

Biodegrades (slow). Rapid volatilization. Not expected to bioconcentrate.

13. DISPOSAL CONSIDERATIONS

Disposal of Waste Method:

Waste management priorities (depending on volumes and concentration of waste) are : 1. recycle (reprocess), 2. energy recovery (cement kilns, thermal power generation), 3. incineration, 4. disposal at a licensed waste disposal facility. Do not attempt to combust waste on site. Incinerate at a licensed waste disposal site with approval of environmental authority.

Contaminated Packaging:

Empty containers should be recycled or disposed of through an approved waste management facility.

14. TRANSPORT INFORMATION

DOT (U.S.):

DOT Shipping Name:	Xylenes
Hazard Class:	3
UN/NA Number:	UN1307
DOT Packing Group:	III
DOT Reportable Quantity (lbs):	100
Marine Pollutant:	No.

ICAO/IATA:

IATA Proper Shipping Name:	Xylenes
IATA Hazard Class:	3
UN/NA Number:	UN1307
Packing Group:	III
IATA Label:	Flammable liquid.
Remarks:	No additional remark.

IMDG:

IMDG Proper Shipping Name:	Xylenes
Hazard Class:	3
Packing Group:	III
EMS No.:	3-07
MFAG Table No.:	Not applicable.
Marine Pollutant:	No.
IMDG Flash Point (C):	17 - 23
IMDG Label:	Flammable liquid.
Remarks:	No additional remark.

TDG (Canada):

TDG Proper Shipping Name:	Xylenes
Hazard Class:	3
UN Number:	UN1307
Packing Group:	III
Note:	No additional remark.
Marine Pollutant:	No.

15. REGULATORY INFORMATION

U.S. TSCA Inventory Status:	Listed.
Canadian DSL Inventory Status:	Listed.
Canadian NDSL Inventory Status:	Not Listed.

U.S. Regulatory Rules

Xylene, Mixture Of Isomers 60-100 1330-20-7
CERCLA/SARA - Section 302: Not Listed.
SARA (311, 312) Hazard Class: Listed
CERCLA/SARA - Section 313: Listed

Ethyl Benzene 10-30 100-41-4
CERCLA/SARA - Section 302: Not Listed.
SARA (311, 312) Hazard Class: Listed
CERCLA/SARA - Section 313: Listed

California Proposition 65: Not Listed.

MA Right to Know List: Listed.

New Jersey Right-to-Know List: Listed.

Pennsylvania Right to Know List: Listed.

Canada - WHMIS Classification: B2 FLAMMABLE LIQUIDS
D2A VERY TOXIC MATERIALS
D2B TOXIC MATERIALS



16. OTHER INFORMATION

The following sections have been revised: Nothing has been revised.

Additional Information: This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

Disclaimer: NOTICE TO READER:
Vopak, expressly disclaims all express or implied warranties of merchantability and fitness for a particular purpose, with respect to the product or information provided herein, and shall under no circumstances be liable for incidental or consequential damages.

Do not use ingredient information and/or ingredient percentages in this MSDS as a product specification. For product specification information refer to a Product Specification Sheet and/or a Certificate of Analysis. These can be obtained from your local Vopak Sales Office.

All information appearing herein is based upon data obtained from the manufacturer and/or recognized technical sources. While the information is believed to be accurate, Vopak makes no representations as to its accuracy or sufficiency. Conditions of use are beyond Vopak's control and therefore users are responsible to verify this data under their own operating conditions to determine whether the product is suitable for their particular purposes and they assume all risks of their use, handling, and disposal of the product, or from the publication or use of, or reliance upon, information contained herein. This information relates only to the product designated herein, and does not relate to its use in combination with any other material or in any other process.

*****END OF MSDS*****

APPENDIX C

CERTIFICATION OF HAZARDOUS WASTE TRAINING, MEDICAL SURVEILLANCE, AND FIT TESTING

Summary of Training Qualifications as of 03 August 2007

Employee	Physical ¹	Respirator Fit ²	40 Hour Hazwopper ¹	8 Hour Hazwopper Refresher ²	Hazwopper Supervisor ¹	First Aid ²	CPR ²
Doug Hawn	5/31/2008	5/31/2008	7/14/1989	8/18/2007		08/03/2010	08/03/2007
Jim Madaj	4/30/2008	4/30/2008	1/29/1988	10/30/2007	1/4/1994		
Brian Odom	1/26/2008	1/26/2008	1/7/2000	1/27/2008	1/16/2002	08/03/2010	08/03/2007
Powers, Charles	10/31/2007	10/31/2007	7/13/2003	11/2/2007		10/30/2009	10/30/2007
Ray, Joseph	10/31/2007	10/31/2007	8/16/2004	11/12/2007		10/30/2009	10/30/2007
Ray, Ralph	6/1/2008	6/1/2008	5/19/2000	11/12/2007		10/30/2009	10/30/2007
Jeff Williams	8/29/2007	8/29/2007	4/6/1992	8/22/2007	10/15/2001	7/29/2008	10/30/2007

Note: As noted on the table above, some personnel require physicals, respirator fit tests, or other training in order to be current. All required credentials will be up to date before personnel are allowed on site.

¹Date shown is the date the original training was completed.

²Date shown is the expiration date of the most recently completed training course, physical, or respirator fit test.

Certificate of Completion

Doug Hawn

In Recognition of Having Successfully Completed

HAZWOPER 8 HOUR ANNUAL REFRESHER

On

August 18, 2006

in accordance with

OSHA 29 CFR 1910.120(e)(8)/1926.65(e)(8) HAZWOPER Standard

T.R. Crouse

T.R. Crouse, CSP

KSR-04-3078

CONCENTRA MEDICAL CENTERS

OAK RIDGE, TENNESSEE 37830

MEDICAL SURVEILLANCE CERTIFICATE

George D. Hawn 6022

Has completed a physical exam in accordance with:

- ☒ 29CFR 1910.120 HazWaste
- ☒ 29CFR 1910.1001/1926.1101 Asbestos
- ☒ 29CFR 1910.134 Respiratory Protection
- ☒ ANSI Z117.1-1995 Sec. 16 Confined Spaces

And is MEDICALLY QUALIFIED. Restrictions on reverse.

Issue date 5-31-07 Exam Due 5-31-08

Provider Don E. Goss PA-C

RESTRICTIONS (if applicable)

Corrective lenses required,
near vision



ERC
Environmental
and Energy
Services Co.

Certify that

George Douglas Hain

of
ERCE

Successfully Completed a
40 hour Equivalent Training Course
in

HEALTH AND SAFETY
and is Awarded this Certificate for
**HAZARDOUS WASTE OPERATIONS
AND EMERGENCY RESPONSE**

July 14, 1989

Date

William L. Duggan, CPH
Instructor

W. W. White
Executive Vice President

Certificate of Completion

Jim Madaj

In Recognition of Having Successfully Completed

HAZWOPER 8 HOUR ANNUAL REFRESHER

On

October 30, 2006

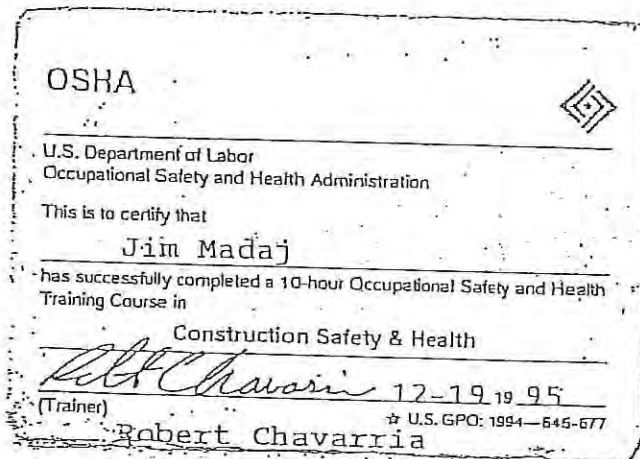
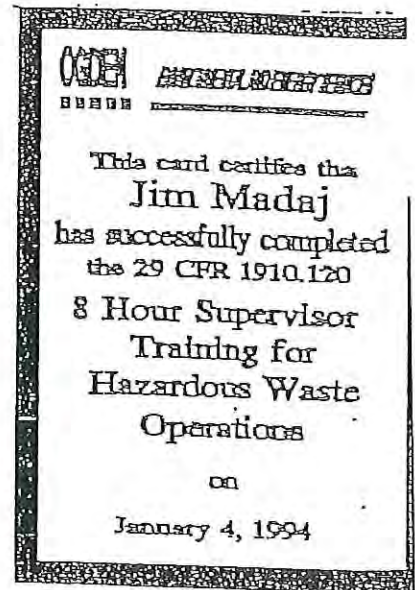
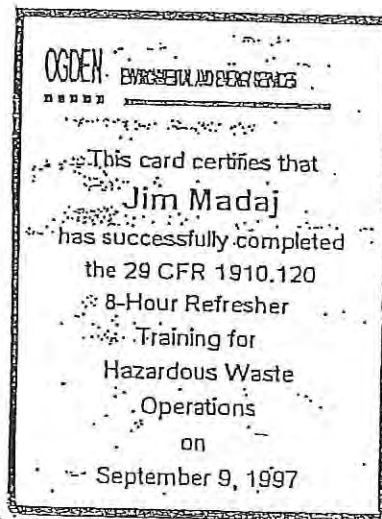
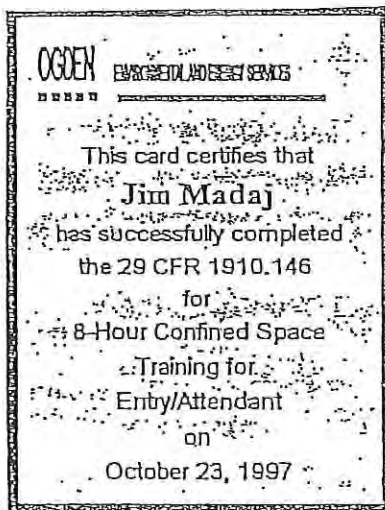
in accordance with

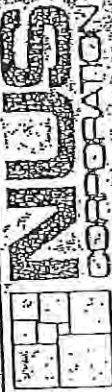
OSHA 29 CFR 1910.120(e)(8)/1926.65(e)(8) HAZWOPER Standard

T.R. Crouse

T.R. Crouse, CSP

KSR-04-3146





CERTIFICATE OF TRAINING

THIS CERTIFIES THAT

AMBEROSE MADDAJ

has successfully completed a 40 hour course of instruction in

HAZARDOUS MATERIALS HANDLING

prepared and conducted by the
NUS Corporation,
Pittsburgh, Pennsylvania

JANUARY 25-29, 1988

Date of Award

Richard C. Gerlach

Richard C. Gerlach, Ph.D., M.C.I.H.
Program Manager, Health Sciences

David P. Boon

David P. Boon
Vice President and General Manager
Central Business Operations

CONCENTRA MEDICAL CENTERS

OAK RIDGE, TENNESSEE 37830

MEDICAL SURVEILLANCE CERTIFICATE

Ambrose J. Madaj 9608

Has completed a physical exam in accordance with:

- (☒) 29CFR 1910.120 HazWaste
- () 29CFR 1910.1001/1926.1101 Asbestos
- (☒) 29CFR 1910.134 Respiratory Protection
- (☒) ANSI Z117.1-1995 Sec. 16 Confined Spaces

And is MEDICALLY QUALIFIED. Restrictions on reverse.

Issue date 4-30-07 Exam Due 5-7-07

Provider: Dr. Oesch, MD.

CONCENTRA MEDICAL CENTERS RESPIRATOR FIT CERTIFICATE

NAME (Last, First, Middle Initial) MADAJ, AMBROSE J. S.S. # 9608
 HAS RECEIVED BASIC INSTRUCTION ON PROPER RESPIRATOR USE
 AND IS QUALIFIED AND FITTED TO WEAR THE SPECIFIC RESPIRATOR(S)
 INDICATED ON THE REVERSE SIDE.
 ISSUE DATE 04-30-07 EXP. DATE 04-30-08
 TECHNICIAN SIGNATURE Concentra Medical Centers CMCRESPIRATORFIT

RESPIRATOR INFORMATION

MODEL	TYPE	SIZE	App#	APF
MSA		M		
ULTRA TWIN FULL		TC B4A 0181	100	

VALID WITH CURRENT MEDICAL CLEARANCE
QUANTITATIVE FIT TEST

CMCRESPIRATORFIT

RESTRICTIONS (if applicable)

Corrective lenses required,

Far, depth

CONCENTRA MEDICAL CENTERS
RESPIRATOR FIT CERTIFICATE

NAME (Last, First, Middle Initial)

Powers, Charles G.

SS #

HAS RECEIVED BASIC INSTRUCTION ON PROPER RESPIRATOR USE
AND IS QUALIFIED AND FITTED TO WEAR THE SPECIFIC RESPIRATOR(S)
INDICATED ON THE REVERSE SIDE.

ISSUE DATE 10-31-06

EXP. DATE 10-31-08

TECHNICIAN SIGNATURE

RESPIRATOR INFORMATION

MODEL	TYPE	SIZE	App#	FT
-------	------	------	------	----

MSA

L

ULTRA TWIN FULL TC 84A 0181 100

VALID WITH CURRENT MEDICAL CLEARANCE
QUANTITATIVE FIT TEST

CONCENTRA MEDICAL CENTERS
1030 OAK RIDGE TURNPIKE
OAK RIDGE, TN 37830
(865) 425-4640
FAX: (865) 425-4646

TEMPORARY MEDICAL CERTIFICATION
(THIS CERTIFICATION EXPIRES 30 DAYS FROM DATE OF EXAMINATION)

Powers, Charles G.

Employer: Step Inc
SSN: 412-11-7241 DOB: 09/13/1961
Case Date: 10/31/2006

A physical examination has been completed in accordance with the requirements of OSHA Standard(s):

- ☒ 29CFR1910.120 (Hazardous Waste)
- ☒ 1910.134 (Respiratory Protection)
- ☒ 1910.1001/1926.1101 (Asbestos)

on the above named individual on 10-31-06

Based upon the findings from the physical examination and spirometry test, I have determined this individual may may not use respiratory protection while performing his or her employment services.

Upon receipt and review of all test results, including laboratory test, a final report (Physician's Statement) on the above named individual will be forwarded to you, the employer.

EMPLOYEE NOTIFICATION

The above named individual will be informed of the results of this medical examination. Detected medical conditions, which require additional examinations or treatment, will be explained and applicable follow-up recommended.

RECORD OF THE ABOVE MAINTAINED AT CONCENTRA MEDICAL CENTERS

Dr. E. G. ... PA-C

Date: *10-31-06*

This will certify that

Gerald Powers

has completed the 40 Hour Program
per Regulation 29CFR1910.120
HAZARDOUS WASTE OPERATIONS
AND EMERGENCY RESPONSE
Certification Expiration 07/13/2004

Andy Green

Director of Training

HazMat Training

Temporary Certificate of Completion

Charles Gerald Powers

completed the requirements of

Kelly's HAZWOPER 8 Hour Annual Refresher Online

on 11/2/2006.

Kelly Scientific Resources, Inc. will mail the final Certificate of Completion within 60 calendar days of the completion date.

This Temporary Certificate VOID 60 days after completion date.

If you need the final certificate sooner, please call our Hot Line at 865-777-1401 ext.201

Thank you for choosing Kelly for your training needs. We look forward to serving you again soon.

American
Red Cross



Together, we can save a life

This recognizes that
Gerald Powers
has completed the requirements for
Adult CPR

conducted by
Appalachian Chapter
Date completed **10/30/06**
The American Red Cross recognizes this certificate
as valid for **1** year(s) from completion date.

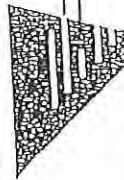
American
Red Cross



Together, we can save a life

This recognizes that
Gerald Powers
has completed the requirements for
First Aid Basics

conducted by
Appalachian Chapter
Date completed **10/30/06**
The American Red Cross recognizes this certificate
as valid for **3** year(s) from completion date.



Compliance Solutions

"Today's Training... Tomorrow's Solution"

10515 E 40th Ave, Suite 116, Denver Colorado
80239 Phone: 800-711-2706

Student Affiliation:

IT Corp

Certificate of Completion

This is to certify that

Brian Odom

has successfully completed the classroom requirements for
40 Hour HAZWOPER
29 CFR 1910.120(e)

Presented

Friday, January 07, 2000

Compliance Solutions Occupational Trainers, Inc.

Certificate Number: 21096

Neval Gupta
Vice President

Rick Cassidy
Instructor

Association of
Bay Area Governments



ABAG Training Center
www.hazmatschool.com

CERTIFICATE OF COMPLETION

Brian Odom

has successfully completed the course titled

OSHA 8-hr Annual HAZWOPER Refresher

Satisfies 29 CFR 1910.120(e)(6)

on:

January 27, 2006

and has earned

IACET authorized 0.8 CEUs (Continuing Education Units) from the program

Certificate No 47285

(verify at www.hazmatschool.com)



Brian Kirking, Training Director
Sharon McGreadie, Training Coordinator
www.abag.ca.gov; (510) 464-7964

Paul W. Gantt, REA
Safety Compliance Management, Inc.

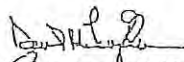
American
Red Cross

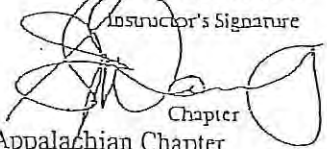


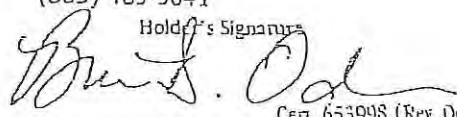
Together, we can save a life

This recognizes that
Brian Odom
has completed the requirements for
Adult CPR

conducted by
Appalachian Chapter
Date completed **10/30/06**
The American Red Cross recognizes this certificate
as valid for **1** year(s) from completion date.


Instructor, American Red Cross
Instructor's Signature


Chapter
Appalachian Chapter
(865) 483-5641


Holder's Signature

Cert. 653998 (Rev. Oct. 2001)

Physical Examination

Name: Brian E Odom SSN: 249022444
Date of Birth: 10/15/73 Company: Self Pay Patients
Height: 5.10" Weight: 281 BP: 130/86 Pulse: 68
Respiration: 16

Exam components; address only those areas of concern identified in the health history.

	Normal	Abnormal
General Appearance	<u>/</u>	<u> </u>
Nose	<u>/</u>	<u> </u>
Throat	<u>/</u>	<u> </u>
Lungs	<u>/</u>	<u> </u>
Heart	<u>/</u>	<u> </u>

Comments: _____

Chest X-Ray: No / Yes (Attach Report Copy)

Pulmonary Function Test (Attach Copy): / Normal
 Abnormal
FEV₁ 81%

Comments: _____

Phyllis PAC
Examining Healthcare Professional's Signature

1/20/07
Date of Exam



CERTIFICATE of COMPLETION

Presented To

Brian D. Odom

In Recognition of Having Successfully Completed the Prescribed Course of Study for
8-Hour HAZWOPER Supervisor Training

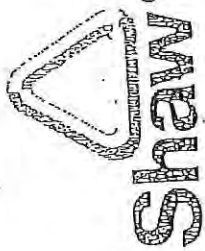
OSHA 29 CFR 1910.120 (e) (4)

I certify that the above trainee has completed this training course as
given by The IT Group or one of its subsidiaries.

DON L. UNRUH, CIH, CSP
Manager, Internal Training Group

01/16/2002

EFFECTIVE DATE



Shaw® Shaw Environmental & Infrastructure, Inc.

CERTIFICATE of COMPLETION

Presented To

Brian D. Odom

In Recognition of Having Successfully Completed the Prescribed Course of Study For
H&S Program Mgt. for Project Managers & Supervisors

05/21/2003

EFFECTIVE DATE

I certify that the above trainee has completed this training course as
given by Shaw E&I or one of its subsidiaries.

Don L. Unruh

DON L. UNRUH, CIH, CSP
Manager, Internal Training Group

Temporary Certificate of Completion

Joseph Shawn Ray

completed the requirements of

Kelly's HAZWOPER 8 Hour Annual Refresher Online

on 11/12/2006.

Kelly Scientific Resources, Inc. will mail the final Certificate of Completion within 60 calendar days of the completion date.

This Temporary Certificate VOID 60 days after completion date.

If you need the final certificate sooner, please call our Hot Line at 865-777-1401 ext.201

Thank you for choosing Kelly for your training needs. We look forward to serving you again soon.

Certificate of Completion

Joseph Ray

In Recognition of Having Successfully Completed
HAZWOPER 8 HOUR ANNUAL REFRESHER

On
November 12, 2006

in accordance with
OSHA 29 CFR 1910.120(e)(8)/1926.65(e)(8) HAZWOPER Standard

T.R. Crouse

T.R. Crouse, CSP

KSR-04-3160

CONCENTRA MEDICAL CENTERS
1030 OAK RIDGE TURNPIKE
OAK RIDGE, TN 37830
(865) 425-4640
FAX: (865) 425-4646

TEMPORARY MEDICAL CERTIFICATION
(THIS CERTIFICATION EXPIRES 30 DAYS FROM DATE OF EXAMINATION)

Ray, Joseph S.

Employer: Step Inc
SSN: 410-37-1724 DOB: 11/16/1981
Case Date: 10/31/2006 X-ray #: 06238

A physical examination has been completed in accordance with the requirements of OSHA
Standard(s):

- ☒ 29CFR1910.120 (Hazardous Waste)
- ☒ 1910.134 (Respiratory Protection)
- ☒ 1910.1001/1926.1101 (Asbestos)

on the above named individual on 10-31-06

Based upon the findings from the physical examination and spirometry test, I have determined
this individual may may not use respiratory protection while performing his or her employment
services.

Upon receipt and review of all test results, including laboratory test, a final report (Physician's
Statement) on the above named individual will be forwarded to you, the employer.

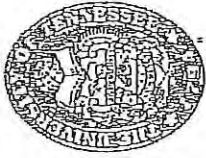
EMPLOYEE NOTIFICATION

The above named individual will be informed of the results of this medical examination.
Detected medical conditions, which require additional examinations or treatment, will be
explained and applicable follow-up recommended.

Energy, Environment and Resources Center

at

The University of Tennessee



This is to certify that

Joseph Ray

has successfully completed the 40 hour course in
Hazardous Waste Operations and Emergency Response
as required by 29 CFR 1910.120.

8-16-04

Date

W. A. Shaw

Instructor(s)

ENVIRONMENT,
SAFETY & HEALTH
EDUCATION

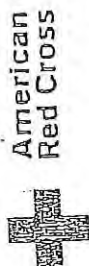
OR-02-SP-01



Together, we can save a life

This recognizes that
Joseph Ray
has completed the requirements for
First Aid Basics

conducted by
Appalachian Chapter
Date completed *10/30/06*
The American Red Cross recognizes this certificate
as valid for **3** year(s) from completion date.



Together, we can save a life

This recognizes that
Joseph Ray
has completed the requirements for
Adult CPR

conducted by
Appalachian Chapter
Date completed *10/30/06*
The American Red Cross recognizes this certificate
as valid for **1** year(s) from completion date.

Certificate of Completion

Ralph Ray

In Recognition of Having Successfully Completed
HAZWOPER 8 HOUR ANNUAL REFRESHER

On
November 23, 2006

in accordance with

OSHA 29 CFR 1910.120(e)(8)/1926.65(e)(8) HAZWOPER Standard

T.R. Crouse

T.R. Crouse, CSP

KSR-04-3165

OAK RIDGE, TN 37830
(865) 425-4640
FAX: (865) 425-4646

TEMPORARY MEDICAL CERTIFICATION
(THIS CERTIFICATION EXPIRES 30 DAYS FROM DATE OF EXAMINATION)

Ray, Ralph F.

Employer: Step Inc
SSN: 413-04-1854 DOB: 05/02/1957
Case Date: 06/01/2007

A physical examination has been completed in accordance with the requirements of OSHA Standard(s):

- ☒ 29CFR1910.120 (Hazardous Waste)
- ☒ 1910.134 (Respiratory Protection)
- ☒ 1910.1001/1926.1101 (Asbestos)

on the above named individual on 6/1/07

Based upon the findings from the physical examination and spirometry test, I have determined this individual may / may not use respiratory protection while performing his or her employment services.

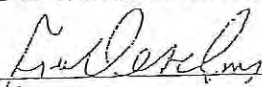
Upon receipt and review of all test results, including laboratory test, a final report (Physician's Statement) on the above named individual will be forwarded to you, the employer.

EMPLOYEE NOTIFICATION

The above named individual will be informed of the results of this medical examination. Detected medical conditions, which require additional examinations or treatment, will be explained and applicable follow-up recommended.

RECORD OF THE ABOVE MAINTAINED AT CONCENTRA MEDICAL CENTERS

Signature of Provider



Date:

6/1/07

American
Red Cross



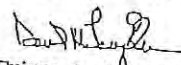
Together, we can save a life

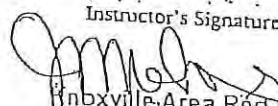
This recognizes that
RALPH RAY
has completed the requirements for
ADULT CPR/AED

conducted by
KNOXVILLE AREA CHAPTER

Date completed **06/03/2005**

The American Red Cross recognizes this certificate
as valid for **1** year(s) from completion date.


Chairman, American Red Cross
Instructor's Signature


Knoxville Area Red Cross
(865) 584-2999

Holder's Signature

Cert. 653998 (Rev. Oct. 2001)

American
Red Cross



Together, we can save a life

This recognizes that

Jeffrey Williams
has completed the requirements for

First Aid Basics

conducted by

Appalachian Chapter

Date completed 7/29/05

The American Red Cross recognizes this certificate
is valid for 3 year(s) from completion date.

American
Red Cross



Together, we can save a life

This recognizes that

Jeff Williams
has completed the requirements for

Adult CPR

conducted by

Appalachian Chapter

Date completed 10/30/06

The American Red Cross recognizes this certificate
is valid for 1 year(s) from completion date.

American
Red Cross



Together, we can save a life

This recognizes that
Jeffrey Williams
has completed the requirements for
Adult CPR

conducted by
Appalachian Chapter
Date completed **7/29/05**
The American Red Cross recognizes this certificate
as valid for **1** year(s) from completion date.

