SITE SAFETY PLAN
CHROMIUM PLATING FACILITY
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

Prepared For:

AlliedSignal, Inc.
Stratford, Connecticut

Prepared By:

Harding Lawson Associates
Portland, Maine
Project No. 2842-00

November 10, 1998
Revised May 3, 1999

Harding Lawson Associates
Engineering and Environmental Services
511 Congress Street
P.O. Box 7050
Portland, Maine 04112-7050

Harding Lawson Associates (HLA)
SITE SAFETY PLAN
(For hazardous waste remedial action operations)

This Site Safety Plan is specifically prepared for:

Project Location: Stratford Army Engine Plant Chromium Plating Facility- Stratford, Connecticut

Project / Task Number: 44411 / 0284200

Date: November 10, 1998

Revision Date: May 3, 1999

ALL PERSONNEL PARTICIPATING IN THE FIELD MUST BE TRAINED IN THE GENERAL AND SPECIFIC HAZARDS UNIQUE TO THE JOB AND, IF APPLICABLE, MEET RECOMMENDED MEDICAL EXAMINATION REQUIREMENTS ALL SITE PERSONNEL AND VISITORS SHALL FOLLOW THE GUIDELINES, RULES, AND PROCEDURES CONTAINED IN THIS SAFETY PLAN. THE PROJECT MANAGER OR SITE SAFETY OFFICER MAY IMPOSE ANY OTHER PROCEDURES OR PROHIBITIONS THAT THEY BELIEVE ARE NECESSARY FOR SAFE OPERATIONS.

THIS PLAN IS PREPARED TO INFORM ALL FIELD PERSONNEL, INCLUDING HLA CONTRACTORS AND HLA SUBCONTRACTORS, OF THE POTENTIAL HAZARDS ON THE SITE. HOWEVER, EACH CONTRACTOR OR SUBCONTRACTOR MUST ASSUME DIRECT RESPONSIBILITY FOR HIS OWN EMPLOYEES' HEALTH AND SAFETY.

TABLE OF CONTENTS

I. INTRODUCTION

A. SITE LOCATION: Stratford Army Engine Plant (SAEP) – Stratford, Connecticut

B. PLAN PREPARED: Rod Pendleton (Name) 11/10/98 (Date)

C. PLAN APPROVED: _____ (Project Manager) _____ (Date)

_____ (DHSO) _____ (Date)

D. PLAN REVISED: Amy E. Bates (Name) 05/03/99 (Date)

E. REVISION APPROVED: _____ (Project Manager) 5/3/99 (Date)

Cynthia Sundquist CIH/CSP 5/3/99 (DHSO) (Date)

F. THE POSSIBLE HAZARDS ON THIS JOB ARE EXPECTED TO BE:

Dust generated during drilling of concrete floor may contain chromium contamination.

Potential chromium (III and VI) contamination in sampled soil and groundwater.

Potential VOC contamination in sampled soil, groundwater, and soil gas.

G. REQUIRED PERSONAL PROTECTIVE ITEMS AND EQUIPMENT FOR THIS PROJECT:

Level C dermal and respiratory protection during concrete coring, and Modified Level D protection during soil, groundwater, and soil gas sampling.

H. Only personnel that are current in their HAZWOPER (29CFR 1910.120) training, enrolled in HLA's Medical Monitoring Program, and are medically authorized to work on hazardous waste projects will be allowed within the Chromium Plating Facility.

II. PERSONS RESPONSIBLE AND INVOLVED

A. PROJECT MANAGER - Nelson Walter, P.E.

Health and Safety Responsibilities: Follow health and safety practices when on site and insure all potential personnel are aware of health and safety plan.

B. SITE SUPERVISOR – D. Roderick Pendleton

Health and Safety Responsibilities: Follow health and safety practices and safe work practices when on-site. Perform frequent inspections for safe work practices. Take appropriate action to maintain safe work environment.

C. SITE SAFETY OFFICER – Glenn Daukas

Health and Safety Responsibilities: Follow health and safety practices when on-site and inspect for compliance with health and safety practices and safe work conditions during on-site activities. Take appropriate action when necessary to maintain a safe work environment.

D. OTHERS - Wolfgang Calicchio, Amy E. Bates, Stephen Mitchell, Gina Rustad, Patrick Craine, Tom Longley, Brad LaForest

Health and Safety Responsibilities: Follow health and safety safe work practices when on-site and and report observed unsafe work conditions.

E. SUBCONTRACTORS - Clean Harbors Environmental Services (for dust decontamination and investigation-derived waste disposal), Stratigraphics, Inc. (for cone penetrometer investigation)

Health and Safety Responsibilities: Follow health and safety safe work practices when on-site and and report observed unsafe work conditions.

III. FACILITY BACKGROUND

A. FACILITY BACKGROUND AND DESCRIPTION: The SAEP facility began operations in 1929, manufacturing seaplanes. The facility continued to develop and manufacture aviation equipment and engines until 1995. The site consists of 124 acres and 77 buildings.

B. SITE HISTORY (USE OF SITE, ORIGIN OF CONTAMINATION): This portion of the SAEP, located in the southeast corner of Building B-2, was used as an electroplating shop. Chromium, nickel, and copper plating activities were conducted in this area.

C. HAZARDOUS INCIDENCE HISTORY (HISTORY OF INJURIES, EXPOSURE, CHEMICAL SPILLS, COMPLAINTS, ETC.):

Unknown.

D. PURPOSE OF ACTIVITY/OBJECTIVE OF HLA's WORK (CHARACTERIZATION, REMEDIAL ACTIONS, EXCAVATION, TRENCHING; INCLUDE LOCATION WITH RESPECT TO AREAS OF KNOWN OR SUSPECTED CONTAMINATION):

Further characterization of subsurface soil, groundwater, and soil gas in order to decide on implementation of potential removal actions.

E. SITE STATUS (ACTIVE, INACTIVE, UNKNOWN): Inactive

F. SURROUNDINGS (LOCATION WITH RESPECT TO CITY, ROADS, RESIDENCES, BUSINESSES, NATURAL FEATURES, GRADIENTS, TANKS, ETC.):

The surrounding area is light industrial use The site is bounded on the east by the Housatonic River, on the south and north by paved parking and open areas, and on the west by Main Street and the Sikorsky Memorial Airport.

G. SITE MAP (ATTACHED MAP AT END OF THIS PLAN SHOWING SALIENT FEATURES, INCLUDING LOCATION OF HLA'S WORK AND LOCATION OF CONTAMINATED AREAS) (SEE PLATE 1).

