe condition until completion of backfilling.

D. Material Storage: Stockpile satisfactory excavated materials in approved areas, until required for backfill or fill. Place, grade and shape stockpiles for proper drainage.
   1. Locate and retain soil materials away from edge of excavations.
   2. Dispose of excess soil material and waste materials as specified hereinafter.

E. Where the existing material beneath the cover system is considered unsuitable by the ENGINEER, CONTRACTOR shall remove and replace it with general backfill.

3.5 UNAUTHORIZED EXCAVATION

A. All excavation outside the lines and grades shown, and which is not approved by the ENGINEER, together with the removal and disposal of the associated material shall be at the CONTRACTOR's expense. The unauthorized excavation shall be filled and compacted with select backfill by the CONTRACTOR at his expense.

3.6 DRAINAGE AND DEWATERING

A. General:
   1. Prevent surface and subsurface water from flowing into excavations and from flooding adjacent areas with the exception of the two areas designated as stormwater detention/infiltration basins.
   2. Remove water from excavation as fast as it collects.
   3. Maintain the ground water level a minimum of 1-foot below the bottom of the excavation to provide a stable surface for construction operations, a stable subgrade for the permanent work, and to prevent damage to the Work during all stages of construction.

4. Provide and maintain pumps, sumps, suction and discharge lines and other dewatering system components necessary to convey water away from excavations.
5. Provide approved sediment traps when water is conveyed into water courses.

B. Standby Requirements for Dewatering: Provide standby equipment to insure continuous dewatering operations.

C. Disposal of Water Removed by Dewatering System:
1. Dispose of all water removed from the excavation that has not contacted contaminated soil in such a manner as not to endanger public health, property, or any portion of the Work under construction or completed.
2. Dispose of all water that has contacted contaminated soil or has been determined to be contaminated by separately collecting and disposing of off-site in an approved manner.
3. Dispose of water in accordance with the approved Environmental Control Plan specified in Article 1.3.D.
4. Convey water from the construction site in a closed conduit. Do not use trench excavations as temporary drainage ditches.
5. Dispose of water in such a manner as to cause no inconveniences to the OWNER, ENGINEER, or others on or adjacent to the area of excavation.

3.7 GENERAL SITE FILL

A. Subgrade surface shall be level, dry, firm and subject to ENGINEER's approval. Fill shall not be placed if any water is on the surface of area to receive fill. Fill shall not be placed or compacted in a frozen condition or on top of frozen material.

B. Fill shall be placed in horizontal loose lifts of 12 inches maximum thickness. It shall be mixed and spread in a manner to assure uniform lift thickness after placing.

C. Each layer of fill shall be compacted before placement of the next lift.

D. Fill containing lumps, pockets or concentrations of silt or clay, rubble, debris, wood or other organic matter shall not be placed.

E. CONTRACTOR shall wet the fill materials during placement to achieve water contents needed for effective compaction.

F. Compaction of fill shall be performed with equipment suitable for the type of fill material being placed. CONTRACTOR shall select equipment which is capable of providing the densities required and shall submit the equipment to the ENGINEER for approval.

G. Vibratory rollers or vibratory plate compactors are suitable for compaction of fill. Each layer of fill material shall be compacted by at least two complete coverages of all portions of the surface of each lift using approved compaction equipment. One

coverage is defined as the condition reached when all portions of the fill lift have been subjected to the direct contact of the compacting surface of the compactor.

H. The minimum density to be obtained in compacting the fill shall be 95 percent of maximum density obtained in the laboratory in accordance with ASTM D 698, most recent revision. This percentage is of Standard Proctor density. If the field and laboratory tests indicate unsatisfactory compaction, CONTRACTOR shall provide the additional compaction necessary to obtain the specified degree of compaction. All additional compaction work shall be performed by the CONTRACTOR at no additional cost to the OWNER until the specified compaction is obtained, all additional costs associated with retesting shall be at the CONTRACTOR'S expense.

I. CONTRACTOR shall employ and pay for an independent testing service to perform compaction testing services. Testing service shall be subject to approval by the ENGINEER.

J. Fill necessary to replace subgrade materials disturbed and softened as a result of the CONTRACTOR'S operations or to backfill unauthorized excavation shall be provided, placed and compacted at no additional cost to the OWNER.

3.8 GRADING

A. General: Uniformly grade areas within limits of grading under this Section, including adjacent transition areas. Smooth subgrade surfaces within specified tolerances, compact with uniform levels or slopes between points where elevations are shown, or between such points and existing grades.

B. Grading Outside Building Lines: Grade areas adjacent to roads, and other structures to drain away from them and to prevent ponding. Finish surfaces free from irregular surface changes, and as follows:
   1. Turfed Areas or Areas Covered with Gravel, Stone, Wood Chips, or Other Special Cover: Finish areas to receive topsoil or special cover areas to within not more than 1 inch above or below the required subgrade elevations.

C. Compaction:
   1. After grading, compact subgrade surfaces to the depth and percentage of maximum density for each area classification, adding extra material and recompacting as necessary to maintain required grade and density standards.

3.9 FLOWABLE FILL MATERIAL

A. General:
   1. Place flowable fill in locations as specified or as shown on the Contract Drawings.
   2. No flowable fill shall be placed in excavations containing standing water.

3. Excavation receiving flowable fill shall be inspected and approved for backfill prior to CONTRACTOR backfilling excavation.

B. Placing:
   1. Place flowable fill in a manner to prevent segregation of aggregate material during placement of flowable fill.

3.10 DISPOSAL OF EXCAVATED MATERIALS

A. Material removed from the excavations which does not conform to the requirements of Section 02230, Select Fill, or is in excess of that required for backfill shall be disposed of by the CONTRACTOR at no additional cost to the OWNER. Material specified as contaminated soil shall be disposed of as specified in other sections of the Contract Documents. In no case shall material identified for off-site disposal be used for on-site fill.

3.11 TEMPORARY FENCING

A. CONTRACTOR shall furnish and install a temporary fence surrounding his excavations. It shall have openings only at vehicular, equipment, and pedestrian access points.

B. Upon completion of the work, the fence shall be removed from the site.

3.12 FIELD QUALITY CONTROL TESTING

A. Quality Control Testing During Construction: ENGINEER must inspect and approve subgrades and fill layers before further construction work is performed thereon.

B. If, based on results of the testing and inspection, subgrade or fills which have been placed are below specified density, CONTRACTOR shall provide additional compaction and testing at no additional expense to OWNER.

C. If the materials provided and placed by the CONTRACTOR do not meet the requirements specified then the CONTRACTOR shall remove and replace the material with approved material at no additional cost to the OWNER.

++ END OF SECTION ++

SECTION 02230

SELECT FILL

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:
   1. CONTRACTOR shall furnish all labor, materials, source evaluation testing, equipment, and incidentals required to furnish and install select fill materials as shown and specified.
   2. Select fill materials include:
      a. General Site Fill.
      b. Flowable Fill.

B. Related work specified elsewhere:
   1. Section 02200, Excavation & Backfill.
   2. Section 02052, Removal and Disposal of Tank and Associated Contaminated Soil.
   3. Section 02053, Septic Tank Abandonment.

1.2 QUALITY ASSURANCE

A. Tests: The services of a qualified testing agency shall be engaged by the CONTRACTOR to conduct tests to confirm the acceptability for the fill materials specified. Underlying layers or lifts shall not be covered until the test results have been approved by the ENGINEER. OWNER shall not be responsible for delays caused by laboratory or field testing.

PART 2 - PRODUCTS

2.1 GENERAL SITE FILL

A. Material shall be clean, free of boulders, wood, muck, mud, frozen material, organic matter, or other deleterious materials and suitable for providing a stable subsurface for construction. ENGINEER will determine if general site fill is suitable for construction.

B. Material shall be capable of being compacted as specified in Section 02220.

C. Only material approved by the ENGINEER may be placed without first stockpiling the material.

D. CONTRACTOR shall sample and test material at the following frequency or whenever a change in material occurs or as directed by the ENGINEER.

Test	Method	Frequency
Particle Size Analysis of Soils	ASTM D422	1 per 1,000 c.y.
Moisture Density Relationship of Soils and Soil Aggregate Mixtures using 4.4 lb Hammer and 12-inch Drop (Standard Proctor)	ASTM D698	1 per 1,000 c.y.

E. Off-site general fill shall meet the following gradation:

Sieve Size	Percent Passing by Weight
4 inch	100
No. 200	0 to 20

2.2 FLOWABLE FILL MATERIAL

A. Flowable fill material shall be used in locations as specified in the Contract Drawings.

B. Flowable fill shall be a cementitious backfill material that flows like a liquid and levels without tamping or vibrating to reach 95% of relative optimum compaction.

C. Flowable fill material shall conform to the following specifications:

Mix Design:
- 50 lbs./cy - cement, Portland ASTM C150, Type II
- 400 lbs/cy - Fly Ash
- 3,000 lbs/cy - Fine Aggregate (SSD)
- 350 lbs/cy - Potable water

Properties:
- 9-19.5 inch slump
- Flowability - 25 feet

PART 3 - EXECUTION

3.1 MATERIAL INSTALLATION

A. Installation of General Site Fill is specified in Section 02220, Excavation and Backfill.

B. Installation of Flowable Fill Material is specified in Section 02220, Excavation and Backfill.

+ + END OF SECTION + +

SECTION 02272

GEOSYNTHETICS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope: CONTRACTOR shall provide all labor, materials, equipment, and services necessary to the placement of geotextile separation and stabilization fabrics, as shown on the Drawings and specified.

B. Related Sections:
   1. Division 02000, Site Work.

1.2 QUALITY ASSURANCE

A. Manufacturer's Qualifications:
   1. Geosynthetic manufacturer shall be a specialist in the manufacture of the particular geosynthetic and shall have produced and successfully installed a minimum of five million square feet.

B. Submittals:
   1. Shop Drawings:
      a. Submit six copies of manufacturer's data, specifications, installation instructions and dimensions.
      b. Submit six copies of an affidavit certifying that each geosynthetic furnished complies with all requirements specified herein.
      c. No geosynthetic shall be shipped until the affidavit is submitted to ENGINEER.
      d. Geosynthetics shall be obtained from one qualified manufacturer for each type of geosynthetic.

1.3 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Each roll of geosynthetic delivered to the site shall be labelled by the manufacturer identifying the manufacturer's name, product identification, lot number, roll number and roll dimensions.

B. All geosynthetics shall be protected from ultraviolet light exposure, precipitation or other inundation, mud, dirt, dust, puncture, cutting or any other damaging or deleterious conditions. Geosynthetic rolls shall be shipped and stored in relatively opaque and watertight wrappings.

C. CONTRACTOR shall provide all labor and equipment required to assist ENGINEER in inspection of materials upon delivery to the site.

PART 2 - PRODUCTS

2.1 STABILIZATION FABRIC

A. Stabilization fabric shall be a woven pervious sheet composed of polymeric yarn or fiber and manufactured by:
   1. Amoco, 2000
   2. Or equal.

B. Stabilization fabric shall comply with the following minimum average certifiable roll values:

Property	Test Method	Value
1. Grab Tensile Strength	ASTM D4632	140 lbs
2. Grab Elongation	ASTM D4632	15%
3. Mullen Burst	ASTM D3786	325 psi
4. Puncture Strength	ASTM D4833	65 lbs
5. Trapezoid Tear Strength	ASTM D4533	45 lbs
6. Apparent Opening Size	ASTM D4751	30 sieve

C. Stabilization fabric shall be installed in locations shown on Contract Drawings.

PART 3 - EXECUTION

3.1 INSTALLATION - GENERAL

A. All geosynthetics shall be weighted with sandbags or the equivalent when required. Such sandbags shall be installed during placement and shall remain until replaced with cover material or geomembrane.

B. If white or light colored geotextile is used, precautions shall be taken against "snowblindness" of personnel.

C. CONTRACTOR shall take any necessary precautions to prevent damage to underlying layers during placement of each geosynthetic.

D. During placement of geosynthetics, care shall be taken not to entrap in the geosynthetics stone, excessive dust, or moisture that could damage the geosynthetic, generate clogging, or hamper subsequent seaming.

E. Geosynthetics shall not be exposed to precipitation prior to being installed, and shall not be exposed to direct sunlight for more than 15 days. Any materials not complying with this requirement shall be removed and replaced at no cost to the OWNER.

F. CONTRACTOR shall not operate trucks or equipment on geosynthetics without the specified depth of cover being in place.

G. Excavation of fill material over geosynthetics shall be completed by hand with plastic shovels.

H. CONTRACTOR shall place cover soils in such a manner as to prevent movement of the geosynthetics. Any geosynthetic that experiences movement or wrinkles shall be excavated, repaired or replaced at no additional cost to the OWNER.

3.2 GEOTEXTILE FABRICS

A. Geotextile fabrics shall be overlapped 12 inches.

B. Any burn mark, material defect or tear in the fabric shall be repaired as follows:
   1. A fabric patch shall be placed, overlapping the defect a minimum of 2 feet in all directions.
   2. Should any damaged area exceed 10 percent of the width of the roll, the roll shall be cut, overlapped and sewn to form a new seam.

C. If fabric overlaps are observed to be damaged or intruded with soil, fill or drainage materials during operations, CONTRACTOR shall hand excavate with plastic shovels, clean and restore seam as directed by ENGINEER.

3.3 PLACEMENT OF COVER MATERIALS

A. CONTRACTOR shall place all cover materials in such a manner to ensure: the geosynthetics are not damaged; minimal slippage of the geosynthetics on underlying layers; no excess wrinkling develops; and no excess tensile stresses in the geosynthetics are developed. A minimum of 12 inches of cover materials shall be placed prior to operating equipment above placed geosynthetics. unless otherwise specified.

++ END OF SECTION ++

SECTION 02921

TOPSOIL

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:
   1. CONTRACTOR shall provide all labor, materials, equipment and incidentals as shown, specified and required to furnish and install topsoil Work. Topsoil shall be placed upon all areas disturbed during construction including but not limited to the cap cover, swales, etc.
   2. The types of topsoil Work required include the following:
      a. Topsoil from off-site sources.
      b. Topsoil testing to provide certified acceptability of topsoil for landscape Work.
      c. Topsoil amendments, as may be required by test results to provide topsoil acceptable for landscape Work.
      d. Spreading topsoil.
      e. Maintenance Work.

B. Coordination:
   1. Review installation procedures under other Sections and coordinate the installation of items that must be installed with the topsoil.

C. Related Sections:
   1. Section 02220, Excavation and Backfill.
   2. Section 02930, Turf.

1.2 QUALITY ASSURANCE

A. Source Quality Control:
   1. Off-Site Topsoil: Obtain topsoil only from naturally well- drained sites where topsoil occurs in depth of not less than 4-inches; do not obtain from bogs or marshes.
   2. Provide analysis by recognized laboratory made in accordance with methods established by the Association of Official Analytical Chemists wherever applicable or as further specified.

B. Reference Standards: Comply with applicable provisions and recommendations of the following, except where otherwise shown or specified:
   1. ASTM C 602, Agricultural Liming Materials.
   2. ASTM D 2487, Classifications of Soils for Engineering Purposes.
   3. Association of Official Analytical Chemists, Official Methods of Analysis.

1.3 SUBMITTALS

A. Shop Drawings: Submit for approval the following:
   1. Before delivery of off-site topsoil, written statement giving the location of the properties from which the topsoil is to be obtained, the names and address of the suppliers, the depth to be stripped and the crops grown during the past 2 years.
   2. Manufacturer's specifications and application instructions for all soil amendments required.

B. Test Reports: Before delivery of off-site topsoil submit for approval a soil analysis made by an approved soil testing laboratory stating porosity, the percentages of silt, clay, sand, and organic content, the pH and the mineral and plant nutrient content of the topsoil.

C. Certificates: Submit for approval certificates of inspection as may be required by governmental authorities to accompany shipments, and manufacturer's or vendors certified analysis for soil amendments. For standard products submit other data substantiating that materials comply with specified requirements.

1.4 JOB CONDITIONS

A. Environmental Requirements: Do not spread topsoil if condition is unsuitable due to frost, excessive moisture or other conditions. Cease Work until the topsoil is in a suitable condition as determined by ENGINEER.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Topsoil:
   1. Off-site Topsoil: Fertile, friable, loamy surface soil, with the ability to support specified vegetation. Topsoil with the following analysis shall be considered to meet this requirement:
      a. 2-inch mesh, 100 percent passing.
         3/4-inch sieve, 90 to 100 percent passing.
         No. 200 sieve, 10 to 80 percent passing.
      b. Clay content of material passing No. 200 sieve not greater than 60 percent.
      c. pH 5.5 to 7.6.
      d. Organic content: 2 to 16 percent.
   2. Topsoil shall be tested by the CONTRACTOR on samples collected under the observation of the ENGINEER at the following frequency, whenever a change in consistency occurs, or as directed by the ENGINEER. ENGINEER may order additional tests as requested.

Test	Method	Frequency
Organic Content	ASTM D5268	1 per 1,000 c.y.
Sieve Analysis	ASTM D422	1 per 1,000 c.y.
pH	ASTM D4972	1 per 1,000 c.y.

B. Soil Amendments:

1. Lime: Natural limestone containing not less than 85 percent of total carbonates, ground so that not less than 90 percent passes a 10-mesh sieve and not less than 50 percent passes a 100-mesh sieve.

PART 3 - EXECUTION

3.1 INSPECTION

A. CONTRACTOR and his installer shall examine the subgrade, verify the elevations, observe the conditions under which Work is to be performed, and notify ENGINEER of unsatisfactory conditions. Do not proceed with the Work until unsatisfactory conditions have been corrected in a manner acceptable to ENGINEER.

3.2 INSTALLATION

A. Place and spread topsoil using Low Ground Pressure (LGP) equipment, over the areas shown, to a minimum depth of 6-inches after natural settlement and light rolling, in a manner that the completed work conforms to the lines and grades shown.

B. Do not spread topsoil while in a frozen condition or when moisture content is so great that excessive compaction will occur nor when so dry that dust will form in the air or that clods will not break readily.

C. Do not compact topsoil.

D. After the topsoil is spread, remove all large, stiff clods, rocks, roots, or other foreign matter over two (2) inches.

E. Apply soil amendments, as required by machine over all areas receiving topsoil, to bring the soil to a neutral pH. Work lightly into the top 3 inches of topsoil.

F. Manipulate topsoil to attain a properly drained surface.

G. Grade topsoil areas to smooth, even surface with loose, uniform, fine texture.

H. Roll and rake and remove ridges and fill all depressions, ruts, low spots, or unsuitable areas which result after settlement so that the area is suitable for subsequent work.

I. Direct contact with the geomembrane shall be minimized (i.e., the geomembrane in traffic areas shall have a minimum of 24 inches of protective soil and also be protected by geotextiles, extra geomembrane, or other suitable materials).

3.3 MAINTENANCE

A. Maintain topsoiled areas by filling in erosion channels and correcting drainage as required.

B. Maintain the topsoil in a loose, friable condition until the Work under other Sections begins.

3.4 CLEAN UP AND PROTECTION

A. During topsoiling Work, store materials and equipment where directed. Keep pavements clean and areas in an orderly condition.

B. Protection includes all temporary fences, barriers and signs and other Work incidental to proper protection.

3.5 INSPECTION AND ACCEPTANCE

A. When the topsoiling Work is completed, including maintenance, ENGINEER will make an inspection to determine acceptability.

B. Where inspected topsoil Work does not comply with the requirements, regrade rejected Work and maintain until reinspected by ENGINEER and found to be acceptable.

++ END OF SECTION ++

SECTION 02930

TURF

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:
   1. CONTRACTOR shall provide all labor, materials, equipment and incidentals as shown, specified and required to furnish and install turf Work.
   2. The extent of the turf Work shall be located in all areas disturbed during construction. No areas shall remain barren without the establishment of turf.
   3. The types of turf Work required include the following.
      a. Seeding all areas within the project boundaries.
      b. Adding soil amendments.
      c. Mulching.
      d. Replanting unsatisfactory or damaged turf.
      e. Guarantees.
      f. Maintenance for one year from the date of acceptance.

B. Coordination:
   1. Review installation procedures under other Sections and coordinate the installations of items that must be installed with the turf.

C. Related Sections:
   1. Section 02921, Topsoil.

1.2 QUALITY ASSURANCE

A. Landscape Subcontractor Qualifications: Subcontractor shall have a minimum of five years of experience of conducting substantially similar Work and shall show evidence of at least five satisfactory installations. Provide adequate supervision by a qualified foreman.

B. Source Quality Control:
   1. General: Ship turf materials with certificates of inspection as required by governmental authorities. Comply with governing regulations applicable to turf materials.
   2. Analysis and Standards: Package standard products with manufacturer's certified analysis. For other materials, provide analysis by recognized laboratory made in accordance with methods established by the Association of Official Analytical Chemists, wherever applicable or as further specified.

C. Reference Standards: Comply with applicable provisions and recommendations of the following, except where otherwise shown or specified:

1. American Joint Committee on Horticultural Nomenclature, Standardized Plant Names.
2. ASTM D 977, Emulsified Asphalt.
3. ASTM C 602, Agricultural Liming Materials.
4. FSO-F-241D, Fertilizer, Mixed, Commercial.
5. Official Seed Analysists of North America, Standards of Quality.

1.3 SUBMITTALS

A. Shop Drawings: Submit for approval the following:
   1. Planting schedule for turf installation showing, scheduled planting dates for each type of turf.
   2. Manufacturer's specifications and installation instructions for all materials required.

B. Certificates: Submit for approval the following:
   1. Certificates of inspection as may be required by governmental authorities to accompany shipments, and manufacturer's or vendors certified analysis for soil amendments and fertilizer materials. For standard products submit other data substantiating that materials comply with specified requirements.
   2. Certificates from seed vendors for each seed mixture required, stating botanical and common name, percentage by weight and percentages of purity, germination, and weed seed for each species.

C. Operation and Maintenance Data: Submit for approval typewritten instructions recommending procedures to be established by OWNER for the maintenance of turf for one full year. Submit prior to expiration of required maintenance period.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Delivery of Materials:
   1. Do not deliver seed, until site conditions are ready for planting.
   2. Deliver packaged materials in containers showing weight, analysis and name of manufacturer. Protect materials from deterioration during delivery.
   3. Furnish seed in sealed, standard containers.

B. Storage of Materials:
   1. Store and cover materials to prevent deterioration. Remove packaged materials which have become wet or show deterioration or water marks from the project site.
   2. Seed that is wet or moldy or that has been otherwise damaged in transit or storage is not acceptable. Replace at no further cost to OWNER.

1.5 JOB CONDITIONS

A. Environmental Requirements:
   1. Proceed with and complete the turf Work as rapidly as portions of the site become available, working within the seasonal limitations for each type of turf required.
   2. Do not spread seed when wind velocity exceeds 5 miles per hour.
   3. Do not plant turf when drought, or excessive moisture, or other unsatisfactory conditions prevail.

B. Scheduling:
   1. Plant or install materials only during normal planting seasons.

1.6 ALTERNATIVES

A. Do not make substitutions. If specified turf material is not obtainable, submit to ENGINEER proof of non-availability and proposal for use of equivalent material.

1.7 GUARANTEE

A. Guarantee turf through the specified maintenance period, and until Final Acceptance of the Work.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Grass Materials:
   1. Grass Seed Mixture: Provide fresh, clean, new-crop seed complying with the tolerance for purity and germination established by the Official Seed Analysts of North America. Provide seed of the grass species, proportions and minimum percentages of purity, germination, and maximum percentage of weed seed, as specified.
   2. The "Schedule of Grass Seed Requirements" is as follows:

Weight lbs/ac)	Scientific Name	Common Name
40	Fetuca rubra	Creeping Red Fescue
40	Lolium perene "Riviera"	Perennial Ryegrass"Riveria"
20	Poa pratensis	Kentucky Bluegrass
15	Lolium multiflorum	Annual Ryegrass
5	Trifolium repens	White Clover

120 lbs/ac is the seeding rate for the turf grass mixture.

   a. Weed seed content not over 0.25 percent and free of noxious weeds.

B. Soil Amendments:
   1. Lime: Natural limestone containing not less than 85 percent of total carbonates, ground so that not less than 90 percent passes a 10-mesh sieve and not less than 50 percent passes a 100-mesh sieve.

C. Fertilizers:
   1. Commercial Fertilizer: Complete fertilizer of neutral character, with a minimum of 75 percent nitrogen derived from natural organic sources or ureaform; 40-50 percent of the nitrogen shall be water soluble. Available phosphoric acid derived from superphosphate, bone, or tankage. Potash derived from muriate of potash, containing 60 percent potash. Uniform in composition, freeflowing and suitable for application with approved equipment. Provide fertilizer with the following percentages of available plant nutrients:
      a. Not less than 10 percent total nitrogen.
      b. Not less than 20 percent available phosphoric acid.
      c. Not less than 20 percent soluble potash.

D. Mulch:
   1. Anti-Erosion Mulch: Provide clean, seed-free salt hay or threshed straw of wheat, rye, oats or barley, free from noxious weeds. Materials which are low grade and unfit for farm use such as "U.S. Sample Grade" are acceptable.
   2. Wood Cellulose Fiber Pulp:
      a. Provide specially prepared wood cellulose fiber, processed to contain no growth or germination inhibiting factors, and dyed an appropriate color to facilitate visual metering of application of the materials.
      b. Supply in packages having a gross weight not in excess of 60 pounds.
      c. Moisture content not to exceed 10 percent air dry weight, manufactured so that after addition and agitation in slurry tank the fibers become uniformly suspended to form a homogeneous slurry that when hydraulically sprayed on the ground the material will form a blotter like ground cover impregnated uniformly with seed and which after application allows the absorption of moisture, either rainfall or mechanical watering, to percolate to the underlying soil.
      d. Product and Manufacturer: Provide one of the following:
         1) Conwed Virgin Wood Fiber Mulch by Conwed Incorporated.
         2) Silva Fiber by Weyerhaeuser Company.
         3) Or equal.

E. Water: Potable.

PART 3 - EXECUTION

3.1 INSPECTION

A. CONTRACTOR and his installer shall examine the topsoil, verify the elevations, and depth of topsoil, observe the conditions under which Work is to be performed, and notify ENGINEER of unsatisfactory conditions. Do not proceed with the Work until unsatisfactory conditions have been corrected in a manner acceptable to ENGINEER.