American
Red Cross



Together, we can save a life

This recognizes that
Jeffrey Williams
has completed the requirements for
First Aid Basics

conducted by
Appalachian Chapter
Date completed **7/29/05**
The American Red Cross recognizes this certificate
as valid for **3** year(s) from completion date.

CONCENTRA MEDICAL CENTERS
OAK RIDGE, TENNESSEE 37830

MEDICAL SURVEILLANCE CERTIFICATE

Williams, Jeffrey L. **2904**

Has completed a physical exam in accordance with:

- (X) 29CFR 1910.120 HazWash
- () 29CFR 1910.1001/1928.1101 Asbestos
- (X) 29CFR 1910.134 Respiratory Protection
- (X) ANSI Z117.1-1995 Sec. 16 Confined Spaces

And is MEDICALLY QUALIFIED. Restriction, on reverse.

Issue date **8-29-07** Exam. Due **8-29-07**

Provider **Don D. Cope, PA-C**

DATE RECEIVED

DATE RECEIVED

RESTRICTIONS (if applicable)

Corrective lenses required.
Fav, wear, teleph

**HAZARDOUS WASTE SUPERVISOR
TRAINING COURSE**



NAME
JEFFREY C. WILLIAMS
ID
413042904
CERTIFICATE
41304290441341001
DATE COMPLETED
10/15/01
RENEWAL DATE
10/15/02

COMPLIES WITH OSHA REGULATION 29 CFR 1910.120



**LABORERS-AGC
EDUCATION AND TRAINING FUND**

37 Deerfield Road
P.O. Box 37
Pomfret Center, CT 06259

CONCENTRA MEDICAL CENTERS
1030 OAK RIDGE TURNPIKE
OAK RIDGE, TENNESSEE 37830
(865) 425-4640

PHYSICIAN'S STATEMENT

DATE OF EXAM: 8-28-06

TYPE OF EXAM:

- ☐ BASELINE
☒ ANNUAL
☐ EXIT

Williams, Jeffrey C.

Employer: Step Inc

SSN: 413-04-2904 DOB: 05/12/1959

Case Date: 08/29/2006

OPINION OF RISK/MEDICAL CLEARANCE FOR HAZARDOUS WASTE OPERATIONS

I have reviewed the results of the occupational and medical history, physical examination and laboratory tests based upon these, I certify that this individual:

- ☒ Has no medical condition that would place the individual at increased risk of health impairment from hazardous waste site work, when conducted under the conditions of adequate training and a health and safety plan.
- ☐ Has a medical condition that would place the individual at increased risk of health impairment from hazardous waste site work.
- ☐ Has a medical condition, which may require special consideration by the company.
- ☐ Deferred, pending further evaluation.

MEDICAL CLEARANCE FOR RESPIRATOR USE

Based upon the examination, I certify that this individual:

- ☒ Is medically qualified to use properly fitted respiratory protection equipment.
- ☐ Is NOT medically qualified to use respiratory protection equipment.
- ☒ Qualified for Confined Space Entry.
- ☐ Is not qualified for Confined Space Entry.
- ☐ Deferred, pending further evaluation.

Comments/Restrictions

- ☐ The individual has undergone a physical examination in accordance with OSHA Standards 29CFR 1910.120, 29CFR 1910.1001, 1926.1101, 29CFR 1910.134 and ANSI Standard Z117.1-1995, Section 16.
- ☒ The individual has undergone a physical examination in accordance with OSHA Standards 29CFR 1910.120, 29CFR 1910.134 and ANSI Standard Z117.1-1995, Section 16.

☒ Corrective lenses required:

- ☒ Far Vision
☒ Near Vision

- ☐ Deficient stereo depth perception
☒ Depth perception

☒ Hearing protection recommended

☒ Recommend tetanus toxoid immunization to be updated every 10 years.

EMPLOYEE NOTIFICATION

This individual has been informed of the results of this medical examination. Detected medical conditions which require additional examinations or treatment have been explained and applicable. Follow-up recommended.

Don E. [Signature] Date 9-26-06

Seaver Environmental

Proudly Presents This
Certificate to

Jeffrey C Williams

for completing the initial 40-hour training in
Hazardous Waste Operations and Emergency Response
at Oak Ridge, Tennessee on 06 Apr 92
to satisfy OSHA rules, 29 CFR Part 1910.120

Certificate Number: *4*

SSAN:

413-04-2904

Gary V. Seaver

Gary Seaver, Trainer

Seaver Environmental
Rt. 1, Box 18
Ridge Road
Lancing, TN 37770
615-346-7439

Association of
Bay Area Governments



ABAG Training Center
www.hazmatschool.com

CERTIFICATE OF COMPLETION

Jeffrey Williams

has successfully completed the course titled

OSHA 8-hour HAZWOPER Annual Refresher Plus

Satisfies 29 CFR 1910.120(e)(8)

on

August 22, 2006

and has earned

IACET authorized 0.8 CEUs (Continuing Education Units) from the program

Certificate No 51475
(verify at www.hazmatschool.com)

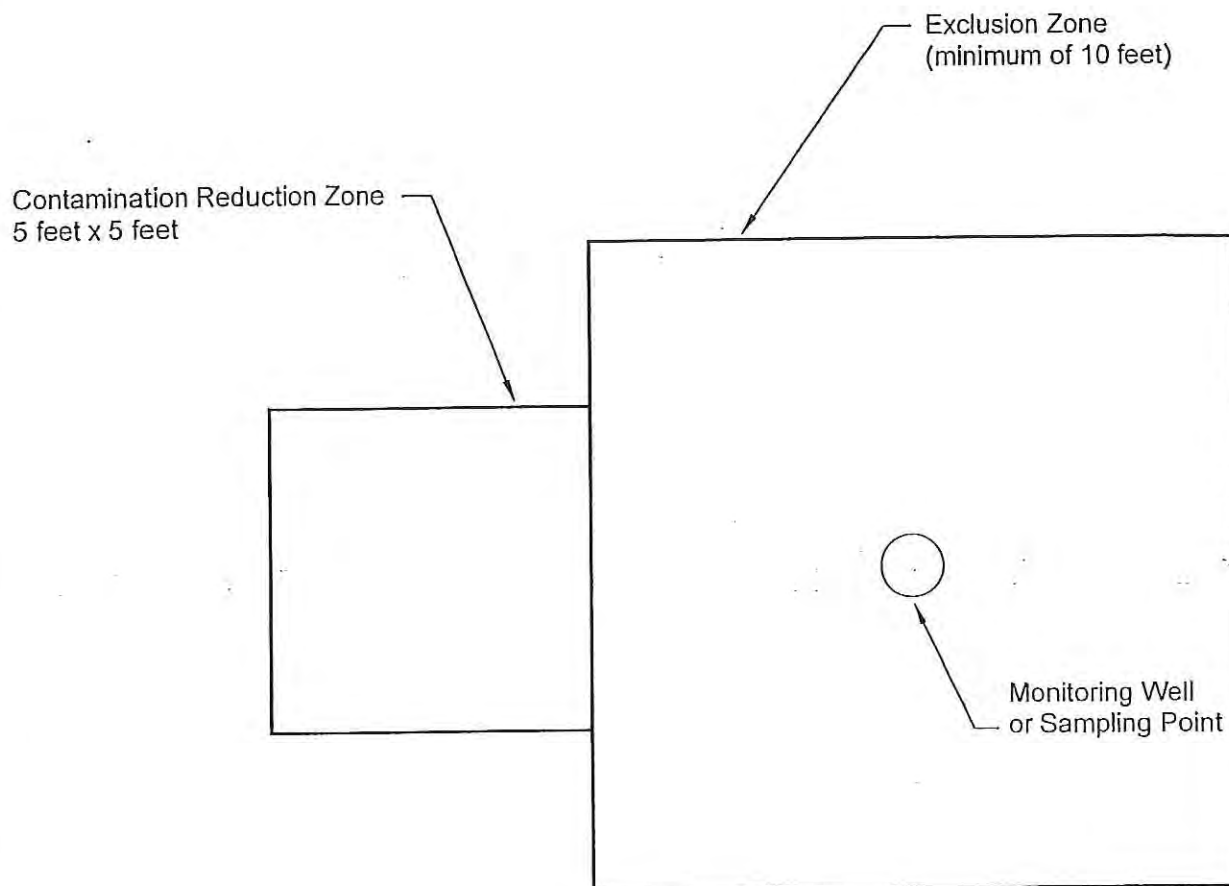
Paul W. Gantt, REA
Safety Compliance Management, Inc.

Brian Kirking, Training Director
Sharon McCreddie, Training Coordinator
www.abag.ca.gov; (510) 464-7964



APPENDIX D

REPRESENTATIVE SITE CONTROL ZONES



Legend



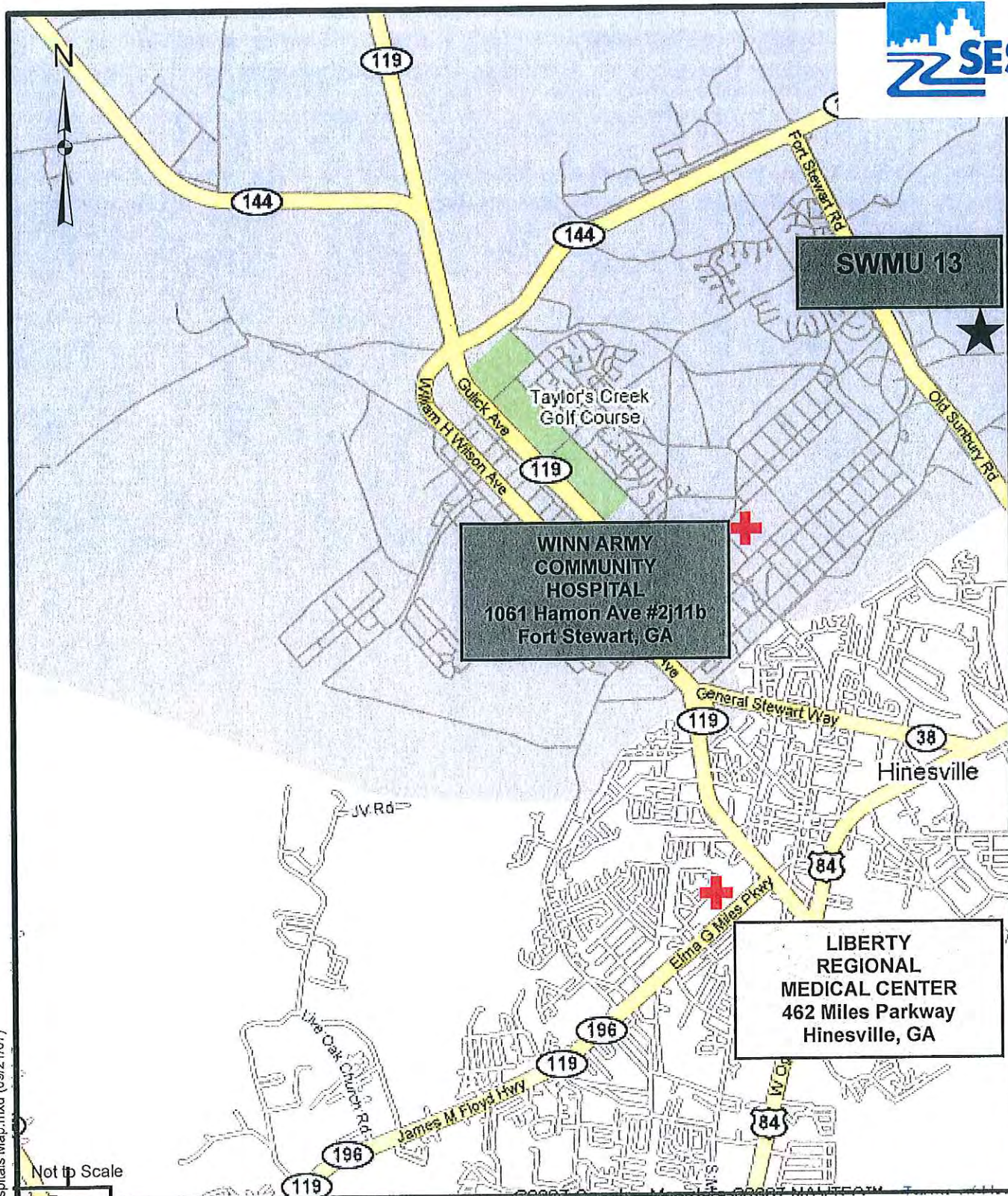
Prepared For: USACE
Savannah District

Source: USACE
Job Title: HASP for Semi-Annual Sampling
at the 250th Quartermaster Motor Pool
building 1345, Underground Storage Tanks
25 and 26, Facility ID #9-025008
Hunter Army Airfield, Georgia

Appendix D - Representative Site-Control Zones

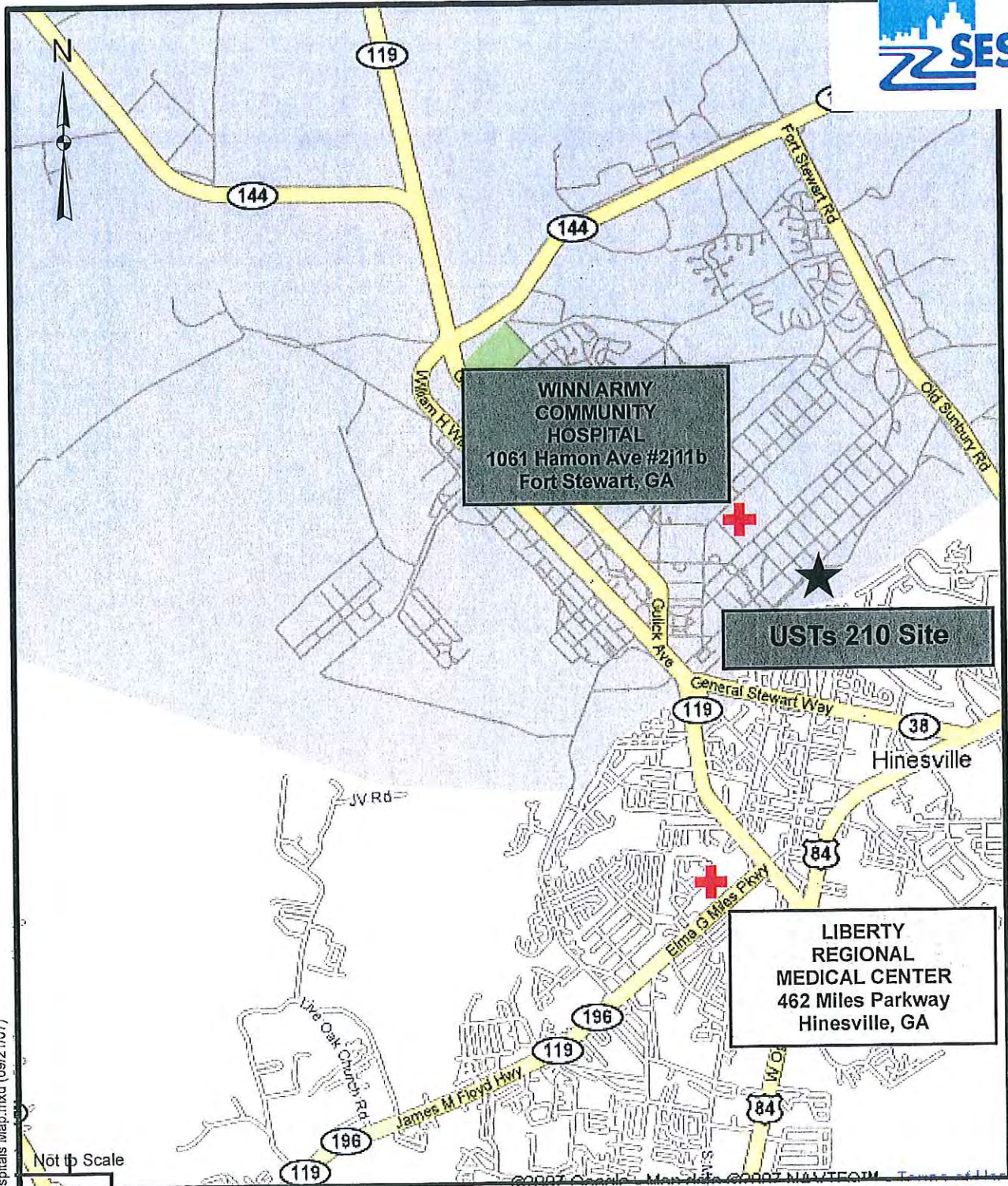
APPENDIX E

HOSPITAL LOCATION MAP

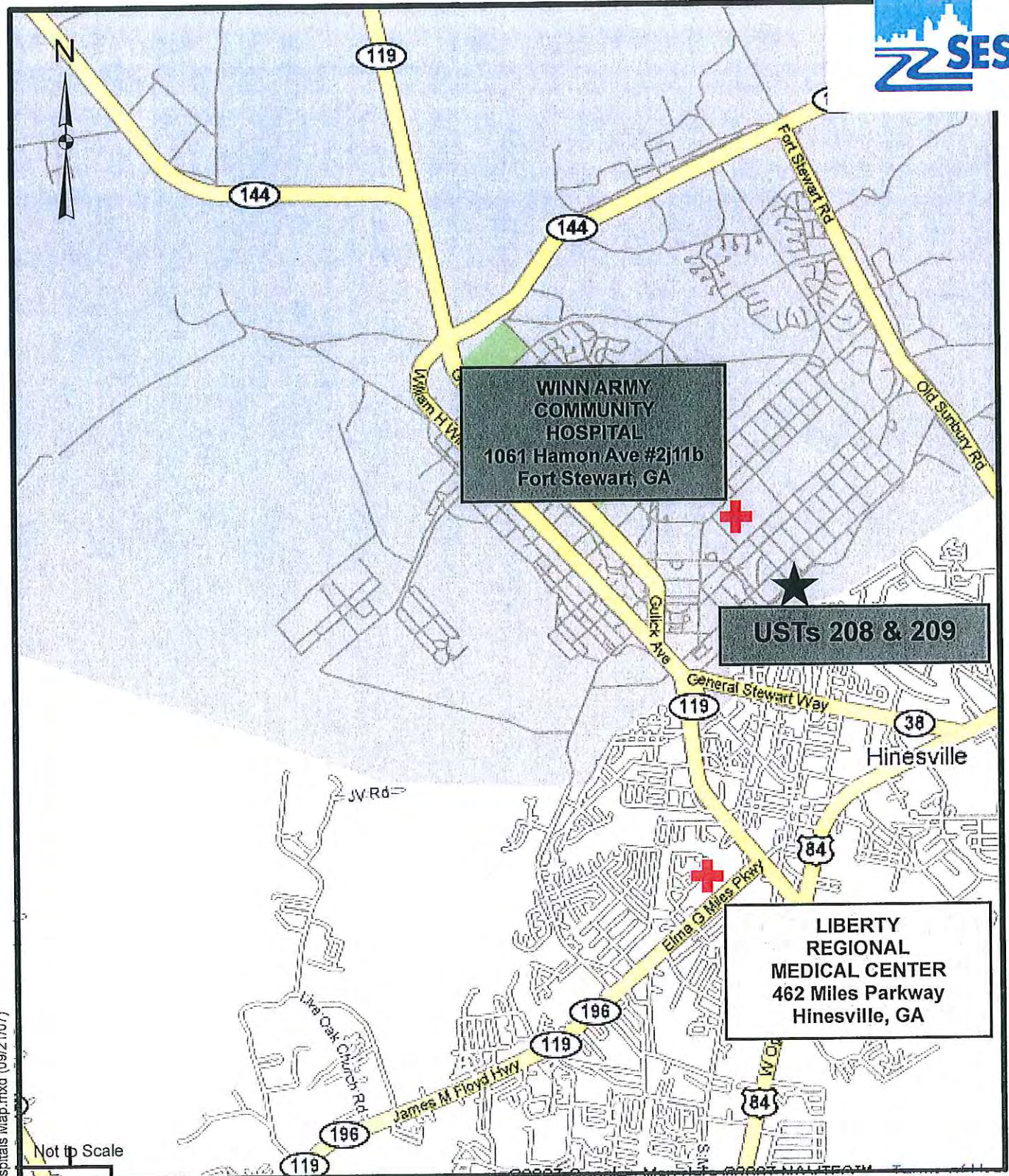


- ★ Site Location
- ✚ Hospital Locations

09/27/07



R:\E0138.0003\Graphics\Route to Hospitals Map.mxd (09/21/07)



LEGEND

- ★ Site Location
- ✚ Hospital Locations

Route to Hospitals Map

APPENDIX F

RESUMES



⌘ Professional Profile

JEFF WILLIAMS, PE
DESIGN ENGINEER / CIVIL ENGINEER

Education: University of Tennessee, Knoxville
B.S., Civil Engineering, 1983

Professional Training: OSHA 40-hour Hazardous Waste Operations Training and annual refreshers
USACE – Construction Quality Management Training
Rad Worker I and II

Mr. Williams has 23 years experience representing a diverse background in the environmental, geological, geotechnical, and engineering disciplines. He has conducted environmental and hydrological assessments for the DOD and DOE as well as for industrial and commercial facilities and residential subdivisions. He has experience performing data acquisition, analysis, and modeling for potential soil, groundwater, and surface water contamination and environmental remediation designs for underground storage tanks, stormwater, and waste disposal facilities. Additional experience includes data acquisition and designs for erosion control and stormwater collection, containment, chemical treatment, and discharge facilities; land use plans; topographic mapping; and engineering surveying. Mr. Williams has performed surveying for site plans, topographic surveys, construction layouts, and as built drawings using electronic field data collection and has produced topographic maps using AutoCad software for more than 110 projects and thousands of acres. His erosion control design experience includes ditches, culverts, earthen dams, riverbank stabilization, and storm conveyances along roads. He has designed roadways in subdivisions including the appropriate drainage structures.

During his career, Mr. Williams has designed over 20 landfills ranging in size from 15-150 acres, to contain hazardous waste, construction/demolition debris, and RCRA Subtitle C&D waste. He has also designed over 100 surface mine permits, and has a thorough knowledge of Bureau of Land Management, Department of the Interior, Office of Surface Mining, and State regulations in Tennessee, Kentucky, and Nevada. In addition to solid waste and mining permits, he has also prepared NPDES permits. His remedial design experience includes addressing contamination at airfields, POL facilities, and fuel distribution sites. In many cases, he has also supervised the implementation of the remediation. He has managed over 50 remediation tasks in Tennessee, Kentucky and Georgia, and is familiar with remedial regulations and wastewater permitting in those states. His managerial capabilities include supervising of project teams and monitoring project performance.

Mr. Williams has performed engineering design and construction supervision for coal mines, landfills, subdivisions, and drainage control structures at sites in Tennessee, Kentucky, California, Nevada, and Georgia.

Experience: SpecPro Environmental Services, LLC (formerly Solutions to Environmental Problems, Inc.); Oak Ridge, Tennessee; 1992-present
Civil Engineer/Project Manager

2006-2007; South Central Landfill: Fort Stewart, GA. Project Manager
responsible for responding to a methane migration problem associated with an old

landfill. Directed a geophysical survey and exploratory trenches to delineate the boundaries of an old disposal area. When sanitary debris was found outside the boundary of the landfill, was responsible for removal of over 50,000 tons of waste and appropriate disposal into an active cell. Installed a less permeable barrier using compacted borrow soil to prevent methane migration off site.

2005-2006: Tank Support; Robins Air Force Base, GA. QC Manager responsible for ensuring that the scope of work and specifications were followed and met during the project. Tasks included evaluating and installing Stage 1 vapor recovery at three locations, correcting tank deficiencies at 30 locations, performing tank vapor and interstitial monitoring at 90 wells in 17 different locations, and providing Robins AFB with technical support as needed.

2006: Corrective Measures Study for SWMU 170Z11; Fort Campbell, KY. Task Manager and lead author for the corrective measures study for the site of a former lubrication rack where free product and dissolved groundwater contaminants were a concern. Developed site-specific, qualitative cleanup goals to address contamination and protect human health and the environment. Evaluated five remedial alternatives, and ultimately selected passive skimmers as a cost-effective remedial strategy to meet remedial goals.

2005: UST Removals at Ellyson Army Airfield Sites 3 and 6, Pensacola, FL. Task Manager responsible for removal and closure of four small USTs located at Site 3 (Government Services Building); fourteen 500-gallon lube oil USTs; 47 fuel dispensing pits/dispensers; one oil water separator and wash rack; four valve pits; three junction pits; and approximately 6,000 feet of piping runs.

2005: Removal of 23 Heating Oil Tanks from the Cantonment Area; Ft. Campbell, KY. Task Manager responsible for removal of 23 underground storage tanks located in both Tennessee (16 tanks) and Kentucky (7 tanks), and investigation of five additional sites where tanks were not found. Coordinated with Ft. Campbell representatives to ensure that residual liquids were removed as required. Directed field crews during removal of each tank, any associated piping, and contaminated soil. Work included soil sampling for EPH for sites in Tennessee and sampling for PAHs at sites in Kentucky. Provided oversight during proper disposal of all wastes and site restoration. Fieldwork was completed within budget and ahead of schedule.

2004-2005: Removal of 33 Heating Oil Tanks within the Main Cantonment Area and Campbell Army Airfield; Ft. Campbell, KY. Task Manager responsible for removal of 33 tanks, ranging in size from 250 gallons to 6,000 gallons in accordance with Kentucky and Tennessee UST regulations. Specific responsibilities included preparation of project documents (work plan, QC plan, health and safety plan, and the final report), directing the field team, and coordinating all work with local facility personnel and Ft. Campbell utility personnel. Each tank was excavated and removed, along with all associated piping and contaminated soil. Confirmatory samples were collected, and the sites were restored. No further action was recommended for 25 sites in Kentucky and three sites in Tennessee; the remaining five sites will require further action to meet cleanup criteria. All fieldwork was completed within budget and ahead of schedule;

STEP received a follow-on task for an additional 23 tanks based upon the success of this project.

2004; Permanent Tank Closure, Robins Air Force Base, GA. Task Manager responsible for removing two underground storage tanks in accordance with Georgia closure requirements. Work included disposal of tank contents, sampling soil and groundwater, drilling soil borings, removal of existing vapor monitoring wells, and determining action levels based on the distance to nearby water wells and groundwater pollution susceptibility. Prepared all closure documentation to support no further action at both sites.