H. CLIMATE

AVERAGE WIND SPEED AND DIRECTION:

	July	October	January	April
MEAN HIGH TEMPERATURE	86	64	32	60
MEAN LOW TEMPERATURE	70	45	28	42

IV. IDENTIFIED CHEMICAL CONTAMINANTS

A. IDENTIFIED CHEMICAL CONTAMINANTS KNOWN TO BE PRESENT

List chemical contaminants that have been identified, their concentration, and the environmental media in which they are present. Hazardous property information for selected chemicals appears in the appendix. Review this information for all chemicals listed below. If chemicals are not listed in the appendix, you must enter the hazardous property information in the appendix in the spaces provided.

Chemical	Environmental Media (Enter Code)	Measured Concentration	
		Minimum	Maximum
Hexavalent chromium	Indoor surfaces	0.1 mg/m^2	176 mg/m^2
Total chromium	Indoor surfaces	0.275 mg/m^2	5,720 mg/m^2
Hexavalent chromium	So	0.534 mg/kg	640 mg/kg
Total chromium	So	3.43 mg/kg	2,460 mg/kg
Cyanide	So	0.416 mg/kg	230 mg/kg
Nickel	So	5.2 mg/kg	223 mg/kg
Hexavalent chromium	GW	0.1mg/L	950 mg/L
Total chromium	GW	0.001mg/L	950 mg/L
TCE	GW	1 µg/L	830,000 µg/L
PCE	GW	1 µg/L	1,900 µg/L
1,1-DCE	GW	1 µg/L	8,500 µg/L
1,2-DCE	GW	1 µg/L	29,000 µg/L
1,1,1-TCA	GW	1 µg/L	100,000 µg/L
Vinyl Chloride	GW	1 µg/L	2,600 µg/L
Lead	So	6.1 mg/kg	19,700 mg/kg
t-1,2-DCE	GW	5 µg/L	1,000 µg/L
c-1,2-DCE	GW	1.3 µg/L	5,500 µg/L

B. SUSPECTED CHEMICAL CONTAMINANTS ONSITE

List chemical contaminants that are suspected to be present.

Chemical	Environmental Media
Chromium (III) and (VI)	So, GW, indoor building surfaces
VOCs	So, GW

Code for environmental media:

Sl Sludge
GW Groundwater
SW Surface water
LW Liquid waste
So Soil
A Air
Other - Specify

C. CHEMICAL CONTAMINANTS CHARACTERIZATION

Has the site been adequately characterized to the best of your knowledge?

Yes _____ No ___X____

If yes, list applicable references or previous reports/studies.

Other areas of the SAEP facility have extensive characterization (see Phase I and Phase II Remedial Investigations by Woodward-Clyde Consultants); however the extent of VOC contamination in groundwater associated with the Chromium PlatingFacility has not been adequately characterized or delineated.

V. GENERAL WORK PRACTICES

- No one will be permitted to engage in work operations alone.
- Smoking, eating, drinking, chewing gum or tobacco will not be permitted within the work zones.
- Personnel should keep track of weather conditions and wind direction to the extent they could affect potential exposure.
- Personnel should be alert to any abnormal behavior on the part of other workers that might indicate distress, disorientation, or other ill effects.
- Personnel should never ignore symptoms which could indicate potential exposure to chemical contaminants. These should be immediately reported to their supervisor or the Site Safety Officer.
- Others (specific to tasks, i.e., trenching safety, drill rig safety, site entry, etc.)

VI. SITE CONTROL/WORK ZONES

A. DESCRIBE LOCATION OF EXCLUSION ZONE, HOT LINE, CONTAMINATION REDUCTION ZONE, AND DECONTAMINATION AREA AND SUPPORT ZONE. SHOW LOCATIONS ON SITE PLAN.

The attached site plan (Plate 1) identifies the proposed work zone (i.e., exclusion zone and decontamination area) and the support zone for the dust decontamination activities. The exclusion zone, contamination reduction zone, and decontamination area will be located within the boundaries of the chromium plating room. Access to this room will be limited during investigation and decontamination/remediation activities. The support zone will be located outside of this area. During site-wide soil, groundwater, and soil gas sampling conducted with a GeoProbe, a work zone (i.e., exclusion zone and decontamination area) and the support zone will be established around the vehicle using caution tape.

B. DEFINE THE SITE CONTROL/SECURITY MEASURES (I.E., FENCING, LOCKED GATES, KEYS, SECURITY GUARDS, FLAGGING, ETC.

Access to the SAEP facility itself is limited by security guards located at the main entrance. Access to the exclusion, contamination reduction, and decontamination zones will be restricted using caution tape. There are limited access points to the chromium plating facility (i.e., two doors). Caution tape will prevent entry to work zones by unauthorized personnel.

C. DESCRIBE SAFETY PLAN LOCATIONS.

Copies of the safety plan will be located in the vehicle used during completion of work and in Room 15 of Building B-1 (i.e., HLA's on-site field office)

VII. SITE RESOURCES

SITE RESOURCES LOCATIONS

Toilet facilities: In Buildings B-1 and B-12, outside of work zone

Drinking water supply: In Buildings B-1 and B-12, outside of work zone

Telephone: In Buildings B-1 and B-12, outside of work zone and cellular phone in support zone

Radio: contact with security via on-site radios

Other: N/A

VIII. HAZARD ANALYSES

List all activities in the Job Activity Column and assign a number to each activity (example: 1. Groundwater Sampling)

Identify how each category of hazard exists at each activity. See example hazard analyses in Appendix 2.

Activity Number	Job Task	Mechanical	Electrical	Chemical	Temperature	Acoustical	Radioactive	02 Deficiency-Confined Space	Biohazard
1	Dust Decontamination	Mechanical lift, vacuum, sprayer	Power for equipment	Chromium dust	Heat stress	Vacuum noise	NE	NE	NE
2	Concrete drilling	Concrete Hammer	Power for equipment	Chromium dust from concrete coring	Heat stress	Hammer noise	NE	NE	NE
3	Subsurface soil sampling	GeoProbe tools	NE	Potential contaminants in soil	Heat stress	Rig noise	NE	NE	NE
4	Groundwater sampling	GeoProbe tools	NE	Potential contaminants in groundwater	Heat stress	Rig noise	NE	NE	NE
5	Groundwater sampling (conventional)	Pump, generator	NE	Potential contaminants in groundwater	Heat stress	Generator and pump noise	NE	NE	NE
6	Cone penetrometer soil and groundwater sampling	GeoProbe tools (including cone penetrometer)	NE	Potential contaminants in groundwater	Heat stress	Rig noise	NE	NE	NE
7	Soil gas sampling	GeoProbe tools	NE	Potential contaminants in soil gas	Heat stress	Rig noise	NE	NE	NE

NE = Not Expected

IX. HAZARD MITIGATION

Identify procedures to mitigate all hazards listed in Section VIII by placing the task number next to the appropriate mitigating measure. Listing of standard procedures is not inclusive. A specific procedure must be entered to mitigate each hazard identified in Section VIII.