3.2 SOIL PREPARATION

A. Apply ground limestone, by machine, over all areas to receive turf, as required, to bring the soil to a neutral pH. Work lightly into the top 3 inches of topsoil at least five days before applying the commercial fertilizers.

B. Apply commercial fertilizers in the following quantities:
   1. 10-20-20 fertilizer shall be applied at a rate of 300 lb/acre.

C. Apply commercial fertilizers within 10 days of planting.

D. Apply commercial fertilizers in 2 operations. First application shall be 3/4 of total amount.

E. Thoroughly and evenly incorporate commercial fertilizers with the soil to depth of 3 inches by discing, or other approved method.
   1. In areas inaccessible to power equipment, use hand tools.
   2. Adjacent to existing trees, adjust depth to avoid disturbing roots.

F. Grade planting areas to smooth, even surface with loose, uniformly fine texture. Remove all stones and extraneous foreign material in excess of 1-inch diameter. Roll and rake and remove ridges and fill depressions, as required to meet finish grades. Limit fine grading to areas which can be planted immediately after grading.

G. Apply a second dressing of fertilizer. Use 1/4 of the total required amount.

H. Moisten prepared planting areas before seeding, if soil is dry. Water thoroughly and allow surface moisture to dry before planting. Do not create a muddy soil condition.

I. Restore planting areas to specified condition if eroded or otherwise disturbed after fine grading and prior to seeding.

3.3 INSTALLATION

A. Seeding:
   1. Sow seed using a spreader or seeding machine.
   2. Distribute seed evenly over entire area by sowing equal quantity in 2 directions at right angles to each other.

3. Sow not less than the quantity of seed specified.
4. Cultipacker, or approved similar equipment, may be used to cover the seed and to firm the seedbed in one operation. In areas inaccessible to cultipacker:
   a. Rake the seed lightly into top 1/8 inch of soil, roll in two directions with a water ballast roller, weighing not less than 100 pounds per linear foot.
   b. Take care during raking that seed is not raked from one spot to another.
5. Protect seeded areas against erosion by spreading specified lawn mulch after completion of seeding operations.
   a. Spread anti-erosion mulch to form a continuous blanket not less than 1-1/2-inch loose measurement over seeded areas. Provide mulch with a partial coating of emulsified asphalt. Place mulch using either of the following methods:
      1) Anchor mulch by spraying with asphalt emulsion at the rate of 10 to 13 gallons per 1000 square feet.
      2) Place mulch with equipment that will blow or eject, by means of a constant air stream, controlled quantities of the mulch and asphalt in a uniform pattern over the specified area. If the mulch is excessively cut or broken take measures to reduce the cutting or breakage to a limit approved by ENGINEER. Introduce the asphalt into the air stream by means of a spray arranged so that it will partially coat the mulch with a spotty asphalt tack prior to the depositing of the mulch covering. Rate of application not less than 75 gallons per ton of mulch.
6. Do not leave seeded areas unmulched for longer than 3 days. Reseed areas which remain without mulch for longer than 3 days.
7. Prevent foot or vehicular traffic, or the movement of equipment, over the mulched area. Reseed areas damaged as a result of such activity.
8. Water seeded areas thoroughly with a fine spray.
9. CONTRACTOR may apply the seed using one of the following methods:
   a. Apply seed dry, and mulch, as specified for grass seed.
   b. Use hydraulic equipment for spreading a slurry of seed, fertilizer, limestone and wood cellulose fiber pump as follows:
      1) Use seeder equipped with a power driven built-in agitation system with an operating capacity sufficient to agitate, suspend and homogeneously mix a slurry containing the specified materials plus 200 pounds per acre of wood cellulose fiber pulp.
      2) Spray the slurry over the area to be crownvetched so that a uniform thickness of slurry is deposited on the soil.
      3) Immediately apply mulch. Mulch may be clean straw or timothy hay (with asphalt tack) at 2.5 tons per acre, or wood cellulose pulp at 1,200 pounds per acre. Long exposure between steps 1 and 2 will permit the sun and wind to kill the inoculating bacteria which may result in failure.
      4) Prevent damage or staining of construction or other planting adjacent to hydro seeded and mulched areas.
      5) Prevent foot or vehicular traffic, or the movement of equipment over the mulched area. Reseed areas damaged as a result of such activity.
10. Water seed applied by the dry method thoroughly with a fine spray as specified.

3.4 MAINTENANCE

A. The CONTRACTOR shall begin maintenance of the seeded areas immediately after planting and shall continue for one year from date of acceptance of the work by the ENGINEER.

B. Maintain turf grass by fertilizing, mowing and reseeding as required to establish acceptable growth free of eroded or bare areas.
   1. Mowing: Maintain turf grass by mowing during the growing season. Mowing shall take place in June/July and August/September. Do not remove more than 1/3 of grass height. Do not mow when grass is wet.
   2. After grass has started, reseed repeatedly all areas greater than 12 inches square which fail to show a uniform stand of turf grass for any reason whatsoever until all areas are covered with a satisfactory stand of turf grass, as determined by ENGINEER.

3.5 CLEANUP AND PROTECTION

A. During turf Work, store materials and equipment where directed. Keep pavements clean and work area in an orderly condition.

B. Protect turf Work and materials from damage due to operations by other contractors and trades and trespassers. Maintain protection during installation and maintenance periods. Treat, repair or replace damaged turf Work as directed.

C. Take all precautions to insure that hydroseed slurry, is only placed on the areas designated. Completely clean any overspray, on areas not designated to receive slurry, to the satisfaction of ENGINEER.

D. Remove all rubbish, equipment and rejected materials from the project site.

E. Protection includes all temporary fences, barriers and signs and other work incidental to proper maintenance.

3.6 INSPECTION AND ACCEPTANCE

A. When the turf Work is completed, including maintenance, ENGINEER will, make an inspection to determine acceptability.

B. Seeded areas will be acceptable provided all requirements, including maintenance, have been complied with, and a healthy, uniform, close stand of the specified grass is established, free of weeds, bare spots and surface irregularities.

++ END OF SECTION ++

APPENDIX A

NYSDEC TAGM No. HWR-89-4031

New York State Department of Environmental Conservation

MEMORANDUM

TO: Regional Hazardous Waste Remediation Engrs., Bur. Directors & Section Chiefs
FROM: Michael J. O'Toole, Jr., Director, Division of Hazardous Waste Remediation
SUBJECT: DIVISION TECHNICAL AND ADMINISTRATIVE GUIDANCE MEMORANDUM--FUGITIVE DUST SUPPRESSION AND PARTICULATE MONITORING PROGRAM AT INACTIVE HAZARDOUS WASTE SITES
DATE: OCT 2 7 1989

1. Introduction

Fugitive dust suppression, particulate monitoring, and subsequent action levels for such must be used and applied consistently during remedial activities at hazardous waste sites. This guidance provides a basis for developing and implementing a fugitive dust suppression and particulate monitoring program as an element of a hazardous waste site's health and safety program.

2. Background

Fugitive dust is particulate matter--a generic term for a broad class of chemically and physically diverse substances that exist as discrete particles, liquid droplets or solids, over a wide range of sizes--which becomes airborne and contributes to air quality as a nuisance and threat to human health and the environment.

On July 1, 1987, the United States Environmental Protection Agency (USEPA) revised the ambient air quality standard for particulates so as to reflect direct impact on human health by setting the standard for particulate matter less than ten microns in diameter (PM_{10}); this involves fugitive dust whether contaminated or not. Based upon an examination of air quality composition, respiratory tract deposition, and health effects, PM_{10} is considered conservative for the primary standard--that requisite to protect public health with an adequate margin of safety. The primary standards are 150 ug/m^3 over a 24-hour averaging time and 50 ug/m^3 over an annual averaging time. Both of these standards are to be averaged arithmetically.

There exists real-time monitoring equipment available to measure PM_{10} and capable of integrating over a period of six seconds to ten hours. Combined with an adequate fugitive dust suppression program, such equipment will aid in preventing the off-site migration of contaminated soil. It will also protect both on-site personnel from exposure to high levels of dust and the public around the site from any exposure to any dust. While specifically intended for the protection of on-site personnel as well as the public, this program is not meant to replace long-term monitoring which may be required given the contaminants inherent to the site and its air quality.

3. Guidance

A program for suppressing fugitive dust and monitoring particulate matter at hazardous waste sites can be developed without placing an undue burden on remedial activities while still being protective of health and environment. Since the responsibility for implementing this program ultimately will fall on the party performing the work, these procedures must be incorporated into appropriate work plans. The following fugitive dust suppression and particulate monitoring program will be employed at hazardous waste sites during construction and other activities which warrant its use:

(1) Reasonable fugitive dust suppression techniques must be employed during all site activities which may generate fugitive dust.

(2) Particulate monitoring must be employed during the handling of waste or contaminated soil or when activities on site may generate fugitive dust from exposed waste or contaminated soil. Such activities shall also include the excavation, grading, or placement of clean fill, and control measures therefore should be considered.

(3) Particulate monitoring must be performed using real-time particulate monitors and shall monitor particulate matter less than ten microns (PM_{10}) with the following minimum performance standards:

Object to be measured: Dusts, Mists, Aerosols
Size range: <0.1 to 10 microns
Sensitivity: 0.001 mg/m^3
Range: 0.001 to 10 mg/m^3
Overall Accuracy: ±10% as compared to gravimetric analysis of stearic acid or reference dust

Operating Conditions:
Temperature: 0 to 40°C
Humidity: 10 to 99% Relative Humidity

Power: Battery operated with a minimum capacity of eight hours continuous operation

Automatic alarms are suggested.

Particulate levels will be monitored immediately downwind at the working site and integrated over a period not to exceed 15 minutes. Consequently, instrumentation shall require necessary averaging hardware to accomplish this task; the P-5 Digital Dust Indicator as manufactured by MDA Scientific, Inc. or similar is appropriate.

(4) In order to ensure the validity of the fugitive dust measurements performed, there must be appropriate Quality Assurance/Quality Control (QA/QC). It is the responsibility of the entity operating the equipment to adequately supplement QA/QC Plans to include the following critical features: periodic instrument calibration, operator training, daily instrument performance (span) checks, and a record keeping plan.

(5) The action level will be established at 150 ug/m^3 over the integrated period not to exceed 15 minutes. While conservative, this short-term interval will provide a real-time assessment of on-site air quality to assure both health and safety. If particulate levels are detected in excess of 150 ug/m^3, the upwind background level must be measured immediately using the same portable monitor. If the working site particulate measurement is greater than 100 ug/m^3 above the background level, additional dust suppression techniques must be implemented to reduce the generation of fugitive dust and corrective action taken to protect site personnel and reduce the potential for contaminant migration. Corrective measures may include increasing the level of personal protection for on-site personnel and implementing additional dust suppression techniques (see Paragraph 7). Should the action level of 150 ug/m^3 be exceeded, the Division of Air Resources must be notified in writing within five working days; the notification shall include a description of the control measures implemented to prevent further exceedences.

(6) It must be recognized that the generation of dust from waste or contaminated soil that migrates off-site, has the potential for transporting contaminants off-site. There may be situations when dust is being generated and leaving the site and the monitoring equipment does not measure PM_{10} at or above the action level. Since this situation has the potential to migrate contaminants off-site, it is unacceptable. While it is not practical to quantify total suspended particulates on a real-time basis, it is appropriate to rely on visual observation. If dust is observed leaving the working site, additional dust suppression techniques must be employed. Activities that have a high dusting potential--such as solidification and treatment involving materials like kiln dust and lime--will require the need for special measures to be considered.

(7) The following techniques have been shown to be effective for the controlling of the generation and migration of dust during construction activities:

1. Applying water on haul roads.
2. Wetting equipment and excavation faces.
3. Spraying water on buckets during excavation and dumping.
4. Hauling materials in properly tarped or watertight containers.
5. Restricting vehicle speeds to 10 mph.
6. Covering excavated areas and material after excavation activity ceases.
7. Reducing the excavation size and/or number of excavations.

Experience has shown that utilizing the above-mentioned dust suppression techniques, within reason as not to create excess water which would result in unacceptable wet conditions, the chance of exceeding the 150 ug/m^3 action level at hazardous waste site remediations is remote. Using atomizing sprays will prevent overly wet conditions, conserve water, and provide an effective means of suppressing the fugitive dust.

(8) If the dust suppression techniques being utilized at the site do not lower particulates to an acceptable level (that is, below 150 ug/m^3 and no visible dust), work must be suspended until appropriate corrective measures are approved to remedy the situation. Also, the evaluation of weather conditions will be necessary for proper fugitive dust control--when extreme wind conditions make dust control ineffective, as a last resort remedial actions may need to be suspended.

There may be situations that require fugitive dust suppression and particulate monitoring requirements with action levels more stringent than those provided above. Under some circumstances, the contaminant concentration and/or toxicity may require appropriate toxics monitoring to protect site personnel and the public. Additional integrated sampling and chemical analysis of the dust may also be in order. This must be evaluated when a health and safety plan is developed and when appropriate suppression and monitoring requirements are established for protection of health and the environment.

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D. Ritter
Regional Directors
Regional Engineers
RSHWE
Reg. Citizen Participation Specs.

APPENDIX B

USEPA TO-4

METHOD FOR THE DETERMINATION OF ORGANOCHLORINE PESTICIDES AND POLYCHLORINATED BIPHENYLS IN AMBIENT AIR

1. Scope

1.1 This document describes a method for determination of a variety or organochlorine pesticides and polychlorinated biphenyls (PCBs) in ambient air. Generally, detection limits of > 1 ng/m^3 are achievable using a 24-hour sampling period.

1.2 Specific compounds for which the method has been employed are listed in Table 1. Several references are available which provide further details on the development and application of the method. The sample cleanup and analysis methods are identical to those described in U.S. EPA Method 608. That method is included as Appendix A of this methods compendium.

2. Applicable Documents

2.1 ASTM Standards

D1356 Definition of Terms Related to Atmospheric Sampling and Analysis (7).

2.2 Other Documents
Ambient Air Studies (1-3)
U.S. EPA Technical Assistance Document (4).
U.S. EPA Method 608 (5). See Appendix A of methods compendium.

3. Summary of Method

3.1 A modified high volume sampler consisting of a glass fiber filter with polyurethane foam (PUF) backup absorbent cartridge is used to sample ambient air at a rate of ~200-280 L/minute.

3.2 The filter and PUF cartridge are placed in clean, sealed containers and returned to the laboratory for analysis. The PCBs and pesticides are recovered by Soxhlet extraction with 5% ether in hexane.

3.3 The extracts are reduced in volume using Kuderna-Danish (K-D) concentration techniques and subjected to column chromatographic cleanup.

3.4 The extracts are analyzed for pesticides and PCBs using gas chromatography with electron capture detection (GC-ECD), as described in U.S. EPA Method 608 (5).

4. Significance

4.1 Pesticides, particularly organochlorine pesticides, are widely used in both rural and urban areas for a variety of applications. PCBs are less widely used, due to extensive restrictions placed on their manufacture. However, human exposure to PCBs continues to be a problem because of their presence in various electrical products.

4.2 Many pesticides are PCBs exhibit bioaccumulative, chronic health effects and hence monitoring ambient air for such compounds is of great importance.

4.3 The relatively low levels of such compounds in the environment requires the use of high volume sampling techniques to acquire sufficient sample for analysis. However, the volatility of these compounds prevents efficient collection on filter media. Consequently, this method utilizes both a filter and a PUF backup cartridge which provides for efficient collection of most organochlorine pesticides, PCBs, and many other organics within the same volatility range.

5. Definitions

Definitions used in this document and any user-prepared SOPs should be consistent with ASTM D1356 (7). All abbreviations and symbols are defined within this document at the point of use.

6. Interferences

6.1 The use of column chromatographic cleanup and selective GC detection (GC-ECD) minimizes the risk of interference from extraneous organic compounds. However, the fact that PCBs as well as certain organochlorine pesticides (e.g., toxaphene and chlordane) are complex mixtures of individual compounds can cause difficulty in accurately quantifying a particular formulation in a multiple component mixture.

6.2 Contamination of glassware and sampling apparatus with traces of pesticides or PCBs can be a major source of error in the method, particularly when sampling near high level sources (e.g., dumpsites, waste processing plants, etc.) Careful attention to cleaning and handling procedures is required in all steps of the sampling and analysis to minimize this source of error.

7. Apparatus

7.1 Hi-Vol Sampler with PUF cartridge - available from General Metal Works (Model PS-1). See Figure 1.

7.2 Sampling Head to contain glass cartridge with PUF plug - available from General Metal Works. See Figure 2.

7.3 Calibration orifice - available from General Metal Works.

7.4 Manometer - to use with calibration orifice.

7.5 Soxhlet extraction system - including Soxhlet extractors (500 and 250 mL), heating mantels, variable voltage transformers, and cooling water source - for extraction of PUF cartridges before and after sampling. Also for extraction of filter samples.

7.6 Vacuum oven connected to water aspirator - for drying extracted PUF cartridges.

7.7 Gas chromatograph with electron capture detector - (consult U.S. EPA Method 608 for specifications).

7.8 Forceps - to handle quartz fiber filter samples.

7.9 Die - to cut PUF plugs.

7.10 Various items for extract preparation, cleanup, and analysis - consult U.S. EPA Method 608 for detailed listing.

7.11 Chromatography column - 2 mm I.D. x 15 cm long - for alumina cleanup.

8. Reagent and Materials

8.1 Polyurethane foam - 3 inch thick sheet stock, polyether type used in furniture upholstering. Density 0.022 g/cm^3.

15.3.6 A third PUF cartridge is spiked with the same amounts of the compounds used in 14.3.2 and extracted to determine analytical recovery.

15.3.7 In general analytical recoveries and collection efficiencies of 75% are considered to be acceptable method performance.

15.3.8 Replicate (at least triplicate) determinations of collection efficiency should be made. Relative standard deviations for these replicate determinations of ± 15% or less is considered acceptable performance.

15.3.9 Blind spiked samples should be included with sample sets periodically, as a check on analytical performance.

15.4 Method Precision and Accuracy

Typical method recovery data are shown in Table 1. Recoveries for the various chlorobiphenyls illustrate the fact that all components of an Arochlor mixture will not be retained to the same extent. Recoveries for tetrachlorobiphenyls and above are generally greater than 85% but di- and trichloro homologs may not be recovered quantitatively.

REFERENCES

1. Lewis, R. G., Brown, A. R., and Jackson, M. D., "Evaluation of Polyurethane Foam for Sampling of Pesticides, Polychlorinated Biphenyls, and Polychlorinated Naphthalenes in Ambient Air", Anal. Chem. 49, 1668-1672, 1977.

2. Lewis, R. G. and Jackson, M. D., "Modification and Evaluation of a High-Volume Air Sampler for Pesticides and Semivolatile Industrial Organic Chemicals", Anal. Chem. 54, 592-594, 1982.

3. Lewis, R. G., Jackson, M. D., and MacLeod, K. E., "Protocol for Assessment of Human Exposure to Airborne Pesticides", EPA-600/2-80-180, U.S. Environmental Protection Agency, Research Triangle Park, NC, 1980.

4. Riggin, R. M., "Technical Assistance Document for Sampling and Analysis of Toxic Organic Compounds in Ambient Air", EPA-600/4-83-027, U.S. Environmental Protection Agency, Research Triangle Park, NC, 1983.

5. Longbottom, J. E. and Lichtenberg, J. J., "Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater", EPA-600/4-82-057, U. S. Environmental Protection Agency, Cincinnati, OH, 1982.

6. Bjorkland, J., Compton, B., and Zweig, G., "Development of Methods for Collection and Analysis of Airborne Pesticides." Report for Contract No. CPA 70-15, National Air Pollution Control Association, Durham, NC, 1970.

7. Annual Book of ASTM Standards, Part 11.03, "Atmospheric Analysis", American Society for Testing and Materials, Philadelphia, PA, 1983.

8. Reference Method for the Determination of Suspended Particulates in the Atmosphere (High Volume Method). Federal Register, Sept. 14, 1972 or 40CFR50 Appendix B.

TABLE 1. SELECTED COMPONENTS DETERMINED USING HI-VOL/PUF SAMPLING PROCEDURE

Compound	GC Retention Time, Minutes[a]	24-Hour Sampling Efficiency[b] Air Concentration ng/m³	% Recovery
Aldrin	2.4	0.3 - 3.0	28
4,4'-DDE	5.1	0.6 - 6.0	89
4,4'-DDT	9.4	1.8 - 18	83
Chlordane	(c)	15 - 150	73
Chlorobiphenyls			
4,4' Di-	--	2.0 - 20	62
2,4,5 Tri-	---	0.2 - 2.0	36
2,4',5 Tri-	--	0.2 - 2.0	86
2,2',5,5' Tetra-	--	0.2 - 2.0	94
2,2',4,5,5' Penta-	--	0.2 - 2.0	92
2,2',4,4',5,5' Hexa	--	0.2 - 2.0	86

(a) Data from U.S. EPA Method 608. Conditions are as follows:

Stationary Phase - 1.5% SP2250/1.95% SP-2401 on Supelcoport (100/120 mesh) packed in 1.8 mm long x 4mm ID glass column.

Carrier - 5/95 methane/Argon at 60 mL/Minute

Column Temperature - 160°C except for PCBs which are determined at 200°C.

(b) From Reference 2.

(c) Multiple component formulation. See U.S. EPA Method 608.

FIGURE 1. HIGH VOLUME AIR SAMPLER. AVAILABLE FROM GENERAL METAL WORKS (MODEL PS-1)

FIGURE NOT PROVIDED

SEE ORIGINAL DOCUMENT

FIGURE 2. SAMPLING HEAD

Performed by _____ Calibration Orifice S/N _____ Ambient Temperature _____ °C
Date/Time _____ Manometer S/N _____ Bar. Press. _____ mm Hg

Sampler S/N	Variac Setting V	Timer OK? Yes/No	Calibration Orifice Data		Sampler Venturi Data		% Difference Between Calibration and Sample Venturi Flow Rates.	Comments
			Manometer, in. H_2O	Flow Rate, scm/min [a]	Magnehelic, in. H_2O	Flow Rate scm/min [b]		

(a) From Calibration Tables for Calibration Orifice or Venturi Tube

(b) From Calibration Tables for Venturi Tube in each Hi-Vol unit.

Date Check by _____ Date _____

FIGURE 3. TYPICAL CALIBRATION SHEET FOR HIGH VOLUME SAMPLER

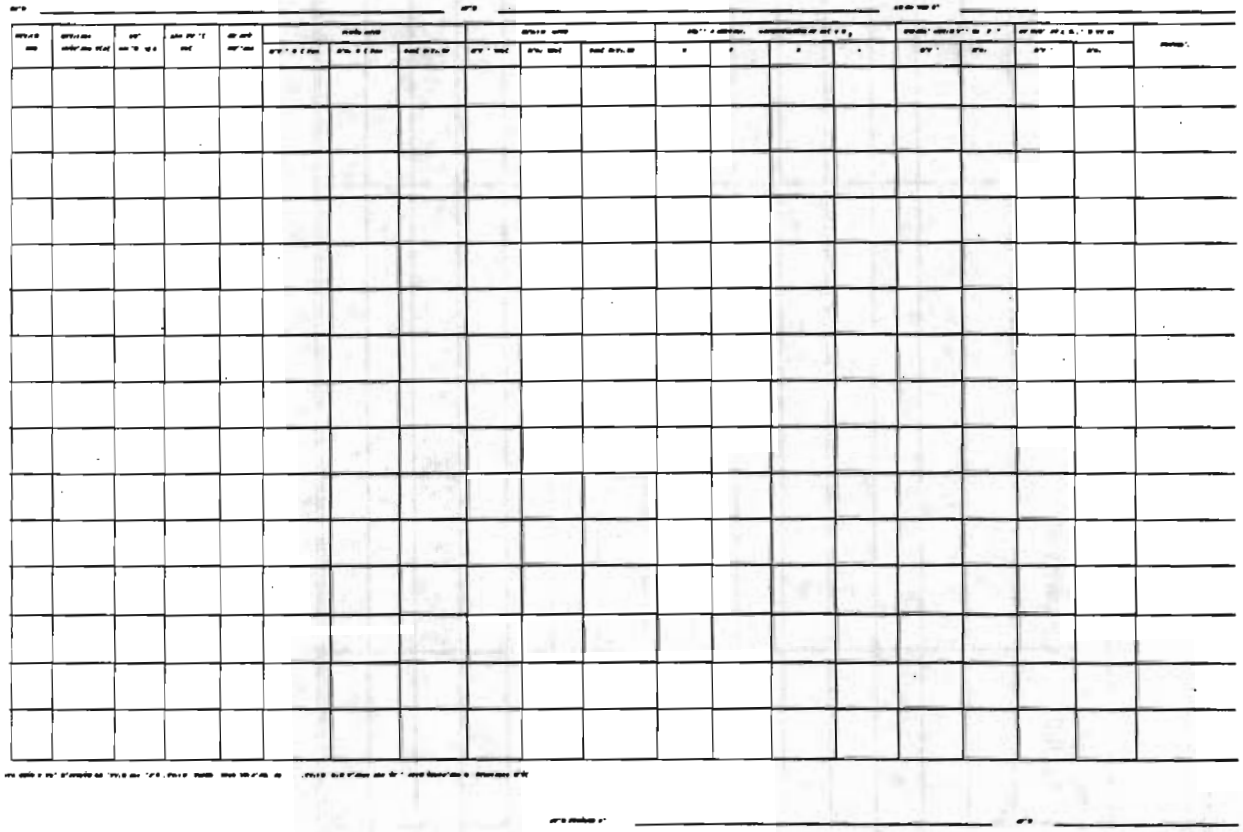

FIGURE 4. TYPICAL SAMPLING DATA FROM FOR HIGH VOLUME PESTICIDES/PCB SAMPLER

APPENDIX C

Asbestos Survey Report

Testwell Laboratories, Inc.
Environmental & Construction Services

30 Corporate Circle Suite 131
Albany, New York 12203
Tel: (518) 464-6039
Fax: (518) 464-9522

Asbestos Demolish Survey

Orkin Pest Control Site
South Glens Falls, New York

For

Orkin Pest Control

Generated on:

3/8/99

TESTWELL LABORATORIES, INC.

Brian K. McLaren
Project Manager
30 Corporate Circle suite 131
Albany, New York 12203

Tel: (518) 464-6039 Fax: (518) 464-9522

TLI Testwell Laboratories, Inc.
Environmental & Construction Services

30 Corporate Circle Suite 131
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Tel: (518) 464-6039
Fax: (518) 464-9522

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2). Pink Maps
3). Bulk Reports

Section 3: Testwell Laboratories Inc.