2004; Hemmitt Tanker Pad Construction; Fort Campbell, KY. Project Manager responsible for installation of a new reinforced concrete pad, complete with a secondary containment system, for the new Hemmitt tanker parking facility. The project included a topographic survey to determine existing site elevations and site preparation including grubbing, grading, filling, and compacting as needed. Managed installation of the 8-inch reinforced concrete pad approximately 141 ft by 61 ft. Secondary containment curbing (3 sides) and rollover (1 side) was constructed to meet regulatory requirements, and control joints were sealed with fuel-resistant caulking. Five galvanized static ground connection rods were installed with the pad.

2004; Sinkhole Verification; Fort Campbell, KY. Project Manager of a task to verify the existence of over 90 sinkholes that were referenced in historical documents at Fort Campbell. Visited each site to assess whether stormwater flowed into the sinkholes, photograph each area, install markers, and collect survey data using GPS equipment.

2004; Bryan Village CAP A; Fort Stewart, GA. Lead Professional Engineer during installation of four groundwater wells, well sampling, and soil sampling around a former tank pit where fuel related contamination had been detected in the groundwater. Served as a member of the field team during a two week effort. Performed the majority of fieldwork at night to minimize disruption to the active fueling facility. Provided peer review of the work plan and other project documents.

2003-2004; UST Removal at Wright Army Airfield, GA. Task Manager and Professional Engineer responsible for removal of a 2,000 gallon UST used for heating oil. Directed fieldwork during tank and line removal, and collected soil samples in accordance with Georgia requirements. Completed all fieldwork including capping lines, and removing the tank and associated equipment, in just two days, well ahead of schedule. Completed all permanent closure documentation, and authored the project report.

2003; USACE-Nashville District; SWMU 12&15, Fort Campbell, KY. Quality Control Supervisor for a project involving the application of hydrogen release compound (HRC) into the subsurface in an effort to remediate TCE and benzene contamination. HRC was pumped into injection points through hollow stem rods. Periodic samples were collected to determine the effectiveness of the HRC. Responsible for QC review of project documents, logbooks, and field procedures.

2002-2003; USACE – Nashville District; SWMU 146 Bioremediation; Fort Campbell, KY. Quality Control Supervisor for QC review of logbooks, field procedures, and project documents during a project to test whether oxygen release compound (ORC) will accelerate bioremediation in groundwater at SWMU 146. ORC was applied at the site in October 2002 to mitigate TPH-EPH contamination. The ORC was sprayed as slurry on the bottom and sidewalls of an excavated area, which was subsequently backfilled with #57 limestone, restored to blend with the surrounding topography, and monitored for one year to determine the effectiveness of the treatment.

2003; USACE – Nashville District; Old Hospital Complex Investigation, Fort Campbell, KY. Participated as a member of the sampling team responsible for collecting over 600 soil samples analyzed for metals, VOC, SVOC, and pesticide contamination on a 70-acre site. Conducted a QC review of the project document including all laboratory data.

2003; USACE – Nashville District; Oil Pit Removal; Ft. Campbell, KY. Task Manager for a follow-on task to remove additional oil pits at Fort Campbell. Responsible for preparation of project reports; and oversight of fieldwork to remove oil pits 149B and 149O in Tennessee and 149S, 149T, 149U, and 149V in Kentucky. Surface and subsurface oil pit structures were removed, along with contaminated soil. Confirmatory samples were collected.

2003; USACE – Mobile District; Removal and Permanent Closure of 5 USTs at Hunter Army Airfield, Ft. Stewart, GA. Task Manager for permanent closure for five USTs in accordance with the requirements in the state of GA. Tanks ranged in size from 500 gallons to 12,000 gallons and contained diesel fuel, used oil, and anti-freeze. Responsible for oversight of removal of all tanks and ancillary equipment. Tanks were recycled and confirmatory samples were collected (soil and groundwater). All removal activities were completed in less than two weeks.

2002; Severson; Boneyard Burnyard Project; Y-12 Facility, Oak Ridge, TN. Professional Engineer responsible for oversight during removal of approximately 80,000 cubic yards of low level radioactive waste. Coordinated with radiation control personnel during sampling activities.

2002; USACE – Nashville District; SWMU 11, Fort Campbell, KY. Project Manager during the investigation of a suspected landfill site. To determine whether buried debris was present over the 40-acre area, 80 trenches were excavated. Responsible for surveying, and preparation of the work plan and health and safety plan. Interviewed knowledgeable utility personnel to determine likely areas of debris. Determined the borders of a 3-acre landfill, and prepared final drawings..

2002; USACE – Nashville District; Landfill 17; Fort Campbell, KY. Project Engineer during restoration of the vegetative cover at Landfill 17. Restoration was necessary because of erosion damage and debris settlement. Responsible for surveying and verifying that the final design provided positive drainage for the site. Fill material was brought in, graded, and seeded to re-establish vegetation.

2002; SWMU 27 Investigation, Fort Campbell, KY. Project Engineer during an investigation at the Open Burn/Open Detonation site. Worked closely with UXO

personnel and conducted UXO avoidance during soil and groundwater sampling. Surveyed soil samples and provided peer review of project reports.

2001-2002; Oil Pit /Lube Rack Removals, Fort Campbell, KY. Project Manager responsible for removal of 12 oil pits and one lube rack in the Main Cantonment area of Fort Campbell. Prepared the work plan, health and safety plan, and final project reports. Responsible for managing the field crew, surveying excavation areas and sample locations, collecting confirmatory soil samples, and coordinating off-site disposal for contaminated soil.

1999-2003; USACE – Nashville District Groundwater Summary Report; Fort Campbell, Kentucky. QC Manager responsible for final report review. The annual report summarizes analytical data collected from over 140 wells at various solid waste management units, one area of concern, and the Campbell Army Airfield.

2000; USACE – Nashville District; Drakes Creek Project; Hendersonville, Tennessee. Project Engineer and QC Manager responsible for the initial soundings of the Drakes Creek area to determine the thickness of sediment. Performed the initial topographic verification before dredging activities began. This project was conducted to restore the Drakes Creek embayment through dredging to a depth of five feet, installation of geotubes to contain the dredged material, and restoration of the site using bioengineering and conventional techniques.

1999-2000; USACE – Nashville District; Mousetail Landing; Perry County, Tennessee. Project Engineer responsible for performing the initial topographic survey to verify site conditions. Identified additional erosion that required redesign efforts. Project activities included the protection of shoreline and an exposed Indian Burial Mound using geotextile and class B riprap.

1999-2000; USACE – Nashville District; Knoxville Streambank Protection, Knoxville, Tennessee. Project Engineer responsible for the initial topographic verification of pre-construction conditions. Project activities included the installation of riprap and geotextile to protect shoreline near Neyland Drive.

1999-2000; USACE-Nashville District; Wastewater Treatment Plant Demolition and Characterization; Fort Campbell, KY. Project Engineer for the characterization and demolition of an abandoned wastewater treatment plant located in the NW corner of the Old Clarksville Base are of Ft. Campbell. Conducted soil sampling and mapping of the sampling locations. Assisted in writing and editing the reports.

1999-2000; USACE-Nashville District; Drain Line Replacement at AOC A and D; Fort Campbell, KY. Project Engineer for the AOC A phase II drain line replacement at Fort Campbell. Responsible for sampling of the contaminated soils beneath the old pipe that was removed and for placing the new pipe on grade to achieve gravity flow. Assisted in writing and editing the reports and providing as-built drawings for the new line.

1999; USACE-Nashville District; Subsurface Investigation of SWMU 149 Oil Pits; Fort Campbell, KY. Project Engineer for confirmatory sampling at two oil pits within SWMU 149 at Fort Campbell to confirm the presence of total petroleum

hydrocarbons (TPH), semivolatile organic compounds (SVOCs), and PCBs. Responsible for sampling of the soils to determine contamination, guiding the removal at 149a from the work plan, staking the trench locations at 149f to guide the trenching activities, and writing and editing the reports.

1998: USACE-Nashville District: COE Streambank Protection; Decatur, Hardin, Perry and Wayne Counties, TN. Project Engineer for streambank protection on the Tennessee River. Work included the installation of erosion controls, excavation and restoration of the existing stream channel, installation of geotextile, clearing, and grubbing. Responsible for redesign to realign approximately 3000 feet of streambank on the Tennessee River at Clifton Marina along with the construction stakeout. Responsible for the construction layout for stormwater drainage piping with inlet grates on the downstream side of the earthen portion of Center Hill Dam.

1998: Tennessee Valley Authority: Land Between the Lakes Landfill; Golden Pond, KY. Project Engineer responsible for redesigning the final grade of the supplemental cover for a non-permitted landfill at Land between the Lakes. Redesigned the configuration of a portion of the landfill for positive drainage and to eliminate excessive settling of the existing cap, provided construction stake out, and prepared as-built drawings. Assisted in groundwater sampling and editing the reports.

1998: LMES-HAZWRAP; Landfill Reclamation and Protective Cover to Address/Avoid Notices of Violation, Abandoned Landfill No. 7; Fort Campbell, KY. Civil Engineer supporting remedial activities at Fort Campbell. Redesigned the final topography and surrounding channels. Supervised construction of the channels and placement of riprap along with construction stakeout of the final cover. Conducted pre-construction site preparation for the new troop medical and dental facility. Duties included site characterization and design of removal of landfill debris, QA/QC sampling to determine if all the debris was removed and whether any contaminants had leached into the soil beneath the landfill, and supervising disposal of the excavated debris at Landfill 7.

1998: LMES-HAZWRAP; FP; Fort Campbell IDW Yard; Fort Campbell, KY. Project Engineer for the design of the Investigative Derived Waste (IDW) Facility at Fort Campbell. Designed the IDW yard site layout. Prepared the site grading/drainage plan and road design and sited a pre-fabricated metal building and a truck/drill rig washing facility.

1997-1998; LMES-HAZWRAP; Fort Campbell Landfill No. 9; Fort Campbell, KY. Project Engineer supporting remedial activities at Fort Campbell. Redesigned the final cover configuration, drainage system, and access roads for this non-permitted site, which was constructed prior to current regulatory requirements. Prepared the initial construction layout and as-built drawings.

1994-1996; Construction Demolition Landfill Services, Inc.; Poplar View Landfill; Knoxville, TN. Project Engineer for the planning, investigation, design, and permitting of a 26-acre Class IV RCRA Subtitle D construction/demolition landfill in Knox County. Responsible for the design, construction, construction monitoring, initial daily supervision, and certification documents for the Poplar

View Landfill. Investigations included the hydrogeologic investigation with the associated modeling and the construction of the geologic buffer required to satisfy siting requirements.

LMES: K-25 Powerhouse Demolition Project, Oak Ridge, TN. Project Engineer responsible for surveying sampling locations to support decontamination and decommissioning activities. Materials characterized included all insulation, building components and surfaces, wire, roofing material, floor mastic, oils, grease, paint, lead containing materials, and mercury switches. Materials were sampled for the presence of radiological emissions, PCBs, lead, chromium, cadmium, mercury, and asbestos. The surface area of the buildings requiring characterization exceeded 1,000,000 square feet.

1994; Lockheed Martin Energy Services, Inc.; Oak Ridge, TN. Project Engineer for conducting three conceptual designs for Subtitle D Class IV landfills within the K-25 site. This included addressing site access, placement of wastes, and operational and cover requirements for a substantial quantity of demolition debris. Responsible for conceptual designs for landfills at the K-25 site for disposal of wastes to be generated from decommissioning and demolition activities.

1994; IMCO Recycling, Inc.; IMCO Landfill Design; Rockwood, TN. Project Engineer for the planning, investigations, design, and permitting of a 150-acre Subtitle D, Class II Industrial Landfill in Roane County. Responsibilities included the conceptual design, hydrogeological investigation using computer modeling, and design to contain and dispose special industrial waste that produces heat and ammonia when exposed to water. Design included ponds, roads, and disposal cells using EPA's HELP computer model.

1994-2000; Jacobs Engineering Group; Jacobs EM Team; Oak Ridge, TN. Civil Engineer supporting the Jacobs EM Team. Determined capping requirements and stormwater impacts for the feasibility study for Bear Creek Valley Project at the Y-12 Plant. This site included numerous waste disposal areas, and analysis indicated that contaminants were migrating off site.

1993-1996; Tennessee Valley Authority; TVA Landfill Closure Plans; New Johnsonville, TN. Project Engineer for the design and preparation of closure plans for TVA landfills in TN and KY. Responsible for the site investigation, RCRA corrective action design, construction QA/QC during remedial actions, and closure certification for a 2-acre Class IV demolition landfill contaminated with TCE. Work included site characterization and engineering design to minimize/prevent migration of TCE from contaminating the groundwater beneath the site.

1993-1996; Construction Demolition Landfill Services, Inc.; Ridgeview Landfill; Knoxville, TN. Project Engineer for the planning, investigation, design, and permitting of a 16-acre Class IV RCRA Subtitle D construction/demolition landfill in Knox County. Responsible for the design, construction, construction monitoring, initial daily supervision, and certification documents for Ridgeview Landfill. Investigations included the hydrogeologic investigation with the associated modeling and addressing zoning issues.

Lockheed Martin Energy Systems, Inc., Hazardous Waste Remedial Action

Program: Oak Ridge, Tennessee. Project civil engineer for remediation projects at Fort Campbell, Kentucky. For Landfill 9, redesigned the cover/cap, drainage system, and roads for this non-permitted site, which was constructed prior to current regulatory requirements. Prepared the initial construction layout and as-built drawings. For Landfill 7, redesigned the cap and surrounding channels. Supervised construction of the channels and placement of riprap. This project resulted in considerable savings to the client partially because the channels were designed to use existing drainages. The client and USACE were very pleased with the success of this project and awarded STEP another contract to construct an additional 500 feet of channels. Designed investigation derived waste site. Prepared the site grading/drainage plan and road design and sited a pre-fabricated metal building and a truck/drill rig washing facility. This site was designed to facilitate decontamination onsite for regulatory driven investigations, resulting in more rapid decontamination of equipment and shorter field investigations. Conducted pre-construction site preparation for the new troop medical and dental facility, which is to be built on an old landfill. Duties included site characterization and design of removal of landfill debris, QA/QC sampling to determine if all the debris was removed and whether any contaminants had leached into the soil beneath the landfill, and supervising disposal of the excavated debris. The project was completed in a brief time to allow construction of \$7.2 million clinic to proceed on schedule.

Tennessee Valley Authority: Knoxville, Tennessee. Project engineer responsible for redesigning the cap for a non-permitted landfill at Land between the Lakes. The landfill, which was constructed in 1984, pre-dated permitting requirements, but the State of Kentucky directed that it be characterized under CERCLA. Redesigned the cap for positive drainage and to eliminate excessive settling of the existing cap, supervised cap reconstruction, and prepared as-built drawings.

Construction and Demolition Landfill Services, Inc.: Knoxville, Tennessee.

Project engineer for the design, construction, construction monitoring, daily supervision, and certification documents for Ridgeview Landfill, an 18-acre Class IV landfill. Responsible for designing and supervising the construction of a stormwater impoundment. Also responsible for design of the cap, and the daily operation plan. The project included the treatment and disposal of 50,000 gallons of contaminated water and the design, construction, and construction supervision of a leachate control system.

U.S. Bronze Powders; Maryville, Tennessee. Project engineer for the site investigation, regulatory negotiations, remedial design, and remedial actions of an uncontrolled industrial disposal area containing buried drums, fugitive metallic waste, and concrete debris. This was one of the initial voluntary clean-up actions in the state and was based on our recommendation to the client to proceed before regulators required it.

1993-1996; Tennessee Valley Authority: Landfill Closure Plans; New Johnsonville, Tennessee. Project engineer for the site investigation, cap design, construction, QA/QC during remedial actions, and closure certification for a 2-acre Class IV demolition landfill contaminated with TCE. Work included site characterization and engineering design to minimize/prevent TCE from contaminating groundwater beneath the site.

1994-2000; Jacobs Engineering Group; Jacobs EM Team; Oak Ridge, Tennessee. Civil engineer for determining capping requirements and storm water impacts for the feasibility study for Bear Creek Valley at the Y-12 Plant. This site included numerous waste disposal areas, and analyses indicated that contaminants were migrating off site. This project was the pilot for the watershed approach to investigation and remediation and resulted in substantial savings to the client.

Metal Resources, Inc.; Loudon, Tennessee. Design engineer for redesigning a landfill in Loudon County for disposal of industrial waste producing heat and ammonia. The landfill was redesigned according to RCRA Subtitle C requirements in order to improve the efficiency and maintenance requirements of the initial design, and to reduce construction costs. The design included a double liner system; leachate collection and leak detection systems; ponds and impoundments for surface runoff; access roads; disposal cells, grading to promote positive drainage, control of gas migration, and a vegetative cover to minimize erosion.

IMCO Recycling, Inc.; Roane County, Tennessee. Design engineer for the design of a RCRA Subtitle C landfill near Midtown in Roane County. The first phase of the project was a preliminary investigation of the soils and a stream as well as conceptual design plans. The second phase consisted of conducting the hydrogeological investigation for the Part II permit application required by the Tennessee Division of Solid Waste Management. This investigation included 84 soil borings and the associated testing/evaluation of the samples, which were used to describe the subsurface conditions. Based on this information, the next phase entailed producing the engineering designs for a monolithic landfill. Although the regulations do not require such stringent designs for Class II industrial waste solid waste disposal facilities, this landfill was designed to meet the requirements of RCRA Subtitle C for hazardous wastes. The landfill was designed using two geomembrane liners in addition to the geologic buffer. Specific design elements included establishing the perimeter of the landfill, establishing final contours, balancing cut and fill, developing the phasing and sequencing plan, preparing the basin/ditch layout and hydrologic investigation, designing collection and diversion ditches, designing sediment impoundments, designing the leachate collection system, conducting a threatened and endangered species survey, and conducting a Phase I archaeological survey. A second conceptual design was prepared that specified having all waste disposal activities conducted under a moving shelter system on rails to keep the wastes dry. This design was proposed because the wastes produce ammonia gas when contacted by water. The site closure plan included provisions for management of the landfill gasses, erosion control, and grading for proper drainage.

Lockheed Martin Energy Services, Inc.; Oak Ridge, Tennessee. Project engineer for designing a landfill at K-25 for decommissioning and demolition activities.

Roane County; Roane County, Tennessee. Project engineer for the redesign, regulatory negotiation, leachate control, remediation, construction, and construction management of a 30-acre Class I solid waste landfill. Prevented discharge of leachate mixed with surface water into Watts Bar Lake for three months. Designed and constructed a 10,000,000 gallon holding pond. This project allowed the client to successfully comply with regulations by redesigning the operations and closure plan for the landfill. The closure plan included regrading the site to promote positive

drainage, a cover of vegetation in order to minimize erosion damage, and gas migration controls.

Tennessee Valley Authority; Gallatin, Tennessee. Project engineer responsible for construction quality control during remedial actions and closure certification for a 7-acre demolition Class II landfill containing asbestos.

Core Group, Inc.; 1989-1992
Vice President/Owner

Responsible for permitting, design, and environmental compliance for coal mines and landfills.

Kenwill, Inc.; Maryville, TN; 1981-1989
Vice President/Natural Resources

Served in progressive roles from Engineering Technician to Vice President of the Natural Resources Division. Responsible for permitting, design, and environmental compliance for coal mines and landfills.

G&B Nolan, Inc.; Lake City, TN; 1979-1981
Mining Consultant

Responsible for coal mine design and preparing mining permits to comply with applicable regulations.

Dixie Pine Coal; Lafollette, TN; 1978-1979
Engineering Technician

Assisted with coal mining permits and design.

Professional
Affiliations:

Registered Professional Engineer, Tennessee # 19235 (Registration 8/11/87)
Registered Professional Engineer, Kentucky #15560 (Registration 8/10/88)
Registered Professional Engineer, Georgia #028348 (Registration 12/31/02)

AWARDS:

In August 2000, Mr. Williams received the Award for Individual Excellence, presented by the Fort Campbell Environmental Restoration Staff.

⌘ Professional Profile



DOUG HAWN
STAFF ECOLOGIST / ENVIRONMENTAL SCIENTIST

Education: University of Tennessee, Knoxville
B.S., Wildlife and Fisheries Science, 1988

Professional
Training:

Asbestos Inspector
OSHA 40 Hour Hazardous Waste Operations Training and Refreshers
CPR/First Aid
Asbestos in Buildings: Inspector training and refreshers
Emergency Response

Mr. Hawn has diversified experience as an environmental scientist. He specializes in environmental assessments, regulatory compliance audits, field investigation, and environmental remediation. He has worked in 26 states as well as Guam, Midway Island, Germany, and Canada. Many of the regulatory audits were conducted for active manufacturing facilities to determine compliance with appropriate environmental regulations. He has performed many Phase I environmental assessments which typically involve site visits, record searches at regulatory agencies, and review of aerial photographs and old maps. Many of these assessments have been used to support property transfer agreements.

In addition to his field investigation and remediation experience, he also serves as analytical coordinator for many of STEP's projects. He is responsible for planning sampling requirements, and coordinating with field staff, laboratory personnel, and validators to ensure that samples are collected, shipped, and analyzed for the appropriate parameters.

Mr. Hawn has supported numerous projects for the DOD, including both construction and demolition activities, RCRA facility investigations, and remedial actions. For these projects, his responsibilities have included peer review of project documents, management of field activities, conducting confirmatory sampling, oversight of monitoring well installation, laboratory coordination and management of analytical data, and QA/QC. He has also prepared project deliverables such as work plans, corrective action plans and reports, sampling and analysis plans, and QA plans. In addition, as the Task Manager for UST projects, he has managed monitoring activities and the installation of groundwater monitoring wells, UST excavation and removal, and soil sampling during closure activities.

He performed building material characterization (asbestos, lead-based paint, PCBs, radioactivity) prior to the decontamination and decommissioning of several DOE buildings in Oak Ridge; prepared PAs/SIs for numerous contaminated areas at the DOE Savannah River Site for which he reviewed environmental assessments, investigated historical data, developed a sampling and analysis plan, and evaluated analytical data; and performed regulatory compliance for a feasibility study at a DOE facility which included wetlands and floodplains assessments, threatened and endangered species surveys, cultural and archaeological resources assessments, and ecological risk assessments.

Experience: Solutions to Environmental Problems, Inc., 1994 to present.
Oak Ridge, Tennessee
Environmental Scientist/Project Manager

2006: Corrective Measures Study for SWMU 170Z11; Fort Campbell, KY.

Provided peer review of the corrective measures study for the site of a former lubrication rack where free product and dissolved groundwater contaminants were a concern. Provided regulatory guidance during development of site-specific, qualitative cleanup goals to address contamination and protect human health and the environment. Five remedial alternatives were evaluated, and passive skimmers were selected as a cost-effective remedial strategy to meet remedial goals.

2005-2006: Tier II and Tier III Risk Assessment for the Old Hospital Complex, Ft. Campbell, KY.

Environmental Scientist and Task Manager responsible directing risk assessment and data management personnel during a large scale human health risk assessment involving over 600 soil samples. Work included analysis of risks to future residents and recreational users of the site from pesticide, metals, and semivolatile organic compounds in soil.

2005: Preliminary Site Investigation; Loudon, TN.

Project Manager responsible for an investigation of an old convenience store in support of a property transfer. Performed a site inspection, historical record search, and interviews of prior site tenants to determine the potential for future environmental problems. Prepared the Phase I report.

2004: Sinkhole Verification; Fort Campbell, KY.

Environmental Scientist during a project to verify the existence of over 90 sinkholes that were referenced in historical documents at Fort Campbell. Visited each site to assess whether stormwater flowed into the sinkholes, photograph each area, install markers, and collect survey data using GPS equipment.

2003-2004: Soil Removal at SWMU 15; Millington, TN.

Analytical Coordinator during a large-scale removal action of over 57,000 tons of petroleum-contaminated soil at a former fuel farm. Coordinated with laboratory personnel and the field team during collection and analysis of over 50 soil samples to ensure that all contaminated soil was removed.

2004: Bryan Village CAP A; Fort Stewart, GA.

Analytical Coordinator and member of the field team during installation of four groundwater wells, well sampling, and soil sampling around a former tank pit where fuel related contamination had been detected in the groundwater. Coordinated all sampling during the two week effort. Performed the majority of fieldwork at night to minimize disruption to the active fueling facility. Prepared the project workplan and provided peer review of other project documents.

1999-2003: USACE – Nashville District Groundwater Summary Report; Fort Campbell, Kentucky.

Data Manager responsible for preparation of the annual report summarizing analytical data collected from over 100 wells at various solid waste management units, one area of concern, and the Campbell Army Airfield. This report is used as a planning document to determine whether contaminant concentrations are increasing or decreasing, and to help determine future remedial strategies.

2003: Site Investigation at the Old Hospital Complex, Ft. Campbell, KY.

Environmental Scientist responsible for leading the field sampling team during an investigation to determine the presence and extent of contamination from previous activities at the Old Hospital Complex. Managed collection of both surface and subsurface soil samples using both direct push technology (Geoprobe) along with stainless steel spoons and trowels. Over 600 samples were collected and submitted to the analytical laboratory for analysis in accordance with Fort Campbell Standard Operating Procedures. Soil was also visually examined and field screened using a MiniRAE 2000 photoionization detector with a 10.6 eV lamp.

2002-2003; AIMTech; RCRA Facility Investigation at SWMU 39; Fort Stewart, GA. Environmental Scientist responsible for oversight during Geoprobe boring and monitoring well installation. Sampled existing and new wells, and soil for PAH and VOC analysis. Sampling was performed to investigate boundaries of a waste oil plume at the site. Assisted with preparation of the RFI report.

2002; AIMTech; UST/Heating Oil Tank Investigation; Fort Stewart, GA. Environmental Scientist during a subsurface investigation of underground fuel storage systems at Fort Stewart. Responsible for oversight of drilling personnel during installation of 32 monitoring wells. Collected soil and groundwater samples, and coordinated with laboratory and data validation personnel.