Activity List Number	
	A. Mechanical Hazards
NE	Do not stand near backhoe buckets and earthmoving equipment.
1,2,3,4,5,6,7	Verify that all equipment is in good condition.
1	Do not stand or walk under elevated loads or ladders.
NE	Do not stand near unguarded excavation and trenches.
NE	Do not enter excavation or trenches over 5 feet deep that are not properly guarded, shored, or sloped.
NE	Consult DHSO if other mechanical hazards exist.
	B. Electrical Hazards
2,3,6,7	Locate and mark buried utilities before drilling.
2,3,6,7	Utilities located by: SAEP personnel during construction and located on site plans.
NE	Maintain at least 10-foot clearance from overhead power lines.
NE	Contact utility company for minimum clearance from high voltage power lines.
NE	If unavoidably close to buried or overhead power lines, have power turned off, with circuit breaker locked and tagged.
1,2,5	Properly ground all electrical equipment.
1,2,5	Avoid standing in water when operating electrical equipment.
NE	If equipment must be connected by splicing wires, make sure all connections are properly taped.
1,2,3,4,5,6,7	Be familiar with specific operating instructions for each piece of equipment.
	C. Chemical Hazards
1,2,3,4,5,6,7	Use personal protective equipment indicated in Section XI.
1,2,3,4,5,6,7	Conduct direct reading air monitoring to evaluate respiratory and explosion hazards (list instrument, action level, monitoring location, and action to be taken in Section X).
NE	Consult DHSO for personal air monitoring.

NE = NOT EXPECTED
Task 1 = Building dust decontamination
Task 2 = Concrete drilling
Task 3 = Subsurface soil sampling
Task 4 = Groundwater sampling (using GeoProbe)
Task 5 = Groundwater sampling (conventional)
Task 6 = Cone penetrometer soil and groundwater sampling
Task 7 = Soil gas sampling

D. Temperature Hazards

1. Heat Stress

1,2,3,4,5,6,7 — When temperature exceeds 70°F, take frequent breaks in shaded area. Unzip or remove coveralls during breaks. Have cool water or electrolyte replenishment solution available. Drink small amounts frequently to avoid dehydration. Count the pulse rate for 30 seconds as early as possible in the rest period. If the pulse rate exceeds 110 beats per minute at the beginning of the rest period, shorten the work cycle by one-third.

2. Cold Stress

3,4,5,6,7 — Wear multilayer cold weather outfits. The outer layer should be of wind resistant fabric.

NE — 0° to -30°F total work time is 4 hours. Alternate 1 hour in and 1 hour out of the low-temperature area. Below -30°F, consult industrial hygienist.

NE — Drink warm fluid. Provide warm shelter for resting. Use buddy system. Avoid heavy sweating.

E. Acoustical Hazards

1,2,3,4,5,6,7 — Use earplugs or earmuffs when noise level prevents conversation in normal voice at distance of 3 feet.

F. O_2 Deficiency - Confined Space Hazards

Confined spaces include trenches, pits, sumps, elevator shafts, tunnels, or any other area where circulation of fresh air is restricted or ability to readily escape from the area is restricted. Consult DHSO and Corporate Health and Safety Policy prior to entering confined space.

NE — Obtain permits for confined space entry

NE — Monitor O_2 and organic vapors before entering. If following values are exceeded, do not enter:

- O_2 less than 19.5 percent or greater than 25%.
- Total hydrocarbons greater than 5 ppm above background, if all air contaminants have not been identified.
- Concentrations of specific contaminants exceeding action level in Section X if all air contaminants are identified.

NE = NOT EXPECTED
Task 1 = Building dust decontamination
Task 2 = Concrete drilling
Task 3 = Subsurface soil sampling
Task 4 = Groundwater sampling (using GeoProbe)
Task 5 = Groundwater sampling (conventional)
Task 6 = Cone penetrometer soil and groundwater sampling
Task 7 = Soil gas sampling

NE	Monitor O_2 and organic vapors continuously while inside confined space. If values cited in Item 1 are exceeded, evacuate immediately. Record instrument readings.
NE	At least one person must be on standby outside the confined space who is capable of pulling workers from confined space in an emergency.
NE	Use portable fans or blowers to introduce fresh air to confined spaces whenever use of respirator is required.
NE	Work involving the use of flame, arc, spark, or other source of ignition is prohibited within a confined space.
	G. Radiation Hazards
NE	If radiation meter indicates 2 mR/hr or more, leave the area and consult DHSO.
	H. Biohazards
NE	Poison oak, poison ivy.
NE	Infectious waste.
NE	Rabid animals.
6,7	Ticks, mosquitoes, and other insects (disease carriers or poisonous).
NE	Biological or animal laboratories.

NE = NOT EXPECTED
Task 1 = Building dust decontamination
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X. AIR MONITORING

Air monitoring should be conducted with instruments selected to measure contaminants that employees may be exposed to. Measurements should be taken within the breathing zones of workers. If action levels are reached for a 1-minute reading, appropriate action must occur.

A. GASES AND VAPORS

Instrument & Date of Calibration	Calibration Gas Standard	Frequency/ Duration of Air Monitoring	Action Level (a)(b) Above Background (Breathing Zone)	Action
Photoionization Detector	Isobutylene	Periodic	Any detection above background	Introduce engineering controls (i.e., blower fans) (Level D)
Vinyl Chloride 0.5/a Draeger tube	N/A	Periodic	≥ 0.5 ppm	
Photoionization Detection	Isobutylene	Periodic	≥ 22 ppm	Don respirator (Level C)
Photoionization Detector	Isobutylene	Periodic	≥ 296 ppm	Upgrade to Level B
Vinyl Chloride 0.5/a Draeger tube	N/A	Periodic	≥ 0.5 ppm	
Photoionization Detector	Isobutylene	Periodic	≥ 445 ppm	Upgrade to Level A. May also backoff and allow situation to stabilize; consult with Project Manager and DHSO.

(a) Action Levels for "known contaminants" should be based upon the contaminants Permissible Exposure Level (PEL) or Threshold Limit Values (TLVs).

(b) Action levels for unknown contaminants are based upon the following:

HNu or OVA Measurements in Breathing Zone
Reading for 1 minute

Background	Level D
>0-5 ppm above background	Level C
5-500 ppm above background	Level B

500-1000 ppm above background	Level A or backoff and allow situation to stabilize; consult with Project Manager and DHSO.

Comments: _____

_____

B. EXPLOSION HAZARD

Instrument & Date of Calibration	Action Level Above Background (Ambient Air)	Frequency/Duration of Air Monitoring	Action
Combustible gas indicator	Greater than 20% LEL	Periodic	Leave area

C. OXYGEN DEFICIENCY

Instrument & Date of Calibration	Action Level (Ambient Air)	Frequency/Duration of Air Monitoring	Action
O_2 meter	Less than 19.5% O_2 More than 23% O_2	15 minutes	Leave work area if meter alarm sounds or reading is low.