1). Department of Labor License
2). Albany N.Y.S. ELAP Certifications
3). Ossining N.Y.S. ELAP Certifications
4). The American Industrial Hygiene Association
5). NVLAP Certifications (Air & Bulks)
6). Department of Labor Certifications
7). McCrone Certifications

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Asbestos Survey Investigation

Executive Summary

The Shed, Garage and portion of the office building has been inspected and evaluated during the development of this Asbestos Survey Investigation, for Asbestos Containing Building Materials (ACBM).

Inspection Procedures:

An asbestos survey investigation was conduced on the above-unoccupied buildings. The survey was done in accordance with 12 NYCRR Part 56 (56 1.9) requirements and 40 CFR 763 and the new OSHA Regulation.

Building History: The above referenced buildings were built in the late 1950's. All structures except the office building are 1 story structure with a slab on grade. The office building has a full basement the garage and the shed are slab on grade. The exteriors are wood siding and masonry block walls with a flat and pitch roofs.

1).	Shed:	No asbestos containing material was found.
2):	Garage:	Rolled roofing was the only asbestos containing material found.
3):	Shed:	Thermal System Insulation (TSI) was assumed to be in the basement area. White linoleum (ACBM) was assumed to be in the bathroom based on visual observations. Direct access to these areas of the building was not possible because of the degraded condition of the structure.

The sampling Scheme consists of assigning each room in the building a functional space number, and identify all suspect asbestos containing material and grouping them into homogeneous Categories which are also numbered.

Inspection procedures were conducted in accordance with the requirements of the AHERA Regulations, HUD guide lines new OSHA requirements and New York State Code Rule 56 to the best of the contributing inspector's abilities. A Certified Inspector performed all inspecting and bulk sampling.

All friable bulk samples were tested using polarized light microscopy (PLM), EPA interim method using dispersion staining, Non-Friable Organically Bound Material By ELAP, to determine the asbestos content. Polarized light microscopy is not consistently reliable in detecting asbestos in floor coverings and similar non-friable organically bound materials. Before this material can be considered or treated as non-asbestos containing, confirmation must be made by quantitative transmission electron microscopy. All tests performed by a Certified Lab Technician.

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Asbestos Survey Investigation

Assessments - Recommendations

If this building is schedule to be rehabilitation. Removal of all Asbestos Containing Building Material must be removed by license Asbestos Contractor before the building is remodeling. Removal required under EPA, NYS, OSHA, PESHA and NESHAP Regulations (40 CFR Part 61).

Final Remedial - Recommendations & Responses

Management Planners recommendations, response choice and reasons.

Rolled Roofing, Felts & White Linoleum	1,010 Sq. Ft. of Non-Friable Removals	$ 3,500.00
Thermal System Insulation	135 Ln. Ft. of Friable Removals	$ 2,000.00
Boiler Insulation & Chimney Packing	34 Sq. Ft. of Friable Removals	$ 1,000.00

Project Air Monitoring Cost for over all project $ 1,200.00

Estimated Cost to remove ACBM ..... $ 7,700.00

Qualifications \ Accreditation

The NYS Labor Department certifies Testwell Laboratories, Inc. Albany Division as a License Asbestos Contractor, is certified by the NYS Health Department for analysis of air and bulk asbestos samples (ELAP 10871), as well as by the National Voluntary Laboratory Accreditation Program (EPA NVLAP 1102) and AIHA American Industrial Hygiene Association.

Brian K. McLaren - Certified Inspector/Management Planner AH: 88-10819

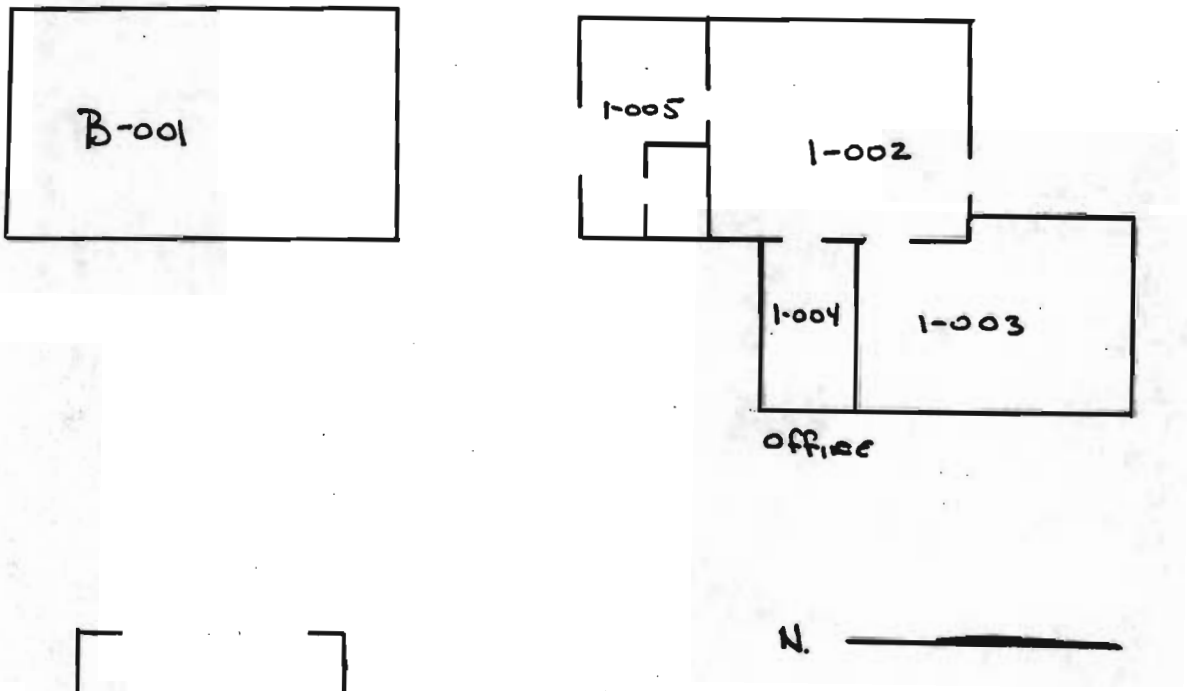
As the certified Inspector/Management Planner responsible for development of this Survey plan, I certify that it has been written and reviewed in a manner, which is in full compliance with the Applicable rules and regulations as required by Federal Regulations 40 CFR, Part 763.

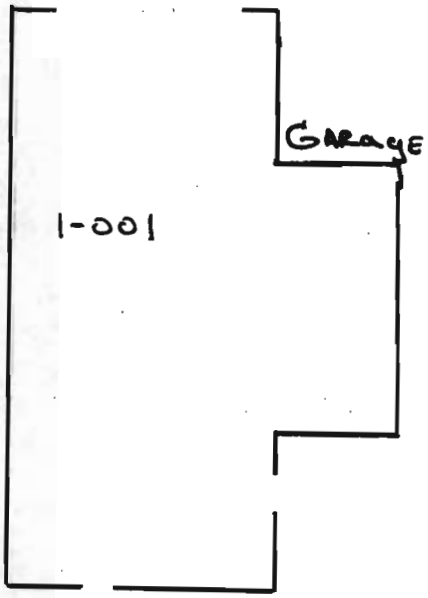
Testwell Laboratories, Inc.

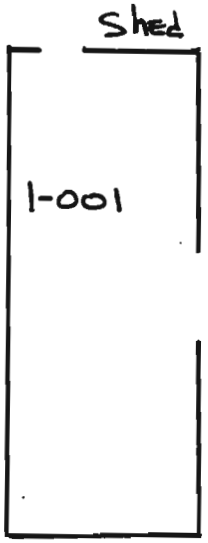
Brian K. McLaren

Brian K. McLaren
Project Manager

TESTWELL LABORATORIES, INC.
30 Corporate Circle Suite 131
Albany, New York 12203







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Orkin Pest Control

Orkin Pest Control Site in Moreau
South Glens Falls New York

Garage Building

Index of Homogeneous Area

Areas underlined type are confirmed Asbestos Containing Building Material (ACBM)

0001	Rolled Roof & Felts	Confirmed ACBM
0002	Shingle Siding & Felts	Non ACBM
0003	Window Putty	Non ACBM

TESTWELL LABORATORIES, INC.
30 Corporate Circle Suite 131
Albany, New York 12203

Building Name:	Orkin Pest Control Site, Garage	Level No.:	Roof
Functional Space:	Exterior	Space I.D. #:	Roof

Homogenous Material List

Material:	Non Friable	Amount	Damaged
0001 Rolled Roofing & Felts	Non Friable	300 Sq. Ft.	0 Sq. Ft.
0002 Shingle Siding & Felts	Non Friable	20 Sq. Ft.	0 Sq. Ft.
0003 Window Putty	Non Friable	5 Ln. Ft.	0 Sq. Ft.

Recommended Response Actions:

Homogenous 0001 is Confirmed ACM.

Homogenous 0002 & 0003 is non ACM.

Notes/Comments:

All Non Friable Asbestos should be removed from this building before it is demolished under NESHAPS, EPA, NYSDOL, OSHA & HUD Regulations.

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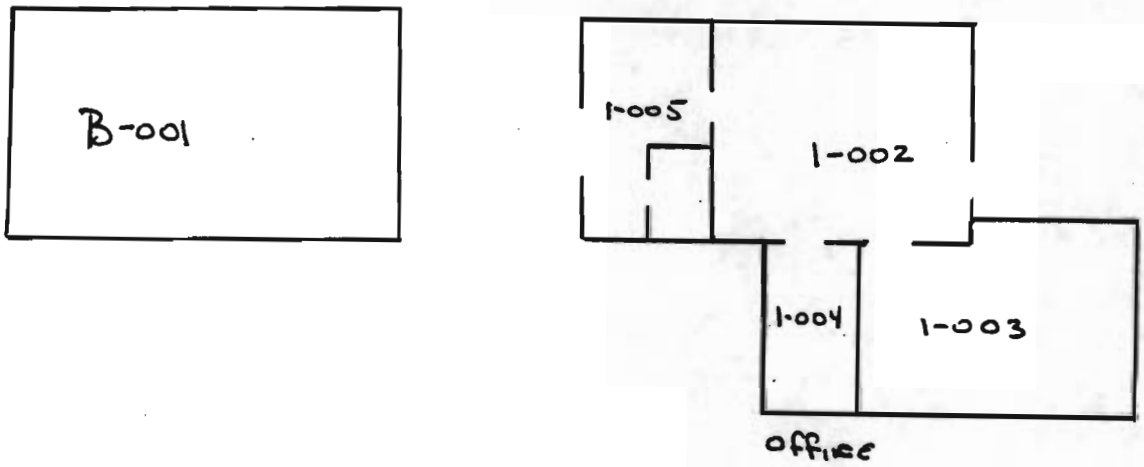
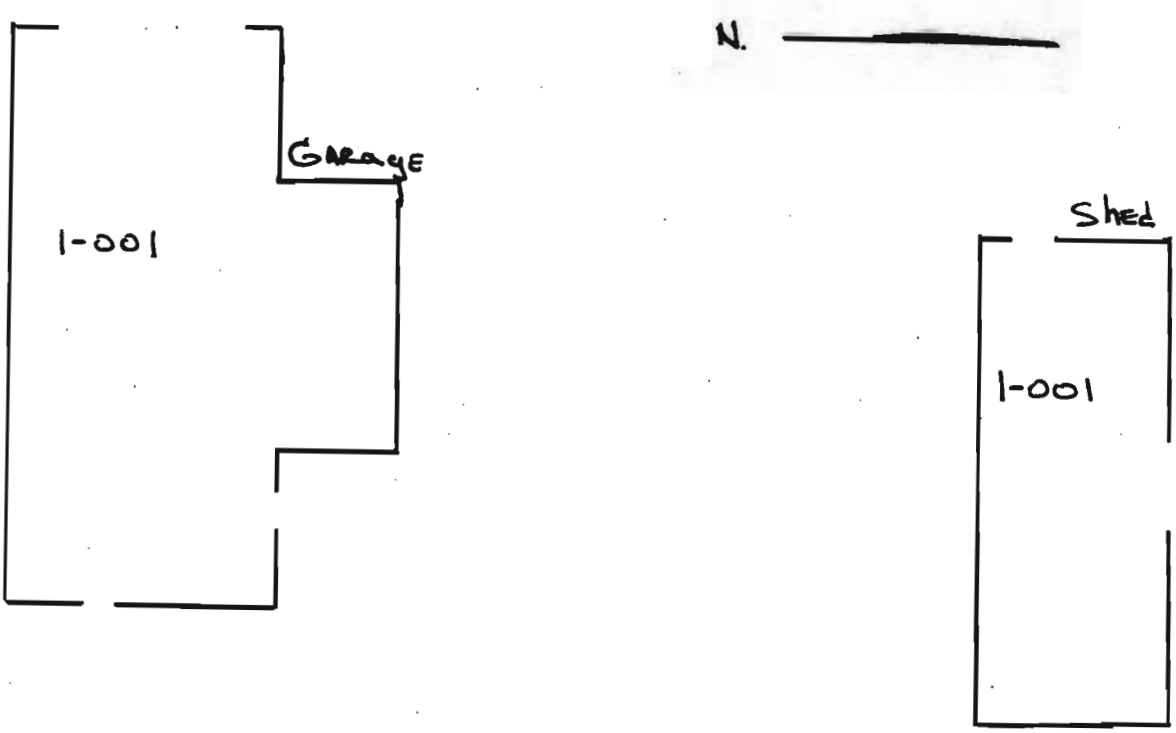
Albany, New York 12203





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Orkin Pest Control

Orkin Pest Control Site in Moreau
South Glens Falls New York

Shed Building

Index of Homogeneous Area

Areas underlined type are confirmed Asbestos Containing Building Material (ACBM)

0001 Shingle Siding & Felts — Non ACBM

TESTWELL LABORATORIES, INC.
30 Corporate Circle Suite 131
Albany, New York 12203

Building Name:	Orkin Pest Control Site, Shed	Level No.:	Roof
Functional Space:	Exterior	Space I.D. #:	Roof

Homogenous Material List

Material:	Non Friable	Amount	Damaged
0001 Shingle Siding & Felts	Non Friable	90 Sq. Ft.	0 Sq. Ft.

Recommended Response Actions:

Homogenous 0001 is Non-ACM.

Notes/Comments:

All Non Friable Asbestos should be removed from this building before it is demolished under NESHAPS, EPA, NYSDOL, OSHA & HUD Regulations.

TLI Testwell Laboratories, Inc.
Environmental & Construction Services

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Albany, New York 12203
Tel: (518) 464-6039
Fax: (518) 464-9522

Orkin Pest Control

Orkin Pest Control Site in Moreau
South Glens Falls New York

Office Building

Index of Homogeneous Area

Areas underlined type are confirmed Asbestos Containing Building Material (ACBM)

0001	Aircell Pipe Insulation	Assumed ACBM
0002	Pipe Fitting Insulation	Assumed ACBM
0003	Boiler Insulation	Assumed ACBM
0004	Chimney Packing Insulation	Assumed ACBM
0005	Gypsum Board	Non ACBM
0006	1x1 Ceiling Tile	Non ACBM
0007	White Linoleum	Assumed ACBM
0008	Rolled Roofing & Felts	Confirmed ACBM
0009	Window Putty	Non ACBM
0010	Masonite Board	Non ACBM

TESTWELL LABORATORIES, INC.
30 Corporate Circle Suite 131
Albany, New York 12203

Building Name:	Orkin Pest Control Site, Office	Level No.:	Basement
Functional Space:	Basement	Space I.D. #:	B-001

Homogenous Material List

Material:	Non Friable	Amount	Damaged
0001 Aircell Pipe Insulation	Friable	100 Ln. Ft.	100 Ln. Ft.
0002 Pipe Fitting Insulation	Friable	35 Ln. Ft.	35 Ln. Ft.
0003 Boiler Insulation	Friable	32 Sq. Ft.	32 Sq. Ft.
0004 Chimney Packing	Friable	2 Sq. Ft.	2 Sq. Ft.

Recommended Response Actions:

Homogenous 0001, 0002, 0003 & 0004 is Assumed ACM.

Notes/Comments:

All Friable and Non Friable Asbestos should be removed from this building before it is Demolished under NESHAPS, EPA, NYSDOL, OSHA & HUD Regulations.

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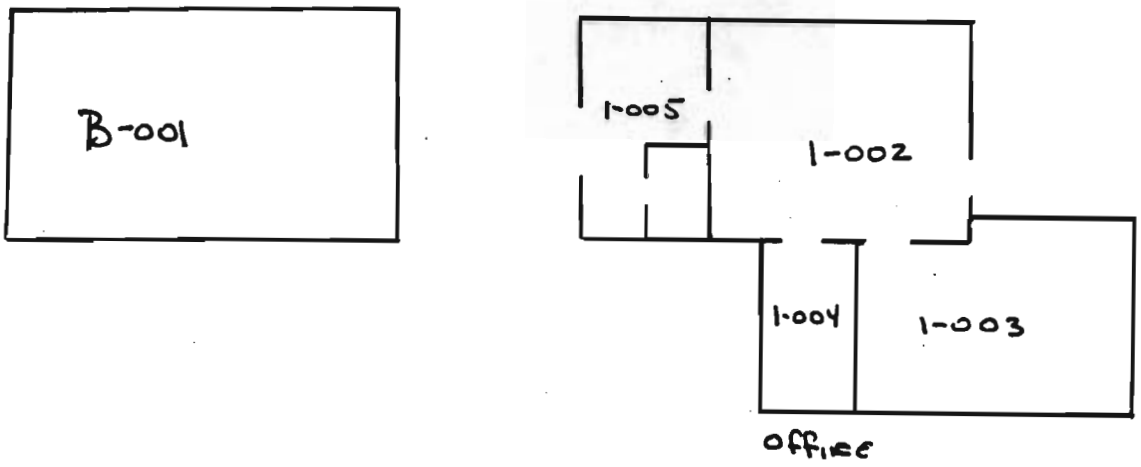

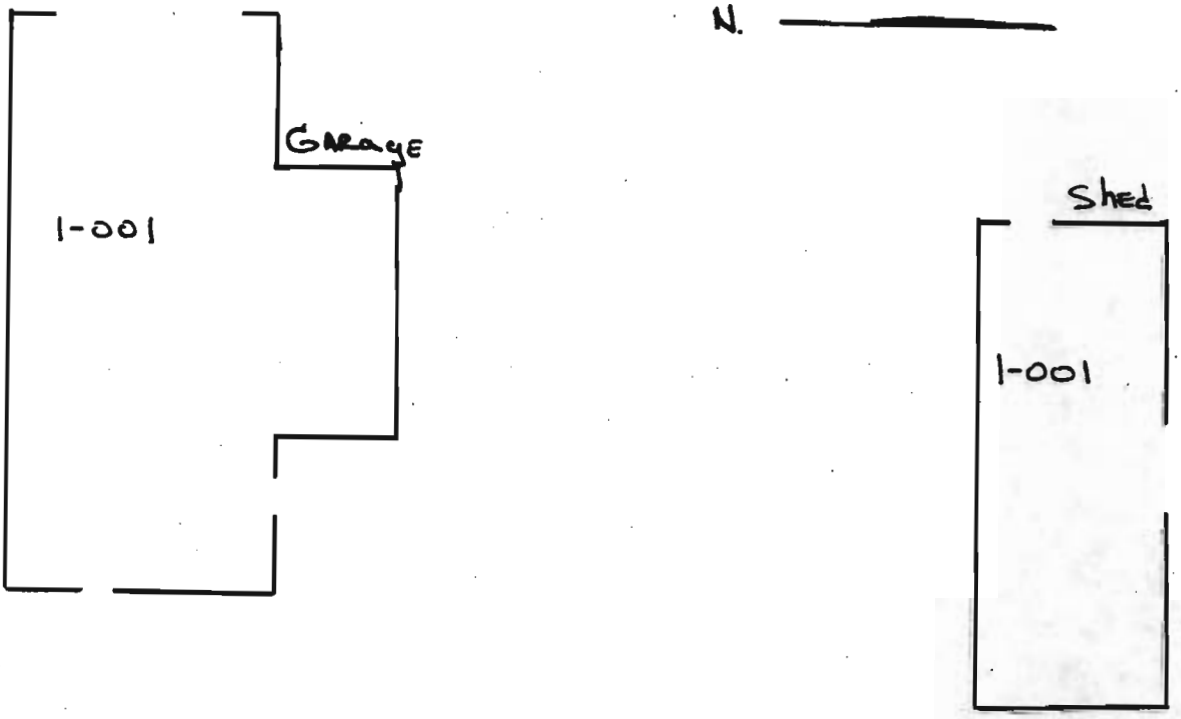

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30 Corporate Circle Suite 131
Albany, New York 12203

Building Name:	Orkin Pest Control Site, Office	Level No.:	1st Floor
Functional Space:	Office	Space I.D. #:	1-003

Homogenous Material List

Material:	Non Friable	Amount	Damaged
0005 Gypsum Board	Friable	296 Sq. Ft.	296 Sq. Ft.
0006 1x1 Ceiling Tile	Friable	56 Sq. Ft.	56 Sq. Ft.

Recommended Response Actions:

Homogenous 0005 & 0006 are Non-ACM.

Notes/Comments:

All Friable and Non Friable Asbestos should be removed from this building before it is Demolished under NESHAPS, EPA, NYSDOL, OSHA & HUD Regulations.

TESTWELL LABORATORIES, INC.
30 Corporate Circle Suite 131
Albany, New York 12203

Building Name:	Orkin Pest Control Site, Office	Level No.:	1st Floor
Functional Space:	Office	Space I.D. #:	1-002

Homogenous Material List

Material:	Non Friable	Amount	Damaged
0005 Gypsum Board	Friable	368 Sq. Ft.	368 Sq. Ft.
0006 1x1 Ceiling Tile	Friable	80 Sq. Ft.	80 Sq. Ft.

Recommended Response Actions:

Homogenous 0005 & 0006 are Non-ACM.

Notes/Comments:

All Friable and Non Friable Asbestos should be removed from this building before it is Demolished under NESHAPS, EPA, NYSDOL, OSHA & HUD Regulations.

TESTWELL LABORATORIES, INC.
30 Corporate Circle Suite 131
Albany, New York 12203

Building Name:	Orkin Pest Control Site, Office	Level No.:	1st Floor
Functional Space:	Office	Space I.D. #:	1-004

Homogenous Material List

Material:	Non Friable	Amount	Damaged
0005 Gypsum Board	Friable	296 Sq. Ft.	296 Sq. Ft.
0006 1x1 Ceiling Tile	Friable	56 Sq. Ft.	56 Sq. Ft.

Recommended Response Actions:

Homogenous 0005 & 0006 are Non-ACM.

Notes/Comments:

All Friable and Non Friable Asbestos should be removed from this building before it is Demolished under NESHAPS, EPA, NYSDOL, OSHA & HUD Regulations.

TESTWELL LABORATORIES, INC.
30 Corporate Circle Suite 131
Albany, New York 12203

Building Name:	Orkin Pest Control Site, Office	Level No.:	1st Floor
Functional Space:	Office	Space I.D. #:	1-005

Homogenous Material List

Material:	Non Friable	Amount	Damaged
0005 Gypsum Board	Friable	368 Sq. Ft.	368 Sq. Ft.
0006 1x1 Ceiling Tile	Friable	80 Sq. Ft.	80 Sq. Ft.
0007 White Linoleum	Non Friable	10 Sq. Ft.	10 Sq. Ft.

Recommended Response Actions:

Homogenous 0005 & 0006 are Non-ACM.

Homogenous 0007 is assumed ACM

Notes/Comments:

All Friable and Non Friable Asbestos should be removed from this building before it is Demolished under NESHAPS, EPA, NYSDOL, OSHA & HUD Regulations.

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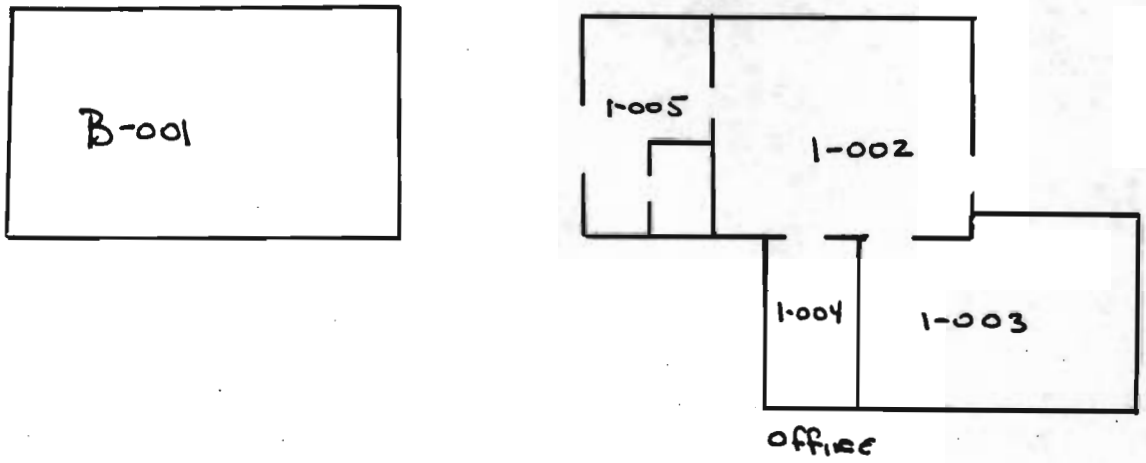
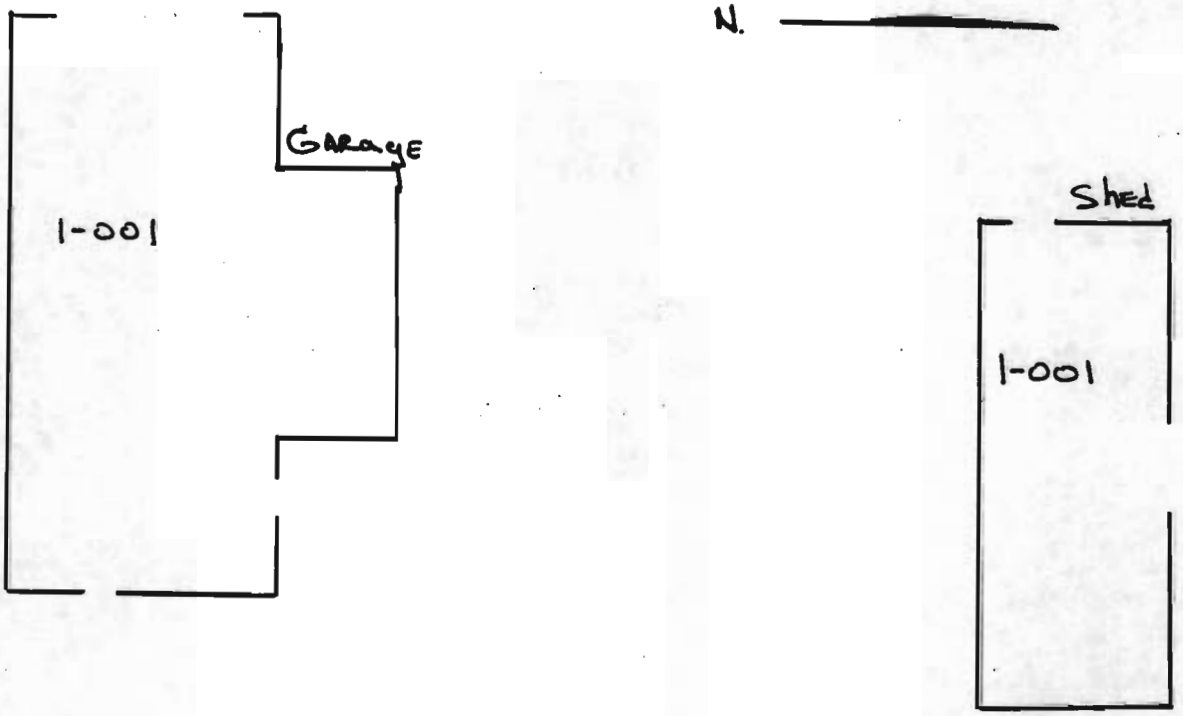
Albany, New York 12203





TESTWELL LABORATORIES, INC.
30 Corporate Circle Suite 131
Albany, New York 12203

Building Name:	Orkin Pest Control Site, Office	Level No.:	Roof
Functional Space:	Exterior	Space I.D. #:	Roof

Homogenous Material List

Material:	Non Friable	Amount	Damaged
0008 Rolled Roof & Felts	Non-Friable	700 Sq. Ft.	700 Sq. Ft.
0009 Window Putty	Non-Friable	10 Ln. Ft.	10 Ln. Ft.
0010 Masonite Board	Non-Friable	200 Sq. Ft.	200 Sq. Ft.

