U.S. Army Corps of Engineers

FUSRAP

Niagara Falls Storage Site FUSRAP Site
Lewiston, New York

Addendum-1 to the Work Plan for Waste Containment Structure Characterization and Continued RI Activities: Gamma Walkover Survey and Geophysical Survey

For the

Geophysical Study of Vicinity Property G

Prepared for:
U.S. Army Corps of Engineers
Buffalo District

Prepared by:
Science Applications International Corporation
Dublin, Ohio

Contract: DACW49-00-R-0027

October 2001

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ADDENDUM-1 TO THE WASTE CONTAINMENT STRUCTURE CHARACTERIZATION WORK PLAN FOR CONTINUED RI ACTIVITIES: GAMMA WALKOVER SURVEY AND GEOPHYSICAL SURVEY

FOR THE

GEOPHYSICAL STUDY OF VICINITY PROPERTY G

NIAGARA FALLS STORAGE SITE LEWISTON, NEW YORK

Prepared for:
U.S. Army Corps of Engineers
Buffalo District

Prepared by:
Science Applications International Corporation
4900 Blazer Parkway
Dublin, Ohio 43017

Contract: DACW49-00-R-0027

October 2001

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ABBREVIATIONS AND ACRONYMS

AEC	Atomic Energy Commission
BNI	Bechtel National, Incorporated
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CWM	Chemical Waste Management
Cs-137	Cesium-137
DOE	Department of Energy
DQO	Data Quality Objective
EPA	Environmental Protection Agency
FUSRAP	Formerly Utilized Sites Remedial Action Program
GPR	Ground Penetrating Radar
GPS	Global Positioning System
IDW	Investigative Derived Waste
ITR	Independent Technical Review
LOOW	Lake Ontario Ordinance Works
MED	Manhattan Engineer District
NFSS	Niagara Falls Storage Site
NYSDEC	New York State Department of Environmental Conservation
ORAU	Oak Ridge Associated Universities
PAH	polynuclear aromatic hydrocarbon
PPE	Personal Protective Equipment
QA/QC	Quality Assurance/Quality Control
QATP	Quality Assurance Technical Procedures
Ra-226	Radium-226
RI	Remedial Investigation
RI/FS	Remedial Investigation/Feasibility Study
Rn-222	Radon-222
SAIC	Science Applications International Corporation
SSHO	Site Safety and Health Officer
SSHP	Site Safety and Health Plan
Th-235	Thorium- 235
TPP	Technical Project Planning
U-238	Uranium-238
USACE	U.S. Army Corps of Engineers

1.0 PROJECT DESCRIPTION

1.1 INTRODUCTION

Under the Formerly Utilized Sites Remedial Action Program (FUSRAP), the United States Government is remediating contaminants generated as a result of the Manhattan Engineer District/Atomic Energy Commission (MED/AEC) activities, at the Niagara Falls Storage Site (NFSS). FUSRAP actions at the NFSS are being carried out under the direction of the U.S. Army Corps of Engineers (USACE) - Buffalo District. As part of the FUSRAP actions, a Remedial Investigation/Feasibility Study (RI/FS) is currently underway at the NFSS. The RI/FS is being conducted so that the requirements in the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) are met.

The USACE Buffalo District has identified the need for a geophysical survey over Vicinity Property G (as shown in Figure 1.1) of the FUSRAP NFSS in support of the ongoing NFSS CERCLA RI/FS process. Vicinity Property G is physically located on the current Chemical Waste Management (CWM) property, formerly the (Lake Ontario Ordinance Works) LOOW property. However, since buried waste may contain radioactive contaminants, the site is investigated under the FUSRAP. The information attained from this characterization will be used to support the RI/FS of the NFSS.

1.2 PURPOSE AND SCOPE

The activities discussed in this Addendum detail the effort required to conduct and document the geophysical characterization of Vicinity Property G. The geophysical survey will be completed in accordance with the Work Plan for Waste Containment Structure Characterization and Continued RI Activities: Gamma Walkover Survey and Geophysical Survey (SAIC 2001). This Addendum presents only new information needed to complete this geophysical survey.

The project strategy is to evaluate the possible existence of burial areas known to have been present on the former LOOW site. This will be accomplished using one or more non-intrusive field investigation methods with the capability of detecting such anomalies.

1.3 ORGANIZATION OF THE WORK PLAN ADDENDUM

This Addendum contains only information not presented in the SAIC (Science Applications International Corporation) Work Plan (SAIC 2001). It includes six sections and an addendum to the Site Safety and Health Plan (SSHP) for Continued RI Activities at the Niagara Falls Storage Site as an attachment. The remaining portion of this section provides an overview of the project organization. Section 2 provides a brief summary of the history of Vicinity Property G and prior investigations conducted by U.S. Department of Energy (DOE) and USACE. Section 3 contains the approach for performing the survey. Section 4 contains policies and procedures governing quality assurance/quality control practices. Section 5 contains the proposed project schedule and Section 6 is a list of references used in producing this WP.

1.4 PROJECT ORGANIZATION AND RESPONSIBILITIES

The Work Plan prepared by SAIC in April 2001 outlined the project organization and management plan for the Continued RI (Remedial Investigation) activities. The SAIC project organization and management for the Geophysical Study of Vicinity Property G covered by this Addendum is the same. The organization chart illustrated in Figure 1.2 outlines the management structure that will be used to implement the project. The functional responsibilities of key personnel are described in the Work Plan. Resumes of key personnel are included as Appendix A.

"M" STREET

WE
311.7

CAMBELL STREET

AREA
G

Liquid Treatment Pond

Liquid Treatment Pond

WE
313.8

CASTEL GARDEN STREET

WE
332.1

WE
327.6

LEGEND

Geophysical Survey Area

CWM
CHEMICAL
SERVICES,
INC. , PROPERTY

NIAGARA FALLS STORAGE SITE PROPERTY

CWM
CHEMICAL
SERVICES,
INC. , PROPERTY

N
True
North

150′ 75′ 0 150′

SCALE 1"=150′

VICINITY PROPERTY G

NIAGARA FALLS STORAGE SITE

SAIC. Science Applications International Corporation Columbus, Ohio

DRAWN	DATE	SCALE	PROJECT NO.	FIGURE NO.
JMc	10/02/01	AS NOTED	52-0500	1.1

NAME: AREA G-S:\NIAGRA FALLS\NFSS\089812\SITE-G.DWG DATE: OCT 02, 2001 TIME: 5:37 AM CTB: S:\CTB PLOTTING\MONOCHROME.CTB

1.4.1 Project Organization

Table 1.1 Staff Organization and Contact Information

Position	Name	Telephone
USACE Project Manager	Dr. Judith Leithner	(716) 879-4234
USACE Project Engineer	Michelle Rhodes	(716) 879-4198
SAIC Project Manager	Michael Giordano	(614) 791-3345
SAIC RI Task Manager	Jeff Dick	(330) 405-9810
SAIC Health and Safety Manager	Stephen L. Davis	(865) 481-4755
SAIC Data Manager	David Kulikowski	(614) 793-7600
SAIC Quality Assurance/Quality Control (QA/QC) Officer	Steve McBride	(614) 793-7600
SAIC Radiation Safety Officer	Claude Laney	(803) 345-9340
SAIC Field Manager Geophysics	Rick Hoover	(717) 901-8100
SAIC Site Safety and Health Officer (SSHO)	Brad Richardson	(614) 793-7600

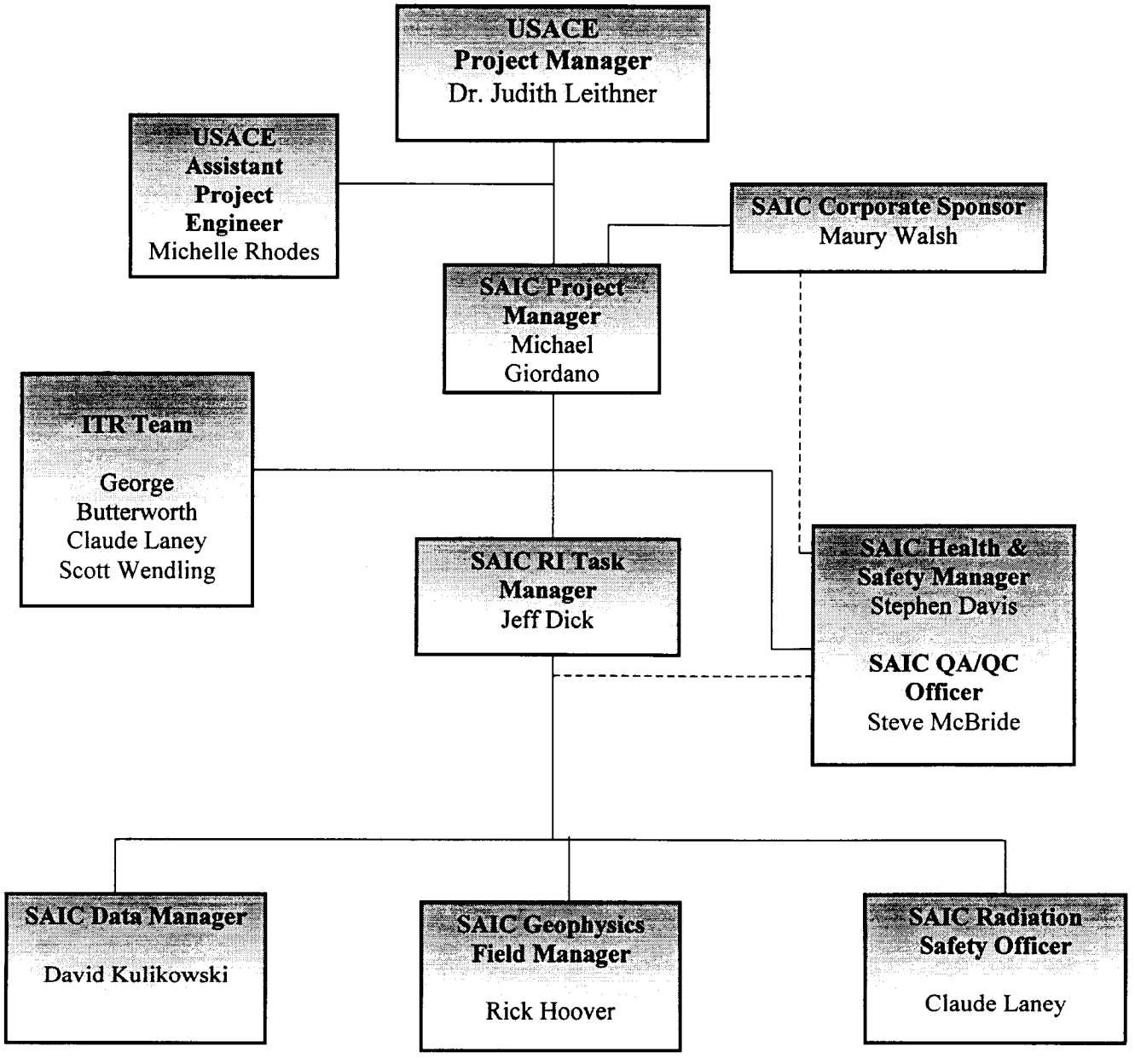

Figure 1.2 Organizational Chart for the Geophysical Study of Vicinity Property G at the Niagara Falls Storage Site in Lewiston, New York

2.0 VICINITY PROPERTY G

As shown on Figure 1.1 Vicinity Property G is one of the vicinity properties associated with the NFSS in Lewiston, New York. Property G is rectangular in shape and measures approximately 409 meters (~1,320 feet) long by 293 meters (~940 feet) wide. It occupies a total area of 12.0 hectares (~29.7 acres). The site is bounded on three sides by roads: "M" Street on the north, Castle Garden Road on the east, and Campbell Street on the west. A chain-link fence north of "N" Street delineates the southern boundary. A liquid treatment pond covers the central eastern and northeastern portion of the property.

2.1 SITE HISTORY AND CONTAMINANTS

Scoping information indicates that low-level contaminated waste was stored and buried on Vicinity Property G during the early 1950's. The Castle Garden Dump, located in the northeastern section of the property, was the major storage and burial location for contaminated and uncontaminated debris and building rubble (some from the Linde Plant), ashes, acid bricks, residue, process material, drums, cesium gaps, transite, insulation, and various pieces of equipment (Aerospace Corporation, 1982.). Cleanup of surface debris was performed (also during the 1950's) to reduce exposure levels to below 0.63 milliroentgen/hour (mR/h) (gamma), a level considered to be background. In addition, during the 1971-1972 timeframe, areas in and around the Dump were excavated to an approximate depth of 1 foot. However, available records do not sufficiently describe whether the entire Dump has been removed.

A contaminated metal burial site measuring about 15 meters by 60 meters was located in the south central section of the property. It reportedly contained contaminated metal, drums (some D-65 residue), boxes, and yellow process material to a depth of 8 feet (Aerospace Corporation, 1982). Decontamination to a depth of 10 feet was performed in 1972, and the material was removed to a spoils pile onsite.

A third area, located also in the south and central section, was a small (6.5 meters by 6.5 meters) burial area for small animal carcasses and other contaminated wastes from the University of Rochester. During Manhattan Engineer District (MED) activities, the University performed research in support of radiation safety. In 1954, the burial area was found to be as high as 40 millireps per hour (~37 millirads per hour); and a screening survey conducted in 1970 found levels of 30 mR/h. In 1972, 512 cubic yards containing drums and debris were removed from a 10-foot deep excavation. Based on the results of subsequent surveys, no further remedial action has been performed at this area.

Follow-up surveys of Vicinity Property G in 1972-1973 indicated some areas of uranium, radium, and cesium contamination and direct radiation levels above 20 microroentgens per hour (uR/h) remained in the northeast and southwest portion of the property (ORAU, 1984). However, the levels in the northeast section were believed to be "shine" from the contaminated areas located on the north side of "M" street or natural radiation from the roadbed material. The radiation levels in the southwest section were suspected to be "shine" from the fission products reported to have been stored in the Navy waste area. Most of the area of the Former Castle Garden Dump is presently occupied by the liquid treatment pond.

2.1.1 Constituents of Concern

Constituents of Concern at the site include primarily Radium-226 (Ra-226). Constituents of Concern, that occur on-site in lesser amounts, include Uranium-238 (U-238), Thorium-232 (Th-232), and Cesium-137 (Cs-137). Organic chemical contamination, specifically polynuclear aromatic hydrocarbons (PAHs) are also of concern in burial areas.