D. OTHER INSTRUMENTS

Instrument & Date of Calibration	Action Level (Breathing Zone/ Ambient Air)	Duration/Frequency of Air Monitoring	Action
Date			
Draeger pump/tubes: Vinyl Chloride 0.5/a	0.5 ppm	Periodic	Introduce engineering controls or upgrade to Level B.
Radiation monitor			
Heat stress meter			
Noise meter			
H_2S meter			
Respirable dust meter	0.5 mg/m^3	Continuous (during dust decontamination)	Upgrade to Level C
pH analyzer			
Others: Personal air sampling for chromium[1]	0.5 mg/m^3	Representative (during dust decontamination, if necessary)	Confer with DSHO

In the event visible dust cannot be controlled with wet or other methods, personal air sampling pumps with collection filters will be used to measure for chromium dust during subsequent chromium analysis.

XI. REQUIRED PERSONAL PROTECTIVE AND RELATED SAFETY EQUIPMENT

Place the activity number from Section VIII next to each item of personal protective equipment anticipated to be required for that task. All personal safety equipment must meet ANSI standards or equivalent.

LEVEL: _____ A _____ B 1,2 C 3,4,5,6,7 Modified D

Comments: _____

_____

_____

Head

1,2,3,4,6,7 Hardhat

Eye/Face

1,2,3,4,5,6,7 Safety Glasses
_____ Faceshield
_____ Chemical Goggles

Hand

1,2,3,4,5,6,7 Neoprene
_____ Nitrile
_____ PVC
_____ Viton
1,2,3,45,6,7 Underglove-Nitrile
_____ Other =_____

Body

_____ Full Encapsulating Suit: _
_____ Two Piece Rainsuit, Material = _____
_____ One Piece Splash Suit, Material = _____
1,2,3,4,5,6,7 Hooded Tyvek Suit
_____ Hooded Tyvek/Saranax Suit
_____ Hooded Tyvek/Polyethylene Suit
_____ Cloth Coveralls
_____ High Visibility Vest
_____ Other _____

Lung

_____ SCBA (open circuit, pressure demand): _____
1,2_____ Full Face Respirator, cartridge = Particulate/N95 cartridges
3,4,5,6,7__ Full Face Respirator, cartridge = MSA GMC or equivalent with N95 pre-filter (only if Level C upgrade is required)
_____ Supplied Air, Airline
_____ Half Mask Respirator, cartridge = _____
_____ Other _____

Ear

2,3,4,5,6,7	Earplug, type = _____
_____	Earmuff, type = _____

Foot

1,2,3,4,5,6,7	Steel-toed Boots, type = ANSI Approved
_____	Disposable Overboots, type = _____

Other Safety Equipment

3,4 (when indoors)	Ventilation blower/fan
_____	Traffic cones
_____	Barrier tape
_____	Blast alarm
_____	Ground fault circuit interrupter
_____	Lifeline harness
_____	Radiation Dosimeter

Comments: Water spray bottles and/or other appropriate mist spray equipment will be available for dust suppression during Task 2 (concrete drilling). A ventilation blower/fan will be used to circulate air through the work area and prevent the accumulation of fumes from the gas-powered equipment (i.e., GeoProbe) when working indoors, if necessary.

XII. DECONTAMINATION PROCEDURES

A. EQUIPMENT (SAMPLING, CONSTRUCTION, ETC.) DECONTAMINATION (SOLVENTS USED, EQUIPMENT USED, METHOD OF DISPOSAL). ATTACH SITE DECONTAMINATION MAP AS NECESSARY.

Concrete coring equipment will be decontaminated using potable water and Liquinox, following use. Sampling equipment that comes in contact with the sample media will be decontaminated with a solution of Liquinox and potable water, followed by a deionized water rinse.

B. PERSONNEL DECONTAMINATION (SOLVENTS USED, METHOD OF SOLVENT DISPOSAL; INCLUDE DECONTAMINATION METHOD OF PPE AND DISPOSAL OF PPE). ATTACH DECONTAMINATION MAP AS NECESSARY.
PPE will be placed in 55-gallon DOT-approved drums and disposed off-site. Decontamination water containing surfactants (i.e., Liquinox) will be placed in 55-gallon DOT-approved drums and disposed off-site. Solid and liquid wastes will be drummed separately. Purged groundwater will be containerized in 55-gallon drums and pre-treated using a granular activated carbon unit prior to discharge to the sump at Building 63, where it will then be pumped to the to the Chemical Waste Treatment Plant.

C. INVESTIGATION-DERIVED MATERIAL DISPOSAL

1. Drill cuttings/well water: Soil cuttings will be placed in 55-gallon DOT-approved drums and disposed off-site (by Clean Harbors). Purged groundwater will be containerized in 55-gallon drums and pre-treated using a granular activated carbon unit prior to discharge to the sump at Building 63, where it will then be pumped to the to the Chemical Waste Treatment Plant.

2. Decontamination solutions: Decontamination water containing surfactants (i.e., Liquinox) will be placed in 55-gallon DOT-approved drums and disposed off-site (by Clean Harbors).

3. Other: Chromium dust and related decontamination equipment will be containerized in 55-gallon drums and transported to an off-site Clean Harbors facility.

XIII. DOCUMENTATION

HLA PERSONNEL TRAINING AND MEDICAL RECORDS ARE LOCATED AT HLA – PORTLAND, MAINE. RECORDS WILL BE MAINTAINED ONSITE AS NECESSARY.

A. PROJECT PERSONNEL LIST AND SAFETY PLAN DISTRIBUTION RECORD

1. HLA Employees

All project staff must sign, indicating they have read and understand the Site Safety Plan. A copy of this Site Safety Plan must be made available for their review and readily available at the job site.

Employee Name/Job Title	Date Distributed	Signature
D. Roderick Pendleton		
Gina L. Rustad		
Wolfgang Calicchio		
Amy E. Bates		
Nelson Walter		
Patrick Craine		
Glenn Daukas		
Tom Longley		
Brad LaForest		

2. Contractors, Subcontractors

A copy of this safety plan shall be provided to contractors and subcontractors who may be affected by activities covered under the scope of this Site Safety Plan. All contractors and subcontractors must comply with applicable OSHA, EPA, and local government rules and regulations.

Firm Name	Contact Person	Date Distributed
Clean Harbors Environmental Services	John Mullen, 860-583-8917	
Stratigraphics, Inc.	Christine Strutysky, 630-790-4610	

B. HEALTH AND SAFETY MEETING - ALL PERSONNEL PARTICIPATING IN THE PROJECT MUST RECEIVE INITIAL HEALTH AND SAFETY ORIENTATION. THEREAFTER, A BRIEF TAILGATE SAFETY MEETING IS REQUIRED AS DEEMED NECESSARY BY THE SITE SAFETY OFFICER (OR AT LEAST ONCE EVERY 10 WORKING DAYS).

