Administrative Record

REPORT

Remedial Design Work Plan

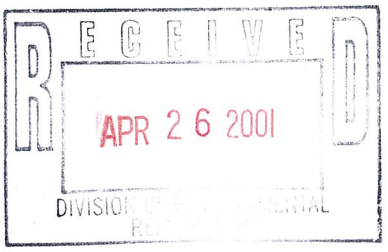
Universal Instruments Corporation
Binghamton, New York (7-04-024)

April 2001

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

TECHNICAL REPORT

Remedial Design Work Plan



Universal Instruments Corporation
Binghamton, New York

April 2001

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

consultants with focus

Table of Contents

1. Introduction

Blasland, Bouck & Lee, Inc. (BBL) was retained by Universal Instruments Corporation (Universal Instruments) to prepare the Remedial Design (RD) Work Plan for the former Binghamton Plastics facility in Binghamton, New York (Site Number 7-04-024). The RD Work Plan was prepared in accordance with the executed Order on Consent between Universal Instruments and the New York State Department of Environmental Conservation (NYSDEC), dated January 2001.

1.1 Purpose

The purpose of this RD Work Plan is to provide a detailed scope of work and schedule for the presentation and submittal of the Remedial Design Package to the NYSDEC, which will contain plans and specifications for implementation of the selected remedial actions in the Record of Decision (ROD), dated March 30, 2000. The selected remedial actions in the ROD include:

- a soil vapor extraction (SVE) pilot study to determine the effectiveness of a full-scale SVE system to remediate any residual contamination in the subsurface soils at the site;
- a full-scale SVE system if the pilot study so indicates;
- a ground-water extraction and treatment system to recover the non-aqueous phase liquid (NAPL) and dissolved constituents of concern (COCs) at the site;
- deed restrictions placed upon the property as long as residual contamination remains at the site; and
- an operation and maintenance (O&M) Plan (for the active components of the remedy) and long-term monitoring program.

This work plan is divided into the following sections:

- Section 1 - Introduction;
- Section 2 - Background;
- Section 3 - Remedial Design Tasks;
- Section 4 - Schedule and Submittals; and
- Section 5 - References.

Section 1 contains the introduction to the work plan and the goals of the RD.

Section 2 summarizes the site history and results from previous investigative activities at the site.

Section 3 begins with a description of the pre-design activities, including implementation of the SVE pilot study. The pilot study will determine whether or not the amount of the COCs that can be removed by SVE warrant the implementation of a full-scale SVE system to remediate the subsurface soils beneath the southwest corner of the building. This section then presents the tasks for completing the full-scale remedial system design and documenting it in the report entitled "Remedial Design Package" to be submitted to the NYSDEC.

Sections 4 and 5 present the schedule for the submittal of documents to the NYSDEC and the references for this document, respectively.

1.2 Goals

The goal of the remedial program is to meet all of the NYSDEC's Standards, Criteria, and Guidance (SCGs) and to be protective of human health and the environment. The goals of the RD for this site are:

- to remove, to the maximum extent possible, the COCs from the subsurface soils beneath the southwest corner of the building identified in the site investigations;
- to recover and dispose of NAPL and dissolved COCs on site determined in the site investigations;
- to design and implement a cost-effective remedial program as prescribed in the ROD to achieve the remedial goals; and
- to protect human health and the environment through implementation, operation, and monitoring of the remedial program.

2. Background

The former Binghamton Plastics facility is located at 498 Conklin Avenue, Binghamton, Broome County, New York. The site is situated in an industrial/residential setting. A site location map is shown on Figure 1, and Figure 2 is the site plan.

The site is bounded by McIntosh Laboratories to the west; the Erie-Lakawanna Railroad, a public park, and the Susquehanna River to the north; and residential properties to the east and south. The site property, approximately 2 acres in size, consists of an industrial building (44,800 square feet) with associated parking, landscaping, and storage area. Dovatron, Inc. (Dovatron) is the current owner of the property and currently leases the facility to McIntosh Laboratories.

2.1 Site History

The facility was first constructed in 1956, with additions made in 1963, 1974, and 1982. Binghamton Plastics operated the facility until the early 1980s when Universal Instruments purchased the property and converted it to a circuit board manufacturing plant. Universal Instruments operated the facility until the takeover by Dover Electronics Corporation (Dover Electronics) in the late 1980s. In 1993, Dover Electronics separated from Dover as a stand-alone corporation and was renamed Dovatron. The building has been leased to McIntosh Laboratories since the early 1990s, and is currently operated as an electronics repair facility. Figure 3 shows the historical site features of the facility.