2.2 PREVIOUS INVESTIGATIONS

During the period of April-June 1983, a comprehensive survey of the Vicinity Property G was performed by the Radiological Site Assessment Program of Oak Ridge Associated Universities (ORAU) to provide an assessment of radiological conditions and associated potential health effects (ORAU, 1984). The survey included surface radiation scans. Measurements of direct radiation levels, and ground penetrating radar were gathered. Analyses were collected for radionuclide concentrations in soil, sediments and water samples. The survey did not include the location of the former Castle Garden Dump due to lack of accessibility. At the previous University of Rochester burial area, elevated radiation levels were not observed, and no further remedial action was deemed necessary. The survey results did identify numerous small, isolated areas of elevated direct radiation and surface soil contamination believed to be associated with previous MED/AEC activities. The major contaminant was Ra-226; however, U-238, Th-232, and Cs-137 contamination was also noted. Most of these areas were associated with pieces of rock-like material (possibly chemical-processing slag), building rubble, and residues located in a previous metal burial area site.

Results of the Ground Penetrating Radar (GPR) survey found subsurface metal targets resembling disposal containers in the area of the metal burial site. These containers were estimated at 0.5 to 1.5 meters (~1.6 to 4.9 feet) below ground surface (bgs). With the exception of the metal burial site, all of the identified areas from the 1984 survey were remediated (decontaminated and back-filled) in 1986. Remediation of the buried metals site was completed in 1987, and is discussed below. Radiological post-remedial action surveys conducted after the 1986 and 1987 remediation verified that these remedial actions had been satisfactorily completed (BNI, 1989 and DOE, 1989). "This meant that the areas that were remediated at the time met guidelines (and that the documentation supporting the remedial action process was adequate and accurate), but it did not mean that the entire property was verified for release" (ORAU, 1990 and DOE, 1992).

2.2.1 Metal Burial Site

During the remedial activities in 1986, a radiologically contaminated drum containing residual chemicals was unearthed at one of the locations (DOE, 1987). During its removal, portions of additional drums were also observed. Analysis of the tar-like contents of the drum indicated numerous organic compounds (PAHs) (CEP, 1986) believed to be common constituents of coal tar and coal tar derivatives. Radiological monitoring of the drum indicated elevated readings were confined to the bottom of the drum. It was believed that the drums were originally used to store K-65 residues (one drum was marked "K-65"), and that residual contamination existed because it was not possible to remove all of the K-65 residues. The emptied drums may then have been filled with the sludge-like material. The source of the material is unknown (DOE, 1988).

Due, in part, to impending inclement weather and limited funding, further remedial activities were postponed for the remainder of 1986 until the nature and extent of the drum area could be assessed. In March 1987, an electromagnetic (EM) terrain conductivity survey was conducted in the area adjacent to the excavated drum to determine the magnitude of the burial drum area (BNI, 1987a). Several targets were located within an area of approximately 50 by 50 feet. Further excavation proceeded in June 1987. Thirty-one additional drums were removed, radiologically monitored, and placed in over-packs. During removal, most drums were found not to have lids; others were ruptured, and some contents may have been spilled. Spilled materials which exhibited radiological contamination above background were also excavated and placed in drums. Cleanup of "all traces" of the tar-like residue in the surrounding soil was completed in September 1987.

A total of 90 drums of soil contaminated with the material from the original drums were removed. Following an inspection of the area by representatives of SC Chemical Services and the New York State Department of Environmental Conservation (NYSDEC), the NYSDEC declared the site had been cleaned-up and available to be back-filled (BNI, 1987b). Upon completion of back-filling, a final inspection was conducted on October 1, 1987, and the area was "accepted" by NYSDEC. Although post-remedial action surveys verified that remediation for radiological contamination has been satisfactorily completed, it appears that no confirmation sampling was performed to verify the removal of organic chemical contamination (DOE, 1988). Completion of remediation appears to have been visually determined. Consequently, there is some concern regarding the presence of residual organic chemicals at this area.

2.2.2 Liquid Treatment Pond Area (consisting of 2 ponds)

A radiological assessment of the soil under the liquid treatment pond was not conducted due to the presence of standing water in the pond. The pond measures approximately 320 feet by 800 feet, and also covers the most of the Castle Garden Dump area located on Off-Site Property G. It appears that one boring (H-3) was advanced in the former dump during the 1983 survey where it is not covered by the treatment pond. Soil sample results from Boring H-3 at surface and 3 feet bgs found concentrations of radium, uranium, thorium, and cesium that were either below or consistent with baseline radiological concentrations.

3.0 CHARACTERIZATION AND SURVEY APPROACHES

The following sections describe in detail the process by which Vicinity Property G will be evaluated

3.1 SITE CLEARING REQUIREMENTS

Site clearing will be conducted to provide access to assure that the survey techniques are reasonably consistent in all areas regardless of vegetation. Site clearing activities will be conducted in accordance with the SAIC Work Plan and SSHP.

3.2 GEOPHYSICAL WORK PLAN

3.2.1 Geophysical methods

Three geophysical methods will be used in the survey of Vicinity Property G:

- EM-31
- EM-61
- Ground Penetrating Radar.

Information on these methods including QA/QC procedures is detailed in the SAIC Work Plan.

3.2.2 Vicinity Property G Geophysical Strategy

Vicinity Property G is approximately 29.7 acres. A liquid treatment pond covers the central eastern and northeastern portion of the property (approximately 97.5 meters by 243.8 meters (320 feet by 800 feet) which is excluded from this geophysical survey. See Figure 1.1 for the areas in Property G which will undergo the Geophysical Survey

3.2.2.1 Vicinity Property G EM Survey

An EM-31 survey will be conducted at Vicinity Property G using a Geonics EM-31 terrain conductivity meter. The survey will be conducted in accordance with SAIC's *Detailed Operating Procedure for Surface Electromagnetic Survey* (NFSS Work Plan (SAIC,2001) Appendix A). Except for the liquid treatment pond portion of the property, the entire Vicinity Property G will have EM-31 survey conducted. The first stage of the survey will be to establish the survey grid. The survey will be conducted along traverses spaced every 3 meters (10 feet) and oriented north to south. The EM-31 data will be collected at a rate of one measurement per second as the operator walks along the survey traverses. Generally, this rate of collection results in a data point every 0.6 to 0.9 meter (2.5 to 3 feet) inline. It is anticipated that approximately 24.6 kilometers (15.3 linear miles) of data will be collected during this survey.

Positioning will be by global positioning system (GPS) following SAIC's *Detailed Operating Procedure for Mapping with a GPS.*

The EM data will be merged with the GPS data and will be presented in map form using the mapping program Surfer™ by Golden Software. Both inphase and quadrature phase (conductivity) maps will be provided.

3.2.2.2 Vicinity Property G Focused EM-61 Survey

SAIC will conduct a focused EM-61 survey at Vicinity Property G using a Geonics EM-61 metal detector. The purpose of the focused EM-61 survey will be to verify the EM-31 findings regarding metallic material, including buried drums. SAIC will conduct the survey in accordance with SAIC's *Detailed Operating Procedure for Surface Electromagnetic Survey* (Appendix A). Following the collection, reduction and presentation of the EM-31 data in Vicinity Property G, SAIC will perform a focused EM-61 survey to refine anomalies identified in the EM-31 survey data. A survey grid will be set up on the individual anomalies and the EM-61 data will be collected on traverses spaced every 1 meter (3.3 feet) and oriented north to south. The EM-61 data will be collected at a rate of one measurement per second as the operator walks along the survey traverses. Generally, this rate of collection results in a data point every 0.6 to 0.9 meter (2.5 to 3 feet) inline. The EM-61 may be used to make depth estimates of metallic anomalies, as the proposed EM-31 method will not provide depth estimates. During the EM-61 survey, it is estimated that approximately 12 kilometers (7.5 miles) of data will be collected at Vicinity Property G.

Positioning will be by GPS following SAIC's *Detailed Operating Procedure for Mapping with a GPS* (Appendix A).

EM-61 data will be presented in map form using the program Surfer™.

3.2.2.3 Vicinity Property G Focused GPR Survey

A focused GPR survey will be performed to refine anomalies identified in the EM-31 survey. The GPR survey will be conducted along the same traverses established for the EM-61 surveys. The GPR will be collected on traverses spaced every 1 meter (3.3 feet). SAIC will conduct the GPR survey in accordance with SAIC's *Detailed Operating Procedure for Ground Penetrating Radar Survey*. The survey will be conducted using 200 and 500-megahertz antennae, with fudicial marks placed in relation to the grid markers established in the field. The use of the 200 and 500 megahertz antennae will provide the best opportunity to meet the survey objectives of this method.

At NFSS the observed GPR depths of penetration was approximately 1.4 meters (4.6 feet). At Property G, the lack of GPR penetration will be used to recognize the clayey soils. Where deeper penetration is present, the radar will readily show areas that have been disturbed and provide a means to examine the disturbed area in detail.

The GPR will provide greater vertical resolution of subsurface features and allow an evaluation of subsurface stratigraphy, or in this case, the interruption of the stratigraphy at the location of the buried material. The EM-61 will only respond to metals, which is not directly a target in the survey, but an ancillary objective.

The GPR data will be examined in the field as it is collected by a geophysicist and then processed using the software package IXeTerra, by Interpex Ltd. During the processing, the data will be horizontally scaled to remove lateral distortions caused by variations in the data collection speeds. Selected horizontal and vertical filters may be applied, as necessary, to enhance features of interest. A copy of the data, as well as viewing software will be provided.

3.3 INVESTIGATIVE DERIVED WASTE MANAGEMENT

Investigative Derived Waste (IDW) includes all materials generated during the performance of an investigation that cannot be effectively reused, recycled, or decontaminated in the field. IDW generated during field activities will include solid sanitary waste [disposable personal protective equipment (PPE), etc.] and will be managed in accordance with the SAIC Work Plan.

Table 3.1 Schedule of Geophysical Activities

Task No.	Task	Estimated Number of Days to Complete Task	1	2	3	4	5	6	7	8	9
	Set up of Grids	9									
1	EM-31	6									
2	EM-61	3									
3	GPR	3									

Table 3.2 Data Quality Objectives

	Method	Data Quality Objectives (DQOs)
Vicinity Property G	EM-31	Buried Drums and Debris Buried Animal Carcasses
	EM-61	Buried Drums Buried Metallic Debris
	GPR	Buried Drums Buried Metallic Debris

4.0 QUALITY ASSURANCE PLAN

Section 4 of the SAIC Work Plan details the specific quality assurance procedures that will be followed for the collection, reduction, analysis, documentation, and presentation of the field survey data.

4.1 PROJECT OBJECTIVES

The objectives for this task are as follows:

1. To ascertain if there are any remaining equipment, drums, debris and animal carcasses in areas or at depths below that remediated by DOE.
2. Illustrate and identify contents of waste pile, using geophysical results and historical information.
3. Use generated survey data and historical site data, to identify and map the locations of objects/anomalies that are named above.
4. Use survey data to identify potential contaminant plumes.
5. Use survey data to infer depths of potentially buried material.
6. Compare depth of groundwater from the geophysic's data and the groundwater monitoring data with the inferred burial depth and infer potential for contaminant migration.

The information obtained from this characterization will be used by the USACE and their contractors to support the RI/FS of the Niagara Falls Storage Site. The overall strategy for the NFSS is to remediate radiological and chemical contaminants at the site, where necessary, such that the requirements of CERCLA are met.

4.2 DATA QUALITY OBJECTIVES

The primary objective of the field tasks is to geophysically characterize Vicinity Property G that satisfies the site and project strategies and the CERCLA process. The USACE – Buffalo District has developed a Scope of Work for acquiring the necessary data to satisfy these objectives. DQOs worksheets, as detailed in the SAIC Work Plan, for Vicinity Property G are included as Table 4-1.

Table 4-1. Data Quality Objectives Worksheet

Site: Niagara Falls Storage Site

Vicinity Property G - DOQ Statement Number: 1

DQO Element Number	DQO Element Description	Site Specific DQO Statement
Intended Data Use(s):		
1	Project objective(s) satisfied.	Define subsurface waste areas.
Data Need Requirements:		
2	Data user perspective(s).	
3	Features of interest to be identified.	Identify buried drums.
4	Characteristics to be identified.	Isolated small metallic features
5	Required investigation areas and depths identified.	Vicinity Property G, to a depth of 16-feet (5 meters)
6	Measurement spacing required:	As small as economically viable. Three meters (10 feet) recommended for EM-31. One meter (3 feet) spacing for the EM-61 and GPR surveys on anomalous areas identified in the EM-31 data.
7	Level of analytical resolution	Need to identify presence to avoid hazards, or identify objective for any future intrusive activities
Appropriate Sampling and Analysis		
8	Measurement method identified	EM31 inphase data for lateral resolution up to a depth of 16 feet (5 meters), EM-61 data and GPR traverses for depth measurements.
9	Data analysis method	Contoured maps to show lateral location. Data traverse profiles may be necessary to facilitate interpretation.

Vicinity Property G - DOQ Statement Number: 2

DQO Element Number	DQO Element Description	Site Specific DQO Statement
Intended Data Use(s):		
1	Project objective(s) satisfied.	Define subsurface waste areas.
Data Need Requirements:		
2	Data user perspective(s).	
3	Features of interest to be identified.	Identify debris.
4	Characteristics to be identified.	Inhomogeneous subsurface response with occasional metallic response.
5	Required investigation areas and depths identified.	Vicinity Property G to a depth of 16-feet (5-meters).
6	Measurement spacing required:	As small as economically viable. Three

		meters (10 feet) recommended for EM-31. One meter (3 feet) spacing for the EM-61 and GPR surveys on anomalous areas identified in the EM-31 data.
7	Level of analytical resolution	Need to identify presence to avoid hazards, or identify objective for any future intrusive activities.
Appropriate Sampling and Analysis		
8	Measurement method identified	EM31 quadrature phase and inphase to a depth of 16-feet (5-meters). EM-61 data and GPR traverses for depth measurements.
9	Data analysis method	Contour maps of data and evaluation of lateral variation. Data traverse profiles may be necessary to facilitate interpretation.

Vicinity Property G - DOQ Statement Number: 3

DQO Element Number	DQO Element Description	Site Specific DQO Statement
Intended Data Use(s):		
1	Project objective(s) satisfied.	Define subsurface waste areas.
Data Need Requirements:		
2	Data user perspective(s).	
3	Features of interest to be identified.	Buried Animal carcasses
4	Characteristics to be identified.	Inhomogeneous subsurface response with occasional metallic response.
5	Required investigation areas and depths identified.	Vicinity Property G to a depth of 16-feet (5-meters).
6	Measurement spacing required:	As small as economically viable. Three meters (10 feet) recommended for EM-31. One meter (3 feet) spacing for the EM-61 and GPR surveys on anomalous areas identified in the EM-31 data.
7	Level of analytical resolution	Need to identify objective for any future intrusive activities.
Appropriate Sampling and Analysis		
8	Measurement method identified	EM31, inphase and quadrature phase at depths less than 16-feet (5-meters) offers lateral resolution at shallow depths to effectively delineate the feature. EM-61 data and GPR traverses offer depth resolution.
9	Data analysis method	Contour maps of data and evaluation of lateral variation. Data traverse profiles may be necessary to facilitate interpretation.

5.0 SCHEDULE

A project schedule for the Vicinity Property G work is presented in Figure 5.1. The schedule breaks down the major project milestones in terms of duration and timing for each task.

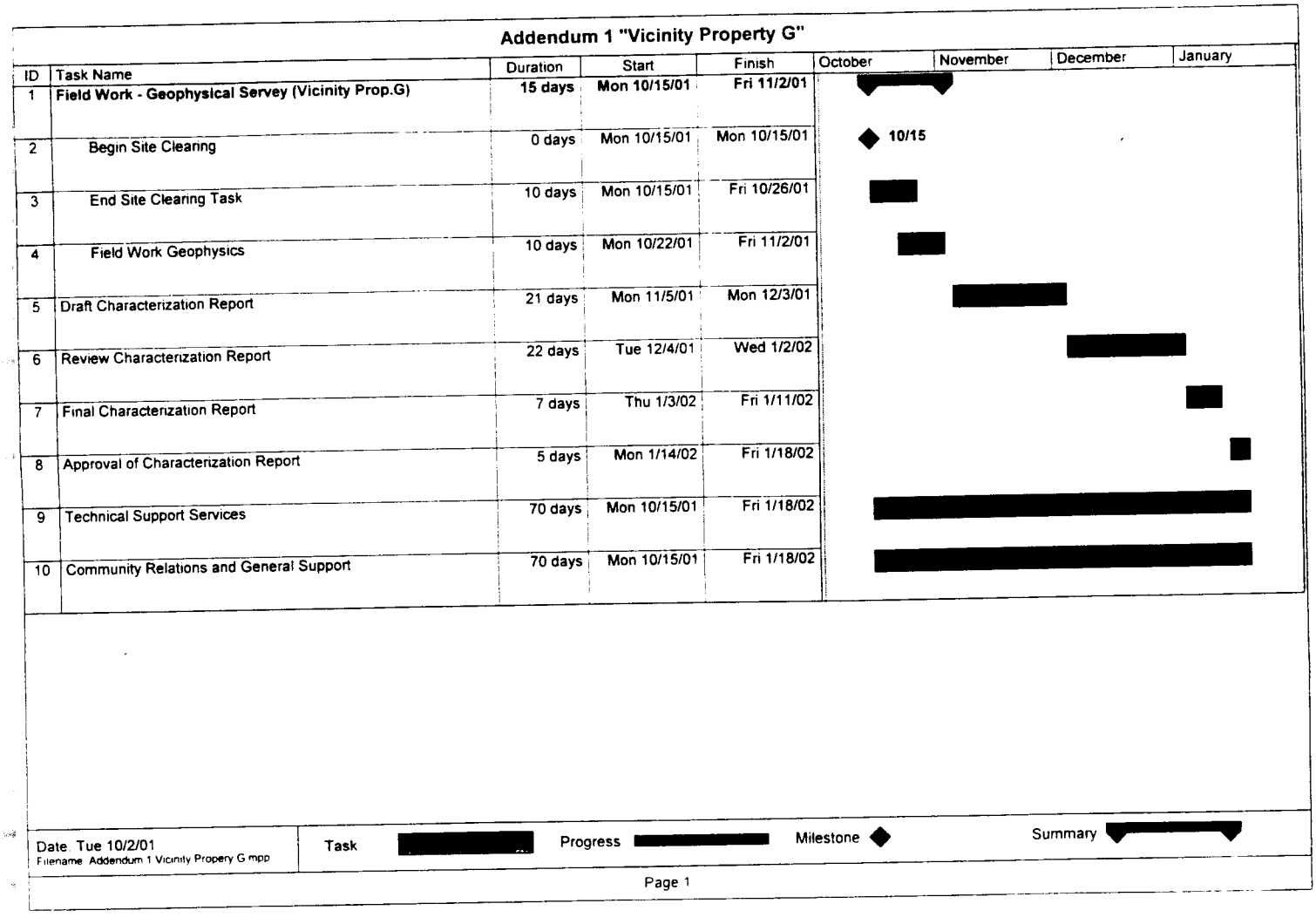

Figure 5.1 Project Schedule

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Appendix A

Resumes of Key Personnel

JEFF A. DICK

EDUCATION:

M.S., Environmental Engineering, University of Cincinnati, 1992
B.S., Civil Engineering, University of Akron, 1989

SECURITY CLEARANCE:

U.S. DOE: Level L - September 1992 (Inactive)

WORK SUMMARY:

Mr. Dick has over ten years experience in providing environmental engineering support to public and privately funded projects. He is well versed in meeting the requirements of RCRA Corrective Action [RCRA Facility Assessments (RFA)/RCRA Facility Investigations (RI)/ Corrective Measures Studies (CMS)], RCRA Closures and CERCLA [Remedial Investigations (RI)/Feasibility Studies (FS)] Programs and RD/RA (Remedial Design/Remedial Actions). His work with the USACE FUSRAP Program, Fort Benjamin Harrison (BRAC Site), Portsmouth Gaseous Diffusion Plant (PORTS) and commercial clients has provided him with the opportunity to identify, evaluate, and apply modern and innovative solutions to hazardous and radioactive waste remediation, with special emphasis on activities associated with water and sediment. Mr. Dick has extensive project management experience in leading and representing clients in negotiating risk based cleanups of contaminated sites.

PROFESSIONAL EXPERIENCE:

November 1991 to present, Office Manager/Environmental Engineer, SAIC

Mr. Dick is the Program Manager for a 4 year project to perform the investigation, feasibility study, engineering design and remediation for over 15,000 cu. Yds. of contaminated sediment located in Michigan for a commercial client. This action is being performed as a Supplemental Environmental Project (SEP).

Mr. Dick is the Program Manager for a multi-year project to investigate and remediate de-icing (glycol) fluid contamination in soil, surface water and sediment at the Cleveland, Ohio Airport. This action is being performed under the requirements of a Consent Decree.

Mr. Dick was successful in locating and removing ninety-three tons of radioactively contaminated soil from a solid waste landfill where it had been inadvertently placed. State regulatory agencies demanded that this material be removed immediately from the landfill, in addition, the landfill only had 60 days of auxiliary space left before they would be forced to suspend operations. A major rail company involved in this occurrence hired SAIC to identify and mitigate this problem. SAIC proposed an innovative investigation technique of downhole gamma logging to pinpoint the location of the material within the 17,000 cu. yd. cell to enable a focused removal. SAIC successfully located the material, and integrated 3-Dimensional IT modeling to determine the nature and extent of the radiologically contaminated soil, presented the results to regulatory agencies, developed a removal action work plan, negotiated agency approval and began removal operation in less then 30 days. The material was successfully removed and agency approval for the landfill to resume operation was received on schedule. Mr. Dick represented the

client on all negotiations with regulatory agencies regarding nature and extent of the material requiring removal.

Mr. Dick successfully directed a project for a major rail company to locate an underground coal fire. SAIC installed piezometers and utilized temperature measurements and 3-Dimensional IT modeling to assess the nature and movement of an underground fire at a major rail yard in PA. The results of this investigation assisted the customer in assessing the appropriate response and threat to their facilities.

Mr. Dick is the SAIC project manager for work performed under contract to Buffalo USACE at the Luckey and Painesville FUSRAP sites. At the Luckey site Mr. Dick developed and is responsible for implementing a 2.6 million dollar fast track Remedial Investigation under CERCLA. This has involved the preparation of an innovative RI/FS WorkPlan, which was developed to meet the requirements of EM 200-1-3, in 30 days for USACE and regulatory review and implementation of the field work required to characterize the 42 acre site that is contaminated with Beryllium and radionuclides. The Remedial Investigation includes sampling of soil, sediment, surface water, ground water, air, and buildings. Mr. Dick has assembled an integrated team of drillers, health physics support staff, and geologists to successfully complete an aggressive schedule of 2.5 months. This work was performed in half of the time that was originally scheduled for it and in less than half the original budget. Mr. Dick developed and implemented an innovative real-time assessment approach that involved 24 hour turn-around of analytical samples and the use of a web site to forward results to the USACE team in various districts that enabled rapid assessment and revision to the sampling strategy. This work required the investigation and evaluation of sediment samples over an 11 mile stretch of creek. This work has included the installation of 42 groundwater monitoring wells, the installation of 243 soil borings, and the collection of over 1000 samples of environmental media. In addition, 7 buildings were surveyed and characterized for radioactive and chemical contamination. This work was performed at a privately owned site with an operating industry and was completed without inpact to the owners manufacturing activities.

At the Painesville site, Mr. Dick managed the preparation of a site characterization report prepared from data collected by others and the development of an EE/CA responsiveness summary and proposed plan for the mitigation of over 1500 cu.yds. of soil contaminated with radionuclides.

Mr. Dick is managing engineering studies for contaminated media at Fort Benjamin Harrison in Indiana under contract to Louisville USACE. This has included developing Proposed Plans at six sites for No Further Action, the development of a Removal Site Evaluation (RSE) for soil contaminated with lead at three firing ranges, and the subsequent development of an Engineering Evaluation/Cost Estimate (EE/CA) which evaluated alternatives for the remediation of over 14,000 cu. yds. of metal contaminated soil.

Mr. Dick has successfully directed the design for the preferred remedial alternative for mitigating over 14, 000 cu. yds. of contaminated soil, which consisted of in-situ treatment, followed by excavation and disposal. The sites will then be restored for their future use as a state park. This project required close coordination with USEPA, IDEM, IDNR, U.S. Department of Interior, COE, and the Army, and was performed under contract to Nashville USACE for Louisville USACE.

Mr. Dick identified and directed efforts required for remediation of lead contaminated soil from around 14 houses at a U.S. Army Base closure site to facilitate property transfer. This involved identifying the nature and extent of contamination surrounding the houses as a result of previous lead based paint removal activities, negotiating clean-up levels with the Indiana Department of Environmental Management, and design and implementation of the removal action. The transfer of these properties from

the U.S. Army to the private sector was contingent on successful mitigation of the contaminated soil. This work was performed under contract to the National Guard Bureau.

Mr. Dick performed a regulatory compliance assessment for two closed landfills. This assessment entailed evaluating the condition of the landfills and assessing status regarding compliance with state and federal requirements. In addition, recommendations were provided to mitigate areas where corrections regarding the actual physical closure and reporting requirements were provided. This work was prepared under contract to Louisville USACE.

Mr. Dick identified and designed the solution for the uncontrolled release of contaminated media into waters of the State of Indiana. This involved the relocation of a 400 foot section of creek, which was eroding a hillside contaminated with metals to prevent releases of contamination into waters of the state. In addition, 600 cu. yds. of contaminated soil was excavated and disposed of off-site. This work was performed under contract to Nashville USACE.

Mr. Dick designed and implemented a workplan, investigation, evaluation and the remediation for over 8 miles of creek bank at a DOE facility in Ohio. This included performing gamma walkover surveys of the banks and creek bed, evaluation of the data to identify "hot spots" and performance of removal actions at areas of contamination.

As an environmental engineer Mr. Dick reviewed and identified data gaps for soil and groundwater sampling in two RCRA Facility Investigations(RFI). As a follow up Mr. Dick assisted DOE in developing a phase II investigation in order to produce an RFI that would be acceptable to the regulatory agencies. This included developing a new sampling strategy, identification of additional sampling locations, and interpretation of phases I and II data. Mr. Dick has performed technical reviews of numerous reports including; remedial investigations, engineering studies, treatability studies, remedial designs, closure plans and regulatory compliance documents.

Mr. Dick led an effort to produce a RCRA Corrective Action/RCRA Closure Integration Work Plan for the PORTS facility. This document outlines an innovative approach to meeting the substantive requirements of the Ohio RCRA closure program as part of RCRA Corrective Action. Acceptance of the Work Plan by the regulatory agencies will establish an efficient and cost-effective manner for mitigating contamination at various SWMUs under a number of regulatory authorities.

As a task manager Mr. Dick was extensively involved in developing Corrective Measures Studies (CMS) work plans. This required the development of innovative strategies for preparing CMS reports for which little guidance exists. These studies were prepared to meet the collective requirements of CERCLA, RCRA and NEPA. He was appointed project manager of five multi-million dollar CMS tasks. He was involved in all aspects of management and technical oversight of these tasks; responsibilities include: development of work breakdown structure (WBS), oversight of treatability studies, involvement in all technical aspects of the studies, coordination of CMS activities with other contractors on site, participation in discussions with federal and state agencies, and development of project status reports. These studies performed within the time-frame set by the regulators and under the DOE projected budget were the first CMS reports to be approved at a DOE site.

Mr. Dick has also spearheaded the effort to develop innovative solutions for remediating contamination at the PORTS site. He has initiated and led an effort to perform treatability studies at the site to assess the performance of innovative technologies toward developing remedial alternatives to mitigate

contamination. In addition, he has worked with USEPA and DOE in coordinating these studies with the Superfund Innovative Technology Evaluation (SITE) program.

Mr. Dick identified the lack of an assessment to determine risks poised to human health by contamination in deep soil. His research into this deficiency identified the need for a soil leaching model to determine the potential of contaminants to migrate from soil into the ground water. He has led a joint project team (SAIC and LMES) in developing an agency approved fate and transport model to evaluate the threat to ground water from chemical constituents in the vadose zone.

Mr. Dick initiated and led an effort to develop an electronic system for identifying potentially applicable technologies to support CMS efforts. This system contains information on performance, limitations, and cost for over 80 remedial technologies and has been used to support corrective actions at PORTS. He was involved in the evaluation of innovative technologies to determine applicability to the site and the need to perform treatability studies.

Mr. Dick led an accelerated effort to develop unit summaries and risk evaluations for 155 SWMUs at PORTS as part of the Management Action Plan (MAP). The unit summaries provided information for each unit in relation to its location, regulatory status, environmental status, etc. Development of the risk evaluations required the evaluation of all environmental data collected at the site since 1990 to develop a baseline risk evaluation (1990) and a current risk evaluation (1995). This work will help LMES to status the progress of the environmental program at PORTS and assist in prioritization of units.

June 1990 to November 1991, Graduate Research Assistant, University of Cincinnati Mr. Dick conducted research involving accelerated aging of solidified waste for projects associated with Fernald DOE plant. Key person in developing and organizing project. Responsibilities included development and implementation of research, data evaluation and processing of summary reports, and oversight of lab personnel and activities.

January 1990 to June 1990, Engineer, K.A. Pendleton Company Mr. Dick assisted private and public companies in managing hazardous waste. Responsibilities ranged from assisting in lab packing of small quantities of waste, to arranging for the pick-up, transport, and destruction of large quantities of waste.

May 1987 to December 1989, Engineer Co-op, Environmental Design Group Mr. Dick processed charge orders for two $13 million wastewater treatment plants. This required the evaluation of field and vendor data, and the preparation of cost estimates. Company expert in conducting detailed hydraulic studies for redesign and renovation of proposed and existing bridges. This required gathering field data, performing hydrology studies, Fortran programming, and executing Hec-2 program. Mr. Dick ran a surveying crew that performed property surveys.

MISCELLANEOUS:

Registrations and Memberships
Professional Engineer (P.E.) – Missouri (8/96), Ohio (2/95), Indiana (11/95), Michigan (11/95), Alabama (1/96), Nebraska (4/96), Texas (5/96)
Member, American Society of Civil Engineers (ASCE)
Member, Air & Waste Management Association (AWMA)

Presentations
Development and Application of a Vadose Zone Soil Leaching Model, The Seventh National TIE Workshop, Cincinnati, Ohio March,1995.

Papers
Remediation Team Relocates Creek Channel in Realignment of Closed Army Base, SAIC Environmental Bulletin, Spring, 1998.

CUSTOMERS:
Army Environmental Center (AEC), Aberdeen Proving Grounds
Buffalo Corps of Engineers, Buffalo, New York
Nashville Corps of Engineers, Nashville, Tennessee
Louisville Corps of Engineers, Louisville, Kentucky
Department of Energy (DOE), Portsmouth Gaseous Diffusion Plant (PORTS)
Lockheed Marietta Energy Systems (LMES), Portsmouth Gaseous Diffusion Plant (PORTS)
National Guard Bureau
City of Cleveland

REFERENCES:
Rich Shank, Operations Manager, (614) 793-7600
Maury Walsh, Business Unit Manager, (614) 793-7600

31864
Group 116, Division 1700, Location 914

RICHARD A. HOOVER, P.G., C.P.G.S.

Project Director

Mr. Hoover initiated SAIC's in-house geophysical program, and developed SAIC's underground storage tank (UST) and rapid response programs. He has been integral in the growth of SAIC's Environmental Site Assessment (ESA) Program for property transfers, permit compliance sampling services, and the initiation of SAIC's Auditing Program, which includes asbestos services. Mr. Hoover is currently involved in developing commercial client relationships and providing comprehensive environmental services. He joined SAIC in 1985.

Education: B.S. in Physics 1976
Lock Haven State University

Registrations/ Certification: American Geophysical Union
American Institute of Professional Geologists
Assn. of Groundwater Scientists & Engineers, a Division of the National Water Well Assn.
European Assn. of Exploration Geophysicists
Environmental & Engineering Geophysical Soc.
Society of Exploration Geophysicists
National Assn. of Safety & Health

PROJECT EXPERIENCE

Near Surface Geophysical Investigations

As project geophysicist and manager for geophysical investigations, responsibilities included all aspects of this specialty service including marketing, proposal preparation, cost estimating, equipment specification for acquisition, software specifications, field acquisition parameter definition, data acquisition, data interpretation, and reporting procedures.

Acutec Realty, Harrisburg, PA - As a project scientist, performed geophysical investigation for the identification of underground storage tanks prior to real estate ownership transfer. Geophysical techniques included electromagnetic magnetic (EM) and metal detector investigations.

Armstrong World, Lancaster, PA -Using borehole geophysical techniques of resistance, and spontaneous potential, defined lithology and water bearing zones in a production well without other information available. (89098)

Army Corps of Engineers, Alabama Army Ammunition Plant, Childersburg, AL - Senior geophysicist provided quality control and quality assurance, review of final report on electrical imaging (EI) of karst features prior to release to client. For Phase II geophysical investigation, collected and provided preliminary processing of 14,000 lineal feet of EI data.

Army Corps of Engineers, Combustion Engineering Site in Windsor, CT - Senior geophysicist prepared geophysical work plan and scope of work for the delineation and characterization of a radioactive landfill area.

Army Corps of Engineers, Detroit Arsenal, Detroit MI - Provided mapping assistance and QA/QC for electromagnetic (EM-61) and ground penetrating radar (GPR) surveys collected to delineate former landfill areas, and identify targets of environmental concern for subsequent drilling and sampling.

Army Corps of Engineers, Fort Knox, KY - Directed the collection of EM-31 data for the investigation of waste pits. Provided QA/QC for the final report presenting the findings.

Army Corps of Engineers, Ravena, OH - Senior geophysicist provided technical guidance for staff geophysicists conducting electromagnetic terrain conductivity (EM-31), ground penetrating radar (GPR) and high sensitivity metal detection using transient electromagnetic methods (EM-61) surveys to identify the burial locations of potential mustard gas canisters. Primary responsibilities were quality control and quality assurance, review of final report prior to release to client.

Army Corps of Engineers, Savanna, IL - Senior geophysicist provided technical guidance for staff geophysicists conducting electromagnetic terrain conductivity (EM-31) and ground penetrating radar (GPR) surveys for the identification of landfills. Performed GPR processing and interpretation, quality control and quality assurance, review of final geophysical report prior to release to client.

Army Corps of Engineers, Wayne NJ - Senior geophysicist prepared geophysical work plan for the delineation and characterization of a radioactive landfill area using GPR, EM and EI techniques. Provided review of final geophysical reporting.

Ayub Iqbal, Reading, PA - Forty-acre site slated for industrial development evaluated the potential for sinkholes using electromagnetic terrain conductivity methods(EM-31 and EM-34). (85142)

Ayub Iqbal Beacon Development, Reading, PA - Electromagnetic geophysical assessment (EM-31) of sinkholes at a construction site. (90206)

BFW Group, Palmyra, PA - Managed electromagnetic investigation (EM-31) for subsurface characteristics that may be associated with sinkholes prior to development, oversight, and coordination with environmental assessment; wetlands delineation. (89264)

Bethlehem Steel, Lackawanna, NY - Collected and reduced 4,150 feet of electrical imaging data investigating the setting and impacts from former industrial lagoons. Utilized a global positioning system (GPS) with sub-meter accuracy for mapping geophysical data locations. Generated profiles, processed and interpreted data and mapped interpreted limits of landfill and subsurface impact by contaminants. Prepared comprehensive geophysical report including the integration of EM-61 data collected by other employees for the delineation of buried drums.

Big Springs School District, Carlisle, PA - Designed and reported electromagnetic investigation to delineate subsurface characteristics prior to site construction. Of primary interest were thick soil areas for the location of on-site septic systems, and indicators of possible sinkhole development. (89289)

BMY, York, PA - Buried Lagoon Investigation - Using EM, identified the lateral extent of a former disposal lagoon. (88058)

Brault Lagoon, Chazy Township, Clinton County, NY - Employed electromagnetic and seismic methods to identify the geologic setting around several former waste lagoons formerly used for hazardous waste disposal to identify migration pathways. (8503)

Central Dauphin, Middle Paxton Elementary School, Dauphin, PA - Conducted an electromagnetic survey to locate a fracture traces controlling contaminant migration in order to site a groundwater recovery well. (87042)

Ciba Geigy, Toms River, NJ - Reviewed and commented on the results of a geophysical investigation by others of contaminant plume using EM and seismic refraction. This is NPL Site 196. (85123)

City of Hampstead, MD - At the Corbin well field conducted spontaneous potential, seismic reflection, and seismic refraction surveys as a basis to locate a municipal water supply well. (86118)

Client Confidential, East Fishkill, NY - Analyzed site lithology through the interpretation of borehole geophysical logs in order to define contaminant migration routes and aquitards in the area. (8436)

Client Confidential, Armonk, NY - Conducted an EM survey to identify and map the impact area of a former salt storage pile. (88072)

Client Confidential, Armonk, NY - Using seismic refraction, mapped bedrock shape in glacial a buried glacial valley to identify migration route of groundwater contaminants. (89007)

Client Confidential, Greencastle, IN - Used seismic refraction and computer modeling to identify bedrock irregularities that may be associated with contamination migration routes for the design of a contamination cutoff wall/groundwater collection system. (88211)

Client Confidential, York County, PA - Designed and conducted seismic refraction survey to identify bedrock and weathered rock configurations in the vicinity of a landfill expansion. This is near NPL site 776. (88099)

Client Confidential, Harrisburg, PA - Investigated potential contaminant plume, emanating from this research facility using EM methods. (92443)

Client Confidential, Williamstown, PA - Defined bedrock topography, to investigate contaminate plume using EM, and seismic refraction methods. (86024)

Client Confidential, Brodbecks, PA - Delineated contaminant plumes using EM methods. (86140)

Confidential Client, Carlisle, PA - Conducted seismic survey to identify bedrock configuration to assist in monitoring well design efforts. (87001)

Confidential Client, Glen Rock, PA - Conducted seismic survey to identify bedrock configuration to assist in defining contaminant migration pathways and monitoring well design efforts. This is NPL site 525. (8486)

Client Confidential, Windsor Township, PA - An EM survey was conducted to identify the existence and limits of a landfill identified during a pre-acquisition survey.

Client Confidential, Exeter Township, PA - Investigated and mapped the extent of sodium chloride distribution in the subsurface emanating from a former salt storage pile, affecting nearby residential wells. (89096)

CONRAIL, Reading, PA - Investigated soil properties near an underground fire in order to evaluate drilling safety utilizing seismic refraction. (86116)

Combe Fill South, Morris County, NJ - Interpreted magnetometer and terrain conductivity data to track contamination plumes and to locate buried drums. This is NPL site 315. (8455)

Cumberland County Landfill, Cumberland, PA - Conducted EM investigation to delineate hazardous material migration from storage facility. (88121)

Derck & Edson, Campbelltown, PA - Directed EM survey for subsurface characterization inventory through geophysical methods prior to property design and construction. (90199)

Department of Energy, Savanna River GA - Senior geophysicist developed work plan, provided technical guidance for staff geophysicists collecting GPR and EM-61 data to delineate multiple landfill areas. Processed GPR data.

Department of Energy, Nevada Test Site, Mercury, NV- Senior geophysicist, In Area 25, Reactor Maintenance Assembly and Disassembly Area (RMAD) provided guidance to staff geophysicists collecting EM-31, EM-61, magnetic gradiometer, and ground penetrating radar data for the delineation of landfill areas. Data was collected and integrated with global positioning system (GPS) information to gather position information. Provided integrated data interpretation and prepared reports. Conducted an electrical imaging (EI) survey to further delineate landfill areas and better characterize waste areas. Work included data collection, interpretation and reporting, along with recommendations for future sampling and testing activities.

Department of Energy, Nevada Test Site, Mercury, NV - Senior geophysicist, In Area 25, Engine Maintenance Assembly and Disassembly Area (EMAD) provided guidance to staff geophysicists collecting EM-31, EM-61, magnetic gradiometer, and ground penetrating radar data for the delineation of landfill areas. Data was collected and integrated with global positioning system (GPS) information to gather position information. Provided data interpretation and report preparation.

Department of Energy, Tonapah Test Range, Tonapah, NV - Senior geophysicist, At the Roller Coaster area, provided guidance to staff geophysicists collecting EM-31, EM-61 and ground penetrating radar data for the delineation of decontamination pads and waste disposal areas used during nuclear testing. Multiple GPR antennas were evaluated for use at in the area on other investigations occurring concurrently. Provided data field and final data interpretation, preliminary reporting from the site and final report preparation.

Department of Energy, Tonapah Test Range, Tonapah, NV - Sr. Geophysicist, At the Double Tracks area, developed work plan for geophysical data collection, provided guidance to staff geophysicists collecting EM-31, EM-61, and ground penetrating radar data for the delineation of potential waste disposal areas used during nuclear testing. Data was collected and integrated with global positioning system (GPS) information to gather position information. Provided field and final data interpretation preliminary reporting from the site and final report preparation.

Department of Energy, Tonapah Test Range, Tonapah, NV - Sr. Geophysicist, At five different sites, the presence of buried war heads containing depleted uranium and possible explosive materials was investigated. Provided guidance to staff geophysicists collecting EM-31, EM-61 and magnetic

gradiometer data for the location of the features of concern. Data was collected and integrated with global positioning system (GPS) information to gather position information. Provided field and final data interpretation preliminary reporting from the site and final report preparation and presentation.

Dickinson College, Carlisle, PA - Designed, implemented, interpreted, and reported an electromagnetic terrain conductivity survey in order to evaluate the potential for sinkhole development associated with library expansion. (92128)

Getty Oil, Bellefonte, DE - Project manager for collection, interpretation and reporting of EM-31 and electrical imaging data for the delineation of gneiss bedrock fractures prior to the installation of monitoring wells.

Goodkind & O'Dea, West Manchester Township, PA - Project scientist for the caliper logging and reporting of a 1,000 foot deep water supply well.

Howard R. Greene, Iowa City, IA - Directed the design, acquisition, interpretation, and reporting of regional gravity, resistivity sounding, and seismic refraction data over a 50-square-mile area for a buried aquifer groundwater acquisition project. (91499)

H. R. Green, Waverly, IA - Senior geophysicist provided quality control and quality assurance, review of final report on electrical imaging of air photograph interpreted fractures and lineaments prior to release to client.

Elkton Sparkler, Elkton, MD - Designed and interpreted EM investigation to delineate magnesium contamination level determination and delineation in the subsurface. (88186)

Ephrata Borough, Ephrata, PA - Located geologic contact with EM techniques and vertical EM soundings to define subsurface conditions for municipal supply well, EM. (8514)

Geomechanics Corporation, Carlisle, PA - Designed and oversaw the implementation of an EM geophysical investigation prior to the construction of a shopping mall. Performed detailed geotechnical boring integration with geophysical data for a site geotechnical evaluation. (90089)

Grove North America, Shady Grove, PA - Collected and reduced 1,875 feet of electrical imaging data tracing a geologic fault thought to be controlling contaminant migration. Activities included field collection of data, processing, interpretation, and presentation to client.

Harley-Davidson, York, PA - Located abandoned drum areas on industrial site, using EM techniques. (88087)

H. B. Mellott Estates, Beaver Creek, MD - Designed geophysical survey methods to gauge mining impact on local water source near a trout hatchery. (622)

Heleva Landfill, Egypt, PA - Reviewed results of geophysical investigation of contaminant plume and underground mine locations using seismic refraction, reflection, EM, and resistivity. This is NPL site 199. (8563)

Hershey Chocolate, Hershey, PA - Landfill delineation and subsurface characterization prior to site development using EM techniques. (89275)

Kaw Nation, Kaw City, OK - Provided classroom and field training for "Introduction to Geophysical Techniques" class. Field training included the establishment of site grids, collection of EM-31, magnetic gradiometer and GPR data for the identification of grave sites and cemetery mapping of 15 and 5 acre parcels. Provided technical review, quality control and quality assurance on final investigation report.

Lancaster Area Refuse Authority, Lancaster County, PA - Investigated sinkhole possibilities, bedrock topography, and competence utilizing EM and seismic refraction. (89193)

Lancaster County Solid Waste Management Authority, Frey Farm Landfill, Lancaster, PA - Designed, conducted, and reported EM and seismic investigations to characterize site setting of a new landfill in the area adjacent to the Susquehanna River. (89037)

Lebanon County Landfill, Lebanon, PA - Assisted in the collection and reduction of GPR, EM-31, EM-34, EM-61 and Electrical Imaging data for a feasibility evaluation of geophysical methods to determine the bottom of old landfilled areas. Peer reviewed final production report which included EM-31, EM-61 electrical imaging and cone penetrometer verification data.

McGregor Printing, Westminster, MD - Investigated sinkhole possibilities prior to site development in marble using EM techniques. (87068)

Medford Quarry, Carroll County, MD - Reviewed and commented upon a geophysical investigation for quarry expansion. Undertook geophysical survey to define sinkhole hazards associated with a proposed new road location using EM methods. (88056)

Middletown Borough, Middletown, PA - Located fracture traces to site municipal supply well using EM techniques. (86234)

Mobile Oil Corporation, Paulsboro Refinery, Paulsboro, NJ - EM, metal detector and ground-penetrating radar methods were used to investigate and delineate potential buried metal storage drums. (90225)

Mylin Messic, Mount Joy, PA - Located underground pipelines using EM techniques prior to land development project. (87055)

Olivetti Corporation, Harrisburg, PA - Use of a variety geophysical techniques to locate underground storage tanks and lines for soil sampling prior to site closure (92519)

Pennoni Associates/National Park Service, Philadelphia, PA - Managed utility mapping services to define electric, water, sewer, natural gas, and telephone lines present at seven roadway crossings prior to boring under the roadways to put in an air-conditioning system among historic buildings Multiple geophysical techniques were used including inductive and conductive line locating, metal detection, and ground penetrating radar. Final report included the mapping of utilities, and a discussion of the techniques utilized (97412).

Pennoni Associates/Navy Ships Parts Control Center, Mechanicsburg, PA - Collected and interpreted 1220 feet of electrical imaging data along a proposed utility line excavation in order to determine the top of bedrock. The data was collected in the center of a main road. Also collected and interpreted seismic refraction data to determine the rippability of the bedrock for classification prior to bidding. A final

report was prepared that integrated the results of a utility investigation undertaken by other employees that included the use of inductive and conductive line locating, metal detection, and ground penetrating radar.

Pennsylvania Auditor General's Office, Harrisburg, PA - Designed, interpreted, and reported an electromagnetic field survey in the Auditor General daycare center area. (91250)

Pennsylvania Department of Environmental Protection (DEP), Erie, PA - Designed, implemented, interpreted, and reported geophysical investigation to determine the presence of buried drums in preparation for litigation and enforcement actions by the DEP. (92083)

Pennsylvania State Educators Retirement System, Third Street, Harrisburg, PA - Senior geophysicist developed work plan and provided technical guidance for staff geophysicists collecting GPR data in support of a geotechnical investigation into building subsidence. Work performed, included geophysical data reduction and reporting.

Pennsylvania Industrial Development Authority, Milton, PA - Conducted an EM survey to assist in defining the geologic setting and contaminant migration pathways as part of a fuel oil spill investigation and remediation program. (87084)

Pennsylvania Department of General Services/Camp Hill Prison, Camp Hill, PA - Provided quality assurance and quality control and report review for this subsurface utility investigation prior to construction (97159).

Pennsylvania State University, University Park, PA - Supervised a ground-penetrating radar (GPR) survey and conducted a confirmation EM survey to identify potential sinkhole areas within the existing airport facility and areas considered for expansion. (88236)

Pennsylvania State University, University Park, PA - Designed, conducted, and reported EM and soil vapor survey to delineate the extent of a former landfill. (88042)

Pennsylvania State University, Blue Golf Course, State College, PA - Conducted EM survey to characterize the geology for sinkhole identification in the vicinity of a former irrigation pond. (89082)

Pfaltzgraff, Lancaster, PA - Conducted an EM survey to characterize the soils in an area planned for waste deposition. (8216)

Real Estate Development Supply Well, Carroll County, MD - Conducted an EM survey for the purpose of confirming air photograph analysis interpretation for the location of water supply wells. (88264)

Reese, Lawler, Patrick and Scott, Lancaster County, PA - Designed an EM and seismic refraction survey to evaluate the potential for sinkhole development prior to the development of a 0.3-acre parcel. Directed data collection efforts and participated in data interpretation and reporting. (92111)

Rettew Associates, Triad Development, Lititz, PA - Designed and interpreted EM investigation for subsurface characterization prior to subdivision. (89321)

R. E. Wright Environmental, Inc., Middletown, PA - Conducted a seismic refraction survey to determine rippability versus blast requirements for building expansion. (86106)

Star Enterprise Henry Avenue Philadelphia, PA - Project scientist for the collection, interpretation and reporting of GPR data to identify and locate subsurface utilities prior to installation of monitoring wells.

Star Enterprise Plymouth Meeting, PA - Project scientist for the collection, interpretation and reporting of GPR data to locate subsurface utilities prior to installation of monitoring wells.

Statler-Brehm, Carlisle, PA - Designed and interpreted an EM survey for subsurface characterization prior to site development, including top of rock and landfill delineation. (90180)

Sharkey Farm Landfill, Morris County, NJ - Interpreted electromagnetic data to identify the extent of contamination plumes. This is NPL site 277. (85129)

Union Bridge Development, Union Bridge, MD - 70-acre site for industrial and residential development - Used EM survey to characterize the overall site and identify sinkhole-prone areas for the purpose of land planning for development of the site. (89026)

Upper Saucon Township, PA - Senior geophysicist Provided review and comment to the township planning commission on a very low frequency (VLF) geophysical survey conducted for the evaluation of sinkholes in an area proposed for development.

U.S. Air Force, Kelly Air Force Base, San Antonio, TX - Senior geophysicist, collected, interpreted and reported electrical imaging data associated with multiple groundwater investigations where contaminant migration was controlled by stratigraphic variations in the subsurface.
U.S. Air Force, Kelly Air Force Base, San Antonio, TX - Reviewed seismic reflection reports prepared by others to determine the effectiveness and technical accuracy of the field methods, data processing, and interpretation applied to this site. It was determined that the approach being utilized would result in misleading results if applied as proposed. The technical accuracy of the approach was called into question (97432).

U.S. Air Force, Kelly Air Force Base, San Antonio TX - Senior geophysicist collected, interpreted, and reported GPR data at a former building location.

U.S. Navy, Keflavik, Iceland - As part of a Preliminary assessment and Site Investigation (PASI) designed, conducted, and reported over 20 miles of EM surveying across nine separate sites to identify landfill edges and contaminant source areas and possible contaminant plumes. Coordinated investigation activities to detail soil vapor investigation areas. Undertook initial soil sampling of identified areas of concern. (97040)

United States Postal Service, Milroy, PA - Collected and reduced 1,050 feet of electrical imaging data investigating the geological setting controlling site hydrogeology and contaminant migration. Data were processed, cross-section produced, interpreted, and reported. The results of the investigation provided guidance into the placement of additional groundwater monitoring and recovery wells.

Vermont Savings, Westminster, MD - Undertook the design, implementation, interpretation, and reporting of geophysical investigation to determine the presence of underground storage tanks. (M91531)

Western Maryland College, Westminster, MD - Used EM survey to identify the location of geologic contact proximal to a planned storm water management pond. (90015)

Westminster City Salt Contamination, Westminster, MD - Conducted EM survey to identify and map the distribution of a sodium and chloride plume emanating from a historical sale pile storage area, adversely affecting a municipal water supply well. (92633)

RCRA Investigations

A variety of miscellaneous projects have been undertaken that are driven by RCRA regulations and are not described elsewhere. Additional projects do not lend themselves to the topics presented elsewhere but represent miscellaneous projects. These projects have required a variety of technical and administrative duties each of which are described within the project.

Armstrong World Industries, Lancaster, PA - Directed annual site-wide groundwater sampling and analysis to evaluate the current status of volatile organic compound impacts to the subsurface. Evaluated the effectiveness of current remedial activities. Successfully initiated discussions with the DEP to reduce the number of required onsite monitoring wells in light of Pennsylvania's Brownfields regulations (90009, 97557)

ALCOA, Lancaster PA - Directed the collection and reporting of samples for NPDES compliance, and the operation and maintenance of a groundwater remediation system. (89100)

Air Products & Chemicals, Mitchell Avenue, Allentown, PA - Project director for the compilation and reporting of site characterization and environmental history data collected over the preceding 10-year period. The impacted groundwater impacted three different properties, requiring comprehensive evaluation and mitigation approaches. Developed a strategy to identify and mitigate potential groundwater receptor impacts. Oversaw detailed toxicological investigation into PCE and TCE impacts to a spring and trout being raised for consumption. Evaluated diffuse and conduit groundwater flow to a nearby stream and determined impacts would be below ambient water quality criteria. Attended and/or conducted numerous public meetings. Interfaced with State and City regulatory personnel. Devised air sparging and vacuum extraction testing that permitted significant volatile organic contaminant reduction in the source area. Currently undertaking remedial system evaluation, design, operation and maintenance of testing system, and regional groundwater quality monitoring.

Barley Snyder Senft & Cohen, York College of Pennsylvania, York PA - Evaluated the environmental impacts associated with a variety of chemicals that were identified by a property owner and provided to the college, who was interested in acquiring the former industrial property. The chemicals were evaluated with respect to the current Brownfields rules in effect at the time of evaluation, and various options were provided to the College Board of Directors. The College has purchased a portion of the property, and is continuing to evaluate the environmental aspects of the remaining property.

Bonney Forge, Huntington, PA - Oversaw the interpretation and reporting of soil sampling and groundwater collection. (89121)

Bonney Forge, Allentown, PA - Directed the installation of groundwater monitoring wells, soil sampling, and reporting of all activities. (90374)

Brush Wellman, Shoemakersville, PA - Directed regional hydrologic evaluation associated with a surface water impact allegedly related to facility discharge. Work activities supervised included a stream base flow study, installation of well points, groundwater discharge monitoring from facility treatment plant, groundwater monitoring well sampling and reporting, and hydrologic assessments associated with individual wells. (8343)

Butler Mine Tunnel, Pittston, PA - Determined precipitation frequencies and analyzed static water levels to complete a water budget study and reduced and analyzed chemical data to delineate contaminant migration. This is NPL site 208. (85149)

Confidential Client, York County, PA - Supervised the drilling and construction of a monitoring well and performed a pumping test. This is an NPL site. (86142)

CONRAIL, Philadelphia, PA - Conducted a frequency analysis and report of precipitation in regard to a landslide. (8475)

Department of Energy Paducah, KY - Provided project management oversight and assistance. The project involved a geophysical investigation of former radioactive landfill areas, and subsequent subcontracted drilling to confirm the geophysical finding (97194).

Heleva Landfill, Egypt, PA - Conducted hydrologic modeling to predict effects of long-term pumping. This is NPL site 199. (8563)

International Mill Service/Patton, Westmoreland County, PA - Oversaw and provided final approval for a mine drainage plan/mine permit prepared by SAIC staff. (91401)

Joppa Sand and Gravel Landfill, Harford County, MD - Collected soil and water samples for laboratory analysis for complete EPA priority pollutants. (85102)

Keystone Landfill, Hanover, PA - Consultation and on-site pumping test and sampling oversight of Superfund investigation, on behalf of the PRP group. This is NPL site 795. (89209)

Lancaster Battery PRP Group, Lancaster, PA - In accordance with a CERCLA section 106 order, directed soil sampling to delineate the horizontal and vertical extent of the contamination, managed a remediation feasibility evaluation, directed the development of field screening techniques using X-ray fluorescence, the final excavation and removal of lead-bearing soils and site restoration. Directed the investigation of impacted building structures (sumps and drains) as well as their remediation. (91541)

Lockheed Martin, Cherry Hill, NJ - Developed remedial action plan to excavate soils impacted by a No. 6 Fuel Oil release that was acceptable to the New Jersey Department of Environmental Protection. Provided plan implementation oversight of contractor hired by Lockheed Martin to de-water, excavate, transport and dispose of the soils. Performed quality assurance sampling and final report review. Collected soil samples and directed additional remediation of polychlorinated biphenyls (PCBs) near a former transformer, and a small landfill located onsite to the satisfaction of the property purchaser. (97206)

Lear Corporation, Masland Division, Carlisle, PA - Directed the regional hydrogeologic assessment regarding a chromium solution loss associated with a production line. Work activities included regional hydrogeology, dye testing, and regulatory negotiation. (92571)

Lear Corporation, Masland Division, Carlisle, PA - Directed the investigation into a hazardous materials release. Negotiated with regulatory agencies on the potential impacts, and provided incident closure documentation.

Lear Corporation, Masland Division, Lewistown, PA - Directed the evaluation of aquifer-use criteria under the Pennsylvania land recycling act. Petitioned the DEP for a ruling on the aquifer-use issue. Currently compiling historical information to submit a comprehensive site characterization document to the DEP for acceptance of the property into the Brownfields program for release of liability.

Lear Corporation, Masland Division, Lewistown, PA - Directed the design, installation, and reporting of groundwater and soil monitoring wells, remediation system feasibility evaluation, design, and installation. (90388)

Lear Corporation, Masland Division, Lewistown, PA - Directed the preparation, submittal, approval, and subsequent regulatory approval of storm water management plans. (91462)

Murry's Steaks, PA, MD - Directed SAIC audit activities associated with primary packaging and warehouse facilities of the organization. (93493)

New Jersey Zinc, Palmerton, PA - Using tax maps of multiple counties, identified landowners in preparation for a RCRA sampling program. This is NPL site 368. (8520)

New York Wire, York, PA - Directed services at multiple sites regarding air emissions testing and evaluation regarding DEP orders, underground storage tank site characterization, property transfer evaluations, and geotechnical services. (94286)

New York Wire, York, PA - Managed groundwater sampling of monitoring wells for chlorinated volatile organic compounds, and reporting These wells were located around former lagoons adjacent to facility as part of closure requirements. (94260)

Pennsylvania Industrial Development Authority/Bartolini Facility, West Wyoming, PA - Managed the investigation and development of bidding specifications and documents to address asbestos contamination at this fire damaged property. R. E. Wright originally conducted a Phase I environmental site assessment on this facility in 1992. PIDA made a decision to leave the asbestos-containing materials (ACM's) in place for future property owners. In 1996 fire damaged a portion of the facility, and it was decided to demolish the entire structure. An asbestos building inspection was directed, bid specifications developed for the removal of ACM's, including the oversight and reporting of removal activities by licensed personnel from within the company.

R. R. Donnelley/East Plant, Lancaster, PA - Directed the site characterization associated with reported solvent loss at aboveground storage tank handling area. Activities included soil vapor survey, soil sampling, groundwater monitoring well installation, water sampling, and report preparation. (93317)

Ruben Steel, Lancaster, PA - Directed soil sampling, interpretation, and reporting associated with polychlorinated biphenyl (PCB) spill under order of the DEP. Directed impacted soil removal and appropriate disposal. (91169)

Shindler Elevator, Gettysburg, PA - Directed preliminary compliance audit of the facility and comprehensive reporting. (92529)

Specialty Screw, Lancaster, PA - Project director for the assimilation and evaluation of seventeen years of soil and groundwater environmental data. Provided strategy options for seeking liability relief under the Pennsylvania Land Recycling Act (ACT 2).

Trimet Chemical Company, Allentown, PA - Directed the initial stages of a preliminary compliance audit at the chemical plant facility. (94050)

Tredegar Industries, Coledale, PA - Directed the development of a spill preparedness, prevention contingency plan. (94112)

Tredegar Industries/Capitol Products Facility, Mechanicsburg, PA - Reviewed initial site evaluation activities undertaken by others. Developed multidisciplinary approach for further site characterization and remediation to convert the former manufacturing property into saleable retail property. Work activities included direction of asbestos inspection, abatement design, and abatement activities; geophysical investigation in order to establish the location of underground storage tanks, buried pipelines, and other subsurface features. Oversaw the excavation of chromium-contaminated soils for off-site disposal, removal of chromium-impregnated flooring materials and disposal as hazardous waste, excavation and bio-remediation of 12,000 cubic yards of solvent- and hydrocarbon-bearing soils. Directed aquifer tests to determine aquifer segments and off-site responsibilities for contamination present. Directed periodic groundwater sampling, monitoring well installation, and groundwater feasibility evaluations. Responsible for all project reporting activities and negotiation with regulatory agencies and prospective purchasers on behalf of property owner. (92658)

United States Army Corp of Engineers, York, PA - Directed the screening, sampling, and disposal of a drum of unknown materials, which appeared at Corp facilities. (92445)

United States Army Corp of Engineers/Fort Indiantown Gap, Annville, PA - Preliminary assessment and site investigation associated with DEH scrap yard. Directed historical information review and the identification of likely source areas. Directed soil sampling, surface water sampling, installation of groundwater monitoring wells, and groundwater sampling, information interpretation and reporting. (94367)

Wimpey Minerals, Hanover, PA - Directed the development of a spill preparedness and prevention plan associated with one-million-gallon aboveground fuel oil tank. (93046)

Wimpey Minerals, Annville, PA - Directed the preparation and submittal for regulatory approval of an air discharge permit associated with crusher operations. (92404)

Due Diligence Services

As group manager for environmental site assessments, general responsibility is maintained for marketing, pricing, contracts, proposals, performance protocols, protocol compliance audits, final report review, and personnel assignments. Direct involvement with Phase II and remedial design, implementation, interpretation, and reporting. Responsible for all regulatory negotiation. As group manager, have directly supervised between 300 and 400 Phase I environmental site assessments. The following highlight some that are applicable.

Cambria and Indiana Railroad, Cambria County, PA - Directed an environmental site assessment prior to divestiture of a 300-acre railyard and 23 linear miles of track in separate land parcels. (94139)

Central Dauphin School District, Rutherford Elementary School, Rutherford, PA - Directed Phase I assessment of property adjacent to the school prior to acquisition by the School District.

City of Lancaster, Lancaster, PA - Directed the review of provided environmental data associated with pre-acquisition evaluation of the Dillerville Yard. Designed and directed the collection of additional soil and groundwater samples and the installation of groundwater wells. (91236)

CSX/Cumberland, Cumberland, MD - Oversaw Phase I environmental site assessment activities prior to divestiture of this railyard. (91074)

Conrail/Rutherford, Rutherford, PA - Directed the cleanup of several problems identified during a Phase I assessment. Activities included hydrocarbon contaminated soil collection, drum sampling and disposal, and waste pile consolidation and disposal. (92225)

Dauphin Deposit Bank, Various locations throughout PA - Directed the evaluation of numerous properties prior to problem loan workout or loan foreclosure, financing, or refinancing throughout this bank's service area. (Various project numbers)

Dauphin Deposit Bank, Harrisburg, PA - Provided classroom instruction to new lenders and small business lenders regarding phase I environmental site assessments, the process, regulations, and what to look for in a good report. The instruction involved practice reviews of sample projects. (97095).

Dickinson College, Carlisle, PA - Directed a Phase I environmental site assessment on behalf of the College prior to the acquisition of property. Directed asbestos building inspection, abatement planning, and abatement monitoring on behalf of the building seller. (94208)

EnviroPower (Chemical Leaman Trucking Co.), Numerous U.S. Sites - Directed teams of assessors and auditors in an evaluation of 33 different truck storage/maintenance/washing facilities prior to acquisition of this company by Chemical Leaman Trucking. Developed the protocols used by investigation teams, coordinated schedules, reviewed reports for consistency and regulatory accuracy. Prepared an executive summary of all sites and prioritized the environmental sensitivity for management evaluation prior to purchase. (97118)

Feather and Feather, Lebanon, PA - Directed Phase I environmental assessment and subsequent soil vapor, soil sampling, groundwater monitoring well installation, groundwater sampling, and reporting activities associated with historic property use. (93319)

Graystone Group, Myerstown, PA - Directed Phase I environmental site assessment as well as subsequent soil and groundwater sampling in association with a National Priority List site adjacent to this parcel. Contaminants of concern included arsenic. (93446)

Harrisburg International Airport, Middletown, PA - Directed multiple Phase I environmental site assessment activities prior to property development of this NPL site (last ranking 656). Further directed soils sampling, and industrial hygiene services during additional remedial investigation. (Multiple Project Numbers)

Industrial Engraving, Allentown, PA - Directed initial Phase I environmental site assessment activities prior to divestiture of property. Further directed sampling of soils beneath the facility in order to measure environmental impact associated with historic operations. (92639)

Legg Mason Real Estate Advisors/Public School Employees Retirement System, Multiple locations, PA - Directed environmental and engineering reviews of properties to be financed by Public School Employees Retirement System at multiple locations throughout the Commonwealth of Pennsylvania. (Multiple Project Numbers)

Mellon Bank, Various Locations throughout PA - Direction of numerous environmental site assessments in support of Mellon's lending activities. (Various project numbers)

New York Wire, York, PA - Oversaw Phase I and Phase II environmental site assessment activities associated with pre-acquisition evaluation of the former manufacturing facility. (90349)

New York Wire, York, PA - Directed Phase I environmental site assessment activities at the current facility. Defined numerous conclusions and recommendations and have overseen the implementation of the early stages of additional work including installation of groundwater monitoring wells. Directed air permitting at this facility. (94156)

New York Wire, York, PA - Directed Phase I environmental site assessment prior to consideration of the property acquisition. Developed detailed sampling programs to evaluate environmental impacts. Directed air-permitting services at this facility. (94260)

Norfolk Southern/Rutherford Yard, Rutherford, PA - Designed and directed a Phase I and Phase II environmental assessment of a rail yard prior to leasing. Phase II activities included soil sampling, groundwater monitoring well installation, sampling collection and analysis, and comprehensive reporting. (92061)

Pennsylvania Industrial Development Authority/Kogen Building, Harrisburg, PA - Reviewed environmental site assessment reports by others and advised the Pennsylvania Industrial Development Authority Board of potential environmental problems associated with the facility and those additional investigation actions which may be appropriate. (92586)

Pennsylvania Industrial Development Authority/Bartolini, West Wyoming, PA - Directed environmental site assessment activities on behalf of the Pennsylvania Industrial Development Authority following their receipt of this property. Undertook Phase II assessment activities including residual waste sampling, drum screening and disposal, underground storage tank removal, and hydrocarbon site characterization activities including the installation of groundwater monitoring well points. (92535)

Pennsylvania Industrial Development Authority/Cooper Industries, Canonsburg, PA - Reviewed reports to determine environmental exposure for PIDA in providing a loan (87084)

Richmond International Airport, Richmond, VA - Performed environmental site assessments on properties near the runway being considered for acquisition by the airport. (93578)

R. K. Ag Services, NY, PA, MD - Directed environmental site assessment of five sites in three different states over a two-week period. Responsible for final report uniformity and impact evaluation. (91499)

Stallman Leasing Company, York, PA - Reviewed environmental site assessment reports prepared by others. Designed a multi-year site characterization plan and currently is overseeing implementation. Plan includes underground storage tank removal; groundwater monitoring well installation; soil and waste stream sampling; and data interpretation, evaluation, and reporting. (91000)

Turkey Hill Dairies, Conestoga, PA - Conducted five separate environmental site assessments as Turkey Hill Dairies purchased land assets of Turkey Hill Farms over the coarse of several years.

Hydrocarbon Investigation and Remediation

As project manager for hydrocarbon work responsible for proposal preparation and cost estimating, underground storage tank (UST) removal, soil and water sampling, closure reporting, test pit and monitoring well installations and technical of soil and bedrock, descriptions, structural interpretation, contaminant plume mapping, aquifer testing, remedial system design, installation, supervision, start-up, permitting operations and maintenance, regulatory agency discussions, soil remediation, and vapor mitigation.

Agway, York, PA - Rapid response fuel oil spill, guided backhoe subcontractor during soil excavation, sampling, reporting and soil disposal. (90133)

Armstrong World, Lancaster, PA - Supervised the drilling and coring, of five wells using hollow stem auger techniques, sampled 25 wells for contaminants, participated in tank tightness testing, hydrologic analysis of shallow aquifer, start-up of groundwater recovery system. (86083)

British Petroleum, Washington DC - Location of underground storage tank through geophysical methods. Underground storage tank removal guidance, and hydrocarbon-bearing soil disposal. (90090)

British Petroleum, Sinking Springs, PA - Terminal hydrocarbon investigation, Health and Safety consideration consultation. (90011)

Carlos R. Leffler, Inc., Ephrata, PA - Investigated source of gasoline found in public sewer, participated in tank removal, monitoring well installation, soil and groundwater sampling, site geology, reporting. (87065)

Chambersburg School District, Chambersburg, PA - Managed underground storage tank installation and removal review and critique. (89201)

Congolium Corporation, MD - Directed the delineation of hydrocarbon-bearing soil and removal. Site closure report prior to real estate transfer. (89341)

Central Dauphin School District, Middle Paxton Elementary School, Dauphin, PA - Supervised the drilling of recovery well, and conducted hydrologic investigation, groundwater and soil sampling, tank removal. Performed geophysical and geological investigation, residential well abandonment, groundwater withdrawal and treatment, and removal of free phase gasoline from recovery and residential wells. (87042)

City of York/Broad Street Garage, York, PA - Directed the design, installation, sampling, and reporting of groundwater wells to perform a site characterization resulting from a leaking underground storage tank. Negotiated with regulatory agencies and continue to oversee problem monitoring. (92005)

Coastal Remediation, Various sites, PA - Directed the groundwater sampling, analysis, and reporting of gasoline constituents at over 20 service stations within a week, prior to property transfer. (91384)

Dana Corporation, Berwick, PA - 10,000-gallon fuel oil spill. Conducted initial investigation, directed monitoring well construction inside manufacturing plant, designed groundwater collection and free product recovery systems, trained plant personnel in operations and maintenance of systems. (88151)

Exxon, Halifax, PA - Directed a sensitive receptor survey for the bulk terminal facility. Provided data interpretation and final report review. (91337)

Fairfield Graphics, Fairfield, PA - Conducted soil and water sampling and underground storage tank removal guidance. (86180)

Farmer Petroleum, Williamsport, PA - Designed and installed monitoring wells and collected soil and groundwater samples for a site characterization at a gasoline station loss, prepared Discharge investigation corrective action report. (90092)

Gaebler Trucking, Aspers, PA - Designed and oversaw the installation and reporting of monitoring wells, soil, and groundwater sampling and analysis. Directed contaminated soil excavation, negotiated with regulatory body, and performed ex-situ bio-remediation of the soils. (90278)

General Electric, Cherry Hill, NJ - No. 6 fuel oil discharge from underground storage tank. Designed and directed a discharge investigation corrective action evaluation, including hydrogeologic evaluation, sampling plans, and oversaw their implementation. Coordinated design, installation and operation of groundwater and free phase fuel recovery systems. Directed operation and maintenance. (88315)

Interstate Construction, Vorhees, VA - Guided the removal of five underground storage tanks, performed soil sampling, prepared tank closure report. (89076)

ICF/Pennsylvania Underground Storage Tank Indemnification Fund, Various sites in PA - Directed technical staff performing all technical activities associated with review of claims for underground storage tank loss reimbursement on behalf of the Pennsylvania Insurance Department. Activities included the design and development of technical protocols and procedures for claim evaluation; coordination of technical work with claims adjusters, soil and water sampling, and inventory reconciliation. (94144, 95144)

Lancaster County Solid Waste Management Authority, Lancaster County, PA - Developed hydrocarbon soil evaluation criteria for soils being used as during landfill construction. (89348)

Lancaster County Solid Waste Management Authority, Lancaster County, PA - Consultation on the development of a typical DEP Module 1 application for hydrocarbon bearing soil receptions by the landfill. (90006)

Lebanon Family Restaurant, Lebanon, PA - Directed SAIC response activities to gasoline vapors that had resulted in building evacuation. Oversaw the initial hydrogeologic and soils investigation, designed and supervised installation of vapor mitigation system and source determination. (90441)

Lebanon Foundry, Lebanon, PA - Oversaw the investigation of a 10,000-gallon fuel oil spill. Installed monitoring wells, collected soil and water samples; performed hydrogeologic assessment and provided long-term recommendations (88103)

Littlestown Hardware, Littlestown, PA - Directed the design and implementation of a geophysical survey to delineate a major regional fault and the installation and sampling of groundwater wells in response to a hydrocarbon loss at the site. Oversaw feasibility design for remediation, storage tank removal activities, tank removal sampling and reporting and preliminary groundwater remediation design. (91440)

Moses Gulf, York, PA - Directed SAIC personnel overseeing underground storage tank removal documentation. Participated in litigation preparation associated with impact responsibility determination. (90325)

Newcomer Oil, Marietta, PA - Directed the installation of monitoring wells, soil sampling, groundwater sampling, and reporting. (90376)

Norfolk Southern/Pomfret Yard, Westfield, NY - Directed the installation of groundwater monitoring wells, soil and groundwater sampling and reporting in order to determine the impacts associated with former underground storage tanks. (92190)

Pennsylvania Department of Environmental Resources, Hometown, PA - Under an emergency request, designed and oversaw the installation of gasoline vapor mitigation systems in 12 separate residences. The sub-slab residential vapor remediation system developed for this project has become a standard design used on numerous other projects. (91572)

Pennsylvania Department of Environmental Resources, Hometown, PA - Directed SAIC activities under the General Environmental Technical Assistance Contract in delineating hydrocarbon impact through geological and hydrological investigation, soil vapor investigation, monitoring well installation, and sampling, performance and reporting of pumping tests, development of remedial alternative evaluation, and remediation system design and specifications for public bidding. Activities included expert testimony on behalf of DEP at the Pennsylvania Environmental Hearing Board. (92302)

Pennsylvania Department of Environmental Resources, Kennett Square, PA - Under this General Environmental Technical Assistance Contract, undertook the delineation of hydrocarbon impact through soil vapor investigation, soil sampling, monitoring well installation, and groundwater sampling, pumping testing, vacuum extraction testing, and preparation of remedial alternative evaluation. (92544)

Pennsylvania Department of Environmental Resources, Bald Eagle State Park, Howard, PA - Rapid response investigation and remediation for an underground gasoline pipeline leak. Guided the installation of a soil cutoff trench, contaminated soil stockpiling. Directed the hydrogeologic evaluation. (88144)

Pennsylvania State Police Academy, Hershey, PA - Rapid response fuel oil spill. Performed geological reconnaissance, and designed site investigation. Managed the installation and sampling of groundwater monitoring wells, and designed the storm water system gasoline loss recovery system. (90187)

Perry Petroleum, Conyngham, PA - Performing oversight and guidance for underground storage tank removal, soil and water sampling and reporting. (88297)

Perry Petroleum, Carlisle, PA - Managed underground storage tank removal supervision, soil sampling and evaluation closure report. (90127)

Perry Petroleum/Project Scientist, York, PA - Underground storage tank removal supervision, sampling, evaluation and closure report. (90150)

Petroleum Heat and Power Equipment, Various Locations - Directed investigations and remediation activities at numerous sites in Pennsylvania, Maryland, Virginia, Washington D.C., and New Jersey. Activities included initial investigations related to fuel oil releases at bulk facilities or residential customer homes. Remediations implemented include excavation and bioremediation. Provided regulatory negotiations and closeout documentation in all states where services were provided.

Pheasant Hill Estates, Harrisburg, PA - Designed and reported site investigation activities responding to reported soil contamination associated with a removed underground storage tank. Work included identifying the regional hydrologic setting; monitoring well placement and design, and pumping test supervision with treatment of effluent. Oversaw design and installation of remediation system and regulatory closure. (90286)

Phoenix Petroleum, Mechanicsburg, PA - Rapid response, fuel oil spill into a storm-drainage line with the collection of fuel oil, water and contaminated sediments, contaminated solid and fluid disposal coordination. (90098)

PPG Industries, Gurnee, IL - Directed the excavation and removal of eight underground storage tanks and the restoration of the excavations at this chemical manufacturing facility. Seven of the UST's were located in a tank battery adjacent to an active railroad siding serving the facility. UST contents included alcohol, fuel oil and solvents. Project activities included coordination of environmental activities with site personnel, pre-removal inspection of the UST's soil sampling and UST closure reporting.

Quaker Oats, Lancaster, PA - Directed the investigation of elevator hydraulic fluid loss inside the building. Investigation included project sampling, monitoring well installation, groundwater sampling, and reporting. (94277)

R. R. Donnelley/West Plant, Lancaster, PA - Designed and directed a site characterization associated with reported underground storage tank losses, including the evaluation of regional hydrogeology, monitoring well installation, sampling and regulatory reporting. (93086)

R. R. Donnelley/West Plant, Lancaster, PA - Report review and quality control/quality assurance (QA/QC) underground storage tank removal. (90163)

Ralph Rode, Mechanicsburg, PA - Conducted an investigation and performed the remediation of gasoline vapors in basement of a private residence. (96226)

Red Rose Transit Authority, Lancaster, PA - Performed underground storage tank release investigation including soil vapor survey and soil sampling. Subsequently directed rapid response to a separate release, including the design and implementation of soil and groundwater remediation, and DEP negotiation. (89214)

Remediation, Inc., Mt. Holly, PA - Guided underground storage tank removal, soil sampling, and regulatory closure reporting. (89305)

Reese Metals, Lancaster County, PA - Directed a Phase I environmental site assessment of the property. Oversaw the removal of underground storage tanks and the sampling of existing wells and adjacent stream. Directed Geoprobe® delineation of hydrocarbon impacts associated with underground storage tanks and gained the first state regulatory acceptance of this method for a site characterization associated with underground storage tank releases. (93003)

Roadway, Elmira, NY - Directed the reinterpretation of hydrogeologic data collected by others, and critiqued the proposed remedial system. Oversaw the installation and sampling of additional groundwater monitoring wells by other employees, and identified an uncontaminated deep aquifer. Directed the excavation and ex-situ bio-remediation of impacted soils resulting in the remediation of the shallow aquifer. (91210)

Roadway, Irving, TX - Directed the installation of groundwater monitoring wells, soil and groundwater sampling, and site characterization reporting related to an underground storage tank release. (92088)

Service Oil Company, Harrisburg, PA - Consultation on underground storage tank guidelines relative to tank installation in the flood plain. (90129)

Star Enterprise, Ambler, PA - Pre-acquisition environmental assessment of a gasoline station. Designed and supervised the installation of wells, the sampling of site soils and groundwater, interpreted, and reported site characterization activities for a gasoline station acquisition. Developed budget estimates for remedial considerations associated with property transfer. (89206)

Star Enterprise, Mechanicsburg, PA - Designed and oversaw the implementation of the installation and sampling of monitoring wells and reporting of all data for site characterization of bulk terminal facility. (91316)

Star Enterprise, Altoona, PA - Designed and oversaw the monitoring well installation and sampling, water table, and groundwater chemistry mapping. (91314)

Star Enterprise, South Williamsport, PA - Designed and oversaw the installation and sampling of monitoring wells and reporting of groundwater and soil chemistry data. (90184)

Star Enterprise, Coraopolis, PA - Underground storage tank removal guidance. Directed hydrocarbon-bearing soil removal and sampling, performed groundwater sampling. (89354)

Star Enterprise, Hershey, PA - Pre-acquisition environmental site assessments, including monitoring well installation, soil, and groundwater sampling and report preparation. (89322)

Star Enterprise, Philadelphia, PA - Pre-acquisition environmental assessment, including monitoring well installation, soil, and groundwater sampling. (89323)

SICO Company, Gilbertsville, PA - Performed a hydrogeologic analysis, which included mapping local geology, drilling and constructing monitoring wells, groundwater and soil sampling, conducting pumping and free product recovery tests. Oversaw the installation of carbon filters on impacted residential wells, recommended and implemented groundwater remediation, participated in community relations activities and litigation support. Provided remedial system operations and maintenance. (85125)

Sun Pipeline, Abbottstown, PA - Responding to a major petroleum pipeline rupture, activities were directed to ensure the local municipality retained the water supply. Activities included directing the installation of a temporary pipeline with power and pumps in addition to coordination of holding tanks and personnel schedules for water supply deliveries over a nine-month period. (93494)

Southland Corporation, Hummelstown, PA - Managed the installation of groundwater monitoring wells, soil and groundwater sampling, falling head testing, data reduction, and reporting. (90500)

Texaco Refining and Marketing, Inc., Brooklyn Park, MN - Managed the closure and abandonment of monitoring wells, and the termination of monitoring activities for this site. (97077)

Texaco Refining and Marketing, Inc., Bruce, WI - Assumed project responsibility at the conclusion of a remedial design for a shallow aquifer remediation of gasoline contamination at this former bulk storage and distribution facility. Wisconsin Department of Natural Resources (WDNR) ordered Texaco to address minor contaminant levels that were threatening a nearby municipal supply well. Negotiated with WDNR the scope of work required to investigate the deeper aquifer, prepared a work scope for bid, and oversaw the deep aquifer investigation. Oversaw the installation of a three well pump and shallow tray aerator treatment system installation. Deep aquifer work included the verification of an aquitard between the shallow and deep aquifer using municipal well pumping observed in nearby monitoring wells, geophysical well logging of PVC constructed wells, abandonment of several wells and piezometers which compromised the aquitard, and developed a monitoring program for the shallow and deep aquifers. This project is currently in a monitoring/reporting stage (97077/120)

Texaco Refining and Marketing, Inc., Eden Prairie, MN - Prepared requests for bid for proposals, recommended award, managed work implementation and oversaw final report preparation by consultant. Work included conducting a soil vapor survey, installing additional wells, sampling new and existing wells to delineate hydrocarbon contaminant plume emanating form this former gasoline station. Secured access and well permits for drilling on Minnesota Department of Transportation property. Successfully negotiated site closure with Wisconsin Department of Natural Resources. (970140).

Texaco Refining and Marketing, Inc., Paulsboro, NJ - Supervised the drilling of seven wells using continuous split spoon sampling, and mud rotary, sampling. Completed and reported hydrological investigation. (87210)

United Refining Company, York, PA - Investigated a 1,000-gallon gasoline leak, causing explosive-level vapor in an adjacent residence. Designed and supervised the installation of residential vapor mitigation system and performed initial operation and maintenance. Supervised the installation of test pits, soil sampling, performing groundwater well drilling, regional geologic, hydrogeologic work, and groundwater and free phase gasoline recovery system implementation with groundwater depression pumps, air stripping tower, and carbon filtration. (87211)

United Refining Company, Mechanicsburg, PA - Rapid response, hydrocarbon-bearing soil excavation at a leaking underground storage tank. Soil sampling, regional hydrogeology interpretation, oversight of monitoring well installation and groundwater sampling. Regulatory reporting. (88187)

United Refining Company, Mansfield, PA - Rapid gasoline response. Two homes affected with vapors and one groundwater supply well affected with dissolved contaminants. Performed regional hydrological assessment, soil vapor survey, designed and supervised a cutoff trench installation. Installed an Auto-Skimmer® for free phase hydrocarbon recovery as the primary remediation method. (88315)

United Refining Company, Tyrone, PA - Gasoline pipeline leak with gasoline appearing on an adjacent stream. Rapid response. Supervised placement and maintenance of sorbent booms on the stream, soil vapor survey. Designed and supervised cutoff trench installation, soil sampling limited long-term monitoring of stream. Stockpiled contaminated soils for on-site treatment. (88169)

United Refining, Fayetteville, PA - Rapid response to a gasoline spill. Environmental site assessment, including soil vapor survey, to delineate contaminant distribution, and the development of long-term recommendations for site restoration. (88246)

United Refining Company of Pennsylvania, Williamsport, PA - Directed a site characterization following a release at this facility. Five monitoring wells were constructed, soil and groundwater samples collected, and a characterization report submitted to the DEP.

United Parcel Service, Northumberland, PA - Leaky diesel fuel tank impact delineation and remediation; included soil sampling, the installation of monitoring wells, groundwater sampling, and hydrogeologic assessment and reporting. (88145)

United Parcel Service, Harrisburg, PA - QA/QC for Spill Response Plan (90096)

Wesley United Methodist Church, Middletown, PA - Directed the installation of monitoring wells and soil and groundwater sampling and reporting in order to evaluate the impact associated with an underground storage tank release of hydrocarbons. (94274)

Wimpey Minerals, Annville, PA - Undertook a review of a hydrocarbon remediation system installed by others. Recommended aggressive remedial activities and system modification. Directed hydrocarbon-bearing soil excavation and disposal, installation of additional monitoring wells, remediation system modification, and ongoing groundwater monitoring and regulatory reporting. (92070)

Litigation Support

As project manager and group manager, litigation support for projects is a necessary part of some projects. The experience following identifies those projects with a significant litigation component, where the responsibilities included a dominant role in the process.

Pannebaker and Jones, P.C., Elizabethtown, PA - Reviewed all documents associated with environmental investigation and remediation activities in order to support litigation associated with an underground storage tank loss. (94295)

Conrail/Klaperthal Junction, Reading, PA - Managed companies' activities in preparation for Pennsylvania Hearing Board review of a Department of Environmental Resources order. (90042)

Shammah, York, PA - Working with Barley, Snyder, Senft & Cohen, a pre-blast survey was conducted of a residential home. Recognizing the building design (poured reinforced concrete) and the geologic setting (constructed on bedrock along strike with a quarry), testimony was provided to the local zoning hearing board regarding potential effects and impacts from adjacent expansion. (92338)

Stone, Hagerstown, MD - Related to a property transfer, the presence of underground storage tanks were investigated using geophysical methods. Expert testimony was rendered in Washington County Court (Maryland) regarding the presence of underground storage tanks. (94581)

Pennsylvania Department of Environmental Resources, Hometown, PA - As project director for SAIC-rendered services to the DEP under the General Environmental Technical Assistance Contract (GETAC), personnel and procedures utilized were directly supervised. Regional hydrogeologic setting was established, monitoring wells were installed, and groundwater and soil samples were collected. A direct cause and effect relationship was established between hydrocarbon loss at a gasoline station, the presence of gasoline vapors in 16 homes, and the gasoline accumulations on a pond. Expert testimony was provided before the Environmental Hearing Board (EHB) in establishing the relationship. (92302)

New Jersey Department of Environmental Protection, Lakehurst Exxon, Lakehurst, NJ - Managed vacuum extraction and groundwater remediation well and system installation. Construction and remedial equipment installation was supervised to remediate a gasoline loss from a service station. Deposition for third-party litigation was provided regarding remediation activities undertaken. (1556BR)

Service Oil, Harrisburg, PA - Funding for ongoing hydrocarbon accumulation monitoring project by SAIC provided by the insurance company terminated. Deposition was provided describing SAIC activities and observed insurance carrier/insured relationships and historical project management. (711)

Industrial Hygiene Investigations

As group manager responsible for the initiation of Industrial Hygiene/Occupational Safety services at SAIC, a variety of roles was assumed. Personnel recommendations were made regarding staffing levels and personnel, marketing plans and strategies developed, and business plans prepared. The technical approaches were worked out with group staff, and projects initiated. Responsibilities included defining appropriate and inappropriate business areas and types of projects, personnel assignments, and the establishment of corporate protocols for project performance in this area.

Bell Socialization, York, PA - Directed building inspection for asbestos-containing materials and budget preparation for maintenance or abatement. (94150)

Carlisle Tire and Rubber, Carlisle, PA - Directed the collection of air samples at various work stations in order to design air handling systems associated with indoor air quality issues. (92385)

Central Pennsylvania Blood Bank, Hershey, PA - Directed air sampling in response to indoor air quality complaints and developed mitigation plan. (92547)

Kinney Shoe Corporation, Lancaster, PA - Directed asbestos abatement design and abatement activity oversight. (94423)

Lancaster County Vocational Technical School, Lancaster County, PA - Directed asbestos abatement design and abatement oversight activities and reporting. (94683)

Milton Hershey School, Hershey, PA - Directed indoor air quality investigation. (93074)

Milton Hershey School, Hershey, PA - Directed the investigation, evaluation, and reporting of an indoor air quality problem. (93074)

Lancaster Leaf Tobacco, Lancaster, PA - Directed asbestos abatement design and abatement oversight activities. (94459)

Penn Fuel Gas, Allentown, PA - Directed asbestos abatement design and abatement oversight activities. (94577)

Phoenix Contact, Middletown, PA - Directed industrial hygiene evaluation activities in association with evaluating worker exposure. (94148)

Pennsylvania Auditor General, Harrisburg, PA - Directed air-sampling activities in response to indoor air quality complaints. (92232)

R. S. Mowery, Lebanon, PA - Supervised building inspection for asbestos and subsequent asbestos abatement design activities. (94230)

Wright Laboratory Services/Lotto Building, Harrisburg, PA - Designed and directed the field screening and sampling of a building in response to indoor air quality complaints. Worked with laboratory personnel to identify appropriate analytic methods and define problem solutions. (92015)

Geophysical Interpretation - Oil and Gas Exploration

North Celtic Sea Basin

Regional seismic data interpretation.