Date	Topics	Name of Attendee	Firm Name	Employee Initials

C. VISITOR - IT IS HLA's POLICY THAT VISITORS MUST FURNISH HIS/HER OWN PERSONAL PROTECTIVE EQUIPMENT. ALL VISITORS ARE REQUIRED TO SIGN THE VISITOR LOG AND COMPLY WITH THE SAFETY PLAN REQUIREMENTS. IF THE VISITOR REPRESENTS A REGULATORY AGENCY CONCERNED WITH SITE HEALTH AND SAFETY ISSUES, THE SITE SAFETY OFFICER SHALL ALSO IMMEDIATELY NOTIFY DHSO.

VISITOR LOG

Name of Visitor	Firm Name	Date of Visit	Signature

XIV. CONTINGENCY/EMERGENCY INFORMATION

A. REQUIRED EMERGENCY EQUIPMENT LOCATION

Safety shower/eyewash: In support zone.
First aid kit: In support zone.
Fire extinguisher: In support zone.

B. EMERGENCY TELEPHONE NUMBERS

Ambulance:	Call security (6653); they will call 911	
Police:	Call security (6653); they will call 911	
Fire department:	Call security (6653); they will call 911	
Hospital:	Bridgeport Hospital (203) 384-3000	
Client contact:	Security Headquaters (6652)	
Poison Control Center:	(800) 233-3360	
CHEMTREC:	(800) 424-9300	
Project Manager	Office (207) 828-3637	Home Redacted - Privacy Act
DHSO	Office (207) 828-3309	Home

C. * STANDARD PROCEDURES FOR REPORTING EMERGENCIES:

When calling for assistance in an emergency situation, the following information should be provided:

1. Name of person making call
2. Telephone number at location of person making call
3. Name of person(s) exposed or injured
4. Nature of emergency
5. Actions already taken

Recipient of call should hang up first-not the caller.

D. EMERGENCY ROUTES: ATTACH MAP SHOWING ROUTE TO NEAREST HOSPITAL. DESCRIBE NARRATIVELY THE ROUTE TO THE HOSPITAL. HAS HOSPITAL BEEN CONTACTED TO DETERMINE IF THEY WILL HANDLE A CHEMICAL EXPOSURE?

Follow Main Street north about ¾ mile to W. Broad Street. Left on W. Broad Street about ¼ mile to Barnum Avenue. Left on Barnum about ½ mile to Mill Hill Avenue. Right on Mill Hill Avenue to Bridgeport Hospital on left. Hospital has been contacted. See Plate 2.

E. CONTINGENCY PLANS AS APPROPRIATE: DESCRIBE CONTINGENCY PLANS FOR EMERGENCIES SUCH AS: FIRES, EMERGENCY CARE, INJURY, PPE, OR OTHER EQUIPMENT FAILURE. INCLUDE EMERGENCY SIGNALS AND EVACUATION ROUTES. IF FORMAL CONTINGENCY PLAN DOCUMENT HAS BEEN PREPARED, ATTACH A COPY.

In the event of a fire, personnel will exit the building through the nearest exterior exit to the West Parking Lot. Personnel will have access to a golf cart for rapid transport to a telephone and the main facility entrance.

Appendix A

HAZARDOUS PROPERTY INFORMATION

This appendix contains hazardous property information for selected compounds. Place a check mark next to each compound identified in Section IV, and review the hazardous property information for those compounds. If you have identified compounds in Section IV that are not listed in the appendix, you must list the compounds and enter the appropriate information.

(INCLUDE COPIES OF MATERIAL SAFETY DATA SHEETS FOR SELECTED COMPOUNDS IN ADDITION TO COMPLETION OF APPENDIX 1.)

HAZARDOUS PROPERTY INFORMATION

Check if present	Material	Water Solubility[a]	Specific Gravity	Vapor Density	Flash Point °F	Vapor Pressure[e]	LEL UEL	LD_{50} mg/kg	TLV-TWA[g]	IDLH Level	Odor Threshold or Warning Concentration	Hazard[j] Property	Dermal[k] Toxicity	Acute[l] Exposure Symptoms
VOLATILE ORGANIC PRIORITY POLLUTANTS														
	Acrolein	22%	0 8410	1 9	-15	214 mm	2 8% 31%	46	0 1 ppm	5 ppm	0.1-16 6 (0.21-0 5)	BCED	BJ	ABDFGHIK LMNOPQR
	Acrylyenitrile	7 1%	0 8060	1 8	30	83 mm	3% 17%	82	2 ppm	4,000 ppm	19-100	BCEGO	DIG	FGIKLMNO R
	Benzene	820 ppm	0 8765	2 8	12	75 mm	0 339% 7/1%	3800	11 ppm	2,000 ppm	4 68	BCGO	CIG	BCDFHIKL MNOQR
	Bromomethane	0 1 g	1 732	3 3	none	1 88 atm	13 5%[c] 14 5%		5 ppmh	2,000 ppm	no odor	CD		BCDEIJKL MNOQR
	Bromodichloromethane	Insoluble	1 980	--	none	n/a	non flam	916	none established	none specified		CGO		BIMN
	Bromoform	0 01 g	2 887	--	none	5 mm	non flam	1147	0 5 ppm	n/a	530	CED		BCDKLM
	Carbon Tetrachloride	0 08%	1 5967	5 3	none	91 mm	non flam	2800	5 ppmh	300 ppm	21.4-200	CD	JGH	ABCFGHK MO
	Chlorobenzene	0 01 g	1 1058	3.9	84	8 8 mm	1 3% 9 6%	2910	75 ppm	2,400 ppm	0 21-60	BCD	CIF	BCFIKLMN OPQR
	Chloroethane	0 6 g	0 8978	2 2	-58	1 36 atm	3 8% 15.4%		1000 ppm	20,000 ppm		BCD		BFHIKMNP
	2-Chloroethylvinyl Ether	Insoluble	1 0475	3.7	80	30 mm	--	250	none established	none specified		BCD		NIM
	Chloroform	0 8 g	1 4832	4 12	none	160 mm	non flam	800	10 ppmh	1,000 ppm	50-307 fatigue (>4096)	CD		BCDGIKLM N
	Chloromethane	0 74%	0 9159	1.8	32	50 atm	7.6% 19%		50 ppmh	10,000 ppm	10-100 no odor (500-1000)	BCD	DHF	ABCDEFGIJ KLOQR
	Dibromochloromethane	Insoluble	2 451	--	--	--	--	848	none established	none specified		BCD		BFHIMNPQ