Recommended Response Actions:

Homogenous 0009 & 0010 are Non-ACM.

Homogenous 0008 is confirmed ACM.

Notes/Comments:

All Friable and Non Friable Asbestos should be removed from this building before it is Demolished under NESHAPS, EPA, NYSDOL, OSHA & HUD Regulations.

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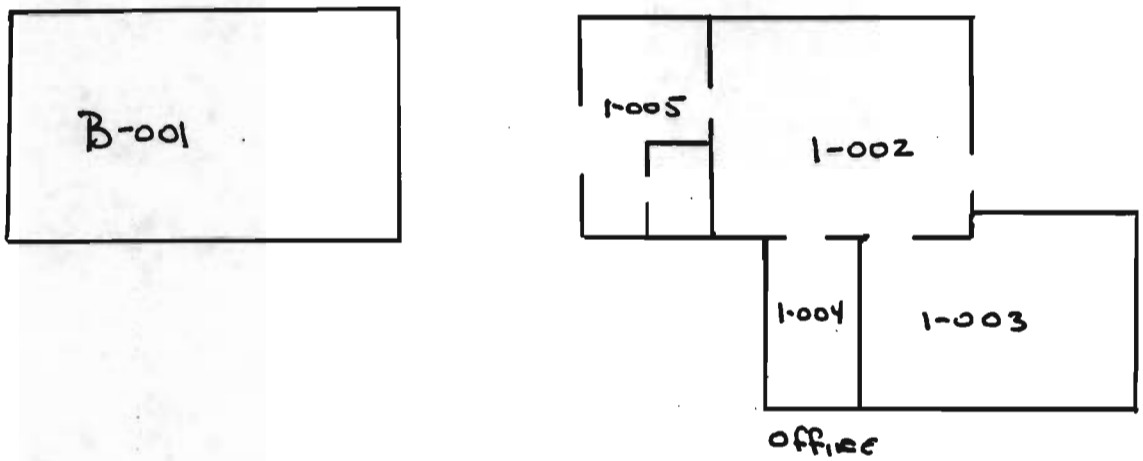

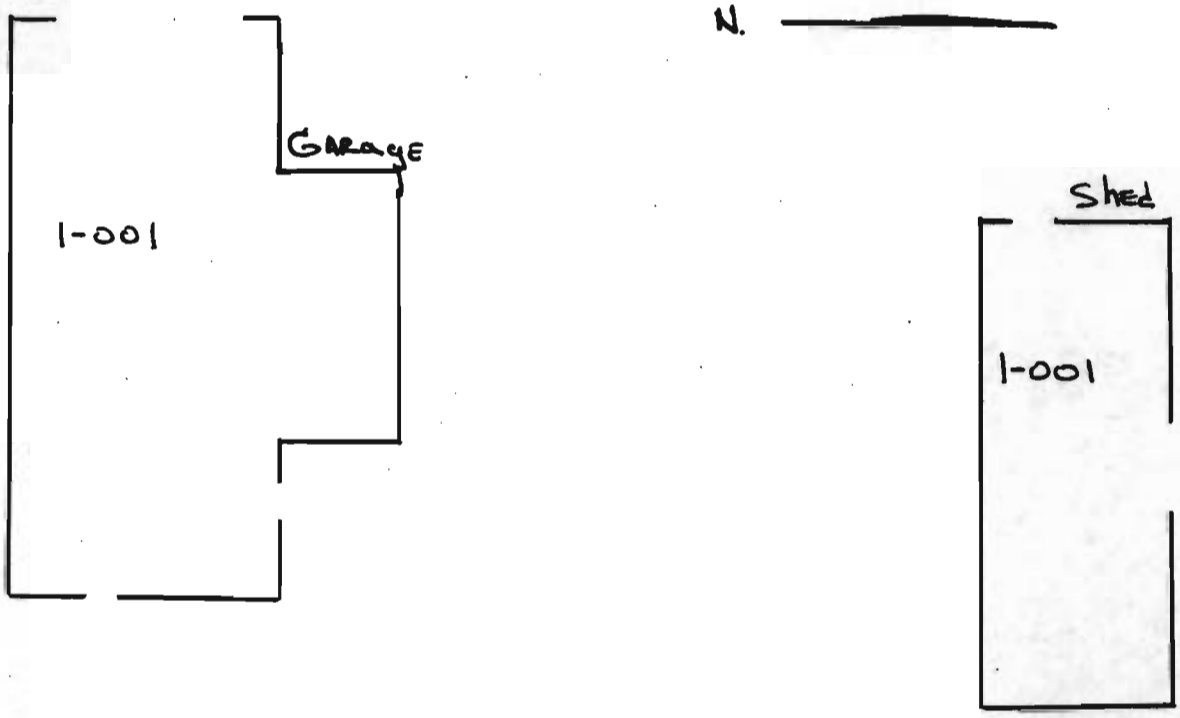

STATE OF NEW YORK - DEPARTMENT OF LABOR
DIVISION OF SAFETY AND HEALTH
License and Certificate Unit
BUILDING 12, STATE CAMPUS
ALBANY, NY 12240

ASBESTOS HANDLING LICENSE

LICENSE NUMBER: 98-1215
DATE OF ISSUE: 12/21/98
EXPIRATION DATE: 12/31/99

Contractor: Testwell Craig Laboratories, Inc.
Address: 47 Hudson St.
Ossining NY 10562

Duly Authorized Representative: Charles S. Schnugg

This license has been issued in accordance with applicable provisions of Article 30 of the Labor Law of New York State and of the New York State Codes, Rules and Regulations (12 NYCRR Part 56). It is subject to suspension or revocation for a (1) serious violation of state, federal or local laws with regard to the conduct of an asbestos project, or (2) demonstrated lack of responsibility in the conduct of any job involving asbestos or asbestos material.

This license is valid only for the contractor named above and this license or a photocopy must be prominently displayed at the asbestos project worksite. The licensee verifies that all persons employed by the licensee on an asbestos project in New York State have been issued an Asbestos Certificate, appropriate for the type of work they perform, by the New York State Department of Labor.

Richard Cucolo, Director
FOR THE COMMISSIONER OF LABOR

DOSH 432 (1-98)

BARBARA A. DEBUONO, M.D., M.P.H. Commissioner

Expires 12:01 AM April 1, 1999
ISSUED April 1, 1998
REVISED June 30, 1998

CERTIFICATE OF APPROVAL FOR LABORATORY SERVICE

Issued in accordance with and pursuant to section 502 Public Health Law of New York State

No.: 11142

Director: DR. JOHN CHEN
Lab Name: TESTWELL CRAIG LABORATORIES INC
Address : 47 HUDSON STREET-BUILDING B
OSSINING NY 10562

is hereby APPROVED as an Environmental Laboratory for the category

ENVIRONMENTAL ANALYSES NON POTABLE WATER

All approved subcategories and/or analytes are listed below:

rocarbon Pesticides :
pp
EHC
tal
rin
ldehyde
I
ulfan II
ulfan sulfate
epoxide
xychlor
ne

Wastewater Miscellaneous :
Cyanide, Total
Oil & Grease Total Recoverable
Hydrogen Ion (pH)
Sulfide (as S)
Temperature
Nitroaromatics and Isophorone (ALL)
Polychlorinated Biphenyls (ALL)
Purgeable Aromatics (ALL)

Wastewater Metals III :
Molybdenum, Total
Thallium, Total
Benzidines (ALL)
Chlorinated Hydrocarbons (ALL)
Wastewater Metals I (ALL)
Nitrosoamines (ALL)
Phthalate Esters (ALL)
Purgeable Halocarbons (ALL)

Mineral :
Sulfate (as SO4)
Acrolein and Acrylonitrile (ALL)
Chlorophenoxy Acid Pesticides (ALL)
Haloethers (ALL)
Wastewater Metals II (ALL)
Polynuclear Aromatics (ALL)
Priority Pollutant Phenols (ALL)
TCLP Additional Compounds (ALL)

ial No.: 103056

Wadsworth Center

Property of the New York State Department of Health. Valid only at the address shown.
be conspicuously posted. Valid certificate has a red serial number.

OH-3317 (3/97)

NEW YORK STATE DEPARTMENT OF HEALTH

BARBARA A. DEBUONO, M.D., M.P.H. Commissioner

Expires 12:01 AM April 1, 1999
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ENVIRONMENTAL ANALYSES/ POTABLE WATER

All approved subcategories and/or analytes are listed below:

Miscellaneous :

Drinking Water Metals I (ALL) Drinking Water Metals II (ALL)

Serial No.: 103057

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REVISED June 30, 1998

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Lab ID No.: 11142

Director: DR. JOHN CHEN
Lab Name: TESTWELL CRAIG LABORATORIES INC
Address : 47 HUDSON STREET-BUILDING B
OSSINING NY 10562

is hereby APPROVED as an Environmental Laboratory for the category

ENVIRONMENTAL ANALYSES/AIR AND EMISSIONS

All approved subcategories and/or analytes are listed below:

eous Air :

Metals I (ALL)

Serial No.: 103058

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OSSINING NY 10562

is hereby APPROVED as an Environmental Laboratory for the category

ENVIRONMENTAL ANALYSES/AIR AND EMISSIONS

All approved subcategories and/or analytes are listed below:

Miscellaneous Air :
Asbestos
Fibers

Metals I (ALL)

Polychlorinated Biphenyls (ALL)

Serial No.: 104072

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Lab ID No.: 11142

Director: DR. JOHN CHEN
Lab Name: TESTWELL CRAIG LABORATORIES INC
Address : 47 HUDSON STREET-BUILDING B
OSSINING NY 10562

is hereby APPROVED as an Environmental Laboratory for the category

ENVIRONMENTAL ANALYSES/SOLID AND HAZARDOUS WASTE

All approved subcategories and/or analytes are listed below:

ristic Testing :
vity
ty
Toxicity - Metals Only

Acrolein and Acrylonitrile (ALL)	Chlorophenoxy Acid Pesticides (ALL)	Chlor. Hydrocarbon Pesticides (ALL)
Chlorinated Hydrocarbons (ALL)	Haloethers (ALL)	Metals I (ALL)
Metals II (ALL)	Miscellaneous (ALL)	Nitroaromatics Isophorone (ALL)
Polynuclear Arom. Hydrocarbon (ALL)	Polychlorinated Biphenyls (ALL)	Phthalate Esters (ALL)
Priority Pollutant Phenols (ALL)	Purgeable Aromatics (ALL)	Purgeable Halocarbons (ALL)

Serial No.: 103059

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DOH 2317 (3/97)

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REVISED June 30, 1998

CERTIFICATE OF APPROVAL FOR LABORATORY SERVICE

Issued in accordance with and pursuant to section 502 Public Health Law of New York State

Lab ID No.: 10871

Director: MS. ISABEL CATLIN
Lab Name: TESTWELL CRAIG LABORATORIES OF ALBANY INC
Address : 30 CORPORATE CIRCLE - STE 131
ALBANY NY 12203

is hereby APPROVED as an Environmental Laboratory for the category

ENVIRONMENTAL ANALYSES/SOLID AND HAZARDOUS WASTE

All approved subcategories and/or analytes are listed below:

Miscellaneous :
Asbestos in Friable Material

Serial No.: 103052

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Lab ID No.: 10871

Director: MS. ISABEL CATLIN
Lab Name: TESTWELL CRAIG LABORATORIES OF ALBANY INC
Address : 30 CORPORATE CIRCLE - STE 131
ALBANY NY 12203

is hereby APPROVED as an Environmental Laboratory for the category

ENVIRONMENTAL ANALYSES/AIR AND EMISSIONS

All approved subcategories and/or analytes are listed below:

cellaneous Air :
'lbers

Serial No.: 103051

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NEW YORK STATE DEPARTMENT OF HEALTH

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Lab ID No.: 11142

Director: DR. JOHN CHEN
Lab Name: TESTWELL CRAIG LABORATORIES INC
Address : 47 HUDSON STREET-BUILDING B
OSSINING NY 10562

is hereby APPROVED as an Environmental Laboratory for the category

ENVIRONMENTAL ANALYSES NON POTABLE WATER

All approved subcategories and/or analytes are listed below:

...rbon Pesticides :
...
-DDI
-DDT
...BHC
...
...rdane Total
...a-BHC
...
...dehyde
...rin
...osulfan I
...lfan II
...n sulfate
...
...tachlor epoxide
...ne
...lor
...

Wastewater Miscellaneous :
- Cyanide, Total
- Oil & Grease Total Recoverable
- Hydrogen Ion (pH)
- Sulfide (as S)
- Temperature

Nitroaromatics and Isophorone (ALL)
Polychlorinated Biphenyls (ALL)
Purgeable Aromatics (ALL)

Wastewater Metals III :
- Molybdenum, Total
- Thallium, Total

Benzidines (ALL)
Chlorinated Hydrocarbons (ALL)
Wastewater Metals I (ALL)
Nitrosoamines (ALL)
Phthalate Esters (ALL)
Purgeable Halocarbons (ALL)

Mineral :
- Sulfate (as SO4)

Acrolein and Acrylonitrile (ALL)
Chlorophenoxy Acid Pesticides (ALL)
Haloethers (ALL)
Wastewater Metals II (ALL)
Polynuclear Aromatics (ALL)
Priority Pollutant Phenols (ALL)
TCLP Additional Compounds (ALL)

Serial No.: 103056

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CERTIFICATE OF APPROVAL FOR LABORATORY SERVICE

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ELAP ID No.: 11142

Director: DR. JOHN CHEN
Lab Name: TESTWELL CRAIG LABORATORIES INC
Address : 47 HUDSON STREET-BUILDING B
OSSINING NY 10562

is hereby APPROVED as an Environmental Laboratory for the category

ENVIRONMENTAL ANALYSES/ POTABLE WATER

All approved subcategories and/or analytes are listed below:

Potable Water : Drinking Water Metals I (ALL) Drinking Water Metals II (ALL)

Serial No.: 103057

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REVISED June 30, 1998

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ID No.: 11142

Director: DR. JOHN CHEN
Lab Name: TESTWELL CRAIG LABORATORIES INC
Address : 47 HUDSON STREET-BUILDING B
OSSINING NY 10562

is hereby APPROVED as an Environmental Laboratory for the category

ENVIRONMENTAL ANALYSES/AIR AND EMISSIONS

All approved subcategories and/or analytes are listed below:

Air : *Metals I (ALL)*

Serial No.: 103058

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STATE OF NEW YORK - DEPARTMENT OF LABOR
DIVISION OF SAFETY AND HEALTH
License and Certificate Unit
BUILDING 12, STATE CAMPUS
ALBANY, NY 12240

ASBESTOS HANDLING LICENSE

RESTRICTED LICENSE

LICENSE NUMBER: 98-1211
DATE OF ISSUE: 12/21/98
EXPIRATION DATE: 12/31/99

Contractor: Testwell Laboratories, Inc.
Address: 47 Hudson St.
Ossining NY 10562

Duly Authorized Representative: Daniel Damiano, Jr.

This license has been issued in accordance with applicable provisions of Article 30 of the Labor Law of New York State and of the New York State Codes, Rules and Regulations (12 NYCRR Part 56). It is subject to suspension or revocation for a (1) serious violation of state, federal or local laws with regard to the conduct of an asbestos project, or (2) demonstrated lack of responsibility in the conduct of any job involving asbestos or asbestos material.

This license is valid only for the contractor named above and this license or a photocopy must be prominently displayed at the asbestos project worksite. The licensee verifies that all persons employed by the licensee on an asbestos project in New York State have been issued an Asbestos Certificate, appropriate for the type of work they perform, by the New York State Department of Labor.

Richard Cucolo, Director
FOR THE COMMISSIONER OF LABOR

DOSH 432 (1-98)

NEW YORK STATE DEPARTMENT OF HEALTH

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REVISED November 20, 1998

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Lab ID No.: 11142

Director: DR. JOHN CHEN
Lab Name: TESTWELL LABORATORIES INC
Address : 47 HUDSON STREET-BUILDING B
OSSINING NY 10562

is hereby APPROVED as an Environmental Laboratory for the category

ENVIRONMENTAL ANALYSES NON POTABLE WATER

All approved subcategories and/or analytes are listed below:

Chlor. Hydrocarbon Pesticides :
- 4,4'-DDD
- 4,4'-DDE
- 4,4'-DDT
- alpha-BHC
- Aldrin
- beta-BHC
- Chlordane Total
- delta-BHC
- Dieldrin
- Endrin aldehyde
- Endrin
- Endosulfan I
- Endosulfan II
- Endosulfan sulfate
- Heptachlor
- Heptachlor epoxide
- Lindane
- Methoxychlor
- Toxaphene

Wastewater Miscellaneous :
- Cyanide, Total
- Oil & Grease Total Recoverable
- Hydrogen Ion (pH)
- Sulfide (as S)
- Temperature

Nitroaromatics and Isophorone (ALL)
Polychlorinated Biphenyls (ALL)
Purgeable Aromatics (ALL)

Wastewater Metals III :
- Molybdenum, Total
- Thallium, Total

Benzidines (ALL)
Chlorinated Hydrocarbons (ALL)
Wastewater Metals I (ALL)
Nitrosamines (ALL)
Phthalate Esters (ALL)
Purgeable Halocarbons (ALL)

Mineral :
- Sulfate (as SO4)

Acrolein and Acrylonitrile (ALL)
Chlorophenoxy Acid Pesticides (ALL)
Haloethers (ALL)
Wastewater Metals II (ALL)
Polynuclear Aromatics (ALL)
Priority Pollutant Phenols (ALL)
TCLP Additional Compounds (ALL)

Serial No.: 104070

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Lab Name: TESTWELL LABORATORIES INC
Address : 47 HUDSON STREET-BUILDING B
OSSINING NY 10562

Is hereby APPROVED as an Environmental Laboratory for the category

ENVIRONMENTAL ANALYSES/AIR AND EMISSIONS

All approved subcategories and/or analytes are listed below:

Miscellaneous Air
Asbestos
Fibers

Metals I (All)

Polychlorinated Biphenyls (All)

Serial No.: 104072

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Lab Name: TESTWELL LABORATORIES INC
Address : 47 HUDSON STREET-BUILDING B
OSSINING NY 10562

is hereby APPROVED as an Environmental Laboratory for the category

ENVIRONMENTAL ANALYSES/ POTABLE WATER

All approved subcategories and/or analytes are listed below:

D.W. Miscellaneous : Asbestos

Drinking Water Metals I (ALL)

Drinking Water Metals II (ALL)

Serial No.: 104071

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The American Industrial Hygiene Association

is proud to acknowledge that

Testwell Craig Laboratories, Inc.

Ossining, NY

Laboratory ID# 6965

has fulfilled the requirements for Industrial Hygiene Laboratory Accreditation and has earned distinguished recognition as an

AIHA Accredited Laboratory

Originally Accredited February 1, 1995 [illegible] February 1, 1998. [illegible] AIHA accreditation criteria.

April 1, 1995

President
American Industrial Hygiene Association

Date Prepared

Mark A. Puskar

468

Chairman
Laboratory Accreditation Committee

Certificate Number

National Institute of Standards and Technology

NVLAP®

National Voluntary Laboratory Accreditation Program

ISO/IEC GUIDE 25:1990
ISO 9002:1987

Scope of Accreditation

AIRBORNE ASBESTOS FIBER ANALYSIS **NVLAP LAB CODE 200083-0**

TESTWELL LABORATORIES, INC./TESTWELL INDUSTRIES, INC.
47 Hudson Street
Ossining, NY 10562
Mr. V. Reddy Kancharla
Phone: 914-762-9000 Fax: 914-762-9638

NVLAP Code	*Designation*
18/A02	U.S. EPA's "Interim Transmission Electron Microscopy Analytical Methods-Mandatory and Nonmandatory-and Mandatory Section to Determine Completion of Response Actions" as found in 40 CFR, Part 763, Subpart E, Appendix A.

June 30, 1999

Effective through

For the National Institute of Standards and Technology

United States Department of Commerce
National Institute of Standards and Technology

NVLAP®

ISO/IEC GUIDE 25:1990
ISO 9002:1987

Certificate of Accreditation

DEPARTMENT OF COMMERCE * UNITED STATES OF AMERICA *

TESTWELL LABORATORIES, INC./TESTWELL INDUSTRIES, INC.

OSSINING, NY

is recognized under the National Voluntary Laboratory Accreditation Program for satisfactory compliance with criteria established in Title 15, Part 285 Code of Federal Regulations. These criteria encompass the requirements of ISO/IEC Guide 25 and the relevant requirements of ISO 9002 (ANSI/ASQC Q92-1987) as suppliers of calibration or test results. Accreditation is awarded for specific services, listed on the Scope of Accreditation for:

AIRBORNE ASBESTOS FIBER ANALYSIS

June 30, 1999

Effective through

For the National Institute of Standards and Technology

NVLAP Lab Code: 200083-0

NVLAP-01C (11-96)

National Institute of Standards and Technology

NVLAP®

National Voluntary Laboratory Accreditation Program

ISO/IEC GUIDE 25:1990
ISO 9002:1987

Scope of Accreditation

BULK ASBESTOS FIBER ANALYSIS **NVLAP LAB CODE 200083-0**

TESTWELL LABORATORIES, INC./TESTWELL INDUSTRIES, INC.
47 Hudson Street
Ossining, NY 10562
Mr. V. Reddy Kancharla
Phone: 914-762-9000 Fax: 914-762-9638

NVLAP Code	*Designation*
18/A01	U.S. EPA's "Interim Method for the Determination of Asbestos in Bulk Insulation Samples" as found in 40 CFR, Part 763, Subpart F, App. A, or the current U.S. EPA method for the analysis of asbestos in building material.