Development of regional geological and geophysical data base.

West Africa - Offshore Nigeria, Zaire, Cabinda (Angola)

Development and maintenance of geophysical and geological data bases.

Coordination of manpower and computer resource availability among district, regional, and area geologists and geophysicists for interactive interpretation.

Ras Al Kaimah - United Arab Emirates

Creation of 2-D seismic and 3-D seismic data bases.

Interpretation of 2-D and 3-D seismic data for prospect generation.

Offshore California

Interpretation of Tectonic setting of Point Arena area. Interpretation of regional seismic data.

Seismic data processing and Interpretation of seismic data in Santa Barbara Channel area.

Reduction of seismic and well log data to map form in Point Arguello area; integration of sparker and bottom coring data.

Reflection seismic data interpretation in support of planned refraction seismic studies and thermal gradient/hydrocarbon maturation studies.

Gulf of Mexico

Processing seismic data in numerous parts of Gulf of Mexico.

Lithologic research on the effects of amplitude variation with offset in the High Island area of the Gulf of Mexico. This included compressional and shear wave data interpretation.

Two- and three-dimensional modeling, High Island area.

Tuscaloosa Trend - Southern Louisiana

Regional seismic data interpretation.

Delineation of depositional systems in the various parts of the trend by integrating detailed seismic and well log information.

Stratigraphic analysis and inferences of geologic conditions from seismic data.

Integration of detailed gravity and magnetic data.

Investigation of the effects of Raleigh waves on seismic data. Methods of attenuation by processing and acquisition.

The effects of seismic data geophone offset on velocity analysis for very deep target reservoirs.

The effects of over-pressuring at great depth on seismic data.

Additional Areas with Less Significant Oil and Gas Exploration Experience

Central Michigan

Williston Basin - North and South Dakota, Montana

Pearl River Basin - off shore China

Tierra Del Fuego - Argentina

Barrierenhas and Portigual Basins, Brazil

Boqueron Basin, Paraguay

Geophysical Methodology

Research on the cause, effect, and methods of attenuating statics; both very long wavelength static's and high amplitude static's on low fold data.

Research on applications of interactive seismic interpretation systems (ISIS). Debugging of software, using community insights on development.

Work on integrating seismic, well log, well data, gravity, and magnetic databases onto an interactive computer system for interpretation.

Design and debugging of interactive well log interpretation system.

Design and implementation assistance on geophysical and geological data base management systems.

Publications

"Residual Static Program PISCES, an Introduction and Analysis," Gulf Research and Development Technical Memorandum Number 4203TN844, 41P., 1982

"Tuscaloosa Data Acquisition, A Follow Up Study" Gulf Research and Development, Technical Memorandum 4203TP870, 15P., 1983

"The Tuscaloosa Trend, A Guide to Future Exploration" with D. E. Petroy, Gulf Research and Development Technical Memorandum 4000TP105, 55P., 1983

"Seismic Data Amplitude Variations with Offset" with Himsworth, Branzet, Kramer, Yanchak, Gulf Technical Memorandum 4000TR138, 35p., 1984

Continuing Education and Training

National Registry of Environmental Professionals/University of Wisconsin at Madison, Certified Environmental Auditor April, 1996

Rapid Response Leader Training and Incident Command System Awareness February, 1996

Professional Environmental Auditor by National Association of Safety and Health Professionals, May 1993.

Certified Hazards Manager by National Association of Safety and Health Professional, May 1993.

Technical Writing Workshop by Temple University, September 1987.

Application of Ground Conductivity Meters to Groundwater Contamination Mapping administered by Geonics Ltd., May 1987.

Geophysical Engineering Field Training Course given by Bison Instruments, Inc., April 1986.

Introduction to IBM Job Control Languages given by Gulf Oil Corporation, April 1984.

Seismic Facies Analysis given by Geoquest International, Inc., April 1984.

Technical Writing Workshop given by Gulf Oil Corporation, May 1983.

Stratigraphy for Geophysicists by Oil and Gas Consultants International, Inc., March 1982.

Basic Geophysics given by Geoquest International, Inc., June 1981.

Modern Seismic Data Processing given by Geoquest International, Inc., April 1981.

Introduction to Well Log Analysis by the Schlumberger Company, April 1980.

Public Presentations

York County Board of Realtors, "Remediation - What Do I Do When I Find Something," January 30, 1992.

Commonwealth Bank Commercial Lenders "ESA's - What Do We Look For," September 29, 1992.

Pennsylvania Allergy Association "Evaluating Environmental Exposures - Indoor Air Quality," June 27, 1993.

Pennsylvania Rural Water Association "Preliminary Environmental Site Assessments," February 26, 1992.

Adams County Board of Realtors "Phase I Environmental Site Assessments," February 20, 1992.

Fertilized and Pesticide Dealers of Pennsylvania "Environmental Site Assessments," February 5, 1992, February 21, 1991.

Modern Heat Council of Lebanon Valley "Environmental Issues for the Fuel Industry," September 4, 1990.

Public Works Association, Central Pennsylvania Chapter "Aboveground and Underground Storage Tanks - Inspection, Testing, and Removal," April 10, 1990.

Agriculture and Environmental Issues Sponsored by Lancaster County Extension Office "Environmental Liability and Agriculture," November 8, 1990.

Realtors Land Institute, Pennsylvania Chapter #10 "Fuel Tanks - What the Realtor Should Know!," April 6, 1992.

Pennsylvania Aggregate and Concrete Association "New Residual Waste Regulations - What They Mean to You," November 12, 1992.

Geological Society of America, North Central Section "Examples of Karst Features Identification by Geophysical Techniques," April 19, 1991.

Learning Center of Applied Environmental Technology "Environmental Site Assessments for Commercial Realtors and Lenders," August 19, 1993, September 21, 1993.

Pennsylvania Mortgage Bankers Association of Central Pennsylvania "Environmental Issues at a Crossroads," November 10, 1994.

Mason Dixon Chapter of the National Purchasing Managers Association "Environmental Issues of Today," September 12, 1995

Professional Background:

Jan 1997-Present Project Director, Science Applications International, Corporation, Middletown, PA

1995 - Jan 1997 Project Director, R. E. Wright Environmental, Inc., Middletown, PA.

1990 - 1994 Group Manager, R. E. Wright Associates, Inc., Middletown, PA. Responsible for project technical approach, employee productivity and technical standards, client services and contractual relations and marketing.

1988 - 1990 Project Manager, R. E. Wright Associates, Inc., Middletown, PA. Responsible for technical performance, project budget, and technical proposals.

1985 - 1988 Project Geophysicist, R. E. Wright Associates, Inc., Middletown, PA. Responsible for technical implementation of specialty services in the area of geophysics.

1984 - 1985 Senior Geophysicist, Gulf Oil International Exploration and Production Company, Houston, TX. Regional data base development and data interpretation for project development.

1980 - 1984 Geophysicist/Senior Geophysicist, Gulf Research and Development Company, Houston, TX., Harmarville, PA. Responsible for testing and evaluating new technologies for oil and gas exploration. Research included statics reduction, and interactive interpretation schemes and data base systems.

1977 - 1980 Senior Geophysical Analyst, Evergreen Geophysical Associates, Evergreen, CO. Assist in data interpretation, coordinate data flow through various groups within the company, including seismic data interpretation reduction, digitization, and map preparation. Design of data interpretation software to assist in data reduction quality assurance and quality control.

Attachment A

ADDENDUM-1 TO THE SITE SAFETY AND HEALTH PLAN FOR WASTE CONTAINMENT STRUCTURE CHARACTERIZATION WORK PLAN FOR CONTINUED RI ACTIVITIES: GAMMA WALKOVER SURVEY AND GEOPHYSICAL SURVEY

FOR THE

GEOPHYSICAL STUDY OF VICINITY PROPERTY G

NIAGARA FALLS STORAGE SITE LEWISTON, NEW YORK

Prepared for:
U.S. Army Corps of Engineers
Buffalo District

Prepared by:
Science Applications International Corporation
4900 Blazer Parkway
Dublin, Ohio 43017

Contract: DACW49-00-R-0027

July 2001

This document is provided as an amendment to the Niagara Falls Storage Site (NFSS) Lewiston, New York, Site Safety and Health Plan for Waste Containment Structure Characterization and Continued RI Activities: Gamma Walkover Survey and Geophysical Survey to address the health and safety requirements for field activities at Vicinity Property G. Work to be performed at Vicinity Property G includes site clearing and geophysical surveys.

All of the requirements of the original SSHP will apply to this additional work. A copy of the SSHP along with this addendum must be present onsite while performing work.

2.0 HAZARD/RISK ANALYSIS

A Hazard Analysis (Table 1) has been conducted for the geophysical survey being performed at Vicinity Property G.

TABLE 2.2 HAZARDS ANALYSIS

ACTIVITY GEOPHYSICAL SURVEYS **ANALYZED BY/DATE** M. CLOUGH

PRINCIPAL STEPS	POTENTIAL SAFETY AND HEALTH HAZARDS	RECOMMENDED CONTROLS
1. Mobilization and Demobilization to and from the site	General safety hazards	Level D PPE Site-specific training, HAZWOPER 40-hour training, current refresher training. Cardiopulmonary Resuscitation (CPR) and First Aid training for at least 2 on-site personnel. Radworker Trained
	Vehicle accidents	All terrain vehicle operator training (documentation) Speed limit less than 10 mph Refuel in safe area, no open flames and engine off
	Biological hazards (bees, ticks, wasps, poison ivy)	PPE (boots, work clothes, taped pant legs as necessary) Insect repellant as necessary. Self inspection for ticks
	Exposure to chemicals (see Table 2.3)	Level D PPE Medical clearance for HAZWOPER work Wash face and hands prior to taking anything by mouth
	Radiological contamination (See Table 2.3) Internal Exposure External Exposure Skin Contamination	**SEE Radiation Protection Plan in SSHP** PPE (Level D) Medical clearance for HAZWOPER work Minimal contact, radiological frisk, wash face and hands prior to taking anything by mouth. RESRAD Model performed. See Appendix D of SSHP
	Temperature extremes	Administrative controls (see Section 8.0).

TABLE 2.2 HAZARDS ANALYSIS

ACTIVITY GEOPHYSICAL SURVEYS **ANALYZED BY/DATE** M. CLOUGH

PRINCIPAL STEPS	POTENTIAL SAFETY AND HEALTH HAZARDS	RECOMMENDED CONTROLS
2. Walking/and or driving over the site to perform survey.	General safety hazards	Level D PPE Site-specific training, HAZWOPER 40-hour training, current refresher training. Cardiopulmonary Resuscitation (CPR) and First Aid training for at least 2 on-site personnel. Radworker Trained
	Vehicle accidents	All terrain vehicle operator training (documentation) Speed limit less than 10 mph Refuel in safe area, no open flames and engine off
	Biological hazards (bees, ticks, wasps, poison ivy)	PPE (boots, work clothes, taped pant legs as necessary) Insect repellant as necessary. Self inspection for ticks
	Exposure to chemicals (see Table 2.3)	Level D PPE Medical clearance for HAZWOPER work Wash face and hands prior to taking anything by mouth
	Radiological contamination (See Table 2.3) Internal Exposure External Exposure Skin Contamination	**SEE Radiation Protection Plan in SSHP** PPE (Level D) Medical clearance for HAZWOPER work Minimal contact, radiological frisk, wash face and hands prior to taking anything by mouth. RESRAD Model performed. See Appendix D of SSHP
	Temperature extremes	Administrative controls (see Section 8.0).

TABLE 2.2 HAZARDS ANALYSIS

ACTIVITY GEOPHYSICAL SURVEYS **ANALYZED BY/DATE** M. CLOUGH

PRINCIPAL STEPS	POTENTIAL SAFETY AND HEALTH HAZARDS	RECOMMENDED CONTROLS
	Surface surveys near chemical treatment pond	Buddy System. Use of equipment (i.e. carts, buggy) must be operated with care to avoid falling into pond.
3. Use of Ground Penetrating Radar to survey area.	General safety hazards	Level D PPE (**see Radiation Protection Plan**) Site-specific training, HAZWOPER 40-hour training, current refresher training. Cardiopulmonary Resuscitation (CPR) and First Aid training for at least 2 on-site personnel. Radworker Trained Operation per manufacturer's directions Operating manual on site Only experienced operators
	Vehicle accidents	All terrain vehicle operator training (documentation) Speed limit less than 10 mph Refuel in safe area, no open flames and engine off
	Biological hazards (bees, ticks, wasps, poison ivy)	PPE (boots, work clothes, taped pant legs as necessary) Insect repellant as necessary. Self inspection for ticks
	Exposure to chemicals (see Table 2.3)	Level D PPE Medical clearance for HAZWOPER work Wash face and hands prior to taking anything by mouth

TABLE 2.2 HAZARDS ANALYSIS

ACTIVITY GEOPHYSICAL SURVEYS **ANALYZED BY/DATE** M. CLOUGH

PRINCIPAL STEPS	POTENTIAL SAFETY AND HEALTH HAZARDS	RECOMMENDED CONTROLS
	Radiological contamination (See Table 2.3) Internal Exposure External Exposure Skin Contamination	**SEE Radiation Protection Plan** PPE (Level D) Medical clearance for HAZWOPER work Minimal contact, radiological frisk, wash face and hands prior to taking anything by mouth. RESRAD Model performed. See Appendix D in SSHP
	Non-ionizing radiation	Operation of equipment in accordance with manufacturer's recommendations. Only experienced operators
	Temperature extremes	Administrative controls (see Section 8.0).
	Surface surveys near chemical treatment pond	Buddy System. Use of equipment (i.e. carts, buggy) must be operated with care to avoid falling into pond.

EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
Vehicles	Daily Vehicle inspection.	HAZWOPER 40-hour training current refresher training
Geonics EM-31 Terrain Conductivity Meter	Daily Safety Inspections documented on Daily Safety Inspection Form in Appendix A.	Rad Worker Training
Geonics EM-61 Terrain Conductivity Meter		Site-specific Training including site hazard communication training
Ground Penetrating Radar		Cardiopulmonary Resuscitation (CPR) and First Aid training for at least 2 onsite personnel