HAZARDOUS PROPERTY INFORMATION

Check if present	Material	Water Solubility[a]	Specific Gravity	Vapor Density	Flash Point °F	Vapor Pressure[e]	LEL UEL	LD_{50} mg/kg	TLV-TWA[g]	IDLH Level	Odor Threshold or Warning Concentration	Hazard[j] Property	Dermal[k] Toxicity	Acute[l] Exposure Symptoms
	1,1-Dichloroethane (DCA)	0.1 g	1 1757	8 4	22	182 mm	6% 16%	725	100 ppm	4,000 ppm	5 ppm	BCD		AGHIMNO
	1,2-Dichloroethane	0 8%	1 2554	3 4	55	87 mm	6.2% 16%	670	10 ppmh	1,000 ppm	6 ppm	BCDG		BCFGOLMN Q
X	1,1-Dichloroethylene (DCE)	2250 mg/l @77of	--	3 4	3	591 mm	7 3% 16.0%	200	5 ppmh	none specified		BCD		BIMN
X	Trans-1,2-Dichloroethylene	Slightly soluble	1 2565	--	36	400 mm	9 7% 12 8%		none established	none specified	0043 mg/l	BCD		ABFILOQ
	1,2 Dichloropropane	0.26%	1 583	3.9	60	40 mm	3.4% 14.5%	1900	75 ppm	2,000 ppm	50	BCD		ABGHIKMN O
	Cis-1,3-Dichloropropane	Insoluble	1.2	3.8	83	28 mm	5% 14 5%		1 ppmh	none specified		BCD		ABGIKLMN P
	Trans-1,3-Dichloropropane	Insoluble	1 2	3 8	83	28 mm	5% 14 5%		1 ppmh	none specified		BCD		ABGIKLMN P
	Ethylbenzene	0 015 g	0.867	3 7	59	7 1 mm	1.0% 6.7%	3500	100 ppm	2,000 ppm		BCD	CIF	ABFHIKLM NPQR
	Methylene Chloride	Slightly soluble	1 335	2 9	none	350 mm	12%[c] unavail-able	167	100 ppmh	5,000 ppm	25-320 (200)	CED	CIF	BCIKLMNP R
	1,1,2,2-Tetrachloroethane	0 19%	1 5953	5.8	none	5 mm	non flam		1 ppmh	150 ppm	3-5	CD		ABCFHIKL MNOQ
X	Tetrachloroethylene	0 15 g/ml	1 6227	5 8	none	15 8 mm	non flam	8850	50 ppmh	500 ppm	4 68%-50 (160-690)	CD		ACFHIKLM NP
X	1,1,1-Trichloroethane (TCA)	0 7 g	1 3390	4 6	none	100 mm	8 0%[c] 10.5%	10300	350 ppm	1,000 ppm	20-400 (500-1000)	BCED		ABEFHIKL NOP
	1,1,2-Trichloroethane	0 45	1 4397	4 6	none	19 mm	6%[c] 15.5%	1140	10 ppm	500 ppm	-0-	C		DEFGHIKM NOPQ
X	Trichloroethylene (TCE)	0.1%	1.4642	4.5	90[d]	58 mm	12.5% 90%	4920	50 ppmh	1,000 ppm	21.4-400	BC		BFKLNOPQ
	Trichlorofluoromethane	0 11 g	1.494	--	none	0.91 atm	non		1000 ppm	10,000 ppm	135-209	CD		BFHKLQ

HAZARDOUS PROPERTY INFORMATION

Check if present	Material	Water Solubility[a]	Specific Gravity	Vapor Density	Flash Point °F	Vapor Pressure[e]	LEL UEL	LD_{50} mg/kg	TLV-TWA[g]	IDLH Level	Odor Threshold or Warning Concentration	Hazard[j] Property	Dermal[k] Toxicity	Acute[l] Exposure Symptoms
							flam							
	Toluene	0 05 g	0 866	3 2	40	22 mm	1 3% 7 1%	5000	100 ppm	2,000 ppm	0.17-40 fatigue (300-400)	BC	BHE	DEFHIKLM NOPQ
X	Vinyl Chloride	negligible	0 9100	2 24	-108	3 31 atm	3.6% 33%	500	1 ppm	none specified	260	BCEG	DJG	ABFHIKLM N
METALS														
	Arsenic	b	5 727	n/a	none	n/a	f		10 Tg/m^3	none specified		CEG	CJG	ACDGJMOQ R
	Beryllium	b	1 85	n/a	none	n/a	f		2 Tg/m^3	none specified		C		IJMNR
	Cadmium	b	8 642	n/a	none	n/a	f	225	0.5 mg/m^3	40/mg^3		C		ABGHIKLM NQR
X	Chromium	b	7 20	n/a	none	n/a	f		0 5 mg/ m^3h	500/mg^3	Not Applicable	C		FMNQ
	Copper	b	8 92	n/a	none	n/a	f		0.1 mg/m^3	none specified		C		FGIJMOQR
X	Lead	b	11.3437	n/a	none	n/a	f		50 Tg/m^3	none specified	Not Applicable	C		ACDFGKOQ R
	Mercury	b	13 5939	7 0	none	0 0012 mm	f		50 Tg/m^3h	28 mg/m^3		C		AGLMNQ
X	Nickel	b	8.9	n/a	none	n/a	f		1 mg/m^3	none specified		C		DGHLMNQ
	Silver	b	10 5	n/a	none	n/a	f		0.01mg/m^3	none specified		C		IN
	Thallium	b	11 85	n/a	none	n/a	f		0.01mg/m^3	20 mg/m^3		C	BG	ABGLNOQ
	Zinc	b	7 14	n/a	none	n/a	f		none established	none specified		C		DF
MISCELLANEOUS														
	Asbestos	Insoluble	2 5	n/a	none	n/a	non flam		0 2-2 fibers/cc	none specified		CG		MN

HAZARDOUS PROPERTY INFORMATION

Check if present	Material	Water Solubility[a]	Specific Gravity	Vapor Density	Flash Point °F	Vapor Pressure[e]	LEL UEL	LD_{50} mg/kg	TLV-TWA[g]	IDLH Level	Odor Threshold or Warning Concentration	Hazard[j] Property	Dermal[k] Toxicity	Acute[l] Exposure Symptoms
X	Cyanides	58-72%		n/a	none	n/a	non flam		5 mg/m^3		Not Applicable	CE		FKLMPQ
	PCB (generic)	slightly	--	n/a	none	n/a	non flam		1 0 Tg/m^3 1	none specified		CG		CHLPQ
	Phenol	8 4%	1 0576	3 2	175	0 36 mm	1 8% 8 6%	414	5 ppm	100 ppm	0 47-5 (48)	C		ABCDGIKM NOQR
	Xylene	0 00003%	0 8642	3 7	84	9 mm	1.1% 7%	5000	100 ppm	10,000 ppm	0.5-200 (200)	BCD		ABFHIKLM NPQ
	Acetone	soluble	0 8	2.0	-4	400 mm	2 6% 12.8%	9750	750 ppm	10,000 ppm	100	BCD	DI	H
	Chromic Acid	soluble	1 67-2 82	n/a	none	n/a	non flam		none established	none specified		ACEG		GIH
	Diesel Fuel	insoluble	0 81-0 90	--	130	--	0 6-1.3 6-7.5		none established	none specified	0 08	BC	ABC	IN
	Gasoline	insoluble	0 72-0 76	3 4	-45	variable	1.4% 7 6%		300 ppm	none specified	0 005-10 x 0.25	CD	AB	IN
	Kerosene	insoluble	0 83-1 0	--	100-165	5	0 7% 5.0%		none established	none specified	1 0	BCD	AB	IN