On-site residuals of 1,1,1-trichloroethane (1,1,1-TCA); trichloroethene (TCE); and phase-separated hydrocarbons (PSHs) have been observed at the site. The PSHs are attributed to leakage from a 1,000-gallon underground storage tank (Figure 3), which had been used as a hydraulic oil reservoir and left in place by Binghamton Plastics. The tank was removed in 1986, though no documentation exists detailing the work performed at that time. The Phase III Investigation Final Report (Stetson-Harza, 1992) indicates that approximately 650 gallons of hydraulic oil contaminated with 1,1,1-TCA and TCE were found inside the tank. Shield Environmental Associates, Inc. (Shield Environmental) suggested in their Remedial Investigation (2000) that all of the field and analytical data collected to date indicated that the primary source of the chlorinated organics in the ground water lies beneath the southwest corner (1963 addition) of the building. Despite these indications, the source of 1,1,1-TCA and TCE has not been identified.

2.2 Summary of Previous Site Investigations

Several remedial investigations at the facility have been conducted since 1986 when the 1,000-gallon underground storage tank was removed. The chronology of the activities undertaken by various environmental consultants since then is summarized below:

1986 – Tank Removal

A 1,000-gallon hydraulic oil tank was reportedly removed from the area just west of the southwest corner of the on-site building in 1986. It was found to contain approximately 650 gallons of 1,1,1-TCA- and TCE-contaminated hydraulic oil (Stetson-Harza, 1992).

1990 – Phase I Investigation

Hagopian Engineering Associates (Hagopian) conducted limited soil sampling and collected six concrete cores from areas inside the building. Two of the soil borings contained detectable concentrations of 1,1,1-TCA; TCE; and lubricating oil. Concrete core data indicated no chemical contamination. Information concerning this investigation is contained in the report entitled *Environmental Site Investigation for Dover Electronics Company: DEM East and Kirkwood North Locations* (Hagopian, 1990).

1991 – Phase II Investigation

Hagopian conducted a subsequent investigation consisting of the installation of four ground-water monitoring wells (MW-1 to MW-4) and the collection of soil, soil gas, and ground-water samples. Elevated concentrations of 1,1,1-TCA and TCE were detected in the soil and ground-water samples collected from MW-1 and MW-2. This information is contained in the report entitled *Phase II Environmental Site Investigation for Dover Electronics* (Hagopian, 1991).

1992 – Phase III Investigation

Stetson-Harza began an investigation in July 1992 consisting of four additional soil borings and the collection of soil and ground-water samples. 1,1,1-TCA; TCE; 1,1-dichloroethane (1,1-DCA); 1,1-dichloroethene (1,1-DCE); and trans- and cis-1,2-dichloroethene (1,2-DCE) were detected in the ground-water samples. The results of this investigation are documented in the report entitled *Dover Electronics Company DEM-East Phase III Investigation* (Stetson-Harza, 1992).

1993 – Ground-Water Interim Remedial Measure

Based on the investigation results, Stetson-Harza installed a ground-water treatment system using the existing well MW-1 as an interim remedial measure (IRM). The system began operating in October 1993. A total of 50,000 gallons of water was pumped and treated over a period of 450 days. The system was not run continuously, and was shut down periodically for maintenance and repair. This system is currently no longer in operation.

1996-1999 – Additional Investigations

Shield Environmental undertook a series of site investigations between 1996 and 2000. In October 1997, three soil borings were advanced and sampled, and later converted to ground-water monitoring wells MW-5, MW-6, and MW-7. In January 1998, 12 additional soil borings were advanced and sampled, of which six were later converted to monitoring wells MW-8 through MW-13. The ground-water monitoring wells were sampled in October 1996, October 1997, and February 1998. These investigations prior to the initiation of the Remedial Investigation (RI)/ Feasibility Study (FS) were reported to the NYSDEC in the *Baseline Summary Report* (Shield Environmental, 1998).

2.3 Summary of the Remedial Investigation/Feasibility Study

Shield Environmental initiated the RI fieldwork in November 1998. The initial phase of the RI work included eleven exploratory trenchings in the expected source area, four soil borings outside of the building, two monitoring well (MW-14 and MW-15) installations, ground-water sampling from all monitoring wells, surface water sampling at three locations, and two limited pump tests. Wells MW-1 through MW-4 previously installed by Hagopian were renamed DMW-1 through DMW-4. In May 1999, a passive soil gas survey was conducted under the concrete floor

in the southwest corner of the building. Based on the results, soil samples were collected below the floor. Although there were many detections of chlorinated organics in the soil samples collected below the building, only one sample exceeded the NYSDEC *Soil Cleanup Objectives to Protect Ground Water Quality* (TAGM 4046) for TCE. In July 1999, two additional trenches were excavated along the subsurface utilities along Chamber Street. In August 1999, air monitoring activities were conducted in the building to document worker safety and potential exposure. Based on the results of the indoor air monitoring, the New York State Department of Health (NYSDOH) has concluded that indoor air volatile organic compound (VOC) concentrations do not pose a health threat to workers at the facility.

The final RI Report (Shield Environmental, 2000) and FS Report (Shield Engineering, 2000) were submitted to the NYSDEC in June 2000. The RI Report summarizes the results of all investigations conducted to date at the site and presents a conceptual model of contaminant migration. It also evaluates the nature and extent of any threats to human health or the environment caused by contamination at the site. The FS Report contains alternatives for appropriate remedial action to minimize or mitigate any identified risks associated with COCs at the site.