2002; AIMTech; RCRA Facility Investigation at SWMU 27, Open Burn/Open Detonation Unit, Fort Campbell, KY. Task Manager responsible for a RCRA Facility Investigation to determine whether residual contamination from explosives was present at the site. The task included developing and sampling 16 existing wells, and collecting 35 surface soil samples and 21 subsurface samples from 7 Geoprobe borings. Samples were analyzed for VOCs, SVOCs, energetics, sulfites, nitrates/nitrites, and total phosphorous. Coordinated transfer of lab data and with validation personnel. Also responsible for coordinating field efforts with UXO specialists to ensure that all project activities were conducted safely. Prepared the final project report.

2002; Phase I Environmental Audit for the Former Custom Pak Meats Property. Task Manager responsible for a Phase I audit in support of a property transfer for the Former Custom Pak Meats property in Knox County. Completed a site visit, personnel interviews to determine site history, and research at regulatory agencies to determine any past environmental problems at the site or with adjacent properties. Authored final phase I report.

Phase I Environmental Assessment for 17 Property Parcels in Knox County, TN. Task Manager responsible for a Phase I Environmental Assessment covering approximately 5.5 acres. Reviewed topographic maps of the area, property boundary information, environmental databases incorporating federal and state lists of contaminated sites, and local tax maps. Also contacted local fire and health departments to obtain information regarding underground storage tanks, spills, and reported health problems at the site or in the area. Reviewed historic aerial photographs of the site and vicinity, to obtain soil information, wetlands maps, and floodplain maps. Conducted a site visit to visually inspect the site for any evidence of environmental impairment, and identified building materials that could potentially contain lead based paint and asbestos. Phase II sampling was recommended.

2001; USACE – Mobile District; IDIQ Base Environmental Support Contracts.
Analytical Coordinator for two \$3M Base Environmental Support Contracts. Responsible for arranging laboratory analysis, coordinating with the data validator, and management of electronic databases containing results. Task orders under these contracts have included a deconstruction feasibility study, removal of asbestos and lead based paint-contaminated housing, a preliminary site assessment; removal of lead-contaminated waste piles; design of a waste treatment system; a RCRA facility investigation, and compilation of a yearly groundwater summary report.

2001; Environmental Site Assessment for the Bungalow Market Site; Maryville, TN. Task Manager for a Phase I Environmental Site Assessment. to determine whether potentially adverse environmental conditions were present. Reviewed local, state, and federal databases for listings of the property or of properties in the immediate area. Contacted local officials and employees of the facility to inquire about environmental conditions, and reviewed the history of the site. Authored final report.

2000-2001; USACE – Nashville District; Update to the Fort Campbell Generic Work Plan and Sampling and Analysis Plan. Task Manager responsible for the Generic Work Plan, and Sampling and Analysis Plan update. These documents are used by both Fort Campbell and subcontractor personnel. Mr. Hawn was lead author responsible for incorporation of new regulatory information, sampling techniques, and environmental investigation procedures.

1999-2001; Stokely/National Park Service; LeConte Lodge Wilderness Camp; Gatlinburg, TN. Lead Environmental Scientist during the inspection and sampling of kerosene-impacted soil within the fuel storage area. Responsibilities included coordination for approval with the State of Tennessee, Remediation Division of Solid Waste and the National Park Service on the Sampling and Analyses Plan and remediation alternatives.

1998-2001; USACE Nashville District; ID/IQ Contracts at Fort Campbell, KY. Environmental Scientist on over 30 tasks at Fort Campbell carried out under HTRW IDIQ contracts. Work included sampling and analysis, ecological risk assessments, data validation and interpretation, and environmental compliance studies and regulatory interface. Acted as laboratory and electronic data management coordinator for all Fort Campbell HTRW tasks. Part of the team that received the Fort Campbell Corporate Performance Award.

2000; USACE- Nashville; Environmental Assessment at the WJCW site, Gray, TN. Environmental Scientist responsible for sampling the WJCW radio station site where leaks from an old UST had impacted groundwater. Project activities included sampling three groundwater wells and surface water from a nearby stream. Samples were analyzed for TPH EPH.

2000; Environmental Audits; Alltrista Corporation. Lead Environmental Auditor responsible for routine environmental compliance and permit reviews at Alltrista facilities in FL, TN, IN, AK, IA, and SC. Responsible for site visits, interviews with key personnel, and review of analytical data. Ensured that all hazardous waste, solid waste, and wastewater management activities were in compliance with local, state, and Federal regulations.

1999-2000, Drakes Creek Project, Hendersonville, Tennessee. Environmental Scientist responsible for set up of sampling procedures and equipment during the Drakes Creek restoration project. Restoration was performed by dredging the creek in most areas to a depth of five feet, installing geotubes to contain dredged material, and use of bioengineering and conventional techniques for site restoration. Sampling was conducted to monitor the turbidity of the water in the creek.

2000; USACE – Nashville; AOC H, Fort Campbell, Kentucky. Environmental Scientist during collection of additional sediment and surface water samples (7 pairs, 14 total), update the existing Tier I Human health risk evaluation, update the existing Tier I Ecological Risk Assessment and conduct a Tier III Baseline Ecological Risk Assessment. Managed sampling activities and was responsible for coordination with the laboratory and data validator.

1999-2000; Skeet Range; Fort Campbell, Kentucky. Project Manager for the Phase I RFI. Responsible for sediment, surface water, and soil sampling to address lead and PAH contamination at the site. Coordinated data analysis and validation in accordance with the project work plan. Also responsible for report preparation, and an ecological assessment of the site based on EPA guidance.

2000; Solid Waste Management Unit 149x and 149y; Fort Campbell, Kentucky. Analytical Coordinator responsible for sampling equipment, tracking, and electronic data deliverables. Reviewed all analytical data and served as primary point of contact with laboratory personnel.

2000; Underground Storage Tank Investigation; Fort Stewart, Georgia. Environmental Scientist responsible for the construction oversight of eight groundwater monitoring wells at potentially contaminated sites. Conducted soil and groundwater sampling in accordance with the work plan, and served as primary point of contact for laboratory personnel.

1999-2000; USACE-Nashville District; Wastewater Treatment Plant Demolition and Characterization; Fort Campbell, KY. Environmental Scientist for the characterization and demolition of an abandoned wastewater treatment plant. Responsibilities included review of SOW with regard to regulatory issues (e.g., analytical methods, sampling techniques and decontamination), supporting the preparation of the Work Plan (reviewed and approved by the COE, EPA, and the Commonwealth of KY), management of the field activities (e.g., sampling, decontamination and coordination with Post personnel), coordination with the laboratories, management of analytical data, and report preparation.

Other representative projects at Fort Campbell with similar responsibilities include: Subsurface Investigation of SWMU 149 Oil Pits, Area of Concern D, and Ft. Campbell CAAF Groundwater Sampling.

1999; US Slate & Marble; Morristown, Tennessee. Lead Auditor during an Environmental Audit. US Slate & Marble was vacating a site for a new owner. Responsibilities included an on-site visit, review of documentation and existing environmental data, and interviewing key personnel.

1998-1999; USACE-Nashville District; Fort Campbell Battery Shop; Fort Campbell, KY. Regulatory Specialist/Environmental Scientist for confirmatory sampling at SWMU 163, Maintenance Battery Shop. Prepared the Work Plan, QA Plan, and Sampling and Analysis Plan for the removal/demolition of a battery shop.

1999; Lockheed Martin Energy Systems, Inc., Hazardous Wastes Remedial Action Program; Oak Ridge, Tennessee. Environmental scientist and regulatory specialist for remediation at Fort Campbell, Kentucky. Prepared work plan for Pumphouses 1 and 2 at Area of Concern A. The area was suspected to have fuel contamination. Work plan included Geoprobe sampling, soil borings, sampling existing monitoring wells, and installing new monitoring wells. Conducted field QA/QC, laboratory coordination, data analysis, and report preparation for a RCRA facility investigation at eight sites. Prepared the work plan, QA plan, and sampling and analysis plan for the removal and demolition of a battery shop. The site was suspected to have lead contamination. This project was especially challenging because it involved a combination of environmental investigation and construction activities. Coordinated the revegetation efforts for two landfill sites. Also responsible for coordinating laboratory activities and revegetation of a former landfill site that was used for building a new troop medical and dental clinic. This project was successfully completed in a very short time to allow construction of the building to begin.

1998-1999; Frederickson Truck Terminal, Knoxville, Tennessee. Project Manager and Lead Environmental Scientist for the removal of a 10,000 gallon UST which contained 2,400 gallons of diesel fuel. After excavation and removal of the tank, soil samples were collected from inside the pit and from the stockpiled soil. The Tennessee Department of Environment and Conservation approved the UST closure report for this site.

1997-present; Rice Oil Company; Caryville, TN. Project Manager and Lead Environmental Scientist for the installation of groundwater monitoring wells and soil sampling for an Environmental Assessment of underground storage tanks. Completed a Corrective Action Plan for the remediation of the site and negotiated with the UST Division of Tennessee Department of Environment and Conservation (TDEC) during all phases of the assessment and corrective action.

1995-1998; Westinghouse Savannah River Company (WSRC), Inc.; Aiken, South Carolina. Project manager and lead environmental scientist responsible for preparing preliminary assessments/site investigations at the DOE Savannah River Site. Investigated past uses of sites, developed and implemented sampling and analysis plan for three sludge application sites totaling over 70 acres, evaluated analytical data, and prepared reports. Managerial responsibilities included cost and schedule control, billing, interacting with the WSRC technical representative. By providing a more extensive review of existing data rather than conducting more sampling, costs to the client were reduced.

1995-1997; Ridgeview Landfill, Knoxville, Tennessee. Environmental Scientist during the planning, investigation, design, and permitting of a 16 acre Subtitle D construction/demolition landfill in Knox County, Tennessee. Investigations included a hydrogeologic study with the associated modeling; a threatened and endangered

survey, an archeological survey, and zoning surveys. Responsible for topographic surveying, quarterly groundwater sampling, and annual stormwater sampling.

1995-1997; Dutton Motors, Lenior City, Tennessee. Environmental Scientist for the UST project which included monitoring of 2 unpermitted UST pits in order to bring them into compliance. Two wells were installed, and the stockpiled soil was monitored. Clean closure approval was received following monitoring activities.

1996; Lockheed Martin Energy Systems, Inc.; Oak Ridge, Tennessee. Project scientist for building material characterization (asbestos, lead-based paint, PCBs, radioactivity) prior to D&D of the K-25 Power House, Building 1401, Building 1200, Building 1001, and Building 1037. This project was completed in a very rapid time (6 days per week, 10 hours per day) to save the client money by allowing the demolition team on the adjacent location to begin work on this site without the need for remobilization costs.

1994-1996; Lockheed Martin Energy Systems, Inc.; Oak Ridge, Tennessee. Environmental scientist responsible for regulatory compliance for the Bear Creek Valley feasibility study at the DOE Y-12 Plant. This investigation included wetlands and floodplains assessments, threatened and endangered species surveys, cultural and archaeological resources assessments, and ecological risk assessment. This project was the pilot for the watershed approach to investigation and remediation and resulted in substantial savings to the client.

1994; Geotek Drilling Co., Oak Ridge, Tennessee. Project Manager responsible for soil sampling during the closure in place of ten USTs at Oak Ridge National Laboratory.

*Ogden Environmental and Energy Services Company, Inc., 1989-1994
Knoxville and Oak Ridge, Tennessee
Environmental Scientist*

1991-1992; Ebasco Environmental; State of Mississippi. Environmental scientist on a team that conducted compliance surveys of more than 100 National Guard Armories in Mississippi. Survey assessed facilities for compliance with RCRA, CERCLA, TSCA, CAA, and other Federal regulations. This project was completed in a very short time, with results of the day's investigation being sent via modem to a central location for concurrent incorporation into a report.

1993; Stone and Webster; Oak Ridge, Tennessee. Environmental scientist for wastewater sampling at the Radford Army Ammunition Depot, Virginia. Determined sampling locations, set up continuous samplers, and collected samples. Used SW-846 methodology and maintained chain-of-custody. All field activities were conducted within an active ammunition facility.

1993-1994; U. S. Navy, Pacific Naval Facilities Command; Honolulu Hawaii. Field manager for inspections at three U.S. Naval facilities in Guam, Midway Island, and Hawaii. Inspected 900 structures for asbestos and lead-based paint in six weeks. Results were used for D&D of the buildings. This project was completed in a very

short time frame, involved extensive travel, and included both active and inactive facilities.

1991: Ogden Environmental Services Co.; San Diego, California. Environmental scientist for a PCB remediation project at an active oil field in remote areas in the Kenai National Wildlife Refuge in Alaska. This project involved sampling areas before, during, and after remediation and included more than 600 soil, water, oil, and wipe samples. Successfully coordinated activities of remediation contractor, oil field engineers, laboratory personnel, and U.S. Fish and Wildlife Services, Region 7.

1989-1993; OSCO, Inc.; Nashville, Tennessee. Asbestos specialist in charge of asbestos surveys, bulk sampling, quantification of asbestos-containing materials, and cost estimates for asbestos abatement planning and removal for more than 15 million square feet of private, commercial, industrial properties in numerous states. This project involved extensive travel and difficult working conditions, sometimes in active hospitals.

Professional
Affiliations:

Society of Wetlands Scientists



Professional Profile

AMBROSE J. (JIM) MADAJ, P.G.
HYDROGEOLOGIST / PROGRAM MANAGER

Education: University of Oklahoma
B.S., Geology, 1985

Professional Training: OSHA 40-hour Hazardous Waste Operations Training
OSHA 8-hour Annual Refresher
OSHA 8-hour Confined Space Training
OSHA 8-hour Supervisor Training
OSHA 10-hour Construction Safety and Health

Mr. Madaj serves as Project Manager and Technical Advisor for projects at Fort Campbell and Fort Stewart. At STEP, he is responsible for coordination with the USACE - Nashville District and with Fort Campbell environmental personnel to ensure that all projects run smoothly. He is also responsible for allocating resources for simultaneous projects, review of reports to ensure technical accuracy, and ensuring that projects are completed on time and within budget. In addition, he works closely with client representatives and regulators to determine remedial options.

Mr. Madaj specializes in subsurface hydrogeology. During his career, he has installed over 1,000 wells at sites in AL, AR, CA, CO, FL, GA, IL, KS, ME, MI, MO, MS, NC, NM, NY, OK, SC, TN, TX, and WA. These wells have been installed in all types of soil and rock including fractured rock, crystalline rock, carbonate rock, sandy coastal soil, and mountainous areas. In addition, as part of a research study, Mr. Madaj installed temporary wells into coral areas near the Marshall Islands. He has drilled to depths of 1500 feet, and has used a variety of drilling technologies including horizontal and small-diameter wells. Regulatory experience includes a thorough understanding of EPA sampling and drilling guidance, as well as state-specific regulations. Using his knowledge of subsurface hydrogeology, he has managed and provided technical input on projects dealing with shallow and deep petroleum contamination, deep solvent contamination (up to 400 feet below ground surface at a site in California), and shallow pesticide and dioxin contamination.

Using his drilling and sampling expertise, Mr. Madaj has written procedures for these activities, and instructed others in soil, groundwater, sediment, and surface water sampling.

Experience: SpecPro Environmental Services, LLC (formerly Solutions to Environmental Problems, Inc.), Oak Ridge, TN. 1998 to present.
Program Manager/Senior Hydrogeologist.
Senior Project Manager

2006-2007; South Central Landfill; Fort Stewart, GA. Program Manager responsible for responding to a methane migration problem associated with an old landfill. Directed a geophysical survey and exploratory trenches to delineate the boundaries of an old disposal area. When sanitary debris was found outside the boundary of the landfill, was responsible for removal of over 50,000 tons of waste and appropriate disposal into an active cell. Installed a less permeable barrier using compacted borrow soil to prevent methane migration off site.

2005-2006; Tank Support; Robins Air Force Base, GA. Project Manager responsible for evaluating and installing Stage 1 vapor recovery at three locations, correcting tank deficiencies at 30 locations, performing tank vapor and interstitial monitoring at 90 wells in 17 different locations, and providing Robins AFB with technical support as needed. Mr. Madaj ensured that all specifications were met, and coordinated with the Robins AFB Contracting Officer and Robins AFB Environmental Management Resources Division.

2006; Corrective Measures Study for SWMU 170Z11; Fort Campbell, KY. Project Manager for the corrective measures study for the site of a former lubrication rack where free product and dissolved groundwater contaminants were a concern. Directed development of site-specific, qualitative cleanup goals to address contamination and protect human health and the environment. Evaluated five remedial alternatives, and ultimately selected passive skimmers as a cost-effective remedial strategy to meet remedial goals.

2003-2005; Investigation, Risk Assessment and Corrective Measures Study for the Old Hospital Complex Site; Ft. Campbell, KY. Project Manager responsible for directing the collection of over 600 soil samples, and a subsequent human health risk assessment and corrective measures study for a 70-acre site contaminated with pesticides and SVOCs.

2005; Oil/Water Separator Directory; Ft. Campbell, KY. Project Manager responsible for confirming active or closure status of oil water separators at more than 100 sites across Ft. Campbell. Directed the update of information and photographic documentation in the directory to ensure accurate listings.

2005; Review of Land Use Controls; Ft. Stewart, GA. Project Manager responsible for completing a five year review of existing documentation for nine sites at Fort Stewart to determine the effectiveness of corrective action and institutional controls. Directed site visits and research for three inactive landfills, 4 closed EOD sites, a former fire training area, and a tanker purge station to determine whether chosen remedies had functioned as intended and whether exposure assumptions were still valid. Provided senior review of the final report.

2004-2005; Interim Action and Corrective Measures Study at SWMU 39, Ft. Stewart, GA. Project Manager responsible for interim action at a site used for vehicle service. A pilot study was conducted using multi-phase extraction to remediate both waste oil and solvent contamination as an interim measure. The corrective measures study evaluated several options including the following remedial technologies: passive skimmer pumps, active skimmer pumps, multi-phase extraction, and excavation of the area containing free product. In addition, the in-situ groundwater remediation technologies evaluated in the study were monitored natural

attenuation, hydrogen peroxide injection, bacteria injection, oxygen injection, hydrogen injection, and soil vapor extraction.

2004: AST Repairs; Fort Campbell, KY. Senior Project Manager responsible for providing oversight and coordinating with facility representatives during repairs for large aboveground tanks used for bulk fuel storage at three separate sites at Fort Campbell. Work included repairs to piping and structural supports, as interior tank cleaning and welding repairs. Much of this project involved confined space entry for personnel in up to Level C PPE.

2004: Removal of 33 Heating Oil Tanks within the Main Cantonment Area and Campbell Army Airfield; Fort Campbell, KY. Senior Project Manager responsible for allocating resources and oversight during removal of 33 underground heating oil tanks (six tanks in Kentucky, 27 tanks in Tennessee). Directed excavation and removal of tanks, contaminated soil removal, and confirmatory sampling in accordance with Kentucky and Tennessee requirements. Removal was completed ahead of schedule. Recommended clean closure for 28 tank sites, the remaining five will require further action to meet cleanup criteria.

2004: Convault Replacement; Fort Campbell, KY. Senior Project Manager for the time critical removal and replacement of an 18,000 lb. aboveground tank supplying fuel to the generator for runway lights at Fort Campbell. Under his leadership, fieldwork was completed ahead of schedule in just two days, and the use of a temporary tank ensured no interruption for the services of the generator.

2003: Free Product Recovery at Campbell Army Airfield, Fort Campbell, KY. Project Manager for an ongoing product recovery effort at the Campbell Army Airfield. Directed the installation of a solar-powered product recovery pump, which automatically seeks the oil/water interface. The unit is portable and is used for pockets of groundwater contamination and hard to reach areas. Because groundwater can fluctuate as much as 20 feet at the airfield, the automatically adjusting pump reduces monitoring and maintenance that would be required with fixed pumps.

2003: Removal of Small Arms Ammunition at Fort Campbell, KY. Project Manager responsible for coordinating removal services when an area of buried small arms ammunition was identified at Fort Campbell. Provided oversight for the UXO subcontractor, and coordinated all activities with Fort Campbell representatives. Directed project personnel during excavation and removal of 3,240 rounds of .3 caliber and five rounds of .5 caliber ammunition. The ammunition was transported to the Clean Harbors Colfax facility in Louisiana, with all appropriate hazardous waste manifest documentation. Following removal, UXO specialists conducted a sweep of the area to confirm removal.

2002: USACE – Nashville District: Phase 4 RFI at Campbell Army Airfield for Bravo Parking Apron and Solid Waste Management Unit 41; Fort Campbell, KY. Project Manager for an RFI involving the installation of two groundwater monitoring wells at SWMU 41 and the completion of three soil gas surveys at Campbell Army Airfield to delineate the extent of subsurface fuel contamination. Results were used in a human health risk assessment. Responsible for coordinating field activities and review of final reports.

2002: AIMTech: RCRA Facility Investigation at SWMU 27, Open Burn/Open Detonation Unit, Fort Campbell, KY. Project Manager responsible for a RCRA Facility Investigation to determine whether residual contamination from explosives was present at the site. The task included developing and sampling 16 existing wells, and collecting 35 surface soil samples and 21 subsurface samples from 7 Geoprobe borings. Samples were analyzed for VOCs, SVOCs, energetics, sulfites, nitrates/nitrites, and total phosphorous. All field efforts were coordinated with UXO specialists to ensure that all project activities were conducted safely.

2001-2002; USACE – Nashville District; Oil/Water Separator Removal, Ft. Campbell, KY. Project Manager responsible for oversight during removal of 42 oil/water separators. Removal activities included demolition of below ground structures and the associated influent and effluent piping. Pits were overexcavated and confirmatory samples were collected and analyzed for VOCs, SVOCs, RCRA 8 Metals, and PCBs.

2001; USACE – Nashville District; Various Projects Involving Fuel Releases at the Campbell Army Airfield, Fort Campbell, KY. Project Manager responsible for addressing fuel releases to soil and groundwater near Pumphouse 1, Pumphouse 2, and Hangar 3 at the Campbell Army Airfield. Free product recovery at the two pumphouses was performed using vapor extraction and skimmer pumps. Over the first 11 weeks, over 11,000 gallons of fuel were recovered.

2000-2002; AIMTech, UST Investigation, Fort Stewart, GA. Project Manager responsible for oversight to determine the extent of contamination related to UST and heating oil tanks at Fort Stewart. Project activities included installation of groundwater monitoring wells, and soil and groundwater sampling to determine the extent of VOC and PAH contamination.

2000; USACE – Nashville District; Investigation of Oil Pit sites at SWMU 149. Project Manager during investigation of 40 suspected oil pits used for vehicle maintenance fluids. Intrusive investigation activities included verification of the presence of the oil pits, removal of contaminated soil from two of the sites, installation of groundwater monitoring wells, and soil sampling. Worked with client representatives to determine remedial options.

2000; USACE – Nashville District, Pumphouse 1 Fuel Reconnaissance and Pipeline Repair, Fort Campbell, KY. Project Manager during pipeline repair near Pumphouse 1 at Fort Campbell. During April 2000, tracer testing on the active fuel line near the Pumphouse indicated the presence of a fuel leak. Project activities included excavating to a depth of 8 feet to expose the pipeline in the suspected leak area. Sampling was performed to determine appropriate disposal.

1999-2001; USACE-Nashville District: RFI and Corrective Action– Skeet Range; Fort Campbell, KY. Project Manager for RFI activities to characterize surface soil, sediment, and surface water contamination. Surface soil samples, surface water, and sediment samples were collected and analyzed for TCL PAHs and TAL metals. Responsible for project management, client interface, technical direction and oversight during removal of the top 18 inches of soil from the site.

1999-2000; USACE-Nashville District; Update Generic WP and SAP: Fort Campbell, KY. Project Manager responsible for revision of the Fort Campbell Generic Work Plan and Standard Sampling and Analysis Plan to reflect changes in regulatory requirements and better understanding of site conditions.

1999-2000; USACE-Nashville District; Fort Campbell Pump House RFI; Fort Campbell, KY. Project Manager conducting sampling to determine the presence or absence of fuel contamination. Two groundwater wells were installed. Surface and subsurface soil samples were collected and analyzed for TCL VOCs, SVOCs, TAL metals, and TPH and geotechnical parameters. Responsible for project management and technical oversight.

1999-2001; USACE-Nashville District; PX Service Station RFI and CMS; Fort Campbell, KY. Project Manager for a Phase II and III RFIs to delineate the extent of soil and groundwater impact, determine the future movement of contaminants, assess potential risks to human health and the environment, and determine the requirement for corrective actions. Served as technical advisor when drilling activities unexpectedly encountered a large subterranean cave. Responsible for project management, client interface, and technical direction. Provided oversight for the corrective measures study to evaluate and select appropriate remedial methods.

1999; USACE-Nashville District; Fort Campbell 801st Oil Pit Investigation; RFI; Fort Campbell, KY. Project Manager for an RFI at SWMUs 134-137 to determine the presence or absence of groundwater contamination due to past practices at the motor pool. Performed a field investigation, installed 2 monitoring wells, and conducted sampling of soil and groundwater (analyzed for TCL VOCs, TCL SVOCs, PCBs and TAL metals). Responsible for project management, client interface, and technical direction and oversight.

1998-1999; LMES-HAZWRAP; Fort Campbell RFI (Master RFI); Fort Campbell, KY. Project Manager for several RFIs and confirmatory sampling investigations at Fort Campbell ranging from UST removals to complex RFIs that delineate/investigate complex underground fuel distribution systems. Attended meetings with state and federal regulatory agencies to expedite the review and approval of submitted plans and reports.

Ogden Environmental and Energy Services Company, Inc. (1995 – 1998); and Science and Technology, Inc. (1991-1995); Oak Ridge, TN.
Senior Hydrogeologist.