June 30, 1999
Effective through

For the National Institute of Standards and Technology

United States Department of Commerce
National Institute of Standards and Technology

NVLAP®

ISO/IEC GUIDE 25:1990
ISO 9002:1987

Certificate of Accreditation

DEPARTMENT OF COMMERCE * UNITED STATES OF AMERICA *

TESTWELL LABORATORIES, INC./TESTWELL INDUSTRIES, INC.
OSSINING, NY

is recognized under the National Voluntary Laboratory Accreditation Program for satisfactory compliance with criteria established in Title 15, Part 285 Code of Federal Regulations. These criteria encompass the requirements of ISO/IEC Guide 25 and the relevant requirements of ISO 9002 (ANSI/ASQC Q92-1987) as suppliers of calibration or test results. Accreditation is awarded for specific services, listed on the Scope of Accreditation for:

BULK ASBESTOS FIBER ANALYSIS

June 30, 1999
Effective through

For the National Institute of Standards and Technology

NVLAP Lab Code: 200083-0

NVLAP 01C (11-94)

02/09/99 17:34 FAX 914 941 1154 TESTWELL LABORATORIES

McCRONE RESEARCH INSTITUTE

certifies that

Isabel Catlin

has successfully completed an intensive course of instruction in

Microscopical Identification of Asbestos

given by the McCrone Research Institute

Presented this 22nd day of March, 1991

John G. Delly

Walter C McCrone

Course Date: 18-22 March, 1991
35CEU's

APPENDIX D

Former Pit Boring Log

MALCOLM PIRNIE	TEST BORING LOG	BORING No. PB-1

PROJECT	Former Abalene Pest Control	LOCATION	Moreau, New York			SHEET 1 OF 2
CLIENT						PROJECT No. 1368016
DRILLING CONTRACTOR	SJB					MEAS. PT. ELEV.
PURPOSE	Site Investigation					GROUND ELEV.
WELL MATERIAL	NA					DATUM
DRILLING METHOD(S)	Hollow Stem Auger		SAMPLE	CORE	CASING	DATE STARTED 12/7/93
DRILL RIG TYPE		TYPE				DATE FINISHED 12/7/93
GROUND WATER DEPTH	22.0'	DIA.	"			DRILLER SJB
MEASURING POINT		WEIGHT	#			PIRNIE STAFF C. Gaule
DATE OF MEASUREMENT		FALL	"			

DEPTH FT.	SAMPLE TYPE, RECOVERY, NUMBER	BLOWS ON SAMPLE SPOON PER 6"	PID	GRAPHIC LOG	GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc.	ELEV. / DEPTH	WELL Constr.	REMARKS
2								
4		1 1 1 3			Brown coarse to fine SAND, little silt, moist. Black poly liner in tip of split spoon. Approximately 0.25 inches of clay above liner.			
6						6.0		
8								
10		4 8 10 10	13		Light brown coarse to fine SAND, trace silt. Strong odor.			
12						11.0		Clear plastic sheeting pulled up along augers at approximately 12 feet bgs.
14		4 9 10 8			Light brown medium to fine SAND, trace silt, slight odor, dry. Black banding along length of sample.			
16						16.0		
18								

MALCOLM PIRNIE	TEST BORING LOG	BORING No. PB-1
PROJECT Former Abalene Pest Control	LOCATION Moreau, New York	SHEET 2 OF 2
CLIENT		PROJECT No. 1368016

DEPTH FT.	SAMPLE TYPE, RECOVERY, NUMBER	BLOWS ON SAMPLE SPOON PER 6"	PID	GRAPHIC LOG	GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc.	ELEV. / DEPTH	WELL Constr.	REMARKS
22		4 3 7 10			Brown fine SAND, wet.			▼
24						24.0		

APPENDIX B

Long-Term Monitoring and Maintenance Plan

MALCOLM PIRNIE

LONG-TERM MONITORING AND MAINTENANCE PLAN

Former Abalene Pest Control
Moreau, New York

NYSDEC Site Number 546035

Orkin Exterminating Company, Inc.
Atlanta, Georgia

Prepared by:

Malcolm Pirnie, Inc.
15 Cornell Road
Latham, New York 12110

March 1999
1368016

RECYCLED PAPER

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LIST OF APPENDICES

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A	Field Equipment Calibration Instructions
B	Field Data Forms

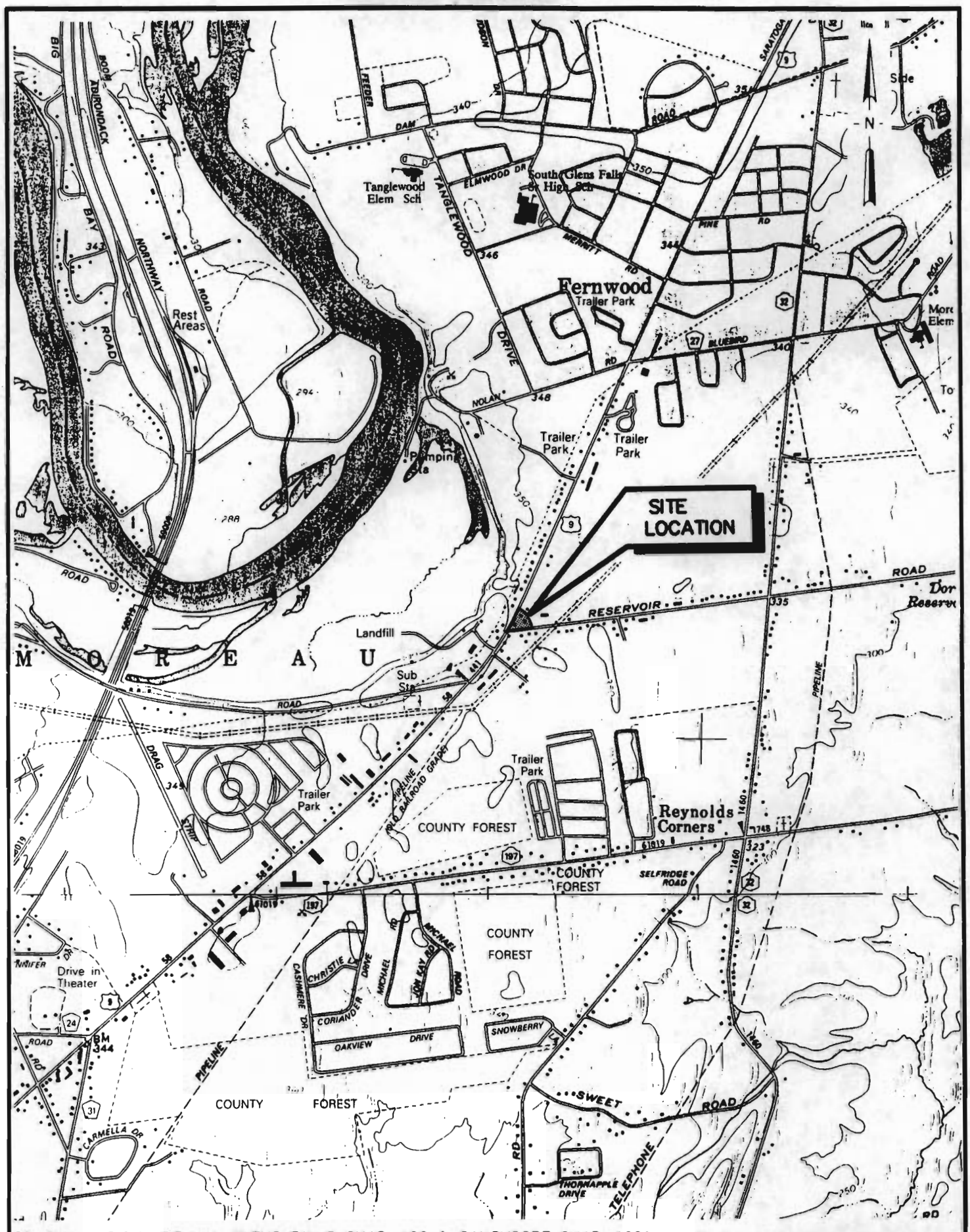
1.0 INTRODUCTION

To meet the monitoring and maintenance standards for remedial activities specified in the Record of Decision (ROD) and 6 NYCRR Part 375 for the Former Abalene Pest Control Hazardous Waste site in Moreau, New York, the following Long-Term Monitoring and Maintenance Plan has been prepared. The plan presents, in specific terms, the policies, organizations, objectives, and standards followed in order to monitor the site following completion of the remedial action.

2.0 BACKGROUND

2.1 SITE INFORMATION

The Abalene Pest Control site is located at the intersection of Reservoir Road and New York State Route 9 in the Town of Moreau, Saratoga County, New York, Figure 2-1. The site is approximately 34,000 square feet in size as shown in Figure 2-2. The surrounding land use is residential and commercial. The site is relatively flat with little or no storm water run-off.



SOURCE: U.S.G.S. 7.5 MIN. GLENS FALLS QUAD. 199 & GANSVOORT QUAD. 1991

MALCOLM PIRNIE

ABALENE PEST CONTROL
MOREAU, NEW YORK

SITE LOCATION MAP

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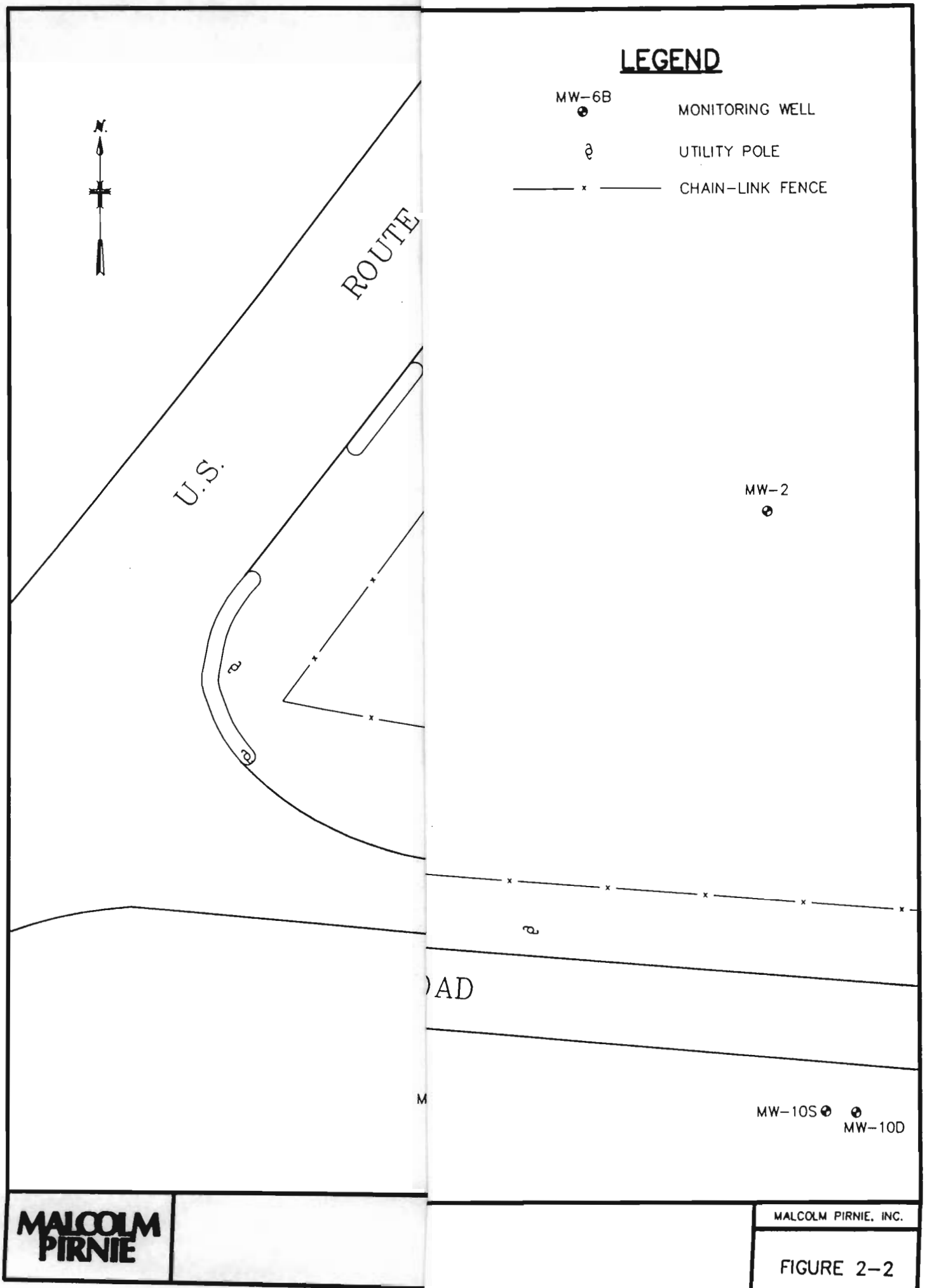
MALCOLM PIRNIE, INC.

FIGURE 2-1



4871 : 1396012900\I:\ACAD\PROJ\1368012900\1368-76 SCALE: 1:30i 05/23, 1996 at 15:45

MALCOLM PIRNIE

MALCOLM PIRNIE, INC.

FIGURE 2-2

3.0 MONITORING AND MAINTENANCE OBJECTIVES

3.1 MONITORING

3.1.1 Groundwater

Groundwater samples will be collected from all monitoring wells on a semi-annual basis beginning in Spring 1999. Semi-annual groundwater sampling will be conducted for a period of three years, after which time the sampling frequency and/or the number of wells sampled may be reduced based on the results of the first three years of monitoring. The data from the groundwater sampling will be compared to historic groundwater quality data to document trends in pesticide concentration with time.

Groundwater from the following monitoring wells will be sampled: MW-1, MW-2, MW-3, MW-4, MW-5, MW-6S, MW-6D, MW-6B, MW-7S, MW-7D, MW-7B, MW-8B, MW-9S, MW-9D, MW-9B, MW-10S, and MW-10D. Groundwater samples will be analyzed for Pesticides by USEPA Method 8081A. USEPA-approved low-flow purging techniques will be used to collect representative, low-turbidity samples. During sampling, field parameters will be measured to evaluate the geochemical characteristics of groundwater at the site. These parameters will include temperature, pH, specific conductance, and turbidity. Detailed procedures for groundwater sampling are provided in the Quality Assurance Project Plan (QAPP) developed for the remedial action (Remedial Action Work Plan Appendix C). A multi-parameter Horiba U-10 will be used to measure the field parameter data. The calibration procedures, operation and maintenance of this unit is described in Appendix A. Forms used to read field parameter data and sampling data are included in Appendix B.

Prior to starting groundwater sampling activities, water levels will be measured in each well. This data will be used to construct potentiometric contour maps and monitor groundwater flow patterns at the site.

3.2 MAINTENANCE

3.2.1 Soil Cover

After completion of the remedial action, the site will be inspected semi-annually. Inspections will be conducted to document the integrity of the soil cap and the general condition of the site. Inspections will be conducted in the spring and fall of each year. Field audit forms will be completed during the site inspection and are included in Appendix C. The inspection will include the following items:

1. The soil cap will be inspected for:
   - erosion
   - animal burrows
   - unvegetated (bare) areas
   - settlement

2. The site drainage system will be inspected for:
   - erosion in swales or drainage ditches
   - obstructions or sediment in swales or drainage ditches
   - evidence of ponding water

3. The monitoring wells will be inspected for:
   - intact locks
   - damage to the protective casing
   - erosion around the casing
   - integrity of the well cement pad
   - integrity of the flush-mount seal

3.2.2 Maintenance of Vegetative Cover

Vegetative cover will be mowed at least twice a year to control growth.

3.2.3 Response/Contingency Plan

If, during the semi-annual inspections any concerns are identified, they shall be reported to Orkin and the following responses will be initiated:

- Eroded areas will be filled to original grade. Unvegetated areas will reseeded and fertilized as necessary.

- Repairs to monitoring wells.

- A detailed description of the work performed will be prepared after the corrective measure has been completed. This report will be included with the annual report submitted to the NYSDEC.

3.2.4 Reporting

The results of the Long-Term Monitoring and Maintenance Plan for each year of monitoring will be summarized in an annual report and submitted to Ms. Denise Wagner, NYSDEC Region 5 Office, P.O. Box 296, Route 86, Ray Brook, New York 12977. The annual report will include:

- Well purge logs.
- Results of groundwater sample analyses in summary tables and appended laboratory data sheets.
- A comparison of analytical results to historic data, NYSDEC Class GA standards, and USEPA MCLs.
- Potentiometric contour maps for the shallow water table and the deep sand unit.
- A discussion of the semi-annual inspections of the site, including a description of repairs performed.

The annual report will be submitted within 60 days of receipt of the analytical data from the second semi-annual event for that year (Fall sampling event).

3.2.5 Contact List

A contact list for the parties involved on the Monitoring and Maintenance Plan (M&M Plan) for the Orkin site is as follows:

- Party Responsible for M&M Plan: Mr. Bruce R. Nelson
  Malcolm Pirnie, Inc.
  15 Cornell Road
  Latham, New York 12110
  Phone: (518) 786-7349

- Site Owner:

  Mr. Joe Malinowksi
  Orkin Pest Control
  2170 Piedmont Road N.E.
  Atlanta, GA 30324
  Phone: (404) 888-2641

- Department of Health Contact:

  Mr. Bob Montione
  New York State Department of Health
  Bur. of Environmental Exposure Investigation
  2 University Place, Room 205
  Albany, NY 12203-3399
  Phone: (518) 458-6316

- NYSDEC Contact:

  Ms. Denise Wagner
  New York State Department of
  Environmental Conservation
  Region V, Route 86
  Ray Brook, NY 12977
  Phone: (518) 897-1241

APPENDIX A

Field Equipment Calibration Instructions

HORIBA

INSTRUCTION MANUAL

WATER QUALITY CHECKER U-10

CODE: 040801000HK-5

WARNING

The DO sensor contains a strong alkaline solution. Should any of this solution come in contact with your clothing or skin, wash it away immediately with plenty of water.

Be especially careful not to allow any of the alkaline liquid in the DO sensor to get in your eyes.

⚠CAUTION

Insert the battery with ample care to the polarity. Reverse insertion on the polarity will make damage to the inner PCB.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provede reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

The U-10 Water Quality Checker is a state-of-the-art instrument for simultaneous multiparameter measurement of water quality. The HORIBA U-10 measures six different parameters of water samples: *pH*, *conductivity*, *turbidity*, *dissolved oxygen*, *temperature*, and *salinity*.

The U-10 is compact enough to be held in one hand while taking measurements. It has a large easy-to-read LCD readout. Measurements are taken simply by immersing the probe right into the water sample.

The U-10 is extremely versatile and sophisticated, yet easy to use. You will find it a valuable addition to on-site water control operations, whatever your needs – from testing factory discharges to urban drainage, river water, lake and marsh water, aquatic culture tanks, agricultural water supplies, and sea water.

To get the most out of your U-10 Water Quality Checker, please read this *Instruction Manual* carefully before you begin to take measurements.

Note that Horiba cannot be held responsible for any equipment malfunction or failure should the U-10 Water Quality Checker be operated incorrectly or in a manner other than specified in this *Instruction Manual*.

Horiba's aim is to produce the best possible equipment and documentation for our products. We welcome comments, questions, or suggestions for improvement concerning both our products and the accompanying documentation, such as this *Instruction Manual*.

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Note that the contents of this Instruction Manual are subject to change without prior notice as design changes are made on the instrument.

Second edition: November, 1991
First edition: July, 1991

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Section **1**

Getting Started

This section first gives an overview of the U-10. It then shows how to set up your U-10 by inserting the DO sensor and the battery.

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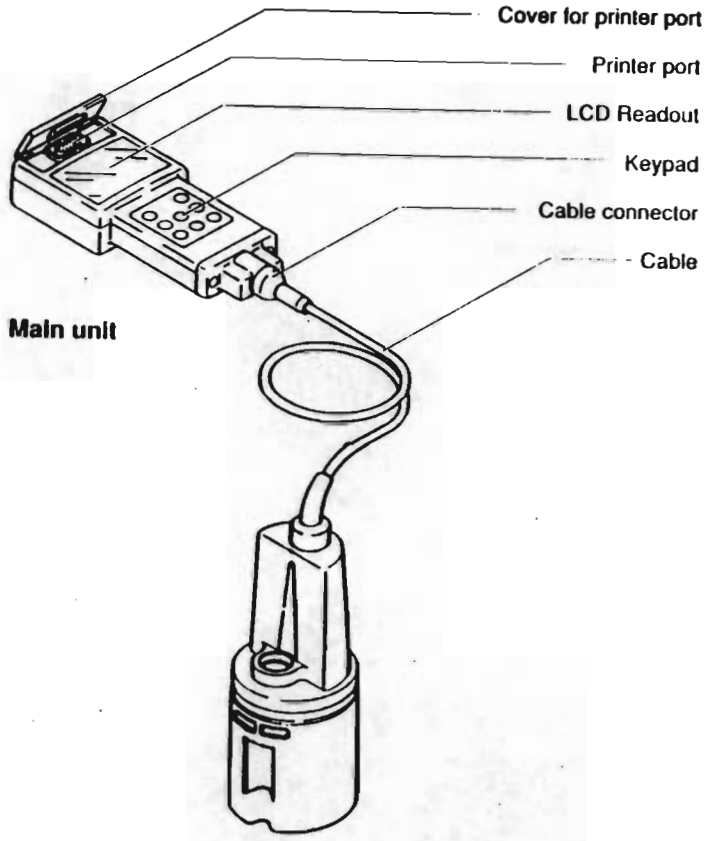
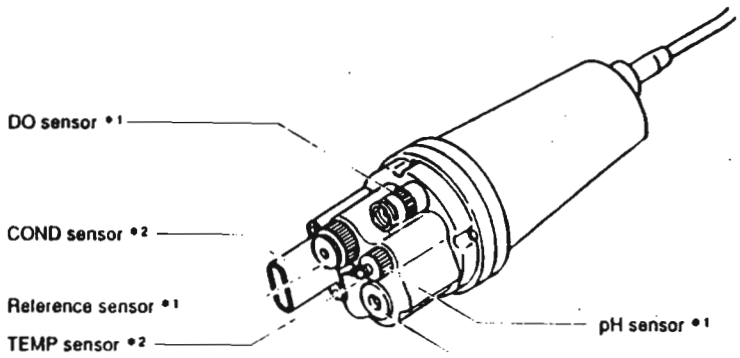
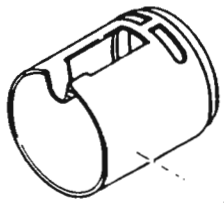
Configuration of the U-10

Main unit



Probe



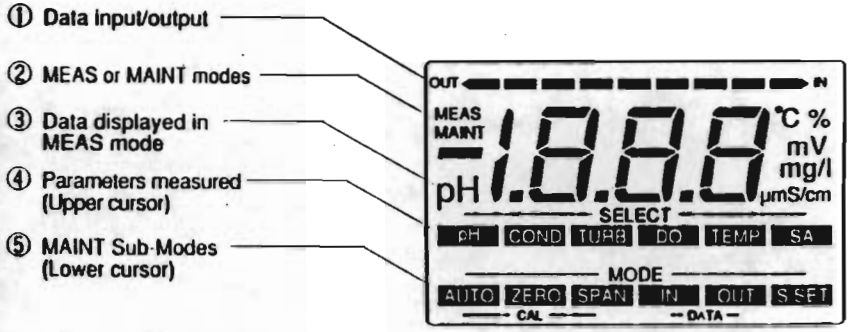


*1. Removable
DO (Dissolved oxygen)
Reference
pH

*2. Non-removable
COND (Conductivity)
TEMP (Temperature)
TURB (Turbidity)

The Readout

The readout has two main functions: (1) it displays the results of measurements, and (2) it serves as a message board to show the operating status of the U-10.



① Data input/output

OUT — Data output

— IN Data input

② MEAS or MAINT modes

The U-10 may be used in one of two modes: Measurement (MEAS) mode or Maintenance mode.

MEAS the U-10 is ready to make 6-parameter measurements

MAINT the U-10 is ready for other operations, e.g., calibration, data input/recall, or salinity setting

③ **Data displayed in MEAS mode**

- 6-parameter results:
  pH, conductivity, turbidity, DO, temperature, and salinity
- Designated value for salinity setting
- Error codes

④ **Parameters measured**

Value displayed on readout is highlighted by upper cursor.

pH	pH
COND	Conductivity
TURB	Turbidity
DO	Dissolved-Oxygen
TEMP	Temperature
SAL	Salinity

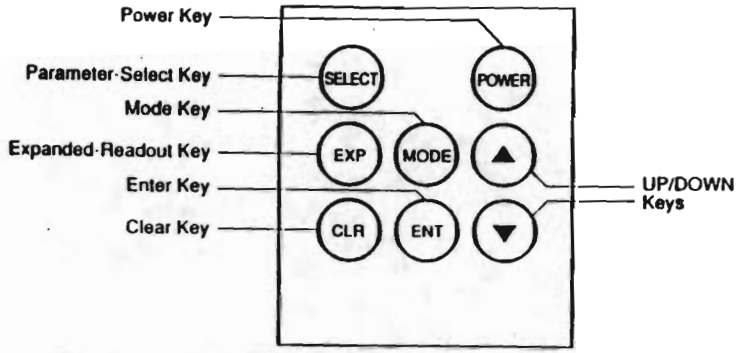
⑤ **MAINT Sub-Modes**

One of six Sub-Modes selected is highlighted by lower cursor.

AUTO	Automatic 1-point calibration
ZERO	Manual zero calibration
SPAN	Manual span calibration
IN	Data input
OUT	Data output (recall)
S.SET	Salinity setting correction

The Keypad

The U-10 is operated by the keypad on the main unit, which has eight surface-sealed keys, as illustrated.



POWER

Power Key (POWER)
Turns the main unit ON/OFF.

When this key is pressed to turn the U-10 ON, the readout comes in the MEAS mode, showing the parameter last displayed in the previous measurement. If the U-10 is left with the power ON for 30 minutes without any of the keys being activated, the power will be turned OFF automatically.

SELECT

Parameter-Select Key (SELECT)
Use this key to move the upper cursor to the measured parameter you want to show on the readout. It toggles through the six parameters in order:

pH → COND → TURB → DO → TEMP → SAL

MODE

Mode Key (MODE)
Toggles back and forth between MEAS and MAINT modes. When in the MAINT mode, this key toggles the lower cursor through the six maintenance Sub-Modes.

AUTO → ZERO → SPAN → IN → OUT → S.SET

EXP

Expanded-Readout Key (EXP)
Toggles between (1) standard readout value and (2) expanded readout, for greater resolution, with decimal point moved one digit to the left.

ENT

Enter Key (ENT)
This acts like the RETURN Key or Enter Key on a computer keyboard. The U-10 Enter Key has four main functions, depending on which mode the unit is in.

1. In the AUTO Sub-Mode: Press this key to start automatic calibration.
2. In either the ZERO or SPAN Sub-Modes: Used in manual calibration to set the value for the standard solution being used.
3. In the IN Sub-Mode: Inputs data being measured to memory.
4. In the OUT Sub-Mode: Recalls values from one of the 20 Data-Set Nos. that is now shown on the readout. Prints data when a printer is connected.

CLR

Clear Key (CLR)
This acts like the ESCAPE Key on a computer keyboard It has three main functions, depending on which mode the unit is in.

1. In the AUTO Sub-Mode: Aborts the auto-calibration now in progress.
2. In the IN Sub-Mode: Deletes data in memory from all 20 Data-Sets.
3. When the readout shows an error code: Clears the error code from the readout.

▲
▼

UP/DOWN keys
Use these keys to select values when in one of the MAINT Sub-Modes. They have two main functions.

1. In either the ZERO or SPAN Sub-Modes: Use these keys to select value for the standard solution.
2. In the OUT mode: Used to toggle through the 20 Data-Set Nos. to select the one you wish to recall.

Setting up the U-10

Preparations of the pH sensor and the reference sensor

1. Remove the protective rubber cap from the pH sensor.
2. Remove the sealing tape from the reference sensor.

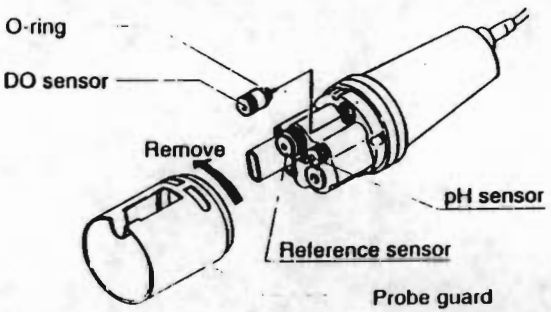
Inserting the DO sensor

WARNING

The DO sensor contains a strong alkaline solution. Should any of this solution come in contact with your clothing or skin, wash it away immediately with plenty of water. Be especially careful not to allow any of the liquid in the DO sensor to get in your eyes.