The remedy recommended in the FS and subsequently selected in the March 2000 ROD by the NYSDEC includes:

- Ground-water extraction and treatment to address the dissolved COCs on site. This remedy is aimed at reducing the concentration of the dissolved COCs, and lowering the ground-water elevation, to the maximum extent possible, to below the elevation of the utilities under Chambers Street to prevent migration of ground water via these utilities.

- A soil vapor extraction pilot study to determine whether or not a full-scale SVE system is warranted for removing the COCs from the subsurface soils beneath the southwest corner of the building.

- Deed restrictions placed upon the property as long as residual contamination remains at the site.

- An O&M program and long-term monitoring plan.

3. Remedial Design Tasks

The remedial design tasks will be conducted in two phases: pre-design and full-scale remedial design. Because results of the activities of the pre-design phase will affect the full-scale remedial design, tasks described in Section 3.2 Remedial Design Tasks will be fully developed upon submittal and the NYSDEC's approval of the Pre-Design Report.

3.1 Pre-Design Tasks

The pre-design activities will determine the scheme and specifications of the full-scale remedial actions for the site. This section describes the tasks for completing the pre-design phase of the program.

3.1.1 Soil Vapor Extraction Pilot Study

The purpose of the SVE pilot study is to determine whether or not the quantity of COCs that can be removed by SVE warrant its full-scale implementation for remediation of the subsurface soils under the southwest corner of the building. The pilot study will also provide the following information to design the full-scale system, if warranted:

- the achievable air flow rate from the SVE operation under a given vacuum;
- the area of influence of the SVE well;
- the permeability (k) of the soil to air flow; and
- an estimate of VOC removal rates.

3.1.1.1 Pilot Study Design and Submittal

The pilot study will be conducted in two phases in an area to address the residual contaminants in the southwest corner of the building. Exhaust from the SVE pilot system will be treated by vapor phase carbon before discharging to the atmosphere. In the first phase, a short-term test will be performed, during which air will be extracted from one SVE test well for approximately eight hours while pressure changes are monitored at soil gas monitoring points. Using data from the short-term test, an air extraction rate will then be determined for use in the second phase of the pilot study. During the second phase, air will be extracted from the same SVE test well for approximately four weeks. Periodic measurement of the contaminant soil gas concentrations will be made at the exhaust point of the SVE system and soil gas monitoring points to evaluate the effectiveness of SVE on this site.

A pilot study design will be prepared and submitted to the NYSDEC for review and approval. The pilot study design will include the following:

- specifications and design of the test well, monitoring point(s), and equipment;
- specifications and design of the manifold piping and associated instrumentation;
- procedures for short-term and long-term field tests;
- data evaluation procedures and computer modeling protocols; and
- a detailed schedule for field implementation and reporting.

3.1.1.2 Pilot Study System Construction and Installation

After receiving the NYSDEC's comments and approval of the pilot study design, we will begin installation and construction of the pilot study system. Installation and construction of the pilot study system will be done in accordance with the approved pilot study design. Deviations from the approved design, if any, will be discussed with the NYSDEC. We will obtain the NYSDEC's approval before making any modification to the pilot study design.

3.1.1.3 Pilot Study Implementation

At the conclusion of the system construction and installation, field tests will be conducted in accordance with the test procedures described in the approved pilot study design. Modifications to the test procedures, if any, will be discussed with the NYSDEC. Revisions to the test procedures will not be made without the NYSDEC's approval.

3.1.2 Pump Test Data Analysis

Pump tests were conducted at MW-5 and DMW-1 by Shield Environmental in February 1999 to determine the hydraulic conductivity, transmissivity, and storativity of the perched aquifer in the area of greatest ground-water impact. Procedures for the pump tests and their results can be found in the *Remedial Investigation Report* (Shield Environmental, 2000). This information is also summarized below.

The first series of tests was conducted at MW-5 located near Chambers Street west of the southwest corner of the building (see Figure 2). The first pump test was a step-drawdown test conducted at MW-5, with MW-15 as the observation well 16 feet away. A variable speed submersible pump was placed at the bottom of MW-5 at an approximate depth of 20 feet below ground surface (bgs). The drawdown was then noted at MW-5 and at MW-15 at two different pumping rates. Several days later, a five-hour pump test and a two-hour recovery test were also conducted at this location. Pressure transducers with internal data loggers were placed at the bottom of the pumping well and in observation wells MW-15 and MW-8, located 16 feet and 25 feet from the pumping well, respectively. After five hours of sustained pumping, the drawdown was noted at each of the monitoring wells and at the pumping well. Following the five-hour pump test, the recovery test was conducted, in which the pump was turned off and the aquifer allowed to recharge over a period of two hours.