HAZARDOUS PROPERTY INFORMATION
EXPLANATIONS AND FOOTNOTES

Water solubility is expressed in different terms in different references. Many references use the term "insoluble" for materials that will not readily mix with water, such as gasoline. However, most of these materials are water soluble at the part per million or part per billion level Gasoline, for example, is insoluble in the gross sense, and will be found as a discrete layer on top of the groundwater. But certain gasoline constituents, such as benzene, toluene, and xylene will also be found in solution in the groundwater at the part per million of part per billion level.

a. Water solubility expressed as 0.2 g means 0.2 grams per 100 grams water at 20°C.

b. Solubility of metals depends on the compound in which they are present.

c. Several chlorinated hydrocarbons exhibit no flash point in conventional sense, but will burn in presence of high energy ignition source or will form explosive mixtures at temperatures above 200°F.

d. Practically non-flammable under standard conditions.

e. Expressed as mm Hg under standard conditions.

f. Explosive concentrations of airborne dust can occur in confined areas.

g. Values for Threshold Limit Value-Time Weighted Average (TLV-TWA) are OSHA Permissible Exposure Limits except where noted in h and i.

h. TLV-TWA adopted by the American Conference of Governmental Industrial Hygienists, which is lower than the OSHA PEL.

i. TLV-TWA recommended by the national Institute for Occupational Safety and Health (NIOSH). A TLV or PEL has not been adopted by ACGIH or OSHA.

j.

A	-	corrosive
B	-	flammable
C	-	toxic
D	-	volatile
E	-	reactive
F	-	radioactive
G	-	carcinogen
H	-	infectious

k. Dermal Toxicity data is summarized in the following three categories:

Skin Penetration

-	A	-	negligible penetration (solid-polar)
+	B	-	slight penetration (solid-nonpolar)
++	C	-	moderate penetration (liquid/solid-nonpolar)

+++	D	-	high penetration (gas/liquid-nonpolar)

Systemic Potency

E	-	slight hazard - LD_{50} = 500-15,000 mg/kg lethal dose for 70 kg man = 1 pint-1 quart
F	-	moderate hazard - LD_{50} = 50-500 mg/kg lethal dose for 70 kg man = 1 ounce-1 pint
G	-	extreme hazard - LD_{50} = 10-50 mg/kg lethal dose for 70 kg/man = drops to 20 ml

Local Potency

H	-	slight - reddening of skin
I	-	moderate - irritation/inflammation of skin
J	-	extreme - tissue destruction/necrosis

1. Acute Exposure Symptoms

A	-	abdominal pain
B	-	central nervous system depression
C	-	comatose
D	-	convulsions
E	-	confusion
F	-	dizziness
G	-	diarrhea
H	-	drowsiness
I	-	eye irritation
J	-	fever
K	-	headache
L	-	nausea
M	-	respiratory system irritation
N	-	skin irritation
O	-	tremors
P	-	unconsciousness
Q	-	vomiting
R	-	weakness

Appendix B
Hazard Analysis Examples

Hazard Analyses

List all activities in the Job Activity Column and assign a number to each activity (example: 1. Drilling, Soil Sampling, and Well Installation)

Identify how each category of hazard exists at each activity.

Activity Number	Job Task	Mechanical	Electrical	Chemical	Temperature	Acoustical	Radioactive	02 Deficiency-Confined Space	Biohazard
1	Drilling, Soil Sampling, and Well Installation	Rig Equipment, materials handling	Overhead/buried power lines at two locations	Potentially in soils and groundwater	Heat stress	Rig noise	NE	NE	NE
2	Well Development	Pumping equipment	Generator	Potentially in soils and groundwater	Heat stress	Pumping equipment	NE	NE	NE
3	Groundwater Sampling from Monitoring Wells	NE, potentially pumping equipment	NE		Heat stress	NE	NE	NE	NE
4	Geophysical Survey	Portable equipment weight & bulkiness	Portable equipment	NE	NE	NE	nuclear gauges	NE	Mosquitoes, snakes
5	Excavation of Contaminated Soil, Gasoline Station	Excavation stability, mechanical equip	Utilities	Same as 1, free and dilute product	Heat stress	Excavation equipment	NE	Excavation can be a confined space	NE
6	Inspect Excavation of Landfill (Domestic Nonhazardous Waste)	Excavation stability, shoring stability	NE	Same as 1, broad range organic/ inorganic	Heat stress	NE	Pot from hospital and other wastes	Excavation can be a confined space	Microbes, insects, rodents, birds