The Dissolved-Oxygen (DO) sensor has a delicate membrane that can easily be ruptured. For safety's sake, the U-10 is shipped to you with the DO sensor packed separately. You should insert the DO sensor when you unpack your U-10 unit.

1. Make sure that the DO sensor has the correct O-ring, as shown.
2. First, fit the DO sensor lightly into its socket, and then put on the probe guard to align it correctly.
3. Then, tighten the DO sensor securely to the probe body. When doing this, be especially careful not to damage the membrane, which is located in the front of the DO sensor.



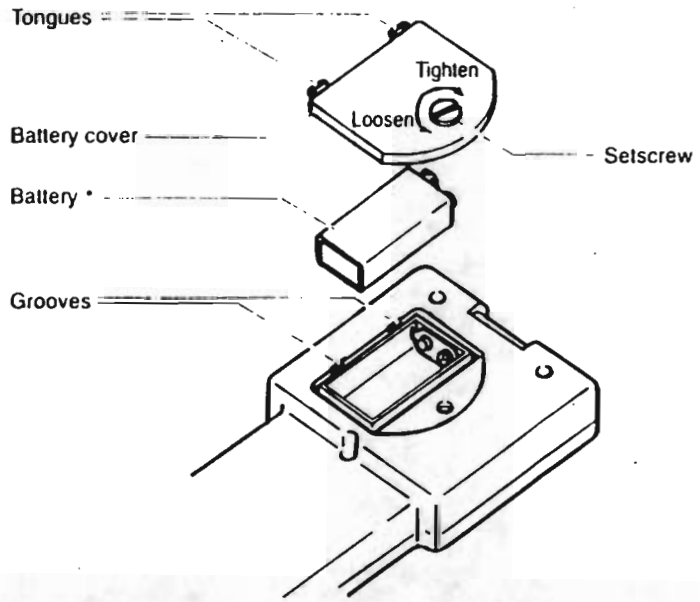
Inserting the battery

The U-10 is shipped from the factory with the battery packed separately.

The battery may be inserted by loosening the set-screw on the battery cover and pulling up the cover. Make sure that the plus and minus poles of the battery match the terminals correctly.

If the readout shows the message Er 1, it means that the battery is defective or exhausted and should be replaced.

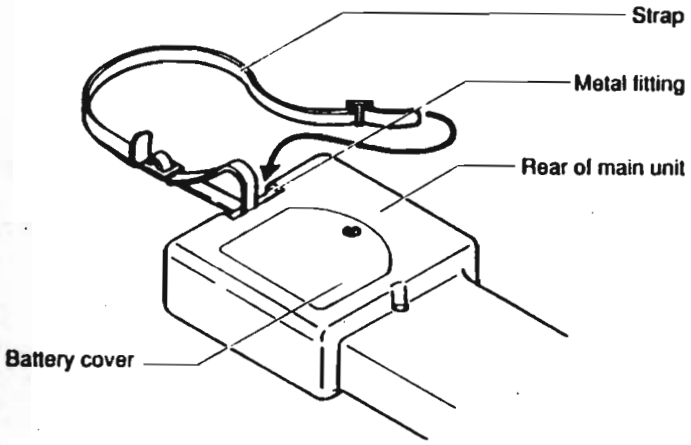
If you are replacing the battery and already have data stored in the U-10 memory that you wish to save, be sure to turn OFF the POWER Key before you remove the old battery. This will assure that data stored in memory will be maintained by the internal backup battery.



• Use a 9V-battery

Attaching the carrying strap

Hook both ends of the strap through the metal fitting on back of the main unit, as illustrated.



Section 2

Making Measurements

Making a measurement with the U-10 Water Checker is extremely simple. Just turn on the power and place the probe in the sample of water you wish to measure.

All six parameters are measured simultaneously. These parameters may be stored in memory, printed out, or viewed one-by-one on the LCD readout. For printing and data storage, see the appropriate sections following this one. To view the parameters one-by-one on the readout, use the SELECT Key to toggle the upper cursor through them.

While the U-10 is both rugged and precise, the key to accurate measurements is cleanliness and frequent calibration. It is essential to clean the U-10 thoroughly after each measurement, and it is recommended that you re-calibrate your U-10 as frequently as possible. For best results, you should recalibrate it before each measurement session. Cleaning and calibration procedures are described below in this section and in the following one.

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How to make a measurement

POWER **1** Turn the power on.

2 Gently place the probe into the water sample.

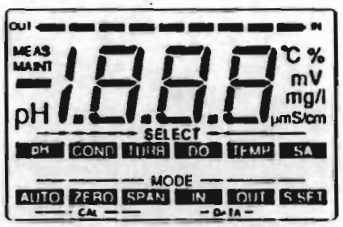
Basically, that's all there is to it: just turn it on and put the probe in the sample. Of course, the U-10 can do many sophisticated things with the sample data, and for best results, you should be careful about calibrating the unit and maintaining it in good condition. This is explained in detail below and in the next section.

Be careful!
Never drop or throw the probe into the water. It is a precision instrument containing five delicate sensors and five pre-amps; you can damage it beyond repair by unnecessary rough handling.

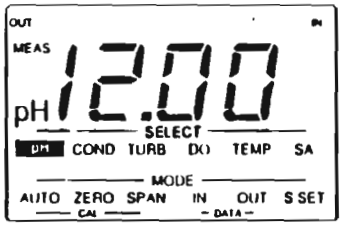
Initial readout

POWER

When you first turn the power on, the U-10 will be in the MEAS mode, the readout will look like this, with all the LCD segments activated.



After about two seconds, the readout will change to show that a new measurement is being made. The readout will show the last parameter that the upper cursor was on when the previous measurement was made, i.e., pH as illustrated here.



(Expanded readout shown)

The display of the decimal point in the readout mode will also be in the same format as was selected with the EXP Key in the previous measurement, i.e., standard or expanded (as illustrated here).

Select the parameter you want shown on the readout of the measured data

SELECT

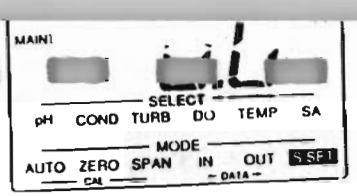
All six parameters are automatically measured at once. Use the SELECT Key to toggle the upper cursor to the parameter you want.

pH	: pH
COND	: Conductivity
TURB	: Turbidity
DO	: Dissolved oxygen
TEMP	: Temperature
SAL	: Salinity

To get a uniform reading, slowly move the probe up and down to circulate the water through it. (Move it 1 foot (30 cm) per sec.) Then wait for the readout to stabilize while doing this.

TURB	0-100 NTU	10 NTU	1 NTU
DO	0-19.9 mg/l	0.1 mg/l	0.01 mg/l
TEMP	0-50°C	1°C	0.1°C
SAL	0-4%	0.1%	0.01%

Note that the salinity parameter is the only value not measured directly with its own sensor. The U-10 obtains salinity by converting the conductivity value. If large amounts of conductive ions other than salt-water components are present in the sample, an error may occur. Be cautious when interpreting the salinity results.



ENT

3. Finally, press the ENT Key to complete the salinity setting while in the S.SET Sub-Mode.

MODE

4. When the salinity setting has been made, switch back to the MEAS mode by pressing the the MODE Key.

Section 3

Calibrating the U-10

The U-10 Water Checker may be calibrated either manually or automatically. The 4-parameter auto-calibration procedure is quite handy and should be sufficient for most measurement operations.

Manual calibration for each of the four parameters is more accurate but, of course, also more time-consuming. This method should be used for more precise measurement. The manual calibration procedure is explained below in detail, following the description of the auto-calibration procedure.

The auto-calibration procedure is extremely simple. The U-10 Water Checker uses just a single solution to do a simultaneous calibration of four parameters: *pH, COND, TURB,* and *DO*. Your U-10 comes with a bottle of standard phthalate pH solution and a calibration beaker for this purpose.

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1.Zero calibration 24
2.Span calibration 25
COND Calibration 26
1.Zero calibration 28
2.Span calibration 29
TURB Calibration 30
1.Zero calibration 31
2.Span calibration 31
DO Calibration 32
1.Zero calibration 33
2.Span calibration 33

Auto-calibration procedure

Fill the calibration beaker to about 2/3 with the standard solution. Note the line on the beaker.

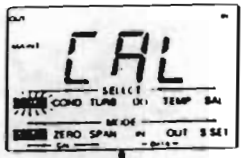
Fit the probe over the beaker, as illustrated. Note that the beaker is specially shaped to prevent the DO sensor from being immersed in the standard solution. This is because the DO auto-calibration is done using atmospheric air.

Calibration beaker

MODE With the power on, press the MODE Key to put the unit into the MAINT mode. The lower cursor should be on the AUTO Sub-Mode; if it is not, use the MODE Key to move the lower cursor to AUTO.

ENT With the lower cursor on AUTO, press the ENT Key. The readout will show CAL. Wait a moment, and the upper cursor will gradually move across the four auto-calibration parameters one-by-one: *pH, COND, TURB,* and *DO*. When the calibration is complete, the readout will briefly show End and then will switch to the MEAS mode.

The upper cursor will blink while the auto-calibration is being made. When the auto-calibration has stabilized, the upper cursor will stop blinking.

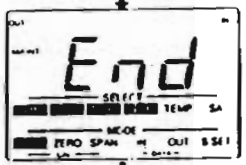


First, pH is being auto-calibrated

Then, COND is being auto-calibrated

Next, TURB is being auto-calibrated

Finally, DO is being auto-calibrated



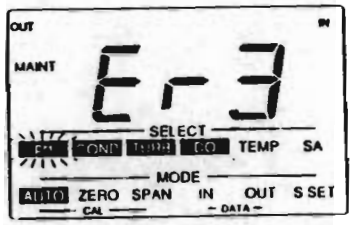
Auto-calibration now ends

And the readout switches to the MEAS mode

Note: If you wish to abort the auto-calibration for any reason, press the CLR Key. The parameters auto-calibrated so far will be stored in memory.

Auto-calibration error

After the DO auto-calibration, if the unit does not switch to the MEAS mode as it should, and the readout shows either Er3 or Er4, an auto-calibration error has occurred. Parameters will blink where an error occurred.



pH auto-calibration error

CLR

If this happens, re-do the auto-calibration. First, press the CLR Key to cancel the error code.

ENT

Then press the ENT Key to re-start the auto-calibration. Restart the auto-calibration beginning again with pH.

Manual (2-point) calibration procedures

For normal measurements, the 4-parameter auto-calibration described above is sufficiently accurate. However, you may wish to do a parameter-by-parameter, 2-point manual calibration of one or more of the four parameters. This is recommended either for high-accuracy measurements, especially when using the expanded readout mode. It is necessary if a new probe is being used for the *first time*.

Parameters to be calibrated manually.

pH	• Zero	(see page 24.)
	• Span	(see page 25.)
COND	• Zero	(see page 28.)
	• Span	(see page 29.)
TURB	• Zero	(see page 31.)
	• Span	(see page 31.)
DO	• Zero	(see page 32.)
	• Span	(see page 33.)

Parameters not to be calibrated.

Sample temperature
Salinity

pH calibration

pH calibration on the U-10 is done using two commercially-available standard solutions of different pH values, one for the zero calibration, the other for the span calibration. Note that the temperature characteristics of the various standard solutions that are available may differ; therefore, before using these two solutions to make the pH calibration, carefully measure the temperature and determine the temperature characteristics of each.

Preparation

Wash the probe 2-3 times, using de-ionized or distilled water. Place it in a beaker of each standard solution.

1. Zero calibration

Use a pH7 standard solution for the zero calibration.

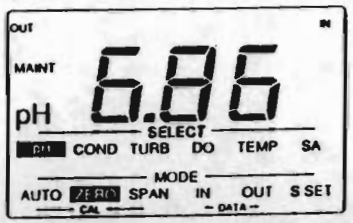
Operation

1. With the power on, press the MODE Key to put the unit into the MAINT mode.

2. Press the MODE Key again to move the lower cursor to ZERO.

3. Use the SELECT Key to move the upper cursor to pH.

4. When the readout has stabilized, use the UP/DOWN Keys to select the value of the pH 7 standard solution at the temperature of the sample. Refer to Table 2 for pH values of standard solutions at various temperatures.



5. Press the ENT Key to complete the zero calibration for pH.

2. Span calibration

Use either a pH4 or a pH9(10) standard solution for the span calibration.

Operation

1. Use the MODE Key to move the lower cursor to SPAN.

2. As in Step 4. above in zero calibration, when the readout has stabilized, use the UP/DOWN Keys to select the value of the standard solution (i.e., either pH4 or pH9) at the temperature of the sample. Again, refer to Table 2 for pH values of standard solutions at various temperatures.

3. Press the ENT Key to complete the span calibration for pH.

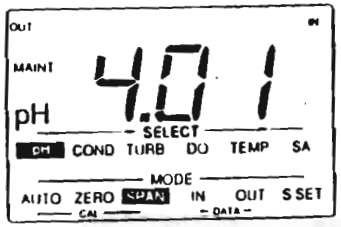


Table 2 pH values of standard solutions at various temperatures*

Temperature °C / °F	pH2[a]	pH4[b]	pH7[c]	pH9[d]	pH10[e]	pH12[f]
0 / 32	1.67	4.01	6.98	9.46	10.32	13.43
5 / 41	1.67	4.01	6.95	9.39	10.25	13.21
10 / 50	1.67	4.00	6.92	9.33	10.18	13.00
15 / 59	1.67	4.00	6.90	9.27	10.12	12.81
20 / 68	1.68	4.00	6.88	9.22	10.06	12.63
25 / 77	1.68	4.01	6.86	9.18	10.01	12.45
30 / 86	1.69	4.01	6.85	9.14	9.97	12.30
35 / 95	1.69	4.02	6.84	9.10	9.93	12.14
40 / 104	1.70	4.03	6.84	9.07	9.89	11.99
45 / 113	1.70	4.04	6.83	9.04	9.86	11.84
	1.71	4.06	6.83	9.01	9.83	11.70

a : oxalate, b : phthalate, c : neutral phosphate, d : borax,
e : carbonate, f : Sat.calcium hydroxide solution

* These pH valves are for Japanese standard solutions. Should you prefer to use different standard solutions, be sure to make the proper adjustments in calibration.

COND calibration

The U-10 can measure conductivity in the range of 0-100 mS/cm. Depending on the sample concentration, however, the U-10 automatically selects the proper range out of its three possible ranges of 0-1 mS/cm, 1-10 mS/cm, and 10-100 mS/cm.

Therefore, if you are doing a manual calibration for COND, this must be done for each of the three ranges. However, since the zero point is common for all three ranges, only the three one-point span calibrations need be done separately.

Preparing the standard solution for COND span calibration

This solution uses a potassium chloride as a reagent. For greater accuracy, the solution should be freshly prepared each time. If it is unavoidable to use a stored solution, be sure to keep it tightly capped in a polyethylene or hard glass bottle. The shelf life of this solution is six months. Date-stamp the bottle for reference. Never use a KCl standard solution that has been stored for more than six months: the calibration accuracy may be adversely affected.

Use potassium chloride powder of the best quality commercially available. Dry the powder for two hours at 105°C, and cool it down, in a desiccator. Weigh out an appropriate amount of dried and cooled potassium chloride powder according to the table below. Make the potassium chloride standard solution as shown.

Table 3 Making the potassium chloride standard solution

KCl standard solution	KCl weight g	Conductivity* mS/cm	Range to be calibrated mS/cm
0.005N	0.373	0.718	0-1
0.05N	3.73	6.67	1-10
0.5N	37.28	58.7	10-100

* Value at the temperature, 25°C

To prepare the standard solution, use a 1-liter volumetric flask. First, dissolve the KCl in a small amount of de-ionized or distilled water. Then fill the flask with de-ionized or distilled water up to the 1-liter line. Finally, shake the solution to mix it thoroughly.

1. Zero calibration

This calibration is carried out in atmospheric air; no solution is needed.

Preparation

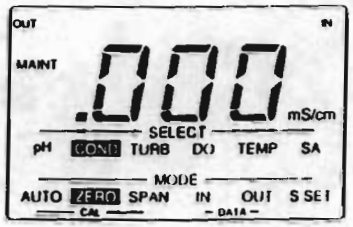
Wash the probe 2-3 times, using de-ionized or distilled water. Shake the probe to remove any water droplets from the COND sensor. Then allow it to dry by exposing it to fresh air.

Operation

1. Use the MODE Key to move the lower cursor to ZERO.

2. Use the SELECT Key to move the upper cursor to COND.

3. Use the UP/DOWN Keys to set the readout to zero.



4. Press the ENT Key. This completes the zero calibration for COND.

2. Span calibration

This procedure uses a standard solution of potassium chloride. For best results, a fresh batch of the solution should be prepared each time. See page 27 for details.

Preparation

Wash the probe 2-3 times using de-ionized or distilled water. Following this, wash it 2-3 times in the KCl standard solution you have prepared. Then place the probe in a beaker of the KCl solution maintained at a temperature of 25±5°C.

Operation

1. Use the MODE Key to move the lower cursor to SPAN.

2. After the readout stabilizes, as you did for the pH calibration, use the UP/DOWN Keys to select set the value of the KCl standard solution, referring to the KCl table.

3. Press the ENT Key to complete the span calibration for this COND range.

4. Repeat this procedure for the three ranges, using each of three values of KCl standard solutions.

TURB calibration

Use good-quality de-ionized water, which may be considered as having a turbidity of zero. If that is not readily available, distilled water may be used instead. When doing the turbidity zero calibration, it is particularly crucial that you clean the probe thoroughly. Never use a dirty probe; otherwise the calibration will be unreliable.

Preparing the standard solution for TURB span calibration

1. Weigh out 5.0 g of hydrazine sulfate.
2. Dissolve this in 400 m/ of de-ionized or distilled water.
3. Then weigh out 50 g of hexamethylenetetramine, and dissolve it in 400 m/ of de-ionized or distilled water.
4. Mix these two solutions, add enough de-ionized or distilled water to make 1,000 m/, and stir the mixed solution thoroughly.
5. Allow this solution to stand for 24 hours at a temperature of 25 ±3°C.

   The turbidity of this solution is equivalent to 4000 NTUs. The shelf-life of this solution is six months; i.e., this 4,000-NTU value will remain accurate for a maximum of six months.

   Each time you carry out this calibration, it is necessary to dilute the 4,000-NTU standard solution to prepare an 800-NTU standard solution for calibration. To do this, measure out 50 m/ of the 4,000-NTU solution into a 250-m/ measuring flask.

   It is recommended that you use a rubber pipette aspirator for this. Then add de-ionized or distilled water up to the 250-m/ line.

   The standard solution used here for the turbidity calibration will precipitate easily. Therefore, be sure to stir the solution thoroughly before use.

1. Zero calibration

Preparation

Wash the probe thoroughly 2-3 times using de-ionized or distilled water. Shake off excess water droplets, and then place it in a beaker of de-ionized or distilled water.

Operation

1. Use the MODE Key to move the lower cursor to ZERO.

2. Use the SELECT Key to move the upper cursor to TURB.

3. After the readout has stabilized, set it to 0.0, using the UP/DOWN Keys.

4. Press the ENT Key to complete the zero calibration for TURB.

2. Span calibration

Preparation

Wash the probe thoroughly, using de-ionized or distilled water. Shake off excess water droplets. Then place it in a beaker of the 800-NTU solution you have prepared for this purpose.

Operation

1. Stir this 800-NTU span standard solution thoroughly.

2. Use the MODE Key to move the lower cursor to SPAN.

3. After readout has stabilized, i.e., about 60 to 90 seconds, set the readout to "800" NTU, which is the value for this standard solution.

4. Press the ENT Key to complete the span calibration for TURB.

DO calibration

Unlike the other calibration procedures, the solution for the DO calibration cannot be stored for use; because the amount of dissolved oxygen in the solution is crucial, a fresh batch must be prepared each time, just before it is used in the DO calibration.

1. Zero calibration

Use a solution of sodium sulfite dissolved in either de-ionized water or tap water.

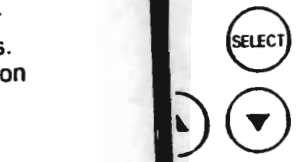
Preparation

1. Add about 50g of sodium sulfite to 1,000 ml of water (either de-ionized water or tap water will do). Stir this mixtuer to dissolve.

2. Wash the probe 2-3 times in tap water, and place it in the zero standard solution.

Operation

1. Use the MODE Key to move the lower cursor to ZERO.



2. Use the SELECT Key to move the upper cursor to DO.

3. After the readout has stabilized, set it to 0.0, using the UP/DOWN Keys.

4. Press the ENT Key. This completes the zero calibration for DO.

2. Span calibration

Use either de-ionized water or tap water that has been saturated with oxygen in air.

Preparation

1. Put 1 or 2 liters of water in a container (either de-ionized water or tap water will do). Use an air pump to bubble air through the solution until it is oxygen-saturated.

2. Wash the probe 2-3 times in tap water, and put it in the span calibration solution.

Operation

1. First, be sure the U-10 is set for fresh water readings. To do this, set the S.SET Sub-Mode to 0.0%.

MODE

2. Then, use the MODE Key to move the lower cursor to SPAN.

3. After the readout has stabilized, while slowly moving the probe up and down in the solution, set the readout value to the appropriate DO value for the temperature of this solution. For DO values at various temperatures, refer to Table 4.

ENT

4. Press the ENT Key to complete the span calibration for DO.

Table 4 Amounts of saturated dissolved oxygen in water at various temperatures, salinity = 0.0%

Temperature	DO	Temperature	DO
0 °C	14.16 mg/l	21 °C	8.68 mg/l
1	13.77	22	8.53
2	13.40	23	8.39
3	13.04	24	8.25
4	12.70	25	8.11
5	12.37	26	7.99
6	12.06	27	7.87
7	11.75	28	7.75
8	11.47	29	7.64
9	11.19	30	7.53
10	10.92	31	7.42
11	10.67	32	7.32
12	10.43	33	7.22
13	10.20	34	7.13
14	9.97	35	7.04
15	9.76	36	6.94
16	9.56	37	6.86
17	9.37	38	6.76
18	9.18	39	6.68
19	9.01	40	6.59
20	8.84		

Section **4**

Data Storage and Printout

The U-10 can store up to 20 sets of data, 120 data points, of the values measured for each of the six parameters: pH, COND, TURB, DO, TEMP, and SALINITY. Values stored in memory can be recalled to the readout as desired.

If a printer is connected to the U-10 printer port, whenever a Data-Set is either stored in memory or recalled to the readout, it can also be simultaneously output to the printer.

Storing data 36
Recalling data 38
Deleting data 40
Printing out data 41

Storing data

MODE

1. Press the MODE Key to put the U-10 in the MAINT mode.

MODE

2. Continue to press the MODE Key to move the lower cursor to IN, the *Input* Sub-Mode.

SELECT

3. Use the SELECT Key to move the upper cursor to the parameter you wish to see on the readout.

ENT

4. When the readout stabilizes on a value, press the ENT Key. This will automatically input the set of six parameters for this measurement into memory.

The readout will first show the Data-Set No. for about two seconds. At the top right-hand corner, a dashed arrow points to IN, showing that data is being input. Then each parameter is automatically read into memory, one-by-one from pH to salinity. The upper cursor skips along to show this. If a printer is connected, these six values will also be printed out at the same time.

The upper cursor then returns to pH, with the U-10 still in the IN Sub-Mode.

ENT

5. You may now continue and input another set of data: simply press the ENT Key again.

The Data-Set No. will automatically advance one digit, and the next set of six parameters will be read into memory in the same manner. This procedure can be repeated for up to a total of 20 Data-Sets.

If 20 Data-Sets have been read into memory, the storage capacity is full and no more data may be input. The U-10 will beep three times to indicate the memory is full.

MODE

6. To return the readout to the previous setting in the MEAS mode, press the MODE Key again.

Recalling data

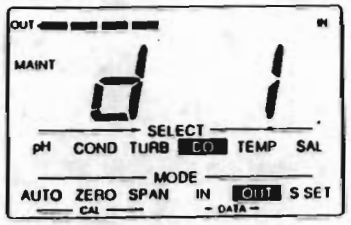
MODE

1. Press the MODE Key to put the U-10 in the MAINT mode.

MODE

2. Continue to press the MODE Key to move the lower cursor to OUT, the *Output* Sub-Mode. The readout will show d.1, meaning Data-Set No. 1.

At the top left-hand corner, a dashed arrow points to OUT, showing that data can be output now to the readout.



▲ ▼

3. Use the UP/DOWN Keys to display the Data-Set No. of the values you wish to recall.

SELECT

4. Use the SELECT Key to move the upper cursor to the parameter you wish to view.

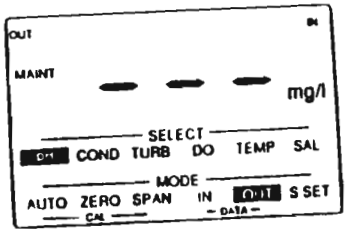
ENT

5. Press the ENT Key to display the data on the readout.

If a printer is connected, all six parameters in this Data-Set will also be printed out at the same time.

ENT

6. When the ENT Key is pressed again, the next Data-Set No. is displayed in order, i.e., d2, if two data sets are in memory. At this point, you can either press the ENT Key again to view the contents of this Data-Set, or you can use the UP/DOWN Keys to go up or down to another Data-Set No.
   If a particular Data-Set is empty, three dashes appear on the readout.



MODE

7. To return the readout to the previous setting in the MEAS mode, press the MODE Key again.

Deleting data

Set the U-10 as if you were going to input data:

MODE

1. Press the MODE Key to put the U-10 in the MAINT mode.

MODE

2. Continue to press the MODE Key to move the lower cursor to IN, the Input Sub-Mode.

CLR

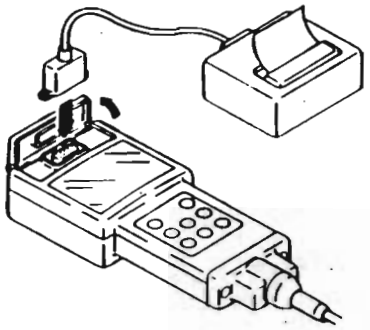
3. Then, to erase all the data from all the Data-Sets in memory, press the CLR Key. The readout will show the message CLr for about two seconds.

Be careful!
You cannot delete individual Data-Sets. The CLR Key always erases all data from memory.

Printing out data

If a printer is connected to the U-10 printer port, whenever a Data-Set is either stored in memory or recalled to the readout, it is also simultaneously output to the printer.

The U-10 printer port is a standard Centronics parallel port. To connect a parallel printer to the U-10: Open the rubber printer-port cover, located directly over the readout on the main unit, and connect the printer cable.



Note:
When a printer is not being used, disconnect the cable from the U-10 printer port, and close the cover tightly.

- **Sample printout**

```
NO. 1 DATE  /  /
 pH      5.0
 COND    1.5    mS/cm
 TURB 390       NTU
 DO      0.5    mg/l
 TEMP   23      °C
 SAL     3.0    %
NO. 2 DATE  /  /
 pH      3.1
 COND    1.3    mS/cm
 TURB 270       NTU
 DO      0.7    mg/l
 TEMP   25      °C
 SAL     0.1    %
NO. 3 DATE  /  /
 pH      3.1
```


Section **5**

Daily Maintenance and Troubleshooting

For accurate measurements and prevention of malfunction, routine careful maintenance of the U-10 is important. In particular, failure to maintain the sensors properly can lead to serious trouble or incorrect measurements. The U-10 is provided with error-code functions for the ready detection of potential problems.

Error codes 44
Normal probe maintenance 47
Replacing faulty sensors 49
Replacing a faulty probe 50

Error Codes

The U-10 has an easy-to-understand error message function so you can spot trouble readily. Error codes are displayed on the readout and the unit will beep if an error occurs.
(Note that if you press an incorrect sequence of keys, the unit will beep three times to indicate you have pushed the wrong key.)

Error Code	Cause	Action
Bad battery Er 1	• Defective or low battery	• Replace battery
Failure in main unit Er 2	• Malfunction of memory backup IC	• Push POWER Key to turn the U-10 ON again. If this error code is still displayed, contact your Horiba dealer for repair or replacement.
Zero-calibration error Er 3	*for all parameters*	
	• Poor connection in probe-to-main unit cable	• Connect the cable securely.
	• Water in one of the sensor sockets	• Dry out the sensor sockets.
	• Temperature of sample exceeds maximum scale of U-10	• Replace the probe.
	for pH	
	• Contaminated pH sensor.	• Clean the pH sensor.
	• Improper concentration of reference solution in reference sensor	• Replace the reference solution.
	for COND	
	• Contaminated COND sensor	• Clean the sensor, using tooth brush and neutral detergent.

Error Code	Cause	Action
	for TURB	
	• Contaminated or defective LED sensor	• Clean out the tube containing the LED turbidity sensor, using test tube brush and neutral detergent. Never use an abrasives or cleansers for this.
	for DO	
	• Broken DO sensor membrane.	• Check the LED turbidity sensor. If it defective, the entire probe must be replaced. Check DO sensor. If defective, replace.
Span-calibration error Er 4	*for all parameters*	
	• Poor connection in probe-to-main unit cable	• Connect the cable securely.
	• Water in one of the sensor sockets	• Dry out the sensor sockets.
	• Temperature of sample exceeds maximum scale of U-10	• Replace the probe.
	for pH	
	• Contaminated pH sensor.	• Clean the pH sensor.
	• Improper concentration of reference solution in reference sensor	• Replace the reference solution.
	for COND	
	• Contaminated COND sensor	• Clean the sensor, using tooth brush and neutral detergent.
	for TURB	
	• Contaminated or defective LED sensor	• Clean out the tube containing the LED turbidity sensor, using test tube brush and neutral detergent. Never use an abrasives or cleansers for this. • Check the LED turbidity sensor. If it defective, the entire probe must be replaced.

Error Code	Cause	Action
Span-calibration error		
Er4	*DO Auto-calibration*	
	• Broken DO sensor membrane.	• Check DO sensor membrane. If defective, replace.
	• Excessive difference between DO sensor temperature and atmospheric temperature.	• Leave DO sensor in atmosphere for 30-60 min.
	DO aqueous solution calibration	
	• Broken DO sensor membrane.	• Check DO sensor membrane. If defective, replace.
	• Contaminated electrode.	• Clean the electrode using a soft brush, taking care not to scratch membrane.
	• Insufficient agitation of solution.	• Agitate solution thoroughly.
Memory full		
Er5	• Data-sets for 20 samples are already in memory.	• To delete all data from memory, put the U-10 in the IN Sub-Mode mode and press the CLR Key.
Printer error		
Er6	• Jammed printer paper.	• Eliminate jamming of printer paper.
	• Poor cable connection .	• Replace the cable.
	• Wrong printer.	• Use proper parallel Centronics printer.
	• Defective printer.	• Replace the printer as necessary.

Normal probe maintenance

Washing the turbidity sensor

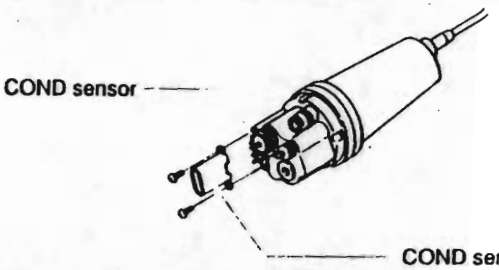
The sensor is a glass tube. Wash out the tube and remove stains carefully, using tap water and a test tube brush.

Be careful not to scratch the inside of the glass tube. Never use abrasives or cleansers.

Cleaning the conductivity sensor

Remove COND sensor guard, and carefully use a soft brush to clean off any dust from the sensor unit.

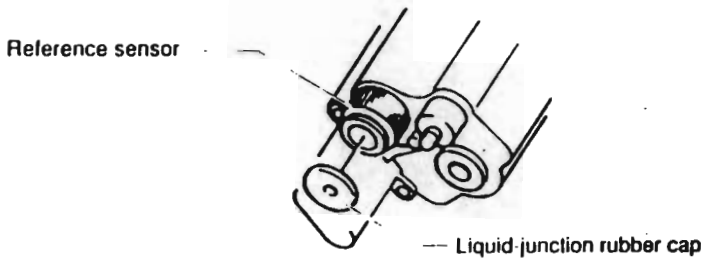
Be sure to replace the COND sensor guard before taking measurements.



Recharging the reference sensor with reference solution

Recharge the reference sensor with reference solution about once every two months, as follows.

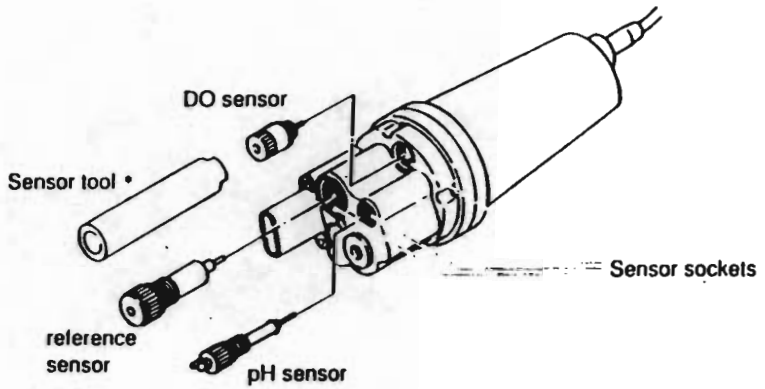
1. Remove the liquid-junction rubber cap from the reference sensor, and pour out the old solution.
2. Fill the reference sensor completely with new reference solution. Make sure there are no air bubbles.
3. Replace the liquid-junction rubber cap.
4. Carefully wash off all excess reference solution from the probe.



Replacing faulty sensors

Three of the U-10's sensors are replaceable: the *pH sensor*, the *reference sensor*, and the *DO sensor*.
These may be replaced as follows.

1. Wipe off any water droplets from the probe.
2. Remove faulty sensor.
3. Insert the new sensor carefully with your fingers.
4. Be careful not to let the sensor sockets get wet.

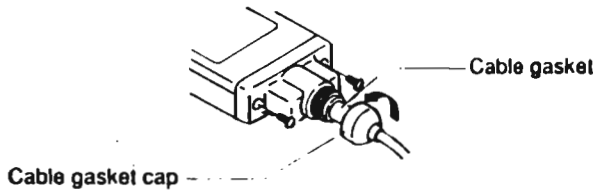


• When replacing the DO sensor, use the sensor tool provided as an accessory.

Replacing a faulty probe

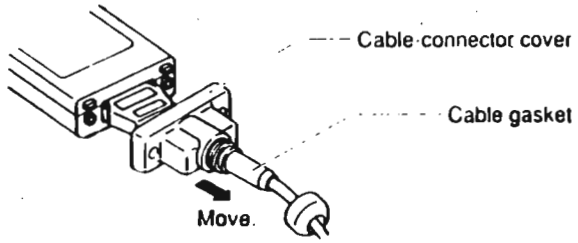
Disconnect the cable from the main unit

1. Loosen the cable gasket cap, and remove cap from gasket.



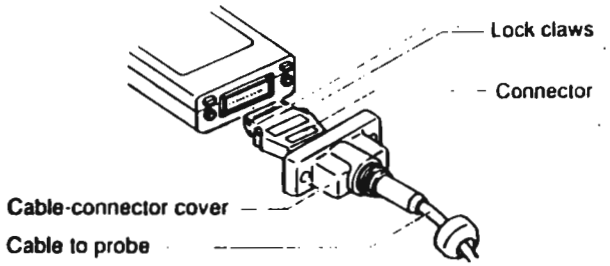
2. Slide back the gasket.

3. Back off the two screws on the cable-connector cover.



4. Slide off the cable-connector cover to expose the connector lock claws.

5. Press lock claws on both sides with your fingers to release the connector. Pull out the connector from the main unit.



Connect the new probe

1. Insert the connector until it clicks.

2. Re-attach the cable-connector cover to the main unit.

3. Slide the cable gasket toward the cable-connector cover, and screw on the cable gasket cap.

Before you use a new probe for the first time, it is necessary to calibrate it manually for all four parameters. Refer to Section 3, "Calibrating the U-10," for instructions on manual calibration.

MALCOLM PIRNIE

Well No. _____

Well Development/Purging Log

PROJECT NAME: _____

PROJECT NUMBER: _____

DATE: _____

SAMPLERS: _____

_____

			Well I.D.	Vol. Gal./Ft.
①	Total Casing and Screen Length (ft.)	_____	1"	0.04
			2"	0.17
②	Casing Internal Diameter (in.)	_____	3"	0.38
			4"	0.66
③	Water Level Below Top of Casing (ft.)	_____	5"	1.04
			6"	1.50
④	Volume of Water in Casing (gal.)	_____	8"	2.60

$v = 0.0408 (②)^2 \times (① - ③) = ④$

$v = 0.0408 (\quad)^2 \times (\quad - \quad) =$ _____ gal.

PARAMETER	ACCUMULATED VOLUME PURGED										
Gallons											
Time											
Conductivity (mohm/cm)											
Dissolved Oxygen (ppm)											
Eh (mV)											
pH											
Temp (°C)											
Turbidity (NTUs)											

_____

COMMENTS:

CHAIN OF CUSTODY RECORD

Project Name:		Project Number:				Number of Containers													
Date	Time	Sample Identification		Comp.	Grab	Sample Pres.													
Sampled by: (Signature)		Date/Time		Received by: (Signature)			Relinquished by: (Signature)			Date/Time		Received by: (Signature)							
Relinquished by: (Signature)		Date/Time		Received by: (Signature)			Relinquished by: (Signature)			Date/Time		Received by: (Signature)							
Relinquished by: (Signature)		Date/Time		Received for Laboratory by: (Signature)			Date/Time		Remarks:										

APPENDIX C

Quality Assurance Plan

MALCOLM PIRNIE

QUALITY ASSURANCE PLAN

Remedial Action

Former Abalene Pest Control
Moreau, New York

NYSDEC Site Number 546035

Orkin Exterminating Company, Inc.
Atlanta, Georgia

Prepared by:

Malcolm Pirnie, Inc.
15 Cornell Road
Latham, New York 12110

March 1999
1368016

RECYCLED PAPER

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1.0 INTRODUCTION/BACKGROUND

1.1 BACKGROUND/OBJECTIVES

This Quality Assurance Project Plan (QAPP) presents, in specific terms, the quality assurance (QA) and quality control (QC) activities designed to achieve the data quality goals of the Remedial Action at the former Abalene Pest Control Site in Moreau, New York (NYSDEC Site No. 546035).

2.0 FIELD INVESTIGATION PROCEDURES

2.1 SAMPLING PROCEDURES AND EQUIPMENT

The field investigation procedures which will be followed during this Site Investigation are summarized below.

2.1.1 Decontamination of Sampling Equipment

Cross contamination of samples from any source is to be avoided. All sampling equipment must be clean and free from the residue of any previous samples. To accomplish this, the following procedures will be followed:

- All non-dedicated sampling equipment must be cleaned initially and prior to being reused. The following is the procedure for decontamination and does not apply to heavy equipment or drilling equipment, with the exception of split-spoon samplers. All heavy equipment and drilling equipment will be steam cleaned in a predesignated location prior to use and between locations.
- Wash and scrub with low phosphate detergent,
- Rinse with tap water,
- Rinse with pesticide grade isopropanol;
- Rinse thoroughly with deionized water,
- Air dry, and
- Wrap in aluminum foil for transport.

Well equipment such as submersible pumps, will be decontaminated by thoroughly washing all internal and external surfaces with soapy water and rinsing with deionized water prior to use. All tubing must be dedicated to individual wells, i.e., tubing cannot be reused.

Field instrumentation should be cleaned per manufacturer's instructions. Probes, such as those used in pH and conductivity meters, and thermometers must be rinsed prior to and after each use with deionized water.

2.1.2 Confirmatory Soil Sampling

2.1.2.1 Soil Sampling Objectives

Confirmatory soil samples will be collected from the sidewalls and bottoms of the excavations to document removal of off-site soils with pesticide concentrations in excess of the Target Concentration Levels (TCLs). Soil samples will also be collected to assess whether excavated soils from on-site locations will be disposed of on or off of the site. Specific sampling objectives are outlined in the Remedial Action Work Plan (RAWP). Soil samples to be collected during the Remedial Action at the former Abalene Pest Control facility are summarized in Table 2-1.

2.1.2.2 Soil Sampling Equipment

The following equipment will be used to collect soil samples:

- Photoionization Detector (PID)
- JMC Environmentalist Sub-soil Probe (JMC)
- Stainless steel spatula or spoon
- Stainless steel bowl
- Latex gloves (disposable)
- Neoprene gloves
- Certified, precleaned sample containers
- Aluminum foil
- Field logbook and pen
- Decontamination equipment.

2.1.2.3 Soil Sampling Procedures

Sidewall and bottom samples from off-site excavations, as well as from on-site excavations in Areas 1, 2, and 3, will be collected using the following procedure. Aliquots of soil will be collected from the side and/or bottom of the excavation at the designated locations using a decontaminated stainless steel spoon or trowel, then placed in a decontaminated stainless steel bowl. The soil in the bowl will be homogenized and then

TABLE 2-1

FORMER ABALENE PEST CONTROL
REMEDIAL ACTION
MOREAU, NEW YORK
CONFIRMATORY SOIL SAMPLES

LOCATION	TOTAL NUMBER OF SAMPLES
CONFIRMATORY SAMPLES	
Off-site	9
On-site (excavation samples)	19
On-site (composite samples)	5
QA/QC SAMPLES	
Field Duplicates	2
Field Blanks	2
TOTALS	37

transferred to a laboratory supplied, precleaned sample container for off-site analysis by the analytical laboratory.

Composite samples from the relocated soil placed in the on-site soil relocation area will be collected using the following procedure. Composite samples will be collected using the JMC, a hand-operated soil coring device. The JMC consists of two main parts, the drive assembly, which houses the sampling tube, and the retrieval device. Subsurface soil samples are collected by driving the sampling tube into the ground with a slam-bar. Upon reaching the target depth, the sampling tube is removed from the ground using the retrieval device. The soil core is then removed from the sampling tube and placed on a clean piece of polyethylene sheeting for soil characterization and sampling. The JMC will be decontaminated between composite sampling locations.

The JMC core(s) from each sampling location will be placed in a decontaminated stainless steel bowl. Upon reaching the bottom of the relocated soil pile, the soil in the bowl will be homogenized and then transferred to a laboratory supplied, precleaned sample container for off-site analysis by the analytical laboratory.

2.1.3 Water Level Measurements

2.1.3.1 Measurement Objectives

Water levels in groundwater monitoring wells will be measured and used in conjunction with horizontal and vertical ground survey data to determine horizontal components of groundwater flow. Water level measurements will also be used to determine the volume of standing water in monitoring wells prior to well purging activities.

2.1.3.2 Measurement Equipment

The following equipment will be used to measure water levels:

- Electronic water level indicator
- Field logbook and pen
- Photoionization Detector (PID)
- Deionized Water
- Low Phosphate Detergent

2.1.3.3 Measurement Procedure

At each measuring point, the PVC cap will be removed and the head space and breathing zone's air quality will be monitored with a PID.

The battery of the electric water level indicator will be checked by pushing the battery check button, and waiting for the audible signal to sound or the instrument light to come on. The water level indicator will be decontaminated before collecting a measurement in each well point by using an alconox wash and deionized water rinse. The instrument will then be turned on and the probe will be slowly lowered into the monitoring well, until the audible signal is heard or the instrument light goes on, indicating that the sensor in the probe has made contact with the water surface.

The depth to water will be recorded to the nearest one-hundredth of a foot, from the top of the measuring mark on the monitoring well riser. The date, time, monitoring well number, and depth to water will be recorded in the field book.

2.1.4 Groundwater Sampling

2.1.4.1 Sampling Objectives

Groundwater samples will be collected for chemical quality analysis. Specific sampling objectives are outlined in the RAWP. Groundwater samples to be collected at the former Abalene Pest Control facility are summarized in Table 2-2.

2.1.4.2 Sampling Equipment

The following equipment will be needed to collect groundwater samples for analysis:

- Electric water level indicator
- Bladder or submersible pump
- Air compressor or Generator
- Polyethylene or nalgene tubing and foot-valve
- Temperature, pH, dissolved oxygen, specific conductivity and turbidity meters
- Photoionization Detector (PID)
- Field logbook and field logs
- Preservatives
- Laboratory prepared sample containers
- Roll of polyethylene sheeting
- Decontamination equipment

TABLE 2-2

FORMER ABALENE PEST CONTROL
REMEDIAL ACTION
MOREAU, NEW YORK
GROUNDWATER SAMPLES

DATE	MONITORING WELLS	OFFICE WELL	FIELD DUPLICATES	FIELD BLANKS	TOTAL SAMPLES
Spring 1999	17*	1**	1	1	20
Fall 1999	17	---	1	1	19
Spring 2000	17	---	1	1	19
Fall 2000	17	---	1	1	19
Spring 2001	17	---	1	1	19
Fall 2001	17	---	1	1	19

* MW-1, MW-2, MW-3, MW-4, MW-5, MW-6S, MW-6D, MW-6B, MW-7S, MW-7D, MW-7B, MW-8B, MW-9S, MW-9D, MW-9B, MW-10S, and MW-10D.

** The Office Well will be abandoned after the first round of sampling in accordance with the Project Specifications.

2.1.4.3 Sampling Procedures

Groundwater sampling will be conducted in accordance with the USEPA Low-Flow Sampling Protocol (USEPA 1998). A piece of polyethylene sheeting will be fitted over the monitoring well and laid on the ground. The sampling equipment will be placed on the polyethylene sheeting. The well cap will be removed and the headspace at the top of the monitoring well will be measured with a PID. This step may be omitted in those monitoring wells which have already demonstrated in the previous rounds of water level measurement that they contain no or insignificant amounts of vapors or gases. The PID will be calibrated before the start of each sampling event.

The water volume in the monitoring well will be calculated using the following equation:

$$V = 7.48\ \pi r^2 h$$

(NOTE: 1 ft^3 = 7.48 gal)

where:

v = volume of water in monitoring well casing (gal.)
h = height of water column (feet)
r = casing internal radius (feet)

Clean, new polyethylene tubing will be attached to the centrifugal or positive placement pump, which will be decontaminated between monitoring well locations, as described in Section 2.1.1. The pump will be lowered into the water column to a maximum depth of 2 feet above the bottom of the well. A foot-valve will be used in conjunction with the tubing to eliminate back flow from the pump. The well will be purged at a steady rate of 200 to 500 milliliters per minute (ml/min). Measurements of field parameters consisting of pH, specific conductance, temperature, dissolved oxygen, reduction potential, turbidity, and water level will be conducted in each monitoring well prior to, during, and after purging (just before sampling) through the use of a flow-through cell. Both the pH and the specific conductivity meters will be calibrated for water temperature before each sampling event.

The volume of water removed from each monitoring well will be dependent upon the amount of time required for stabilization of the field parameters. In general, the well will be

considered stabilized for sample collection when field parameters have stabilized for three consecutive readings as follows:

- pH: +/- 0.1 standard units
- Specific Conductance: +/- 3%
- Reduction Potential: +/- 10 millivolts
- Dissolved Oxygen +/- 10%
- Turbidity +/- 10%

When the field parameters have stabilized, the volume of water will be recorded, and groundwater in the monitoring well will be sampled through the pump at a flow rate between 100 and 250 ml/min. The purge water will be discharged in accordance with Section 2.5.

The sample bottles will be pre-preserved by the laboratory. The preservation requirements are presented on Table 2-3. The sample bottles will be immediately placed in a cooler held at 4°C.

Disposable gloves will be worn by the sampling personnel and changed between sampling points.

Data to be recorded in the field logbook will include the information presented in Section 2.4 and purging and sampling methods, depth to water, volume of water removed during purging, pH, temperature and specific conductivity values, and PID readings.

2.2 FIELD QUALITY CONTROL SAMPLES

Quality control procedures will be employed to check that sampling, transportation and laboratory activities do not bias sample analytical quality. Field blanks and duplicate samples will provide a qualitative basis for data review of the analytical data. A summary of the anticipated QA/QC samples for each media is included in Tables 2-1 and 2-2.

2.2.1 Field Blanks

A field blank consists of an empty set of laboratory-cleaned sample containers. At the field location, deionized, analyte-free water is passed through decontaminated sampling equipment and placed in the empty set of sample containers for analysis of the same

TABLE 2-3

FORMER ABALENE PEST CONTROL
REMEDIAL ACTION
MOREAU, NEW YORK
SAMPLE CONTAINER, PRESERVATION AND HOLDING TIME REQUIREMENTS

MATRIX	ANALYSIS	CONTAINER	PRESERVATION	HOLDING TIME
Soil	Pesticides (EPA 8081A)	1 4 oz. glass	Cool to 4°C	14 days to extraction 40 days to analysis
Groundwater	Pesticides (EPA 8081A)	2 1 Liter Amber Glass	Cool to 4°C	7 days to extraction 40 days to analysis

parameters as the samples collected with the sampling equipment. One field blank will be collected per twenty environmental samples per matrix.

2.2.2 Field Duplicates

For each sample matrix, a field duplicate sample will be collected at a rate of one sample per twenty environmental samples. The duplicate sample is collected at the same location as the environmental sample. The field duplicate sample is identified using the sample designation system described in Section 2.3. The identity of the field duplicate is not revealed to the laboratory. The analytical results of the environmental sample will be compared to the field duplicate sample, to evaluate field sampling precision.

2.3 SAMPLE DESIGNATION

A sample numbering system will be used to identify each sample. This system will provide a tracking procedure to allow retrieval of information about a particular sample, and will assure that each sample is uniquely numbered. The sample identification will consist of at least three components as described below. Identification numbers for soil boring samples will also have a fourth component.

- ***Project Identification:*** The first component consists of a two letter designation which identifies the project site. For this project, the two letter designation will be AP for Abalene Pest Control.

- ***Sample type:*** The second component, which identifies the sample type, will consist of a two letter code as follows:

  MW - Monitoring Well (Groundwater Sample)
  SS - Soil Sample

- ***Sample Location:*** The third component identifies the sample location using a two digit number.

- ***Sample Identification:*** The fourth component will only be used for soil samples, to indicate the interval from which the sample was collected.

- ***Quality Assurance/Quality Control Samples***: The samples will be labeled with the following suffixes:

  FB - Field Blank

Duplicate samples will be numbered uniquely as if they were samples. A record of identification for duplicate samples will be maintained.

Examples of identification numbers are given below:

AP-SS-02-(0.0-0.5):	Soil sample, sample location number 2, interval from 0.0-0.5 feet below ground surface.
AP-MW-3:	Monitoring well groundwater sample, monitoring well sample location 3.
AP-MW-FB:	Field blank for monitoring well sample.

2.4 FIELD DOCUMENTATION

2.4.1 Introduction

Field documentation must provide sufficient information and data to enable reconstruction of field activities. Field logbooks provide the basic means for documenting field activities. The following information must be provided on the inside front cover of each field logbook:

- Project Name (Site Name)
- Site Location
- Site Manager
- Date of Issue

2.4.2 Documentation of Field Activities

Field logbook entries must be legibly written and provide an unbiased, concise, detailed picture of all field activities. Use of preformatted data reporting forms must be identifiable and referenced to field notebook entries.

Instructions and procedures for documenting field activities are provided below:

- Leave the first two pages blank. They will provide space for a table of contents to be added when the field logbook is complete.

- The first written page for each day identifies the date, time, site name, location, MPI personnel and their responsibilities, other non-personnel and observed weather conditions.

- Entries are made on a new page at the start of each day's field activities.

- All photos taken must be traceable to field logbook entries.

- All entries must be made in ink.

- All entries must be accompanied by the appropriate military time (such as 1530 instead of 3:30).

- Errors must be lined through and initiated. No erroneous notes are to be made illegible.

- The person documenting must sign and date each page as it is completed.

- Isolated logbook entries made by a team member other than the team member designated responsible for field documentation, must be signed and dated by the person making the entry.

- Additions, clarifications, or corrections made after completion of field activities must be dated and signed.

2.4.3 General Site Information

General site characteristics must be recorded. Information may include:

- Type of access into facility (locked gates, etc.).

- Anything that is unexpected on-site.

- Information obtained from interview with access or responsible party personnel (if applicable), or other interested party contact on-site.

- A site map or sketch may be provided. It can be sketched into the logbook or attached to the book.

2.4.4 Sample Activities

A chronological record of each sampling activity must be kept.

- Explanation of sampling at the location identified in the sampling plan (e.g., discolored soil, stressed vegetation).

- Exact sample location, using permanent recognizable landmarks and reproducible measurements.
- Sample matrix.
- Sample descriptions.
- Decontamination procedures used.

As part of chain-of-custody procedures, recorded on-site sampling information must include sample number, date, time, sampling personnel, sample type, designation of sample as a grab or composite, and any preservative used. Sample locations should be referenced by sample number on the site sketch or map.

2.4.5 Sample Dispatch Information

When sampling is complete, all sample documentation such as chain-of-custody forms shall be copied and copies placed in the project files. A notation of numbers of coolers shipped, carrier and time delivered to pick-up point should be made in the field notebook.

2.5 CONTROL AND DISPOSAL OF INVESTIGATION DERIVED WASTE

Investigation derived wastes will be handled in accordance with the NYSDEC Proposed Decision Technical and Administrative Guidance Memorandum (TAGM) - Disposal of contaminated groundwater generated during Site Investigations. Groundwater that is purged from monitoring wells during sampling activities will be transported to the former Abalene Pest Control site and discharged to the ground (off-site wells) or discharged to the ground adjacent to the monitoring well (on-site wells) if the following criteria are met:

1. There is a defined site which is the source of the groundwater contamination;
2. There is no free product observed such as LNAPLs;

3. Recharge pits are used to preclude run-off from the site and the pits are covered with clean soil when no longer needed;

4. The infiltrating groundwater is being returned to the same water bearing zone from which it is being purged.

If the above criteria are not met the materials will be containerized in U.S. Department of Transportation (DOT)-approved, 55-gallon steel drums.

Depending on the levels of personal protection used during the field investigation, some disposable personal protective equipment (PPE) and decontamination fluids will be generated. Attempts will be made to wash surface contamination off so that PPE (e.g., Tyvek coveralls, gloves, and other disposable items) may be disposed of as ordinary solid waste. If contamination is suspected, these materials will be collected and containerized in DOT-approved, 55-gallon steel drums (separately from contaminated soils and water); the contents will be identified with weather-resistant labels attached to drum exteriors. Decontamination fluids will be disposed of with the purged groundwater.

Containerized materials will be transported to, and staged at, a designated location. Malcolm Pirnie will maintain a log of the containers and their contents; the contents will be evaluated upon receipt of results of the analytical data obtained during field investigations. Handling, transportation, and disposal of these materials will be in accordance with requirements of RCRA and other applicable federal, state, and local regulations and be the responsibility of the Orkin Exterminating Company. Nonhazardous disposable items will be contained and disposed of in a dumpster or via a licensed waste hauler, as appropriate.

3.0 SAMPLE AND DOCUMENT CUSTODY PROCEDURES

3.1 SAMPLE HANDLING

The analytical laboratory will provide the sample containers necessary for all soil, and groundwater. Container closures will be screw-on type, made of inert materials. Sample containers will be cleaned and prepared by the laboratory prior to being sent to the site.

All samples collected will be identified with a sample label. A label will be attached to each bottle and each sample will be identified with a unique sample number.

Immediately following sample collection, each sample container will be marked with the following information:

- Sample Code
- Project Number
- Date/Time
- Sample Type
- Preservative, if used
- Sampler's Initials

The sample code will indicate the site location, media sampled and the sample station.

After all sample identification information has been recorded, each sample label will be covered with waterproof clear plastic tape to preserve its integrity. All samples will be recorded and tracked under strict chain-of-custody protocols. In the field, each sample will be checked for proper labeling. The samples will then be packed into coolers with ice and shipped to the laboratory. A chain-of-custody form will be completed for each cooler. The form will be signed and dated by the person who collected the samples, the person the samples were relinquished to for transport to the laboratory, and the laboratory sample controller/custodian who receives the samples.

3.2 COMPLETION OF CHAIN-OF-CUSTODY RECORD

A chain-of-custody record is a printed form that accompanies a sample or group of samples as custody is transferred from person to person. It documents custody transfer from person to person and sample information recorded on bottle labels. A chain-of-custody record is a controlled document.

As soon as practicable after sample collection, preferably after decontamination, the following information must be entered on the chain-of-custody form. All information is to be recorded in black ink.

1. ***Malcolm Pirnie project number.*** Enter the seven-digit alphanumeric designation assigned by Malcolm Pirnie that uniquely identifies the project site.

2. ***Project name.*** Enter site name.

3. ***Samplers.*** Sign the name(s) of the sampler(s).

4. ***Station number.*** Enter the sample number for each sample in the shipment. This number appears on the Malcolm Pirnie, Inc. sample identification label.

5. ***Date.*** Enter a six-digit number, indicating the year, month, and day of sample collection; for example, 981201.

6. ***Time.*** Enter a four-digit number indicating the military time of collection; for example, 1354.

7. ***Composite or grab.*** Indicate the type of sample.

8. ***Station location.*** Describe the location where the sample was collected.

9. ***Number of containers.*** For each sample number, enter the number of sample bottles that are contained in the shipment.

10. ***Remarks.*** Enter any appropriate remarks.

3.2.1 Transferring Custody From Malcolm Pirnie, Inc. Shipper to Common Carrier

Instructions for Malcolm Pirnie, Inc. shipper transferring custody of samples to a common carrier are given below.

1. Sign, date, and enter time under "Relinquished by" entry.

2. Enter name of carrier (e.g., UPS, Federal Express) under "Received by."

3. Enter bill-of-lading of Federal Express airbill number under "Remarks."

4. Place the original of the chain-of-custody form in the appropriate sample shipping package. Retain a copy with field records.

5. Sign and date the custody seal. The custody seal is part of the chain-of-custody process and is used to prevent tampering with samples after they have been collected in the field.

6. Wrap the seal across filament tape that has been wrapped around the package at least twice.

7. Fold the custody seal over on itself so that it sticks together.

8. Complete other carrier-required shipping papers.

Common carriers will usually not accept responsibility for handling chain-of-custody forms; this necessitates packing the record in the sample package.

3.2.2 Transferring Custody From Malcolm Pirnie, Inc. Sampler Directly to Carrier

To transfer custody of samples from the Malcolm Pirnie, Inc. sampler directly to a carrier, proceed as above, except eliminate the Malcolm Pirnie, Inc. shipper's signature.

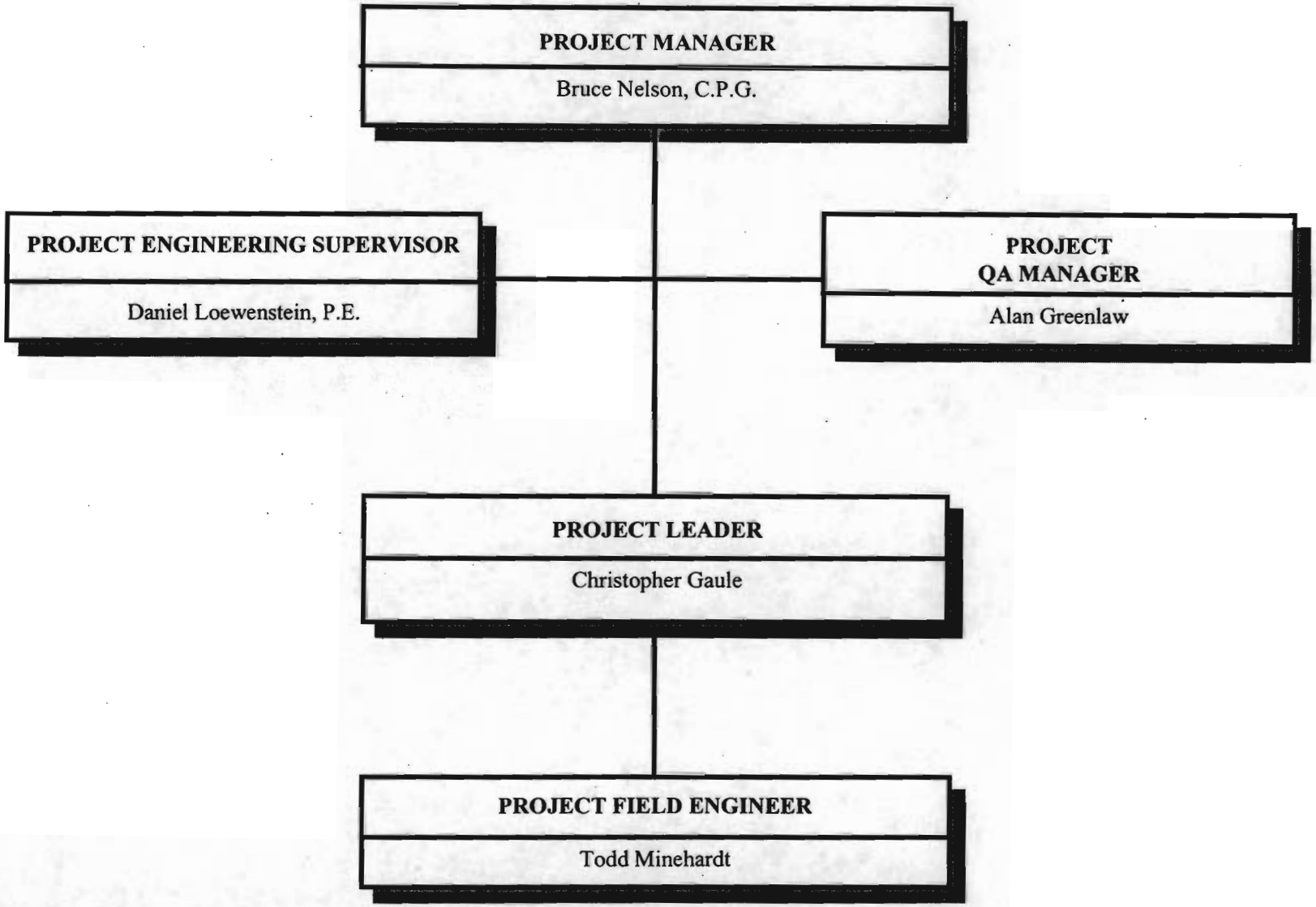
4.0 PROJECT ORGANIZATION AND RESPONSIBILITIES

An organization chart showing the Malcolm Pirnie discipline leaders and field team personnel for this project is presented on Figure 4-1. The Malcolm Pirnie Project Manager is responsible for managing the project staff, communicating with the analytical laboratory and the client, assuring that all project QC procedures are followed, and providing additional authority, when required, to support the Project QA Manager.

The Malcolm Pirnie Project Engineering Supervisor coordinates with all staff and subcontractors to ensure compliance with the approved project engineering specifications.

The Malcolm Pirnie Project QA Manager interacts with the corporate officers, division managers, and client and subcontractor QA/QC personnel to correct QA/QC issues as necessary. The project QA Manager reviews all QA/QC reports to the principal engineer and the client.

The Malcolm Pirnie Project Leader is responsible for managing day to day project activities and coordinates with project field staff to ensure compliance with the required QA/QC procedures.



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MALCOLM PIRNIE

PROJECT ORGANIZATION
REMEDIAL ACTION
FORMER ABALENE PEST CONTROL
MOREAU, NEW YORK

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FIGURE 4-1

5.0 REFERENCES

United States Environmental Protection Agency (USEPA) Region II, 1998, Ground Water Sampling Procedure, Low Stress (Low Flow) Purging and Sampling Standard Operating Procedure.

APPENDIX D

Citizen Participation Plan

MALCOLM PIRNIE

CITIZEN PARTICIPATION PLAN

Remedial Action
Former Abalene Pest Control
Moreau, New York

NYSDEC Site Number 546035

Orkin Exterminating Company, Inc.
Atlanta, Georgia

Prepared by:

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March 1999
1368016

RECYCLED PAPER

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1.0 INTRODUCTION

The Citizen Participation Plan (CPP) for the former Abalene Pest Control site, owned by Orkin Pest Control (Orkin), in Moreau, New York, has been developed to provide a site-specific outline and guidance for citizen participation. The CPP was prepared in accordance with 6 NYCRR Part 375 and the New York State Department of Environmental Conservation (NYSDEC) guidance document, New York State Inactive Hazardous Waste Site Citizen Participation Plan (August, 1988). Orkin and the NYSDEC are committed to a citizen participation program as a part of the Remedial Action (RA) process at the former Abalene Pest Control site. Citizen participation promotes public understanding of the responsibilities, planning activities, and remedial activities associated with this process. Citizen participation provides Orkin and the NYSDEC with an opportunity to gain public input to support a comprehensive remedial program which is protective of both public health and the environment.

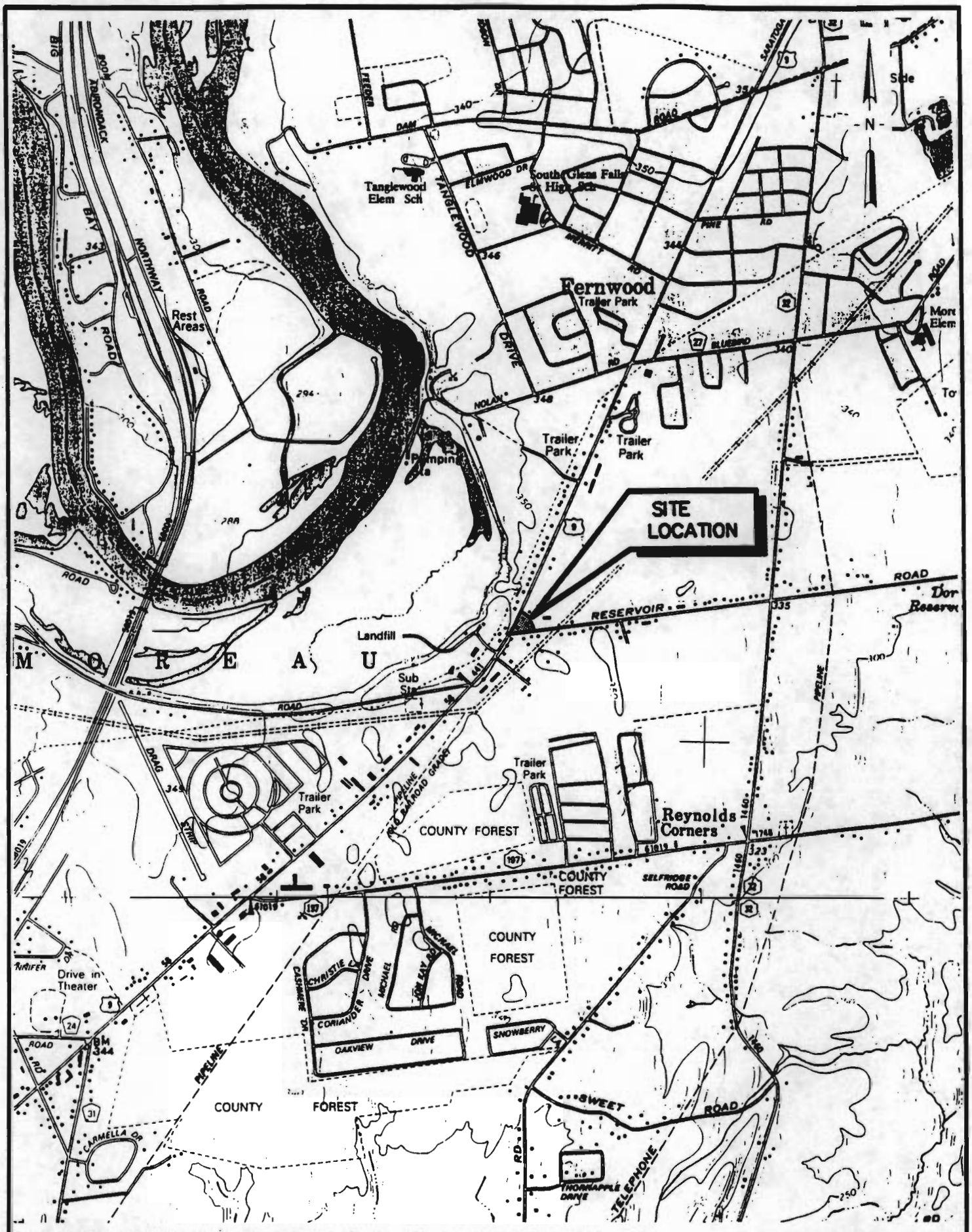
2.0 SITE BACKGROUND

2.1 Site Location

The former Abalene Pest Control site is located at the intersection of Reservoir Road and U.S. Route 9 in the Town of Moreau, Saratoga County, New York (Figure 1). The site is approximately 34,000 square feet in size and has an eight-foot high chain-link fence along its perimeter. Within the fenced boundary of the property are three wooden framed buildings (office, storage shed and barn) which were previously used during the formulation and storage of pesticides. Surrounding land use is residential and commercial.

2.2 Site History

Abalene Pest Control owned and operated a pesticide formulation and storage facility at the site from 1975 until 1986. On December 31, 1986, Orkin purchased the site and continued its operation for approximately three months. Orkin ceased operations at the site in early 1987.



SOURCE: U.S.G.S. 7.5 MIN. GLENS FALLS QUAD. 199 & GANSVOORT QUAD. 1991

MALCOLM PIRNIE

ABALENE PEST CONTROL
MOREAU, NEW YORK

SITE LOCATION MAP

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FIGURE 1

On March 30, 1987, the NYSDEC discovered that pesticide wastes had been buried in a disposal pit on the eastern portion of the property. As an emergency response action, the NYSDEC Region 5 Spill Response hired a contractor to excavate the wastes under the supervision of the NYSDEC.

Subsequent to the NYSDEC's excavation of the pit, Abalene Pest Control hired Swanson Environmental, Inc. (Swanson) which arranged for the proper staging and off-site disposal of the pesticide/herbicide containers, PPE, and sampling equipment.

Swanson also collected and analyzed soil samples. Based on this initial scope of work, Swanson was retained to investigate the extent of pesticide/herbicides in the soil and groundwater. The results of this work were reported by Swanson on October 12, 1987 in the report entitled, "Report on Interim Remedial Action, Soils and Groundwater Investigation."

In May 1987, Swanson was contracted by Orkin to conduct off-site sampling and analysis of several residential water supply wells surrounding the site. Residential wells exhibiting low concentrations of pesticides were fitted with carbon filtration units. In subsequent years, carbon filtration units on additional homes have been added by Orkin at the request of property owners. The periodic sampling of raw water and maintenance of the carbon filtration units is a continuing activity.

An interim remedial measure (IRM) to address the former waste disposal pit was performed by Fred C. Hart Associates in May 1988. The IRM included double lining the disposal pit with Visqueen and placing the stockpiled soils back in the pit. The backfilled pit was covered with clean sand to create a mound to minimize infiltration in this area and an excavation of a drainage ditch surrounding the pit area to divert surface water flow. A chain-link fence was installed surrounding the backfilled pit to secure the area. Crushed stone was placed on the site soils to prevent off-site migration of dust.

The former Abalene Pest Control site is classified by the NYSDEC as a Class 2 - Inactive Hazardous Waste Disposal Site (Site No. 546035). Pursuant to a Consent Order, the NYSDEC required that a Remedial Investigation/Feasibility Study (RI/FS) be undertaken at the site in order to determine the nature and extent of the identified contamination at the site, define the potential risks and to select an appropriate remedial action. The identified

contamination at the site includes pesticides, volatile organic compounds, and selected metals.

The RI was conducted between June 1992 and June 1994 by Malcolm Pirnie, Inc. (Malcolm Pirnie). The RI included investigation of contamination in the air, surface soil, subsurface soil, the former disposal pit, and groundwater. A Health Risk Assessment and Fish and Wildlife Impact Analysis were also performed.

No pesticides were detected in the ambient air. The surface soil sampling identified four locations with concentration of total pesticides greater than 100 parts per million (ppm). The off-site surface soil samples ranged from less than 1 ppm to 27.6 ppm. The pesticide concentrations decreased significantly with increasing depth. The two soil samples collected from between the liners of the former disposal pit contained concentrations of 152 ppm and 126 ppm totals pesticides and the two soil samples collected from 3 feet below the former disposal pit contained concentrations of 1.2 ppm and 19.1 ppm total pesticides.

Several pesticides were detected in groundwater samples from within the shallow groundwater monitoring wells. These pesticides include Lindane, Chlordane, 4,4'-DDE, Heptachlor, and Bromacil. Groundwater standards were exceeded in four samples collected from on-site monitoring wells for Lindane and one sample collected from an on-site monitoring wells for Chlordane. Groundwater analytical results for samples collected from the deep monitoring wells did not indicate the presence of any pesticides/herbicides. Tap water samples were collected from 11 residences surrounding the site. The results of this sampling indicated non-detectable levels of all compounds analyzed for with the exception of the sample collected from the Rourke supply well. Following the initial sampling and prior to the resampling of the Rourke supply well, a new, deeper well was installed to replace the existing well. The analytical results of the new water supply were reported as non-detect.

3.0 PROJECT DESCRIPTION

Based on the results of the RI/FS, the NYSDEC issued the Record of Decision (ROD) in January 1996 which presents the selected remedial action for the former Abalene Pest Control site. The selected remedy for the site includes the following:

- Abandonment of the on-site drinking water well(s),
- Building demolition and off-site disposal,
- Fence removal,
- Excavation of off-site soil contaminated with pesticides in excess of Target Concentration Limits,
- Excavation of soil 3 inches deep in a 10 to 15 foot radius around four isolated "hot spots" of elevated surface contamination on-site,
- Underground gasoline storage tank excavation and removal,
- Cleaning and in-place abandonment of septic tanks,
- Excavation and removal of the soil between the liners in the former disposal pit area,
- Placing a geotextile material and 12 inches of topsoil over the northeast portion of the site that includes the disposal pit area,
- Spot excavation 3 inches deep around select locations,
- Site grading and placement of a 6-inch topsoil cap over the entire site, and
- Development of a Maintenance and Monitoring Plan which will address issues including the continued integrity of the topsoil cap and any changes in the status of the site.

Off-site and on-site soils with a concentration greater than 100 ppm of total pesticides will be disposed of in a permitted facility. Excavated soils with a concentration less than 100 ppm of total pesticides will be consolidated and placed under the geotextile material in the northeast portion of the site.

4.0 CITIZEN PARTICIPATION ACTIVITIES

Citizen participation activities are planned to promote communication between the community surrounding the former Abalene Pest Control site, the NYSDEC, and Orkin.

4.1 Document Repository

A local document repository (Appendix B) will be established at the Crandal Public Library at the start of RA activities. Documents related to the RA and citizen participation activities will be placed at the document repository for public review.

4.2 Remedial Action Work Plan

A copy of the final Remedial Action Work Plan will be placed in the local document repository. A fact sheet which will briefly describe the site, Remedial Action Work Plan objectives and activities planned for the RA will be mailed to the Contact List (Appendix A). In addition, the fact sheet will indicate the location of the local document repository and identify appropriate points of contact.

APPENDIX A

Contact List

APPENDIX A

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APPENDIX B

Document Repository

APPENDIX B

LOCATION OF DOCUMENT REPOSITORY

Crandal Public Library
251 Glen Street
Glens Falls, NY
(518) 792-6508

Hours:	Monday - Wednesday	9:00 am to 9:00 pm
	Thursday - Friday	9:00 am to 6:00 pm
	Saturday	9:00 am to 5:00 pm
	Sunday	1:00 pm to 5:00 pm

APPENDIX C

Glossary

APPENDIX C

GLOSSARY OF COMMONLY USED CITIZEN PARTICIPATION TERMS

Community Participation - A process to inform and involve the interested/affected public in the decision-making process during identification, assessment and remediation of inactive hazardous waste sites. This process helps to assure that the best decisions are made from environmental, human health, economic, social and political perspectives.

Citizen Participation Plan - A document that describes the site-specific community participation activities that will take place to complement the "technical" (remedial) activities. It also provides site background and rationale for the selected community participation program at the site. A plan may be updated or altered as public interest or the technical aspects of the program change.

Consent Order - A legal and enforceable negotiated agreement between the NYSDEC and the potentially responsible party in which the potentially responsible party agrees to undertake investigation and remediation, if necessary, at the site. The Consent Order includes a description of the remedial actions to be taken and a schedule for implementation.

Contact List - Names, addresses and/or telephone numbers of individuals, groups, organizations and media interested and/or affected by an inactive hazardous waste site. The contact list is used to inform and involve the interested/affected public.

Document Repository - A location, typically a public building, near a particular site at which documents related to remedial and community participation activities at the site are available for public review. The document repository provides access to documents at times and a location convenient to the public.

Fact Sheet - A written discussion of the site's history, the status of the environmental study, or the remedial process. The fact sheet may be mailed to all or part of the contact list, distributed at meetings, or sent on an "as requested" basis.

Feasibility Study (FS) - A process for developing, evaluating and selecting remedial actions, using data gathered during the RI to: define objectives of the remedial program for the site and broadly develop remedial action alternatives; perform an initial screening of these alternatives; and perform a detailed analysis of a limited number of alternatives which remain after the initial screening stage.

Potentially Responsible Party (PRP) - Individuals, companies (e.g. site owners, operators, transporters or generators of hazardous waste) who may be responsible for an inactive hazardous waste disposal site.

Proposed Remedial Action Plan (PRAP) - A pubic document prepared by the NYSDEC after the Feasibility Study which summarizes the remedial options for a site and proposes a specific remedial alternative for implementation.

Public - The universe of individuals, groups and organizations: a) affected (or potentially affected) by the site and/or its remedial program; b) interested in the site and/or its remediation; c) having information about the site and its history.

Public Consultation/Community Meeting - A scheduled gathering which may present study findings, discuss alternatives, respond to questions and receive public comment.

Record of Decision (ROD) - A public document prepared by the NYSDEC following the selection of a remedy for a site. The ROD presents the rationale for the selected remedy and is prepared after a public comment period on the PRAP.

Registry - The NYSDEC Registry of Inactive Hazardous Waste Disposal Sites in New York State.

Remedial Action Work Plan - Once a remedial action has been selected, technical plans and specifications for the remedial action at a site are developed, as specified in the ROD. The documents are used to bid and construct the selected remedial action.

Remedial Investigation (RI) - A process to determine the nature and extent of contamination by collecting data and analyzing the site. It includes sampling and monitoring, as necessary, and includes the gathering of sufficient information to determine the necessity for, and proposed extent of, a remedial program for the site.

Responsiveness Summary - A summary and response to public questions and comments.

APPENDIX D

Points of Contact

APPENDIX D

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