The second series of tests was conducted at DMW-1 near the west wall of the southwest corner of the building (see Figure 2). The ground-water extraction and treatment system will be designed for installation at this well. A step-drawdown test was conducted with a variable speed submersible pump at approximately 15 feet bgs. The drawdowns produced in DMW-1 at three different pumping rates were recorded. A five-hour pump test and two-hour recovery test were then conducted at DMW-1 several days later. Pressure transducers with internal data loggers were placed at the bottom of the pumping well and in two observation wells (MW-15 and MW-10), both located approximately 40 feet from the pumping well. The water levels in the wells were recorded over the five hours of sustained pumping.

Based on the pump test results, the aquifer properties were estimated and are presented below.

AQUIFER PROPERTIES

Location	MW-5	DMW-1
Transmissivity	0.617 ft^2/min	1.0 ft^2/min
Storativity	0.001679	0.001039
Hydraulic Conductivity	$3.09x10^{-2}$ ft^2/min	$5.00x10^{-2}$ ft^2/min
Radius of Influence	≥16 ft	≥40 ft

Source: (Shield, 2000)

Though these values are much higher than what is normally expected in a tight till, Shield noted that soils in the vicinity of DMW-1 and MW-5 were not as dense as in the surrounding area. The soils in this area were saturated below a depth of 6 feet. Furthermore, many of the wells in the shallow aquifer produced less than 0.05 gallon per minute (gpm) during the low-flow sampling activities.

The results of the pump tests will be evaluated and used to design a full-scale hydraulic control system. Water table drawdown projection and capture zone analysis will be conducted to configure the layout of the ground-water recovery system and size the equipment associated with the ground-water hydraulic control system. The existing ground-water extraction and treatment system may be incorporated into the final design.

3.1.3 Pre-Design Report Preparation and Submittal

The results of the SVE pilot study and the aquifer analysis will be evaluated and summarized in the Pre-Design Report. The Pre-Design Report will include the following:

- date and descriptions of the field activities;
- description of test design and procedures;
- discussion of test results;
- calculation of design parameters and estimation of VOC removal rates;
- evaluation of the effectiveness of a full-scale SVE system to remediate the subsurface soils under the southwest corner of the building;
- chain-of-custody and field measurement records and laboratory results;
- evaluation of the aquifer characteristics corresponding to ground-water pumping;
- conclusions and recommendations; and
- a conceptual layout and design of the recommended remedial action.

The Pre-Design Report will be submitted to the NYSDEC for review and comment.

3.2 Remedial Design Tasks

Upon receiving the NYSDEC's approval of the Pre-Design Report, the RD, as required by the Order on Consent, will begin. The RD will include the technical specifications and design drawings for the selected remedial actions, an O&M program, a Contingency Plan, a site-specific Health and Safety Plan, and a Citizen Participation Plan.

3.2.1 Technical Specifications and Design Drawings

The technical specifications of the full-scale remediation system will be prepared to include a detailed engineering design of the selected remedial actions, the material and schedule of the associated equipment, controls, equipment enclosure, operational monitoring systems, manifold piping, etc. A detailed set of design drawings will also be prepared to show site plans, well and equipment details, and sections of the proposed equipment and work.

3.2.2 Operation and Maintenance Program

The O&M program will be developed to monitor the progress of the remedial actions and to maintain optimal performance of the remedial system. The plan will include:

- background information and rationale of the components of the O&M Plan;
- operating procedures;
- a schedule for the periodic sampling of ground water and soil vapor (if the SVE system is implemented) in the remedial area;
- parameters, conditions, procedures, and protocols for determining the effectiveness of the RD;
- reporting requirements; and
- conclusions and recommendations.

3.2.3 Contingency Plan

A Contingency Plan will be prepared in the event that any element of the RD fails to achieve its objectives or otherwise fails to protect human health or the environment. This plan will contain alternative methods for treating the soil vapor beneath the building and the ground-water plume if the chosen technology should fail to achieve the remedial objectives.

3.2.4 Health and Safety Plan

The site-specific Health and Safety Plan will be prepared for the protection of persons at and in the vicinity of the site during the construction and O&M of the remedial system. It will be prepared in accordance with 29 CFR 1910 by a certified health and safety professional.

3.2.5 Citizen Participation Plan

The Citizen Participation Plan for the facility will be updated and used for the design and construction phases of the remedial program. Universal Instruments and the NYSDEC will jointly coordinate the CP activities. The Citizen Participation Plan will include the appropriate activities outlined in the NYSDEC's publication entitled "Citizen Participation in New York's Hazardous Waste Site Remediation Program: A Guide Book" (June 1998) and any subsequent revisions, and 6 NYCRR Part 375.

3.2.6 Remedial Design Package Submittal

The components described above will be compiled into the Remedial Design Package, which will be submitted to the NYSDEC for review and comment. The Remedial Design Package will include the following:

- detailed descriptions of the remedial objectives and implementation of the selected remedial alternative to achieve those objectives;
- design drawings, specifications, and documents prepared, signed, and sealed by a New York Professional Engineer and in compliance with all local, state, and federal laws, rules, and regulations;
- a detailed time schedule for implementation of the RD;
- an O&M program and evaluation criteria for the monitoring and assessment of the performance of the RD;
- a Contingency Plan in the event of a failure of any element of the RD to achieve its objectives;
- a Health and Safety Plan; and
- a Citizen Participation Plan.

The RD will be prepared by and bear the signature and seal of a professional engineer who will certify that the RD was prepared in accordance with the Order on Consent (NYSDEC, 2001) and the ROD (NYSDEC, 2000).

4. Schedule and Submittals

Upon the NYSDEC's written approval of this RD Work Plan, the work plan will be implemented in accordance with the schedule presented in this section. The schedule for the preparation and submittal to the NYSDEC of the plans and specifications for implementation of the RD is summarized on Figure 4. The deliverables and their dates of submittal to the NYSDEC are listed below:

- Remedial Design Work Plan - April 27, 2001
- Pilot Study Design - May 25, 2001
- Pre-Design Report - September 28, 2001
- Remedial Design Package - October 26, 2001

Copies of final report and work plan submittals will be distributed as follows:

- Four copies (one unbound) to:

  Andrew English
  Division of Environmental Remediation
  New York State Department of Environmental Conservation
  50 Wolf Road
  Albany, New York 12233-7010

- One copy to:

  Regional Director
  New York State Department of Environmental Conservation
  Region 7
  615 Erie Boulevard West
  Syracuse, New York 13204-2400

- Two copies to:

  G. Anders Carlson, Ph.D.
  Director, Bureau of Environmental Exposure Investigation
  New York State Department of Health
  Flanigan Square
  547 River Street
  Troy, New York 12180-2216

- One copy to:

  Maura C. Desmond, Esq.
  Division of Environmental Enforcement
  New York State Department of Environmental Conservation
  270 Michigan Avenue
  Buffalo, New York 14203

Each report submitted to the NYSDEC will be reviewed and either approved or disapproved in writing. Once a report is approved, it will be incorporated into and become an enforceable part of the Order on Consent. Should the NYSDEC disapprove a report submittal, a revised submittal addressing all of the NYSDEC's reasons for disapproval will be submitted within 45 calendar days of receiving the written notice.

Within 30 days of the NYSDEC's approval of any submitted report, one computer readable magnetic media copy in American Standard Code for Information Interchange (ASCII) format and one microfilm copy (16 millimeter roll film M-type cartridge) of the approved report will be submitted to the Director of the Division of Environmental Remediation.

5. References

Hagopian Engineering Associates. October 8, 1990. *Environmental Site Investigation for Dover Electronics Company: DEM-East and Kirkwood North Locations.*

Hagopian Engineering Associates. August 29, 1991. *Phase II Environmental Site Investigation for Dover Electronics.*

New York State Department of Environmental Conservation (NYSDEC). March 2000. *Record of Decision: Former Binghamton Plastics Site, Binghamton (C), Broome County, Site Number 7-04-024.*

New York State Department of Environmental Conservation (NYSDEC). January 2001. *Order on Consent: Index #B7-0516-97-05.*

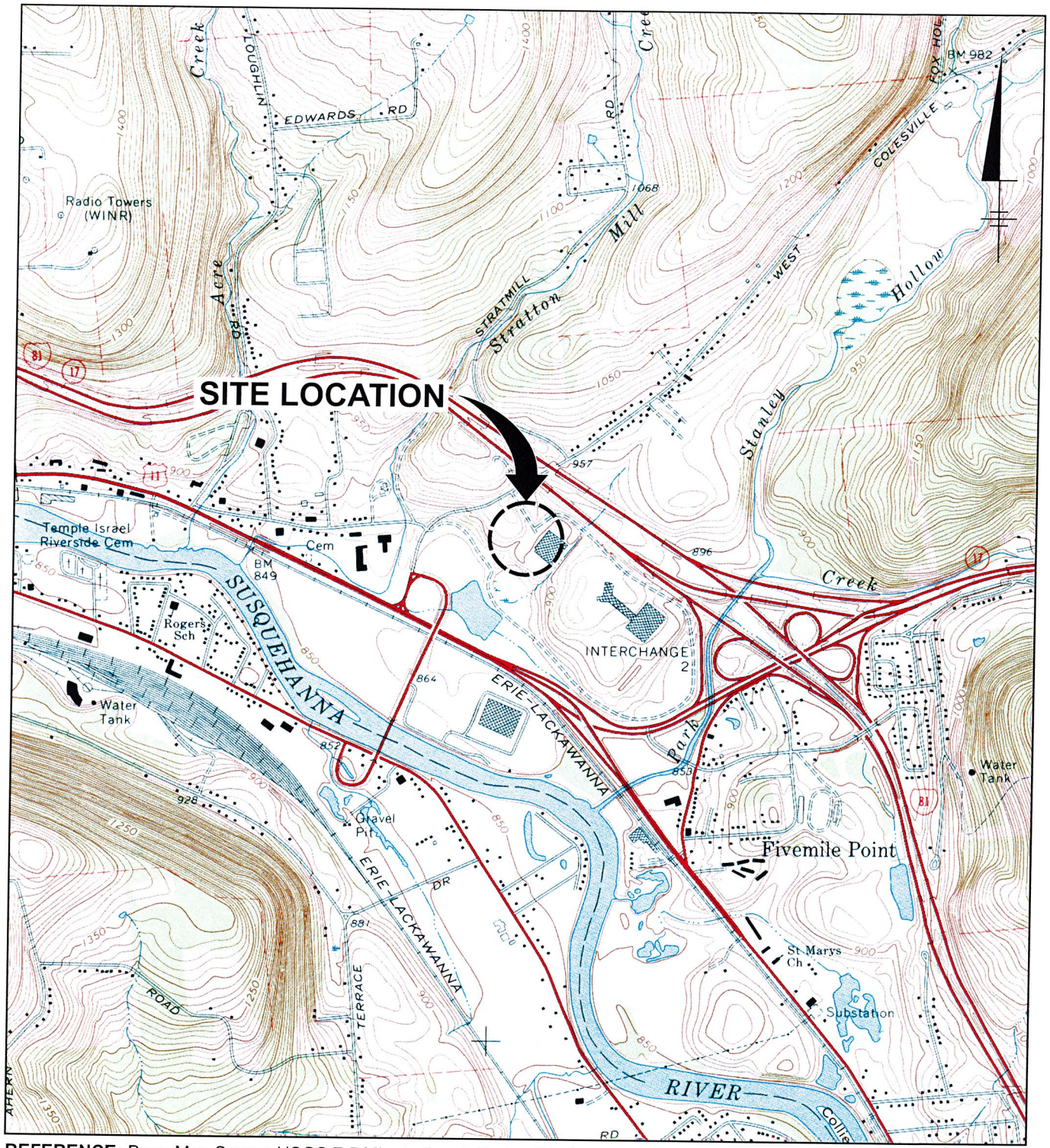
Shield Engineering Associates, Inc. June 2000. *Feasibility Study Report.*

Shield Environmental Associates, Inc. May 8, 1998. *Baseline Summary Report.*

Shield Environmental Associates, Inc. June 2000. *Remedial Investigation Report.*

Stetson-Harza. December 1992. *Dover Electronics Company DEM-East Phase III Investigation.*

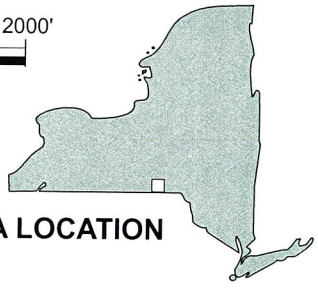
Figures



REFERENCE: Base Map Source USGS 7.5 Minute Quad. Series Binghamton East, New York, 1968, Photorevised 1976.

2000' 0 2000'

Approximate Scale: 1" = 2000'



AREA LOCATION

UNIVERSAL INSTRUMENTS CORPORATION
KIRKWOOD, NEW YORK

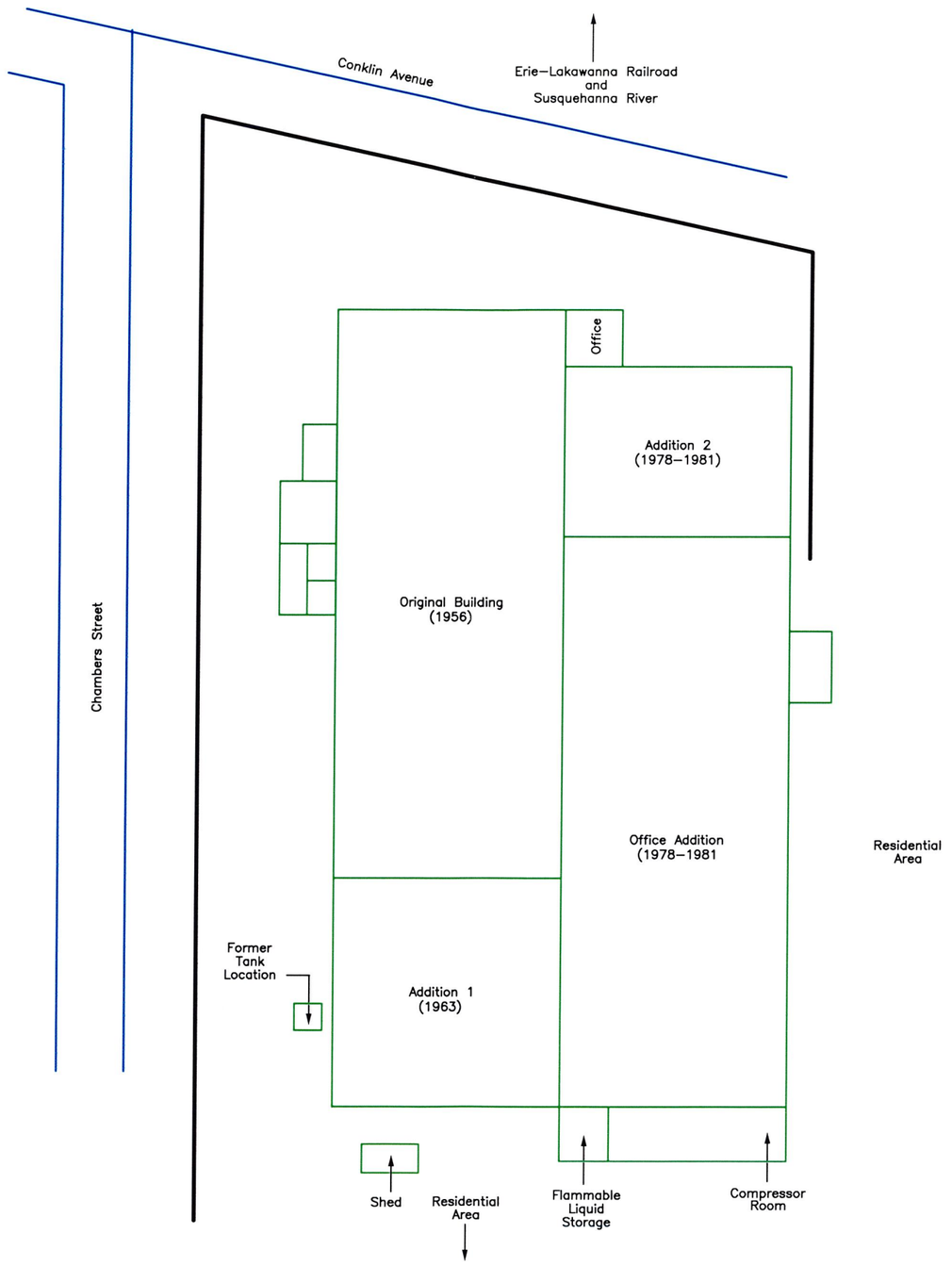
REMEDIAL DESIGN WORK PLAN

LOCATION MAP

BBL BLASLAND, BOUCK & LEE, INC.
engineers & scientists

FIGURE 1

01/01 SYR-D54-DJH
05203001/05203n01.cdr



N

NOTE:

THIS DRAWING TAKEN FROM FIGURE 2 OF THE REMEDIAL INVESTIGATION REPORT DATED JUNE 2000 BY SHIELD ENVIRONMENTAL ASSOCIATES, INC. LEXINGTON, KENTUCKY.

0 50' 100'

GRAPHIC SCALE

UNIVERSAL INSTRUMENTS CORPORATION
BINGHAMTON, NEW YORK
REMEDIAL DESIGN WORK PLAN

HISTORICAL SITE FEATURES AND SURROUNDING PROPERTIES

BBL BLASLAND, BOUCK & LEE, INC. *engineers & scientists*

FIGURE **3**

L: ON=*, OFF=REF*
P: STD-PCP/BL
1/26/01 CRA-54-TLF SYR-54-GMS
05202001/05202B01.DWG

FIGURE 4

PROPOSED REMEDIAL DESIGN SCHEDULE

UNIVERSAL INSTRUMENTS CORPORATION
BINGHAMTON, NEW YORK

	Task	*Task Description*	*Duration* (weeks)	12-Jan 1	19-Jan 2	26-Jan 3	02-Feb 4	09-Feb 5	16-Feb 6	23-Feb 7	02-Mar 8	09-Mar 9	16-Mar 10	23-Mar 11	30-Mar 12	06-Apr 13	13-Apr 14	20-Apr 15
RD Work Plan	1.1	Preparation of Draft RD Work Plan	5															
		NYSDEC Review of Draft RD Work Plan	5															
	1.2	Revision of Draft RD Work Plan	4															
		NYSDEC review of revisions to Draft RD Work Plan	2															
		Submittal of Final RD Work Plan to NYSDEC	---															
Pre-Design	2.1	Preparation of Draft Pilot Study Design	6															
		NYSDEC Review of Draft Pilot Study Design	2															
	2.2	Revision of Draft Pilot Study Design	2															
		Submittal of Final Pilot Study Design to NYSDEC	--															
	2.3	Pilot Study System Construction and Installation	2															
	2.4	Pilot Study Implementation	4															
	2.5	Preparation of Draft Pre-Design Report	6															
		NYSDEC Review of Draft Pre-Design Report	4															
	2.6	Revision of Draft Pre-Design Report	2															
		Submittal of Final Pre-Design Report	---															
Remedial Design	3.1	Preparation of Technical Specifications and Design Drawings	8															
	3.2	Preparation of O& M Program	8															
	3.3	Preparation of Contingency Plan	4															
	3.4	Preparation of Health and Safety Plan	4															
	3.5	Preparation of Citizen Participation Plan	4															
	3.6	Preparation of Draft Remedial Design Package	5															
		NYDEC Review of Draft Remedial Design Package	4															
	3.7	Revision of Draft Remedial Design Package	4															
		Submittal of Final Remedial Design Package	---															