NE = Not expected

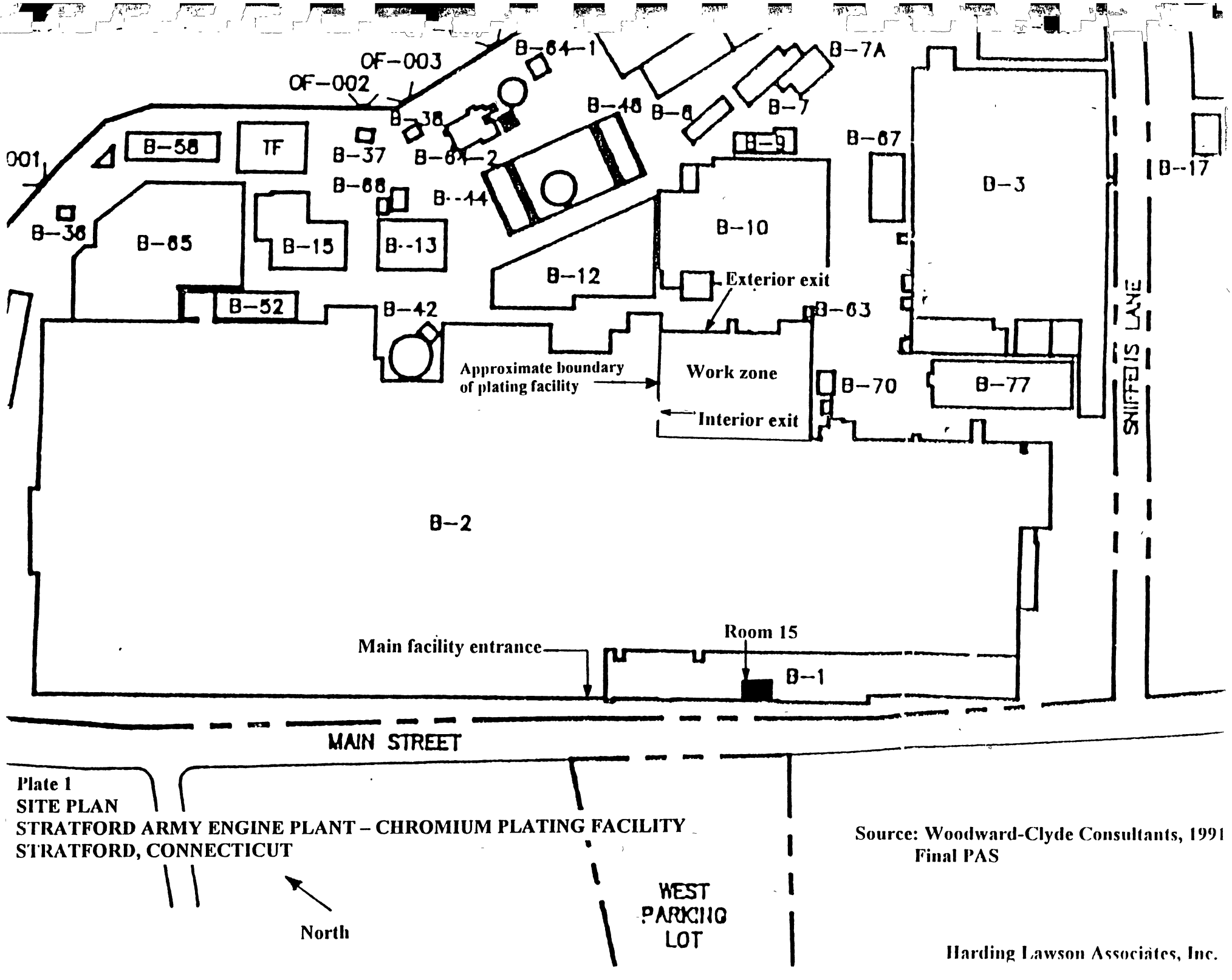

Plate 1
SITE PLAN
STRATFORD ARMY ENGINE PLANT – CHROMIUM PLATING FACILITY
STRATFORD, CONNECTICUT

Source: Woodward-Clyde Consultants, 1991
Final PAS

Harding Lawson Associates, Inc.

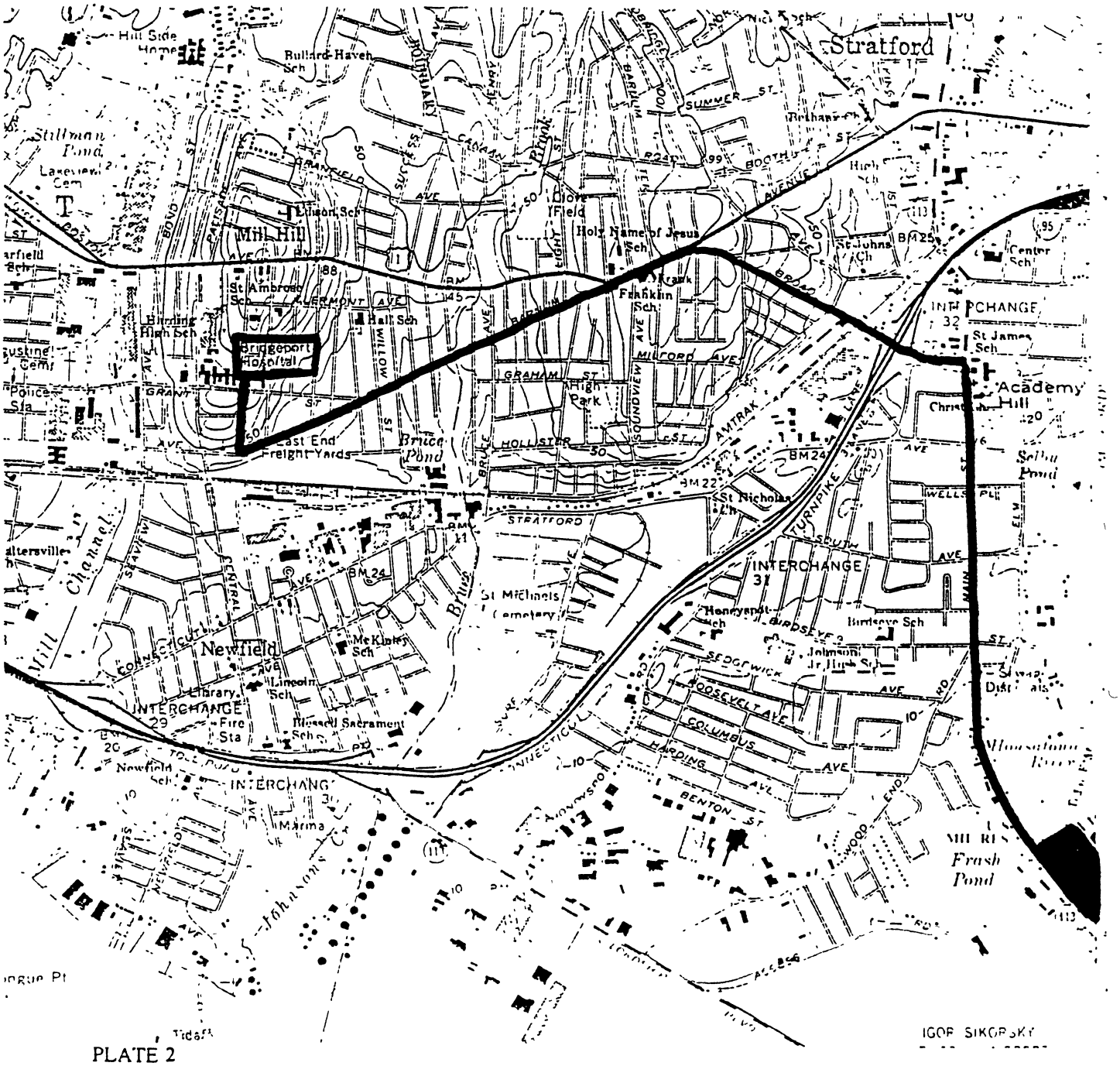

PLATE 2
LOCATION AND ROUTE TO NEAREST HOSPITAL
STRATFORD ARMY ENGINE PLANT – CHROMIUM PLATING FACILITY
STRATFORD, CONNECTICUT

Harding Lawson Associates, Inc

Engineering and
Environmental Services

511 Congress Street PO Box 7050 Portland, ME 04112-7050 207/775-5401 Fax 207/772-4762