1991-1998; Lockheed Martin Energy Systems, Inc., Hazardous Waste Remedial Actions Program; Oak Ridge, Tennessee. Provided full-time technical support to HAZWRAP. Assisted in the effort to identify, control, and remediate environmental contamination resulting from past methods of storage, handling, and disposal of hazardous waste at military bases across the country. Prepared statements of work; reviewed business and technical proposals; reviewed work plans and technical reports; interacted with subcontractors, clients, and regulators; provided technical consulting support to the project manager; and provided technical oversight of field work. Ensured quality of all deliverables for CERCLA and UST projects. On several projects, acted as technical lead for the Air National Guards Rapid Response UST

Program. Supervised preparation of environmental assessment plans, environmental assessment reports, and corrective action plans. Trained personnel for environmental fieldwork including drill rig supervision and sample collection techniques. DOD facilities included McConnell Air Force Base, Loring Air Force Base, Maine, Columbus Air Force Base, Chanute Air Force Base, Tinker Air Force Base, Mountain Home Air Force Base, Fresno Air Terminal, and New York Air National Guard. Managed Rapid Response Investigation at McGhee Tyson Air National Guard Base in Tennessee. Prepared work plans, sampling and analysis plans, QA plans, health and safety plans, and the final report. Maintained projects within budget and interfaced with clients and regulatory agencies.

NUS Corporation, Tucker Georgia, 1988 – 1991
Project Manager

Planned, conducted, and supervised assignments. Estimated and scheduled work to meet completion dates. Directed assistants, reviewed progress and evaluated results, made changes in methods, and designed equipment. Designed cost-effective approaches to define the extent of contamination at various hazardous waste sites in an accurate manner and for developed feasibility remedial options. Developed site safety plans for all field personnel according to NUS directives as well as OSHA, NIOSH, and other health and safety guidelines. Other duties included project manager, field drilling manager, and sampling field team member on numerous hazardous waste site investigations. Conducted site inspections. Designed and implemented environmental sampling programs. Coordinated field activities and managed sampling teams. Prepared drilling bid specifications and supervised subcontractors in the drilling and installation of groundwater monitoring wells. Prepared site investigation and hydrogeologic reports for EPA. Specific NPL sites included National Southwire Aluminum, Kentucky; Lakeland Tanning, Florida; Zellwood De-listing Project, Florida; Valley Sanitation Landfill, Kentucky; Annicola Dump, Tennessee; Southwire, Georgia; Beckwith Dump, South Carolina; Ringold Chemical, North Carolina; and Caldwell Systems, North Carolina.

Tinker Air Force Base; Midwest City, Oklahoma. 1987-1988
Hydrogeologist

- Responsible for asbestos surveys and asbestos abatement at multiple sites.

Association of Central Oklahoma Governments (ACOG), Water Resources Division; Oklahoma City, Oklahoma. 1986 – 1987
Hydrogeologist

- Completed water resource studies to determine whether water supply resources were sufficient for surrounding populations.

U.S. Geological Survey (USGS), Water Resources Division. Oklahoma City, Oklahoma. 1982 – 1986
Hydrologic Technician

- Conducted hydrogeologic and surface water studies at sites in Oklahoma and the surrounding states.

Professional
Affiliations:

Professional Geologist, Tennessee #0516
Professional Geologist, Alabama #0612
Professional Geologist, Mississippi #624
Professional Geologist, Texas, #5147
Professional Geologist, Georgia # PG001805 (8/5/05)

Awards:

Received the "Award for Individual Excellence, for exceptional individual professionalism, dedication, and loyalty demonstrated in support of the Installation Restoration Program, Fort Campbell, Kentucky during the period of October 1, 2000 through September 30, 2001" presented by the Fort Campbell Environmental Restoration Staff, 6/27/01.



⌘ Professional Profile

BRIAN ODOM, PG
GEOLOGIST/ SITE SUPERINTENDENT

Education: Auburn University, Auburn, AL
B.S., Geology, 1999

SOUTH BALDWIN CENTER FOR TECHNOLOGY: Robertsdale, AL
Drafting Certificate, 1992

Professional
Training:

- OSHA Hazwoper 8-hour refresher
- OSHA 10-hour Construction Safety and Health Course
- Georgia Level 1A Land Disturbance Qualified Personnel Training
- Design, chemical cleaning, disinfection, and redevelopment of water wells
- OSHA Hazwoper Supervisor training (Shaw)
- OSHA Hazwoper Supervisor training (IT Corporation)
- OSHA Hazwoper 40-hour training

Experience: *SpecPro Environmental Services, LLC (formerly Solutions to Environmental Problems, Inc.), July 2005 to present.*
Geologist/Site Supervisor

2007; Lube Rack Investigation, Ft. Campbell, KY. Project Geologist responsible for soil sampling to determine the presence or absence of contamination in support of Shaw Environmental's Performance Based Contract.

2006-2007; Tank Support: Robins Air Force Base, GA. Project Manager responsible for coordinating personnel and resources during the project. Tasks included performing regulatory compliance inspections on every tank at Robins AFB, correcting tank deficiencies, and providing technical support to the Robins AFB Tank Program Manager to ensure regulatory compliance was maintained.

2006; Ash Pond 2 Closure and Pond 3 Subgrade Development at Georgia Power's Plant Arkwright, Macon, GA. Safety Officer and Site Superintendent responsible for oversight of the field crew during removal of over 120,000 cubic yards of fly ash and associated water from Ash Pond #2. The ash was dried and transported to Pond #3, where it was consolidated and graded in preparation for a final clay cap. Because the two ponds were located ¾ mile from each other, STEP constructed a temporary haul road, and installed silt fence, culverts, ditches and check dams to protect sensitive wetland areas from excessive sediment. The project was completed within budget and ahead of schedule.

2006; Free Product Study; Campbell Army Airfield, KY. Project Geologist during an investigation of the extent of free product contamination in the subsurface

at Campbell Army Airfield. Work included oversight of drilling and sampling teams during installation of soil borings and monitoring/extraction wells.

2005-2006: Tank Support: Robins Air Force Base, GA. Site Supervisor and Safety Officer responsible for coordinating personnel and resources during the project. Tasks included evaluating and installing Stage 1 vapor recovery at three locations, correcting tank deficiencies at 30 locations, performing tank vapor and interstitial monitoring at 90 wells in 17 different locations, and providing Robins AFB with technical support as needed.

2005: Hurricane Katrina Emergency Response: Gulfport, Wiggins, Saucier, and Lyman, MS. Regulatory Specialist during cleanup and removal of 92 damaged transformers from four cities in Mississippi as part of the Hurricane Katrina relief effort. Within one day of receiving project requirements, mobilized with a 12-person team. Work included removal of transformers, oil spill cleanup, and removal of contaminated soil. Responsible for preparation of spill cleanup and decontamination records. Authored final report.

2005: Confirmatory Sampling at 160th Special Operation Aviation Regiment Area, Ft. Campbell, KY. Project Geologist responsible for soil and groundwater sampling to determine the presence or absence of contamination after reports of petroleum odors during a geotechnical investigation.

Shaw Environmental and Infrastructure; 2003- 2005; Knoxville, TN
Scientist II (E06)

Site Supervisor for the Moody Air Force Base Total Environmental Restoration Contract (TERC) Project in Valdosta, GA.

- Presidents Award was given to the project for its contribution to the OMAHA TERC II program reaching 1500 days with no lost time accidents.
- Presidents Award was given to the project for its contribution to the OMAHA TERC II program reaching 1,000,000 hours with no lost time accidents.
- Received a letter of commendation from the U.S. Army Corps of Engineers Project Manager for the Moody AFB Environmental Restoration Program

IT Corporation/Shaw Environmental and Infrastructure, Inc.; 2002-2003; Knoxville, TN
Engineer/Scientist I (E04)

Site Supervisor for the Moody Air Force Base (TERC) Project in Valdosta, GA.

- Received the Commander-in-Chief's Installation Excellence Special Recognition Award.

IT Corporation; June 2000 – March 2002; Knoxville, TN
Senior Assistant Engineer/Scientist (E03)

Assistant Site Supervisor, Lead Field Geologist, and Site Health and Safety Officer
for the Moody Air Force Base (TERC) Project in Valdosta, GA.

IT Corporation; January 2000 – June 2000; Knoxville, TN
Assistant Engineer/Scientist (E02)

Staff Geologist for the Redstone Arsenal (TERC) Project in Huntsville, AL.

Briggs and Stratton Corporation; November 1998 – December 1999; Auburn, AL
Assembly Worker/Equipment Operator
Assembled Briggs and Stratton small air-cooled engines. In addition, served on the
communication team in the employee involvement program.

City of Foley; June 1990 – September 1998; Foley, AL
Maintenance Worker/Equipment Operator
Served as a maintenance worker and equipment operator for the City of Foley. Duties
included maintaining all of the city's athletic fields and swimming pools. In addition,
maintained and operated front-end loaders, tractors, and backhoes.

Professional
Registrations

Professional Geologist, Tennessee #5137, August 2005
Professional Geologist, Georgia #1858, November 2006
Professional Geologist, Kentucky #2412, February 2007

CLARK A. ROBERTS, C.I.H.

Areas of Expertise

- ✓ Risk Management
- ✓ Regulatory Compliance Assessment
- ✓ Quality Assurance Audits
- ✓ Sampling & Analytical Procedures
- ✓ Data Validation and Verification

Mr. Roberts has more than 23 years of progressive experience in developing solutions to client needs in the areas of regulatory, operational, and liability risk management. He is experienced in developing specifications for hazard abatement and managing technical and professional personnel. Mr. Roberts has developed national policies and programs for the U.S. Navy and U.S. Department of Energy (DOE) in management of occupational health issues. Mr. Roberts has performed over 500 occupational workplace investigations and reviews, including asbestos, lead and chemical exposure investigations; accident/fatality investigations, regulatory compliance assessments, remedial site investigations, and a variety of performance based evaluations. As a former compliance officer for the Occupational Safety and Health Administration (OSHA), Mr. Roberts has significant experience with determining potential exposure to health and safety hazards, setting appropriate exposure limits, recommending controls, and assessing the effectiveness of existing program efforts. Mr. Roberts is also an EPA Accredited asbestos building inspector, management planner and abatement designer.

Education

M.S., Public Health, University of Illinois, Chicago, 1983
B.S., Chemistry and Biology, Heidelberg College, 1978

Certification and Registration

Certified Industrial Hygienist, 1988 (#3957)
Registered Environmental Assessor, California, 1990 (#3000)
Licensed Asbestos Consultant, Texas, 2004 (#105654)

Project Experience

- ♦ PROJECT INDUSTRIAL HYGIENIST, ALAMODOME STADIUM PAINT REMOVAL AND FACILITY UPGRADE PROJECT, SAN ANTONIO, TX.

Developed and implemented the site specific health and safety plan, lead compliance plan and environmental protection plan for the \$1.6M project. Working with engineering and architectural staff, developed technical approaches to removal of existing lead-containing paint on the entire building exterior while protecting workers from lead exposures in excess of the OSHA Action Level. Paint removal operations were conducted at heights exceeding 220 feet in some areas of the stadium, necessitating use of specialty scaffolding, man lifts and crane supported work platforms. Performed oversight on all worker and environmental monitoring for lead exposure and release to the environment. Designed final clearance methods and procedures to document removal of lead-containing paint.

- ♦ PROGRAM INDUSTRIAL HYGIENIST, NIKE SITE/FUDS INVESTIGATIONS, US ARMY CORPS OF ENGINEERS, LOUISVILLE DISTRICT.

Clark A. Roberts

Performed technical review and direction for development of site specific health and safety plans for NIKE site investigations at several locations. Potential hazards of interest involved chemical, as well as physical agents, including radionuclides. Developed activity hazard analyses (AHA) for all definable features of work, including soil boring, monitoring well installation and heavy equipment operations.

- ♦ PROGRAM SAFETY AND HEALTH MANAGER, WHITE ALICE SITE DEMOLITION AND REMOVAL ACTION, US ARMY CORPS OF ENGINEERS, ALASKA DISTRICT, ST. LAWRENCE ISLAND, AK. Responsible for the development, implementation, oversight, and enforcement of the Site Safety & Health Plan (SSHP), that implements appropriate engineering controls, work practices and personal protective equipment for material handling, container loading/unloading, demolition, excavation, asbestos abatement, lead materials removal, PCB waste removal, hazardous waste sampling & characterization, construction debris cleanup and waste removal. Performed in-depth activity hazard analysis, asbestos/lead abatement oversight, verification of air monitoring and site clearance activities.
- ♦ PROGRAM MANAGER, REMEDIAL ACTIONS/LONG TERM MONITORING PROGRAM, US NAVY FACILITIES ENGINEERING COMMAND, SOUTHERN DIVISION. Responsible for environmental investigations, asbestos bulk sample surveys, industrial hygiene monitoring, geophysical investigations, remedial plans & designs, abatement plans, quality control, budget, and contract administration for Navy sites in south Texas.
- ♦ PROJECT MANAGER, BATTELLE PNNL, for providing technical support to US Department of Energy (DOE) Headquarters Office of Worker Health and Safety. Support included environmental health and safety program audits and reviews at major DOE sites to determine contractor compliance with DOE policies, requirements and performance standards. Provided program and field support to EH-51 for implementation of the DOE-VPP program to supplement the DOE Integrated Safety Management System program.
- ♦ COMPLIANCE SAFETY AND HEALTH MANAGER FOR THE US DEPARTMENT OF LABOR - OSHA. Managed a team of safety engineers and industrial hygienists to perform workplace inspections/investigations for compliance with standards for occupational safety and health protection, including asbestos, lead, benzene and other toxic materials. Conducted accident/fatality investigations in maritime, general industry and construction environments.
- ♦ DIRECTOR OF SERVICES - MCCRONE ENVIRONMENTAL SERVICES. Managed the western region staff of 12 science professionals to meet client needs in the areas of environmental consulting, industrial hygiene surveillance, and regulatory compliance. Established analytical services and developed the quality assurance/control program for accreditation from the National Institute of Standards & Technology (NIST) and the National Voluntary Laboratory Accreditation Program (NVLAP).
 - o Managed and Performed bulk material sampling surveys in government facilities, administrative buildings, laboratories, communications centers and high-rise commercial office complexes. Managed surveys for facilities up to 2 million square feet.
 - o Managed and performed asbestos abatement oversight and 3rd party air monitoring in government facilities and commercial buildings. Managed contracts up to \$6M.
- ♦ HEALTH AND SAFETY ADVISOR FOR THE ACCESS AND RISK MANAGEMENT PROGRAM (ARMP) FOR THE STATE OF HAWAII KAHŌ'OLawe ISLAND RESERVE COMMISSION (KIRC). The project consisted of assisting the KIRC in developing and implementing the program to guide operations and control access into the Kaho'olawe Island Reserve, evaluating potential

Clark A. Roberts

unexploded ordnance (UXO) risks that users may encounter, and implementing controls to mitigate UXO risks. Developed the draft ARMP for public safety concerns.

- ♦ PROJECT MANAGER FOR SUPPORT TO THE US ENVIRONMENTAL PROTECTION AGENCY PROGRAM "REMEDIATION OF LEAKING UNDERGROUND STORAGE TANKS". Developed the program Health & Safety Management Plan, Quality Assurance Management Plan, Quality Assurance Program Plan and multiple site specific health and safety plans for projects in NY, NM, AZ, CO, CA, WA and ID.

Training

AHERA Asbestos Inspector (1988 & 2004)
AHERA Asbestos Management (1988 & 2004)
Asbestos Abatement Designer (1988 & 2004)
ATSDR Public Health Assessment & Risk Communication (2003)
Mitigation Techniques for Microbial Contamination in Indoor Environments (1998)
ISO 14001 Environmental Management Systems Auditing (1997)
Hazardous Waste Operations and Emergency Response, 40 hour (Current)
Hazardous Waste Operations and Emergency Response Supervisor, 8 hour (Current)
Safety and Health Management for Construction Activities (1994)
Confined Space Entry Operations (1986)
Advanced Techniques for Workplace Ergonomic Assessments (1995)

APPENDIX G

Excerpts from the SES S&H MANUAL

Confined Space Entry
Electrical Safety Program and Lockout/Tagout
Excavation Safety
Fall Protection
Hazard Communication
Personal Protective Equipment
Tool Box Safety Meetings



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15.0 CONFINED SPACE ENTRY POLICY

15.1 OBJECTIVE

The purpose of this procedure is to outline the minimum health and safety requirements for work performed in or around confined spaces. This procedure complies with measures specified in the OSHA Permit Required Confined Spaces Standard, 29 CFR 1910.146.

15.2 SCOPE

This procedure is applicable to all employees and contractors of SES who will be required to enter confined spaces to perform any job function.

15.3 RESPONSIBILITIES

SES will assess all confined spaces throughout the worksites, evaluate each as to whether they are permit-required confined spaces (PRCSs), and institute necessary controls and procedures to reduce or eliminate hazards prior to entry. SES will provide confined space entry information and training, entry equipment, and personal protective equipment to the employees who work in designated permit-required confined spaces. The Confined Space Entry Program also applies to contractors working on the premises. Responsibilities are defined by individual below.

15.3.1 Corporate Safety & Health Manager

- Coordinate and manage the overall written Confined Space Entry Program.
- Specify the types of entry-related equipment to be used.

15.3.2 Site Superintendent

- Evaluate entry procedures by performing a hazard evaluation for each PRCS (Attachment 15-1).
- Ensure confined space rescue services are available for the project duration.
- Review all confined spaces on the site and the hazard evaluations for each space (Attachment 15-1) with rescuers.
- Revise entry procedures prior to subsequent entries whenever there is reason to believe the program is deficient in protecting employees.
- Make the written program available to employees.
- Coordinate confined space entries with the SSHO.
- Ensure all applicable employees have received Confined Space training.
- Require that all Contractors who will be entering PRCSs provide confirmation that their employees have received PRCS entry training.

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- Conduct investigations of Confined Space entry accidents/incidents.

15.3.3 Site Safety and Health Officer (SSHO)

The SSHO will act as the Confined Space Entry Supervisor, and their responsibilities include the following:

- Ensure proper implementation of the Confined Space Entry Program.
- Ensure direct reading instrumentation for monitoring of confined spaces is available and maintained in proper condition.
- Maintain all training records for authorized personnel.
- Provide assistance as requested by the Program Administrator or other individuals.
- Advise Corporate Safety and Health Manager of any program deficiencies noted requiring his/her action or involvement.
- Ensure all affected employees in their work area comply with all elements of the Confined Space Entry Program.
- Discuss and document Confined Space Entry concerns prior to entry.
- Ensure that all known or potential confined spaces are reviewed to determine the type and level of hazards associated with the space.
- Enforce the confined space procedures.
- Ensure all personnel have received proper training in confined space entry procedures and proper use of safety retrieval and emergency equipment.
- Complete and sign the confined space entry permit.
- Ensure confined space entry permits are posted and that a confined space attendant is present during all PRCS entry activities.
- Ensure all necessary safety retrieval equipment for confined spaces is on-site, operational and properly used.
- Ensure the site is properly posted and flagged.
- Conduct an on-site pre-entry briefing with all entrants and attendants prior to the start of the job.
- Cancel the permit whenever the activity is finished or a condition that is not allowed by the permit arises in or near the space.
- Verify the appropriate entries have been made on the permit, that all tests specified by the permit have been conducted and that the procedures and equipment specified by the permit are in place before endorsing the permit and allowing entry to begin.

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15.3.4 Authorized Attendant

The attendant is to be stationed outside the confined space and monitor all entrants located inside the confined space. Attendants shall have the following duties:

- Remains in constant two-way communication with entrants either by verbal or visual contact, or through verbal radio communication.
- Provides standby assistance to occupants when entering or exiting the confined space.
- Directs occupants to immediately evacuate the confined space when:
 1. Conditions arise that are outside the scope of the entry permit, or present unacceptable levels of hazard,
 2. Unauthorized personnel enter the area,
 3. Behavioral changes are detected in the entrant,
 4. Air monitoring equipment detects unacceptable oxygen, flammable or toxic levels,
 5. The attendant must leave the work area,
 6. The attendant detects or suspects a breakdown in communication with the entrants, or
 7. If an emergency signal or alarm is sounded.
- Initiates emergency response procedures in the event that an entrant must be rescued from the confined space, and provides emergency rescue personnel with pertinent information related to the emergency situation to facilitate rescue of the entrants.
- Monitors for internal and external conditions that could adversely effect the continued operations inside the confined space.
- Remains at the entry point unless relieved by another authorized attendant.

15.3.5 Authorized Entrants

- Maintains effective continuous contact with the attendant.
- Evacuates the confined space when prompted by the attendant or when additional hazards are noticed.
- Reviews the entry permit with the attendant and supervisor-in-charge to resolve any concern or questions.
- Communicates with the authorized attendant to enable the attendant to monitor entrant status and working conditions within the permitted space.

15.4 CONFINED SPACE INVENTORY

An inventory of all the confined spaces on the job site will be maintained and each space will be identified as to whether it is permit-required or not. The Hazard Assessment Form included as Attachment 15-1 to this program is intended to be the basis for development of an entry permit for that particular space.

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15.5 LABELING AND POSTING

All confined spaces shall be posted and flagged so as to minimize the potential for unauthorized personnel entering the area. All entry points to any confined space shall be posted. Barricades or caution flagging should be used in addition to posting of signs. Signs for permit required confined spaces shall include but not necessarily be limited to the following information:

- DANGER
- CONFINED SPACE
- DO NOT ENTER
- ENTRY PERMIT REQUIRED

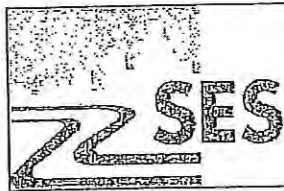
The specific signage requirements for each space are included in the Hazard Assessment Form.

15.6 ENTRY PROCEDURES

15.6.1 Permit-Required Confined Space

Anyone (either employee or contractor) who wishes to enter a confined space must notify the SSHO. The SSHO will then perform or ensure the completion of the following actions:

- Review the Hazard Assessment Form for that space and develop a permit for the entry. A blank Confined Space Entry Permit is provided as Attachment 15-2.
- Select qualified, trained individuals for Entrants and Attendants.
- Ensure all necessary safety equipment for confined spaces is immediately available at the location of the entry, and is operational (including field checking of monitoring instruments).
- Ensure ventilation requirements (if any) are satisfied. Attachment 15-3 contains a discussion on ventilation of confined spaces.
- Ensure the entry location is properly posted and flagged. Material Safety Data Sheets (MSDSs) for all hazardous materials in or brought into the space will be attached to the permit.
- Conduct an on-site pre-entry briefing with all entrants and attendants prior to the start of the job.
- Verify the appropriate entries have been made on the permit, that all tests specified by the permit have been conducted and that the procedures and equipment specified by the permit are in place before endorsing the permit and allowing entry to begin.
- Sign the confined space entry permit prior to entry.
- Notify the designated rescue team by phone of the entry operations prior to entry.
- Ensure confined space entry permits are posted. The confined space entry permit shall be posted as close to the point of entry as possible, and shall remain in that location for the duration of the job. Specific work hazards may also be posted by warning signs to inform workers of specific control measures, such as, but not limited to: respirator required; or high noise area.



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- Ensure that a confined space Attendant is present during all PRCS entry activities and maintains continuous communication with all entrants. The Attendant will not leave the space unless relieved by another Attendant.
- Cancel the permit whenever the activity is finished or a condition that is not allowed by the permit arises in or near the space.

An Entry Permit is valid for only one shift. The permit must be reissued at the beginning of the next shift or if work in the space is stopped for more than 30 minutes. If the space must be evacuated, the permit is no longer valid and must be reissued prior to re-entry.

At the conclusion of the entry, the following will be completed:

- The Attendant will verify that all Entrants have left the PRCS and that all applicable equipment has been removed.
- The Attendant will remove isolation mechanisms, as well as warning signs and barriers.
- Entrants will fill in the exit time on the permit.
- The Entry Supervisor will note any problems encountered on the permit, and forward to the Program Administrator, who will archive it for one year from the date of the permit.

15.7 ENTRY PERMITS

As stated earlier, the permit is included in Attachment 15-2, and is available from the SSHO.

15.8 MONITORING EQUIPMENT

All portable confined space monitoring equipment will be sent off for factory calibration and maintenance on an annual basis (or more frequently if recommended by the manufacturer). Hand aspiration (i.e., rubber squeeze bulb) is not allowed, and only motorized aspiration is allowed for remote sampling. All portable gas monitors will be field checked with suitable calibration gas prior to use every shift.

The appropriate calibration gas that gives an equivalent readout for the anticipated contaminants will be used whenever possible. Correction factor that corrects the reading will be used when an appropriate gas is not available.

15.9 COMPRESSED GAS/FLAME PRODUCING EQUIPMENT/HOT WORK

Cylinders of compressed gas of any type will not be taken into confined spaces. Self-contained breathing apparatus (SCBA) equipment is the only exception.

- If any hot work (including welding, cutting, grinding, or related activities) will be conducted in a permit space, a Hot Work Permit may be required as well. The SSHO will make the determination of the need for a Hot Work permit.

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- If gas hoses (e.g., for torch cutting) are to be used in the space, the hoses will be removed and the gas supply cut off at the cylinder when entrants leave the space.
- Confined space entrants are not to carry matches or cigarette lighters into spaces containing or potentially containing flammable atmospheres.
- Hot work in a non-permit space will render it a PRCS.

15.10 HAZARDOUS CHEMICAL USE

Any use of hazardous chemicals in a confined space will render it a PRCS unless authorized by the Program Administrator.

15.11 EMERGENCY RESCUE

SES will rely on the local Fire Department (or designee) for all PRCS rescues involving entry into the applicable spaces. The Site Superintendent will acquaint the rescue service with all PRCSs at the site. The authorized attendant will immediately initiate the following steps when rescue of one or more entrants becomes necessary:

- The Attendant will summon help (including the local Fire Department) if doing so does not require leaving the space. If leaving the space is necessary to summon help, the Attendant will use the radio (or similar equipment) and instruct others in the facility to call the Fire Department.
- For nonentry rescue situations, the Attendant will then initiate rescue operations from outside the confined space utilizing the winch and the retrieval lines attached to the authorized entrants.
- If entry rescue is necessary, the Attendant will remain near the entrance to prevent unauthorized individuals from attempting rescue entry. **UNAUTHORIZED INDIVIDUALS WILL NOT ATTEMPT ENTRY RESCUE.**
- Upon arrival at the emergency site, the Fire Department will receive a situation report from the authorized attendant. They will then be in control of all entry operations until the space is vacated. The Fire Department should assume immediately dangerous to life or health conditions exist in the space.
- The MSDS attached to the permit will be sent with the emergency rescue service to the health care facility providing treatment.
- A brief discussion of the facility Emergency Action Plan will be included in the initial site briefing for any on-site work.