NOTE:

Within 30 days of the NYSDEC's approval of any report submitted pursuant to
the Order on Consent, an electronic copy and a microfilm copy of the approved report will be submitted.

revised: 4/25/01

FIGURE 4

PROPOSED REMEDIAL DESIGN SCHEDULE

UNIVERSAL INSTRUMENTS CORPORATION
BINGHAMTON, NEW YORK

	Task	Task Description	Duration (weeks)	27-Apr 16	04-May 17	11-May 18	18-May 19	25-May 20	01-Jun 21	08-Jun 22	15-Jun 23	22-Jun 24	29-Jun 25	06-Jul 26	13-Jul 27	20-Jul 28	27-Jul 29	03-Aug 30
RD Work Plan	1.1	Preparation of Draft RD Work Plan	5															
		NYSDEC Review of Draft RD Work Plan	5															
	1.2	Revision of Draft RD Work Plan	4															
		NYSDEC review of revisions to Draft RD Work Plan	2															
		Submittal of Final RD Work Plan to NYSDEC	---	@	April 27, 2001													
Pre-Design	2.1	Preparation of Draft Pilot Study Design	6															
		NYSDEC Review of Draft Pilot Study Design	2															
	2.2	Revision of Draft Pilot Study Design	2															
		Submittal of Final Pilot Study Design to NYSDEC	--					@	May 25, 2001									
	2.3	Pilot Study System Construction and Installation	2															
	2.4	Pilot Study Implementation	4															
	2.5	Preparation of Draft Pre-Design Report	6															
		NYSDEC Review of Draft Pre-Design Report	4															
	2.6	Revision of Draft Pre-Design Report	2															
		Submittal of Final Pre-Design Report	---															
Remedial Design	3.1	Preparation of Technical Specifications and Design Drawings	8															
	3.2	Preparation of O& M Program	8															
	3.3	Preparation of Contingency Plan	4															
	3.4	Preparation of Health and Safety Plan	4															
	3.5	Preparation of Citizen Participation Plan	4															
	3.6	Preparation of Draft Remedial Design Package	5															
		NYDEC Review of Draft Remedial Design Package	4															
	3.7	Revision of Draft Remedial Design Package	4															
		Submittal of Final Remedial Design Package	---															

NOTE:

Within 30 days of the NYSDEC's approval of any report submitted pursuant to
the Order on Consent, an electronic copy and a microfilm copy of the approved report will be su

revised: 4/25/01

FIGURE 4

PROPOSED REMEDIAL DESIGN SCHEDULE

UNIVERSAL INSTRUMENTS CORPORATION
BINGHAMTON, NEW YORK

	Task	Task Description	Duration (weeks)	10-Aug 31	17-Aug 32	24-Aug 33	31-Aug 34	07-Sep 35	14-Sep 36	21-Sep 37	28-Sep 38	05-Oct 39	12-Oct 40	19-Oct 41	26-Oct 42	02-Nov 43	09-Nov 44	16-Nov 45
RD Work Plan	1.1	Preparation of Draft RD Work Plan	5															
		NYSDEC Review of Draft RD Work Plan	5															
	1.2	Revision of Draft RD Work Plan	4															
		NYSDEC review of revisions to Draft RD Work Plan	2															
		Submittal of Final RD Work Plan to NYSDEC	---															
Pre-Design	2.1	Preparation of Draft Pilot Study Design	6															
		NYSDEC Review of Draft Pilot Study Design	2															
	2.2	Revision of Draft Pilot Study Design	2															
		Submittal of Final Pilot Study Design to NYSDEC	--															
	2.3	Pilot Study System Construction and Installation	2															
	2.4	Pilot Study Implementation	4															
	2.5	Preparation of Draft Pre-Design Report	6															
		NYSDEC Review of Draft Pre-Design Report	4															
	2.6	Revision of Draft Pre-Design Report	2															
		Submittal of Final Pre-Design Report	---								@	September 28, 2001						
Remedial Design	3.1	Preparation of Technical Specifications and Design Drawings	8															
	3.2	Preparation of O& M Program	8															
	3.3	Preparation of Contingency Plan	4															
	3.4	Preparation of Health and Safety Plan	4															
	3.5	Preparation of Citizen Participation Plan	4															
	3.6	Preparation of Draft Remedial Design Package	5															
		NYDEC Review of Draft Remedial Design Package	4															
	3.7	Revision of Draft Remedial Design Package	4															
		Submittal of Final Remedial Design Package	---												@	October 26, 2001		

NOTE:

Within 30 days of the NYSDEC's approval of any report submitted pursuant to
the Order on Consent, an electronic copy and a microfilm copy of the approved report will be su

revised: 4/25/01

BBL®

BLASLAND, BOUCK & LEE, INC.

engineers & scientists

Consultants with focus