15.12 TRAINING AND INFORMATION

The Confined Space Entry Training Program is required for all employees who may serve as Entry Supervisors, Attendants, or Entrants for confined space work. Training must be completed prior to any work in confined spaces. This training shall be repeated annually with updated information to be



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consistent with any possible changes in procedures, protective equipment and/or work processes. All Entrants and Attendants will receive the same training. The training shall cover the following topics:

- What are confined spaces and permit-required confined spaces?
- An explanation of the general hazards associated with confined spaces.
- The reason for, proper use, and limitations of personal protective equipment, retrieval devices, radios, ventilation equipment and air flow principles, and other safety equipment required for entry into confined spaces.
- An explanation of the permit system and other procedural requirements for conducting a confined space entry.
- How to respond to emergencies and procedures for summoning rescue.
- Duties and responsibilities of the confined space entry team.
- Cardiopulmonary resuscitation techniques (minimum 2 persons).
- A description of how to recognize probable air contaminant overexposure symptoms to themselves and co-workers, and methods for alerting attendants.

The supervisor authorizing or in charge of entry shall receive the aforementioned training, as well as additional training on:

- Recognizing the effects of exposure to chemical hazards known to be in the confined space.
- Use of air monitoring equipment and interpretation of results.
- Use and selection of PPE.
- The types of work in non-permit spaces that may render them PRCSS.
- Information regarding SES's written Confined Space Entry Program and any information and materials pertinent to the OSHA Confined Space Standard.

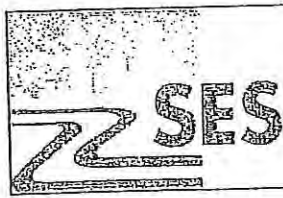
All trainees must pass a written test for successful completion of the course.

15.13 PROGRAM REVIEW AND REVISION

This program will be reviewed at least annually and will be revised to reflect any changes in operational procedures, equipment, or best management practices. Corporate Safety and Health Manager will be responsible for ensuring the conduct of the review and incorporation of any revisions.

15.14 DISCIPLINARY POLICY

All employees are expected to adhere to the procedures given in this written program. Failure to comply will result in disciplinary action as described in the facility's disciplinary policies.



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15.15 RECORD KEEPING

SES will maintain the following information:

- The confined space entry permit will be maintained for at least one year to facilitate the review of the Permit - Required Confined Space Program.
- The latest report of the annual review will be maintained by the Corporate Safety and Health Manager.

15.16 ATTACHMENTS

- Attachment 15-1 Confined Space Hazard Assessment Forms
- Attachment 15-2 Confined Space Entry Permit
- Attachment 15-3 Permit Required Confined Space Ventilation Requirements
- Attachment 15-4 Confined Space Entry Program, Program Performance Verification



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Attachment 15-1

Confined Space Hazard Assessment Forms

Date of Assessment: _____

Location of Space -		Permit Required ☐ Non-Permit ☐				
Type of Space ☐ Pit ☐ HVAC Unit ☐ Trench ☐ Tunnel ☐ Above Ground Tank ☐ Silo ☐ Baghouse ☐ Machine Enclosure ☐ UST ☐ Manhole ☐ Duct work ☐ Water Tower Other: _____						
No. Access Points	Required Sign					
Means of Access ☐ Fixed Interior Ladder ☐ Stairway ☐ Fixed Exterior Ladder ☐ Horizontal Entry ☐ Portable Ladder ☐ Vertical Entry Other: _____						
Hazard Assessment: Check all that are known to exist or potentially present <table border="0"><tr><td><u>Atmospheric Hazards</u> ☐ Oxygen Deficiency (<19.5%) ☐ Oxygen Enrichment (>23.5%) ☐ Flammable Atmosphere ☐ Toxic; Type: _____ ☐ Inerting Agents (Argon, Nitrogen)</td><td><u>Configuration Hazards</u> ☐ Fall Hazards ☐ Entrapment ☐ Structural Integrity ☐ Compartmentalized</td></tr><tr><td><u>Energy Source Hazards</u> ☐ Electrical ☐ Hydraulic ☐ Pneumatic ☐ Thermal (i.e. steam) ☐ Ionizing/ Non-ionizing Radiation</td><td><u>Environmental Hazards</u> ☐ Heat Stress ☐ Slippery/Unstable Surfaces ☐ Poor Illumination ☐ Hot Surfaces ☐ Contact with Hazardous Substances</td></tr></table>			<u>Atmospheric Hazards</u> ☐ Oxygen Deficiency (<19.5%) ☐ Oxygen Enrichment (>23.5%) ☐ Flammable Atmosphere ☐ Toxic; Type: _____ ☐ Inerting Agents (Argon, Nitrogen)	<u>Configuration Hazards</u> ☐ Fall Hazards ☐ Entrapment ☐ Structural Integrity ☐ Compartmentalized	<u>Energy Source Hazards</u> ☐ Electrical ☐ Hydraulic ☐ Pneumatic ☐ Thermal (i.e. steam) ☐ Ionizing/ Non-ionizing Radiation	<u>Environmental Hazards</u> ☐ Heat Stress ☐ Slippery/Unstable Surfaces ☐ Poor Illumination ☐ Hot Surfaces ☐ Contact with Hazardous Substances
<u>Atmospheric Hazards</u> ☐ Oxygen Deficiency (<19.5%) ☐ Oxygen Enrichment (>23.5%) ☐ Flammable Atmosphere ☐ Toxic; Type: _____ ☐ Inerting Agents (Argon, Nitrogen)	<u>Configuration Hazards</u> ☐ Fall Hazards ☐ Entrapment ☐ Structural Integrity ☐ Compartmentalized					
<u>Energy Source Hazards</u> ☐ Electrical ☐ Hydraulic ☐ Pneumatic ☐ Thermal (i.e. steam) ☐ Ionizing/ Non-ionizing Radiation	<u>Environmental Hazards</u> ☐ Heat Stress ☐ Slippery/Unstable Surfaces ☐ Poor Illumination ☐ Hot Surfaces ☐ Contact with Hazardous Substances					
Can energy sources be eliminated from outside the space? List.						



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Hazard Control Measures

VENTILATION REQUIREMENTS

Equipment	Check ()	Equipment	Check ()
Exhaust Ventilation		Natural Ventilation	
Dilution Ventilation		Intrinsically Safe Blower	
Initial Ventilation Purge			

Additional ventilation comments: Evacuation of space must be ordered is ventilation stops for any reason.

ELECTRICAL EQUIPMENT REQUIREMENTS

Equipment	Check ()	Equipment	Check ()
Intrinsically Safe		Battery Operated	
Portable Generator		Low Voltage	
GFCI		Double Insulated Tools	

Additional electrical comments:

ILLUMINATION

Equipment	Check ()	Equipment	Check ()
Permanent lighting provided		Supplemental after dark	
Portable drop lights		Flashlight	
Explosion-proof		Waterproof fixtures	

Additional lighting comments:

ATMOSPHERIC MONITORING

Oxygen	☐ Continuous	☐ Continuous	☐ Periodic	Frequency:
Combustible Gas	☐ Continuous	☐ Continuous	☐ Periodic	Frequency:
Toxic	☐ Continuous	☐ Continuous	☐ Periodic	Frequency:
	☐ CO	☐ H ₂ S	☐ Other	
Personal monitor required:	☐ Yes	☐ No	Type:	

COMMUNICATION

Attendant Required:	☐ Yes	☐ No	
Type of Communication:	☐ Radio	☐ Verbal	☐ Visual



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Personal Protective Equipment

RETRIEVAL & FALL PROTECTION			
Equipment	Check ()	Equipment	Check ()
Fall Arrest/Retrieval System		Wristlets/Anklets	
Lifeline		Boatswain's Chair	
Tripod Mechanical Lift		Material Handling Winch	
Comments:			
RESPIRATORY PROTECTION			
Equipment	Check ()	Equipment	Check ()
SCBA		Airline ☐ Cascade ☐ Compressor	
Half Face Air Purifying Cartridge Type:		Full Face Air Purifying Cartridge Type:	
Powered Air Purifying		Escape SCBA	
Comments:			
EQUIPMENT & APPAREL			
Equipment	Check ()	Equipment	Check ()
Safety Glasses w/ Side shields		Hard Hat	
Chemical Goggles		Hearing Protection	
Full Face Shield		Safety Shoes/Boots	
Gloves – Type		Protective Clothing - Type	
Comments:			



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Attachment 15-2

Confined Space Entry Permit

Location			Attendant(s)		
Starting	am pm	Date	Ending	am pm	Date
Confined Space To Be Entered					
Reason For Entry					
Name(s) Of Entrant(s)					

THE FOLLOWING PRECAUTIONS WILL BE OBSERVED (Circle or check as appropriate)

STOP WORK IF WARNED OF A HAZARD BY ANY EMPLOYEE, OR IN EVENT OF SPILLS OR LEAKS ADJACENT TO YOUR WORK AREA

HAZARD(S)	PREPARATION		PROTECTIVE EQUIPMENT
Corrosive Materials	Lockout Energy Sources	Low Voltage Lights/GFCI	Safety Glasses
Flammable Materials	Isolate / Blank Lines	Pneumatic Tools	Goggles
Toxic Materials	Double Block and Bleed	Ladder Access	Face Shield
Hot Equipment	Inert / Purge Space	Radio/Air Horn/Phone	Steel Toe Shoes
Spilled Liquids	Water / Steam Clean	Emergency #	Hard Hat
Pressurized System	Hot Work Permit Needed	Hoist or Winch	Gloves
Spark Producing	Ventilate Space Prior to Entry:	Other:	Protective clothing (type)
Engulfment	Hours _____		Harness and Lifeline
Mechanical	Minutes _____	COMMUNICATION	Wristlets
Electrical	Ventilate space continuously during entry	Voice	SCBA or Airline Respirator
Radioactive Materials		Radio	Negative pressure respirator
Other:		Intercom	Hearing protection
		Other:	Other:



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PROCEDURE IN CASE OF EMERGENCY:

MONITORING

Monitoring Equipment (Specify by Analyte):		Continuous/Frequency		
Acceptable Conditions		Time/Result	Time/Result	Time/Result
Oxygen	19.5% - 23.5%			
Flammability	<10% LEL			
Toxics (list)	<50%TLV/PEL (lowest)			

Additional monitoring data is to be attached to or retained with this permit.

Signed _____
Entry Supervisor

Person in Charge of Work

**THIS PERMIT IS VOID AFTER EXPIRATION TIME INDICATED
OR IF EMERGENCY IS NOTED.**

Permit must be posted at/near entrance to space, and applicable MSDS(s) attached, at all times during the entry.

Permit cancelled:

DATE: _____

TIME: _____

Entry Supervisor

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Attachment 15-3 Permit Required Confined Space Ventilation Requirements

1.0 Strategy: The Entry Supervisor will determine the most effective strategy for PRCS ventilation. In choosing between mechanical fresh air supply ventilation and mechanical exhaust ventilation consider the following points:

- Supplying air normally provides best airflow and mixing throughout the PRCS.
- Supplying air brings fresh air into workers' breathing zones.
- Supplying air can provide a source of cooling or heating.
- Exhausting air does not normally provide good mixing unless there are several openings.
- Exhausting air provides more controlled air movement and does not disperse contaminants (i.e., settled dusts).
- Exhausting air allows for controlled discharge of contaminants.
- Exhausting air can be effective for localized source control.
- Simultaneous supplying and exhausting air may be applicable in some cases.

2.0 Air Flow Guidelines: Air flow guidelines are expressed here in units of Air Changes Per Hour (ACH). One ACH means that in one hour, an air mover has delivered or exhausted a volume of air equal to the volume of the PRCS. While it is often not possible to measure the volume of the space, these guidelines are provided as a rule of thumb. It does not mean that all the air within the space has been exchanged. How much air has been exchanged depends on the configuration of the PRCS and where the air is supplied to or exhausted from. The following points will be considered in ventilating confined spaces:

- For supply ventilation, the range to strive for is a minimum of 10 ACH (air changes per hour) and up to 60 ACH with 20 ACH as a goal. Flow rates in excess of 60 ACH usually do not provide significant additional benefit.
- When supplying fresh air to a PRCS to remove heavier-than-air contaminants, the end of the supply duct should be kept within three feet of the bottom of the PRCS.
- For exhaust ventilation, the minimum should be 10 ACH with a goal of 20 ACH. Increasing flow as much as feasible does provide additional benefit.
- The space should be ventilated for a minimum of 10 minutes before any entry.

3.0 Air Movers: Observe the following precautions when using mechanical air movers:

- Do not block an entry/exit opening of a PRCS with air movers and ductwork unless a second open and immediately accessible portal is available for rescue.
- Ensure that air movers are rated intrinsically safe or are grounded and bonded when used with potentially combustible atmospheres.
- Protect intakes on air movers used for supplying fresh air from the introduction of chemicals, vehicle emissions, etc.
- Locate outlets on air movers used for exhausting downwind and away from exterior personnel and equipment.



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- When possible, provide movable ductwork which extends into the PRCS. Position ductwork to reduce contaminants near entrants' breathing zones.
- Use compressed air supplied by oil-lubricated compressors for ventilation purposes only if:
 - A venturi-type eductor is placed on the discharge of the compressed air line or hose, and
 - Monitoring for carbon monoxide (CO) is conducted immediately prior to and during work in the PRCS.

4.0 **Natural Ventilation:** As a general rule, do not rely upon natural ventilation; however, it may be used only if the following conditions are met:

- There are no potential atmospheric hazards.
- Pre-entry atmospheric testing indicates acceptable air quality prior to any mechanical ventilation.
- Work operations within the PRCS do not have the potential to cause a change in quality conditions.



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Attachment 15-4 Confined Space Entry Program Program Performance Verification

Reviewer Names: _____

Date: _____

Confined Space Entry Program		Yes	No
1.	Have projects developed a site-specific written Confined Space Program to prevent unauthorized entry, identify and evaluate confined space hazards, and establish procedures for safe entry, including testing and monitoring?		
2.	Is there a written Confined Space Permit Program for entry into confined spaces?		
3.	Have all confined spaces been identified and posted?		
4.	Is personal protective equipment (PPE) and other entry-related equipment available for employees involved in confined space entry?		
5.	Is all entry-related equipment being properly maintained?		
6.	Has training on confined space entry procedures been completed for all applicable employees?		
7.	Are subcontractors briefed as to project confined space locations and procedures for entry?		
8.	If off-site rescue procedures apply, has coordination and familiarization training been completed?		
9.	If on-site rescue procedures apply, have all rescue personnel been trained in rescue procedures?		
10.	Are Attendant, Authorized Entrants, and Entry Supervisory Personnel identified and trained in their responsibilities?		

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6.0 ELECTRICAL SAFETY PROGRAM AND LOCKOUT/TAGOUT

6.1 SCOPE AND APPLICATION

This program is applicable to all employees and contractors of SES while working on any SES work site during construction or maintenance.

6.2 REFERENCES

- Title 29 Code of Federal Regulations (CFR) Part 1926.404-.408, .416 - .417
- Title 29 Code of Federal Regulations (CFR) Part 1910.303-335

6.3 DEFINITIONS

- Qualified Person - an individual who is capable of working safely on energized circuits, and understands proper use of special precautionary techniques, personal protective equipment, insulating and shielding materials, and insulated tools. (i.e., licensed electrician or similarly trained).
- Nonqualified Person - an individual not meeting the definition of a qualified person.
- Authorized Employee - A person who locks out or tags out machines or equipment in order to perform servicing or maintenance on that machine or equipment.

6.4 RESPONSIBILITIES

Program responsibilities for the individuals designated to ensure the proper implementation of the electrical safety and lockout/tagout program are defined below.

6.4.1 Corporate Safety & Health Manager

- Provide the resources and authority to ensure the program elements are instituted as required.
- Hold all assigned responsible parties accountable as outlined in the written program.
- Periodically inspect project sites for electrical safety hazards and compliance with this program.
- Perform and document a Program Performance Verification (PPV) of the Electrical Safety Program at least annually to ensure program elements are being effectively implemented.

6.4.2 Site Superintendent or Foreman

- Ensure all affected employees under your supervision have received the level of electrical safety training necessary to safely perform their jobs.



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- Maintain a file for each qualified person containing documents that are used for confirming their qualifications.
- Require employees to follow the Electrical Safe Work Practices outlined in this program.
- Be knowledgeable of Electrical Safety Program requirements.
- Make routine surveys of the work company to ensure utilization of PPE and safe work practices by employees.
- Ensure that inspection and testing of cord sets, electric tools, all electrical equipment and receptacles is conducted as required.
- Conduct investigations of electrical accidents.

6.4.3 Employees

- Actively participate in the assigned electrical safety, lockout/ tagout, and temporary wiring training sessions and adhere to the safe operating guidelines contained within this program.
- Obey all established requirements outlined in the Electrical Safety Program.
- Use PPE supplied by the company for all work around exposed electrical circuits.
- Utilize all existing engineering controls, work practice controls and administrative controls provided.
- Inform supervision if PPE is lost or damaged or if additional PPE is needed.
- Qualified employees must participate in the annual mandatory training sessions as scheduled.
- Non-qualified employees do not work on exposed electrical circuits unless they have been de-energized in accordance with the Control of Hazardous Energy (Lockout/Tagout) Procedures.

6.5 WORK PRACTICES

- All live parts must be de-energized before the employee works on or near them, unless de-energizing introduces additional or increased hazards. If live parts are not de-energized, other safety related work practices shall be used to protect employees who may be exposed to the electrical hazards involved.
- Conductors and parts of electric equipment that have been de-energized but have not been locked out or tagged out shall be treated as energized parts.
- All employees must follow the SES control of hazardous energy (lockout/tagout) procedures when performing work on fixed electrical equipment or circuits. Test equipment will be used to test the circuit elements and electrical parts of equipment to verify that the circuit elements and equipment parts are de-energized.
- Only qualified persons can perform testing work on electric circuits or equipment.



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- If a circuit is de-energized by a circuit protective device, manual re-energization of the circuit will not be done until the determination is made that the equipment and circuit can be safely energized.

6.6 LOCATION/ENVIRONMENT

- Employees may not enter any area containing exposed energized parts unless adequate lighting is provided.
- Safety signs or symbols must be used where determined necessary to warn employees about the electrical hazards that may endanger them.
- Nonconductive barricades must be used in conjunction with safety signs where it is necessary to prevent or limit employee access to work areas exposing employees to un-insulated energized conductors or circuit parts.

6.7 WORK SPACE

The minimum work spaces around electrical equipment for "qualified" persons to do work are listed in Tables 5-1 and 5-2 below.

Table 6-1 Work Spaces Around Electrical Equipment

Location	600V Nominal or Less	600V to 4160V Nominal
Width in Front	30 in. wide	30 in. wide
Front Clearance	36 in. to 48 in. (see Table 5-2)	36 in. to 60 in.
Headroom	6 ft 3 in. high	6 ft 6 in. high
Lighting	Adequate	Adequate
Entrances to Area	One	One – 24 in. wide, 6 ft. in. high; if control panel >48 in. wide; must be one entrance each side

Table 6-2 Working Clearances

Nominal voltage to ground	Minimum Clear Distance for Condition (ft)		
	Condition A	Condition B	Condition C
0 - 150	3	3	3
151 - 600	3	3 ½	4
600 - 4160	3	4	5



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Conditions A, B, and C, are defined as follows:

- Condition A - Exposed live parts on one side and no live or grounded parts on the other side of the working space, or exposed live parts on both sides effectively guarded by suitable wood or other insulating material. Insulated wire or insulated busbars operating at not over 300 volts are not considered live parts.
- Condition B - Exposed live parts on one side and grounded parts on the other side. Concrete, brick, or tile walls will be considered as grounded surfaces.
- Condition C - Exposed live parts on both sides of the workspace (not guarded as provided in Condition A) with the operator between

If access is needed through the rear of the electrical equipment, at least 36 inches horizontally of work room is to be provided.

6.8 TEMPORARY POWER AT CONSTRUCTION WORK SITES

- All temporary power installations for construction work sites shall be installed only by qualified electricians.
- Temporary electrical power and lighting installations of 600 volts, nominal, or less may be used only during remodeling, maintenance, repair or demolition of buildings or equipment.
- Temporary electrical power and lighting installations over 600 volts, nominal may only be used during periods of tests, experiments, or emergencies.

6.9 ELECTRICAL BOXES AND CABINETS

- A rubber grommet or clamp must be used around the conductor to protect against damage where they enter cabinets or boxes.
- Knockouts, breaker openings, and other fittings in cabinets and boxes should only be removed if they will be used immediately. All openings not in use will be closed with a plug or cover.
- Covers will be provided for all pull boxes, junction boxes and fittings. If metal covers are used, they will be grounded and kept closed.
- Each out box will have a cover, faceplate, or fixture canopy.
- Covers for boxes carrying over 600 volts, nominal will be marked "HIGH VOLTAGE."

6.10 DISCONNECT MEANS

- All disconnects shall have a minimum of 36 in. clearance in front of the disconnect to allow for easy access.
- Circuit breakers must clearly indicate whether they are in the open (off) or closed (on) position. The up position of the handle for vertical switchboards will be the closed (on) position.



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- The disconnect means will plainly indicate whether it is in the open or closed position. The disconnect means is to be installed at a readily accessible location nearest the point of access to the service entrance conductors.
- Single throw knife switches must be installed so that if the switch falls downward, it will fall into its de-energized position (open - "off" position).
- Every electrical apparatus shall have a disconnecting means and be marked with its rating in volts and amperes or volts and watts.
- Every disconnect means shall be clearly labeled to indicate what electrical apparatus it controls.
- Disconnecting mechanisms (circuit breakers, etc.) must be used for the opening, reversing, or closing of circuits under load conditions.

6.11 FLEXIBLE CORDS

- All flexible cords shall be marked SJ, SJO, SJT, SJTO, S, SO, ST, STO as required by OSHA 29 CFR 1926.
- All flexible cords will be used in conjunction with a GFCI "pigtail" in addition to the GFCI receptacles on the site.
- Flexible cords (extension cords) used with grounding-type equipment must contain an equipment grounding conductor.
- Any flexible cord that may be used in wet areas or exposed to damp, moist, or wet conditions must be designed and approved for use in those locations.
- Flexible cords and cables shall not be used as a substitute for the fixed wiring of the structure, run through holes in walls, ceilings, or floors, run through doorways, windows, or similar opening, attached to building surfaces, or concealed behind building walls, ceilings or floors.
- At no time should flexible cords be spliced or taped together.
- Portable cord equipment, plug-connected equipment, and flexible cord sets must be visually inspected before use on each shift for external defects and evidence of possible internal damage. These defects shall be reported to the applicable Supervisor or Crew Leader.

6.12 GROUNDING

- The grounded conductor of a branch circuit must be identified by a continuous white or natural gray color wire.
- The equipment grounding conductor of a branch circuit shall be identified by a continuous green color or a continuous green color with one or more yellow stripes unless the wire is bare.
- The path to ground from circuits, equipment, and enclosures shall:
 - be permanent and continuous,
 - have the capacity to conduct safely any fault current likely to be imposed on it and,



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- have sufficiently low impedance to limit the voltage to ground and to facilitate the operation of the circuit protection devices in the circuit.

6.13 GROUND FAULT CIRCUIT INTERRUPTER (GFCI)

- Ground Fault Circuit Interrupters (GFCI) shall be installed on all circuit breakers for construction power.
- A GFCI "pigtail" shall be used in conjunction with all flexible cords and cord and plug equipment, in addition to the GFCI receptacles on the site.
- Receptacle type GFCIs may be used on common neutral systems and where receptacles are more than 250 feet from the breaker.
- A GFCI polarity tester shall be used to ensure trip current values and to test the satellite receptacles downstream from the receptacle containing the GFCI.
- GFCIs shall be installed and maintained in accordance with the requirements of the National Electric Code (NEC) current edition. The system shall be tested prior to being put into service. The test results shall be documented and maintained on file in the project office.

6.14 WORK NEAR OVERHEAD POWER LINES

- Any nonqualified person, vehicle, or mechanical equipment working in an elevated position near overhead power lines must maintain at least a 10 foot clearance (in reference to the closest conductive object near the power line) for voltages to ground of 50 kV or below and an additional 4 inches for every 10 kV over 50 kV
- Any qualified person working in the vicinity of overhead lines must maintain a distance as identified in the Work Space section of this document. Any use of conductive objects within this distance must have an approved insulated handle.
- If work is to be performed on overhead lines closer than the clearance requirements as identified under Work Space, the lines must be de-energized and grounded.

6.15 LOCKOUT/TAGOUT PROCEDURES

Whenever work on electrical equipment or services is required the electrical power source shall be de-energized, locked and tagged following these steps:

1. Affix a Lockout device and tag. Each applicable authorized person and/ or subcontractor will apply his or her own lock and tag.
2. Test the equipment using a voltmeter to verify the energy is isolated.
3. Perform required work.
4. Ensure tools and people are removed and any guards have been replaced.



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5. Inform affected employees of the removal of locks and tags.
6. Remove the Lockout/Tagout device(s) and energize the equipment.

6.16 CREW OR PERSONNEL CHANGE

Specific instruction shall be utilized during crew or personnel changes to ensure the continuity of lockout/tagout protection, including provision for the orderly transfer of locks or tags between off-going and on-coming employees, to minimize exposure to hazards from the unexpected energization. At no point during the lockout event shall the equipment or machine be in an unlocked condition.

In situations where a lockout event will be of an extended duration, the Supervisor or Crew Leader may apply a crew lock. This crew lock will be attached to a multi-lock hasp and will remain attached for the entire duration of the lockout event. Another group lockout device that can be used is a group lock box; the crew lock will be secured at the lockout point, and its key will be placed inside a group lock box. Authorized employees will attach their personal locks to the hasp/group box when working on the machine and remove their locks at the conclusion of their shift.

6.17 TAGS VS. LOCKS

- A tag that identifies the person responsible for de-energizing the system will be applied every time a piece of equipment is locked out.
- Tagging without locking for energy control purposes is forbidden without the written permission of the Corporate Health & Safety Manager.

6.18 MATERIALS AND HARDWARE FOR LOCKOUT/TAGOUT

- SES shall furnish all locks, tags, hasps, or other devices for isolating and securing equipment or machines from energy sources. These devices shall be identified and used solely for the purpose of lockout/tagout.
- Each authorized employee is issued his/her own lock and key set. The individual personally issued lock is marked with the employee's name for identification purposes.

6.19 LOCKOUT DEVICES REQUIREMENTS

All lockout/tagout devices utilized for protection against unexpected energization or start up of the equipment or machines, or release of stored energy shall meet the following requirements:

- Lockout devices are of durable construction capable of withstanding the environment for the maximum period of time these devices are exposed.
- Lockout devices are standardized within the facility by type and color and may not be used for any other purpose.

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6.20 PROGRAM REVIEW AND REVISION

The Corporate Health and Safety Manager shall perform an annual assessment of this program. The assessment will address the degree and consistency of program element implementation in the workplace. Attachment 6-1 contains the program performance verification criteria that will be utilized to conduct and document this assessment.

6.21 DISCIPLINARY POLICY

All employees are expected to adhere to the procedures given in this written program. Failure to comply will result in disciplinary action as described in the company's disciplinary action policies.

6.22 RECORDKEEPING :

SES shall maintain all employee training records for at least two years from the last training date.

6.23 ATTACHMENTS

- Attachment 6-1 Electrical Safety and Lockout/Tagout Program, Program Performance Verification



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Attachment 6-1 Electrical Safety and Lockout/Tagout Program Program Performance Verification

No.	Program Element	Completed (√)	Target Date
1.	Company has a current, fully developed company specific written Lockout/Tagout Program Approved by the Corporate Safety and Health Manager that incorporates all OSHA mandated elements.		
2.	Company's written lockout/tagout program clearly outlines the roles and responsibilities of all affected functions and individuals.		
3.	Company maintains a current documented listing of all identified "authorized personnel" at this facility who are permitted to perform lockout/tagout related work.		
4.	Company has developed a General Lockout/Tagout Procedure.		
5.	Company maintains an adequate and readily accessible inventory/supply of lockout/tagout hardware (e.g., lockout locks, tags, valve locking mechanisms, chain, cable, blocking material, group lock boxes, multiple locking hasps) to insure safe lockout at all times.		
6.	Company maintains a current inventory of lockout locks denoting who has been assigned such devices.		
7.	Lockout locks (different and distinguishable from other locks used at the company) have been identified to denote ownership.		
8.	Lockout locks are only used for lockout purposes (i.e., not for personal lockers, tool boxes, etc.).		
9.	Company does not permit the use of master keys or locks keyed alike.		
10.	Company has outlined a lock/key control, lost lock, and lock removal policy within its written program.		
11.	Company has established a policy dealing with shift change and group lockout within its written program.		
12.	Company has identified all authorized and affected individuals or groups who require lockout/tagout training.		
13.	Company has developed a documented lockout/tagout training program for all authorized and affected employees.		
14.	Company uses only trained and competent trainers for conducting lockout/tagout training.		
15.	Company conducts documented lockout/tagout training for all authorized and affected personnel on an annual basis.		
16.	New hires and temporary employees receive lockout/tagout awareness level training at the time they start work for the company.		
17.	Company conducts annually, a documented audit of its entire lockout/tagout program (i.e., review written program elements, observing authorized personnel locking out equipment, training conducted, assessing lockout inventory and hardware, etc.).		
18.	Company's written program requires each authorized person to apply their own lock and tag to each energy-isolating source (or authorized group lockbox) and maintain exclusive control of the key(s).		



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Attachment 6-1 Electrical Safety and Lockout/Tagout Program Program Performance Verification (Cont.)

No.	Program Element	Completed (√)	Target Date
19.	Company's written lockout/tagout program requires the sharing of lockout/tagout information and requirements with outside contractors working on company.		
20.	Findings (incidents, near misses reported, deficiencies, lessons learned, worker feedback, positive observations, etc.) from documented lockout audits at company are incorporated into annual refresher lock-out/tagout training for authorized and affected persons.		
21.	Company has developed and communicated to all company employees the disciplinary policy for failure to follow established lockout/tagout procedures.		
22.	Company insures that all managers, supervisors, and/or crew leaders who oversee employees who perform authorized lockout/tagout related work attend documented lockout/tagout training.		
23.	Corporate Safety & Health Manager insures that all documentation (written program, training pro-gram/records, audits, ECPs, etc.) is maintained and readily accessible for review.		
24.	Company requires lockout be used for energy isolation, versus tagging alone. Exceptions to this rule must be reviewed and approved by the Corporate Health & Safety Manager and a procedure must be established that makes deviations to this policy as safe as locking/tagging out equipment, per OSHA standards. Employees must be trained (documented) on such procedures when established (e.g., troubleshooting energized circuit with a multi-meter by qualified persons, clearing jam-ups).		
25.	The company has trained all applicable qualified employees, and is the documentation maintained adequately?		
26.	Has electrical safety PPE and other equipment (e.g., nonconductive ladders) been purchased?		
27.	Has electrical PPE been tested (frequency and type of inspection) by an outside service and according to requirements?		
28.	Is electrical equipment over 600V in restricted access locations?		
29.	Is adequate clearance provided for electrical equipment?		
30.	Is temporary wiring being used for long-term use?		
31.	Are the general rules for electrical safe work practices followed during electrical maintenance and repair activities?		
32.	Is temporary wiring in good condition?		

Comments:	Reviewer Names:



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7.0 EXCAVATION SAFETY

7.1 SCOPE AND APPLICATION

This program applies to excavations typical of SES site work. This program is specific to excavations less than 5 feet in depth and assumes no entry into piers. If an excavation, other than a pier, exceeds 5 feet in depth or entry into a pier hole is necessary, the Corporate Safety & Health Manager shall be notified prior to initiating work. No trench boxes or excavations greater than 5 feet deep are permitted without Corporate Safety & Health Manager approval.

7.2 RESPONSIBILITIES

Excavation Safety Program specific responsibilities are defined below.

7.2.1 Corporate Safety & Health Manager

- Ensure all management and affected employees are aware of the Excavation Safety Program.
- Provide technical assistance for complex excavations and excavations greater than 5 feet in depth.
- Advise Management of any program deficiencies noted requiring his/her action or involvement.
- Conduct an annual program performance verification, using the PPV form in Attachment 7-1.

7.2.2 Site Superintendent and Foreman

- Ensure that all employees adhere to the requirements of this program.
- Act as or ensure an excavation competent person is on site during all excavation work.
- Inspect excavations daily prior to entry for signs of cave-in or collapse.
- Ensure all employees involved with excavation work have been trained.

7.2.3 Employees

- Practice safe work habits and comply with the requirements of this program.
- Attend training as directed by the Supervisor.
- Visually inspect excavation for signs of cave-in or collapse prior to entry.

7.2.4 Subcontractors

- Attend or provide proof of training as directed by SES.
- Act as or ensure an excavation competent person is on site during all excavation work.



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7.3 GENERAL REQUIREMENTS

The following general requirements apply to excavations less than 5 feet deep, excluding piers. Excavations greater than 5 feet in depth will not be initiated without prior approval of the Corporate Safety & Health Manager or designee with the exception of piers. No entry into a pier is permitted without Corporate Safety & Health Manager approval.

- Visually inspect excavation for signs of cave-in or collapse prior to entry.
- Practice safe work habits and comply with the requirements of this program.
- A designated excavation competent person shall be on site at all times during which excavation activities are conducted.
- Utilities will be identified where required prior to starting any excavation.
- All spoils must be placed a minimum of 2 feet from the edge of the excavation. Loose soil or rocks shall be removed from the sides of excavation walls.
- Excavations 4 feet in depth or greater, must have a stairway, ladder, ramp, or other safe means of egress within 25 feet of any employee.
- No employee may enter an excavation where water has accumulated without adequate precaution, as specified by the Competent Person on site.
- Excavations greater than 4 feet in depth where a hazardous atmosphere may exist, such as excavations in a landfill or near hazardous substances, will be tested for oxygen deficiency and other parameters as necessary. These spaces may be classifiable as permit-required confined spaces. The Corporate Safety & Health Manager or designee will be contacted prior to commencing work in excavations that may contain oxygen deficiency or other hazardous atmosphere.
- Reinforcing steel used in excavations shall be protected to prevent impalement through the use of metal-plated rebar caps or other suitable protection.
- Equipment operators near the edge of an excavation will have a clear and direct view of the edge of the excavation or a warning system shall be utilized such as barricades.

7.4 INSPECTIONS

All excavations shall be inspected by an excavation competent person:

- daily before entry,
- at the start of each shift,
- after rain or snowfall,
- after freezing and/or thawing temperatures occur, and
- after any condition that can change the integrity of the soil.

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These inspections shall be documented on the Daily Excavation Inspection Form found in Attachment 7-2.

During rainy weather, work in excavations shall cease until the excavation competent person has evaluated the excavation and the effect the rain is having. The excavation competent person will need to maintain a regular inspection schedule during the rain if employees will continue to work in the excavation. Depending on the amount of rain falling, the duration of the rainfall, and the soil type, the competent person may need to maintain continuous observation of the excavation condition.

7.5 EMPLOYEE INFORMATION AND TRAINING

Each employee who works in or around an excavation shall be trained to recognize the following potential hazards associated with excavations.

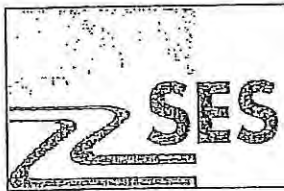
- **Content of General Worker Training Program** – Training topics will include, but will not be limited to:
 - General requirements of this program,
 - Fall hazards.
 - Safe entry and exit, and
 - Hazardous atmospheres
- **Excavation Competent Person Training** - Individuals identified as Excavation Competent Persons must have completed Excavation Competent Person Training. Each individual assigned as an Excavation Competent Person shall have documented training or shall have documentation of experience and qualifications in excavation activities. Only individuals approved by the Corporate Safety & Health Manager may serve as Excavation Competent Persons.

7.6 PROGRAM REVIEW AND REVISION

The Corporate Safety & Health Manager or designee shall perform an annual assessment of this program. The assessment will address the degree and consistency of program element implementation in the workplace. Attachment 7-1 provides the program performance verification criteria will be utilized to conduct and document this assessment.

7.7 DISCIPLINARY POLICY

All employees are expected to adhere to the procedures contained in this Excavation Safety Program. Failure to comply with these procedures and policies will result in disciplinary action as described in the facility's disciplinary policies.

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7.8 RECORD KEEPING

The following records must be maintained as stipulated below.

- A copy of the Excavation Permit and Daily Inspection reports shall be maintained on site at all times.
- Human Resources shall maintain a record of the most current General Employee or Competent Person training records.

7.9 ATTACHMENTS

- Attachment 7-1 Excavation Safety Program, Program Performance Verification
- Attachment 7-2 Daily Excavation Inspection Form



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Attachment 7-1

Excavation Safety Program Program Performance Verification

Facility: _____

Review Date: _____

No.	Program Element	Completed √	Target Date
1.	The Corporate Safety & Health Manager has been appointed and trained to oversee the administration of this program.		
2.	Have all employees involved in excavation work been trained?		
3.	Is there a competent person on each excavation site?		
4.	Are ladders or ramps provided for excavations greater than 4 feet deep and within 25 feet of employees in the excavation?		
5.	Is reinforcing steel protected to prevent impalement? (Note – rebar caps with metal plates)		
6.	Are spoil piles at least 2 feet back from the edge of the excavation?		
7.	Is the accumulation of water controlled in excavations?		
8.	Is the excavation inspected after precipitation and at the beginning of each shift?		
9.	Are training records available for all applicable personnel?		

Comments:

Reviewer Names:



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Attachment 7-2 Daily Excavation Inspection Form

Name of Excavation Competent Person:		Date of Inspection:	
Excavation/Trench location:			
Depth:	Width:	Date Opened:	
Soil classification: ☐ A ☐ B ☐ C			
Indicate, by marking the test below, how the classification was made.			
Manual test(s)	Cohesive Unfissured	Cohesive fissured	Granular
a) plasticity			
b) dry strength			
c) thumb penetration			
d) pocket penetrometer			
e) other			
Visual test(s) (Do as many as possible)	Cohesive Soil		Granular Soil
Spoil pile:	Remains in clumps		Breaks-up easily
Trench Side:	Stands vertical for over 2 hours		Sloughs into trench
The excavation is properly (circle one):			
Shored (indicate the type of shoring)	☐ Closed ☐ Open ☐ Wood ☐ Metal		
Sloped/benched (indicate the slope)	☐ Vertical ☐ ¾:1 ☐ 1:1 ☐ 1 ½:1 ☐ 2:1		
Excavation Checklist	Morning	Mid-Day	Afternoon
Time:			
Weather:			
Is atmospheric testing required?	☐ yes ☐ no ☐ n/a	☐ yes ☐ no ☐ n/a	☐ yes ☐ no ☐ n/a
Is atmospheric testing done?	☐ yes ☐ no ☐ n/a	☐ yes ☐ no ☐ n/a	☐ yes ☐ no ☐ n/a
Is the spoil pile back 3' from the edge?	☐ yes ☐ no ☐ n/a	☐ yes ☐ no ☐ n/a	☐ yes ☐ no ☐ n/a
Have surface encumbrances been removed?	☐ yes ☐ no ☐ n/a	☐ yes ☐ no ☐ n/a	☐ yes ☐ no ☐ n/a
Are there any signs of sloughing or cave-in?	☐ yes ☐ no ☐ n/a	☐ yes ☐ no ☐ n/a	☐ yes ☐ no ☐ n/a
Is there water accumulation in the bottom?	☐ yes ☐ no ☐ n/a	☐ yes ☐ no ☐ n/a	☐ yes ☐ no ☐ n/a
Any vibration sources near the excavation?	☐ yes ☐ no ☐ n/a	☐ yes ☐ no ☐ n/a	☐ yes ☐ no ☐ n/a
Is there adequate access/egress (ladder, ramp)	☐ yes ☐ no ☐ n/a	☐ yes ☐ no ☐ n/a	☐ yes ☐ no ☐ n/a
Has the soil been disturbed previously?	☐ yes ☐ no ☐ n/a	☐ yes ☐ no ☐ n/a	☐ yes ☐ no ☐ n/a
Sides	☐ yes ☐ no ☐ n/a	☐ yes ☐ no ☐ n/a	☐ yes ☐ no ☐ n/a
Top	☐ yes ☐ no ☐ n/a	☐ yes ☐ no ☐ n/a	☐ yes ☐ no ☐ n/a
If the excavation is over 20 feet deep, has a P.E. design been documented and complied with?	☐ yes ☐ no ☐ n/a	☐ yes ☐ no ☐ n/a	☐ yes ☐ no ☐ n/a

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5.0 FALL PROTECTION

5.1 SCOPE AND APPLICATION

This program is intended to inform all personnel working in elevated positions of the techniques necessary to perform their work safely. This program is applicable to all employees and contractors of SES who work on elevated surfaces that have an unprotected side or leading edge that is 6 feet or more above a lower level.

5.2 REFERENCES

- OSHA, Subpart M, Fall Protection - 29 CFR 1926.500-503
- OSHA 29 CFR 1926.1053 – Ladders
- ANSI A14.3 Fixed ladders – safety requirements

5.3 DEFINITIONS

- 100 Percent Fall Protection - Protecting the worker from the possibility of a fall at all times. This includes when moving or stationary. 100-percent fall protection includes guardrail systems, nets, tie off, catch platforms, etc.
- Anchorage - a secure point of attachment for lifelines, lanyards, or deceleration devices. The anchorage shall be capable of withstanding the forces specified in this program.
- Basket Hitch- Technical rigging term referring to a lift sling that is looped under (and not wrapped around) the load.
- Full Body Harness - a configuration of connected straps to distribute a fall arresting force over at least the thighs, shoulders, and pelvis, with provisions for attaching a lanyard, lifeline, or deceleration device.
- Fall Arrest System- a full body harness and lanyard, which is attached to a horizontal or vertical lifeline, which is properly secured to an anchorage(s).
- Drop Line - an independent lifeline secured to an upper anchorage for the purpose of attaching a lanyard or a fall protection device. This line must be at least a ¾-inch manila rope or a ½-inch nylon rope.
- Hardware - Snap hooks, D-rings, buckles, carabineers, adjusters, and O-rings that are used to attach the components of a fall protection system together.
- Horizontal Lifeline - A rail, wire rope, or synthetic rope that is installed in a horizontal plane between two anchorage points and used for attachment of a worker's lanyard or lifeline device while moving horizontally.
- Lifeline - a vertical line from a fixed anchorage or between two horizontal anchorage points, independent of walking or working surfaces, to which a lanyard or device is secured.



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- Locking Snap Hook - a connecting snap hook that requires two separate forces to open the gate, one to deactivate the gatekeeper and a second to depress and open the gate that automatically closes when released; used to minimize roll-out or accidental disengagement.
- Rope Grab - a fall arresting device that is designed to move up or down a lifeline suspended from a fixed overhead or horizontal anchorage point, or lifeline, to which the harness is attached. In the event of a fall, the rope grab locks onto the lifeline rope through compression to arrest the fall. The use of a rope grab device is restricted for fall restraint applications.
- Self-Retracting Lifeline - a deceleration device that contains a drum-wound line that may be slowly extracted from, or retracted onto, the drum under slight tension during normal employee movement, and which after onset of a fall, automatically locks the drum and arrests the fall.
- Shock-Absorbing Lanyard - a flexible line of webbing, cable, or rope used to secure a body belt or harness to a lifeline or anchorage point that has an integral shock absorber.

5.4 RESPONSIBILITIES

The responsibilities of personnel in regards to the Fall Protection Program are as follows:

5.4.1 Corporate Safety & Health Manager

- Ensure all management and affected employees are aware of the Fall Protection Program and enforce the same.
- Provide all materials and hardware for effective implementation of this program and ensure they are properly utilized and maintained.
- Identify jobs requiring the use of fall protection.
- Periodically review worksites for compliance with this program.

5.4.2 Site Superintendent and Foreman

- Be knowledgeable of Fall Protection Program requirements.
- Evaluate fall hazards during the Pre-Job Hazard Assessment
- Make routine surveys of work areas to ensure proper use, condition, and maintenance of fall protection equipment.
- Ensure all affected employees participate in review of project specific fall hazards and attend scheduled annual fall protection training.

5.4.3 Employees

- Actively participate in the assigned fall protection orientation and training sessions and adhere to the safe operating guidelines contained within this program.



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- Inspect fall arrest devices and equipment prior to use. Document the inspection and results on the daily inspection sheet found in Attachment 5-3.
- Report any defects in fall arrest devices noted during daily inspections to their supervisor.
- Store fall arrest devices in the appropriate manner following use.

5.5 GENERAL REQUIREMENTS

One-hundred Percent Fall Prevention measures shall be used when personnel are exposed to fall hazards or are working within 6 feet of an unprotected fall in excess of 6 feet. These fall protection requirements are outlined in a table found in Attachment 5-1. To ensure that these requirements are met, SES requires that all personnel utilize a personal fall arrest system. Free climbing is strictly prohibited.

Fall protection and prevention implemented for any one task may include one or more of the following:

- Preventing a fall by installing standard railings with toeboards;
- Preventing a fall by restricting the travel of individuals through the use of barricades; and/or
- Using personal fall protection equipment (full body harness and lanyards) to arrest a fall.

5.6 PERSONAL FALL ARREST SYSTEMS

- Personal fall arrest systems shall comply with the following:
- Personal fall arrest systems shall consist of a full-body harness and a 6-foot, shock-absorbing lanyard.
- All connectors shall be drop forged, pressed or formed steel, or made of equivalent materials.
- Dee-rings and snap hooks shall have a minimum tensile strength of 5,000 pounds and a minimum tensile load of 3,600 pounds.
- Lanyards and vertical lifelines shall have a minimum breaking strength of 5,000 pounds.
- All ropes and straps used in lanyards, lifelines, and body harnesses shall be made of synthetic fibers.
- All anchorage points for personal fall arrest systems shall be capable of supporting 5,000 pounds per employee attached.
- The attachment point of the body harness shall be in the center of the wearer's back, near shoulder level.
- Components subjected to impact loading shall be removed from service until inspected by a competent person.
- Full body harness systems shall be inspected prior to each use for mildew, wear, damage, and other deterioration, and effective components removed from service if their function or strength has been adversely affected.

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- ANY harness or piece of equipment that has been subjected to a fall by personnel shall be removed from service.

5.7 PERSONNEL LIFTING

Riding the line and use of manbaskets for hoisting personnel shall only be allowed with prior approval of the SES Corporate Safety & Health Manager. All equipment used for the hoisting of personnel to the work area of the tower shall comply with OSHA Directive CPL 2-1.29, ANSI – B30.7, 29 and CFR 1926.550 and Subpart M.

5.8 POSITIONING DEVICE SYSTEMS

- All positioning device systems and their use shall meet the following criteria:
- Positioning devices shall be rigged such that a worker cannot fall more than 24 inches.
- Positioning device anchorage points shall be capable of supporting an impact load of at least 3,000 pounds.
- All connectors shall be drop forged, pressed or formed steel, or equivalent materials, and shall have a minimum tensile strength of 5,000 pounds.
- Dee rings and snap hooks shall be proof-tested to a minimum tensile strength of 3,600 pounds.
- Only locking type snap hooks shall be used.
- Positioning devices systems shall be inspected prior to use and defective components shall be removed from service.

5.9 VERTICAL AND HORIZONTAL LIFELINES

The following requirements apply to all vertical and horizontal lifelines:

- All safety lines and lanyards shall be protected against being cut or abraded.
- Hardware shall have a corrosion-resistant finish, and all surfaces and edges shall be smooth to prevent damage to the attached body harness or lanyard.
- When vertical lifelines (drop lines) are used, not more than one employee shall be attached to any one lifeline.
- Full body harness systems shall be secured to anchorage points capable of supporting 5,000 pounds per employee. When self-retracting lifelines or other deceleration devices that limit free fall to 2 feet are used, anchorage points shall be capable of withstanding 3,000 pounds.
- Independent lifelines (drop lines) shall have a minimum tensile strength of 5,000 pounds.
- Self-retracting lifelines and lanyards that automatically limit free fall distance to 2 feet or less shall have a minimum tensile strength of 3,000 pounds.
- Horizontal lifelines shall have a tensile strength capable of supporting a fall impact load of at least 5,000 pounds per employee using the lifeline, applied anywhere along the lifeline. When

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more than one employee is using a horizontal life line, the life line shall be capable of supporting 5000 pounds per employee or an engineered safety factor of two (2) shall be maintained, based on a worst case scenario.

- Anchorage points shall be independent of any other system and shall be capable of supporting 5,000 pounds per employee using the anchorage.
- Snap hooks shall be locking type snap hooks and shall not be connected to each other.

5.10 LADDERS

The following general precautions are to be followed for safe use of ladders:

- Ladders must be inspected for defects prior to use. Defective ladders shall be tagged "DO NOT USE" and removed from the task site.
- All portable ladders used to gain access to an elevated work surface must be secured to prevent displacement, and extend at least 36 inches above the surface to be accessed.
- Ladders must be placed on stable and level surfaces.
- When using a ladder against a wall, the base of the ladder must be placed at a distance 1/4 of the height of the ladder.
- Step ladders may only be used with the spreaders in the open and locked position.
- Workers must face the ladder and keep at least one hand on the ladder whenever ascending or descending. Materials cannot be hand-carried on a ladder if they require the full-time use of one hand.

5.11 EMPLOYEE INFORMATION AND TRAINING

All workers who may be required to work from elevated surfaces will receive initial and annual training in fall protection. Training topics will include, but will not be limited to:

- Nature of fall hazards at the SES projects.
- The correct procedures for erecting, using, inspecting, and disassembling fall arrest systems.
- The limitations of fall arrest systems.
- The correct method of wearing and attaching safety harnesses and lanyards.
- Role of employees in fall protection measures.
- The requirements of the SES Fall Protection Program.

5.12 PROGRAM REVIEW AND REVISION

The Corporate Safety & Health Manager shall perform an annual assessment of this program. The assessment will address the degree and consistency of program element implementation in the workplace.

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Attachment 5-2 contains the program performance verification criteria that will be used to conduct and document this assessment.

5.13 DISCIPLINARY POLICY

All employees are expected to adhere to the procedures presented in this written program. Failure to comply will result in disciplinary action as described in the company's disciplinary policies.

5.14 RECORD KEEPING

Human Resources shall maintain an accurate record employee-training. Employee training records will be maintained for at least two years from the last training date.

5.15 ATTACHMENTS

- Attachment 5-1 Fall Protection Requirements
- Attachment 5-2 Fall Protection Program, Program Performance Verification
- Attachment 5-3 Daily Inspection Sheet, Climb Belt/Harness/Hardware



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Attachment 5-1 Fall Protection Requirements

Type or Location of Surface	Required Fall Protection System	Additional Requirements or Special Circumstances
1. Surface 6 feet or more above a lower level		
Hoist area	Guardrail system or personal fall-arrest system	If any portion of a guardrail system must be removed to facilitate hoisting, and an employee must lean through or over the edge of the access opening, he/she must be protected by a personal fall-arrest system.
Formwork and reinforcing steel	Personal fall-arrest system, safety net system, or positioning device system	
Ramps, runways, and other walkways	Guardrail system	
Precast concrete erection (including, but not limited to: wall panels, columns, beams, and floor and roof "tees") and related operations such as grouting of precast concrete members.	Guardrail system, safety net system, or personal fall-arrest system, unless another provision in this table is applicable	<i>Exception:</i> Depending on conditions of the workplace, if use of these systems is not feasible or if it may create a greater hazard, SES will develop and implement a Fall Protection Plan that provides alternate safety measures.
Residential construction	Guardrail system, safety net system, or personal fall-arrest system, unless another provision in this table is applicable	<i>Exception:</i> Depending on conditions of the workplace, if use of these systems is not feasible or if it may create a greater hazard, SES will develop and implement a Fall Protection Plan that provides alternate safety measures.
Wall opening with the outside bottom edge 6 feet or more above lower level and inside bottom edge less than 39 inches above the surface	Guardrail system, safety net system, or personal fall-arrest system	
Surfaces not otherwise addressed	Guardrail system, safety net system, or personal fall-arrest system	
2. Area involving hole, excavation, or other item 6 feet or deeper		
Hole, including skylight	Personal fall-arrest system, cover, or guardrail system erected around the hole	This protection is intended to prevent an employee from tripping or stepping into or through holes and to prevent objects from falling through holes
Excavation when not readily seen because of plant growth or other visual barrier	Guardrail system, fence, or barricade	
Well, pit, shaft, and similar excavation	Guardrail system, fence, barricade, or cover	



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Attachment 5-1 - Fall Protection Requirements (Continued)

Type or Location of Surface	Required Fall Protection System	Additional Requirements or Special Circumstances
3. Area above dangerous equipment		
Area less than 6 feet above dangerous equipment	Guardrail system or equipment guard	
Area 6 feet or more above dangerous equipment	Guardrail system, personal fall-arrest system, or safety net system	
4. Overhead bricklaying and related work area		
Area 6 feet or more above lower level	Guardrail system, safety net system, personal fall-arrest system, or work confined to a controlled access zone	
Area 10 inches or more below the work	Guardrail system, safety net system, or personal fall-arrest SYSTEM	Bricklaying operations performed on scaffolds are regulated by additional OSHA regulations in Subpart L of 29 CFR 1926
5. Roof area with unprotected sides and edges 6 feet or more above lower level		
Low-sloped roof	Guardrail system, safety net system, personal fall-arrest system, or a combination of 1) warning line system and guardrail system, 2) warning line system and safety net system, 3) warning line system and personal fall-arrest system, or 4) warning line system and safety monitoring system	On roof that are 50 feet or narrower, the use of a safety monitoring system alone (without the warning line system) is permitted
Steep roof	Guardrail system with toeboards, safety net system, or personal fall-arrest system	

Notes: Source – 29 CFR 1926.501

CFR = Code of Federal Regulations

OSHA = Occupational Safety and Health Administration

SES = SpecPro Environmental Services, LLC



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Attachment 5-2 Fall Protection Program Program Performance Verification Checklist

Review Date: _____

No.	Program Element	Status	
		Complete (√)	Target Date
1.	The Corporate Safety & Health Manager has been appointed and trained to oversee the administration of this program.		
2.	Are all individuals who use fall protection/prevention devices trained in accordance with the written program?		
3.	Are fall protection/prevention devices inspected prior to each use?		
4.	Are fall protection/prevention devices not passing a daily inspection immediately removed from service until repairs can be made?		
5.	Are all accidents involving fall protection investigated for cause and corrective action?		
6.	Do Supervisors include inspection of fall protection/prevention devices in their job site inspections and discuss fall protection issues during tool box safety meetings?		
7.	Do subcontractors comply with Fall Protection Program requirements?		
8.	Are positioning devices used as intended?		
9.	Is 100% fall protection enforced?		

Comments:

Reviewer Names:



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Attachment 5-3 Fall Protection Program, Harness Safety Checklist

Daily Inspection Sheet Climb Belt /Harness /Hardware

Job Name: _____ Date: _____
Supervisor/Crew Leader: _____ Inspection By: _____
Project Manager: _____

	Mon.	Tues.	Wed.	Thur.	Fri.	Sat.	Sun.
Belt / Harness							
Webbing: No tears, cuts/burns, or chemical degradation							
Buckles and Rivets: No deformities, missing springs, or abnormal/excessive wear							
D-Rings: No cracks, wear, or deformity							
Harness: Fits properly							
Lanyards							
Grommets: No excessive wear or deformity							
Snap Hooks: Latch properly, no excessive wear or deformity							
Rope or Strap: No cuts, wear, fraying, chaffing, bunny fur, chemical degradation, ripping, or unraveling braid							
Hardware							
Pelican Hook: Working safety catch, bar closes and latches, no wear or deformity							
Safety Climb: Spring, chains, and quick release pins for proper operation							
Spreader Bars/Chains: No visible damage or wear							

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14.0 HAZARD COMMUNICATION

14.1 SCOPE AND APPLICATION

This program applies to all SES employees who are, or may be exposed to hazardous materials used in the workplace. It also applies to contractors who may be exposed to SES hazardous materials or bring hazardous materials to SES sites or facilities.

14.2 RESPONSIBILITIES

Program responsibilities are defined below for the individuals designated to ensure the proper implementation of this program.

14.2.1 Corporate H&S Manager

- Ensure all management and affected employees are aware of the Hazard Communication Program.
- Coordinate and manage the overall written Hazard Communication Program.
- Advise Management of any program deficiencies noted requiring his/her action or involvement.
- Prepare internal MSDSs as needed.
- Ensure each office's MSDS/Hazardous Material Inventory binders are kept up-to-date and made available to all employees and contractors.
- Prepare example labels and update internal MSDSs as needed.
- Archive MSDSs.
- Ensure a Program Performance Verification of the Hazard Communication Program is performed and documented at least annually.

14.2.2 Human Resources

Maintain all training documentation.

14.2.3 Site Superintendent and Foreman

- Ensure all elements of the HazCom Program are effectively communicated and affected employees in their work area comply with the program elements.
- Ensure workers comply with HazCom guidelines and PPE requirements on a daily basis.
- Conduct employee HazCom training or ensure all employees attend scheduled training.
- Ensure all containers of materials in their work area are labeled.
- Provide or schedule affected employees' training.

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14.2.4 Employees

- Use engineering controls, work practices, and PPE as required by company procedures and policies.
- Inform Management of any symptoms of over exposure that may possibly be related to hazardous chemicals.
- Inform Management of any missing labels on containers.
- Actively participate in all hazard communication training.

14.2.5 Contractors

- If requested, provide a copy of MSDSs to the SES Primary Contact for all hazardous materials brought on to the property prior to them being brought on site.
- Inform their employees of the availability of SES MSDSs.
- Ensure all subcontractors adhere to the requirements of this program.

14.3 CONTRACTORS

SES's Contractor Safety Program is the primary vehicle for interacting with contractors at the facility, including those involving Hazard Communication. The program as applicable to Hazard Communication is summarized below:

- Prior to the initiation of work, the SES Primary Contact for a given Contractor (or designee) will conduct and document a facility Pre-Job Safety Briefing that is unique to the work to be accomplished.
- If requested, Contractors are required to provide copies of all MSDSs to the SES Primary Contact for all hazardous materials brought on to SES property prior to them being brought on site.
- Contractors are required to relay information on facility hazards to their employees.
- Contractors are required to ensure all subcontractors adhere to the requirements of this program.

14.4 HAZARD DETERMINATION

14.4.1 Raw Materials and Supplies

SES does not intend to determine the hazards of materials purchased from suppliers and/or manufacturers, but has chosen to rely upon the evaluation of the materials performed by suppliers and/or manufacturers to satisfy the requirements for hazard determination.

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14.4.2 Facility-Produced Materials

In the event SES must determine the hazards of materials generated at the SES, the hazard determination will be performed or overseen by the Corporate H&S Manager.

14.5 HAZARDOUS MATERIALS INVENTORY

A master Hazardous Materials Inventory will be developed and maintained by the Corporate H&S Manager. Attachment 14-2 contains the most current hazardous material inventory form.

14.6 LABELING

All containers of hazardous materials must be either being used by the individual that recently (i.e., that shift) transferred the material, or it must be labeled. It is the responsibility of the employee using a material that the label is present.

14.6.1 Materials in Original Containers

If labels on original containers are found to be inadequate, defaced, or otherwise unacceptable, the material will be held until the Corporate H&S Manager has determined whether the material will be accepted, and if it will, what label is to be applied.

14.6.2 Secondary Containers/Replacement Labels

All containers that meet the following criteria are considered to be secondary containers:

- not the original container, or the label for the original container is deficient, defaced, or otherwise inadequate; and
- to be used by more than one person on a single shift or by one or more employees over multiple shifts.

All secondary container labels must be completed and the label applied prior to transfer of the material into the container. The Corporate H&S Manager will develop example laminated labels for the most common secondary containers in the facility, and will place these examples in the local MSDS books.

If a container has been used previously, the original label must be removed or defaced so that only one hazard label is on the container at one time.

14.7 MATERIAL SAFETY DATA SHEETS

MSDSs for all hazardous material to which employees are or may potentially be exposed will be obtained and made readily available to all employees. Original MSDSs will be maintained in an office-specific MSDS Binder. MSDSs will be kept current to a maximum date from receipt of five years. The Corporate H&S Manager will be responsible for ordering new MSDSs for existing materials. The Site Safety and



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Health Officer has responsibility for managing and storing MSDSs applicable to a specific job at that job site.

14.7.1 Archiving MSDSs

If a material is no longer used or present at the facility, the MSDS will be archived in a location or file designated for that purpose. Typically, these materials are identified during the annual Hazardous Materials Inventory update. The archive date of the MSDS will be marked in ink on the first page of the MSDS, and the archived MSDS will be retained for 30 years.

14.7.2 SES-Generated MSDSs

If a project must generate an MSDS, the Corporate Safety & Health Manager will generate the MSDS. All internally-produced MSDSs must be updated by the Corporate Safety & Health Manager at least every three years.

14.8 EMPLOYEE INFORMATION AND TRAINING

The Site Superintendent or Foreman will arrange for employee information and training of existing hazardous materials at the time of initial assignment and whenever a new hazardous material is introduced into the work area. Employees will be trained in accordance with the outline in Attachment 14-3.

14.9 HAZARDS FROM NON-ROUTINE TASKS

Periodically, employees are required to perform non-routine tasks with hazardous materials. Prior to starting work on such projects, each affected employee will be given information by their site superintendent about hazards to which they may be exposed during such an activity. The Corporate Safety & Health Manager may be consulted for a determination of potential hazards if not immediately apparent.

14.10 PROGRAM REVIEW AND REVISION

This program will be reviewed at least annually by the Corporate Safety & Health Manager and will be revised to reflect any changes in procedures or best management practices. The assessment will address the degree and consistency of program element implementation in the workplace. Attachment 14-1 contains the program performance verification criteria that will be used to conduct and document this assessment. The Corporate Safety & Health Manager will be responsible for ensuring the conduct of the review and incorporation of any revisions. The latest program performance verification documentation will be retained by the Corporate Safety & Health Manager.



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14.11 DISCIPLINARY POLICY

All employees are expected to adhere to the procedures given in this written program. Failure to comply will result in disciplinary action as described in SES's disciplinary policies.

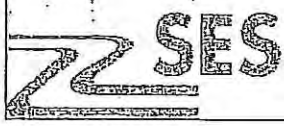
14.12 RECORD KEEPING

The individuals or departments listed below shall maintain the following information:

- All employee training records will be maintained by Human Resources at least two years from the last training date.
- All contractor safety information will be retained by the responsible person as stipulated in the Contractor Safety Program.
- The latest Program Performance Review and latest Hazardous Material Inventory will be retained by the Corporate H&S Manager.
- Original and archived MSDSs will be maintained by the Corporate H&S Manager.

14.13 ATTACHMENTS

- Attachment 14-1 Hazard Communication Program, Program Performance Verification
- Attachment 14-2 Hazardous Materials Inventory
- Attachment 14-3 Employee Information and Training

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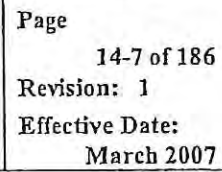
Attachment 14-1
Hazard Communication Program
Program Performance Verification

Reviewer Names: _____

Date: _____

Hazard Communication Program	Yes	No
1. Is a written Hazard Communication Program complete and representative of the current organizational structure?		
2. Is the Hazardous Material Inventory maintained and updated at least annually to reflect products currently in use (updated in last 12 months)?		
3. Is there an MSDS for each chemical listed in the Hazardous Material Inventory?		
4. Are employees working with chemicals trained on how to protect themselves, recognize, and react to overexposure or spill?		
5. Is training documented?		
6. Are all secondary use containers labeled in accordance with the written Hazard Communication Program?		
7. Are contractors required to provide information on chemicals they plan to bring to the facility / site prior to doing so?		

Comments:





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Attachment 14-3 Hazard Communication Program Employee Information and Training

This training outline specifies the SES procedure for Site Superintendents and Foremen to use to provide hazard communication training to the employees assigned to their work teams. To meet the training required by 29 CFR 1910.1200(h), all employees will receive the following information.

1.0 A review of the basic elements and requirements of hazard communication

A review of the company's Hazard Communication Program, including identifying the Corporate H&S Manager. This includes a discussion of the key elements of the OSHA Hazard Communication Standard 29 CFR 1910.1200, including:

- identification of hazardous chemicals used in the facility (or on site) and processes that may produce health or physical hazard exposures to personnel;
- availability of MSDSs for chemicals purchased and used in the facility / site and all processes where exposure to personnel may occur;
- provision of labels, signs, MSDSs, and process instructions to adequately warn of potential or known hazards;
- the training program for all affected employees;
- records retention; and
- periodic program periodic reviews and update procedures.

2.0 Operations or processes where exposures can occur and the hazardous chemicals that are used in the operation/process.

A discussion of each applicable operation/process, along with a review of the applicable hazards and each hazardous chemical in use. The Hazardous Material Inventory and appropriate MSDSs for each chemical will be reviewed or referenced. The following information is to be provided to the employees:

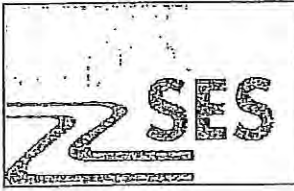
- name of hazardous chemicals used in applicable processes;
- controls in effect to limit exposures (e.g., engineering controls, workplace practices, personal protective equipment); and
- means by which the presence or release of hazardous materials can be detected (e.g., spills, industrial hygiene monitoring, direct-reading instruments, smells).

3.0 Location of documents related to hazard communication, including the following:

- Company Hazard Communication Program - Location of the program and the employee's right to review the written program at any time.
- Hazardous Material Inventory - Including the location of the inventory.

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- Material Safety Data Sheets (MSDSs) – Including the location and availability for each hazardous material in use. An example MSDS will be reviewed, section by section, and instructions on interpreting the MSDS is to be given. All workers must know where the MSDSs are located and that all MSDSs are available for review as needed.



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16.0 PERSONAL PROTECTIVE EQUIPMENT PROGRAM

16.1 SCOPE AND APPLICATION

The PPE Program applies to all workers who will wear PPE as part of the overall injury and illness prevention process. Although engineering controls are generally preferred to PPE, these may not be reasonable, feasible, or practical. PPE use then becomes a necessary and effective control method. The goal is to eliminate exposures through inhalation, ingestion and absorption and to minimize PPE use. PPE is good only if properly selected and used. Improper selection or use can lead to diminished protection and injury. Proper PPE selection and use requires a high degree of personal responsibility. Competent people and training will be provided to assist with proper PPE selection and use. It is everyone's responsibility to properly wear the correct PPE. The SES PPE Program will be reviewed annually and updated as needed.

16.2 RESPONSIBILITIES

16.2.1 Corporate Safety and Health Manager

- Provide all materials and equipment required for effective implementation of this program.
- Provide guidance in the selection of appropriate PPE.
- Perform a documented Program Performance Verification of the program at least annually.

16.2.2 Site Superintendent and Forman

- Evaluate compliance with this program during weekly safety inspections.
- Discuss and document personal protection concerns during safety meetings.
- Ensure that only approved PPE is purchased and used.
- Ensure implementation of the Personal Protective Equipment program.

16.2.3 Employees

- Adhere to all requirements of the PPE Program.
- Inspect all PPE prior to use and obtain new PPE when damaged or defective.

16.2.4 Subcontractors

- Adhere to all requirements of the PPE Program.
- Inspect all PPE prior to use and obtain new PPE when damaged or defective.



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16.3 HAZARD ASSESSMENT

A survey of each work area will be conducted by the Site Superintendent and Foreman. The purpose of the survey is to identify all potential hazards associated with the operations/tasks that are present on the jobsite. Once the hazards have been identified, the superintendent will make recommendations regarding PPE needs for the operation. Attachment 16-2, the PPE Hazard Assessment Worksheet, will be used to assessing each task.

16.4 GENERAL PPE REQUIREMENTS

- Hard hats - shall be worn at all times on site. Hard hats are to be worn with the bill in front, except for welders who are actively welding. All hard hats must meet ANSI Z89.1 and contain labeling satisfying this requirement.
- Safety Glasses - shall be worn at all times when there is a potential exposure to flying projectiles. All safety glasses must meet ANSI Z87.1 and contain labeling satisfying this requirement. Goggles or a face shield over safety glasses are compulsory when drilling, burning, chipping, grinding, gas welding, grouting and where otherwise required by your foreman.
- Foot wear- no sandals, opened toed shoes, tennis shoes or look a likes will be allowed. Only good repairable type work boots or shoes.
- Harness and Lanyards - shall be used when fall potential is six feet or more above the ground. More specific requirements for fall protection PPE is contained within the SES Fall Protection Program.
- Shirts - with at least 4 inch sleeves are to be worn at all times by all personnel while on a company site. Shorts, tank tops, loose or torn clothing will not be permitted.
- Finger rings and wristwatches - are a constant hazard and all employees are encouraged to remove them while working. No jewelry permitted when performing electrical work.
- Welding hoods - are mandatory for all arc welders and safety spectacles must be worn under the hood.
- Gloves - shall be worn when handling material with sharp or rough edges or as directed by your Supervisor.
- Respiratory Protection - Respirator use is covered under the Respiratory Protection Program.

16.5 PURCHASING NEW PPE

When job tasks or processes require new PPE, only approved equipment may be purchased. Most PPE purchased from safety suppliers is approved for intended use. Refer to specific OSHA and consensus standards (NIOSH, ANSI).

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16.6 EMPLOYEE INFORMATION AND TRAINING

Employees must receive training initially. Retraining must be conducted when work processes change; types of PPE are changed; or when there is reasonable belief that employees have not retained the requisite understanding of the above requirements. The training should contain the following content:

- When PPE is necessary;
- What PPE is required;
- How to properly don, doff, adjust and wear PPE;
- Limitations of the PPE; and
- The proper care, maintenance, useful life and disposal of PPE.

16.7 MEDICAL EVALUATIONS

Medical evaluations may be necessary for specific types of PPE (e.g., respirators). The Corporate Safety & Health Manager shall establish which employees are to be included in medical surveillance, as well as the nature of the medical surveillance.

16.8 PROGRAM REVIEW AND REVISION

The Corporate Safety & Health Manager shall perform an annual assessment of this program. The assessment will address the degree and consistency of program element implementation in the workplace. The attached Program Performance Verification criteria will be utilized to conduct and document this assessment.

16.9 DISCIPLINARY POLICY

All employees are expected to adhere to the procedures given in this written program. Failure to comply will result in disciplinary action as described in SES's disciplinary policies.

16.10 RECORD KEEPING

Human Resources shall maintain an accurate record of the following information:

- All employee medical records shall be retained for the duration of the affected employee's employment plus thirty years.
- The most current employee training records.
- Incident Forms will be maintained for five years.

16.11 ATTACHMENTS

- Attachment 16-1 Personal Protective Equipment Program, Program Performance Verification
- Attachment 16-2 PPE Hazard Assessment Worksheet

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Attachment 16-1
 Personal Protective Equipment Program
 Program Performance Verification

Location: _____

Review Date: _____

No.	Program Element	Status	
		Complete (√)	Target Date
1.	The Corporate S&H Manager has been appointed and trained to oversee the administration of this program.		
2.	Is only approved PPE purchased for use?		
3.	Have employees been trained in the use and care of PPE?		
4.	Have hazard assessments been conducted for all job tasks?		
5.	Are visitors supplied with required PPE?		
6.	Is defective PPE removed from service promptly and replaced?		
7.	Are all employees and subcontractors wearing the required minimum PPE?		

Comments:	Reviewer Names:



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Attachment 16-2 PPE Hazard Assessment Worksheet

Location: _____ Date: _____

Job Task: _____ Assessor: _____

Check All That Apply

Comments / PPE Required

Hand Protection

PPE TO BE USED:

Cuts	☐	Abrasions	☐
Hot	☐	Cold	☐
Wet Work	☐	Dry Work	☐
Chemical	☐	Vibration	☐

Foot Protection

PPE TO BE USED:

Object weight _____ lbs.

Sharp Objects in area ☐

Eye Protection/ Face Protection

PPE TO BE USED:

Impact Only ☐

Safety glasses with side shields

Chemical Splash ☐

Goggles/Face Shield

Welding, Sparks, Grinding ☐

Safety glasses & face shields

Head Protection

PPE TO BE USED:

Possible injury/falling object ☐

Contact w/ electrical hazards ☐

Body

PPE TO BE USED:

Protective Clothing ☐

Apron ☐

Hearing Protection

PPE TO BE USED:

Plugs ☐

Apron ☐

Respiratory Protection

PPE TO BE USED:

Disposable (Dust Mask) ☐

Cartridge Type and Changeout Frequency: _____

Other: _____



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8.0 TOOL BOX SAFETY MEETINGS

8.1 SCOPE AND APPLICATION

The scope of the Tool Box Safety Meetings is to ensure proper instruction is provided for employees in the recognition and avoidance of unsafe work practices or conditions. Tool Box Safety Meetings will also provide information on the safety regulations and SES safety program requirements that apply to their work environment. This program is applicable to all SES employees and subcontractors.

8.2 REFERENCES

- SES Tool Box Safety Meeting Manual
- OSHA 29 CFR 1926.21.

8.3 RESPONSIBILITIES

Responsibilities of personnel in regard to ensuring the Tool Box Safety Meetings are properly conducted and documented are as follows.

8.3.1 Corporate Safety & Health Manager

- Ensure all management and affected employees are aware of the requirement to conduct Tool Box Safety Meetings on a weekly basis.
- Provide all materials and hardware for effective presentation and documentation of the Tool Box Safety Meetings and ensure they are properly utilized and maintained.
- Periodically review worksites to ensure meetings are being properly conducted and documented.

8.3.2 Site Superintendent, Foreman, Project Manager

- Be knowledgeable of Tool Box Safety Meeting requirements.
- Acquire a Tool Box Safety Meeting manual from the Corporate Safety Manager
- Prepare for and present the weekly safety meetings to SES field crews and subcontractors.
- Ensure safety meetings are properly documented.
- Ensure all affected employees and subcontractors attend weekly safety meetings.

8.3.3 Employees

Employees will actively participate in the weekly Tool Box Safety Meetings and adhere to the safety instruction provided.

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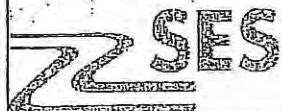
8.4 SAFETY MEETING PREPARATION, PRESENTATION AND DOCUMENTATION

8.4.1 Safety Meeting Preparation

- The Corporate Safety & Health Manager will furnish the SES Supervisors with a copy of the SES Tool Box Safety Meeting manual.
- The Tool Box Safety Meeting manual provides 52 suggested construction safety topics, which are organized into 12, corresponding to each month of the year. You are not required to use the suggested topics, but you are required to hold a tool box meeting each week.
- Preparing for a tool box safety meeting can be as elaborate or as brief as needed, based on the topic you are presenting. In general, a tool box safety meeting is defined as a short safety-training meeting with employees, usually on Mondays at the start of the shift.
- After selecting the meeting topic, you should determine if you need any visual aids or other reference material to present the meeting. You may also need to review relevant OSHA standards or SES Corporate Safety Program documents to supplement the standardized tool box safety meeting material.

8.4.2 Safety Meeting Presentation

- When you conduct the safety meeting, it is best to include only those employees who need the information. For example, for a talk on operating heavy machinery, you would probably only include operators, not everyone on the job site. But for a talk about working in areas where heavy equipment is operating, you may include many more workers from the site, perhaps even all of them.
- Introduce each tool box talk by explaining why you selected the topic, as well as how it applies to the workers and visitors attending the meeting. You need to project your commitment, concern, and interest in the safety program.
- Tool box safety meetings are also an excellent time to discuss specific job site hazards, past accidents, and employee safety concerns. After reviewing the topic selected for the week, you will then address the following four topics:
 - Accident Investigations – Review any recent accident investigations from any accidents with injuries/illnesses or near misses that may have happened on this project or in a similar project environment.
 - Job Hazards – Review any site-specific safety hazards identified as part of the site hazard assessment or through conduct of site safety inspections.
 - Old Business – Review any safety issues or concerns that may have been raised by employees at a previous safety meeting or during the course of the project.
 - New Business – Open the floor for questions or comments on the main topic, site-specific hazards, or any other safety issues that employees would like to share.

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8.4.3 Safety Meeting Documentation

The SES form for documentation of the tool box safety meeting is included as Attachment 8-1 to this program. This form is designed to document the names of the employees who attended, the companies represented, date, location, topic, and provides space to document the site-specific hazard information discussed. The Tool Box Safety meeting form should be completed for each meeting and maintained with other documentation for the project.

8.5 PROGRAM REVIEW AND REVISION

The Corporate Safety & Health Manager shall perform an annual assessment of this program. The assessment will address adherence to program requirements and the overall effectiveness of the tool box safety meetings. Attachment 8-2 contains the program performance verification criteria that will be utilized to conduct and document this assessment.

8.6 DISCIPLINARY POLICY

All employees are expected to adhere to the procedures provided in the Tool Box Safety Meeting Program. Failure to comply will result in disciplinary action as described in SES's disciplinary action policies.

8.7 RECORDKEEPING

All Tool Box Safety Meeting records will be maintained in project files for at least two years from the project completion date.

8.8 ATTACHMENTS

- Attachment 8-1 Tool Box Safety Meeting Form
- Attachment 8-2 Tool Box Safety Meeting Program, Program Performance Verification

Attachment 8-1

Tool Box Safety Meeting Documentation Form

[illegible]



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Attachment 8-2 Tool Box Safety Meetings Program Program Performance Verification

Reviewer Names: _____

Date: _____

Tool box Safety Meeting Program	Yes	No
1. Does the Site Superintendent have a Tool Box Safety Meeting Manual?		
2. Is the Site Superintendent aware of Tool Box meeting requirements?		
3. Does documentation exist for Tool Box Safety meetings?		
4. Are Tool Box meeting forms being completed properly?		
5. Do interviewed employees reveal that meetings occur?		
6. Do interviewed employees feel that the meetings are effective?		
7. Is site-specific information (Job Hazards, Old Business, etc.) also reviewed?		

Comments: