GE
159 Plastics Avenue
Pittsfield, MA 01201
USA

Transmitted Via Overnight Delivery

May 29, 2007

Mr. Dean Tagliaferro
EPA Project Coordinator
United States Environmental Protection Agency
c/o Weston Solutions
10 Lyman Street
Pittsfield, MA 01210

Re: Floodplain GE-Pittsfield/Housatonic River Site
Floodplain Residential and Non-Residential Properties Adjacent to 1½ Mile Reach of Housatonic River (*GECD710 and GECD720)*
Supplemental Information Package for Selected Phase 2 Floodplain Properties

Dear Mr. Tagliaferro:

On March 28, 2007, the General Electric Company (GE) submitted a document to the United States Environmental Protection Agency (EPA) titled *Revised Supplemental Soil Evaluation Report and Removal Design/Removal Action Work Plan Addendum for Selected Phase 2 Floodplain Properties Adjacent to the 1½ Mile Reach of Housatonic River* (Work Plan). EPA conditionally approved the Work Plan in a letter to GE dated April 9, 2007.

Condition No. 1 of EPA's above-referenced conditional approval letter set forth a revised schedule for forthcoming documents and activities. Items (a) and (b) of that condition directed GE to: 1) select a Remediation Contractor within 30 days of the date of the letter (i.e., by May 9, 2007); and 2) submit a Supplemental Information Package (SIP) to EPA within 21 days of Remediation Contractor selection (i.e., by May 30, 2007). This letter and its attachments constitute GE's SIP for the remediation actions to be performed at the Phase 2 floodplain properties and include the following:

- Identification of and contact information for the selected Remediation Contractor;
- Copies of the Remediation Contractor's pre-mobilization submittals (i.e., Health, Safety & Contingency Plans; and Operations Plan);
- A proposed truck route from the Phase 2 floodplain properties to the temporary staging area within the GE Plant Site;
- Identification of a proposed topsoil source and location;
- An inventory of trees and shrubs in the general work area and a tree/shrub restoration plan; and
- Revised polychlorinated biphenyl (PCB) spatial averaging evaluation tables and polygon maps for Parcels I8-4-2,-3,-4 and I8-4-7.

Each of these items is discussed below.

Selection of Remediation Contractor

GE has selected Maxymillian Technologies, Inc. (Maxymillian) of Pittsfield, Massachusetts to conduct remediation actions at the Phase 2 floodplain properties. Contact information for Maxymillian is as follows:

Maxymillian Technologies, Inc.
Sara Epstein, Project Engineer
1801 East Street
Pittsfield, Massachusetts 01201
Telephone: (413) 499-3050
Fax: (413) 443-0511

Remediation Contractor's Pre-Mobilization Submittals

Maxymillian has prepared pre-mobilization submittals prior to initiating remediation actions at the Phase 2 floodplain properties. Copies of Maxymillian's Health, Safety & Contingency Plan and Operations Plan are provided in Attachments A and B, respectively.

Proposed Truck Route

Maxymillian has indicated that it may elect to temporarily stage excavated material at Building 65 within the GE Plant Site prior to transporting these materials to an appropriate offsite disposal facility. A figure showing the proposed primary and secondary truck routes from the Phase 2 floodplain properties to Building 65 is provided in Attachment C.

Topsoil Information

As indicated in the Work Plan, GE will backfill removal areas at the Phase 2 floodplain properties with topsoil only. Maxymillian has proposed to use topsoil from a stockpile at the Maxymillian facility, located in Pittsfield, Massachusetts. Analytical results collected by GE from the proposed source are provided in Table D-1 in Attachment D. GE initially sampled the proposed topsoil source on April 2, 2007. Analytical results associated with this sample indicated that no constituents were detected above the Massachusetts Contingency Plan (MCP) Method 1 S-1 GW-2/GW-3 standards with the exception of lead at a concentration of 373 parts per million (ppm). The Method 1 S-1 GW-2/GW-3 soil standard for lead is 300 ppm. To further quantify the presence of lead within the proposed topsoil source, GE resampled the source on May 16, 2007. Lead was detected in the second sample at 22.4 ppm. The average lead concentration from these two GE samples is 197.7 ppm (well below the Method 1 standard). In addition, Maxymillian has advised GE that it collected 5 composite samples from the proposed source and that the highest detected lead concentration was 26 ppm. Given that the overall average lead concentration from these samples is well below the Method 1 standard, GE proposes to use the topsoil from this source to backfill the removal areas at these properties.

Tree/Shrub Restoration Plan

In accordance with Section 5.5.5 of the Work Plan, an inventory of trees and shrubs has been performed in the general work area and a Restoration Plan has been developed to summarize the restoration activities to be conducted by GE, consistent with the Work Plan, at the Phase 2 floodplain properties following the implementation of remediation actions. The tree and shrub inventory and the Restoration Plan are included in Attachment E. In that attachment, Figure E-1 shows the five survey areas where remediation work will be conducted, Table E-1 shows the results of the tree/shrub inventory in those five areas (only three of which had observed trees or shrubs), and Figure E-2 and Table E-2 show the planting plan in the three areas where trees/shrubs were observed. Attachment E also contains specifications for the tree and shrub planting.

Revised PCB Evaluations

In accordance with Condition No. 2 of EPA's April 9, 2007 conditional approval letter, GE has prepared revised PCB spatial averaging evaluation tables and polygon maps for Parcels I8-4-2,-3,-4 and I8-4-7, both in their exiting condition and after the proposed remediation. The revised post-remediation evaluations reflect certain soil removals that were expanded based on constructability and related factors in accordance with Condition Nos. 2 and 3 of EPA's March 8, 2007 letter conditionally approving a prior (December 2006) version of the Work Plan. The results of the revised post-remediation PCB spatial averaging demonstrate that the expanded removals will further reduce spatial average concentrations below the applicable Performance Standards. The revised PCB spatial averaging evaluation tables and polygon maps for the above-referenced properties are included in Attachment F. The resulting post-remediation spatial average PCB concentrations, in comparison to the applicable Performance Standards and the existing spatial average concentrations, are summarized below:

Parcel No.	Depth Increment (ft)	PCB Performance Standard (ppm)	Existing Average PCB Concentration (ppm)	Post-Remediation Average PCB Concentration (ppm)
I8-4-2,-3,-4	0 – 1'	2	2.14	0.85
	1 – X' (X=5')	2	1.63	1.47
I8-4-7	0 – 1'	10	3.33	0.40
	1 – 3'	15	2.66	1.68
	0 – 15'	100	4.26	3.93

Please feel free to contact me if you have any questions regarding this letter or the attached supplemental information.

Sincerely,

Richard W. Gates/ACC

Richard W. Gates
Remediation Project Manager

ACC/csc
Attachments

cc: Timothy Conway, EPA
Rose Howell, EPA*
Holly Inglis, EPA
K.C. Mitkevicius, USACE (CD-ROM)
Linda Palmieri, Weston (CD-ROM)
Susan Steenstrup, MDEP (2 copies)
Anna Symington, MDEP*
Jane Rothchild, MDEP*
Nancy E. Harper, MA AG*
Dale Young, MA EOEA*
Mayor James Ruberto, City of Pittsfield
Jeffrey Bernstein, Bernstein, Cushner & Kimmel
Michael Carroll, GE*
Andrew Silfer, GE
Rod McLaren, GE*
James Nuss, ARCADIS BBL
James Bieke, Goodwin Procter
Property Owner – Parcels I8-4-201 & -202
Property Owner – Parcels I8-4-2, -3, -4
Property Owner – Parcel I8-4-6
Public Information Repositories
GE Internal Repository

* *cover letter only*

Attachments

ARCADIS BBL

Attachment A

Maxymillian's Health, Safety & Contingency Plan

HEALTH, SAFETY & CONTINGENCY PLAN

General Electric
Selected Phase 2 Floodplain Properties Adjacent to the 1 ½ Mile Reach of Housatonic River; Pittsfield MA

Prepared for:

General Electric Co.
159 Plastics Ave.
Pittsfield MA 01201

and

ARCADIS BBL
6723 Towpath Road
Syracuse NY 13214

Prepared by:

Maxymillian Technologies, Inc.
1801 East Street
Pittsfield MA

May 2007

MAXYMILLIAN TECHNOLOGIES, INC.
Reviewed For Submission

Spec Sect # 5.3 Trans # 1
Date: 05/15/07 By: SJE

HEALTH, SAFETY AND CONTINGENCY PLAN

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Appendix C Maxymillian Technologies, Inc. Hazard Communication Program
Appendix D Maxymillian Technologies, Inc. Control of Hazardous Energy (Lockout/Tagout) Program
Appendix E Maxymillian Technologies, Inc. Respiratory Protection Program

Safety Statement

I have been informed of the MT Health and Safety Plan for activities at the GE Deming Street Site. My signature indicates that I have been notified of the on-site location of the above stated plans, have been provided the opportunity to review the contents of each plan and have been provided with on-site training. I will comply with the requirements and protocols outlined in these plans when working at or visiting the site.

Employee Name [print]	*Employee Signature*	*Date*

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List of Acronyms and Abbreviations

ACGIH	American Conference of Government Industrial Hygienists
bsg	Below Surface Grade
CBC	Complete Blood Count
CFR	Code of Federal Regulations
CGI	Combustible Gas Indicator
CNS	Central Nervous System
CVS	Cardiovascular System
dBA	Decibels
FR	Federal Register
GE	General Electric Company
HSO	Health and Safety Officer
HSP	Health and Safety Plan
IDLH	Immediately Dangerous to Life or Health
LEL	Lower Explosive Limit
LFL	Lower Flammable Limit
MiniRAM®	air monitoring instrument for measuring dust
MADEP	Massachusetts Department of Environmental Protection
MSDS	Material Safety Data Sheet
MSHA	Mine Safety and Health Administration
MT	Maxymillian Technologies
NEC	National Electric Code
NFPA	National Fire Protection Agency
NIOSH	National Institute for Occupational Safety and Health
OSHA	Occupational Safety and Health Administration
PCB	Polychlorinated Biphenyl
PEL	Permissible Exposure Limit
ppm	parts per million
PPE	Personal Protective Equipment
PRP	Potentially Responsible Party
SCADA	Supervisory Control and Data Acquisition System
SCBA	Self Contained Breathing Apparatus
SOP	Standard Operating Procedures
SPCC	Spill Prevention Control and Countermeasures
STEL	Short Term Exposure Limits
TEF	Toxicity Equivalency Factor
TLV	Threshold Limit Value
TSCA	Toxic Substance Control Act
TWA	Time Weighted Average
UFL	Upper Flammable Limit

1.0 OVERVIEW

The discussions in this Health and Safety Plan (HSP) are specific to operations of Maxymillian Technologies, Inc. (MT) for work at the General Electric Company (GE) Deming Street Site.

This Health and Safety Plan declares procedures and strategies to ensure human and environmental safety during any and all operations associated with these activities. This HSP also states safety policy and procedures for ensuring the safety and health of Maxymillian Technologies personnel, the general population around the site, and the environment from possible PCB exposure or other health risks or hazards during work and restoration of the job site.

This Health and Safety Plan is intended to cover Maxymillian Technologies' work on the GE Deming Street Site. The plan is intended to be in effect for MT's total time on-site. All operating personnel will review this plan and will also be briefed by their immediate supervisor on required MT safety practices pertaining to their job before starting work at the site. These safety requirements apply to contracting personnel and visitors as well as employees.

Copies of the Health and Safety Plan will be maintained in the administration trailer at the site and at MT's main office. A copy of the approved plan will be provided to GE. Updates and amendments will be made as needed and submitted for approval. Once approved, copies of updates will be provided to all previous recipients of this document.

The list of emergency telephone numbers will be posted near the phones at the site. The home office will also have a copy of this emergency telephone list readily available for use in an emergency.

Throughout the Health and Safety Plan, the masculine gender is used for simplicity, however, the policies, practices, and procedures described in this plan apply equally to all employees.

Prior to commencement of operations, personnel involved with contaminated material removal, will be trained per Occupational Safety and Health Administration (OSHA) standards in safe operation of personal protective equipment and onsite equipment. Upon completion of 40-hour OSHA training, each of these employees will be requested to sign a sheet certifying completion and comprehension of the training. Copies of this training certification form will be kept at the remediation site and at the home office.

The Health and Safety Plan addresses remediation activities related to the safety and health of site personnel, the general public, and the environment. This plan will focus on:

- Site characteristics
- Maxymillian Technologies' activities
- Safety administration
- General safety issues
- Emergency procedures
- Personnel training
- Medical surveillance
- Safe work practices
- Personal protective equipment
- Site inspection procedures
- Site safety, emergency, and First Aid equipment
- Monitoring equipment
- Decontamination procedures
- Medical and site record keeping requirements
- Proposed site personnel and their responsibilities
- Safety and health concerns for the general population and the environment
- Procedures for preventing and controlling spills
- Contingency procedures

These safety and health considerations are designed to satisfy the requirements of 29 CFR 1910 and 1926 and 40 CFR 761 and will be followed through completion of the project.

Considerations for ensuring safety of site personnel, population that reside near the site, and the environment include:

- Comprehensive training of all site personnel.
- Use of pollution control devices and secondary containment systems for components, with regularly scheduled inspections.
- Provisions for preventing, controlling, and containing spills of hazardous liquids or petroleum products.

1.1 Safety Summary

The purpose and intent of the Health and Safety Plan is to ensure operations for the site are conducted in a safe manner. This site presents a number of safety concerns for site personnel, the general public living near the project, and the environment itself. Site hazards and risks are identified in 5.0 Hazard and Risk Analysis.

Health and safety of site personnel is of primary concern to MT. The Occupational Safety and Health Administration (OSHA) has identified general construction safety training requirements, 29 CFR § 1926 Subpart C, and Hazardous Waste Operations and Emergency Response requirements, 29 CFR § 1910.120 in order to ensure the health and safety of personnel. Adhering to OSHA requirements, MT will:

- Establish and implement a comprehensive training program
- Define a Buddy System approach for all work above Level D protection. The Buddy System will be strictly enforced. No personnel will be allowed to work in this level of protection unless he is under continual surveillance.
- Provide personal protective equipment
- Provide and require medical surveillance
- Target and promote safe work practices
- Detail personal decontamination procedures
- Identify personal hygiene requirements
- Require adherence to general housekeeping rules
- Provide and maintain emergency First Aid equipment

A number of activities associated with remediation projects pose possible health and safety concerns to site personnel. These concerns could include exposure to previous site contaminants (PCB) and activities associated with excavation. In order to prevent potential exposure to contaminants, as well as exposure to hot substances and surfaces, site personnel will wear the personal protective equipment required to protect them in their specific work areas. Details on protective gear are discussed in Section 8.0 Personal Protection and Safety Equipment.

During excavation the potential inhalation of airborne particulate contaminated with PCB is a concern. To prevent fugitive dust generation associated with excavation, dust suppression equipment will be utilized when excavation appears to generate airborne particulate and/or based on air monitoring.

To prevent the potential for dermal contact with PCB-containing material all site personnel will be required to wear appropriate personal protective equipment/clothing as detailed in Section 8.0 Personal Protection and Safety Equipment.

Ingestion of materials is not considered a significant route of exposure. Safe work practices, discussed in Section 3.1.1 Safe Work Practices and Section 3.4 Site Specific Training, will be followed by all personnel and will effectively eliminate this route of exposure.

MT's activities at the site are designed to remediate the area, and should not exacerbate or spread the contamination. MT will adequately protect the environment including the soil and subsoil, surface water, groundwater, and air. Silt fences or other necessary erosion control measures will be installed as necessary.

1.2 Summarized Activities

MT activities at the GE Site will include, and are not limited to, the following:

- mobilization
- implementation of project environmental controls
- excavation of contaminated material
- trucking to GE facility
- equipment decontamination
- stockpiling clean backfill on site
- backfill, re-grade, and
- site restoration

1.3 Site Information and History

The GE Deming Street Site is located in Pittsfield, Massachusetts. The site is adjacent to the Housatonic River and Deming Street. Parts of the area have been confirmed to be contaminated with PCBs.

2.0 PERSONNEL

The safety programs outlined in this document will be accomplished through project management. As new situations unfold this safety program will be reviewed to assure the quality of the program. Safety audits by our off-site Corporate Health and Safety Manger will be performed on a quarterly basis. Recommendations will be made for items to be acted on. Follow-up inspection will be made to ensure all items have been acted on. Personnel associated with operations on this site will include a Health and Safety Officer (HSO)/Site Supervisor, Materials Handling Operators, and various subcontractors.

Specific personnel assigned to the site will be fully trained in the operations and safety considerations associated with this project. MT employs a number of qualified personnel who are capable of fulfilling the responsibilities of each position. Responsibilities of each position are discussed below.

2.1 Health and Safety Officer/ Site Supervisor

The designated Health and Safety Officer (HSO)/ Site Supervisor (SS) will establish and oversee general and environmental safety issues for all aspects of the fieldwork. This includes providing training protocols, implementing programs, and documenting programs. He will ensure that all health and safety monitoring is performed in accordance with 29 CFR §1910.120 and that health and safety documents are maintained on-site as required. The HSO will ensure compliance with all safety requirements of OSHA and MT.

The HSO/SS, will be responsible for conducting safety inspections and meetings. The HSOs will also conduct weekly Toolbox Meetings (safety meetings) and ensure that all health and safety documents are maintained on-site as required. If safety inspections reveal the need for more frequent safety meetings to ensure comprehension and compliance with safety requirements, the HSO will have the authority to conduct more frequent meetings. All MT personnel will be required to attend safety meetings conducted by the HSO or their appointed delegate.

The HSO/SS will also be responsible for managing all on-site activities during implementation of the project and assuring that these activities comply with applicable permits, local and state regulatory agencies. In addition, his responsibilities will include the supervision of all project field work including site preparations, operations and the supervision of all operators. He will maintain close contact with the GE Site Representative.

Additional HSO/SS responsibilities include:

- Reviewing health and safety aspects of any non-routine work in any restricted area
- Ensuring that all site activities are conducted in accordance with safe operating procedures
- Ensuring compliance with all safety requirements of OSHA, EPA, state, and local authorities
- Training
- Implementing safety protocols and requirements
- Implementing dust control if necessary
- Identifying and assessing hazards to on-site personnel and the surrounding community
- Identifying any emergency response procedures necessary
- Determining Personal Protective Equipment use and monitoring inventories (upgrading levels of PPE as necessary)
- Inspecting and auditing work areas for health and safety issues
- Maintaining health and safety documentation (inspections, any injuries, potential hazards, etc.)
- Briefing visitors to the site on health and safety issues
- Reviewing lockout/tagout procedures as necessary
- Contacting and coordinating with local emergency responders
- Notifying appropriate GE Representative of emergencies and on-site incidents
- Implementing evacuation procedures as necessary
- Instituting emergency shutdown procedures in the event of severe weather
- Identifying character, source, amount and extent of any MT material release

2.2 Materials Handling Operators

Materials operators will be responsible for the preparation and transportation of contaminated soil in designated contaminated areas. In addition, they will be responsible for transferring processed soils. All materials handling activities will be conducted such that contaminated materials are not transported over clean areas and clean material does not come into contact with contaminated equipment.

All operators will be trained and experienced in the safe operation of construction equipment and will hold valid operating licenses for the piece(s) of equipment they are assigned to operate. They will also be required to participate in site training to ensure compliance with safe practices for working with hazardous materials.

2.3 Subcontractors

Some non-MT personnel may be present during the field activities. All personnel, including subcontractors, will participate in site safety training, as conducted by the Site Supervisor/ Health and Safety Officer and also will partake in GE Safety Training.

3.0 TRAINING

It is the responsibility of the MT Health and Safety Officer to ensure that training is provided to all MT personnel involved with the project. Training will be according to employee's tasks and the proper safety procedures as set forth in 29 CFR § 1910 and § 1926. Refer to Attachment 1 for an outline of HAZWOPER 40-Hour Curriculum.

The scope of training will ensure that site personnel develop safe work habits and are aware of the hazards involved with materials handling activities and hazardous compounds at the site. Personnel will be trained in the appropriate hazardous waste management procedures relative to their positions and in responding effectively to emergencies.

Records of training will be maintained at MT's home office. Upon satisfactory completion of training, the trainee will be required to sign a certification sheet, indicating the date when training was provided, the name of the trainer, and the nature/extent of the training. As required by state law, refresher training will be provided once every year.

Training for site personnel on site will include, at a minimum:

- Standard OSHA Forty (40) Hours off-site, for removal activities (see Attachment 1)
- Eight hour annual OSHA refresher course
- Site compounds and handling
- Overview of site operations
- Personal Protective and safety equipment required
- Decontamination procedures
- General Construction Safety
- Implementation of Site Emergency Response Plan/Contingency Plan
- Communication and/or alarm systems
- Safety Meetings
- General construction safety and safe work practices

3.1 General Construction Training

In keeping with the requirements set forth in 29 CFR § 1926 Subpart C, MT will provide standard construction safety training to all site personnel. At a minimum, this training will include:

- Recognizing and avoiding unsafe conditions
- Controlling and eliminating hazards and exposure risks
- Methods for safely handling potentially hazardous materials
- Procedures for maintaining personal hygiene and protection
- Techniques for avoiding injury
- Lockout/Tagout procedures
- Fire protection and prevention
- Locations of emergency equipment
- Housekeeping regulations
- Safe work practices
- GE Safety Training of all on-site personnel

3.1.1 Safe Work Practices

Preliminary training includes identification of safe work practices that all site personnel will follow. Examples of safe work practices that will be followed at the site are:

- Smoking, eating, and drinking are allowed only outside the work and decontamination areas
- Employees have the right to refuse to perform an assignment if they feel it is unsafe

The following actions are prohibited:

- Alcoholic beverages and non-medicinal drugs
- Sleeping on the job
- Running
- Use of radios, televisions, tape players, or other forms of entertainment
- Possession of a firearm

Operating personnel are provided with information on chemical properties and health effects of all chemicals or wastes at the site. Material Safety Data Sheets (MSDSs) for chemical substances found or used at the site are included in Appendix B of this Plan.

3.2 Materials Handling Equipment and Excavation Training

In addition to the training requirements of 29 CFR § 1926.21, training will cover safety requirements associated with the operation of earth-moving equipment and activities related to excavation. These requirements are covered under 29 CFR § 1926 Subpart O and Subpart P. Earth-moving equipment operators will be responsible for operating their assigned pieces of equipment according to the requirements outlined in 29 CFR § 1926 Subpart O. Any pieces of equipment not satisfying the requirements of this Section will not be used and the Supervisors will be apprised of the unsatisfactory condition of the piece of equipment as soon as possible. The equipment will be tagged to identify its safety failing until the equipment can be decontaminated, if necessary, and demobilized from the site.

In addition to the training requirements outlined in 29 CFR § 1926, all MT employees involved with contaminated removal work at the site will have completed the standard 40-hour OSHA HAZWOPER training required under 29 CFR § 1910.120. This training will be kept current with yearly 8-hour refresher courses, as required. Certificates for completion of HAZWOPER training are maintained at the home office. Certifications for site personnel will be provided as assigned to the site.

3.3 Hazard Communication Standard

As required by 29 CFR § 1910.1200 and 29 CFR § 1926.59, a company Hazard Communication Standard will be available at the site. Related training will be provided by the Health and Safety Officer. Please refer to Appendix C, Maxymillian Technologies Hazard Communication Program, for additional information.

3.4 Site Specific Training

Preliminary training will be provided to all site personnel. This preliminary training is intended to provide general information about the safe handling of hazardous materials. The Site Supervisor will be familiar with all aspects of facility operation and, with the Health and Safety Officer, will be jointly responsible for providing general training for on-site operations.

Upon arrival at the site "hands-on" training specific to each employee's role will be provided by the Site Supervisor. Training will focus on the specific duties of the position and the methods for meeting safety and operating requirements.

Each employee assigned to a supervisory role will be trained in the safe and thorough operation of his duties as well as those of the personnel who report directly to him. It is expected that, in the event an employee should sustain an injury while at work, his injuries would be reported immediately to the employee's immediate supervisor, who would, in turn, be able to fulfill his subordinate's duties.

Site Specific Training will include the following:

- Regulatory agencies involved at the site
- Contaminants present at the site
- Public concerns
- General site safety
  - Health and Safety Plan and Health and Safety Officer
  - Emergency Response Plan

3.5 Updated Training

The Health and Safety Officer will conduct periodic scheduled inspections that will include monitoring activities of site personnel to ensure compliance with safety requirements. If updated training is required (for example, after minor modification of a process or to improve safety), the Site Supervisor / Health and Safety Officer will conduct a hands-on training session.

3.6 Toolbox Safety Meetings

Weekly follow-up training will be provided in the form of weekly toolbox safety meetings conducted by the Health and Safety Officer. Toolbox safety meetings will discuss safety concerns at the site including potential problems and methods for avoiding such problems and recommendations for improving safety. Attendance at toolbox safety meetings is mandatory for all site personnel.

The Health and Safety Officer will maintain written records on the dates when toolbox safety meetings are held, the topics discussed at the meeting, and a list of attendees. Refer to Form A-4 in Appendix A, Checklists/Inspection Forms, for a sample of this report.

4.0 GENERAL SAFETY

The following general safety procedures will be followed by all site personnel and visitors. Anyone on-site violating these procedures will be warned by the HSO and may be escorted from the site for failing to comply. Warnings will be documented.

4.1 General Safety Items

- A copy of this plan will be available at the job work site.
- Employees will wash their hands and face and remove outer protective garments before eating, drinking, smoking or taking medication.
- Containers will be moved only with the proper equipment and will be secured to prevent dropping or loss of control during transport.
- Emergency equipment will be located in readily accessible uncontaminated locations.
- All personnel entering the site will be thoroughly briefed on the hazards, equipment requirements, safety practices, emergency procedures, and communication methods.

- Unfamiliar operations will be discussed with affected employees prior to beginning work.
- Fire extinguishers will be mounted on all equipment as required.
- Personnel entering the job site will wear appropriate Personal Protective Equipment as required.
- All site personnel will work together to establish and maintain site control.
- Eating, drinking, and smoking will only be permitted in designated areas outside the Exclusion and Decontamination Zones.
- Wearing contaminated protective apparel outside the Decontamination Zone will be prohibited.
- Before beginning any non-routine operation in any restricted area, personnel will consult with the HSO about health and safety requirements.
- A Buddy System will be implemented for all work above Level D.
- Physician-approved First Aid kits shall be kept on-site during work. In addition, one kit shall be placed in the support office.
- First Aid equipment shall be approved, and will be able to provide stabilization for patients requiring off-site treatment and general First Aid.
- A heat and cold stress program will be developed and implemented. The program will address monitoring procedures, prevention, work scheduling, contingency, and other aspect related to both heat and cold stress.
- Protocols will be implemented for loading and unloading material on-site. These protocols will include DOT requirements covering such items as grounding, placarding, driver qualifications, and the use of wheel locks.
- All excavation work will be performed by qualified personnel and in accordance with 29 CFR § 1926.652.
- All electrical installation will comply with the National Electrical Code (NEC). Protective equipment will be provided for electrical system construction. Additionally, design safety standards will be incorporated in electrical systems in accordance with OSHA 29 CFR § 1910.

4.2 General Housekeeping

General housekeeping requirements are based upon OSHA regulations for general construction site safety. Housekeeping will be maintained daily. The requirements listed below will be included in the site training program, and will be followed by all site personnel:

- All stairways, gangways, passageways, and access ways will be kept clear of debris and obstructions.
- All non-excavated loose or light materials will be contained or safely secured so as to prevent their becoming airborne.
- Tools, construction materials, hoses, extension cords, or debris will be located so as not to cause tripping.
- Tools, construction materials, and any equipment subject to displacement or falling will be secured to prevent such mishap.
- Nails protruding from plywood or planks will be bent flush with the wood or placed in containers for removal.

- All scraps and debris will be cleared from work and storage areas on a daily basis.
- All areas of the site will be kept free of combustible or flammable materials unless these materials are properly stored.
- Grass and weeds will be controlled in areas where combustible or flammable materials are stored.
- The Site Supervisors will coordinate daily cleanup of the site to ensure compliance with these general housekeeping requirements.
- Machinery and equipment will be arranged and store to permit safe efficient work activities and tools and accessories will be safely stored out of traffic areas.
- Waste rags will be stored in metal containers.
- Flammable liquids will be stored in safety cans.

4.3 Fire Prevention

The following fire prevention rules will be followed work at the site:

- Fires and open flames will not be left unattended.
- Smoking will be prohibited in all areas except those clearly designated and labeled as such by the Health and Safety Officer as smoking areas.
- All tanks, containers, and pumping equipment associated with the storage or handling of combustible or flammable liquids will be UL-listed.
- All lighting used in areas where flammable or combustible liquids are stored or used will be UL-listed.
- Delivery and storage of combustible or flammable liquids will be in keeping with Department of Transportation regulations.

4.3.1 Spacing

Adequate spacing between temporary buildings, trailers, and portable tanks containing flammable or combustible liquids will minimize the spread of fires and allow access to fire control apparatus. Non-fire-resistant temporary structures will comply with the recommendations of the NFPA and state and local regulations. Prompt removal of debris from work areas is intended to minimize the spread of fires. Clearance around lights and heating units will be maintained to prevent ignition of combustible materials.

4.4 Preventing Ignition of Ignitable Materials

The possible contaminants at the site are not readily ignitable. No additional hazardous materials will be brought to site. Storage of any other materials brought to the site will be in approved storage containers.

"NO SMOKING" signs will be prominently displayed in the appropriate areas, and all authorized visitors will be instructed to refrain from smoking in areas designated as non-smoking areas.

Open flames will not be permitted in areas where fuel is stored or used. Any electrical equipment employed in these areas will be carefully inspected on a regular basis so as to prevent the generation of sparks that might ignite this material.

4.5 Handling of Reactive, Incompatible, or Ignitable Wastes

The wastes deposited at the site are neither incompatible, ignitable, nor reactive. No additional materials will be introduced to site, therefore, there are no procedures applicable to the handling of reactive, incompatible, or ignitable wastes at the site.

4.6 Electrical Safety

The following rules regarding electrical safety will be applied during the site:

- All electrical wiring and equipment will be UL-listed and used for its specific application.
- All electrical installations will comply with the National Electrical Code (NEC) regulations.
- All electrical work will be performed by qualified personnel who are familiar with the hazards of the site and the electrical code requirements.
- Live wires will be guarded to protect all persons and objects from accidental contact.
- All electrical equipment to be worked on will be de-energized before work is begun. Personnel and equipment will be properly grounded before commencing any work around or with electrical equipment. Switches or circuit breakers will be in the "locked off" position during maintenance work on associated lines and circuit breakers will be padlocked and tagged by person placing padlock. This procedure will follow "Lockout/Tagout" guidelines as described by OSHA 29 CFR § 1910.147.
- Personnel working on energized lines will be equipped with rubber gloves and other protective equipment or tools that meet the provisions of the American National Standards Institute (ANSI), when appropriate.
- All electrical circuits will be overload-protected.
- Electric cords must be single and continuous lengths; no patches, splices (unless molded or vulcanized and made by a qualified electrician), or frayed cables will be permitted for use at the site.
- All electric cords and cables will be adequately insulated.
- Cables will not be fastened to surfaces with metal fasteners (i.e. staples, wires, etc.).
- Fuses, switches, and automatic circuit breakers will be clearly marked to minimize accidental operation. These items will be located in a lockable fuse cabinet.
- Fuses and circuit breakers will be properly rated for their designated use.
- All electrical circuits, equipment, and tools will be properly grounded in accordance with the NEC.
- Grounding circuits and devices will be inspected regularly.
- Any bulbs attached to "festoon" lighting strings or cords will be protected by wire cages unless the bulbs are recessed. Broken bulbs and/or exposed light sockets are prohibited.
- All electrical connections will be made through a ground fault circuit interrupter.

- Every electrical connection and electrical wire will be treated as live. Workers will not handle electrical equipment or wires if their hands are wet or if they are standing on wet surfaces.
- Electrical cords will be pulled from an outlet by grasping the plug, not the cord.
- Electrical wires, cords, etc. will be located so that they cannot be tripped over or walked on. Where possible, extension cords will be located overhead, away from traffic areas.
- Electrical tools, extension cord connectors and other equipment and appliances will be kept 50 feet from fuel sources.

The following practices will decrease the risk of electric shock during excavation activities:

- Only qualified personnel will operate electrical equipment.
- Heavy equipment and energized tools will be inspected by the HSO and will meet all applicable local, state and federal standards.
- A crane boom will not be allowed within 20 feet of a power line.
- Excavation areas will be cleared through a local utility manager before starting work.
- All cords will have ground stems.
- Electrical power lines will be marked on applicable project maps and physically marked in the field if necessary.

Please refer to Appendix D, MT Control of Hazardous Energy (Lockout/Tagout) Program for details.

4.6.1 Hand/Power Tools

All personnel assigned to the site will have experience in the safe use of hand and power tools. Refer to the Hand/Power Tool Regulations found in 29 CFR § 1926 Subpart I and 29 CFR § 1910 Subpart P. Rules they will be instructed to follow regarding the safe use of hand and power tools are:

- All hand and power tools will be in good repair and will be used only for their designated purpose.
- Any tools that are defective in strength or operating capacity will be removed from service. Regular inspections will ensure safe operating conditions and proper maintenance of all tools used at the site.
- During performance of overhead work, all tools not being used will be secured.
- Hydraulic equipment will be used in compliance with manufacturers' safe operating pressures and conditions.
- Workers using hand or power tools will not wear loose clothing or dangling jewelry that might become tangled in the equipment.
- Circular saws will be equipped with guards that completely enclose the cutting edge of the blade. Damaged blades will be discarded immediately and properly.
- Under no circumstances will any power tools be left running and unattended.
- Portable electrical tools and equipment will be double-insulated.

4.6.2 Lockout/Tagout

MT's Lockout/Tagout Program establishes policies and provides guidelines to ensure standardized implementation of the OSHA Lockout/Tagout Standard.

This policy, described in detail in Appendix D, MT's Control of Hazardous Energy (Lockout/Tagout) Program, applies to all employees who perform work that involves the unexpected start-up of equipment, as defined in 29 CFR § 1910.147. Training will familiarize the employees with this policy so they may work safely and confidently while performing their assigned tasks. This program does not apply to routine service or maintenance, when guards or safety devices are not bypassed. When working at a facility with an established Lockout/Tagout program, that facility's program will take precedence. Training as outlined in the program will be on an annual basis and will be provided prior to any associated work.

4.7 Construction Equipment Safety

Maintenance Technicians assigned to the site will be experienced in the daily maintenance and minor repair of the construction equipment used at the site. The Site Supervisor will delegate the responsibility of conducting regular inspections of construction equipment to the Maintenance Technicians. It is expected that regular maintenance of construction equipment will minimize downtime resulting from major repairs. If repairs are required that cannot be conducted at the site, the equipment will be removed from the site and replaced with a comparable piece of equipment.

Maintenance Technicians charged with the responsibility of maintaining safe operations of construction equipment will follow these rules:

- All construction equipment delivered for use at the site will be in good operating condition and will have been recently inspected to ensure reliability.
- All construction equipment will be inspected during each shift that it is used. These inspections will occur before the equipment is used to determine that the brakes and operating systems are in good working condition.
- The maintenance technician will be familiar with the manufacturers' preventative maintenance procedures for each piece of equipment and will follow these procedures.
- Machinery or equipment determined by the maintenance technician or Health and Safety Officer to be unsafe will be so tagged. Unsafe equipment will not be used at the site, and will be removed from the site as soon as possible after such determination is made.
- Only authorized personnel will operate construction equipment at the site. Equipment operators will be properly trained and will have valid licenses.
- At no time will construction equipment be left running and unattended.
- When not operating, all construction equipment will be braked.
- When not in use, all ancillary devices on construction equipment (e.g. buckets on front-end loaders) will be placed in the secured position.
- Areas in which construction equipment will be operated or maintained will be properly lighted.

- Construction equipment will be shut down prior to and during re-fueling operations.
- Trailers and towing devices used for transport of construction equipment will be adequately rated and properly employed for the task.
- The locations of construction equipment not in operation will be readily identified by the use of attached reflectors.
- Equipment with windshields will be equipped with automatic windshield wipers in good operating conditions.
- Lift trucks will be used only within their rated capacities.
- Self-propelled construction equipment will be equipped with operating reverse signal alarms. The alarm will be audible under prevailing conditions at construction site, and will operate automatically upon commencement of backward motion.

4.8 Guard Devices

The Health and Safety Officer will periodically check the condition of equipment safety guards and devices. The following devices will be present on equipment to be used at the site:

- Self-propelled equipment will be equipped with a reverse signal alarm, sufficiently audible during equipment operation.
- Sprockets, gears, pulleys, belts, flywheels, chains, shafts, or other moving parts will be guarded.
- Hot surfaces will be guarded/insulated and labeled accordingly.
- Equipment to be operated/supervised by personnel will be provided with the appropriate guardrails, toe boards, hand grabs, walkways, steps, and platforms.
- No guards or safety devices will be removed during the operation of the equipment. Maintenance will be performed when equipment is inoperative.

4.9 Site Control

To prevent unauthorized personnel from entering the site and/or entering contaminated area or known safety and health hazards, site control measures will be established at the site. Site control will also minimize the potential contamination of workers and protect the surrounding environment and public from site hazards. Several site controls will be implemented at site including:

- Using the Buddy System when necessary
- Establishing and strictly enforcing decontamination procedures
- Setting up site communications
- Establishing site security measures
- Enforcing safe work practices

4.9.1 Work Zones

Work zones will be directed by MT's Health and Safety Officer will be set up to minimize the movement of contamination from the contaminated areas of the site to the uncontaminated or treated areas of the site. A site map will be kept onsite depicting the current work zones and decontamination areas.

5.0 HAZARD AND RISK ANALYSIS

All personnel will be familiar with all potential hazards and will adhere to the appropriate safety precautions used to minimize personnel exposure to hazards.

5.1 Physical

Potential physical hazards at the site may result from activities associated with materials handling operations, and operation of heavy equipment. Potential physical hazards may include:

- materials handling
- energized electrical equipment
- cutting, torching, and associated equipment (e.g., compressed gases and systems)
- noise
- falling or tripping
- traffic
- heavy equipment and machinery
- openings/trapping hazards
- access/egress
- housekeeping
- exposure to environmental elements

Exposure to physical hazards will be reduced through the use of engineering controls and general safe work practices. Controls for protection of site personnel may include signs, barricades, verbal warnings, personal protective equipment, and working equipment safety alarms/devices. Routine safety meetings will also alert personnel to changing site conditions and the implemented safety control.

5.1.1 Heat Stress and Cold Exposure

Use of steel-toed, steel shank work boots, safety glasses or goggles, and hard hats (if overhead hazard exists) may be required at the discretion of the HSO when in the work and decontamination areas. Personnel should be cognizant that if additional PPE such as respirators, gloves, and protective clothing are worn, visibility, hearing, and manual dexterity are impaired.

In addition, the PPE required for some activities (coveralls and respirators) places a physical strain on the wearer. Fluids will be provided at regular intervals during the work periods in order to maintain adequate body fluid levels for the field personnel. Refer to Section 6.2 for more detail on monitoring Heat and Cold Stress.

5.2 Chemical

The chemical hazard evaluation is based on the history of the site and the field investigations at the site. The chemical hazard evaluation identifies materials that potentially may be present and ensures that site activities, personnel protection, and emergency response are consistent with the specific contaminants expected to be encountered.

Based on the possible contaminates at the site, the primary routes of exposure are through dermal contact and airborne dust that may be generated during site activities or by air movement. The possible contaminants of concern are PCBs. Appropriate mitigative actions should be implemented prior to upgrading from initial personal protection levels.

5.2.1 Control of Exposure to Chemical Hazards

Ingestion of constituents of concern will be controlled on the site by prohibiting eating and smoking in the work zones and by requiring all field personnel to decontaminate themselves upon leaving the work zone.

Any body parts which come in contact with contaminated materials will be washed with soap and rinsed immediately. All field personnel will report any skin or eye contact symptoms to the HSO. The person will be treated by a physician, if necessary, and steps will be taken to eliminate similar exposures.

Potential hazards will be reduced by protecting against exposures to hazardous materials via utilization of appropriate personal protective equipment (PPE). PPE to protect the body against contact with known or anticipated chemical hazards can be divided into three levels of protection categories (Level D, Modified D, C, B and A) according to the degree of protection afforded. The anticipated levels of personal protective equipment to be used while performing the activities at this site are discussed in Section 8.0, Personal Protection and Safety Equipment.

5.2.2 MSDS Location

In accordance with the OSHA Hazard Communication Standard (29 CFR § 1910.1200), Material Safety Data Sheets (MSDS) or comparable chemical hazard information for regulated chemical materials used during the conduct of site operations will be available from the Site Supervisor and w ill be kept in Appendix B of this plan. MSDS training will be conducted in accordance with 29 CFR § 1910.1200 during the on-site Informational Training.

5.3 Site Specific Hazards

5.3.1 Excavation

If required, 29 CFR § 1926, Subpart P will be followed for excavation activities. The Health and Safety Officer (HSO) will be consulted prior to entering excavations. The HSO will limit entry into excavation areas except when absolutely necessary. All excavation work will be performed from stable ground.

Soil and excavation piles will be located at least 2 feet from the edge of the excavation. A distance of 15 feet will be maintained between equipment and any overhead power lines. If the lines have appreciable sag, or if windy conditions exist, this distance will be 20 feet.

5.3.2 Heavy Equipment and Machinery

All wheeled heavy equipment will have backup alarms, capable of being heard over background noise and over hearing protection. Vehicle operators will adhere to federal, state, and local regulations pertaining to the operation of equipment. Only the intended number of passengers will ride in/on equipment, and they will be seated properly. Equipment will be operated consistent with manufacturer's instructions. All heavy equipment will have a multipurpose, dry fire extinguisher.

5.3.3 Noise

Hearing protection (foam inserts) will be worn as required by 29 CFR § 1910.95 when noise is at or above a time weighted average of 85 dBA. The wearing of hearing protection will be enforced by the site HSO. For high noise operations, ear muffs will be worn in addition to foam inserts. The HSO will monitor noise levels at the start up of operations and will make a determination if hearing protection will be required in specific areas. All personnel will receive baseline and annual audiograms as well as training on the causes and prevention of hearing loss. Noise levels will be evaluated with ANSI Type 2 or 1 sound level meter and/or noise dosimeter or equivalent.

5.3.4 Lifting

Workers will wear gloves for lifting and will request assistance for heavy or bulky items. Workers will have a firm grip before lifting the material. Material will be transported or stored in a stable manner to avoid falling, rolling, or slipping. Lifting will be conducted with the legs, not the back. Long objects will be carried carefully and to avoid pinch points. Whenever possible, heavy loads will be handled by mechanical equipment.

5.3.5 Traffic

Traffic control will be maintained at all times on the site. Traffic flow will be monitored and trucks and heavy equipment will be required to adhere to a maximum speed limit of 5 miles per hour under posted speed limits for all roadways. Pedestrians will have the right of way on-site, and personnel will be careful when working around heavy equipment or walking near roads.

Drivers and operators will adhere to speed limits, signs, and road markings. Special care will be used when transporting contaminated materials. If heavy equipment is used in the Exclusion Zone then must exit into the Support Zone, it will go through via a decontamination station.

5.3.6 Compressed Gases and Systems

Compressed gases will be properly used according to the supplier's instructions and the Compressed Gas Associate guidelines. Cylinders will be handled carefully. Compressor hose segments will be secured using chains and/or locking pins. A pressurized hose will be connected to the compressor through a pressure-sensing device that will discharge the pressure if the hose pressure system fails. Safety glasses and gloves will be worn when handling/hooking up compressed gas cylinders or systems.

As per 29 CFR § 1910.253, inspection of compressed gas cylinders, the HSO shall determine that compressed gas cylinders in use are in a safe condition to the extent that this can be determined by visual inspection. Visual and other inspections will be conducted as prescribed in the Hazardous Materials Regulations of the Department of Transportation (49 CFR Parts 171-179 and 14 CFR Part 103). Where those regulations are not applicable, visual and other inspections shall be conducted in accordance with Compressed Gas Association Pamphlets C-6-1968 and C-8-1962.

5.3.7 Equipment Decontamination Hazards

Currently identified potential health and safety risks associated with the decontamination of equipment include, but are nor limited to the following:

- Steam burns / heat stress
- Fires from steam generator fuels
- Slips and falls on slippery surfaces

6.0 MONITORING

6.1 Dust Monitoring

Dust monitoring will be performed by MT's Health and Safety Officer. He will perform a periodic visual inspection of the site to confirm dust levels are low. If dust can be seen, preventative measures will be taken. The HSO shall implement dust control measures such as wetting the excavation areas and stock piles. The HSO will also take precaution to reduce dust by covering soil piles with tarps as deemed necessary.

Table 6-1

Air Quality Action Levels and Responses

Air Quality Measurement[1]	Action [2]
• No dust visible in breathing zone	Level D Protection or Modified Level D Protection (at the discretion of HSO)
• Dust visible in breathing zone • GE notification to MT of perimeter dust levels above 120 $\mu g/m^3$	Implement dust suppression measures
• Excessive dust in breathing zone • GE notification to MT of perimeter dust levels above 120 $\mu g/m^3$ continuous for one hour.	Suspend work in immediate area and notify the Site Supervisor / Health and Safety Officer. Take mitigative measures as necessary to suppress emissions as appropriate.

(1) All Air Quality Measurements should be made in the breathing zone of personnel who, in the opinion of the HSO, are most exposed to airborne contaminants.

(2) All Actions shall be determined and directed by MT's site HSO.

6.2 Personnel Monitoring

6.2.1 Heat Stress

Heat stress can be caused by a number of factors including workload, weather conditions, personal protective equipment, and physical condition of the individual. If ambient temperatures exceed 100°F, a heat stress monitor, similar to QuestTemp, will be used to more closely track heat stress. Heat stress includes several types of heat related illnesses, each with specific symptoms, listed below:

- Heat rash caused by continuous exposure to heat and humid air. Decreases the body's ability to tolerate heat.

- Heat cramps, caused by excessive perspiring without proper and adequate electrolyte replacement. Symptoms include:
  - pain in the hands, feet, and abdomen
  - muscle spasms
- Heat exhaustion, caused from inadequate blood circulation due to cardiovascular dehydration. Symptoms include:
  - pale, cool skin
  - excessive perspiring
  - fainting
  - nausea
  - dizziness
- Heat stroke, most serious form of heat stress, body temperature regulation fails and body temperature rises rapidly. Immediate action must be taken to cool the body. Medical attention is required. Symptoms include:
  - red, hot, dry skin
  - lack of perspiration
  - nausea
  - dizziness
  - rapid pulse
  - coma

Immediate recognition of heat stress is extremely important because heat-related injuries rapidly increase in their severity without attention. To prevent heat stress, proper training and planning is required including:

- Personnel must be able to recognize signs and symptoms of heat stress and administer immediate attention.
- Work/rest schedules established according to weather conditions, workload, and level of personal protective equipment. Workers will not do other tasks during rest period and will remove impermeable garments during rest periods.
- Maintain adequate body fluid levels, encouraging drinking ample quantities of water, and electrolytes. To prevent dehydration, personnel should be encouraged to drink generous amounts of water even if not thirsty.
- Ensure adequate shelter is available to protect personnel against heat, cold, rain, and snow.
- Allow personnel to become accustomed to site conditions, personal protective equipment, and workload. Rotate teams of personnel in hot weather.
- Utilize cooling devices to assist body cool down (i.e. showers, cooling jackets, etc.).
- Encourage personnel to maintain their physical fitness.

6.2.2 Cold Stress

Personnel working in sub-freezing temperatures are susceptible to cold stress. Areas of the body most susceptible are the fingers, toes, and ears. Cold stress is categorized into three levels, increasing in severity:

- Frost nip - skin is suddenly white/pale
- Superficial frostbite - skin color is white or grayish-yellow, skin surface is firm to the touch but skin beneath is resilient
- Deep frostbite - skin is cold, solid, and pale, blisters appear in 12 to 36 hours

Hypothermia, cooling of the body's core temperature, can also result from exposure to freezing temperatures. Symptoms are usually exhibited in five stages:

- Shivering
- Sleepiness, apathy, and rapid cooling of body temperature to less than 95°F
- Unconsciousness, slow pulse and respiratory rate, glassy stare
- Freezing of the extremities
- Death

To avoid cold stress, personnel must wear the appropriate protective clothing determined by ambient and weather conditions. For ambient temperatures of less than 0°F, continuous exposure of unprotected skin can result in cold stress. Wet clothing, either from perspiration or immersion in water, must be changed immediately.

The Buddy System will be employed during all on-site operations and especially in temperature conditions below 10°F.

6.3 Medical Surveillance

All site personnel will participate in a medical surveillance program, as per OSHA regulations 29 CFR § 1910.120. The objectives of this program are to ensure site personnel are medically fit to perform their job and to provide adequate medical monitoring during their involvement with the site. This will permit detection of any site-related health problems.

A detailed medical and work history is taken covering previous exposures, illnesses, and injuries with emphasis on symptoms related to the handling of hazardous substances and health hazards with emphasis on the ability to wear any required PPE under conditions that may be expected on-site.

Certification that all supervisory and onsite personnel - working in contaminated areas have received appropriate medical examinations shall be provided as personnel is assigned to the site.

6.3.1 Illnesses of Site Personnel

Exposure site contaminants will be minimized by the use of appropriate personal protective equipment by site personnel. Any personnel exhibiting symptoms associated with exposure to contaminants will immediately report them to the Site Supervisor. The occurrence of any of these symptoms by site personnel will be recorded. Upon investigation of the site and personal protective gear being employed, the Health and Safety Officer will assess the need for additional protective measures.

7.0 INSPECTIONS

Maxymillian Technologies' Health and Safety Officer will coordinate inspections of the site. Inspections will be conducted according to the schedule outlined in the following sections.

- General Facility: Personnel will be observed to ensure compliance with health and safety requirements, in particular the use of personal protective equipment. The availability of usable safety and emergency equipment will be verified.
- Excavation/General Construction Area: The excavation area will be checked to identify potential health and safety hazards.

7.1 Safety Inspections

Periodic site safety inspections will be performed by the Health and Safety Officer during the site. The purpose of these safety inspections is to ensure personnel are performing their duties in the safest manner possible and provide continuing analysis and modification to the safety program. Issues arising from safety inspections will be conveyed to Supervisors who will implement corrective actions.

Inspections of the general facility will focus on the consistent compliance with safety requirements and availability of safety and emergency gear. The format to be followed in general facility inspections can be found in Appendix A.

Personal protective gear will be maintained in the personal decontamination area, with additional emergency supplies kept in the administrative trailer. First Aid supplies are kept in the personal decontamination area, with additional stations located at strategic positions within the facility.

7.2 Record Keeping

The HSO or designated person responsible for conducting inspections will maintain records outlining the results of inspections. Inspection records will be maintained on-site. Please refer to Appendix A, Checklists/Inspection Forms, for examples of inspection forms.

8.0 PERSONAL PROTECTION AND SAFETY EQUIPMENT

8.1 Personal Protective Equipment

There is expected to be contaminated materials at the site that will present potential health hazards from exposure by dermal contact, inhalation, and/or ingestion. In areas where this material is presumed to be, personal protective equipment will be used. MT will provide all personal protective equipment (i.e. Tyvek® suits, chemical resistant gloves, respirators, face masks/goggles, ear protection, etc.) for MT personnel, if directed by MT's Health and Safety Officer. No employee-owned safety equipment will be allowed to be used at the site. For operations in the work zone, the level of PPE is based upon visual air dust concentrations, the job function, potential for skin contact or inhalation and will be directed by MT's Health and Safety Officer.

The following requirements will be followed in accordance with OSHA Regulations:

- facial hair will not interfere with the proper fit of respirators;
- contact lenses will not be worn; and,
- eyeglasses that interfere with the proper fit of full-face respirators will not be worn.

Personal safety equipment is inspected weekly by the Health and Safety Officer during excavation and construction operations. Filters on Air Purifying Respirators will be changed as appropriate. The following outlines Levels D, modified D and C of personal protective equipment:

Level D

Level D personal equipment shall be selected when there are no inhalation or dermal hazards and work precludes splashes, immersion, or potential for unexpected inhalation of any chemicals. Level D consists of:

- Gloves*, leather
- Boots, steel toed rubber boots for work around heavy equipment and chemical-resistant foot protection in the Exclusion Zone
- Safety glasses or chemical-splash goggles*
- Hard hat (face shield*)
- Escape mask*

* may be required based on the task to be performed.

Modified Level D

Modified Level D personal protective equipment shall be selected, at the discretion of the HSO, when no airborne particulate is present and there are no inhalation risks. Modified D with strict dust control measures is expected to be used on this project. This equipment shall consist of :

- Gloves*, leather
- Boots, steel toed rubber boots for work around heavy equipment and chemical-resistant foot protection in the Exclusion Zone
- Safety glasses or chemical-splash goggles*
- Hard hat (face shield*)
- Escape mask*
- Latex surgical gloves
- Tyvek® coveralls

* may be required based on the task to be performed.

Level C

Level C personal protective equipment shall be selected, at the discretion of the Health and Safety Officer, when contaminated airborne particulate are present and the criteria for air purifying respirators are met. Level C is not expected to be used on this project but if needed, this equipment shall consist of:

- Half-face, air-purifying, canister-equipped respirator (MSHA/NIOSH approved)
- Tyvek® coveralls
- Gloves (outer), Nitrile chemical-resistant
- Gloves (inner), Nitrile chemical-resistant*
- Boots, steel toed rubber boots for work around heavy equipment and chemical-resistant foot protection in the Exclusion Zone
- Hard Hat (face shield*)
- Escape mask*
- 2-way radio communications (intrinsically safe)
- Explosimeter/O_2 meter
- Photoionization detector or OVA system

* may be required based on the task to be performed.

Task specific levels of protection will be determined by the HSO based on air monitoring results, soil analyses, task specific activities, and other site conditions. General activity levels of protection are identified below but may be modified at the discretion of the HSO.

Personnel working in "clean" areas at the site (e.g. administrative trailer, cleanly filled areas, etc.) will wear standard construction site clothing.

The proper removal and disposal of contaminated personal protective equipment is essential to prevent exposure. Procedures for disposing of and decontaminating personal protective equipment are provided Section 9.0, Decontamination.

8.1.1 Respirator Protection

Respirator protection is not expected to be utilized at the site. If necessary, the type of cartridges to be used will be determined by the Health and Safety Officer. Please refer to Appendix E, Maxymillian Technologies Respirator Protection Program, for detailed information of respirator information. The prohibition of contact lenses is outlined in this program. Corrective eye wear that does not interfere with the seal of the respirator or eye wear designed for use with respirators will be allowed.

8.1.2 Hearing Protection

Per OSHA regulation 29 CFR § 1926.101, hearing protective devices will be provided and worn by personnel working in areas of high decibel noise. Periods of high decibel noise exposure are defined in 29 CFR § 1926.52, Table D-2, Permissible Noise Exposures.

8.2 Personnel Accidents and Injuries

In the event of a worker-related accident, it is MT's primary concern to provide immediate assistance without placing additional site personnel at risk. All accidents and injuries are required to be reported to the Health and Safety Officer and/or Site Supervisor.

All worker injuries will require First Aid procedures to be implemented. If the severity of the injury is beyond on-site First Aid procedures, the employee must be transported to an off-site medical facility. If the employee can be moved, he will be moved to the decontamination area where, if possible, decontamination procedures will be implemented and personal protective equipment removed. Transportation to a local emergency medical facility will be provided. The Project Manger will be required to notify hospital staff if they are to treat a contaminated worker.

If the injury involves chemical exposure, the following situations will require First Aid procedures as listed:

1. Eye exposure - thoroughly rinse at the eye wash station or portable eye wash unit using water and/or eyewash solution. Obtain medical attention immediately.
2. Dermal exposure - rinse affected area immediately using water. Obtain medical attention, if necessary.
3. Ingestion - refer to MSDS and administer emetic, if required. Obtain medical attention immediately.
4. Inhalation - move to fresh air. If breathing has stopped, perform CPR. Obtain medical attention immediately.

Temperature related injuries, including heat and cold stress, are discussed in Section 6.0, Monitoring.

8.3 Buddy System

The Buddy System will be employed by site personnel if workers are required to work in Level C protective gear. Under the Buddy System, each site worker is responsible for monitoring the well-being of another worker. Partners will maintain visual contact with each other. No one works alone when the Buddy System is implemented. At no time will fewer than two MT employees be present at the site if excavation/construction activities are under way.

Site personnel will be trained to observe each other for the following conditions that are symptomatic of toxic exposure:

- Changes in skin complexion (abnormal discoloration)
- Changes in coordination, behavior, or speech
- Excessive salivation
- Changes in papillary responsiveness

If a worker notices a co-worker exhibiting any of these symptoms, the observer will immediately notify his direct supervisor. In addition, any worker suffering from:

- Headaches or dizziness
- Blurred vision or eye irritation
- Stomach cramps
- Skin irritation
- Difficulty in breathing

will immediately notify his immediate supervisor. These conditions may indicate toxic exposure or heat exhaustion. When appropriate a work/rest schedule will be established to minimize the likelihood of a worker suffering from heat exhaustion. Details are included in Section 6.0, Monitoring.

8.4 Safety Equipment

The following safety equipment is provided for the protection of site personnel. The equipment will be properly identified at all times and all personnel will be made aware of the locations of these pieces of equipment. First Aid stations will be readily identifiable and adequately lighted. The Health and Safety Officer will be responsible for inspecting and maintaining the ready availability of these items.

First Aid kits will be supplied with:

- Bandage materials
- Antibacterial ointments
- Splints
- Non-aspirin pain reliever
- Local and topical anesthetics
- Eyewash bottle and solution
- Sterile gloves
- Compresses
- Ammonia inhalant
- Scissors
- Tweezers
- First Aid cream
- Instant cold-packs
- Burn cream

8.5 Confined Space Entry

No confined spaces are expected to be present on this site. For protection in trenches, please see Appendix F, Maxymillian Technologies, Inc. Trenching and Shoring Program.

9.0 DECONTAMINATION

MT will use on-site personnel decontamination facilities, located immediately adjacent to the Exclusion Zone. No one will leave the containment reduction area until they have thoroughly decontaminated their protective equipment, removed the protective equipment and, if applicable, disposed of the protective equipment. The exception to this rule is the removal of an employee for emergency medical attention.

All wash water, solvents, detergents, etc. shall be contained and delivered to GE for disposal.

The personnel decontamination procedure (when applicable) will proceed as follows:

Step 1:	Equipment Drop
Step 2:	Boot* and Outer glove rinse and removal
Step 3:	Suit or coverall removal
Step 4:	Hard hat, eye protection and respirator removal
Step 5:	Inner glove removal
Step 6:	Wash of any potentially exposed skin

*If outer disposable boots are utilized, the outer layer shall be removed and disposed.
*If reusable boots are utilized a two station boot decon will be set up

Decontamination procedures to be followed by all on-site personnel will be determined for site specific conditions.

9.1 Reusable Personal Protective Gear

Gear that can be decontaminated and reused, such as respirator packs and facemasks, will be removed sequentially (the most contaminated equipment first). Decontaminated gear will then be set aside for storage in a clearly marked area of the personnel decontamination area. Decontamination of reusable equipment will be verified by visual inspection by the appointed HSO or a site employee charged with this responsibility.

Decontamination of reusable personal protective gear will be ongoing throughout the process, and will continue through closure. The MT Health and Safety Officer will periodically inspect the condition of reusable personal protective gear to verify its integrity. Upon completion of closure, all reusable gear will be decontaminated and all disposable gear will be transported off-site for safe disposal.

9.2 Single-Use Personal Protective Gear

Single-use personal protective gear, including disposable protective clothing (e.g. Tyvek® suits), is used for a single work shift and then stored for disposal. If the single-use personal protective gear becomes torn or damaged in the course of work within a single work shift, it will be removed and replaced with new single-use gear for the remainder of that work shift.

9.3 Equipment Decontamination

All earthmoving/transportation equipment in contact with any soil will be decontaminated at the edge of the Exclusion Zone prior to moving equipment into clean zones or the removal of the equipment from the site. MT will utilize a steam cleaning method to remove all contaminates from the equipment. After completion, a wipe test will be performed to confirm surfaces have less than 10 µg PCB's/ 100cm ^{2} remaining.

10.0 SPILL PREVENTION CONTROL & COUNTERMEASURES PLAN

10.1 Stored Substances

Some substances will be stored for use at the site. These materials will be kept in the containers provided by the supplier or manufacturer, and stored in the project storage trailer:

Material Safety Data Sheets (MSDSs) for these substances will be included in Appendix B, MSDSs, of this Plan.

10.2 Potential Spills

The primary potential spills that may occur during work at the site involve liquid fuel, lubricating oils, etc. If PCB contaminated soils are found and stored, they also will have a potential to spill.

10.2.1 Liquid Spills

Should a spill occur involving liquids at the at site (i.e. fuel, lubricating oils, etc.), the following procedures will be implemented:

- Contain the spill with berms formed with soil and/or dry absorbent
- Apply dry absorbent to the spill in a quantity sufficient to fully contain the spill
- Shovel absorbent into 55-gallon drum
- Spilled materials and associated wastes will be disposed of according to their regulatory classifications.
- Appropriate spill clean up verification will be performed to the satisfaction of the Regulatory Agency for all spills at the at site. The type of verification sampling is to be determined by the Project Manger and GE oversight Personnel.

11.0 EMERGENCY RESPONSE CONTACTS

Emergency situations can be categorized into three general classifications: fire and/or explosion, releases to the atmosphere and/or soil or surface waters, and severe weather conditions. First and foremost, the initial response to any emergency must be to protect human health and safety and then the environment. Secondary response to the emergency is identification, containment, treatment, and disposal assessment.

Specific emergency procedures to be followed in each situation are detailed in Section 12.0, Contingency Plan. In the event the situation is beyond the capabilities of site personnel, assistance will be contacted.

11.1 Emergency Numbers

- **Ambulance 911**

- Fire Department ..... 911 or (413) 448-9764
- Police Department ..... 911 or (413) 448-9700
- Area Hospital (Berkshire Medical Center) ..... 911 or (413) 447-2000

- Poison Control Center ..... (800) 336-6997
- USEPA National Response Center ..... (800) 438-2427

- MT's Project Manager/HSO, TBD ..... TBD

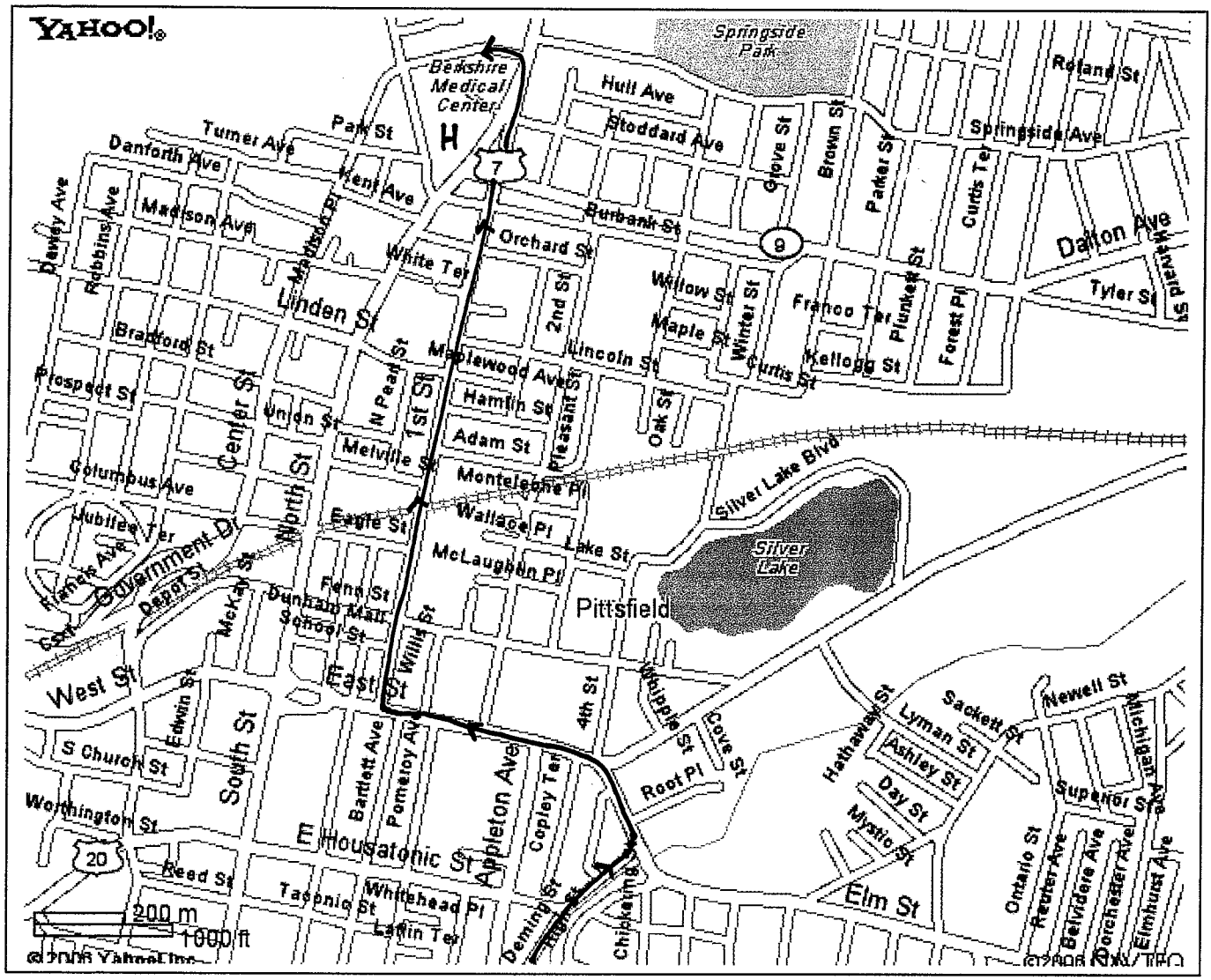
- GE's Representative ..... TBD
- GE Security ..... (413) 448-4900

11.2 Hospital Directions

Go north on Deming Street to Elm Street
Turn Left onto Elm Street, go to light
Take left onto East Street
Follow East Street to First Street, (just before rotary)
Take Right onto First Street
Hospital, Berkshire Medical Center, will be down on the Left

Berkshire Medical Center
725 North Street
Pittsfield, MA

11.3 Map to Hospital



12.0 CONTINGENCY PLAN

Site personnel will conduct normal activities at the site as they were trained to do. In the event conditions at the site change, personnel might be required to modify their behavior to ensure continued safety. Change in status of operating conditions or activities at the site warrants implementation of the Contingency Plan. The Site Supervisor or senior site staff member has authority to implement the Contingency Plan. The Contingency Plan is intended to provide guidance for ensuring the safety of human health and the environment during non-normal operating conditions at the facility.

12.1 Conditions for Implementation

Some of the conditions under which the Contingency Plan would be implemented are:

- Identification of a localized and containable fire
- Occurrence of a spill or material release
- Severe weather conditions
- Physical or chemical injury to a worker

12.2 Assessing the Risk

First and foremost, the HSO's initial reaction to any emergency is to protect human health and safety and then the environment. Secondarily, he will assess the nature of the emergency, the steps required to contain and treat the emergency, and any requirements for disposal that may result from containing and treating the situation.

The HSO must assess possible hazards to human health or the environment that may result from any emergency situation. This assessment must take into consideration both direct and indirect effects of the incident (e.g., the effects of toxic, irritating, or asphyxiating gases that are generated).

12.3 Identifying the Hazards

The HSO will assess the possible hazards to human health or the environment that may result from the release, fire, explosion, or severe weather conditions. He will follow this procedure to make this assessment:

1. Identify the materials involved in the incident
2. Consult the MSDSs to determine the potential effects of exposure/release, and appropriate safety precautions
3. Identify the exposure and/or release pathways and the quantities of materials involved

Based on this assessment, the HSO will determine what risk is posed to personnel at the site and neighboring populations. If the incident cannot be controlled by operating personnel without incurring undue risk, the HSO will implement the emergency procedures. These procedures include the HSO notifying the appropriate governmental agencies and departments that a situation resulting in evacuation has occurred. Should emergency assistance in treating injuries or carrying out the evacuation be required, the HSO will request assistance of the appropriate parties.

If the HSO deems that humans outside of the site are at risk, he will notify the appropriate agencies and departments of the need or potential need to institute off-site evacuation procedures.

12.4 Contingency Procedures for Fire/Explosion

When fire or explosion appear imminent or have occurred, all normal activity related to the site will cease. The HSO will be responsible for performing a risk assessment of the severity of the situation and deciding whether the emergency event is or is not readily controllable with existing portable fire extinguishers or site equipment and materials at hand. Under no conditions will fire fighting be performed if there are risks to the well-being of operating personnel. Local fire departments will be contacted in all situations in which fires and/or explosions have occurred.

12.4.1 Site Evacuation

The decision to evacuate the site must be made quickly by the HSO. This decision must be based on:

- The extent of the fire
- The location of the fire
- The identity of materials involved in the fire
- Proximity of other materials to the fire
- Prevailing weather conditions

If the fire is readily containable (that is, it is small, not fed by combustible materials, is in an isolated area, and is not being fanned by winds), evacuation will not likely be required. Operations outside of the normal realm of activity, such as contained fire fighting, automatically trigger implementation of the Contingency Plan.

If the fire involves a quantity of combustible materials and is being fanned by winds, evacuation of the site might be required. Under these conditions, procedures discussed in this Section would be implemented.

12.5 Contingency Procedures for Spills or Material Release

If a hazardous waste spill or material release or process upset resulting in probable vapor release is noted, the Supervisors will immediately assess the magnitude and potential seriousness of the spill or release by reviewing:

- MSDSs for the material spilled or released
- The source of the release or spillage of hazardous material
- An estimate of the quantity released and the release rate
- The direction in which the spill or air release is moving
- Exposed personnel and possible resulting injuries or illnesses
- Fire or explosion potential
- Estimates of area under influence of the release

If the accident is determined to lie within the on-site emergency response capabilities, the Supervisors will immediately activate the necessary remedial action. Occurrence of a spill automatically triggers activation of the Spill Prevention Control and Countermeasure Plan, discussed in detail in Section 10.0 of this Plan.

If contaminated soil is spilled during handling, the soil will be returned to the Exclusion Zone. If the spill involves liquids, the spill will be cleaned up with use of absorbent materials. If the HSO believes the incident might be beyond the capabilities of the operating crew, he will immediately notify the appropriate off-site response teams and GE Representative.

In the event of an emergency spill or release, all personnel not involved with emergency response activity will immediately evacuate the area around the release. The spill or release area will be roped or otherwise blocked off.

12.6 Severe Weather Conditions

When a tornado is sighted in the area, when a tornado warning has been issued, or when a lightning storm occurs, the information will immediately be relayed to the HSO. The HSO will immediately institute emergency shutdown procedures in the case of a tornado sighting, and all personnel will proceed indoors after completing appropriate shutdown procedures. In the case of a tornado warning or lightning storm, all operations will be stopped and all personnel will stand by for emergency procedures. When the storm has passed, the Supervisors will conduct an inspection of all equipment to ensure its readiness for operation. If the Supervisor's inspection indicates a fire, explosion or release has occurred as the result of a severe weather condition, the procedures for those events will be followed.

Immediately after an emergency, the Supervisors will arrange for treatment, storage, or disposal of recovered wastes, contaminated soil, surface water, or any other contaminated materials.

After an emergency event, all emergency equipment will be cleaned for reuse. Before operations are resumed, the HSO will conduct an inspection of all safety equipment to make certain all equipment is fit for reuse. If the inspection indicates the need for repairs or replacement of equipment, such actions will be taken before activities are resumed. The GE Representative will be notified that post-emergency equipment maintenance has been performed and operations can be resumed.

12.6.1 Lightning

Workers will take necessary precautions during lightning storms to protect themselves from lightning strikes. If possible, workers will stay indoors in a metal structure or car. Workers in a wood or brick structure will avoid touching faucets, electrical equipment, and telephones. If someone is hit by lightning immediate medical attention will be sought, and CPR will be initiated if breathing and/or circulation has stopped.

12.6.2 Thunderstorms and Tornadoes

Site personnel will be aware of weather conditions and alert for thunderstorms and tornadoes. Work will continue during severe thunderstorm or tornado watches. Work will cease during thunderstorms, severe thunderstorm warnings or tornado warnings. During a tornado, personnel on-site will:

- evacuate office trailers or vehicles
- if outdoors, lie flat in a nearby ditch
- stay away from power poles, electrical appliances, and metal objects
- not try to outrun a tornado

12.7 Major Injury to Workers

Major injuries sustained by workers will require professional medical attention at a hospital. The HSO will immediately follow procedures in the Contingency Plan and summon an ambulance and hospital to which the injured worker will be transported. The hospital and ambulance should be advised of:

- The nature of the injury
- Whether the injured worker will be decontaminated prior to transport
- When and where the injury was sustained
- The present condition of the injured worker (e.g. conscious, breathing)

Emergency decontamination procedures will be implemented, if possible. The injured person will, at a minimum, be wrapped in a blanket to prevent spreading of contamination to the transport vehicle. An employee will accompany the injured worker to the hospital and will bring copies of applicable MSDSs.

12.8 Emergency Equipment

Emergency equipment is provided for the protection of at site personnel. MT will notify all their personnel of the location and function of each piece of emergency equipment. The Supervisor is responsible for ensuring that all emergency equipment is functioning properly and is readily available for use.

Emergency equipment includes:

- Portable fire extinguishers
- Brooms and shovels for cleanup of small-quantity soil spills
- Front-end loader for cleanup of large-quantity soil spills
- Absorbent materials for cleanup of liquid spills
- Containers for storage and disposal of contaminated absorbent
- Generator for emergency power and lighting

Fire extinguishers will be stationed at the following locations:

- One on each piece of equipment
- One in storage trailer

All extinguishers will comply with National Fire Code standards for portable fire extinguishers.

Spill or containment equipment located on the site includes:

- Loose dry absorbent
- Shovels - wooden handle, steel type.
- Brooms - wooden handle, push type.
- Leakproof containers for storage and disposal of contaminated absorbent materials.

12.9 Record Keeping

Any incidents that result in implementation of any aspect of the Contingency Plan will be reported immediately to GE. GE notification will indicate the nature of the incident that triggered implementation of the Contingency Plan, the date and time at which the plan was implemented, and the results of the implementation.

12.10 Flood Control Contingency Plan

MT site supervisors will monitor weather conditions on a daily basis. In the event a major rain event is predicted, work in areas adjacent to waterways will be temporarily suspended. Erosion controls will be checked and repaired as needed. No equipment will be parked in low-lying areas. Fuels and other liquids will be stored in approved containers, on higher ground, away from the work zones.

13.0 EVACUATION PLAN

Evacuation procedures are implemented when human health is in danger. If the HSO determines that a site incident (i.e. fire, explosion, etc.) requires evacuation of all on-site personnel, he will follow evacuation procedures. In establishing safe evacuation routes, the HSO will use the following guidelines:

- Evacuation routes will be in the predominantly upwind direction of the Exclusion Zone.
- Evacuation routes will be through the Decontamination Zone in order to decontaminate, if time allows, and to account for site personnel.
- Alternate routes will be established in case the primary route is blocked by fire, spill, etc. Alternate routes will not cross or overlap the primary routes.
- Mobility constraints of personnel wearing protective clothing and equipment will be considered.
- All site personnel will be clearly aware of evacuation routes.

13.1 Record Keeping

Any incidents that require implementation of the Evacuation Plan will be immediately reported to GE. GE will be notified to the nature of the incident that triggered the evacuation, and the extent to which evacuation was conducted (e.g., only site personnel or project and surroundings). The date and time at which the evacuation was implemented and the duration for which the site was abandoned will also be incorporated into the report. At a minimum, the following will be included in the report:

- Chronological history and facts of the incident
- Titles and names of personnel
- Actions, decisions, and orders to whom, by whom, when, and results
- Types of samples and test results taken
- Possible exposure to site personnel

Attachment 1

Maxymillian Technologies, Inc.

Outline of HAZWOPER 40-hour Training Curriculum

EMERGENCY RESPONSE TECHNOLOGIES
246 Pomeroy Avenue
Pittsfield, MA 01201

AGENDA

Hazardous Waste Site Worker
40 Hour Training Program

I. Introduction
- Regulatory Agencies
- Regulations
- Liability

II. Hazards
- Chemical exposure
- Fire & explosion
- Oxygen deficiency
- Ionizing radiation
- Biological hazards
- Safety hazards
- Electrical Hazards
- Heat Stress
- Cold exposures
- Noise

III. Planning & Organization
- Organizational structure
- Work plan
- Site safety plan
- Safety meetings & inspections

IV. Chemistry & Physics of Hazardous Materials
- Basic chemistry
- D.O.T. chemical classifications
- Material Safety Data Sheets
- D.O.T. Emergency Response Guidebook

V. Toxicology
- Dosage, routes of exposure, toxic effects, immediately dangerous to life or health (IDLH), values, permissible exposure limits (PEL), recommended exposure limits (REL), threshold limit values (TLV)

VI. Medical Program
- Pre-employment screening
  - Determination of fitness for duty
  - Baseline data for future exposures
- Periodic medical examinations
- Termination examinations
- Emergency treatment
- Non-emergency treatment
- Documentation of exposures
- Medical Records

VII. Site Control
- Site map
- Site work zones
  - Exclusion zone, (Hot)
  - Contamination reduction zone, (Warm)
  - Support zone, (Cold)
- Buddy system
- Site security
- Communications
- Safe work practices

VIII. Air Monitoring
- Monitoring equipment
  - Functions
  - Capabilities
  - Selection
  - Use
  - Limitations
  - Maintenance
- Site monitoring
  - IDLH & other dangerous conditions
  - General on-site monitoring
  - Periodic monitoring

IX. Personal Protective Equipment
- Respiratory protection
  - Air purifying respirators
  - Supplied air respirators
  - Self contained breathing apparatus
- Protective clothing & accessories
  - Selection
  - Permeation, degradation, & penetration
  - Heat stress
  - Levels of protection (A, B, C, D)

X. Handling Drums and Other Containers
- Inspection
- Planning
- Handling

XI. Decontamination
- Decontamination plan
- Prevention
- Types of contamination
- Decontamination methods
  - Physical removal
  - Chemical removal
- Decontamination facility design
- Decontamination equipment selection
- Disposal methods
- Emergency decontamination

XII. Site Emergencies
- Planning
- Personnel
  - On-site
  - Off-site
  - Federal Response Organizations
- Training
- Emergency recognition & prevention
- Communications
  - Internal
  - External
- Site mapping
- Safe distances & refuge
  - Safe distance
  - Public evacuation
  - Refuges (safety stations)
- Site security and control
- Evacuation routes & procedures
- Decontamination
- Equipment
- Medical treatment/First aid
- Emergency response procedures
  - Notification
  - Size up
  - Rescue response action
  - Follow up
- Documentation

XIII. First Aid & Cardiopulmonary Resuscitation (CPR)
- National Safety Council, Level 1 First Aid
- National Safety Council, Adult CPR

XIV. Confined Space Entry
- Permit required confined spaces
- Confined space entry
- Confined space rescue procedures

Attachment 2

Maxymillian Technologies, Inc.

First Report of Injury Form

OSHA's Form 301
Injury and Illness Incident Report

Attention: This form contains information relating to employee health and must be used in a manner that protects the confidentiality of employees to the extent possible while the information is being used for occupational safety and health purposes.

U.S. Department of Labor
Occupational Safety and Health Administration

Form approved OMB no. 1218-0176

This *Injury and Illness Incident Report* is one of the first forms you must fill out when a recordable work-related injury or illness has occurred. Together with the *Log of Work-Related Injuries and Illnesses* and the accompanying *Summary*, these forms help the employer and OSHA develop a picture of the extent and severity of work-related incidents.

Within 7 calendar days after you receive information that a recordable work-related injury or illness has occurred, you must fill out this form or an equivalent. Some state workers' compensation, insurance, or other reports may be acceptable substitutes. To be considered an equivalent form, any substitute must contain all the information asked for on this form.

According to Public Law 91-596 and 29 CFR 1904, OSHA's recordkeeping rule, you must keep this form on file for 5 years following the year to which it pertains.

If you need additional copies of this form, you may photocopy and use as many as you need.

Completed by _____

Title _____

Phone (____) _____ Date ____/____/____

Information about the employee

1) Full name _____

2) Street _____

City _____ State _____ ZIP _____

3) Date of birth ____/____/____

4) Date hired ____/____/____

5) ☐ Male
☐ Female

Information about the physician or other health care professional

6) Name of physician or other health care professional _____

_____

7) If treatment was given away from the worksite, where was it given?

Facility _____

Street _____

City _____ State _____ ZIP _____

8) Was employee treated in an emergency room?
☐ Yes
☐ No

9) Was employee hospitalized overnight as an in-patient?
☐ Yes
☐ No

Information about the case

10) Case number from the *Log* _____ *(Transfer the case number from the Log after you record the case.)*

11) Date of injury or illness ____/____/____

12) Time employee began work _____ AM / PM

13) Time of event _____ AM / PM ☐ Check if time cannot be determined

14) ***What was the employee doing just before the incident occurred?*** Describe the activity, as well as the tools, equipment, or material the employee was using. Be specific. *Examples:* "climbing a ladder while carrying roofing materials"; "spraying chlorine from hand sprayer"; "daily computer key-entry."

15) ***What happened?*** Tell us how the injury occurred. *Examples:* "When ladder slipped on wet floor, worker fell 20 feet"; "Worker was sprayed with chlorine when gasket broke during replacement"; "Worker developed soreness in wrist over time."

16) ***What was the injury or illness?*** Tell us the part of the body that was affected and how it was affected; be more specific than "hurt," "pain," or "sore." *Examples:* "strained back"; "chemical burn, hand"; "carpal tunnel syndrome."

17) ***What object or substance directly harmed the employee?*** *Examples:* "concrete floor"; "chlorine"; "radial arm saw." *If this question does not apply to the incident, leave it blank.*

18) ***If the employee died, when did death occur?*** Date of death ____/____/____

Public reporting burden for this collection of information is estimated to average 22 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Persons are not required to respond to the collection of information unless it displays a current valid OMB control number. If you have any comments about this estimate or any other aspects of this data collection, including suggestions for reducing this burden, contact: US Department of Labor, OSHA Office of Statistical Analysis, Room N-3644, 200 Constitution Avenue, NW, Washington, DC 20210. Do not send the completed forms to this office.

Appendix A

Maxymillian Technologies Inc.

Checklists and Inspection Forms

Safety and Emergency Equipment Checklist
Form A-1

Inspector:_____ **Date:**_____

Title:_____ **Time:**_____

Equipment	Types of Problems	Status	Remedial Actions
Fire extinguisher	seals, pressure, access	_____	_____
Alarms	horn damage	_____	_____
SCBA	air supply, damaged	_____	_____
Respirators	cartridges, damaged	_____	_____
Face shields, goggles, glasses	low stock, damaged	_____	_____
Hard hats	low stock, damaged	_____	_____
Boots	low stock, damaged	_____	_____
Gloves	low stock, damaged	_____	_____
Protective clothes	low stock, damaged	_____	_____
Eyewash stations	low liquid	_____	_____
First Aid kits	low stock	_____	_____
Emergency lights	battery or bulb failure	_____	_____

Safety Inspection Checklist
Form A-2

Item	Satisfactory	Not Satisfactory
Personal protective equipment		
Safety glasses/goggles/face shields	_____	_____
Gloves	_____	_____
Boots	_____	_____
Respirators	_____	_____
Protective clothing	_____	_____
Safety Equipment		
Eye protection	_____	_____
Hearing protection	_____	_____
Head protection	_____	_____
Foot protection	_____	_____
Skin protection	_____	_____
Respiratory protection	_____	_____
Electrical		
Lighting	_____	_____
Grounding	_____	_____
Insulation	_____	_____
Loose wires	_____	_____
Emergency lighting	_____	_____
Makeshift wiring	_____	_____
Approved equipment for hazardous classification	_____	_____
First Aid		
Eyewash station	_____	_____
First Aid kit	_____	_____
Adequately trained personnel	_____	_____

Item	Satisfactory	Not Satisfactory
Employee Instruction		
Protective equipment	_____	_____
Proper lifting procedures	_____	_____
Smoking area	_____	_____
Evacuation procedures	_____	_____
Decontamination	_____	_____
Horseplay	_____	_____
Rest area	_____	_____
Lunch area	_____	_____
Material Handling Equipment		
Cables, ropes, chains, etc.	_____	_____
Front-end loader	_____	_____
Crane	_____	_____
Crusher/Shredder	_____	_____
Screen	_____	_____
Machinery		
Protective guards or covers	_____	_____
Leak		
Rotation	_____	_____
Lubrication	_____	_____
Grounding	_____	_____
Other	_____	_____
Housekeeping		
Tripping hazards	_____	_____
Trash	_____	_____
Loose material	_____	_____
Storage of flammable materials	_____	_____
Leaks	_____	_____
Unobstructed access	_____	_____

Item	Satisfactory	Not Satisfactory
Material Storage		
Venting	_____	_____
Labeling	_____	_____
Material computability	_____	_____
Container integrity	_____	_____
Open flames	_____	_____
Sparks	_____	_____
Lockout/Tagout Procedures	_____	_____
Health and Safety Plan on Site	_____	_____

Employee Signature: _____ **Date:** _____

Supervisor Signature: _____ **Date:** _____

Inspector Signature: _____ **Date:** _____

Construction Equipment Inspection Sheet
Form A-3

Inspector:_____ **Date:**_____

Title:_____ **Time:**_____

Equipment	Types of Problems	Status	Observations/ Remedial Actions
Backhoe #__	cab glass missing	_____	_____
	no backup signal	_____	_____
	no parking brake	_____	_____
	brakes soft	_____	_____
	hydraulic problem	_____	_____
	no seat belt	_____	_____
Crane # ___	cab glass missing	_____	_____
	no backup signal	_____	_____
	no parking brake	_____	_____
	brakes soft	_____	_____
	hydraulic problem	_____	_____
	no seat belt	_____	_____
Bulldozer # ___	cab glass missing	_____	_____
	no backup signal	_____	_____
	no parking brake	_____	_____
	brakes soft	_____	_____
	hydraulic problem	_____	_____
	no seat belt	_____	_____
Front-End Loader # ___	cab glass missing	_____	_____
	no backup signal	_____	_____
	no parking brake	_____	_____
	brakes soft	_____	_____
	hydraulic problem	_____	_____
	heater broken	_____	_____
	defroster broken	_____	_____
	no seat belt	_____	_____

Appendix B

Maxymillian Technologies, Inc.

Material Safety Data Sheets

The following is a list of MSDSs for materials, which may be on site or may be brought to the site by MT. Additional MSDSs will be added as necessary.

Materials Brought To the Site by MT

Acetylene
Oxygen
Portland Cement
Propane
Mobil Automotive Gasoline
Mobil Diesel Fuels
Mobil Trans HD10W
Mobil Trans HD 30
Mobil Delvac 1300 Super 15W-40
Mobil Hydraulic Oil AW 46
Mobilfluid 424
Mobilgrease XHP 222 Special
Mobilgrease Moly 52
Mobil Multipurpose ATF
Aquamarine ® Oil 46
Windshield Washer Antifreeze Premix; Monson Chemicals
Antifreeze and Summer Coolant (Permanent); Houghton Chemical Co.
Airline System Antifreeze; Power Service Products, Inc.
Thrust Quick Starting Fluid; Radiator Specialty Co.
Diesel Fuel Supplement; Power Service Products, Inc.
WD-40; WD-40 Company
Spray Marking Paint: orange, blue, white; Rust-Oleum Corp.

Site Contaminants of Concern

PCBs

Material Safety Data Sheet Collection
Genium group inc.
1171 RiverFront Center, Amsterdam, NY 12010
(518) 842-4111

Issue Date: 2005-05

Aroclor 1242
ARO4990

Section 1 - Chemical Product and Company Identification 54/60

Material Name: Aroclor 1242
CAS Number: 53469-21-9
Chemical Formula: $C_{12}H_7Cl_3$ (approx)
Structural Chemical Formula: $C_6H_4ClC_6H_3Cl_2$ (approx)
ACX Number: X1002870-1
Synonyms: AROCHLOR 1242; AROCLOR 1242; CHLORIERTE BIPHENYLE,CHLORGEHALT 42%; CHLORODIPHENYL (42% CHLORINE); CHLORODIPHENYL (42% CL); CLORODIFENILI,CLORO 42%; DIPHENYLE CHLORE,42% DE CHLORE; GECHLOREERDEDIFENYL; PCB; PCB-1242; PCB 1242; POLYCHLORINATED BIPHENYL; POLYCHLORINATED BIPHENYL 1242
General Use: Used as dielectric fluids in transformers and capacitors. Prior to 1972, were used as hydraulic and other industrial fluids (e.g., in vacuum pumps, as lubricants and cutting oils), in paints, inks and fire retardants.
Also used in heat transfer systems; gas-transmission turbines; carbonless reproducing paper; adhesives; as plasticizer in epoxy paints; fluorescent light ballasts; wax extenders; coolants; dedusting agents; pesticide extenders; surface treatment and coatings; sealants; caulking material.
This is one of a group of once widely used industrial chemicals whose high stability contributed both to their commercial usefulness and long term deleterious environmental health effects. Consequently their use has been phased out. Manufacture in the U.S.A. was discontinued in 1977 and they were banned as imports in 1979.
Conditions for use are restricted.

Section 2 - Composition / Information on Ingredients

Name	CAS	%
Aroclor 1242	53469-21-9	>98

OSHA PEL
TWA: 1 mg/m^3; skin.

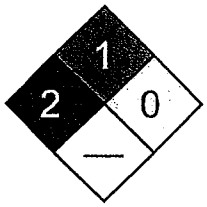
NIOSH REL
TWA: 0.001 mg/m^3.

DFG (Germany) MAK
TWA: 0.1 ppm; PEAK: 0.8 ppm; skin.

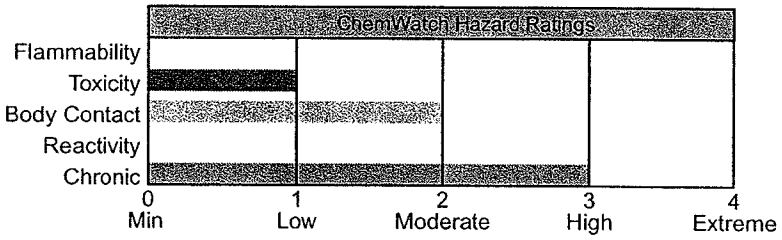
ACGIH TLV
TWA: 1 mg/m^3; skin.

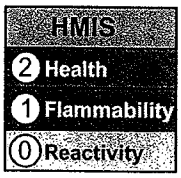
IDLH Level
5 mg/m^3.

Section 3 - Hazards Identification



Fire Diamond





ANSI Signal Word

Warning!

☆☆☆☆☆ Emergency Overview ☆☆☆☆☆

Oily liquid, white crystalline solid, or hard resin. Severely irritating. Chronic: chloracne, GI disturbances, neurological symptoms, liver enlargement, menstrual changes, bronchitis, possible reproductive/teratogenic effects. Suspect cancer hazard.

Potential Health Effects

Target Organs: skin, liver, eyes, mucous membranes, respiratory system
Primary Entry Routes: inhalation, skin contact, ingestion
Acute Effects
Inhalation: Not normally a hazard due to nonvolatile nature of product. Inhalation of vapor is more likely at higher than normal temperatures. The vapor/mist is discomforting and may be extremely toxic if inhaled.
Eye: The vapor/liquid is moderately discomforting and may be harmful to the eyes.
Skin: The liquid is harmful to the skin, it is rapidly absorbed and is capable of causing skin reactions.

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Exposure to material may result in a dermatitis, described as chloracne, a persistent acneiform characterized by comedones (white-, and black- heads), keratin cysts, and inflammed papules with hyperpigmentation and an anatomical distribution frequently involving the skin under the eyes and behind the ears. It occurs after acute or chronic exposure to a variety of chlorinated aromatic compounds by skin contact, ingestion or inhalation and may appear within days or months following the first exposure. Other dermatological alterations including hypertrichosis (the growth of excess hair), an increased incidence of actinic or solar elastosis (the degeneration of elastic tissue within muscles or loss of dermal elasticity produced by the effects of sunlight), and Peyrone's disease (a rare progressive scarring of the penile membrane).

Ingestion: Considered an unlikely route of entry in commercial/industrial environments.

The material is moderately discomforting to the gastrointestinal tract and may be harmful if swallowed in large quantity.

Ingestion may result in nausea, pain, vomiting. Vomit entering the lungs by aspiration may cause potentially lethal chemical pneumonitis.

Digestion may lead to nausea, vomiting, abdominal pain, anorexia, jaundice and liver damage, coma and death.

Headache, dizziness, lethargy, depression, nervousness, loss of libido, muscle, joint pains may be found.

Symptoms appear after a latent period of 5 to 6 months.

PCB's may appear in the breast milk of exposed mothers and in newborn infants.

Carcinogenicity: NTP - Class 2B, Reasonably anticipated to be a carcinogen, sufficient evidence of carcinogenicity from studies in experimental animals; IARC - Group 2A, Probably carcinogenic to humans; OSHA - Not listed; NIOSH - Listed as carcinogen; ACGIH - Not listed; EPA - Class B2, Probable human carcinogen based on animal studies; MAK - Class B, Justifiably suspected of having carcinogenic potential.

Chronic Effects: These compounds may penetrate into the human body by cutaneous, respiratory or digestive exposure. People occupationally exposed to PCB's have relatively high PCB residue levels in blood plasma. Symptoms include chloracne dermatitis and degreasing the skin, pigmentation of skin and nails, excessive eye discharge, swelling of eyelids, transient visual disturbances, distinctive hair follicles, edema of the face and hands.

In common with other polyhalogenated aromatic hydrocarbons, the chlorinated biphenyls exhibit dioxin-like behavior. Polyhalogenated aromatic hydrocarbons (PHAHs) comprise two major groups.

The first group represented by the halogenated derivatives of dibenzodioxins (the chlorinated form is PCDD), dibenzofurans (PCDF) and biphenyls (PCB) exert their toxic effect (as hepatoxicants, reproductive toxicants, immunotoxicants and procarcinogens) by interaction with a cytostolic protein known as the Ah receptor. In guinea pigs the Ah receptor is active in a mechanism which "pumps" PHAH into the cell whilst in humans the reverse appears to true. This, in part, may account for species differences often cited in the literature. This receptor exhibits an affinity for the planar members of this group and carries these to the cellular nucleus where they bind, reversibly, to specific genomes on DNA.

This results in the regulation of the production of certain proteins which elicit the toxic response. The potency of the effect is dependent on the strength of the original interaction with the Ah receptor and is influenced by the degree of substitution by the halogen and the position of such substitutions on the parent compound.

The most potent molecule is 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) while the coplanar PCBs (including mono-ortho coplanars) possess approximately 1% of this potency. Nevertheless, all are said to exhibit "dioxin-like" behavior and in environmental and health assessments it has been the practice to assign each a TCDD-equivalence value.

The most subtle and important biological effects of the PHAHs are the effects on endocrine hormones and vitamin homeostasis. TCDD mimics the effect of thyroxin (a key metamorphosis signal during maturation) and may disrupt patterns of embryonic development at critical stages. Individuals from exposed wildlife populations have been observed to have altered sexual development, sexual dysfunction as adults and immune system suppression.

Immunotoxic effects of the PHAHs (including the brominated congener, PBB) have been the subject of several studies. No clear pattern emerges in human studies however with T-cell numbers and function (a blood marker for immunological response) increasing in some and decreasing in others.

Three incidences have occurred which have introduced abnormally high levels of dioxin or dioxin-like congeners to humans. The explosion at a trichlorophenol-manufacturing plant in Seveso, Italy distributed TCDD across a large area of the country-side, whilst rice-oil contaminated with heat-transfer PCBs (and dioxin-like contaminants) has been consumed by two groups, on separate occasions (one in Yusho, Japan and another in Yu-cheng, Taiwan). The only symptom which can unequivocally be related to all these exposures is the development of chloracne, a disfiguring skin condition, following each incident. Contaminated oil poisonings also produced eye-discharge, swelling of eyelids and visual disturbances. The Babies born up to 3 years after maternal exposure (so-called "Yusho-babies") were characteristically brown skinned, colored gums and nails and (frequently) produced eye-discharges. Delays in intellectual development have been noted. It has been estimated that Yu-cheng patients consumed an average level of 0.06 mg/kg body weight/day total PCB and 0.0002 mg/kg/day of PCDF before the onset of symptoms after 3 months. Preliminary data from the Yusho cohort suggests a six-fold excess of liver cancer mortality in males and a three-fold excess in women.

Recent findings from Seveso indicate that the biological effects of low level exposure (BELLEs), experienced by a cohort located at a great distance from the plant, may be hormetic, i.e. may be protective AGAINST the development of cancer.

The PHAHs do not appear to be genotoxic - they do not alter the integrity of DNA. This contrasts with the effects of the many polycyclic aromatic hydrocarbons (PAHs) (or more properly, their reactive metabolites).

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Exposures as low as 0.001 ug/kg body weight/day produce carcinoma.
Several studies implicate PCBs in the development of liver cancer in workers as well as multi-site cancers in animals.
The second major group of PHAH consists of the non-planar PCB congeners which possess two or more ortho-substituted halogens. These have been shown to produce neurotoxic effects which are thought to reduce the concentration of the brain neurotransmitter, dopamine, by inhibiting certain enzyme-mediated processes.
The specific effect elicited by both classes of PHAH seems to depend on the as much on the developmental status of the organism at the time of the exposure as on the level of exposure over a lifetime.

Section 4 - First Aid Measures

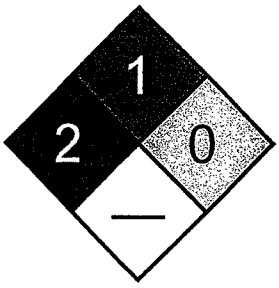
See DOT ERG

Inhalation: Remove to fresh air.
Lay patient down. Keep warm and rested.
If breathing is shallow or has stopped, ensure clear airway and apply resuscitation. Transport to hospital or doctor.
Eye Contact: Immediately hold the eyes open and flush continuously for at least 15 minutes with fresh running water. Ensure irrigation under eyelids by occasionally lifting the upper and lower lids. Transport to hospital or doctor without delay. Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.
Skin Contact: Immediately remove all contaminated clothing, including footwear (after rinsing with water).
Wash affected areas thoroughly with water (and soap if available).
Seek medical attention in event of irritation.
Ingestion: DO NOT induce vomiting. Observe the patient carefully. Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious. Give water (or milk) to rinse out mouth. Then provide liquid slowly and as much as casualty can comfortably drink. Transport to hospital or doctor without delay.
After first aid, get appropriate in-plant, paramedic, or community medical support.
Note to Physicians: Treat symptomatically. If large amounts are ingested, gastric lavage is suggested. In the case of splashes in the eyes, a petrolatum-based ophthalmic ointment may be applied to the eye to relieve the irritating effects of PCBs. If electrical equipment arcs over, PCB dielectric fluids may decompose to produce hydrogen chloride (HCl), a respiratory irritant.
Preplacement and annual medical examinations of workers, with emphasis on liver function, skin condition, reproductive history, are recommended.

Section 5 - Fire-Fighting Measures

See DOT ERG

Flash Point: 176 to 180 °C Cleveland Open Cup
Extinguishing Media: Foam. Alcohol stable foam.
Dry chemical powder.
General Fire Hazards/Hazardous Combustion Products: POLLUTANT - contain spillage. Noncombustible liquid.
Decomposes on heating and produces acrid black soot and toxic fumes of aldehydes, hydrogen chloride (HCl), chlorides and extremely toxic polychlorinated dibenzofuran (PCDF), polychlorinated dibenzodioxin (PCDD).
Fire Incompatibility: Reacts vigorously with chlorine (Cl2).
Fire-Fighting Instructions: POLLUTANT -contain spillage. Noncombustible.
Clear area of personnel and move upwind.
Contact fire department and tell them location and nature of hazard.
Wear full body protective clothing with breathing apparatus. Prevent, by any means available, spillage from entering drains or waterways.
Use fire fighting procedures suitable for surrounding area.
Cool fire-exposed containers with water spray from a protected location.
Avoid spraying water onto liquid pools.
If safe to do so, remove containers from path of fire.
Equipment should be thoroughly decontaminated after use.



Fire Diamond

Section 6 - Accidental Release Measures

See DOT ERG

Small Spills: Clean up all spills immediately. POLLUTANT -contain spillage.
Environmental hazard - contain spillage.
Avoid breathing vapors and contact with skin and eyes.
Wear protective clothing, impervious gloves and safety glasses.
Contain spill with sand, earth or vermiculite.
Wipe up and absorb small quantities with vermiculite or other absorbent material.
Place spilled material in clean, dry, sealable, labeled container.
Large Spills: POLLUTANT -contain spillage. Clear area of personnel.
Contact fire department and tell them location and nature of hazard.

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Wear full body protective clothing with breathing apparatus. Prevent, by any means available, spillage from entering drains or waterways.
Stop leak if safe to do so.
Contain spill with sand, earth or vermiculite.
Collect recoverable product into labeled containers for recycling.
Absorb remaining product with sand, earth or vermiculite.
Collect residues and seal in labeled drums for disposal.
After clean-up operations, decontaminate and launder all protective clothing and equipment before storing and reusing.
If equipment is grossly contaminated, decontaminate and destroy.
If contamination of drains or waterways occurs, advise emergency services.

Regulatory Requirements: Follow applicable OSHA regulations (29 CFR 1910.120).

Section 7 - Handling and Storage

Handling Precautions: Use good occupational work practices. Observe manufacturer's storing and handling recommendations.
Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained.
Avoid all personal contact, including inhalation.
Wear protective clothing and gloves when handling containers.
Avoid physical damage to containers.
Handle gently.
Use in a well-ventilated area.
Local exhaust ventilation may be required for safe working, i.e. to keep exposures below required standards; otherwise, PPE is required.
Use only in completely enclosed system.
Avoid contact with incompatible materials.
When handling, DO NOT eat, drink or smoke.
Wash hands with soap and water after handling.
Work clothes should be laundered separately: NOT at home.

Recommended Storage Methods: Packaging as recommended by manufacturer.
Check that containers are clearly labeled.
Metal can.
Metal drum.
Steel drum with plastic liner.

Regulatory Requirements: Follow applicable OSHA regulations.

Section 8 - Exposure Controls / Personal Protection

Engineering Controls: Provide adequate ventilation in warehouse or closed storage areas.
If inhalation risk of overexposure exists, wear NIOSH-approved organic-vapor respirator.
In confined spaces where there is inadequate ventilation, wear full-face air supplied breathing apparatus.

Personal Protective Clothing/Equipment:

Eyes: Safety glasses with side shields; chemical goggles.
Full face shield.
Contact lenses pose a special hazard; soft lenses may absorb irritants and all lenses concentrate them.

Hands/Feet: Impervious gloves; Viton gloves.
Polyethylene gloves.
PVC gloves.
Protective footwear.

Respiratory Protection:
Exposure Range >1 to <5 mg/m^3: Supplied Air, Constant Flow/Pressure Demand, Full Face
Exposure Range 5 to unlimited mg/m^3: Self-contained Breathing Apparatus, Pressure Demand, Full Face
Note: odor threshold unknown

Other: Impervious protective clothing. Overalls.
Impervious apron.
Eyewash unit.
Ensure there is ready access to a safety shower.

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Section 9 - Physical and Chemical Properties

Appearance/General Info: Clear, almost colorless, mobile oily liquid. Slightly soluble in glycerol and glycols. Soluble in organic solvents and lipids. Viscosity ranges from 82 - 92 Saybolt unit sec. at 38 °C. PCB's are resistant to chemical and biological degradation and because of their solubility in fats and oils they tend to be concentrated in living organisms. The highly chlorinated PCB's are retained in animals' bodies longer and seem to delay the excretion of lower chlorinated PCB's. They have become widely dispersed in the world-wide environment and in the food-chain since their introduction in 1929. They are now recognized internationally to be a major environmental pollutant, their persistence causing serious ecological damage via water pollution. Consequently loss of PCBs to the environment is to be absolutely avoided.

Physical State: Liquid
Vapor Pressure (kPa): Negligible
Formula Weight: 270 (average)
Specific Gravity (H_2O=1, at 4 °C): 1.30 - 1.39 at 25 °C
pH: Not applicable
pH (1% Solution): Not applicable.
Boiling Point: 325 °C (617 °F) to 366 °C (691 °F)
Freezing/Melting Point: -18.89 °C (-2.002 °F)
Volatile Component (% Vol): Negligible
Decomposition Temperature (°C): 370-550
Water Solubility: 703 ppb

Section 10 - Stability and Reactivity

Stability/Polymerization/Conditions to Avoid: Product is considered stable. Hazardous polymerization will not occur. Very inert, chemically.
Storage Incompatibilities: Avoid storage with oxidizers. Segregate from chlorine.

Section 11 - Toxicological Information

No relevant toxicological data found at time of research.

See *RTECS* TQ1356000, for additional data.

Section 12 - Ecological Information

Environmental Fate: Current evidence suggests that the major source of release to the environment may be an environmental cycling process of material previously introduced into the environment; this cycling process involves volatilization from ground surfaces (water, soil) into the atmosphere with subsequent removal from the atmosphere via wet/dry deposition and then revolatilization. It is a mixture of different congeners of chlorobiphenyl and the relative importance of the environmental fate mechanisms generally depends on the degree of chlorination. In general, the persistence of the PCB congeners increases with an increase in the degree of chlorination. Screening studies have shown that it is biodegraded slowly. Although biodegradation may occur slowly in the environment, no other degradation mechanisms have been shown to be important in natural water and soil systems; therefore, biodegradation may be the ultimate degradation process in water and soil. The PCB composition of the biodegraded Aroclor is different from the original Aroclor. If released to soil, the PCB congeners will become tightly adsorbed to the soil particles. Although the volatilization rate may be low from soil surfaces, the total loss by volatilization over time may be significant because of persistence and stability. Enrichment of the low Cl PCBs occurs in the vapor phase relative to the original The residue will be enriched in the PCBs containing high Cl content. If released to water, adsorption to sediment and suspended matter will be an important fate process. Although adsorption can immobilize it for relatively long periods of time, eventual resolution into the water column has been shown to occur. The PCB composition in water will be enriched in the lower chlorinated PCBs because of their greater water solubility, and the least water soluble PCBs (highest Cl content) will remain adsorbed. In the absence of adsorption, it volatilizes relatively rapidly from water. However, strong PCB adsorption to sediment significantly competes with volatilization which may have a half-life of 2-7 years in typical bodies of water. Although the resulting volatilization rate may be low, the total loss by volatilization over time may be significant because of persistence and stability. It has been shown to bioconcentrate significantly in aquatic organisms. If released to the atmosphere, the PCB congeners will exist primarily in the vapor-phase with enrichment of the most volatile PCBs although a relatively small percentage will partition to the particulate phase. The dominant atmospheric transformation process for these congeners is probably the vapor-phase reaction with hydroxyl radicals which has estimated half-lives ranging from 27.8 days to 4.75 months. Physical removal from the atmosphere, which is important environmentally due to chemical stability, is accomplished by wet and dry deposition.

Ecotoxicity: LC_{50} Lepomis macrochirus (Bluegill) 54 ug/l/15 day /Conditions of bioassay not specified; LC_{50} Phasianus colchicus (Ring-necked pheasant) oral 2,078 mg/kg diet (5 days on treated diet plus 3 days untreated); LC_{50} Gammarus pseudolimnaeus (Scud) 10 ug/l/96 hr /Conditions of bioassay not specified; LC_{50} Ischnura verticalis (Damselfly) 400 ug/l/96 hr /Conditions of bioassay not specified; LD_{50} Mustela vison (Mink) ip 1.0 mg/kg; LD_{50} Colinus virginianus (Northern bobwhite) oral 2,098 mg/kg diet; LC_{50} Oronectes nais (Crayfish) 30 ug/l/7 day /Conditions of bioassay not specified

Henry's Law Constant: 5×10^{-5}
BCF: fathead minnow 2.74×10^{5}

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Octanol/Water Partition Coefficient: log K_{ow} = 4.11
Soil Sorption Partition Coefficient: K_{oc} = 2240 to 1.5 x10^5

Section 13 - Disposal Considerations

Disposal: Recycle wherever possible. Consult manufacturer for recycling options.
Follow applicable federal, state, and local regulations.
Due to their environmental persistence and potential health hazards, PCBs cannot be disposed of in landfills or dumped at sea. The only environmentally acceptable method for the disposal of PCBs is by high temperature incineration.
All wastes and residues containing PCB's (e. g. , wiping cloths, absorbent material, used disposable protective gloves, contaminated clothing, etc.) should be collected, placed in proper containers, labelled and disposed of in accordance with applicable regulations.

Section 14 - Transport Information

DOT Hazardous Materials Table Data (49 CFR 172.101):

Note: This material has multiple possible HMT entries. Choose the appropriate one based on state and condition of specific material when shipped.

Shipping Name and Description: Polychlorinated biphenyls, liquid
ID: UN2315
Hazard Class: 9 - Miscellaneous hazardous material
Packing Group: II - Medium Danger
Symbols:
Label Codes: 9 - Class 9
Special Provisions: 9, 81, 140, IB3, T4, TP1
Packaging: **Exceptions:** 155 **Non-bulk:** 202 **Bulk:** 241
Quantity Limitations: **Passenger aircraft/rail:** 100 L **Cargo aircraft only:** 220 L
Vessel Stowage: **Location:** A **Other:** 95

Shipping Name and Description: Polychlorinated biphenyls, solid
ID: UN2315
Hazard Class: 9 - Miscellaneous hazardous material
Packing Group: II - Medium Danger
Symbols:
Label Codes: 9 - Class 9
Special Provisions: 9, 81, 140, IB7
Packaging: **Exceptions:** 155 **Non-bulk:** 212 **Bulk:** 240
Quantity Limitations: **Passenger aircraft/rail:** 100 kg **Cargo aircraft only:** 200 kg
Vessel Stowage: **Location:** A **Other:**

Section 15 - Regulatory Information

EPA Regulations:
RCRA 40 CFR: Not listed
CERCLA 40 CFR 302.4: Listed per CWA Section 311(b)(4), per CWA Section 307(a) 1 lb (0.454 kg)
SARA 40 CFR 372.65: Listed as Compound
SARA EHS 40 CFR 355: Not listed
TSCA: Not listed

Section 16 - Other Information

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Superior performance through quality engineering, manufacturing and service

MATERIAL SAFETY DATA SHEET

LONG DURATION FOAM AC-645

SECTION I: GENERAL INFORMATION

- Manufacturer's Name: RUSMAR INCORPORATED
- Manufacturer's Address: 216 Garfield Avenue • West Chester, PA 19380
- Manufacturer's Phone No.: 610-436-4314
- Chemical Family: Aqueous anionic surfactant mixture
- Trade Name: RUSMAR AC-645

SECTION II: HAZARDOUS INGREDIENTS

- Paints, Preservatives, and Solvents - None
- Alloys and Metallic Coatings - None
- Hazardous Mixtures and Other Materials - None

SECTION III: PHYSICAL DATA

- Boiling Point: 100° C
- Vapor Pressure: 25mm Hg at 25° C
- Vapor Density (Air = 1): N/A
- Water Solubility: Complete
- Specific Gravity: 1.01 to 1.06
- % Volatile, By Volume: None
- Evaporation Rate: N/A
- Appearance/Odor: Translucent, white, milk-like, odorless, viscous liquid

SECTION IV: FIRE AND EXPLOSION HAZARD DATA

- Flash Point (Method): Nonflammable
- Flammable Limits: N/A
- Extinguishing Media: N/A
- Special Fire Fighting Procedures: None
- Unusual Fire and/or Explosion Hazards: None

SECTION V: HEALTH HAZARD DATA

- Threshold Limit Value: Not Determined
- Effects of Overexposure: This material is not expected to present an inhalation or ingestion hazard. It may cause an eye or skin irritation upon direct contact.
- Emergency and First Aid Procedures: Wash thoroughly with clean water

RUSMAR INCORPORATED • 216 Garfield Avenue • West Chester, PA 19380
Toll Free: 1.800.SEE.FOAM • P: 610.436.4314 • F: 610.436.8436 • www.rusmarinc.com

MATERIAL SAFETY DATA SHEET

LONG DURATION FOAM AC-645

SECTION VI: REACTIVITY DATA

- Material is stable
- No material incompatibility
- Hazardous Decomposition Products: Low levels of sulfur oxides on exposure to high temperatures (concentrate). Foam is non-combustible.
- Polymerization will not occur

SECTION VII: SPILL OR LEAK PROCEDURES

- Steps to be taken in case material is released or spilled: If spilled indoors on a hard surface, the spill area may be slippery and should be thoroughly washed with water. Contain spill and absorb material with dirt or other appropriate absorbent.
- Waste Disposal Method: This material is completely biodegradable and can be disposed of in a sanitary landfill according to local regulations.

SECTION VIII: SPECIAL PROTECTION INFORMATION

- Respiratory Protection: None required for normal operations
- Ventilation: No special requirements
- Protective Gloves: Not required, but recommended
- Eye Protection: Not required, but recommended
- Other Protective Equipment: None

SECTION IX: SPECIAL PRECAUTIONS

- Storing/Handling Precautions: Avoid excessive heat. Material will freeze, but thawing will not cause changes in the product.
- Other Precautions: None

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MATERIAL SAFETY DATA SHEET

LONG DURATION FOAM AC-900 SERIES

SECTION I: GENERAL INFORMATION

- Manufacturer's Name: RUSMAR INCORPORATED
- Manufacturer's Address: 216 Garfield Avenue • West Chester, PA 19380
- Manufacturer's Phone No.: 610-436-4314
- Chemical Family: Aqueous anionic surfactant, polymer latex mixture
- Trade Name: RUSMAR AC-900

SECTION II: HAZARDOUS INGREDIENTS

- Paints, Preservatives, and Solvents - None
- Alloys and Metallic Coatings - None
- Hazardous Mixtures and Other Materials - None

SECTION III: PHYSICAL DATA

- Boiling Point: 100° C
- Vapor Pressure: 25mm Hg at 25° C
- Vapor Density (Air = 1): N/A
- Water Solubility: Complete
- Appearance/Odor: Opaque, gray, viscous liquid
- Specific Gravity: 1.01 to 1.06
- % Volatile, By Volume: None
- Evaporation Rate: N/A

SECTION IV: FIRE AND EXPLOSION HAZARD DATA

- Flash Point (Method): Nonflammable
- Flammable Limits: N/A
- Extinguishing Media: N/A
- Special Fire Fighting Procedures: None
- Unusual Fire and/or Explosion Hazards: None

SECTION V: HEALTH HAZARD DATA

- Threshold Limit Value: Not Determined
- Effects of Overexposure: This material is not expected to present an inhalation or ingestion hazard. It may cause an eye or skin irritation upon direct contact.
- Emergency and First Aid Procedures: Wash thoroughly with clean water

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MATERIAL SAFETY DATA SHEET

LONG DURATION FOAM AC-900 SERIES

SECTION VI: REACTIVITY DATA

- Stability: Material is stable. This material will likely coagulate if frozen.
- Incompatibility: Addition of other materials may cause coagulation
- Hazardous Decomposition Products: Low levels of sulfur oxides on combustion and dense, black smoke
- Polymerization will not occur

SECTION VII: SPILL OR LEAK PROCEDURES

- Steps to be taken in case material is released or spilled: If spilled indoors on a hard surface, the spill area may be slippery and should be thoroughly washed with water. Contain spill and absorb material with dirt of other appropriate absorbent.
- Waste Disposal Method: This material has only a modest BOD and can be deposited in sewers. However, it should be flushed with copious amounts of water. The material can be disposed of in approved landfill; dried waste may be incinerated.

SECTION VIII: SPECIAL PROTECTION INFORMATION

- Respiratory Protection: None required for normal operations
- Ventilation: No special requirements
- Protective Gloves: Not required, but recommended
- Eye Protection: Not required, but recommended
- Other Protective Equipment: None

SECTION IX: SPECIAL PRECAUTIONS

- Storing/Handling Precautions: Avoid excessive heat. Material will freeze, thawing will NOT return product to usable form.
- Other Precautions: None

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Praxair Material Safety Data Sheet

1. Chemical Product and Company Identification

Product Name: Acetylene, dissolved (MSDS No. P-4559-I)	**Trade Name:** Acetylene
Chemical Name: Acetylene	**Synonyms:** Acetylen, ethine, ethyne, narcylene
Formula: C_2H_2	**Chemical Family:** Alkyne
Telephone: **Emergencies:** 1-800-645-4633* **CHEMTREC:** 1-800-424-9300* **Routine:** 1-800-PRAXAIR	**Company Name:** Praxair, Inc. 39 Old Ridgebury Road Danbury, CT 06810-5113

** Call emergency numbers 24 hours a day only for spills, leaks, fire, exposure, or accidents involving this product. For routine information, contact your supplier, Praxair sales representative, or call 1-800-PRAXAIR (1-800-772-9247).*

2. Composition/Information on Ingredients

This section covers materials of manufacture only. See sections 3, 8, 10, 11, 15, and 16 for information on by-products generated during use, especially use in welding and cutting. See section 16 for important information about mixtures.

INGREDIENT	CAS NUMBER	CONCEN-TRATION	OSHA PEL	ACGIH TLV-TWA (2004)**
Acetylene	74-86-2	>99%*	None currently established	Simple asphyxiant

** The symbol > means "greater than."*

*** Acetylene cylinders are filled with a porous material containing acetone (CAS 67-64-1) into which the acetylene is dissolved. ACGIH (2004) has established a TLV-TWA of 500 ppm for acetone and a STEL of 750 ppm. OSHA PEL, 1000 ppm, 2400 mg/m^3.*

3. Hazards Identification

EMERGENCY OVERVIEW

DANGER! Flammable gas under pressure.
Can form explosive mixtures with air.
Fusible plugs in top, bottom, or valve melt at 208-224°F (98-107°C).
Do not discharge at pressures above 15 psig (103 kPa).
May cause dizziness and drowsiness.
Self-contained breathing apparatus may be required by rescue workers.
Odor: Garlic-like

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THRESHOLD LIMIT VALUE: TLV-TWA, simple asphyxiant (ACGIH, 2004). See section 2 for solvent TLVs; section 16 for more information on welding hazards. TLV-TWAs should be used as a guide in the control of health hazards and not as fine lines between safe and dangerous concentrations.

EFFECTS OF A SINGLE (ACUTE) OVEREXPOSURE:

INHALATION–Asphyxiant. Effects are due to lack of oxygen. Moderate concentrations may cause headache, drowsiness, dizziness, excitation, excess salivation, nausea, vomiting, and unconsciousness. The vapor from a liquid release may also cause incoordination and abdominal pain. Effects may be delayed. Lack of oxygen can kill.

SKIN CONTACT–No harm expected from vapor. Liquid (acetone) may cause frostbite.

SWALLOWING–An unlikely route of exposure, but frostbite of the lips and mouth may result from contact with the liquid. If swallowed, the liquid may cause nausea.

EYE CONTACT–Vapor containing acetone may irritate the eyes. Liquid may irritate and cause frostbite.

EFFECTS OF REPEATED (CHRONIC) OVEREXPOSURE: No harm expected.

OTHER EFFECTS OF OVEREXPOSURE: Asphyxiant. Lack of oxygen can kill.

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE: The toxicology and the physical and chemical properties of this product suggest that overexposure is unlikely to aggravate existing medical conditions.

SIGNIFICANT LABORATORY DATA WITH POSSIBLE RELEVANCE TO HUMAN HEALTH HAZARD EVALUATION: None known.

CARCINOGENICITY: This product is not listed by NTP, OSHA, or IARC.

4. First Aid Measures

INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, qualified personnel may give oxygen. Call a physician.

SKIN CONTACT: For exposure to liquid, immediately warm frostbite area with warm water not to exceed 105°F (41°C). In case of massive exposure, remove contaminated clothing while showering with warm water. Call a physician.

SWALLOWING: If liquid is swallowed, do not induce vomiting. Call a physician.

EYE CONTACT: In case of splash contamination, immediately flush eyes thoroughly with warm water for at least 15 minutes. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. Urgently seek the advice of a physician, preferably an ophthalmologist.

NOTES TO PHYSICIAN: *Aspirated acetone may cause severe lung damage. If a large quantity of material has been swallowed, stomach contents should be evacuated quickly in a manner that avoids aspiration. Otherwise, there is no specific antidote. Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient.*

5. Fire Fighting Measures

FLASH POINT (test method)	0°F (-17.8°C)	**AUTOIGNITION TEMPERATURE**	581°F (305°C) at 1 atm	
FLAMMABLE LIMITS IN AIR, % by volume	**LOWER**	2.5%	**UPPER**	100%

EXTINGUISHING MEDIA: See the following paragraphs. See CGA Pamphlet SB-4, *Handling Acetylene Cylinders in Fire Situations,* listed in section 16, for further information.

SPECIAL FIRE FIGHTING PROCEDURES: DANGER! Flammable gas under pressure. Evacuate all personnel from danger area. Immediately cool cylinders with water spray from maximum distance taking care not to extinguish flames. If flames are accidentally extinguished, explosive re-ignition may occur. Use self-contained breathing apparatus. Remove ignition sources if without risk. Stop flow of gas if without risk while continuing cooling water spray. Remove all cylinders from area of fire if without risk. Allow fire to burn out. On-site fire brigades must comply with OSHA 29 CFR 1910.156.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Extremely flammable gas. Forms explosive mixtures with air and oxidizing agents. Heat of fire can build pressure in cylinder and cause it to rupture. Acetylene cylinders are provided with pressure relief devices designed to vent contents when exposed to elevated temperature. No part of a cylinder should be subjected to a temperature higher than 125°F (52°C).

If venting or leaking acetylene catches fire, do not extinguish flames. Flammable vapors may spread from leak, creating an explosive reignition hazard. Vapors can be ignited by pilot lights, other flames, smoking, sparks, heaters, electrical equipment, static discharge, or other ignition sources at locations distant from product handling point. Explosive atmospheres may linger. Before entering area, especially confined areas, check atmosphere with an approved explosion meter.

HAZARDOUS COMBUSTION PRODUCTS: Carbon monoxide, carbon dioxide

6. Accidental Release Measures

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: DANGER! Flammable gas under pressure. Forms explosive mixtures with air. Immediately evacuate all personnel from danger area. Use self-contained breathing apparatus where needed. Remove all sources of ignition if without risk. Reduce vapors with fog or fine water spray. Shut off flow if without risk. Ventilate area or move leaking cylinder to well-ventilated area. Flammable gas may spread from leak. Before entering area, especially confined areas, check atmosphere with an appropriate device.

WASTE DISPOSAL METHOD: Prevent waste from contaminating the surrounding environment. Keep personnel away. Discard any product, residue, disposable container, or liner in an environmentally acceptable manner, in full compliance with federal, state, and local regulations. If necessary, call your local supplier for assistance.

7. Handling and Storage

PRECAUTIONS TO BE TAKEN IN STORAGE: Store and use with adequate ventilation. Separate acetylene cylinders from oxygen and other oxidizers by at least 20 ft (6.1 m), or use a barricade of noncombustible material. This barricade should be at least 5 ft (1.53 m) high and have a fire resistance rating of at least ½ hour. Storage in excess of 2,500 cu ft (70.79 m^3) is prohibited in buildings with other

occupancies. Firmly secure cylinders upright to keep them from falling or being knocked over. Acetylene cylinders designed to accept a valve protection cap must be provided with a cap. Screw cap firmly in place by hand. Post "No Smoking or Open Flames" signs in storage and use areas. There must be no sources of ignition. All electrical equipment in storage areas must be explosion-proof. Storage areas must meet national electric codes for Class 1 hazardous areas. Store only where temperature will not exceed 125°F (52°C). Store full and empty cylinders separately. Use a first-in, first-out inventory system to prevent storing full cylinders for long periods.

PRECAUTIONS TO BE TAKEN IN HANDLING: Protect cylinders from damage. Use a suitable hand truck to move cylinders; do not drag, roll, slide, or drop. All piped acetylene systems and associated equipment must be grounded. Electrical equipment must be non-sparking or explosion-proof. Leak check with soapy water; never use a flame. Never use copper piping for acetylene service; use only steel or wrought iron. Open acetylene cylinder valves the minimum amount required for acceptable flow; this will allow you to close valves as quickly as possible in an emergency. Do not open acetylene cylinder valves more than 1½ turns. Never use acetylene at pressures exceeding 15 psig (103.5 kPa). Acetylene cylinders are heavier than other cylinders because they are packed with a porous material and acetone. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. Never insert an object (e.g., wrench, screwdriver, pry bar) into cap openings; doing so may damage the valve and cause a leak. Use an adjustable strap wrench to remove over-tight or rusted caps. Open valve slowly. If valve is hard to open, discontinue use and contact your supplier. For other precautions in using acetylene, see section 16.

For additional information on storage and handling, refer to Compressed Gas Association (CGA) pamphlet P-1, *Safe Handling of Compressed Gases in Containers*, available from the CGA. Refer to section 16 for the address and phone number along with a list of other available publications.

8. Exposure Controls/Personal Protection

VENTILATION/ENGINEERING CONTROLS:

LOCAL EXHAUST–Use a local exhaust system, if necessary, to prevent oxygen deficiency and to keep hazardous fumes and gases below applicable TLVs in the worker's breathing zone.

MECHANICAL (general)–General exhaust ventilation may be acceptable if it can maintain an adequate supply of air and keep hazardous fumes and gases below the applicable TLVs in the worker's breathing zone.

SPECIAL–None

OTHER–None

RESPIRATORY PROTECTION: Use air-purifying or air-supplied respirators, as appropriate, where local or general exhaust ventilation is inadequate. Adequate ventilation must keep worker exposure below applicable TLVs for fumes, gases, and other by-products of welding with acetylene. See sections 3, 10, and 16 for details. An air-supplied respirator must be used in confined spaces. Respiratory protection must conform to OSHA rules as specified in 29 CFR 1910.134. Select per OSHA 29 CFR 1910.134 and ANSI Z88.2.

SKIN PROTECTION: Wear work gloves when handling cylinders; welding gloves for welding and cutting.

EYE PROTECTION: Wear goggles with filter lenses selected as per ANSI Z49.1. Provide protective screens and goggles, if necessary, to protect others. Select as per OSHA 29 CFR 1910.33. For welding, see section 16.

OTHER PROTECTIVE EQUIPMENT: Metatarsal shoes for cylinder handling. Select in accordance with OSHA 29 CFR 1910.132 and 1910.133. For welding, see section 16. Regardless of protective equipment, never touch live electrical parts.

9. Physical and Chemical Properties

MOLECULAR WEIGHT:	26.04
SPECIFIC GRAVITY (Air = 1) at 32°F (0°C) and 1 atm:	0.906
GAS DENSITY at 32°F (0°C) and 1 atm:	0.07314 lb/ft³ (1.1716 kg/m³)
VAPOR PRESSURE at 68°F (20°C):	649.6 psia (4479 kPa abs)*
SOLUBILITY IN WATER, vol/vol at 32°F (0°C) and 1 atm:	1.7
PERCENT VOLATILES BY VOLUME:	100
BOILING POINT at 1 atm:	-119.2°F (-84°C)
MELTING POINT:	-113.35°F (-80.75°C)

APPEARANCE, ODOR, AND STATE: Colorless gas. Acetylene of 100% purity is odorless, but commercial acetylene has a distinctive garlic-like odor.

*Maximum cylinder pressure: 250 psig (kPa) at 70°F (21.1°C)

10. Stability and Reactivity

STABILITY: ☒ **Unstable*** ☐ **Stable**

*Acetylene is stable as shipped. Avoid use at pressures above 15 psig (103 kPa).

INCOMPATIBILITY (materials to avoid): Copper, silver, mercury, or their alloys; oxidizing agents; acids; halogens; moisture.

HAZARDOUS DECOMPOSITION PRODUCTS: Thermal decomposition or burning may produce CO/CO_2H_2. The welding and cutting process may form reaction products such as carbon monoxide and carbon dioxide. Other decomposition products of normal operation originate from the volatilization, reaction, or oxidation of the material being worked.

HAZARDOUS POLYMERIZATION: ☐ **May Occur** ☒ **Will Not Occur**

CONDITIONS TO AVOID: Elevated temperature and pressure and/or the presence of a catalyst.

11. Toxicological Information

The welding process may generate hazardous fumes and gases. (See sections 3, 10, 15, and 16.)

12. Ecological Information

No adverse ecological effects expected. Acetylene does not contain any Class I or Class II ozone-depleting chemicals. Acetylene is not listed as a marine pollutant by DOT.

13. Disposal Considerations

WASTE DISPOSAL METHOD: Do not attempt to dispose of residual or unused quantities. Return cylinder to supplier.

14. Transport Information

DOT/IMO SHIPPING NAME: Acetylene, dissolved

HAZARD CLASS: 2.1	**IDENTIFICATION NUMBER:** UN 1001	**PRODUCT RQ:** None

SHIPPING LABEL(s): FLAMMABLE GAS

PLACARD (when required): FLAMMABLE GAS

SPECIAL SHIPPING INFORMATION: Cylinders should be transported in a secure position, in a well-ventilated vehicle. Cylinders transported in an enclosed, nonventilated compartment of a vehicle can present serious safety hazards.

Shipment of compressed gas cylinders that have been filled without the owner's consent is a violation of federal law [49 CFR 173.301(b)].

15. Regulatory Information

The following selected regulatory requirements may apply to this product. Not all such requirements are identified. Users of this product are solely responsible for compliance with all applicable federal, state, and local regulations.

U.S. FEDERAL REGULATIONS:

EPA (ENVIRONMENTAL PROTECTION AGENCY)

CERCLA: COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT OF 1980 (40 CFR Parts 117 and 302):

Reportable Quantity (RQ): None

SARA: SUPERFUND AMENDMENT AND REAUTHORIZATION ACT:

SECTIONS 302/304: Require emergency planning based on Threshold Planning Quantity (TPQ) and release reporting based on Reportable Quantities (RQ) of Extremely Hazardous Substances (EHS) (40 CFR Part 355):

TPQ: None
EHS RQ (40 CFR 355): None

SECTIONS 311/312: Require submission of MSDSs and reporting of chemical inventories with identification of EPA hazard categories. The hazard categories for this product are as follows:

IMMEDIATE: No	**PRESSURE:** Yes
DELAYED: No	**REACTIVITY:** Yes
	FIRE: Yes

SECTION 313: Requires submission of annual reports of release of toxic chemicals that appear in 40 CFR Part 372.

Acetylene does not require reporting under Section 313.

40 CFR 68: RISK MANAGEMENT PROGRAM FOR CHEMICAL ACCIDENTAL RELEASE PREVENTION: Requires development and implementation of risk management programs at facilities that manufacture, use, store, or otherwise handle regulated substances in quantities that exceed specified thresholds.

Acetylene is listed as a regulated substance in quantities of 10,000 lb (4536 kg) or greater.

TSCA: TOXIC SUBSTANCES CONTROL ACT: Acetylene is listed on the TSCA inventory.

OSHA: OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION:

29 CFR 1910.119: PROCESS SAFETY MANAGEMENT OF HIGHLY HAZARDOUS CHEMICALS: Requires facilities to develop a process safety management program based on Threshold Quantities (TQ) of highly hazardous chemicals.

Acetylene is not listed in Appendix A as a highly hazardous chemical. However, any process that involves a flammable gas on site in one location in quantities of 10,000 lb (4536 kg) or greater is covered under this regulation unless the gas is used as a fuel.

STATE REGULATIONS:

CALIFORNIA: Acetylene is not listed by California under the SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT OF 1986 (Proposition 65).

WARNING: The combustion of acetylene produces carbon monoxide—a chemical known to the State of California to cause birth defects or other reproductive harm.

(California Health and Safety Code §25249.5 et seq.)

PENNSYLVANIA: Acetylene is subject to the PENNSYLVANIA WORKER AND COMMUNITY RIGHT-TO-KNOW ACT (35 P.S. Sections 7301-7320).

16. Other Information

Be sure to read and understand all labels and instructions supplied with all containers of this product.

ADDITIONAL SAFETY AND HEALTH HAZARDS: Using acetylene in welding and cutting may create additional hazards.

Read and understand the manufacturer's instructions and the precautionary labels on the products used in welding and cutting. Ask your welding products supplier for a copy of Praxair's free safety booklet, P-2035, *Precautions and Safe Practices for Gas Welding, Cutting, and Heating*, and for other manufacturers' safety publications. For a detailed treatment, get ANSI Z49.1, *Safety in Welding, Cutting, and Allied Processes*, published by the American Welding Society (AWS), or see OSHA's Web site at http://www.osha-slc.gov/SLTC/weldingcuttingbrazing/. Order AWS documents from Global Engineering Documents, 15 Inverness Way East, Englewood, CO 80112-5710, http://global.ihs.com/

FUMES AND GASES can be dangerous to your health and may cause serious lung disease.

- **Keep your head out of fumes. Do not breathe fumes and gases. Use enough ventilation, local exhaust, or both to keep fumes and gases from your breathing zone and the general area. Short-term overexposure to fumes may cause dizziness; nausea; and dryness or irritation of the nose, throat, and eyes; or may cause other similar discomfort.**

Fumes and gases cannot be classified simply. The amount and type depend on the metal being worked and the process, procedure, equipment, and supplies used. Possible dangerous materials may be found in fluxes and other materials. Get an MSDS for every material you use.

- **Contaminants in the air may add to the hazard of fumes and gases.**

Metal coatings such as paint, plating, or galvanizing may generate harmful fumes when heated. Residues from cleaning materials may also be harmful.

- **Avoid arc operations on parts with phosphate residues (anti-rust, cleaning preparations)—highly toxic phosphine may be produced.**

To find the quantity and content of fumes and gases, take air samples. By analyzing these samples, you can find out what respiratory protection you need. One recommended sampling method is to take air from inside the worker's helmet or from the worker's breathing zone. See AWS F1.1, *Methods for Sampling Airborne Particulates Generated by Welding and Allied Processes*, available from the AWS.

NOTES TO PHYSICIAN:

Acute: *Gases, fumes, and dusts may cause irritation to the eyes, lungs, nose, and throat. Some toxic gases associated with welding and related processes may cause pulmonary edema, asphyxiation, and death. Acute overexposure may include signs and symptoms such as watery eyes, nose and throat irritation, headache, dizziness, difficulty breathing, frequent coughing, or chest pains.*

Chronic: *Protracted inhalation of air contaminants may lead to their accumulation in the lungs, a condition that may be seen as dense areas on chest x-rays. The severity of change is proportional to the length of exposure. The changes seen are not necessarily associated with symptoms or signs of reduced lung function or disease. In addition, the changes on x-rays may be caused by non-work-related factors such as smoking, etc.*

PROTECTIVE CLOTHING AND EQUIPMENT FOR WELDING OPERATIONS:

PROTECTIVE GLOVES: Wear welding gloves.

EYE PROTECTION: Wear a helmet or use a face shield with a filter lens. Select lens per ANSI Z49.1. Provide protective screens and flash goggles if needed to protect others; select per OSHA 29 CFR 1910.133.

OTHER PROTECTIVE EQUIPMENT: Wear hand, head, and body protection. (See ANSI Z49.1.) Worn as needed, these help prevent injury from radiation, sparks, and electrical shock. Minimum protection includes welder's gloves and a face shield. For added protection consider arm protectors, aprons, hats, shoulder protection, and dark, substantial clothing.

OTHER HAZARDOUS CONDITIONS OF HANDLING, STORAGE, AND USE: ***Flammable gas under pressure.*** Use piping and equipment adequately designed to withstand pressures to be encountered. Acetylene systems should be installed only by persons knowledgeable of the unique properties of acetylene and trained and experienced in such installation. ***Arcs and sparks can ignite combustible materials.*** Prevent fires. For more information, get NFPA 51B, *Standard for Fire Prevention During Welding, Cutting, and Other Hotwork,* published by the National Fire Protection Association. ***Keep away from heat, sparks, and open flame.*** Use only spark-proof tools and explosion-proof equipment. ***In choosing tools and equipment, avoid materials incompatible with acetylene.*** Copper, silver, and mercury; their salts, compounds, and high-concentration alloys can form explosive compounds with acetylene. Brass containing less than 65% copper and certain nickel alloys are generally acceptable for use in acetylene service but may not be adequate if high corrosion or excess moisture is present. ***Gas can cause rapid suffocation*** due to oxygen deficiency. Store and use with adequate ventilation. Close valve after each use; keep closed even when empty. ***Do not strike an arc on the cylinder.*** The defect produced by an arc burn could lead to cylinder rupture. ***Never work on a pressurized system.*** If there is a leak, close the cylinder valve. Blow the system down in a safe and environmentally sound manner in compliance with all federal, state, and local laws; then repair the leak. ***Never place a compressed gas cylinder where it may become part of an electrical circuit.*** When using compressed gases in and around electric welding applications, never ground the cylinders. Grounding exposes the cylinders to damage by the electric welding arc.

MIXTURES: When you mix two or more gases or liquefied gases, you can create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an industrial hygienist or other trained person when you evaluate the end product. Remember, gases and liquids have properties that can cause serious injury or death.

HAZARD RATING SYSTEMS:

NFPA RATINGS:		HMIS RATINGS:	
HEALTH	= 0	HEALTH	= 2
FLAMMABILITY	= 4	FLAMMABILITY	= 4
INSTABILITY	= 2	PHYSICAL HAZARD	= 2
SPECIAL	= None		

STANDARD VALVE CONNECTIONS FOR U.S. AND CANADA:

THREADED: The CGA-510 connection is standard for cylinders of greater than 50 cu ft (1.42 m^3) capacity. See CGA Pamphlet V-1 for other, limited-standard connections.

PIN-INDEXED YOKE: Not applicable

ULTRA-HIGH-INTEGRITY CONNECTION: Not applicable

Use the proper CGA connections. **DO NOT USE ADAPTERS.** Additional limited-standard connections may apply. See CGA pamphlet V-1 listed below.

Ask your supplier about free Praxair safety literature as referred to in this MSDS and on the label for this product. Further information about this product can be found in the following pamphlets published by the Compressed Gas Association, Inc. (CGA), 4221 Walney Road, 5th Floor, Chantilly, VA 20151-2923, Telephone (703) 788-2700, http://www.cganet.com/Publication.asp.

G-1.1	*Commodity Specification for Acetylene*
G-1	*Acetylene*
P-1	*Safe Handling of Compressed Gases in Containers*
SB-4	*Handling Acetylene Cylinders in Fire Situations*
SB-8	*Use of Oxy-Fuel Gas Welding and Cutting Apparatus*
V-1	*Compressed Gas Cylinder Valve Inlet and Outlet Connections*
—	*Handbook of Compressed Gases, Fourth Edition*

Praxair asks users of this product to study this MSDS and become aware of product hazards and safety information. To promote safe use of this product, a user should (1) notify employees, agents, and contractors of the information in this MSDS and of any other known product hazards and safety information, (2) furnish this information to each purchaser of the product, and (3) ask each purchaser to notify its employees and customers of the product hazards and safety information.

The opinions expressed herein are those of qualified experts within Praxair, Inc. We believe that the information contained herein is current as of the date of this Material Safety Data Sheet. Since the use of this information and the conditions of use of the product are not within the control of Praxair, Inc., it is the user's obligation to determine the conditions of safe use of the product.

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PRAXAIR®

Praxair, Inc.
39 Old Ridgebury Road
Danbury, CT 06810-5113

Printed in USA

Praxair Material Safety Data Sheet

1. Chemical Product and Company Identification

Product Name: Oxygen, compressed (MSDS No. P-4638-F)	**Trade Name:** Oxygen, MediPure™ Oxygen
Chemical Name: Oxygen	**Synonyms:** Dioxygen
Formula: O_2	**Chemical Family:** Permanent gas
Telephone: **Emergencies:** 1-800-645-4633* **CHEMTREC:** 1-800-424-9300* **Routine:** 1-800-PRAXAIR	**Company Name:** Praxair, Inc. 39 Old Ridgebury Road Danbury, CT 06810-5113

** Call emergency numbers 24 hours a day only for spills, leaks, fire, exposure, or accidents involving this product. For routine information, contact your supplier, Praxair sales representative, or call 1-800-PRAXAIR (1-800-772-9247).*

2. Composition/Information on Ingredients

This section covers materials of manufacture only. See sections 3, 8, 10, 11, 15, and 16 for information on by-products generated during use, especially use in welding and cutting. See section 16 for important information about mixtures.

INGREDIENT	CAS NUMBER	CONCEN-TRATION	OSHA PEL	ACGIH TLV-TWA (2004)
Oxygen	7782-44-7	>99%*	None currently established	None currently established

**The symbol > means "greater than."*

3. Hazards Identification

EMERGENCY OVERVIEW

WARNING! High-pressure, oxidizing gas.
Vigorously accelerates combustion.
Self-contained breathing apparatus may be required by rescue workers.
Odor: None

THRESHOLD LIMIT VALUE: None currently established (ACGIH, 2004). Hazardous fumes may be generated during welding with this product. See section 16 for more information on welding hazards. TLV-TWAs should be used as a guide in the control of health hazards and not as fine lines between safe and dangerous concentrations.

EFFECTS OF A SINGLE (ACUTE) OVEREXPOSURE:

INHALATION–Breathing 80% or more oxygen at atmospheric pressure for more than a few hours may cause nasal stuffiness, cough, sore throat, chest pain, and breathing difficulty. Breathing oxygen at higher pressure increases the likelihood of adverse effects within a shorter time period. Breathing pure oxygen under pressure may cause lung damage and also Central Nervous System (CNS) effects resulting in dizziness, poor coordination, tingling sensation, visual and hearing disturbances, muscular

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twitching, unconsciousness, and convulsions. Breathing oxygen under pressure may cause prolongation of adaptation to darkness and reduced peripheral vision.

SKIN CONTACT–No harm expected.

SWALLOWING–This product is a gas at normal temperature and pressure.

EYE CONTACT–No harm expected.

EFFECTS OF REPEATED (CHRONIC) OVEREXPOSURE: No harm expected.

OTHER EFFECTS OF OVEREXPOSURE: See section 11, Toxicological Information.

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE: See section 11, Toxicological Information.

SIGNIFICANT LABORATORY DATA WITH POSSIBLE RELEVANCE TO HUMAN HEALTH HAZARD EVALUATION: None known.

CARCINOGENICITY: Oxygen is not listed by NTP, OSHA, or IARC.

4. First Aid Measures

INHALATION: Immediately remove to fresh air. If not breathing, give artificial respiration. Keep victim warm and at rest. Call a physician. Advise the physician that the victim has been exposed to a high concentration of oxygen.

SKIN CONTACT: Wash with soap and water; seek medical attention if discomfort persists.

SWALLOWING: This product is a gas at normal temperature and pressure.

EYE CONTACT: Flush eyes thoroughly with water. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. Get medical attention if discomfort persists.

NOTES TO PHYSICIAN: *Supportive treatment should include immediate sedation, anti-convulsive therapy if needed, and rest. See section 11, Toxicological Information.*

5. Fire Fighting Measures

FLASH POINT (test method):	Not applicable	
AUTOIGNITION TEMPERATURE:	Not applicable	
FLAMMABLE LIMITS IN AIR, % by volume:	**LOWER:** Not applicable	**UPPER:** Not applicable

EXTINGUISHING MEDIA: Vigorously accelerates combustion. Use media appropriate for surrounding fire. Water (e.g., safety shower) is the preferred extinguishing method for clothing fires.

SPECIAL FIRE FIGHTING PROCEDURES: WARNING! High-pressure, oxidizing gas. Evacuate all personnel from danger area. Immediately deluge cylinders with water from maximum distance until cool; then move them away from fire area if without risk. Self-contained breathing apparatus may be required by rescue workers. On-site fire brigades must comply with OSHA 29 CFR 1910.156.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Oxidizing agent; vigorously accelerates combustion. Contact with flammable materials may cause fire or explosion. Heat of fire can build pressure in cylinder and cause it to rupture. Oxygen cylinders are equipped with a pressure relief device. (Exceptions may exist where authorized by DOT.) No part of cylinder should be subjected to a temperature higher than 125°F (52°C). Smoking, flames, and electric sparks in the presence of enriched oxygen atmospheres are potential explosion hazards.

HAZARDOUS COMBUSTION PRODUCTS: Not applicable

6. Accidental Release Measures

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: WARNING! High-pressure, oxidizing gas. Shut off flow if without risk. Ventilate area or move cylinder to a well-ventilated area. Remove all flammable materials from vicinity. Oxygen must never be permitted to strike an oily surface, greasy clothes, or other combustible material.

WASTE DISPOSAL METHOD: Prevent waste from contaminating the surrounding environment. Keep personnel away. Discard any product, residue, disposable container, or liner in an environmentally acceptable manner, in full compliance with federal, state, and local regulations. If necessary, call your local supplier for assistance.

7. Handling and Storage

PRECAUTIONS TO BE TAKEN IN STORAGE: Store and use with adequate ventilation, away from oil, grease, and other hydrocarbons. Separate oxygen cylinders from flammables by at least 20 ft (6.1 m) or use a barricade of noncombustible material. This barricade should be at least 5 ft (1.53 m) high and have a fire resistance rating of at least ½ hour. Firmly secure cylinders upright to keep them from falling or being knocked over. Screw valve protection cap firmly in place by hand. Store only where temperature will not exceed 125°F (52°C). Store full and empty cylinders separately. Use a first-in, first-out inventory system to prevent storing full cylinders for long periods.

PRECAUTIONS TO BE TAKEN IN HANDLING: Protect cylinders from damage. Use a suitable hand truck to move cylinders; do not drag, roll, slide, or drop. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. Never insert an object (e.g., wrench, screwdriver, pry bar) into cap openings; doing so may damage the valve and cause a leak. Use an adjustable strap wrench to remove over-tight or rusted caps. Open valve slowly. If valve is hard to open, discontinue use and contact your supplier. Never apply flame or localized heat directly to any part of the cylinder. High temperatures may damage the cylinder and could cause the pressure relief device to fail prematurely, venting the cylinder contents. For other precautions in using this mixture, see section 16.

For further information on storage, handling, and use of this product, see NFPA 55, *Standard for the Storage, Use, and Handling of Compressed and Liquefied Gases in Portable Cylinders*, published by the National Fire Protection Association.

8. Exposure Controls/Personal Protection

VENTILATION/ENGINEERING CONTROLS:

LOCAL EXHAUST–Use a local exhaust system, if necessary, to prevent increased oxygen concentration and, in welding, to keep hazardous fumes and gases below applicable TLVs in the worker's breathing zone.

MECHANICAL (general)–General exhaust ventilation may be acceptable if it can maintain a supply of air that is not too rich in oxygen and, during welding, can keep hazardous fumes and gases below applicable TLVs in the worker's breathing zone.

SPECIAL–None

OTHER–None

RESPIRATORY PROTECTION: None required under normal use. However, air-supplied respirators are required while working in confined spaces with this product. For welding, use air-purifying or air-supplied respirators, as appropriate, where local or general exhaust ventilation is inadequate. Adequate ventilation must keep worker exposure below applicable TLVs for fumes, gases, and other by-products of

welding with oxygen. See sections 3, 10, and 16 for details. The respiratory protection used must conform with OSHA rules as specified in 29 CFR 1910.134.

SKIN PROTECTION: Wear work gloves when handling cylinders; welding gloves for welding. Gloves must be free of oil and grease.

EYE PROTECTION: Wear safety glasses when handling cylinders. For welding, wear goggles with filter lens selected as per ANSI Z49.1. Provide protective screens and goggles, if necessary, to protect others. Select as per OSHA 29 CFR 1910.33

OTHER PROTECTIVE EQUIPMENT: Metatarsal shoes for cylinder handling. Select in accordance with OSHA 29 CFR 1910.132 and 1910.133. As needed for welding, wear hand, head, and body protection to help prevent injury from radiation and sparks. (See ANSI Z49.1.) At a minimum, this includes welder's gloves and protective goggles, and may include arm protectors, aprons, hats, shoulder protection, as well as substantial clothing. Regardless of protective equipment, never touch live electrical parts.

9. Physical and Chemical Properties

MOLECULAR WEIGHT:	31.9988
SPECIFIC GRAVITY (Air = 1) at 70°F (21.1°C) and 1 atm:	1.105
SOLUBILITY IN WATER, vol/vol at 32°F (0°C):	0.0489
PERCENT VOLATILES BY VOLUME:	100
BOILING POINT at 1 atm:	-297.4°F (-183°C)
FREEZING POINT at 1 atm:	-361.1°F (-218.4°C)

APPEARANCE, ODOR, AND STATE: Colorless, odorless, tasteless gas at normal temperature and pressure.

10. Stability and Reactivity

STABILITY: ☐ Unstable ☒ Stable

INCOMPATIBILITY (materials to avoid): Combustible materials, asphalt, flammable materials, especially oils and greases. Oxygen reacts with many materials.

HAZARDOUS DECOMPOSITION PRODUCTS: None known.

HAZARDOUS POLYMERIZATION: ☐ May Occur ☒ Will Not Occur

CONDITIONS TO AVOID: None known.

11. Toxicological Information

The welding process may generate hazardous fumes and gases. (See sections 3, 10, 15, and 16.)

At atmospheric concentration and pressure, oxygen poses no toxicity hazards. At high concentrations, newborn premature infants may suffer delayed retinal damage (retrolental fibroplasia) that can progress to retinal detachment and blindness. Retinal damage may also occur in adults exposed to 100% oxygen for extended periods (24 to 48 hours) or at pressures exceeding atmospheric pressure, particularly in individuals whose retinal circulation has been previously compromised. All individuals exposed for long periods to oxygen at high pressure and all who exhibit overt oxygen toxicity should have ophthalmologic examinations.

At two or more atmospheres, CNS toxicity occurs. Symptoms include nausea, vomiting, dizziness or vertigo, muscle twitching, vision changes, and loss of consciousness and generalized seizures. At three atmospheres, CNS toxicity occurs in less than two hours; at six atmospheres, in only a few minutes.

Patients with chronic obstructive pulmonary disease retain carbon dioxide abnormally. If oxygen is administered, raising their blood-oxygen concentration, their breathing becomes depressed, and retained carbon dioxide rises to a dangerous level.

Animal studies suggest that the administration of certain drugs, including phenothiazine drugs and chloroquine, increases the susceptibility to toxicity from oxygen at high concentrations or pressures. Animal studies also indicate that vitamin E deficiency may increase susceptibility to oxygen toxicity.

Airway obstruction during high oxygen tension may cause alveolar collapse following absorption of the oxygen. Similarly, occlusion of the eustachian tubes may cause retraction of the eardrum and obstruction of the paranasal sinuses may produce vacuum-type headache.

12. Ecological Information

The atmosphere contains approximately 21% oxygen. No adverse ecological effects expected. Oxygen does not contain any Class I or Class II ozone-depleting chemicals. Oxygen is not listed as a marine pollutant by DOT.

13. Disposal Considerations

WASTE DISPOSAL METHOD: Do not attempt to dispose of residual or unused quantities. Return cylinder to supplier. For emergency disposal, secure cylinder in a well-ventilated area or outdoors; then slowly discharge gas to the atmosphere.

14. Transport Information

DOT/IMO SHIPPING NAME: Oxygen, compressed

HAZARD CLASS: 2.2	**IDENTIFICATION NUMBER:** UN 1072	**PRODUCT RQ:** None

SHIPPING LABEL(s): OXYGEN. An oxygen label may be used for domestic shipment in the United States and Canada in place of the NONFLAMMABLE GAS and OXIDIZER labels (49 CFR Part 172).

PLACARD (when required): NONFLAMMABLE GAS or OXYGEN

SPECIAL SHIPPING INFORMATION: Cylinders should be transported in a secure position, in a well-ventilated vehicle. Cylinders transported in an enclosed, nonventilated compartment of a vehicle can present serious safety hazards.

Shipment of compressed gas cylinders that have been filled without the owner's consent is a violation of federal law [49 CFR 173.301(b)].

15. Regulatory Information

The following selected regulatory requirements may apply to this product. Not all such requirements are identified. Users of this product are solely responsible for compliance with all applicable federal, state, and local regulations.

U.S. FEDERAL REGULATIONS:

EPA (ENVIRONMENTAL PROTECTION AGENCY)

CERCLA: COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT OF 1980 (40 CFR Parts 117 and 302):

Reportable Quantity (RQ): None

SARA: SUPERFUND AMENDMENT AND REAUTHORIZATION ACT:

SECTIONS 302/304: Require emergency planning based on Threshold Planning Quantity (TPQ) and release reporting based on Reportable Quantities (RQ) of Extremely Hazardous Substances (EHS) (40 CFR Part 355):

TPQ: None
EHS RQ: None

SECTIONS 311/312: Require submission of MSDSs and reporting of chemical inventories with identification of EPA hazard categories. The hazard categories for this product are as follows:

IMMEDIATE: No
DELAYED: No
PRESSURE: Yes
REACTIVITY: No
FIRE: Yes

SECTION 313: Requires submission of annual reports of release of toxic chemicals that appear in 40 CFR Part 372.

Oxygen does not require reporting under Section 313.

40 CFR 68: RISK MANAGEMENT PROGRAM FOR CHEMICAL ACCIDENTAL RELEASE PREVENTION: Requires development and implementation of risk management programs at facilities that manufacture, use, store, or otherwise handle regulated substances in quantities that exceed specified thresholds.

Oxygen is not listed as a regulated substance.

TSCA: TOXIC SUBSTANCES CONTROL ACT: Oxygen is listed on the TSCA inventory.

OSHA: OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION:

29 CFR 1910.119: PROCESS SAFETY MANAGEMENT OF HIGHLY HAZARDOUS CHEMICALS: Requires facilities to develop a process safety management program based on Threshold Quantities (TQ) of highly hazardous chemicals.

Oxygen is not listed in Appendix A as a highly hazardous chemical.

STATE REGULATIONS:

CALIFORNIA: Oxygen is not listed by California under the SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT OF 1986 (Proposition 65).

PENNSYLVANIA: Oxygen is subject to the PENNSYLVANIA WORKER AND COMMUNITY RIGHT-TO-KNOW ACT (35 P.S. Sections 7301-7320).

16. Other Information

Be sure to read and understand all labels and instructions supplied with all containers of this product.

WARNING: Medical grades of oxygen are subject to strict federal regulations and are for use only under the control of a licensed physician or clinician familiar with the product and its hazards.

ADDITIONAL SAFETY AND HEALTH HAZARDS: ***High-pressure, oxidizing gas.*** Clean all gauges, valves, regulators, piping, and equipment to be used in oxygen service in accordance with CGA pamphlet G-4.1. Keep cylinders and their valves free of oil and grease. Use piping and equipment adequately designed to withstand pressures to be encountered. Close cylinder valve after each use; keep closed even when empty. ***Never use oxygen as a substitute for compressed air.*** Never use an oxygen jet for cleaning purposes of any sort, especially for clothing. Oxygen increases the likelihood of an engulfing fire. ***Never work on a pressurized system.*** If a leak occurs, close the cylinder valve. Blow the system down in a safe and environmentally sound manner in compliance with all federal, state, and local laws; then repair the leak. ***Never place a compressed gas cylinder where it may become part of an electrical circuit.***

Personnel who have been exposed to high concentrations of oxygen should stay in a well-ventilated or open area before going into a confined space or near an ignition source.

SPECIAL PRECAUTIONS: ***Use in welding and cutting.*** Read and understand the manufacturer's instructions and the precautionary label on the product. Ask your welding products supplier for a copy of Praxair's free safety booklet, P-2035, *Precautions and Safe Practices for Gas Welding, Cutting, and heating,* and for other manufacturers' safety publications. For a detailed treatment, get ANSI Z49.1, *Safety in Welding, Cutting, and Allied Processes*, published by the American Welding Society (AWS), 550 N.W. Le Jeune Rd., Miami, FL 33126, http://www.aws.org/, or see OSHA's Web site at http://www.osha-slc.gov/SLTC/weldingcuttingbrazing/. Order AWS documents from Global Engineering Documents, 15 Inverness Way East, Englewood, CO 80112-5710, http://global.ihs.com/.

Arcs and sparks can ignite combustible materials. Prevent fires. Refer to NFPA 51B, *Cutting and Welding Processes*. ***Do not strike an arc on the cylinder.*** The defect produced by an arc burn could lead to cylinder rupture.

MIXTURES: When you mix two or more gases or liquefied gases, you can create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an industrial hygienist or other trained person when you evaluate the end product. Remember, gases and liquids have properties that can cause serious injury or death.

HAZARD RATING SYSTEMS:

NFPA RATINGS:		HMIS RATINGS:	
HEALTH	= 0	HEALTH	= 0
FLAMMABILITY	= 0	FLAMMABILITY	= 0
INSTABILITY	= 0	PHYSICAL HAZARD	= 3
SPECIAL	= OX (OXidizer)		

STANDARD VALVE CONNECTIONS FOR U.S. AND CANADA:

THREADED:	0-3000 psig	CGA-540
	3001-4000 psig	CGA-577
	4001-5500 psig	CGA-701
PIN-INDEXED YOKE:	0-3000 psig	CGA-870 (Medical Use)
ULTRA-HIGH-INTEGRITY CONNECTION:	0-3000 psig	CGA-714

Use the proper CGA connections. **DO NOT USE ADAPTERS.**

Ask your supplier about free Praxair safety literature as referred to in this MSDS and on the label for this product. Further information about this product can be found in the following pamphlets published by the Compressed Gas Association, Inc. (CGA), 4221 Walney Road, 5th Floor, Chantilly, VA 20151-2923, Telephone (703) 788-2700, http://www.cganet.com/Publication.asp.

AV-1	*Safe Handling and Storage of Compressed Gases*
AV-8	*Characteristics and Safe Handling of Cryogenic Liquid and Gaseous Oxygen*
G-4	*Oxygen*
G-4.1	*Cleaning Equipment for Oxygen Service*
P-1	*Safe Handling of Compressed Gases in Containers*
P-2	*Characteristics and Safe Handling of Medical Gases*
P-39	*Oxygen-Rich Atmospheres*
SB-2	*Oxygen-Deficient Atmospheres*
SB-8	*Use of Oxy-Fuel Gas Welding and Cutting Apparatus*
V-1	*Compressed Gas Cylinder Valve Inlet and Outlet Connections*
—	*Handbook of Compressed Gases, Fourth Edition*

Praxair asks users of this product to study this MSDS and become aware of product hazards and safety information. To promote safe use of this product, a user should (1) notify employees, agents, and contractors of the information in this MSDS and of any other known product hazards and safety information, (2) furnish this information to each purchaser of the product, and (3) ask each purchaser to notify its employees and customers of the product hazards and safety information.

The opinions expressed herein are those of qualified experts within Praxair, Inc. We believe that the information contained herein is current as of the date of this Material Safety Data Sheet. Since the use of this information and the conditions of use of the product are not within the control of Praxair, Inc., it is the user's obligation to determine the conditions of safe use of the product.

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Praxair, Inc.
39 Old Ridgebury Road
Danbury, CT 06810-5113

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Material Safety Data Sheet Collection
Genium group inc.
1171 RiverFront Center, Amsterdam, NY 12010
(518) 842-4111

Portland Cement
POR5000

Issue Date: 2004-12

Section 1 - Chemical Product and Company Identification 54/59

Material Name: Portland Cement
CAS Number: 65997-15-1
Chemical Formula: Unspecified or Variable
EINECS Number: 266-043-4
ACX Number: X1003349-5
Synonyms: Portland Cement; PORTLAND CEMENT; CEMENT; HYDRAULIC CEMENT; PORTLAND CEMENT SILICATE
General Use: Hydraulic binder used for mixing concrete, concrete masonry, mortars and grouts; also soil stabilization.

Section 2 - Composition / Information on Ingredients

Name	CAS	%
portland cement	65997-15-1	varies

OSHA PEL
TWA: 50 mppcf; 15 mg/m^3 (total); 5 mg/m^3 (respirable).

NIOSH REL
TWA: 10 mg/m^3; total; TWA: 5 mg/m^3; respirable.

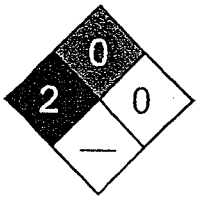
DFG (Germany) MAK
TWA: 5 mg/m^3; measured as inhalable fraction of the aerosol.

OSHA PEL Vacated 1989 Limits
TWA: 10 mg/m^3; total. Other Values: respirable mg/m^3; 5.

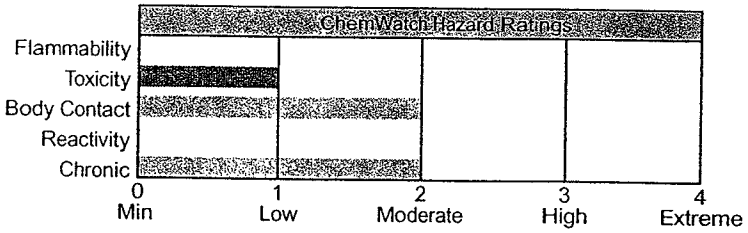
IDLH Level
5000 mg/m^3.

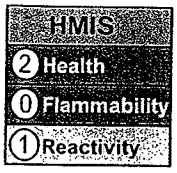
ACGIH TLV
TWA: 10 mg/m^3; Value is for particulate matter containing no asbestos and <1% crystalline silica.

Section 3 - Hazards Identification



Fire Diamond





ANSI Signal Word

Caution

☆☆☆☆☆ **Emergency Overview** ☆☆☆☆☆

Gray powder; odorless. Irritating to eyes/skin/respiratory tract. Also causes (on contact with wet cement): corneal edema, dermatitis, cracked skin. Chronic: bronchitis, dermatitis.

Potential Health Effects

Target Organs: respiratory system, skin, eyes
Primary Entry Routes: inhalation, ingestion, skin contact
Acute Effects

Inhalation: Generated dust may be highly discomforting if inhaled and may even cause in some cases, sensitization. Respiratory sensitization may result in allergic/asthma like responses; from coughing and minor breathing difficulties to bronchitis with wheezing, gasping.
Effects on lungs are significantly enhanced in the presence of respirable particles.

Eye: The solid/dust is highly discomforting, may be abrasive to the eyes and capable of causing a mild, temporary redness of the conjunctiva (similar to wind-burn), temporary impairment of vision and/or other transient eye damage/ulceration.

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Skin: The dust is extremely discomforting to the skin and is capable of causing skin reactions which may lead to dermatitis.

Handling wet cement can cause dermatitis. Cement when wet is quite alkaline and this alkali action on the skin contributes strongly to cement contact dermatitis since it may cause drying and defatting of the skin which is followed by hardening, cracking, lesions developing, possible infections of lesions and penetration by soluble salts.

Cement contact dermatitis (CCD) may occur when contact shows an allergic response, which may progress to sensitization. Sensitization is due to soluble chromates (chromate compounds) present in trace amounts in some cements, cement products. Soluble chromates readily penetrate intact skin.

Cement dermatitis can be characterized by fissures, eczematous rash, dystrophic nails, and dry skin; acute contact with highly alkaline mixtures may cause localized necrosis.

Ingestion: Considered an unlikely route of entry in commercial/industrial environments.

The material is harmful if swallowed.

The dust is discomforting to the gastrointestinal tract.

Carcinogenicity: NTP - Not listed; IARC - Not listed; OSHA - Not listed; NIOSH - Not listed; ACGIH - Not listed; EPA - Not listed; MAK - Not listed.

Chronic Effects: Cement eczema may be due to chromium in feed stocks or contamination from materials of construction. Sensitization to chromium may be the leading cause of nickel and cobalt sensitivity and the high alkalinity of cement is an important factor in cement dermatoses.

Repeated, prolonged severe inhalation exposure may cause pulmonary edema and rarely, pulmonary fibrosis. Workers may also suffer from dust-induced bronchitis with chronic bronchitis reported in 17% of a group occupationally exposed to high dust levels.

Data suggests that occupational exposure to Portland cement dust may lead to a higher incidence of chronic respiratory symptoms and a reduction of ventilatory capacity.

Section 4 - First Aid Measures

Inhalation: Remove to fresh air.

Encourage patient to blow nose to ensure clear breathing passages.

Ask patient to rinse mouth with water but to not drink water.

Seek immediate medical attention.

Eye Contact: Immediately hold the eyes open and flush continuously for at least 15 minutes with fresh running water.

Ensure irrigation under eyelids by occasionally lifting the upper and lower lids.

Transport to hospital or doctor without delay. Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

Skin Contact: Immediately remove all contaminated clothing, including footwear (after rinsing with water).

Wash affected areas thoroughly with water (and soap if available).

Seek medical attention in event of irritation.

Ingestion: Contact a Poison Control Center.

Do NOT induce vomiting. Give a glass of water.

After first aid, get appropriate in-plant, paramedic, or community medical support.

Note to Physicians: Treat symptomatically as for strong alkaline material.

Section 5 - Fire-Fighting Measures

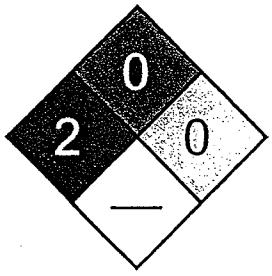
Flash Point: Noncombustible

Autoignition Temperature: Not applicable

LEL: Not applicable

UEL: Not applicable

Extinguishing Media: If small amounts are involved in a fire, there is no restriction on the type of extinguisher. Otherwise, use LARGE AMOUNTS of water to absorb heat generated.



Fire Diamond

General Fire Hazards/Hazardous Combustion Products: Noncombustible.

Not considered to be a significant fire risk; however, containers may burn.

Decomposes on heating and produces toxic fumes of caustic compounds.

Fire Incompatibility: No known incompatibility with normal range of industrial materials.

Fire-Fighting Instructions: Contact fire department and tell them location and nature of hazard.

Wear breathing apparatus plus protective gloves for fire only. Prevent, by any means available, spillage from entering drains or waterways.

Use fire fighting procedures suitable for surrounding area.

Do not approach containers suspected to be hot.

Cool fire-exposed containers with water spray from a protected location.

If safe to do so, remove containers from path of fire.

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Equipment should be thoroughly decontaminated after use.

Section 6 - Accidental Release Measures

Small Spills: Clean up all spills immediately. Avoid contact with skin and eyes.
Wear protective clothing, gloves, safety glasses and dust respirator.
Use dry clean-up procedures and avoid generating dust.
Vacuum up or sweep up. Place in clean drum then flush area with water.
Large Spills: Clear area of personnel and move upwind.
Use dry clean-up procedures. Avoid generating dust.
If inhalation risk of exposure exists, wear NIOSH-approved dust respirator.
Collect recoverable product into labeled containers for recycling.
Regulatory Requirements: Follow applicable OSHA regulations (29 CFR 1910.120).

Section 7 - Handling and Storage

Handling Precautions: Avoid generating and breathing dust. Limit all unnecessary personal contact.
Wear protective clothing when risk of exposure occurs.
Use in a well-ventilated area. Atmosphere should be checked against exposure standards to ensure safe working conditions are maintained.
Avoid contact with incompatible materials.
When handling, DO NOT eat, drink or smoke.
Always wash hands with soap and water after handling.
Use good occupational work practices.
Observe manufacturer's storing and handling recommendations.
Recommended Storage Methods: Packaging as recommended by manufacturer.
Check that containers are clearly labeled.
Metal pail or Paper bag with sealed plastic liner.
Multi-ply woven plastic or paper bag with sealed plastic liner.
Regulatory Requirements: Follow applicable OSHA regulations.

Section 8 - Exposure Controls / Personal Protection

Engineering Controls: Use in a well-ventilated area.
If exposure to workplace dust is not controlled, respiratory protection is required; wear NIOSH-approved dust respirator.
General exhaust is adequate under normal operating conditions.
If risk of overexposure exists, wear NIOSH-approved dust respirator.
Correct fit is essential to obtain adequate protection.
Personal Protective Clothing/Equipment:
Eyes: Safety glasses with side shields; or as required, chemical goggles.
Contact lenses pose a special hazard; soft lenses may absorb irritants and all lenses concentrate them.
Hands/Feet: Barrier cream and Wear chemical protective gloves, eg. PVC.
Wear safety footwear or safety gumboots, eg. Rubber.
Respiratory Protection:
Exposure Range >5 to 50 mg/m^3: Air Purifying, Negative Pressure, Half Mask
Exposure Range >50 to 500 mg/m^3: Air Purifying, Negative Pressure, Full Face
Exposure Range >500 to <5000 mg/m^3: Supplied Air, Constant Flow/Pressure Demand, Full Face
Exposure Range 5000 to unlimited mg/m^3: Self-contained Breathing Apparatus, Pressure Demand, Full Face
Cartridge Color: dust/mist filter (use P100 or consult supervisor for appropriate dust/mist filter)
Other: Overalls. Eyewash unit. Ensure there is ready access to a safety shower.

Section 9 - Physical and Chemical Properties

Appearance/General Info: Finely divided grey to off-white colored powder with no odor. Hardens after reaction with water. A finely ground mixture of cement clinker and gypsum, surface area 300-500 m2/kg (Blaine Method).
Physical State: Divided solid
Vapor Pressure (kPa): Not applicable
Vapor Density (Air=1): Not applicable
Formula Weight: Not applicable.
Specific Gravity (H_2O=1, at 4 °C): 3.0-3.2
Evaporation Rate: Not applicable
pH: alkaline
Freezing/Melting Point: > 1200 °C (2192 °F)
Decomposition Temperature (°C): Not applicable
Water Solubility: Insoluble

Section 10 - Stability and Reactivity

Stability/Polymerization/Conditions to Avoid: Product is considered stable. Hazardous polymerization will not occur.

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Storage Incompatibilities: Segregate from strong oxidizers and strong acids.

Section 11 - Toxicological Information

No relevant toxicological data found at time of research.

See *RTECS* VV 8770000, for additional data.

Section 12 - Ecological Information

Environmental Fate: No data found.
Ecotoxicity: No data found.

Section 13 - Disposal Considerations

Disposal: Recycle wherever possible or consult manufacturer for recycling options.
Follow applicable federal, state, and local regulations.
Bury residue in an authorized landfill.
Recycle containers where possible, or dispose of in an authorized landfill.

Section 14 - Transport Information

DOT Hazardous Materials Table Data (49 CFR 172.101):

Shipping Name and Description: None

Section 15 - Regulatory Information

EPA Regulations:
RCRA 40 CFR: Not listed
CERCLA 40 CFR 302.4: Not listed
SARA 40 CFR 372.65: Not listed
SARA EHS 40 CFR 355: Not listed
TSCA: Listed

Section 16 - Other Information

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Material Safety Data Sheet Collection
Genium group inc.
1171 RiverFront Center, Amsterdam, NY 12010
(518) 842-4111

Issue Date: 2004-12

Section 1 - Chemical Product and Company Identification 54/59

Material Name: Propane
CAS Number: 74-98-6
Chemical Formula: C_3H_8
Structural Chemical Formula: $CH_3CH_2CH_3$
EINECS Number: 200-827-9
ACX Number: X1003352-2
Synonyms: A-108; BOTTLED GAS; DIMETHYL METHANE; DIMETHYLMETHANE; HYDROCARBON PROPELLANT A-108; N-PROPANE; PROPANE; PROPANE; PROPYL HYDRIDE; PROPYLDIHYDRIDE; R 290
General Use: A household and industrial fuel gas, sometimes mixed with butane.
An aerosol propellant. As a refrigerant (CARE 40). In the manufacture of ethylene.

Section 2 - Composition / Information on Ingredients

Name	CAS	%
propane	74-98-6	>99

OSHA PEL
TWA: 1000 ppm; 1800 mg/m^3.

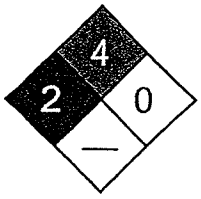
NIOSH REL
TWA: 1000 ppm, 1800 mg/m^3.

DFG (Germany) MAK
TWA: 1000 ppm; PEAK: 2000 ppm.

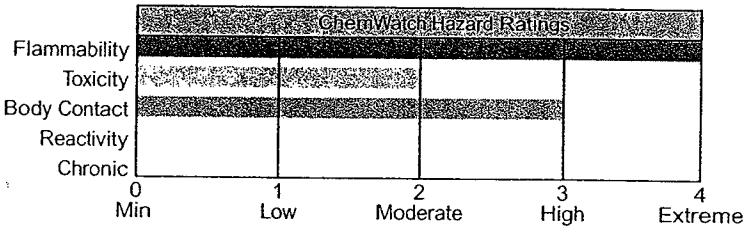
ACGIH TLV
TWA: 2500 ppm.

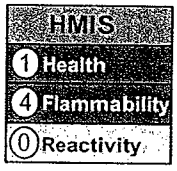
IDLH Level
2100 ppm (10% LEL).

Section 3 - Hazards Identification



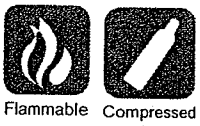
Fire Diamond





ANSI Signal Word

Danger!


Flammable Compressed Gas

☆☆☆☆☆ Emergency Overview ☆☆☆☆☆

Colorless, odorless gas; may have additives to smell like rotten eggs. Irritating to eyes/respiratory tract. Stored as a compressed gas which can cause frostbite. Other Acute Effects: asphyxiation (reduced oxygen available for breathing). Flammable.

Potential Health Effects

Target Organs: central nervous system (CNS)
Primary Entry Routes: inhalation
Acute Effects

Inhalation: The gas is a simple asphyxiant (precludes access to oxygen).
Material is highly volatile and may quickly form concentrated atmosphere in confined or unventilated area. Vapor is heavier than air and may displace and replace air in breathing zone, acting as a simple asphyxiant. This may happen with little warning of overexposure.
If present in sufficient concentration to reduce the oxygen level of inhaled air below 18%, symptoms such as rapid respiration, mental dullness, lack of coordination, poor judgement, nausea and vomiting, and cyanosis may occur even leading to unconsciousness and death.
Propane may be a narcotic in high concentrations.

Eye: The gas is non-irritating to the eyes.
The liquid is extremely discomforting to the eyes and may cause severe cold burns and is capable of causing severe damage with loss of sight.

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Skin: The liquid is highly discomforting to the skin and may rapidly cause severe cold burns.
Vaporizing liquid causes rapid cooling and contact may cause cold burns, frostbite.
Ignited gas may result in burns and the onset of shock.
Ingestion: Not normally a risk due to extreme volatility of liquid.
Considered an unlikely route of entry in commercial/industrial environments.
Carcinogenicity: NTP - Not listed; IARC - Not listed; OSHA - Not listed; NIOSH - Not listed; ACGIH - Not listed; EPA - Not listed; MAK - Not listed.
Chronic Effects: No data found.

Section 4 - First Aid Measures

Inhalation: Remove to fresh air.
Lay patient down. Keep warm and rested.
If available, administer medical oxygen by trained personnel.
If breathing is shallow or has stopped, ensure clear airway and apply resuscitation. Transport to hospital or doctor, without delay.
Eye Contact: Immediately hold the eyes open and flush continuously for at least 15 minutes with fresh running water.
Ensure irrigation under eyelids by occasionally lifting the upper and lower lids.
Transport to hospital or doctor without delay. Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.
Skin Contact: In case of cold burns (frost-bite): Bathe the affected area immediately in cold water for 10 to 15 minutes, immersing if possible and without rubbing.
Do not apply hot water or radiant heat. Apply a clean, dry dressing.
Transport to hospital or doctor.
Ingestion: Contact a Poison Control Center. DO NOT induce vomiting. Observe the patient carefully. Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious. Give water (or milk) to rinse out mouth. Then provide liquid slowly and as much as casualty can comfortably drink. Transport to hospital or doctor without delay.
After first aid, get appropriate in-plant, paramedic, or community medical support.
Note to Physicians: For acute or short-term repeated exposures to petroleum distillates or related hydrocarbons:
1.Primary threat to life from pure petroleum distillate ingestion and/or inhalation is respiratory failure.
2.Patients should be quickly evaluated for signs of respiratory distress (e.g. cyanosis, tachypnea, intercostal retraction, obtundation) and given oxygen. Patients with inadequate tidal volumes or poor arterial blood gases (pO_2 <50 mm Hg or pCO_2 >50 mm Hg) should be intubated.
3.Arrhythmias complicate some hydrocarbon ingestion and/or inhalation and electrocardiographic evidence of myocardial injury has been reported; intravenous lines and cardiac monitors should be established in obviously symptomatic patients. The lungs excrete inhaled solvents, so that hyperventilation improves clearance.
4.A chest x-ray should be taken immediately after stabilization of breathing and circulation to document aspiration and detect the presence of pneumothorax.
5.Epinephrine (adrenalin) is not recommended for treatment of bronchospasm because of potential myocardial sensitization to catecholamines.
Inhaled cardioselective bronchodilators (e.g. Alupent, Salbutamol) are the preferred agents, with aminophylline a second choice.
6.Lavage is indicated in patients who require decontamination; ensure use of cuffed endotracheal tube in adult patients.
For frostbite from liquified petroleum gas: If part has not thawed, place in warm water bath (41-45 °C) for 15-60 minutes, until skin turns pink or red. Analgesia will be necessary while thawing.
If there has been massive exposure, the general body temperature must be depressed, and the patient must be immediately rewarmed, by whole-body immersion in a bath at the above temperature.
Shock may occur during rewarming.
Administer tetanus toxoid booster after hospitalization. Prophylactic antibiotics useful. May require anticoagulants and oxygen.

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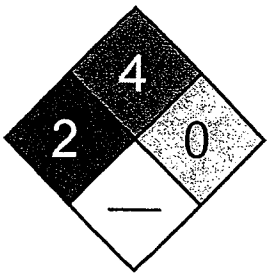
Section 5 - Fire-Fighting Measures

Flash Point: -104.444 °C Closed Cup
Autoignition Temperature: 450 °C
LEL: 2.1% v/v
UEL: 9.5% v/v
Extinguishing Media: Water spray or fog; dry chemical powder.
Carbon dioxide.
General Fire Hazards/Hazardous Combustion Products: Flammable gas. Dangerous hazard when exposed to heat or flame.
Liquid and vapor are highly flammable.
Severe vapor explosion hazard, when exposed to flame or spark.
Gas may form explosive mixtures with air over a wide area.
Emits toxic fumes of carbon monoxide (CO) on combustion.
Other combustion products include, carbon dioxide (CO_2).



Fire Diamond

Fire Incompatibility: Avoid reaction with oxidizing agents.
Fire-Fighting Instructions: Contact fire department and tell them location and nature of hazard.
May be violently or explosively reactive. Wear full body protective clothing with breathing apparatus. Prevent, by any means available, spillage from entering drains or waterways. Consider evacuation.
Cool fire-exposed containers with water spray from a protected location.
Water spray or fog may be used to disperse vapor.
If safe to do so, stop flow of gas.
If flow of gas cannot be stopped, leave gas to burn.
Do not approach cylinders suspected to be hot.
If safe to do so, remove containers from path of fire.
Fight fire from a safe distance, with adequate cover.

Section 6 - Accidental Release Measures

Small Spills: Avoid breathing vapor and any contact with liquid or gas. Protective equipment including respirator should be used. Do NOT enter confined spaces where gas may have accumulated. Shut of all sources of possible ignition and increase ventilation. Clear area of personnel. Stop leak only if safe to so do. Remove leaking cylinders to safe place. Release pressure under safe controlled conditions by opening valve. Keep area clear of personnel until gas has dispersed.
Large Spills: Clear area of all unprotected personnel and move upwind.
Contact fire department and advise them of the location and nature of hazard.
May be violently or explosively reactive.
Wear full body clothing with breathing apparatus.
Prevent by any means available, spillage from entering drains and waterways.
Consider evacuation.
Shut off all possible sources of ignition and increase ventilation.
No smoking or bare lights within area.
Use extreme caution to prevent violent reaction.
Stop leak only if safe to so do.
Water spray or fog may be used to disperse vapor.
Do NOT enter confined space where gas may have collected.
Keep area clear until gas has dispersed.
Regulatory Requirements: Follow applicable OSHA regulations (29 CFR 1910.120).

Section 7 - Handling and Storage

Handling Precautions: Avoid smoking, bare lights or ignition sources.
Avoid breathing vapors and contact with skin and eyes.
Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained.
Avoid sources of heat. Avoid physical damage to containers.
Wear protective clothing and gloves when handling containers.
Use in a well-ventilated area. Use spark-free tools when handling.
Keep containers securely sealed when not in use.
If possible, use outdoors.
Prevent concentration in hollows and sumps. DO NOT enter confined spaces until atmosphere has been checked.
Vapor may travel a considerable distance to source of ignition.
Transport containers on a trolley.

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Use good occupational work practices.
DO NOT transfer gas from one cylinder to another.
Natural gases contain a contaminant, radon-222, a naturally occurring radioactive gas. During subsequent processing, radon tends to concentrate in liquified petroleum streams and in product streams having similar boiling points.
Industry experience indicates that the commercial product may contain small amounts of radon-222 and its radioactive decay products (radon daughters). The actual concentration of radon-222 and radioactive daughters in process equipment (IE lines, filters, pumps and reactor units) may reach significant levels and produce potentially damaging levels of gamma radiation. A potential external radiation hazard exists at or near any pipe, valve or vessel containing a radon enriched stream or containing internal deposits of radioactive material. Field studies, however, have not shown that conditions exist that expose the worker to cumulative exposures in excess of general population limits. Equipment containing gamma-emitting decay products should be presumed to be internally contaminated with alpha- emitting decay products which may be hazardous if inhaled or ingested.
During maintenance operations that require the opening of contaminated process equipment, the flow of gas should be stopped and a four hour delay enforced to allow gamma-radiation to drop to background levels. Protective equipment (including high efficiency particulate respirators (P3) suitable for radionucleotides or supplied air) should be worn by personnel entering a vessel or working on contaminated process equipment to prevent skin contamination or inhalation of any residue containing alpha-radiation.
Airborne contamination may be minimized by handling scale and/or contaminated materials in a wet state.

Recommended Storage Methods: Aerosol pack. Cylinder fitted with valve protector cap.
Ensure the use of equipment rated for cylinder pressure.
Ensure the use of compatible materials of construction.
Cylinder valve must be closed when not in use or when empty.
Cylinder must be properly secured either in use or in storage.
WARNING: Suckback into cylinder may result in rupture.
Use back-flow preventive device in piping.
Check that containers are clearly labeled.
Packaging as recommended by manufacturer.

Regulatory Requirements: Follow applicable OSHA regulations.

Section 8 - Exposure Controls / Personal Protection

Engineering Controls: Use in a well-ventilated area. Local exhaust ventilation usually required.
If risk of overexposure exists, wear NIOSH-approved respirator.
Correct fit is essential to obtain adequate protection. NIOSH-approved self contained breathing apparatus (SCBA) may be required in some situations.
Provide adequate ventilation in warehouse or closed storage area.
Packed as liquid under pressure and remains liquid only under pressure.
Sudden release of pressure or leakage may result in rapid vaporization with generation of large volume of highly flammable/explosive gas.
Used in closed pressurized systems, fitted with safety relief valve.
Vented gas is flammable, denser than air and will spread. Vent path must not contain ignition sources, pilot lights, bare flames.
Obtain a work permit before attempting any repairs.
Do not attempt repair work on lines, vessels under pressure.
Atmospheres must be tested and O. K. before work resumes after leakage.

Personal Protective Clothing/Equipment:

Eyes: Safety glasses with side shields.

Hands/Feet: No special precautions required for gas.
Wear full protective clothing including gloves and safe footwear for contact with liquid.

Respiratory Protection:
Exposure Range >1000 to <2100 ppm: Supplied Air, Constant Flow/Pressure Demand, Half Mask
Exposure Range 2100 to unlimited ppm: Self-contained Breathing Apparatus, Pressure Demand, Full Face
Note: poor warning properties

Other: Protective overalls, closely fitted at neck and wrist. Eye-wash unit.
IN CONFINED SPACES:
1. Non-sparking protective boots
2. Static-free clothing.
3. Ensure availability of lifeline.
Staff should be trained in all aspects of rescue work.
Operators should be trained in correct use & maintenance of respirators.

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Section 9 - Physical and Chemical Properties

Appearance/General Info: A colorless liquified gas, odorless when pure. Transport of unodorized propane gas without Component Authority is prohibited. Burns with a smoky, luminous flame. Contact with water causes liquified gas to boil. Slightly soluble in alcohol and ether. Non-corrosive. Forms a dense vapor cloud at atmospheric conditions. Stored as a liquid under its own vapor pressure.

Physical State: Liquefied gas
Vapor Pressure (kPa): 853 at 21°C
Vapor Density (Air=1): 1.97 at 0 °C
Formula Weight: 44.11
Specific Gravity (H_2O=1, at 4 °C): 0.5 (liquid)
Evaporation Rate: Not applicable
pH: Not applicable

pH (1% Solution): Not applicable.
Boiling Point: -42.1 °C (-44 °F) at 1 atm
Freezing/Melting Point: -189.7 °C (-309.46 °F)
Volatile Component (% Vol): 100
Decomposition Temperature (°C): 650
Water Solubility: 62.4 ppm in water at 25 °C

Section 10 - Stability and Reactivity

Stability/Polymerization/Conditions to Avoid: Presence of an ignition source. Presence of heat source. Product is considered stable and hazardous polymerization will not occur.
Storage Incompatibilities: Avoid reaction with oxidizing agents.

Section 11 - Toxicological Information

No relevant toxicological data found at time of research.

See *RTECS* TX 2275000, for additional data.

Section 12 - Ecological Information

Environmental Fate: Photolysis, hydrolysis and bioconcentration are not expected to be important environmental fate processes. Biodegradation may occur in soil and water; however, volatilization is expected to be the dominant fate process. To a lesser extent, adsorption may also occur. A K_{oc} range of 450 to 460 indicates a medium mobility class in soil. In aquatic systems, it may partition from the water column to organic matter contained in sediments and suspended materials. A Henry's Law constant of 7.07 $x10^{-1}$ atm-cu m/mole at 25 °C suggests extremely rapid volatilization from environmental waters. The volatilization half lives from a model river and a model pond, the latter considers the effect of adsorption, have been estimated to be 1.9 hr and 2.3 days, respectively. It is expected to exist almost entirely in the vapor phase in ambient air. Reactions with photochemically produced hydroxyl radicals in the atmosphere have been shown to occur (average half life of 13 days). Data also suggests that nighttime reactions with radical species and nitrogen oxides may contribute to atmospheric transformation.
Ecotoxicity: No data found.
Henry's Law Constant: calculated at 7.07 $x10^{-1}$
BCF: estimated at 1.56
Biochemical Oxygen Demand (BOD): none
Octanol/Water Partition Coefficient: log K_{ow} = 2.36
Soil Sorption Partition Coefficient: K_{oc} = estimated at 450

Section 13 - Disposal Considerations

Disposal: Evaporate or incinerate residue at an approved site.
Return empty containers to supplier.
Ensure damaged or non-returnable cylinders are gas-free before disposal.
Recycle containers if possible, or dispose of in an authorized landfill.

Section 14 - Transport Information

DOT Hazardous Materials Table Data (49 CFR 172.101):

Note: This material has multiple possible HMT entries. Choose the appropriate one based on state and condition of specific material when shipped.

Shipping Name and Description: Propane *see also* Petroleum gases, liquefied
ID: UN1978
Hazard Class: 2.1 - Flammable gas
Packing Group:
Symbols:
Label Codes: 2.1 - Flammable Gas
Special Provisions: 19, T50

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Packaging: **Exceptions:** 306 **Non-bulk:** 304 **Bulk:** 314, 315
Quantity Limitations: **Passenger aircraft/rail:** Forbidden **Cargo aircraft only:** 150 kg
Vessel Stowage: **Location:** E **Other:**

Shipping Name and Description: Petroleum gases, liquefied *or* Liquefied petroleum gas
ID: UN1075
Hazard Class: 2.1 - Flammable gas
Packing Group:
Symbols:
Label Codes: 2.1 - Flammable Gas
Special Provisions: T50
Packaging: **Exceptions:** 306 **Non-bulk:** 304 **Bulk:** 314, 315
Quantity Limitations: **Passenger aircraft/rail:** Forbidden **Cargo aircraft only:** 150 kg
Vessel Stowage: **Location:** E **Other:**

Section 15 - Regulatory Information

EPA Regulations:
RCRA 40 CFR: Not listed
CERCLA 40 CFR 302.4: Not listed
SARA 40 CFR 372.65: Not listed
SARA EHS 40 CFR 355: Not listed
TSCA: Listed

Section 16 - Other Information

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Mobil

REVISED: 05/01/88

MOBIL OIL CORPORATION MATERIAL SAFETY DATA BULLETIN

I. PRODUCT IDENTIFICATION

AUTOMOTIVE GASOLINES

SUPPLIER: MOBIL OIL CORP.
CHEMICAL NAMES AND SYNONYMS: HYDROCARBONS AND ADDITIVES
USE OR DESCRIPTION: MOTOR FUEL

HEALTH EMERGENCY TELEPHONE: 212-883-4411
TRANSPORT EMERGENCY TELEPHONE: 800-424-9300 (CHEMTREC)
PRODUCT TECHNICAL INFORMATION: 800-662-4525

II. TYPICAL CHEMICAL AND PHYSICAL PROPERTIES

APPEARANCE
CLEAR TO YELLOW/ORANGE LIQUID
ODOR: HYDROCARBON
RELATIVE DENSITY: 15/4 C
0.7 - 0.76
VAPOR PRESSURE: 400.0 MM HG 20C (REID VAPOR PRESSURE: 9-15 PSIA)

VISCOSITY: AT 100 F, SUS 30 AT 40 C, CST 1.0
BOILING RANGE: 75-430 F
FLASH POINT: F(C) (METHOD) -40(-40) (ASTM D-56)
SOLUBILITY IN WATER: NEGLIGIBLE

FOR ADDITIONAL INFORMATION PLEASE CONTACT YOUR LOCAL MARKETING OFFICE

III. INGREDIENTS

HAZARDOUS INGREDIENTS:	WT PCT (APPROX)	EXPOSURE LIMITS MG/M3	PPM	SOURCES (AND NOTES)
GASOLINE	100	900	300	A
BENZENE (COMPONENT OF GASOLINE) (CAS NUMBER 71-43-2)	2		1	O -PEL
			5	O -STEL
			10	A
FOR MOBIL REGULAR GASOLINE ONLY:				
LEAD ALKYL COMPOUNDS	0.0035	0.1		A -(SKIN)
		0.075		O -(SKIN)

KEY TO SOURCES: A=ACGIH-TLV, A*=SUGGESTED-TLV, M=MOBIL, O=OSHA
NOTE: SEE SECTION XI FOR ADDITIONAL INFORMATION CONCERNING BENZENE.

IV. HEALTH HAZARD SUMMARY

-- INCLUDES AGGRAVATED MEDICAL CONDITIONS, IF ESTABLISHED --

THRESHOLD LIMIT VALUE: 300 PPM FOR GASOLINE
EFFECTS OF OVEREXPOSURE: MODERATE SKIN IRRITATION. SLIGHT EYE IRRITATION. RESPIRATORY IRRITATION, DIZZINESS, NAUSEA, LOSS OF CONSCIOUSNESS. PROLONGED EXPOSURE TO HIGH CONCENTRATIONS HAS CAUSED KIDNEY DAMAGE AND KIDNEY CANCER IN RATS AND LIVER CANCER IN MICE. SEE SECTION XI FOR ADDITIONAL DATA.

V. EMERGENCY AND FIRST AID PROCEDURES

--- FOR PRIMARY ROUTES OF ENTRY ---

EYE CONTACT: FLUSH WITH WATER.
SKIN CONTACT: WASH CONTACT AREAS WITH SOAP AND WATER. LAUNDER CONTAMINATED CLOTHING BEFORE REUSE.
INHALATION: REMOVE FROM FURTHER EXPOSURE. IF UNCONSCIOUSNESS OCCURS, SEEK IMMEDIATE MEDICAL ASSISTANCE AND CALL A PHYSICIAN. IF BREATHING HAS STOPPED, USE MOUTH TO MOUTH RESUSCITATION.
INGESTION: DO NOT INDUCE VOMITING. ADMINISTER VEGETABLE OIL. GET MEDICAL ASSISTANCE. (NOTE TO PHYSICIAN: MATERIAL IF ASPIRATED INTO THE LUNGS MAY CAUSE CHEMICAL PNEUMONITIS. TREAT APPROPRIATELY.)

Mobil

AUTOMOTIVE GASOLINES

********** VI. FIRE AND EXPLOSION DATA **********

FLASH POINT: F(C) (METHOD)
-40(-40) (ASTM D-56)

FLAMMABLE LIMITS:
LEL: 1.1 UEL: 7.6

NFPA CODES:
HEALTH 1
FLAMMABILITY 3
REACTIVITY 0

EXTINGUISHING MEDIA:
CO2, FOAM, DRY CHEMICAL OR WATER FOG

SPECIAL FIRE FIGHTING PROCEDURES:
FOR FIRES IN ENCLOSED AREAS, FIREFIGHTERS MUST USE SELF-CONTAINED BREATHING APPARATUS. COOL STORAGE DRUMS WITH WATER SPRAY. EVACUATE AREA. PREVENT RUNOFF FROM FIRE CONTROL OR DILUTION FROM ENTERING STREAMS OR DRINKING WATER SUPPLY.

UNUSUAL FIRE AND EXPLOSION HAZARDS:
EXTREMELY FLAMMABLE LIQUID. VAPOR ACCUMULATION COULD FLASH AND/OR EXPLODE IF IN CONTACT WITH OPEN FLAME.

********** VII. REACTIVITY DATA **********

STABILITY: STABLE
HAZARDOUS POLYMERIZATION: WILL NOT OCCUR
CONDITIONS TO AVOID: HEAT, SPARKS, FLAME, AND BUILD UP OF STATIC ELECTRICITY.
INCOMPATIBLE MATERIALS: HALOGENS, STRONG ACIDS, ALKALINES AND OXIDIZERS.
HAZARDOUS DECOMPOSITION PRODUCTS: CARBON MONOXIDE FROM INCOMPLETE COMBUSTION.

********** VIII. SPILL OR LEAK PROCEDURES **********

ENVIRONMENTAL IMPACT: REPORT SPILLS AS REQUIRED TO APPROPRIATE AUTHORITIES. IN CASE OF ACCIDENT OR ROAD SPILL NOTIFY CHEMTREC (800-424-9300). U.S. COAST GUARD REGULATIONS REQUIRE IMMEDIATE REPORTING OF SPILLS THAT COULD REACH ANY WATERWAY INCLUDING INTERMITTENT DRY CREEKS. THE COAST GUARD TOLL FREE NUMBER IS (800-424-8802).

PROCEDURES IF MATERIAL IS RELEASED OR SPILLED: ELIMINATE ALL IGNITION SOURCES. REMOVE LEAKING CONTAINERS TO SAFE AREA. ADSORB ON FIRE RETARDANT TREATED SAWDUST, DIATOMACEOUS EARTH, ETC. SHOVEL UP AND DISPOSE OF AT AN APPROPRIATE WASTE DISPOSAL FACILITY IN ACCORDANCE WITH CURRENT APPLICABLE LAWS AND REGULATIONS, AND PRODUCT CHARACTERISTICS AT TIME OF DISPOSAL. RUNOFF MAY CREATE FIRE OR EXPLOSION HAZARD IN SEWER SYSTEM.

WASTE MANAGEMENT: PRODUCT IS SUITABLE FOR BURNING FOR FUEL VALUE IN COMPLIANCE WITH APPLICABLE LAWS AND REGULATIONS.

********** IX. SPECIAL PROTECTION INFORMATION **********

EYE PROTECTION: IF EYE CONTACT IS LIKELY, SAFETY GLASSES WITH SIDE SHIELDS OR CHEMICAL TYPE GOGGLES SHOULD BE WORN.

SKIN PROTECTION: IF SKIN CONTACT IS LIKELY, IMPERVIOUS GLOVES SHOULD BE WORN. GOOD PERSONAL HYGIENE PRACTICES SHOULD ALWAYS BE FOLLOWED.

RESPIRATORY PROTECTION: APPROVED RESPIRATORY EQUIPMENT MUST BE USED WHEN VAPOR OR MIST CONCENTRATIONS ARE UNKNOWN OR EXCEED THE TLV.

VENTILATION: VENTILATION REQUIRED AND EQUIPMENT MUST BE EXPLOSION PROOF. USE AWAY FROM ALL IGNITION SOURCES. USE IN WELL VENTILATED AREA WITH LOCAL EXHAUST VENTILATION.

OTHER: AVOID SKIN CONTACT AND BREATHING MISTS/VAPORS.

Mobil

AUTOMOTIVE GASOLINES

********** X. SPECIAL PRECAUTIONS **********

HANDLING: AVOID CONTACT WITH SKIN. AVOID INHALATION OF VAPORS OR MISTS. USE IN WELL VENTILATED AREA AWAY FROM ALL IGNITION SOURCES.

STORAGE: AVOID SPARKING CONDITIONS; GROUND AND BOND ALL TRANSFER AND STORAGE EQUIPMENT. DRUMS MUST BE GROUNDED AND BONDED AND EQUIPPED WITH SELF-CLOSING VALVES, PRESSURE VACUUM BUNGS AND FLAME ARRESTERS. STORE AWAY FROM ALL IGNITION SOURCES IN A COOL AREA EQUIPPED WITH AN AUTOMATIC SPRINKLING SYSTEM. OUTSIDE OR DETACHED STORAGE PREFERRED.

STORED MATERIALS MUST BE LABELED AS: EXTREMELY FLAMMABLE. VAPOR HARMFUL. SEE SECTION XI FOR ADDITIONAL LABELING INFORMATION.

********** XI. TOXICOLOGICAL DATA **********

ACUTE

ORAL TOXICITY: (RATS) LD50 GREATER THAN 5 G/KG. CONSIDERED TO BE NO MORE THAN SLIGHTLY TOXIC BASED ON SINGLE DOSE LEVEL TESTING AT 5 G/KG.

DERMAL TOXICITY: (RABBITS) LD50 GREATER THAN 2 G/KG. CONSIDERED TO BE NO MORE THAN SLIGHTLY TOXIC BASED ON SINGLE DOSE LEVEL TESTING AT 2 G/KG.

INHALATION TOXICITY: (RATS) MODERATELY TOXIC (ESTIMATED) BASED ON TESTING OF SIMILAR PRODUCTS AND/OR THE COMPONENTS.

EYE IRRITATION: (RABBITS) MAY CAUSE SLIGHT IRRITATION, BASED ON TESTING OF SIMILAR PRODUCTS AND/OR COMPONENTS.

SKIN IRRITATION: (RABBITS) MODERATELY IRRITATING TO RABBITS. MAY CAUSE IRRITATION ON PROLONGED OR REPEATED CONTACT.

CHRONIC OR SPECIALIZED (SUMMARY)

RECENT STUDIES WITH LABORATORY ANIMALS HAVE SHOWN THAT GASOLINE VAPORS ADMINISTERED IN HIGH CONCENTRATIONS OVER A PROLONGED PERIOD OF TIME (TWO YEAR LIFE TIME STUDIES) CAUSED KIDNEY DAMAGE AND KIDNEY CANCER IN MALE RATS AND LIVER CANCER IN FEMALE MICE. THESE EFFECTS WERE NOT SEEN IN FEMALE RATS OR MALE MICE.

GENERALLY, HUMAN EXPOSURES TO GASOLINE VAPORS ARE CONSIDERABLY LESS THAN THOSE USED IN THE ANIMAL TOXICITY STUDIES. AS FAR AS SCIENTISTS KNOW, LOW LEVEL OR INFREQUENT EXPOSURE TO GASOLINE VAPORS IS UNLIKELY TO BE ASSOCIATED WITH CANCER OR OTHER SERIOUS DISEASES IN HUMANS.

REGULAR LEADED GASOLINE CONTAINS LEAD COMPOUNDS. LEAD CAN BE A CUMULATIVE POISON.

OTHER DATA

GASOLINE CONSISTS OF A COMPLEX BLEND OF PETROLEUM/PROCESSING DERIVED PARAFFINIC, OLEFINIC, NAPHTHENIC AND AROMATIC HYDROCARBONS WHICH MAY CONTAIN UP TO 5 PERCENT BENZENE, WITH 1-2 PERCENT BEING TYPICAL IN THE U. S.; AND LOW LEVELS OF MULTIFUNCTIONAL ADDITIVES. REPEATED EXPOSURE TO LOW LEVELS OF BENZENE (<100 PPM) HAS BEEN REPORTED TO RESULT IN BLOOD ABNORMALITIES IN BOTH ANIMALS AND HUMANS, INCLUDING ANEMIA AND, IN RARE CASES, LEUKEMIA. THESE EFFECTS WERE NOT OBSERVED IN LABORATORY ANIMALS FOLLOWING REPEATED EXPOSURE TO VAPORS FROM UNLEADED GASOLINE CONTAINING 2 PERCENT BENZENE.

THE U.S. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) FINALIZED AN UPDATED REGULATION ON BENZENE ON SEPTEMBER 11, 1987. THIS STANDARD EXEMPTS THE STORAGE, TRANSPORTATION, DISTRIBUTION, DISPENSING, SALE OR USE OF GASOLINE, MOTOR FUELS, OR OTHER FUELS CONTAINING BENZENE, SUBSEQUENT TO THE FINAL DISCHARGE FROM BULK WHOLESALE STORAGE FACILITIES. CERTAIN INDOOR MOTOR FUEL DISPENSING OPERATIONS ARE COVERED REGARDLESS OF THE EXEMPTION. THE STANDARD ESTABLISHES REQUIREMENTS COVERING POTENTIAL EMPLOYEE EXPOSURES, CONTAINER LABELING, MEDICAL PROGRAMS, AND EMPLOYEE TRAINING. REFER TO CHAPTER 29 OF THE CODE OF FEDERAL REGULATIONS (CFR) PART 1910.1028 FOR SPECIFIC GUIDANCE. THE OSHA MANDATED LABEL OF "DANGER, CONTAINS BENZENE

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AUTOMOTIVE GASOLINES

********** XII. REGULATORY INFORMATION **********

TSCA INVENTORY STATUS: ALL COMPONENTS REGISTERED.

D.O.T. SHIPPING NAME: GASOLINE D.O.T. HAZARD CLASS: FLAMMABLE LIQUID
DOT ID NUMBER: UN 1203

US OSHA HAZARD COMMUNICATION STANDARD: PRODUCT ASSESSED IN ACCORDANCE WITH OSHA CFR 1910.1200 AND DETERMINED TO BE HAZARDOUS.

RCRA INFORMATION: THE DISPOSAL OF THE UNUSED PRODUCT MAY BE SUBJECT TO RCRA REGULATIONS PER 40 CFR PART 261 FOR THE REASONS INCLUDING, BUT NOT LIMITED TO THOSE LISTED BELOW. DISPOSAL OF THE USED PRODUCT MAY BE REGULATED.

TETRAETHYL LEAD: 0.0035 PCT (LEADED GASOLINE)
FLASH: -40(-40) F(C)

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT (SARA) TITLE III:

EXTREMELY HAZARDOUS SUBSTANCES FOR EMERGENCY RESPONSE AND PLANNING

COMPONENT	CAS NUMBER	PERCENT	TPQ(LBS)	RQ(LBS)
TETRAETHYL LEAD (LEADED GASOLINE ONLY)	78-00-2	0.0035	100	10

PRODUCT QUANTITY (GALS) WHICH RESULTS IN AN RQ OF AN EHS: 45000

TOXIC CHEMICALS FOR EMISSION REPORTING

COMPONENT	CAS NUMBER	PERCENT (TYPICAL)
TOLUENE	108-88-3	10
XYLENE	1330-20-7	9
1,2,4-TRIMETHYLBENZENE	95-63-6	3
BENZENE	71-43-2	2
ETHYLBENZENE	100-41-4	2
METHYL TERT-BUTYL ETHER	1634-04-4	15 (MAXIMUM)

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AUTOMOTIVE GASOLINES

********** APPENDIX **********

PRECAUTIONARY LABEL TEXT:
GASOLINE

FOR USE AS MOTOR FUEL ONLY.
DANGER.

EXTREMELY FLAMMABLE. HARMFUL OR FATAL IF SWALLOWED. VAPOR HARMFUL.

LONG-TERM EXPOSURE TO VAPORS HAS CAUSED CANCER IN LABORATORY ANIMALS.

KEEP AWAY FROM HEAT, SPARKS AND FLAME. AVOID PROLONGED BREATHING OF VAPOR. KEEP CONTAINER CLOSED. USE ONLY WITH ADEQUATE VENTILATION. NOT TO BE USED AS A SKIN CLEANSING AGENT. NEVER SIPHON BY MOUTH. KEEP AWAY FROM EYES AND SKIN. FAILURE TO USE CAUTION MAY CAUSE SERIOUS INJURY OR ILLNESS.

FIRST AID: IF SWALLOWED, DO NOT INDUCE VOMITING. CALL A PHYSICIAN IMMEDIATELY.
IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION, PREFERABLY MOUTH-TO-MOUTH AND CALL A PHYSICIAN.

ATTENTION
EMPTY CONTAINERS MAY CONTAIN PRODUCT RESIDUE, INCLUDING FLAMMABLE OR EXPLOSIVE VAPORS. DO NOT CUT, PUNCTURE OR WELD ON OR NEAR CONTAINER. ALL LABEL WARNINGS AND PRECAUTIONS MUST BE OBSERVED UNTIL CONTAINER HAS BEEN THOROUGHLY CLEANED OR DESTROYED.

REFER TO PRODUCT MATERIAL SAFETY DATA BULLETIN FOR FURTHER SAFETY AND HEALTH INFORMATION.

MOBIL OIL CORPORATION, NEW YORK, N.Y.

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PREPARED BY: MOBIL OIL CORPORATION
ENVIRONMENTAL AFFAIRS AND TOXICOLOGY, PRINCETON, NJ
REVISED: 05/01/88

FOR FURTHER INFORMATION CONTACT:
MOBIL OIL CORPORATION
LUBE PRODUCT MANAGEMENT ATTN: MSDS ANALYST
3225 GALLOWS ROAD, FAIRFAX, VA 22037 (703) 849-3265

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INFORMATION GIVEN HEREIN IS OFFERED IN GOOD FAITH AS ACCURATE, BUT WITHOUT GUARANTEE. CONDITIONS OF USE AND SUITABILITY OF THE PRODUCT FOR PARTICULAR USES ARE BEYOND OUR CONTROL; ALL RISKS OF USE OF THE PRODUCT ARE THEREFORE ASSUMED BY THE USER AND WE EXPRESSLY DISCLAIM ALL WARRANTIES OF EVERY KIND AND NATURE, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE IN RESPECT TO THE USE OR SUITABILITY OF THE PRODUCT. NOTHING IS INTENDED AS A RECOMMENDATION FOR USES WHICH INFRINGE VALID PATENTS OR AS EXTENDING LICENCSE UNDER VALID PATENTS. APPROPRIATE WARNINGS AND SAFE HANDLING PROCEDURES SHOULD BE PROVIDED TO HANDLERS AND USERS.

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REVISED: 01/13/89

MOBIL OIL CORPORATION MATERIAL SAFETY DATA BULLETIN

********** I. PRODUCT IDENTIFICATION **********

DIESEL FUELS

SUPPLIER: MOBIL OIL CORP.
CHEMICAL NAMES AND SYNONYMS:
HYDROCARBONS AND ADDITIVES
USE OR DESCRIPTION: FUEL OIL

HEALTH EMERGENCY TELEPHONE: 212-883-4411
TRANSPORT EMERGENCY TELEPHONE: 800-424-9300 (CHEMTREC)
PRODUCT TECHNICAL INFORMATION: 800-662-4525

********** II. TYPICAL CHEMICAL AND PHYSICAL PROPERTIES **********

APPEARANCE:
CLEAR TO AMBER LIQUID
ODOR:
HYDROCARBON
RELATIVE DENSITY: 15/4 C
0.82 - 0.87

VISCOSITY: AT 100 F, SUS 31.0 - 40.0 AT 40 C, CST 1.3 - 4.1
BOILING RANGE: NO.1 300-550 F NO.2 350-700 F
FLASH POINT: F(C) (ASTM D-93) NO.1: 100(40) NO.2: 125(52)

SOLUBILITY IN WATER: NEGLIGIBLE
VAPOR PRESSURE: 0.5 MM HG 20C

(FOR ADDITIONAL INFORMATION PLEASE CONTACT YOUR LOCAL MARKETING OFFICE)

********** III. INGREDIENTS **********

HAZARDOUS INGREDIENTS:	WT PCT (APPROX)	EXPOSURE LIMIT MG/M3	EXPOSURE LIMIT PPM	SOURCES (AND NOTES)
DIESEL OIL (CAS NO. 68334-30-5)	100	575	100	A*

KEY TO SOURCES: A=ACGIH-TLV, A*=SUGGESTED-TLV, M=MOBIL, O=OSHA
NOTE: LIMITS SHOWN ARE FOR GUIDANCE ONLY. FOLLOW APPLICABLE REGULATIONS.

********** IV. HEALTH HAZARD SUMMARY **********

-- INCLUDES AGGRAVATED MEDICAL CONDITIONS, IF ESTABLISHED --

THRESHOLD LIMIT VALUE: NO TLV ESTABLISHED. SUGGESTED TWA EXPOSURE LIMIT OF 100 PPM.

EFFECTS OF OVEREXPOSURE: SLIGHT SKIN IRRITATION. RESPIRATORY IRRITATION, DIZZINESS, NAUSEA, LOSS OF CONSCIOUSNESS. THIS PRODUCT MAY CONTAIN TRACE QUANTITIES OF POLYCYCLIC AROMATIC HYDROCARBONS (PCAH). UNDER CONDITIONS OF POOR PERSONAL HYGIENE AND PROLONGED, REPEATED CONTACT, SOME PCAH HAVE BEEN SUSPECTED AS A CAUSE OF SKIN CANCER IN HUMANS.

********** V. EMERGENCY AND FIRST AID PROCEDURES **********

--- FOR PRIMARY ROUTES OF ENTRY ---

EYE CONTACT: FLUSH WITH WATER.
SKIN CONTACT: WASH CONTACT AREAS WITH SOAP AND WATER.
INHALATION: REMOVE FROM FURTHER EXPOSURE. IF UNCONSCIOUSNESS OCCURS, SEEK IMMEDIATE MEDICAL ASSISTANCE AND CALL A PHYSICIAN. IF BREATHING HAS STOPPED, USE MOUTH TO MOUTH RESUSCITATION.
INGESTION: DO NOT INDUCE VOMITING. ADMINISTER VEGETABLE OIL. GET MEDICAL ASSISTANCE. (NOTE TO PHYSICIAN: MATERIAL IF ASPIRATED INTO THE LUNGS MAY CAUSE CHEMICAL PNEUMONITIS. TREAT APPROPRIATELY.)

********** VI. FIRE AND EXPLOSION DATA **********

FLASH POINT: F(C) (ASTM D-93)
NO.1: 100(40) NO.2: 125(52)

FLAMMABLE LIMITS: LEL: NE UEL: NE

NFPA CODES:
HEALTH 0
FLAMMABILITY 2
REACTIVITY 0

EXTINGUISHING MEDIA:
CO2, FOAM, DRY CHEMICAL OR WATER FOG

SPECIAL FIRE FIGHTING PROCEDURES:

Mobil

DIESEL FUELS

VII. REACTIVITY DATA

STABILITY: STABLE HAZARDOUS POLYMERIZATION: WILL NOT OCCUR
CONDITIONS TO AVOID: HEAT, SPARKS, FLAME, AND BUILD UP OF STATIC ELECTRICITY.
INCOMPATIBLE MATERIALS: HALOGENS, STRONG ACIDS, ALKALINES AND OXIDIZERS.
HAZARDOUS DECOMPOSITION PRODUCTS: CARBON MONOXIDE FROM INCOMPLETE COMBUSTION.

VIII. SPILL OR LEAK PROCEDURES

ENVIRONMENTAL IMPACT: REPORT SPILLS AS REQUIRED TO APPROPRIATE AUTHORITIES. IN CASE OF ACCIDENT OR ROAD SPILL NOTIFY CHEMTREC (800-424-9300). U.S. COAST GUARD REGULATIONS REQUIRE IMMEDIATE REPORTING OF SPILLS THAT COULD REACH ANY WATERWAY INCLUDING INTERMITTENT DRY CREEKS. THE COAST GUARD TOLL FREE NUMBER IS (800-424-8802).
PROCEDURES IF MATERIAL IS RELEASED OR SPILLED: ADSORB ON FIRE RETARDANT TREATED SAWDUST, DIATOMACEOUS EARTH, ETC. SHOVEL UP AND DISPOSE AT AN APPROPRIATE WASTE DISPOSAL FACILITY IN ACCORDANCE WITH CURRENT LAWS AND REGULATIONS, AND PRODUCT CHARACTERISTICS AT TIME OF DISPOSAL.
WASTE MANAGEMENT: PRODUCT IS SUITABLE FOR BURNING FOR FUEL VALUE IN COMPLIANCE WITH APPLICABLE LAWS AND REGULATIONS.

IX. SPECIAL PROTECTION INFORMATION

EYE PROTECTION: NO SPECIAL EQUIPMENT REQUIRED
SKIN PROTECTION: IF SKIN CONTACT IS LIKELY, IMPERVIOUS GLOVES SHOULD BE WORN. GOOD PERSONAL HYGIENE PRACTICES SHOULD ALWAYS BE FOLLOWED.
RESPIRATORY PROTECTION: NO SPECIAL REQUIREMENTS UNDER ORDINARY CONDITIONS OF USE AND WITH ADEQUATE VENTILATION.
VENTILATION: VENTILATION DESIRABLE AND EQUIPMENT MUST BE EXPLOSION PROOF. USE IN WELL VENTILATED AREA.

X. SPECIAL PRECAUTIONS

STORED MATERIAL MUST BE LABELED AS: COMBUSTIBLE
STORAGE: STORE IN A COOL AREA.

XI. TOXICOLOGICAL DATA

ACUTE

ORAL TOXICITY: SLIGHTLY TOXIC (ESTIMATED) - BASED ON TESTING OF SIMILAR PRODUCTS AND/OR THE COMPONENTS.
DERMAL TOXICITY: (RABBITS) NONTOXIC (ESTIMATED) - BASED ON TESTING OF SIMILAR PRODUCTS AND/OR THE COMPONENTS.
INHALATION TOXICITY: (RATS) SLIGHTLY TOXIC (ESTIMATED) - BASED ON TESTING OF SIMILAR PRODUCTS AND/OR THE COMPONENTS.
EYE IRRITATION: (RABBITS) EXPECTED TO BE NON-IRRITATING - BASED ON TESTING OF SIMILAR PRODUCTS AND/OR COMPONENTS.
SKIN IRRITATION: (RABBITS) MAY CAUSE SLIGHT IRRITATION ON PROLONGED OR REPEATED CONTACT - BASED ON TESTING OF SIMILAR PRODUCTS AND/OR THE COMPONENTS.

CHRONIC OR SPECIALIZED (SUMMARY)

THIS PRODUCT MAY CONTAIN TRACE QUANTITIES OF POLYCYCLIC AROMATIC HYDROCARBONS, SOME OF WHICH HAVE BEEN SHOWN TO CAUSE SKIN CANCER IN LABORATORY ANIMALS AFTER PROLONGED, REPEATED SKIN CONTACT.

Mobil

DIESEL FUELS

XII. REGULATORY INFORMATION

TSCA INVENTORY STATUS: ALL COMPONENTS REGISTERED.

D.O.T. SHIPPING NAME: FUEL OIL D.O.T. HAZARD CLASS: COMBUSTIBLE LIQUID
ID NUMBER: NA 1993

US OSHA HAZARD COMMUNICATION STANDARD: PRODUCT ASSESSED IN ACCORDANCE WITH OSHA CFR 1910.1200 AND DETERMINED TO BE HAZARDOUS.

RCRA INFORMATION: THE DISPOSAL OF THE UNUSED PRODUCT MAY BE SUBJECT TO RCRA REGULATIONS PER 40 CFR PART 261 FOR THE REASONS INCLUDING, BUT NOT LIMITED TO THOSE LISTED BELOW. DISPOSAL OF THE USED PRODUCT MAY BE REGULATED.
FLASH: LESS THAN 140 F

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT (SARA) TITLE III:
EXTREMELY HAZARDOUS SUBSTANCES FOR EMERGENCY RESPONSE AND PLANNING
THIS PRODUCT CONTAINS NO EXTREMELY HAZARDOUS SUBSTANCES.
TOXIC CHEMICALS FOR EMISSION REPORTING
THIS PRODUCT CONTAINS NO TOXIC CHEMICALS AT CONCENTRATIONS ABOVE THE ESTABLISHED DE MINIMIS LEVELS.

APPENDIX

PRECAUTIONARY LABEL TEXT:

PETROLEUM DISTILLATE

DANGER.
HARMFUL OR FATAL IF SWALLOWED. VAPOR HARMFUL. COMBUSTIBLE.

KEEP AWAY FROM HEAT AND FLAME. AVOID PROLONGED BREATHING OF VAPOR. KEEP CONTAINER CLOSED. USE ONLY WITH ADEQUATE VENTILATION. AVOID PROLONGED OR REPEATED SKIN CONTACT.

FIRST AID: IF SWALLOWED, DO NOT INDUCE VOMITING. CALL A PHYSICIAN IMMEDIATELY.
IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION, PREFERABLY MOUTH-TO-MOUTH AND CALL A PHYSICIAN.

ATTENTION
EMPTY CONTAINERS MAY CONTAIN PRODUCT RESIDUE, INCLUDING FLAMMABLE OR EXPLOSIVE VAPORS. DO NOT CUT, PUNCTURE OR WELD ON OR NEAR CONTAINER. ALL LABEL WARNINGS AND PRECAUTIONS MUST BE OBSERVED UNTIL CONTAINER HAS BEEN THOROUGHLY CLEANED OR DESTROYED.

REFER TO PRODUCT MATERIAL SAFETY DATA BULLETIN FOR FURTHER SAFETY AND HEALTH INFORMATION.

MOBIL OIL CORPORATION, NEW YORK, N.Y.

Mobil

DIESEL FUELS

********** XII. REGULATORY INFORMATION **********

PREPARED BY: MOBIL OIL CORPORATION
ENVIRONMENTAL AFFAIRS AND TOXICOLOGY, PRINCETON, NJ

REVISED:
01/13/89

FOR FURTHER INFORMATION CONTACT:
MOBIL OIL CORPORATION
LUBE PRODUCT MANAGEMENT ATTN: MSDS ANALYST
3225 GALLOWS ROAD, FAIRFAX, VA 22037 (703) 849-3265

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New oil we will be using in our CAT Equipment

HD10

ExxonMobil

MATERIAL SAFETY DATA SHEET

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

PRODUCT

Product Name: **MOBILTRANS HD 10W**
Product Description: Hydrocarbons and Additives
Product Code: 521120-00, 973296
Intended Use: Manual transmission fluid

CAT machines Hyd System only

COMPANY IDENTIFICATION

Supplier:	**EXXON MOBIL CORPORATION** 3225 GALLOWS RD. FAIRFAX, VA. 22037 USA
24 Hour Health Emergency	609-737-4411
Transportation Emergency Phone	800-424-9300
ExxonMobil Transportation No.	281-834-3296
MSDS Requests	713-613-3661
Product Technical Information	800-662-4525, 800-947-9147

SECTION 2 COMPOSITION / INFORMATION ON INGREDIENTS

No Reportable Hazardous Substance(s) or Complex Substance(s).

SECTION 3 HAZARDS IDENTIFICATION

This material is not considered to be hazardous according to regulatory guidelines (see (M)SDS Section 15).

POTENTIAL HEALTH EFFECTS

Low order of toxicity. Excessive exposure may result in eye, skin, or respiratory irritation. High-pressure injection under skin may cause serious damage.

ENVIRONMENTAL HAZARDS

Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

NFPA Hazard ID:	Health:	0	Flammability:	1	Reactivity:	0
HMIS Hazard ID:	Health:	0	Flammability:	1	Reactivity:	0

NOTE: This material should not be used for any other purpose than the intended use in Section 1 without expert advice. Health studies have shown that chemical exposure may cause potential human health risks which may vary from person to person.

SECTION 4 FIRST AID MEASURES

INHALATION

At ambient/normal handling temperatures, minimal or no irritation due to inhalation of vapor/mist is expected.

SKIN CONTACT

Wash contact areas with soap and water. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

EYE CONTACT

Flush thoroughly with water. If irritation occurs, get medical assistance.

INGESTION

First aid is normally not required. Seek medical attention if discomfort occurs.

SECTION 5 FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

Appropriate Extinguishing Media: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.

Inappropriate Extinguishing Media: Straight Streams of Water

FIRE FIGHTING

Fire Fighting Instructions: Evacuate area. Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply. Firefighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.

Hazardous Combustion Products: Aldehydes, Oxides of carbon, Smoke, Fume, Sulfur oxides, Incomplete combustion products

FLAMMABILITY PROPERTIES

Flash Point [Method]: >200°C (392°F) [ASTM D-92]
Flammable Limits (Approximate volume % in air): LEL: 0.9 UEL: 7.0
Autoignition Temperature: N/D

SECTION 6 ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES

In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations. U.S. regulations require reporting releases of this material to the environment which exceed the reportable quantity or oil spills which could reach any waterway including intermittent dry creeks. The National Response Center can be reached at (800)424-8802.

SPILL MANAGEMENT

Land Spill: Stop leak if you can do it without risk. Recover by pumping or with suitable absorbent.

Water Spill: Confine the spill immediately with booms. Stop leak if you can do it without risk. Warn other

shipping. Remove from the surface by skimming or with suitable absorbents. Seek the advice of a specialist before using dispersants.

Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted. Note: Local regulations may prescribe or limit action to be taken.

ENVIRONMENTAL PRECAUTIONS

Prevent entry into waterways, sewers, basements or confined areas. Large Spills: Dike far ahead of liquid spill for later recovery and disposal.

SECTION 7 HANDLING AND STORAGE

HANDLING

Prevent small spills and leakage to avoid slip hazard.

Static Accumulator: This material is a static accumulator.

STORAGE

Do not store in open or unlabelled containers.

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure limits/standards for materials that can be formed when handling this product: When mists / aerosols can occur, the following are recommended: 5 mg/m³ - ACGIH TLV, 10 mg/m³ - ACGIH STEL, 5 mg/m³ - OSHA PEL.

NOTE: Limits/standards shown for guidance only. Follow applicable regulations.

ENGINEERING CONTROLS

The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Control measures to consider:

No special requirements under ordinary conditions of use and with adequate ventilation.

PERSONAL PROTECTION

Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for use with this material, as provided below, is based upon intended, normal usage.

Respiratory Protection: If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to be considered for this material include:

No special requirements under ordinary conditions of use and with adequate ventilation.

For high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode. Supplied air respirators with an escape bottle may be appropriate when oxygen levels are inadequate, gas/vapor warning properties are poor, or if air purifying filter capacity/rating may be exceeded.

Hand Protection: Any specific glove information provided is based on published literature and glove manufacturer data. Work conditions can greatly effect glove durability; inspect and replace worn or damaged gloves. The types of gloves to be considered for this material include:

No protection is ordinarily required under normal conditions of use.

Eye Protection: If contact is likely, safety glasses with side shields are recommended.

Skin and Body Protection: Any specific clothing information provided is based on published literature or manufacturer data. The types of clothing to be considered for this material include:

No skin protection is ordinarily required under normal conditions of use. In accordance with good industrial hygiene practices, precautions should be taken to avoid skin contact.

Specific Hygiene Measures: Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practice good housekeeping.

ENVIRONMENTAL CONTROLS

See Sections 6, 7, 12, 13.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Typical physical and chemical properties are given below. Consult the Supplier in Section 1 for additional data.

GENERAL INFORMATION

Physical State: Liquid
Color: Amber
Odor: Characteristic
Odor Threshold: N/D

IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

Relative Density (at 15 °C): 0.888
Flash Point [Method]: >200°C (392°F) [ASTM D-92]
Flammable Limits (Approximate volume % in air): LEL: 0.9 UEL: 7.0
Autoignition Temperature: N/D
Boiling Point / Range: > 316°C (600°F)
Vapor Density (Air = 1): > 2 at 101 kPa
Vapor Pressure: < 0.013 kPa (0.1 mm Hg) at 20°C
Evaporation Rate (n-butyl acetate = 1): N/D
pH: N/A
Log Pow (n-Octanol/Water Partition Coefficient): > 3.5
Solubility in Water: Negligible
Viscosity: 42 cSt (42 mm²/sec) at 40 °C | 6.3 cSt (6.3 mm²/sec) at 100°C
Oxidizing Properties: See Sections 3, 15, 16.

OTHER INFORMATION

Freezing Point: N/D
Melting Point: N/A
Pour Point: -33°C (-27°F)
DMSO Extract (mineral oil only), IP-346: < 3 %wt

SECTION 10 STABILITY AND REACTIVITY

STABILITY: Material is stable under normal conditions.

CONDITIONS TO AVOID: Excessive heat. High energy sources of ignition.

MATERIALS TO AVOID: Strong oxidizers

HAZARDOUS DECOMPOSITION PRODUCTS: Material does not decompose at ambient temperatures.

HAZARDOUS POLYMERIZATION: Will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

ACUTE TOXICITY

Route of Exposure	Conclusion / Remarks
Inhalation	
Toxicity (Rat): LC50 > 5000 mg/m³	Minimally Toxic. Based on test data for structurally similar materials.
Irritation: Data available.	Elevated temperatures or mechanical action may form vapors, mist, or fumes which may be irritating to the eyes, nose, throat, or lungs. Based on assessment of the components.
Ingestion	
Toxicity (Rat): LD50 > 2000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials.
Skin	
Toxicity (Rabbit): LD50 > 2000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials.
Irritation (Rabbit): Data available.	Negligible irritation to skin at ambient temperatures. Based on test data for structurally similar materials.
Eye	
Irritation (Rabbit): Data available.	May cause mild, short-lasting discomfort to eyes. Based on test data for structurally similar materials.

CHRONIC/OTHER EFFECTS

For the product itself:

Repeated and/or prolonged exposure may cause irritation to the skin, eyes, or respiratory tract.

Contains:

Base oil severely refined: Not carcinogenic in animal studies. Representative material passes IP-346, Modified Ames test, and/or other screening tests. Dermal and inhalation studies showed minimal effects; lung non-specific infiltration of immune cells, oil deposition and minimal granuloma formation. Not sensitizing in test animals.

Additional information is available by request.

The following ingredients are cited on the lists below: None.

--REGULATORY LISTS SEARCHED--

1 = NTP CARC	3 = IARC 1	5 = IARC 2B
2 = NTP SUS	4 = IARC 2A	6 = OSHA CARC

SECTION 12 ECOLOGICAL INFORMATION

The information given is based on data available for the material, the components of the material, and similar materials.

ECOTOXICITY

Material -- Expected to be harmful to aquatic organisms.

MOBILITY

Base oil component -- Low solubility and floats and is expected to migrate from water to the land. Expected to partition to sediment and wastewater solids.

PERSISTENCE AND DEGRADABILITY

Biodegradation:

Base oil component -- Expected to be inherently biodegradable

SECTION 13 DISPOSAL CONSIDERATIONS

Disposal recommendations based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

DISPOSAL RECOMMENDATIONS

Product is suitable for burning in an enclosed controlled burner for fuel value or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products.

REGULATORY DISPOSAL INFORMATION

RCRA Information: The unused product, in our opinion, is not specifically listed by the EPA as a hazardous waste (40 CFR, Part 261D), nor is it formulated to contain materials which are listed as hazardous wastes. It does not exhibit the hazardous characteristics of ignitability, corrosivity or reactivity and is not formulated with contaminants as determined by the Toxicity Characteristic Leaching Procedure (TCLP). However, used product may be regulated.

Empty Container Warning PRECAUTIONARY LABEL TEXT: Empty containers may retain residue and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to refill or clean container since residue is difficult to remove. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.

SECTION 14 TRANSPORT INFORMATION

LAND (DOT) : Not Regulated for Land Transport

LAND (TDG) : Not Regulated for Land Transport

SEA (IMDG) : Not Regulated for Sea Transport according to IMDG-Code

AIR (IATA) : Not Regulated for Air Transport

SECTION 15 REGULATORY INFORMATION

OSHA HAZARD COMMUNICATION STANDARD: When used for its intended purposes, this material is not classified as hazardous in accordance with OSHA 29 CFR 1910.1200.

NATIONAL CHEMICAL INVENTORY LISTING: AICS, DSL, EINECS, ENCS, KECI, PICCS, TSCA

EPCRA: This material contains no extremely hazardous substances.

ARA (311/312) REPORTABLE HAZARD CATEGORIES: None.

SARA (313) TOXIC RELEASE INVENTORY: This material contains no chemicals subject to the supplier notification requirements of the SARA 313 Toxic Release Program.

The Following Ingredients are Cited on the Lists Below:

Chemical Name	CAS Number	List Citations
SOLVENT DEWAXED HEAVY PARAFFINIC DISTILLATE	64742-65-0	13, 18

--REGULATORY LISTS SEARCHED--

1 = ACGIH ALL	6 = TSCA 5a2	11 = CA P65 REPRO	16 = MN RTK
2 = ACGIH A1	7 = TSCA 5e	12 = CA RTK	17 = NJ RTK
3 = ACGIH A2	8 = TSCA 6	13 = IL RTK	18 = PA RTK
4 = OSHA Z	9 = TSCA 12b	14 = LA RTK	19 = RI RTK
5 = TSCA 4	10 = CA P65 CARC	15 = MI 293	

Code key: CARC=Carcinogen; REPRO=Reproductive

SECTION 16 OTHER INFORMATION

N/D = Not determined, N/A = Not applicable

THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:
No revision information is available.

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DGN: 2005848XUS (518367)

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MATERIAL SAFETY DATA SHEET

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

PRODUCT

Product Name: **MOBILTRANS HD 30**
Product Description: Hydrocarbons and Additives
Product Code: 521138-00, 973916
Intended Use: Manual transmission fluid

COMPANY IDENTIFICATION

Supplier: EXXON MOBIL CORPORATION
3225 GALLOWS RD.
FAIRFAX, VA. 22037 USA

24 Hour Health Emergency	609-737-4411
Transportation Emergency Phone	800-424-9300
ExxonMobil Transportation No.	281-834-3296
MSDS Requests	713-613-3661
Product Technical Information	800-662-4525, 800-947-9147

SECTION 2 COMPOSITION / INFORMATION ON INGREDIENTS

No Reportable Hazardous Substance(s) or Complex Substance(s).

SECTION 3 HAZARDS IDENTIFICATION

This material is not considered to be hazardous according to regulatory guidelines (see (M)SDS Section 15).

POTENTIAL HEALTH EFFECTS

Low order of toxicity. Excessive exposure may result in eye, skin, or respiratory irritation. High-pressure injection under skin may cause serious damage.

ENVIRONMENTAL HAZARDS

Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

NFPA Hazard ID:	Health:	0	Flammability:	1	Reactivity: 0
HMIS Hazard ID:	Health:	0	Flammability:	1	Reactivity: 0

NOTE: This material should not be used for any other purpose than the intended use in Section 1 without expert advice. Health studies have shown that chemical exposure may cause potential human health risks which may vary from person to person.

SECTION 4 FIRST AID MEASURES

INHALATION

At ambient/normal handling temperatures, minimal or no irritation due to inhalation of vapor/mist is expected.

SKIN CONTACT

If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury. Wash contact areas with soap and water.

EYE CONTACT

Flush thoroughly with water. If irritation occurs, get medical assistance.

INGESTION

First aid is normally not required. Seek medical attention if discomfort occurs.

SECTION 5 FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

Appropriate Extinguishing Media: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.

Inappropriate Extinguishing Media: Straight Streams of Water

RE FIGHTING

Fire Fighting Instructions: Evacuate area. Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply. Firefighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.

Hazardous Combustion Products: Aldehydes, Oxides of carbon, Smoke, Fume, Sulfur oxides, Incomplete combustion products

FLAMMABILITY PROPERTIES

Flash Point [Method]: >103°C (218°F) [ASTM D-92]
Flammable Limits (Approximate volume % in air): LEL: 0.9 UEL: 7.0
Autoignition Temperature: N/D

SECTION 6 ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES

In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations. U.S. regulations require reporting releases of this material to the environment which exceed the reportable quantity or oil spills which could reach any waterway including intermittent dry creeks. The National Response Center can be reached at (800)424-8802.

SPILL MANAGEMENT

Land Spill: Stop leak if you can do it without risk. Recover by pumping or with suitable absorbent.

Water Spill: Confine the spill immediately with booms. Stop leak if you can do it without risk. Warn other

shipping. Remove from the surface by skimming or with suitable absorbents. Seek the advice of a specialist before using dispersants.

Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted. Note: Local regulations may prescribe or limit action to be taken.

ENVIRONMENTAL PRECAUTIONS

Large Spills: Dike far ahead of liquid spill for later recovery and disposal. Prevent entry into waterways, sewers, basements or confined areas.

SECTION 7 HANDLING AND STORAGE

HANDLING

Prevent small spills and leakage to avoid slip hazard.

Static Accumulator: This material is a static accumulator.

STORAGE

Do not store in open or unlabelled containers.

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure limits/standards for materials that can be formed when handling this product: When mists / aerosols can occur, the following are recommended: 5 mg/m³ - ACGIH TLV, 10 mg/m³ - ACGIH STEL, 5 mg/m³ - OSHA PEL.

NOTE: Limits/standards shown for guidance only. Follow applicable regulations.

ENGINEERING CONTROLS

The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Control measures to consider:

No special requirements under ordinary conditions of use and with adequate ventilation.

PERSONAL PROTECTION

Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for use with this material, as provided below, is based upon intended, normal usage.

Respiratory Protection: If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to be considered for this material include:

No special requirements under ordinary conditions of use and with adequate ventilation.

For high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode. Supplied air respirators with an escape bottle may be appropriate when oxygen levels are inadequate, gas/vapor warning properties are poor, or if air purifying filter capacity/rating may be exceeded.

Hand Protection: Any specific glove information provided is based on published literature and glove manufacturer data. Work conditions can greatly effect glove durability; inspect and replace worn or damaged gloves. The types of gloves to be considered for this material include:
No protection is ordinarily required under normal conditions of use.

Eye Protection: If contact is likely, safety glasses with side shields are recommended.

Skin and Body Protection: Any specific clothing information provided is based on published literature or manufacturer data. The types of clothing to be considered for this material include:
No skin protection is ordinarily required under normal conditions of use. In accordance with good industrial hygiene practices, precautions should be taken to avoid skin contact.

Specific Hygiene Measures: Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practice good housekeeping.

ENVIRONMENTAL CONTROLS
See Sections 6, 7, 12, 13.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Typical physical and chemical properties are given below. Consult the Supplier in Section 1 for additional data.

GENERAL INFORMATION
Physical State: Liquid
Color: Amber
Odor: Characteristic
Odor Threshold: N/D

IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION
Relative Density (at 15 °C): 0.893
Flash Point [Method]: >103°C (218°F) [ASTM D-92]
Flammable Limits (Approximate volume % in air): LEL: 0.9 UEL: 7.0
Autoignition Temperature: N/D
Boiling Point / Range: > 316°C (600°F)
Vapor Density (Air = 1): > 2 at 101 kPa
Vapor Pressure: < 0.013 kPa (0.1 mm Hg) at 20°C
Evaporation Rate (n-butyl acetate = 1): N/D
pH: N/A
Log Pow (n-Octanol/Water Partition Coefficient): > 3.5
Solubility in Water: Negligible
Viscosity: 100 cSt (100 mm²/sec) at 40 °C | 11.2 cSt (11.2 mm²/sec) at 100°C
Oxidizing Properties: See Sections 3, 15, 16.

OTHER INFORMATION

Freezing Point: N/D
Melting Point: N/A
Pour Point: -18°C (0°F)
DMSO Extract (mineral oil only), IP-346: < 3 %wt

SECTION 10 STABILITY AND REACTIVITY

STABILITY: Material is stable under normal conditions.

CONDITIONS TO AVOID: Excessive heat. High energy sources of ignition.

MATERIALS TO AVOID: Strong oxidizers

HAZARDOUS DECOMPOSITION PRODUCTS: Material does not decompose at ambient temperatures.

HAZARDOUS POLYMERIZATION: Will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

ACUTE TOXICITY

Route of Exposure	Conclusion / Remarks
Inhalation	
Toxicity (Rat): LC50 > 5000 mg/m³	Minimally Toxic. Based on test data for structurally similar materials.
Irritation: Data available.	Elevated temperatures or mechanical action may form vapors, mist, or fumes which may be irritating to the eyes, nose, throat, or lungs. Based on assessment of the components.
Ingestion	
Toxicity (Rat): LD50 > 2000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials.
Skin	
Toxicity (Rabbit): LD50 > 2000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials.
Irritation (Rabbit): Data available.	Negligible irritation to skin at ambient temperatures. Based on test data for structurally similar materials.
Eye	
Irritation (Rabbit): Data available.	May cause mild, short-lasting discomfort to eyes. Based on test data for structurally similar materials.

CHRONIC/OTHER EFFECTS

For the product itself:

Repeated and/or prolonged exposure may cause irritation to the skin, eyes, or respiratory tract.

Contains:

Base oil severely refined: Not carcinogenic in animal studies. Representative material passes IP-346, Modified Ames test, and/or other screening tests. Dermal and inhalation studies showed minimal effects; lung non-specific infiltration of immune cells, oil deposition and minimal granuloma formation. Not sensitizing in test animals.

Additional information is available by request.

The following ingredients are cited on the lists below: None.

--REGULATORY LISTS SEARCHED--

1 = NTP CARC	3 = IARC 1	5 = IARC 2B
2 = NTP SUS	4 = IARC 2A	6 = OSHA CARC

SECTION 12 ECOLOGICAL INFORMATION

The information given is based on data available for the material, the components of the material, and similar materials.

ECOTOXICITY

Material -- Expected to be harmful to aquatic organisms.

MOBILITY

Base oil component -- Low solubility and floats and is expected to migrate from water to the land. Expected to partition to sediment and wastewater solids.

PERSISTENCE AND DEGRADABILITY

Biodegradation:

Base oil component -- Expected to be inherently biodegradable

SECTION 13 DISPOSAL CONSIDERATIONS

Disposal recommendations based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

DISPOSAL RECOMMENDATIONS

Product is suitable for burning in an enclosed controlled burner for fuel value or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products.

REGULATORY DISPOSAL INFORMATION

RCRA Information: The unused product, in our opinion, is not specifically listed by the EPA as a hazardous waste (40 CFR, Part 261D), nor is it formulated to contain materials which are listed as hazardous wastes. It does not exhibit the hazardous characteristics of ignitability, corrositivity or reactivity and is not formulated with contaminants as determined by the Toxicity Characteristic Leaching Procedure (TCLP). However, used product may be regulated.

Empty Container Warning PRECAUTIONARY LABEL TEXT: Empty containers may retain residue and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to refill or clean container since residue is difficult to remove. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.

SECTION 14 TRANSPORT INFORMATION

LAND (DOT) : Not Regulated for Land Transport

LAND (TDG) : Not Regulated for Land Transport

SEA (IMDG) : Not Regulated for Sea Transport according to IMDG-Code

AIR (IATA) : Not Regulated for Air Transport

SECTION 15 REGULATORY INFORMATION

OSHA HAZARD COMMUNICATION STANDARD: When used for its intended purposes, this material is not classified as hazardous in accordance with OSHA 29 CFR 1910.1200.

NATIONAL CHEMICAL INVENTORY LISTING: AICS, DSL, EINECS, ENCS, KECI, PICCS, TSCA

EPCRA: This material contains no extremely hazardous substances.

SARA (311/312) REPORTABLE HAZARD CATEGORIES: None.

SARA (313) TOXIC RELEASE INVENTORY: This material contains no chemicals subject to the supplier notification requirements of the SARA 313 Toxic Release Program.

The Following Ingredients are Cited on the Lists Below:

Chemical Name	CAS Number	List Citations
SOLVENT DEWAXED HEAVY PARAFFINIC DISTILLATE	64742-65-0	13, 18

--REGULATORY LISTS SEARCHED--

1 = ACGIH ALL	6 = TSCA 5a2	11 = CA P65 REPRO	16 = MN RTK
2 = ACGIH A1	7 = TSCA 5e	12 = CA RTK	17 = NJ RTK
3 = ACGIH A2	8 = TSCA 6	13 = IL RTK	18 = PA RTK
4 = OSHA Z	9 = TSCA 12b	14 = LA RTK	19 = RI RTK
5 = TSCA 4	10 = CA P65 CARC	15 = MI 293	

Code key: CARC=Carcinogen; REPRO=Reproductive

SECTION 16 OTHER INFORMATION

N/D = Not determined, N/A = Not applicable

THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:
No revision information is available.

The information and recommendations contained herein are, to the best of ExxonMobil's knowledge and belief, accurate and reliable as of the date issued. ExxonMobil assumes no responsibility for accuracy of information unless the document is the most current available from an official ExxonMobil distribution system. The information and recommendations are offered for the user's consideration and examination, and it is the user's responsibility to satisfy itself that they are suitable and complete for its particular use. If buyer repackages this product, legal counsel should be consulted to insure proper health, safety and other necessary information is included on the container. Appropriate warnings and safe-handling procedures should be provided to handlers and users. Alteration of this document is strictly prohibited. Except to the extent required by law, republication or retransmission of this document, in whole or in part, is not permitted. The term, "ExxonMobil" is used for convenience, and may include any one or more of ExxonMobil Chemical Company, Exxon Mobil Corporation, or any affiliates in which they directly or indirectly hold any interest.

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ExxonMobil

440693-00 MOBIL DELVAC 1300 SUPER 15W-40
MATERIAL SAFETY DATA BULLETIN

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1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: MOBIL DELVAC 1300 SUPER 15W-40
SUPPLIER: EXXONMOBIL OIL CORPORATION
3225 GALLOWS RD.
FAIRFAX, VA 22037

24 - Hour Health and Safety Emergency (call collect): 609-737-4411

24 - Hour Transportation Emergency:
CHEMTREC: 800-424-9300 202-483-7616
LUBES AND FUELS: 281-834-3296

Product and Technical Information:
Lubricants and Specialties: 800-662-4525 800-443-9966
Fuels Products: 800-947-9147
MSDS Fax on Demand: 713-613-3661
MSDS Internet Website: http://www.exxon.com, http://www.mobil.com

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2. COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL NAMES AND SYNONYMS: SEVERE TREAT MIN. OILS & ADDITIVES

GLOBALLY REPORTABLE MSDS INGREDIENTS:

Substance Name	Approx. Wt%
PHOSPHORODITHIOIC ACID, O,O-DI-C1-14-ALKYL ESTERS, ZINC SALT (2:1) ZDDP (68649-42-3)	1-5

See Section 8 for exposure limits (if applicable).

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3. HAZARDS IDENTIFICATION

Under normal conditions of use, this product is not considered hazardous according to regulatory guidelines (See section 15).

EMERGENCY OVERVIEW: Brown Liquid. DOT ERG No. : NA

POTENTIAL HEALTH EFFECTS: Under normal conditions of intended use, this product does not pose a risk to health. Excessive exposure may result in eye, skin or respiratory irritation.

For further health effects/toxicological data, see Section 11.

4. FIRST AID MEASURES

EYE CONTACT: Flush thoroughly with water. If irritation occurs, call a physician.

SKIN CONTACT: Wash contact areas with soap and water. Remove and clean oil soaked clothing daily and wash affected area. (See Section 16 - Injection Injury)

INHALATION: Not expected to be a problem. However, if respiratory irritation, dizziness, nausea, or unconsciousness occurs due to excessive vapor or mist exposure, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or mouth-to-mouth resuscitation.

INGESTION: Not expected to be a problem. Seek medical attention if discomfort occurs. Do not induce vomiting.

5. FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA: Carbon dioxide, foam, dry chemical and water fog.

SPECIAL FIRE FIGHTING PROCEDURES: Water or foam may cause frothing. Use water to keep fire exposed containers cool. Water spray may be used to flush spills away from exposure. Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply.

SPECIAL PROTECTIVE EQUIPMENT: For fires in enclosed areas, fire fighters must use self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS: None.

COMBUSTION PRODUCTS: Fumes, smoke, carbon monoxide, sulfur oxides, aldehydes and other decomposition products, in the case of incomplete combustion.

Flash Point C(F): 230(446) (ASTM D-92).

Flammable Limits (approx.% vol.in air) - LEL: 0.9%, UEL: 7.0%

NFPA HAZARD ID: Health: 0, Flammability: 1, Reactivity: 0

6. ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES: Report spills/releases as required to appropriate authorities. U.S. Coast Guard and EPA regulations require immediate reporting of spills/releases that could reach any waterway including intermittent dry creeks. Report spill/release to Coast Guard National Response Center toll free number (800)424-8802. In case of accident or road spill notify CHEMTREC (800) 424-9300.

PROCEDURES IF MATERIAL IS RELEASED OR SPILLED:

LAND SPILL: Shut off source taking normal safety precautions. Take measures to minimize the effects on ground water. Recover by pumping or contain spilled material with sand or other suitable absorbent and remove mechanically into containers. If necessary, dispose of adsorbed residues as directed in Section 13.

WATER SPILL: Confine the spill immediately with booms. Warn other ships in the vicinity. Notify port and other relevant authorities. Remove from the surface by skimming or with suitable absorbents. If permitted by regulatory authorities the use of suitable dispersants should be considered where recommended in local oil spill procedures.

ENVIRONMENTAL PRECAUTIONS: Prevent material from entering sewers, water sources or low lying areas; advise the relevant authorities if it has, or if it contaminates soil/vegetation.

PERSONAL PRECAUTIONS: See Section 8

7. HANDLING AND STORAGE

HANDLING: No special precautions are necessary beyond normal good hygiene practices. See Section 8 for additional personal protection advice when handling this product.

STORAGE: Keep containers closed when not in use. Do not store in open or unlabelled containers. Store away from strong oxidizing agents and combustible materials. Do not store near heat, sparks, flame or strong oxidants.

SPECIAL PRECAUTIONS: Prevent small spills and leakages to avoid slip hazard.

EMPTY CONTAINER WARNING: Empty containers retain residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to refill or clean container since residue is difficult to remove. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

OCCUPATIONAL EXPOSURE LIMITS:

When mists/aerosols can occur, the following are recommended: 5 mg/m3 (as oil mist)- ACGIH Threshold Limit Value (TLV), 10 mg/m3 (as oil mist) - ACGIH Short Term Exposure Limit (STEL), 5 mg/m3 (as oil mist) - OSHA Permissible Exposure Limit (PEL)

VENTILATION: If mists are generated, use adequate ventilation, local exhaust or enclosures to control below exposure limits.

RESPIRATORY PROTECTION: If mists are generated, and/or when ventilation is not adequate, wear approved respirator.

EYE PROTECTION: If eye contact is likely, safety glasses with side shields or chemical type goggles should be worn.

SKIN PROTECTION: Not normally required. When splashing or liquid contact can occur frequently, wear oil resistant gloves and/or other protective clothing. Good personal hygiene practices should always be followed.

9. PHYSICAL AND CHEMICAL PROPERTIES

Typical physical properties are given below. Consult Product Data Sheet for specific details.

APPEARANCE: Liquid
COLOR: Brown
ODOR: Mild
ODOR THRESHOLD-ppm: NE
pH: NA
BOILING POINT C(F): > 316(600)
MELTING POINT C(F): NA
FLASH POINT C(F): 230(446) (ASTM D-92)
FLAMMABILITY (solids): NE
AUTO FLAMMABILITY C(F): NA
EXPLOSIVE PROPERTIES: NA
OXIDIZING PROPERTIES: NA

VAPOR PRESSURE-mmHg 20 C: NE
VAPOR DENSITY: NE
EVAPORATION RATE: NE
RELATIVE DENSITY, 15/4 C: 0.877
SOLUBILITY IN WATER: Negligible
PARTITION COEFFICIENT: > 3.5
VISCOSITY AT 40 C, cSt: 117.0
VISCOSITY AT 100 C, cSt: 15.5
POUR POINT C(F): -33(-27)
FREEZING POINT C(F): NE
VOLATILE ORGANIC COMPOUND: NE
DMSO EXTRACT, IP-346 (WT.%): <3, for mineral oil only
NA=NOT APPLICABLE NE=NOT ESTABLISHED D=DECOMPOSES

FOR FURTHER TECHNICAL INFORMATION, CONTACT YOUR MARKETING REPRESENTATIVE

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10. STABILITY AND REACTIVITY

STABILITY (THERMAL, LIGHT, ETC.): Stable.
CONDITIONS TO AVOID: Extreme heat and high energy sources of ignition.
INCOMPATIBILITY (MATERIALS TO AVOID): Strong oxidizers.
HAZARDOUS DECOMPOSITION PRODUCTS: Product does not decompose at ambient temperatures.
HAZARDOUS POLYMERIZATION: Will not occur.

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11. TOXICOLOGICAL DATA

---ACUTE TOXICOLOGY---

ORAL TOXICITY (RATS): Practically non-toxic (LD50: greater than 2000 mg/kg). ---Based on testing of similar products and/or the components.
DERMAL TOXICITY (RABBITS): Practically non-toxic (LD50: greater than 2000 mg/kg). ---Based on testing of similar products and/or the components.
INHALATION TOXICITY (RATS): Practically non-toxic (LC50: greater than 5 mg/l). ---Based on testing of similar products and/or the components.
EYE IRRITATION (RABBITS): Practically non-irritating. (Draize score: greater than 6 but 15 or less). ---Based on testing of similar products and/or the components.
SKIN IRRITATION (RABBITS): Practically non-irritating. (Primary Irritation Index: greater than 0.5 but less than 3). ---Based on testing of similar products and/or the components.
OTHER ACUTE TOXICITY DATA: Although an acute inhalation study was not performed with this product, a variety of mineral and synthetic oils, such as those in this product, have been tested. These samples had virtually no effect other than a nonspecific inflammatory response in the lung to the aerosolized mineral oil. The presence of additives in other tested formulations (in approximately the same amounts as in the present formulation) did not alter the observed effects.

---SUBCHRONIC TOXICOLOGY (SUMMARY)---

No significant adverse effects were found in studies using repeated dermal applications of similar formulations to the skin of laboratory animals for 13 weeks at doses significantly higher than those expected during normal industrial exposure. The animals were evaluated extensively for effects of exposure (hematology, serum chemistry, urinalysis, organ weights, microscopic examination of tissues etc.).

---REPRODUCTIVE TOXICOLOGY (SUMMARY)---

No teratogenic effects would be expected from dermal exposure, based on laboratory developmental toxicity studies of major components in this formulation and/or materials of similar composition.

---CHRONIC TOXICOLOGY (SUMMARY)---

Repeated and/or prolonged exposure may cause irritation to the skin, eyes or respiratory tract. Overexposure to oil mist may result in oil droplet deposition and/or granuloma formation. For mineral base oils: Base oils in this product are severely solvent refined and/or severely hydrotreated. Chronic mouse skin painting studies of severely treated oils showed no evidence of carcinogenic effects. These results are confirmed on a continuing basis using various screening methods such as Modified Ames Test, IP-346, and/or other analytical methods. For synthetic base oils: The base oils in this product have been tested in the Ames assay and other tests of mutagenicity with negative results. These base oils are not expected to be carcinogenic with chronic dermal exposures.

---SENSITIZATION (SUMMARY)---

Not expected to be sensitizing based on tests of this product, components, or similar products.

---OTHER TOXICOLOGY DATA---

Used gasoline engine oils have shown evidence of skin carcinogenic activity in laboratory tests when no effort was made to wash the oil off between applications. Used oil from diesel engines did not produce this effect.

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12. ECOLOGICAL INFORMATION

ENVIRONMENTAL FATE AND EFFECTS:

In the absence of specific environmental data for this product, this assessment is based on information for representative products.

ECOTOXICITY: Available ectoxicity data (LL50 >1000 mg/L) indicates that adverse effects to aquatic organisms are not expected from this product.

MOBILITY: When released into the environment, adsorption to sediment and soil will be the predominant behavior.

PERSISTENCE AND DEGRADABILITY: This product is expected to be inherently biodegradable.

BIOACCUMULATIVE POTENTIAL: Bioaccumulation is unlikely due to the very low water solubility of this product, therefore bioavailability to aquatic organisms is minimal.

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13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL: Product is suitable for burning in an enclosed, controlled burner for fuel value. Such burning may be limited pursuant to the Resource Conservation and Recovery Act. In addition, the product is suitable for processing by an approved recycling facility or can be disposed of at an appropriate government waste disposal facility. Use of these methods is

subject to user compliance with applicable laws and regulations and consideration of product characteristics at time of disposal.

RCRA INFORMATION: The unused product, in our opinion, is not specifically listed by the EPA as a hazardous waste (40 CFR, Part 261D), nor is it formulated to contain materials which are listed hazardous wastes. It does not exhibit the hazardous characteristics of ignitability, corrosivity, or reactivity. The unused product is not formulated with substances covered by the Toxicity Characteristic Leaching Procedure (TCLP). However, used product may be regulated.

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14. TRANSPORT INFORMATION

USA DOT: NOT REGULATED BY USA DOT.

RID/ADR: NOT REGULATED BY RID/ADR.

IMO: NOT REGULATED BY IMO.

IATA: NOT REGULATED BY IATA.

STATIC ACCUMULATOR (50 picosiemens or less): YES

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15. REGULATORY INFORMATION

US OSHA HAZARD COMMUNICATION STANDARD: When used for its intended purposes, this product is not classified as hazardous in accordance with OSHA 29 CFR 1910.1200.

EU Labeling: Product is not dangerous as defined by the European Union Dangerous Substances/Preparations Directives. EU labeling not required.

Governmental Inventory Status: All components comply with TSCA, EINECS/ELINCS, AICS, METI, DSL, KOREA, and PHILIPPINES.

U.S. Superfund Amendments and Reauthorization Act (SARA) Title III: This product contains no "EXTREMELY HAZARDOUS SUBSTANCES".

SARA (311/312) REPORTABLE HAZARD CATEGORIES: None.

This product contains the following SARA (313) Toxic Release Chemicals:

CHEMICAL NAME	CAS NUMBER	CONC.
ZINC DITHIOPHOSPHATE	68649-42-3	1.2%

The following product ingredients are cited on the lists below:

CHEMICAL NAME	CAS NUMBER	LIST CITATIONS *
ZINC (ELEMENTAL ANALYSIS) (0.15%)	7440-66-6	22
ZINC DITHIOPHOSPHATE (1.22%)	68649-42-3	18, 20, 21, 22, 24, 25

--- REGULATORY LISTS SEARCHED ---

1=ACGIH ALL	6=IARC 1	11=TSCA 4	16=CA P65 CARC	21=LA RTK
2=ACGIH A1	7=IARC 2A	12=TSCA 5a2	17=CA P65 REPRO	22=MI 293
3=ACGIH A2	8=IARC 2B	13=TSCA 5e	18=CA RTK	23=MN RTK
4=NTP CARC	9=OSHA CARC	14=TSCA 6	19=FL RTK	24=NJ RTK
5=NTP SUS	10=OSHA Z	15=TSCA 12b	20=IL RTK	25=PA RTK
				26=RI RTK

* EPA recently added new chemical substances to its TSCA Section 4 test rules. Please contact the supplier to confirm whether the ingredients in this product currently appear on a TSCA 4 or TSCA 12b list.
Code key:CARC=Carcinogen; SUS=Suspected Carcinogen; REPRO=Reproductive

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16. OTHER INFORMATION

USE: COMMERCIAL ENGINE OIL

NOTE: PRODUCTS OF EXXON MOBIL CORPORATION AND ITS AFFILIATED COMPANIES ARE NOT FORMULATED TO CONTAIN PCBS.

Health studies have shown that many hydrocarbons pose potential human health risks which may vary from person to person. Information provided on this MSDS reflects intended use. This product should not be used for other applications. In any case, the following advice should be considered:

INJECTION INJURY WARNING: If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

INDUSTRIAL LABEL

Under normal conditions of intended use, this product does not pose a risk to health. Excessive exposure may result in eye, skin or respiratory irritation. Always observe good hygiene measures. First Aid: Wash skin with soap and water. Flush eyes with water. If overcome by fumes or vapor, remove to fresh air. If ingested do not induce vomiting. If symptoms persist seek medical assistance. Read and understand the MSDS before using this product.

****

For Internal Use Only: MHC: 1* 1* 1* 1* 1*, MPPEC: A, TRN: 440693-00, CMCS97: 970529, REQ: US - MARKETING, SAFE USE: L
EHS Approval Date: 17JUN2003

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Information given herein is offered in good faith as accurate, but without guarantee. Conditions of use and suitability of the product for particular uses are beyond our control; all risks of use of the product are therefore assumed by the user and WE EXPRESSLY DISCLAIM ALL WARRANTIES OF EVERY KIND AND NATURE, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE IN RESPECT TO THE USE OR SUITABILITY OF THE PRODUCT. Nothing is intended as a recommendation for uses which infringe valid patents or as extending license under valid patents. Appropriate warnings and safe handling procedures should be provided to handlers and users. Alteration of this document is strictly prohibited. Except to the extent required by law, republication or retransmission of this document, in whole or in part, is not permitted. Exxon Mobil Corporation and its affiliated companies assume no responsibility for accuracy of information unless the document is the most current available from an official ExxonMobil distribution system. Exxon Mobil Corporation and its affiliated companies neither represent nor warrant that the format, content or product formulas contained in this document comply with the laws of any other country except the United States of America.

Prepared by: ExxonMobil Oil Corporation
Environmental Health and Safety Department, Clinton, USA

ExxonMobil

583021-00 MOBIL HYDRAULIC OIL AW 46
MATERIAL SAFETY DATA BULLETIN

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: MOBIL HYDRAULIC OIL AW 46
SUPPLIER: EXXONMOBIL OIL CORPORATION
3225 GALLOWS RD.
FAIRFAX, VA 22037

24 - Hour Health and Safety Emergency (call collect): 609-737-4411

24 - Hour Transportation Emergency:
CHEMTREC: 800-424-9300 202-483-7616
LUBES AND FUELS: 281-834-3296

Product and Technical Information:
Lubricants and Specialties: 800-662-4525 800-443-9966
Fuels Products: 800-947-9147
MSDS Fax on Demand: 713-613-3661
MSDS Internet Website: http://www.exxon.com, http://www.mobil.com

2. COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL NAMES AND SYNONYMS: SEVERE TREAT MIN. OILS & ADDITIVES

GLOBALLY REPORTABLE MSDS INGREDIENTS:

None.

See Section 8 for exposure limits (if applicable).

3. HAZARDS IDENTIFICATION

Under normal conditions of use, this product is not considered hazardous according to regulatory guidelines (See section 15).

EMERGENCY OVERVIEW: Dark Amber Liquid. Note: Pressurized mists may form a flammable mixture. DOT ERG No. : NA

POTENTIAL HEALTH EFFECTS: Under normal conditions of intended use, this product does not pose a risk to health. Excessive exposure may result in eye, skin or respiratory irritation.

For further health effects/toxicological data, see Section 11.

4. FIRST AID MEASURES

EYE CONTACT: Flush thoroughly with water. If irritation occurs, call a physician.
SKIN CONTACT: Wash contact areas with soap and water. Remove and clean oil soaked clothing daily and wash affected area.

INJECTION INJURY WARNING: If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

INHALATION: Not expected to be a problem. However, if respiratory irritation, dizziness, nausea, or unconsciousness occurs due to excessive vapor or mist exposure, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or mouth-to-mouth resuscitation.

INGESTION: Not expected to be a problem. Seek medical attention if discomfort occurs. Do not induce vomiting.

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5. FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA: Carbon dioxide, foam, dry chemical and water fog.

SPECIAL FIRE FIGHTING PROCEDURES: Water or foam may cause frothing. Use water to keep fire exposed containers cool. Water spray may be used to flush spills away from exposure. Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply.

SPECIAL PROTECTIVE EQUIPMENT: For fires in enclosed areas, fire fighters must use self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Note: Pressurized mists may form a flammable mixture.

COMBUSTION PRODUCTS: Fumes, smoke, carbon monoxide, sulfur oxides, aldehydes and other decomposition products, in the case of incomplete combustion.

Flash Point C(F): 198(388) (ASTM D-92).

Flammable Limits (approx.% vol.in air) - LEL: 0.9%, UEL: 7.0%

NFPA HAZARD ID: Health: 0, Flammability: 1, Reactivity: 0

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6. ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES: Report spills/releases as required to appropriate authorities. U.S. Coast Guard and EPA regulations require immediate reporting of spills/releases that could reach any waterway including intermittent dry creeks. Report spill/release to Coast Guard National Response Center toll free number (800)424-8802. In case of accident or road spill notify CHEMTREC (800) 424-9300.

PROCEDURES IF MATERIAL IS RELEASED OR SPILLED:

LAND SPILL: Shut off source taking normal safety precautions. Take measures to minimize the effects on ground water. Recover by pumping or contain spilled material with sand or other suitable absorbent and remove mechanically into containers. If necessary, dispose of adsorbed residues as directed in Section 13.

WATER SPILL: Confine the spill immediately with booms. Warn other ships in the vicinity. Notify port and other relevant authorities. Remove from the surface by skimming or with suitable absorbents. If permitted by regulatory authorities the use of suitable dispersants should be considered where recommended in local oil spill procedures.

ENVIRONMENTAL PRECAUTIONS: Prevent material from entering sewers, water sources or low lying areas; advise the relevant authorities if it has, or if it contaminates soil/vegetation.

PERSONAL PRECAUTIONS: See Section 8

7. HANDLING AND STORAGE

HANDLING: High pressure injection under the skin may occur due to the rupture of pressurized lines. Always seek medical attention. No special precautions are necessary beyond normal good hygiene practices. See Section 8 for additional personal protection advice when handling this product.

STORAGE: Keep containers closed when not in use. Do not store in open or unlabelled containers. Store away from strong oxidizing agents and combustible materials. Do not store near heat, sparks, flame or strong oxidants.

SPECIAL PRECAUTIONS: Prevent small spills and leakages to avoid slip hazard.

EMPTY CONTAINER WARNING: Empty containers retain residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to refill or clean container since residue is difficult to remove. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

OCCUPATIONAL EXPOSURE LIMITS:

When mists/aerosols can occur, the following are recommended: 5 mg/m3 (as oil mist)- ACGIH Threshold Limit Value (TLV), 10 mg/m3 (as oil mist) - ACGIH Short Term Exposure Limit (STEL), 5 mg/m3 (as oil mist) - OSHA Permissible Exposure Limit (PEL)

VENTILATION: If mists are generated, use adequate ventilation, local exhaust or enclosures to control below exposure limits.

RESPIRATORY PROTECTION: If mists are generated, and/or when ventilation is not adequate, wear approved respirator.

EYE PROTECTION: If eye contact is likely, safety glasses with side shields or chemical type goggles should be worn.

SKIN PROTECTION: Not normally required. When splashing or liquid contact can occur frequently, wear oil resistant gloves and/or other protective clothing. Good personal hygiene practices should always be followed.

9. PHYSICAL AND CHEMICAL PROPERTIES

Typical physical properties are given below. Consult Product Data Sheet for specific details.

APPEARANCE: Liquid
COLOR: Dark Amber
ODOR: Mild
ODOR THRESHOLD-ppm: NE
pH: NA
BOILING POINT C(F): > 316(600)
MELTING POINT C(F): NA
FLASH POINT C(F): 198(388) (ASTM D-92)
FLAMMABILITY (solids): NE
AUTO FLAMMABILITY C(F): NA

EXPLOSIVE PROPERTIES: NA
OXIDIZING PROPERTIES: NA
VAPOR PRESSURE-mmHg 20 C: < 0.1
VAPOR DENSITY: > 2.0
EVAPORATION RATE: NE
RELATIVE DENSITY, 15/4 C: 0.875
SOLUBILITY IN WATER: Negligible
PARTITION COEFFICIENT: > 3.5
VISCOSITY AT 40 C, cSt: 46.0
VISCOSITY AT 100 C, cSt: 6.7
POUR POINT C(F): < -18(0)
FREEZING POINT C(F): NE
VOLATILE ORGANIC COMPOUND: NE
DMSO EXTRACT, IP-346 (WT.%): <3, for mineral oil only
NA=NOT APPLICABLE NE=NOT ESTABLISHED D=DECOMPOSES

FOR FURTHER TECHNICAL INFORMATION, CONTACT YOUR MARKETING REPRESENTATIVE

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10. STABILITY AND REACTIVITY

STABILITY (THERMAL, LIGHT, ETC.): Stable.
CONDITIONS TO AVOID: Extreme heat and high energy sources of ignition.
INCOMPATIBILITY (MATERIALS TO AVOID): Strong oxidizers.
HAZARDOUS DECOMPOSITION PRODUCTS: Product does not decompose at ambient temperatures.
HAZARDOUS POLYMERIZATION: Will not occur.

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11. TOXICOLOGICAL DATA

---ACUTE TOXICOLOGY---

ORAL TOXICITY (RATS): Practically non-toxic (LD50: greater than 2000 mg/kg). ---Based on testing of similar products and/or the components.
DERMAL TOXICITY (RABBITS): Practically non-toxic (LD50: greater than 2000 mg/kg). ---Based on testing of similar products and/or the components.
INHALATION TOXICITY (RATS): Practically non-toxic (LC50: greater than 5 mg/l). ---Based on testing of similar products and/or the components.
EYE IRRITATION (RABBITS): Practically non-irritating. (Draize score: greater than 6 but 15 or less). ---Based on testing of similar products and/or the components.
SKIN IRRITATION (RABBITS): Practically non-irritating. (Primary Irritation Index: greater than 0.5 but less than 3). ---Based on testing of similar products and/or the components.
OTHER ACUTE TOXICITY DATA: Although an acute inhalation study was not performed with this product, a variety of mineral and synthetic oils, such as those in this product, have been tested. These samples had virtually no effect other than a nonspecific inflammatory response in the lung to the aerosolized mineral oil. The presence of additives in other tested formulations (in approximately the same amounts as in the present formulation) did not alter the observed effects.

---SUBCHRONIC TOXICOLOGY (SUMMARY)---

No significant adverse effects were found in studies using repeated dermal applications of similar formulations to the skin of laboratory animals for 13 weeks at doses significantly higher than those expected during normal industrial exposure. The animals were evaluated extensively for effects of exposure

(hematology, serum chemistry, urinalysis, organ weights, microscopic examination of tissues etc.).

---REPRODUCTIVE TOXICOLOGY (SUMMARY)---

No teratogenic effects would be expected from dermal exposure, based on laboratory developmental toxicity studies of major components in this formulation and/or materials of similar composition.

---CHRONIC TOXICOLOGY (SUMMARY)---

Repeated and/or prolonged exposure may cause irritation to the skin, eyes or respiratory tract. Overexposure to oil mist may result in oil droplet deposition and/or granuloma formation. For mineral base oils: Base oils in this product are severely solvent refined and/or severely hydrotreated. Chronic mouse skin painting studies of severely treated oils showed no evidence of carcinogenic effects. These results are confirmed on a continuing basis using various screening methods such as Modified Ames Test, IP-346, and/or other analytical methods. For synthetic base oils: The base oils in this product have been tested in the Ames assay and other tests of mutagenicity with negative results. These base oils are not expected to be carcinogenic with chronic dermal exposures.

---SENSITIZATION (SUMMARY)---

Not expected to be sensitizing based on tests of this product, components, or similar products.

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12. ECOLOGICAL INFORMATION

ENVIRONMENTAL FATE AND EFFECTS:

In the absence of specific environmental data for this product, this assessment is based on information for representative products.

ECOTOXICITY: Available ectoxicity data (LL50 >1000 mg/L) indicates that adverse effects to aquatic organisms are not expected from this product.

MOBILITY: When released into the environment, adsorption to sediment and soil will be the predominant behavior.

PERSISTENCE AND DEGRADABILITY: This product is expected to be inherently biodegradable.

BIOACCUMULATIVE POTENTIAL: Bioaccumulation is unlikely due to the very low water solubility of this product, therefore bioavailability to aquatic organisms is minimal.

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13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL: Product is suitable for burning in an enclosed, controlled burner for fuel value. Such burning may be limited pursuant to the Resource Conservation and Recovery Act. In addition, the product is suitable for processing by an approved recycling facility or can be disposed of at an appropriate government waste disposal facility. Use of these methods is subject to user compliance with applicable laws and regulations and consideration of product characteristics at time of disposal.

RCRA INFORMATION: The unused product, in our opinion, is not

specifically listed by the EPA as a hazardous waste (40 CFR, Part 261D), nor is it formulated to contain materials which are listed hazardous wastes. It does not exhibit the hazardous characteristics of ignitability, corrosivity, or reactivity. The unused product is not formulated with substances covered by the Toxicity Characteristic Leaching Procedure (TCLP). However, used product may be regulated.

---

14. TRANSPORT INFORMATION

USA DOT: NOT REGULATED BY USA DOT.

RID/ADR: NOT REGULATED BY RID/ADR.

IMO: NOT REGULATED BY IMO.

IATA: NOT REGULATED BY IATA.

STATIC ACCUMULATOR (50 picosiemens or less): YES

---

15. REGULATORY INFORMATION

US OSHA HAZARD COMMUNICATION STANDARD: When used for its intended purposes, this product is not classified as hazardous in accordance with OSHA 29 CFR 1910.1200.

EU Labeling: Product is not dangerous as defined by the European Union Dangerous Substances/Preparations Directives. EU labeling not required.

Governmental Inventory Status: All components comply with TSCA, EINICS/ELINCS, AICS, DSL, KOREA, and PHILIPPINES.

U.S. Superfund Amendments and Reauthorization Act (SARA) Title III:
This product contains no "EXTREMELY HAZARDOUS SUBSTANCES".

SARA (311/312) REPORTABLE HAZARD CATEGORIES: None.

This product contains no chemicals subject to the supplier notification requirements of SARA (313) toxic release program.

The following product ingredients are cited on the lists below:

CHEMICAL NAME	CAS NUMBER	LIST CITATIONS *
ZINC (ELEMENTAL ANALYSIS) (<0.05%)	7440-66-6	22
PHOSPHORODITHOIC ACID, O,O-DI C1-14-ALKYL ESTERS, ZINC SALTS (2: 1) (ZDDP) (0.43%)	68649-42-3	22

--- REGULATORY LISTS SEARCHED ---

1=ACGIH ALL	6=IARC 1	11=TSCA 4	16=CA P65 CARC	21=LA RTK
2=ACGIH A1	7=IARC 2A	12=TSCA 5a2	17=CA P65 REPRO	22=MI 293
3=ACGIH A2	8=IARC 2B	13=TSCA 5e	18=CA RTK	23=MN RTK
4=NTP CARC	9=OSHA CARC	14=TSCA 6	19=FL RTK	24=NJ RTK
5=NTP SUS	10=OSHA Z	15=TSCA 12b	20=IL RTK	25=PA RTK
				26=RI RTK

* EPA recently added new chemical substances to its TSCA Section 4 test rules. Please contact the supplier to confirm whether the ingredients in this product currently appear on a TSCA 4 or TSCA 12b list.
Code key:CARC=Carcinogen; SUS=Suspected Carcinogen; REPRO=Reproductive

---

16. OTHER INFORMATION

USE: HYDRAULIC OIL

NOTE: PRODUCTS OF EXXON MOBIL CORPORATION AND ITS AFFILIATED COMPANIES ARE NOT FORMULATED TO CONTAIN PCBS.

Health studies have shown that many hydrocarbons pose potential human health risks which may vary from person to person. Information provided on this MSDS reflects intended use. This product should not be used for other applications. In any case, the following advice should be considered:

INDUSTRIAL LABEL

Under normal conditions of intended use, this product does not pose a risk to health. Excessive exposure may result in eye, skin or respiratory irritation. Always observe good hygiene measures. First Aid: Wash skin with soap and water. Flush eyes with water. If overcome by fumes or vapor, remove to fresh air. If ingested do not induce vomiting. If symptoms persist seek medical assistance. Read and understand the MSDS before using this product.

****
For Internal Use Only: MHC: 1* 1* 1* 1* 1*, MPPEC: A, TRN: 583021-00, CMCS97: 971019, REQ: US - MARKETING, SAFE USE: L
EHS Approval Date: 13JUN2003
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Prepared by: ExxonMobil Oil Corporation
Environmental Health and Safety Department, Clinton, USA

ExxonMobil

522334-00 MOBILFLUID 424
MATERIAL SAFETY DATA BULLETIN

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1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: MOBILFLUID 424
SUPPLIER: EXXONMOBIL OIL CORPORATION
3225 GALLOWS RD.
FAIRFAX, VA 22037

24 - Hour Health and Safety Emergency (call collect): 609-737-4411

24 - Hour Transportation Emergency:
CHEMTREC: 800-424-9300 202-483-7616
LUBES AND FUELS: 281-834-3296

Product and Technical Information:
Lubricants and Specialties: 800-662-4525 800-443-9966
Fuels Products: 800-947-9147
MSDS Fax on Demand: 713-613-3661
MSDS Internet Website: http://www.exxon.com, http://www.mobil.com

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2. COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL NAMES AND SYNONYMS: SEVERE TREAT MIN. OILS & ADDITIVES

GLOBALLY REPORTABLE MSDS INGREDIENTS:

Substance Name	Approx. Wt%
ZINC DITHIOPHOSPHATE (68649-42-3)	1-5

OTHER INGREDIENTS:

Substance Name	Approx. Wt%
CALCIUM SULFONATE	1-5

See Section 8 for exposure limits (if applicable).

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3. HAZARDS IDENTIFICATION

Under normal conditions of use, this product is not considered hazardous according to regulatory guidelines (See section 15).

EMERGENCY OVERVIEW: Dark Amber Liquid. Note: Pressurized mists may form a flammable mixture. DOT ERG No. : NA

POTENTIAL HEALTH EFFECTS: Under normal conditions of intended use, this product does not pose a risk to health. Excessive exposure may result in eye, skin or respiratory irritation.

For further health effects/toxicological data, see Section 11.

4. FIRST AID MEASURES

EYE CONTACT: Flush thoroughly with water. If irritation occurs, call a physician.

SKIN CONTACT: Wash contact areas with soap and water. Remove and clean oil soaked clothing daily and wash affected area.
INJECTION INJURY WARNING: If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

INHALATION: Not expected to be a problem. However, if respiratory irritation, dizziness, nausea, or unconsciousness occurs due to excessive vapor or mist exposure, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or mouth-to-mouth resuscitation.

INGESTION: Not expected to be a problem. Seek medical attention if discomfort occurs. Do not induce vomiting.

5. FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA: Carbon dioxide, foam, dry chemical and water fog.

SPECIAL FIRE FIGHTING PROCEDURES: Water or foam may cause frothing. Use water to keep fire exposed containers cool. Water spray may be used to flush spills away from exposure. Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply.

SPECIAL PROTECTIVE EQUIPMENT: For fires in enclosed areas, fire fighters must use self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Note: Pressurized mists may form a flammable mixture.

COMBUSTION PRODUCTS: Fumes, smoke, carbon monoxide, sulfur oxides, aldehydes and other decomposition products, in the case of incomplete combustion.

Flash Point C(F): > 198(389) (ASTM D-92).

Flammable Limits (approx.% vol.in air) - LEL: 0.9%, UEL: 7.0%

NFPA HAZARD ID: Health: 0, Flammability: 1, Reactivity: 0

6. ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES: Report spills/releases as required to appropriate authorities. U.S. Coast Guard and EPA regulations require immediate reporting of spills/releases that could reach any waterway including intermittent dry creeks. Report spill/release to Coast Guard National Response Center toll free number (800)424-8802. In case of accident or road spill notify CHEMTREC (800) 424-9300.

PROCEDURES IF MATERIAL IS RELEASED OR SPILLED:
LAND SPILL: Shut off source taking normal safety precautions. Take measures to minimize the effects on ground water. Recover by pumping or contain spilled material with sand or other suitable absorbent and remove mechanically into containers. If necessary, dispose of adsorbed residues as directed in Section 13.
WATER SPILL: Confine the spill immediately with booms. Warn other ships in the vicinity. Notify port and other relevant authorities.

Remove from the surface by skimming or with suitable absorbents. If permitted by regulatory authorities the use of suitable dispersants should be considered where recommended in local oil spill procedures.

ENVIRONMENTAL PRECAUTIONS: Prevent material from entering sewers, water sources or low lying areas; advise the relevant authorities if it has, or if it contaminates soil/vegetation.

PERSONAL PRECAUTIONS: See Section 8

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7. HANDLING AND STORAGE

HANDLING: High pressure injection under the skin may occur due to the rupture of pressurized lines. Always seek medical attention. No special precautions are necessary beyond normal good hygiene practices. See Section 8 for additional personal protection advice when handling this product.

STORAGE: Keep containers closed when not in use. Do not store in open or unlabelled containers. Store away from strong oxidizing agents and combustible materials. Do not store near heat, sparks, flame or strong oxidants.

SPECIAL PRECAUTIONS: Prevent small spills and leakages to avoid slip hazard.

EMPTY CONTAINER WARNING: Empty containers retain residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to refill or clean container since residue is difficult to remove. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.

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8. EXPOSURE CONTROLS/PERSONAL PROTECTION

OCCUPATIONAL EXPOSURE LIMITS:

When mists/aerosols can occur, the following are recommended: 5 mg/m3 (as oil mist) - ACGIH Threshold Limit Value (TLV), 10 mg/m3 (as oil mist) - ACGIH Short Term Exposure Limit (STEL), 5 mg/m3 (as oil mist) - OSHA Permissible Exposure Limit (PEL)

VENTILATION: If mists are generated, use adequate ventilation, local exhaust or enclosures to control below exposure limits.

RESPIRATORY PROTECTION: If mists are generated, and/or when ventilation is not adequate, wear approved respirator.

EYE PROTECTION: If eye contact is likely, safety glasses with side shields or chemical type goggles should be worn.

SKIN PROTECTION: Not normally required. When splashing or liquid contact can occur frequently, wear oil resistant gloves and/or other protective clothing. Good personal hygiene practices should always be followed.

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9. PHYSICAL AND CHEMICAL PROPERTIES

Typical physical properties are given below. Consult Product Data Sheet for specific details.

APPEARANCE: Liquid
COLOR: Dark Amber
ODOR: Mild
ODOR THRESHOLD-ppm: NE
pH: NA
BOILING POINT C(F): > 316(600)
MELTING POINT C(F): NA
FLASH POINT C(F): > 198(389) (ASTM D-92)
FLAMMABILITY (solids): NE
AUTO FLAMMABILITY C(F): NA
EXPLOSIVE PROPERTIES: NA
OXIDIZING PROPERTIES: NA
VAPOR PRESSURE-mmHg 20 C: < 0.1
VAPOR DENSITY: > 2.0
EVAPORATION RATE: NE
RELATIVE DENSITY, 15/4 C: 0.882
SOLUBILITY IN WATER: Negligible
PARTITION COEFFICIENT: > 3.5
VISCOSITY AT 40 C, cSt: 55.0
VISCOSITY AT 100 C, cSt: 9.6
POUR POINT C(F): < -36(-33)
FREEZING POINT C(F): NE
VOC: < 5.00 (Wt. %); 0.358 lbs/gal
DMSO EXTRACT, IP-346 (WT.%): <3, for mineral oil only
NA=NOT APPLICABLE NE=NOT ESTABLISHED D=DECOMPOSES

FOR FURTHER TECHNICAL INFORMATION, CONTACT YOUR MARKETING REPRESENTATIVE

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10. STABILITY AND REACTIVITY

STABILITY (THERMAL, LIGHT, ETC.): Stable.
CONDITIONS TO AVOID: Extreme heat and high energy sources of ignition.
INCOMPATIBILITY (MATERIALS TO AVOID): Strong oxidizers.
HAZARDOUS DECOMPOSITION PRODUCTS: Product does not decompose at ambient temperatures.
HAZARDOUS POLYMERIZATION: Will not occur.

---

11. TOXICOLOGICAL DATA

---ACUTE TOXICOLOGY---

ORAL TOXICITY (RATS): Practically non-toxic (LD50: greater than 2000 mg/kg). ---Based on testing of similar products and/or the components.
DERMAL TOXICITY (RABBITS): Practically non-toxic (LD50: greater than 2000 mg/kg). ---Based on testing of similar products and/or the components.
INHALATION TOXICITY (RATS): Practically non-toxic (LC50: greater than 5 mg/l). ---Based on testing of similar products and/or the components.
EYE IRRITATION (RABBITS): Practically non-irritating. (Draize score: greater than 6 but 15 or less). ---Based on testing of similar products and/or the components.
SKIN IRRITATION (RABBITS): Practically non-irritating. (Primary Irritation Index: greater than 0.5 but less than 3). ---Based on testing of similar products and/or the components.
OTHER ACUTE TOXICITY DATA: Although an acute inhalation study was not performed with this product, a variety of mineral and synthetic oils, such as those in this product, have been tested. These samples had virtually no effect other than a nonspecific inflammatory response in the lung to the aerosolized mineral oil.

The presence of additives in other tested formulations (in approximately the same amounts as in the present formulation) did not alter the observed effects.

---SUBCHRONIC TOXICOLOGY (SUMMARY)---

No significant adverse effects were found in studies using repeated dermal applications of similar formulations to the skin of laboratory animals for 13 weeks at doses significantly higher than those expected during normal industrial exposure. The animals were evaluated extensively for effects of exposure (hematology, serum chemistry, urinalysis, organ weights, microscopic examination of tissues etc.).

---REPRODUCTIVE TOXICOLOGY (SUMMARY)---

No teratogenic effects would be expected from dermal exposure, based on laboratory developmental toxicity studies of major components in this formulation and/or materials of similar composition.

---CHRONIC TOXICOLOGY (SUMMARY)---

Repeated and/or prolonged exposure may cause irritation to the skin, eyes or respiratory tract. Overexposure to oil mist may result in oil droplet deposition and/or granuloma formation. For mineral base oils: Base oils in this product are severely solvent refined and/or severely hydrotreated. Chronic mouse skin painting studies of severely treated oils showed no evidence of carcinogenic effects. These results are confirmed on a continuing basis using various screening methods such as Modified Ames Test, IP-346, and/or other analytical methods. For synthetic base oils: The base oils in this product have been tested in the Ames assay and other tests of mutagenicity with negative results. These base oils are not expected to be carcinogenic with chronic dermal exposures.

---SENSITIZATION (SUMMARY)---

Not expected to be sensitizing based on tests of this product, components, or similar products.

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL FATE AND EFFECTS:

In the absence of specific environmental data for this product, this assessment is based on information for representative products.

ECOTOXICITY: Available ectoxicity data (LL50 >1000 mg/L) indicates that adverse effects to aquatic organisms are not expected from this product.

MOBILITY: When released into the environment, adsorption to sediment and soil will be the predominant behavior.

PERSISTENCE AND DEGRADABILITY: This product is expected to be inherently biodegradable.

BIOACCUMULATIVE POTENTIAL: Bioaccumulation is unlikely due to the very low water solubility of this product, therefore bioavailability to aquatic organisms is minimal.

13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL: Product is suitable for burning in an enclosed, controlled burner for fuel value. Such burning may be limited pursuant to the Resource Conservation and Recovery Act. In addition, the product is suitable for processing by an approved recycling facility or can be disposed of at an appropriate government waste disposal facility. Use of these methods is subject to user compliance with applicable laws and regulations and consideration of product characteristics at time of disposal.

RCRA INFORMATION: The unused product, in our opinion, is not specifically listed by the EPA as a hazardous waste (40 CFR, Part 261D), nor is it formulated to contain materials which are listed hazardous wastes. It does not exhibit the hazardous characteristics of ignitability, corrosivity, or reactivity. The unused product is not formulated with substances covered by the Toxicity Characteristic Leaching Procedure (TCLP). However, used product may be regulated.

14. TRANSPORT INFORMATION

USA DOT: NOT REGULATED BY USA DOT.

RID/ADR: NOT REGULATED BY RID/ADR.

IMO: NOT REGULATED BY IMO.

IATA: NOT REGULATED BY IATA.

STATIC ACCUMULATOR (50 picosiemens or less): YES

15. REGULATORY INFORMATION

US OSHA HAZARD COMMUNICATION STANDARD: When used for its intended purposes, this product is not classified as hazardous in accordance with OSHA 29 CFR 1910.1200.

EU Labeling: Product is not dangerous as defined by the European Union Dangerous Substances/Preparations Directives. EU labeling not required.

Governmental Inventory Status: All components comply with TSCA, EINECS/ELINCS, AICS, METI, DSL, KOREA, and PHILIPPINES.

U.S. Superfund Amendments and Reauthorization Act (SARA) Title III: This product contains no "EXTREMELY HAZARDOUS SUBSTANCES".

SARA (311/312) REPORTABLE HAZARD CATEGORIES: None.

This product contains the following SARA (313) Toxic Release Chemicals:

CHEMICAL NAME	CAS NUMBER	CONC.
ZINC DITHIOPHOSPHATE	68649-42-3	<1.8%

The following product ingredients are cited on the lists below:

CHEMICAL NAME	CAS NUMBER	LIST CITATIONS *
TOLUENE (0.11%)	108-88-3	22, 24
ZINC (ELEMENTAL ANALYSIS) (<0.20%)	7440-66-6	22
ZINC DITHIOPHOSPHATE (<1.79%)	68649-42-3	18, 20, 21, 22, 24, 25

--- REGULATORY LISTS SEARCHED ---

1=ACGIH ALL	6=IARC 1	11=TSCA 4	16=CA P65 CARC	21=LA RTK
2=ACGIH A1	7=IARC 2A	12=TSCA 5a2	17=CA P65 REPRO	22=MI 293
3=ACGIH A2	8=IARC 2B	13=TSCA 5e	18=CA RTK	23=MN RTK
4=NTP CARC	9=OSHA CARC	14=TSCA 6	19=FL RTK	24=NJ RTK
5=NTP SUS	10=OSHA Z	15=TSCA 12b	20=IL RTK	25=PA RTK
				26=RI RTK

* EPA recently added new chemical substances to its TSCA Section 4 test rules. Please contact the supplier to confirm whether the ingredients in this product currently appear on a TSCA 4 or TSCA 12b list.
Code key:CARC=Carcinogen; SUS=Suspected Carcinogen; REPRO=Reproductive

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16. OTHER INFORMATION

USE: HYDRAULIC OIL

NOTE: PRODUCTS OF EXXON MOBIL CORPORATION AND ITS AFFILIATED COMPANIES ARE NOT FORMULATED TO CONTAIN PCBS.

Health studies have shown that many hydrocarbons pose potential human health risks which may vary from person to person. Information provided on this MSDS reflects intended use. This product should not be used for other applications. In any case, the following advice should be considered:

INDUSTRIAL LABEL

Under normal conditions of intended use, this product does not pose a risk to health. Excessive exposure may result in eye, skin or respiratory irritation. Always observe good hygiene measures. First Aid: Wash skin with soap and water. Flush eyes with water. If overcome by fumes or vapor, remove to fresh air. If ingested do not induce vomiting. If symptoms persist seek medical assistance. Read and understand the MSDS before using this product.

****

For Internal Use Only: MHC: 1* 1* 1* 1* 1*, MPPEC: A, TRN: 522334-00, ELIS: 400110, CMCS97: 971955, REQ: US - MARKETING, SAFE USE: L
EHS Approval Date: 26NOV2002

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Information given herein is offered in good faith as accurate, but without guarantee. Conditions of use and suitability of the product for particular uses are beyond our control; all risks of use of the product are therefore assumed by the user and WE EXPRESSLY DISCLAIM ALL WARRANTIES OF EVERY KIND AND NATURE, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE IN RESPECT TO THE USE OR SUITABILITY OF THE PRODUCT. Nothing is intended as a recommendation for uses which infringe valid patents or as extending license under valid patents. Appropriate warnings and safe handling procedures should be provided to handlers and users. Alteration of this document is strictly prohibited. Except to the extent required by law, republication or retransmission of this document, in whole or in part, is not permitted. Exxon Mobil Corporation and its affiliated companies assume no responsibility for accuracy of information unless the document is the most current available from an official ExxonMobil distribution system. Exxon Mobil Corporation and its affiliated companies neither represent nor warrant that the format, content or product formulas contained in this document comply with the laws of any other country except the United States of America.

Prepared by: ExxonMobil Oil Corporation
Environmental Health and Safety Department, Clinton, USA

ExxonMobil

530550-00 MOBILGREASE XHP 222 SPECIAL
MATERIAL SAFETY DATA BULLETIN

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1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: MOBILGREASE XHP 222 SPECIAL
SUPPLIER: EXXONMOBIL OIL CORPORATION
3225 GALLOWS RD.
FAIRFAX, VA 22037

24 - Hour Health and Safety Emergency (call collect): 609-737-4411

24 - Hour Transportation Emergency:
CHEMTREC: 800-424-9300 202-483-7616
LUBES AND FUELS: 281-834-3296

Product and Technical Information:
Lubricants and Specialties: 800-662-4525 800-443-9966
Fuels Products: 800-947-9147
MSDS Fax on Demand: 713-613-3661
MSDS Internet Website: http://www.exxon.com, http://www.mobil.com

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2. COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL NAMES AND SYNONYMS: SEVERE TREAT MIN. OILS & ADDITIVES

GLOBALLY REPORTABLE MSDS INGREDIENTS:

Substance Name	Approx. Wt%
PHOSPHORODITHOIC ACID, O,O-DI C1-14-ALKYL ESTERS, ZINC SALTS (2:1) (ZDDP) (68649-42-3)	1-5

See Section 8 for exposure limits (if applicable).

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3. HAZARDS IDENTIFICATION

Under normal conditions of use, this product is not considered hazardous according to regulatory guidelines (See section 15).

EMERGENCY OVERVIEW: Gray to Black Grease. DOT ERG No. : NA

POTENTIAL HEALTH EFFECTS: Under normal conditions of intended use, this product does not pose a risk to health. Excessive exposure may result in eye, skin or respiratory irritation.

For further health effects/toxicological data, see Section 11.

4. FIRST AID MEASURES

EYE CONTACT: Flush thoroughly with water. If irritation occurs, call a physician.

SKIN CONTACT: Wash contact areas with soap and water. Remove and clean oil soaked clothing daily and wash affected area.
INJECTION INJURY WARNING: If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

INHALATION: Remove from further exposure. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with mechanical device or use mouth-to-mouth resuscitation.

INGESTION: Not expected to be a problem. Seek medical attention if discomfort occurs. Do not induce vomiting.

5. FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA: Carbon dioxide, foam, dry chemical and water fog.

SPECIAL FIRE FIGHTING PROCEDURES: Water or foam may cause frothing. Use water to keep fire exposed containers cool. Water spray may be used to flush spills away from exposure. Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply.

SPECIAL PROTECTIVE EQUIPMENT: For fires in enclosed areas, fire fighters must use self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS: None.

COMBUSTION PRODUCTS: Fumes, smoke, carbon monoxide, sulfur oxides, aldehydes and other decomposition products, in the case of incomplete combustion.

Flash Point C(F): > 204(400) (ESTIMATED FOR OIL, ASTM D-92 (COC)).

Flammable Limits (approx.% vol.in air) - LEL: NE, UEL: NE

NFPA HAZARD ID: Health: 0, Flammability: 1, Reactivity: 0

6. ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES: Report spills/releases as required to appropriate authorities. U.S. Coast Guard and EPA regulations require immediate reporting of spills/releases that could reach any waterway including intermittent dry creeks. Report spill/release to Coast Guard National Response Center toll free number (800)424-8802. In case of accident or road spill notify CHEMTREC (800) 424-9300.

PROCEDURES IF MATERIAL IS RELEASED OR SPILLED:

LAND SPILL: Shut off source taking normal safety precautions. Take measures to minimize the effects on ground water. Recover by pumping or contain spilled material with sand or other suitable absorbent and remove mechanically into containers. If necessary, dispose of adsorbed residues as directed in Section 13.

WATER SPILL: Confine the spill immediately with booms. Warn other ships in the vicinity. Notify port and other relevant authorities. Remove from the surface by skimming or with suitable absorbents. If permitted by regulatory authorities the use of suitable dispersants should be considered where recommended in local oil spill procedures.

ENVIRONMENTAL PRECAUTIONS: Prevent material from entering sewers, water sources or low lying areas; advise the relevant authorities if it has, or if it contaminates soil/vegetation.
PERSONAL PRECAUTIONS: See Section 8

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7. HANDLING AND STORAGE

HANDLING: High pressure injection under the skin may occur due to the rupture of pressurized lines. Always seek medical attention. No special precautions are necessary beyond normal good hygiene practices. See Section 8 for additional personal protection advice when handling this product.
STORAGE: Keep containers closed when not in use. Do not store in open or unlabelled containers. Store away from strong oxidizing agents and combustible materials. Do not store near heat, sparks, flame or strong oxidants.
SPECIAL PRECAUTIONS: Prevent small spills and leakages to avoid slip hazard.
EMPTY CONTAINER WARNING: Empty containers retain residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to refill or clean container since residue is difficult to remove. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.

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8. EXPOSURE CONTROLS/PERSONAL PROTECTION

OCCUPATIONAL EXPOSURE LIMITS:

This product does not contain any components which have recognized exposure limits.

VENTILATION: Use adequate ventilation.
RESPIRATORY PROTECTION: No special requirements under ordinary conditions of use and with adequate ventilation.
EYE PROTECTION: Generally eye contact is unlikely with this type material. If eye contact is likely, safety glasses with side shields or chemical type goggles should be worn.
SKIN PROTECTION: If prolonged or repeated skin contact is likely, oil impervious gloves should be worn. Good personal hygiene practices should always be followed.

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9. PHYSICAL AND CHEMICAL PROPERTIES

Typical physical properties are given below. Consult Product Data Sheet for specific details.

APPEARANCE: Grease
COLOR: Gray to Black
ODOR: Mild
ODOR THRESHOLD-ppm: NE
pH: NA
BOILING POINT C(F): > 316(600)
DROP POINT C(F): > 260(500)
FLASH POINT C(F): > 204(400) (ESTIMATED FOR OIL, ASTM D-92 (COC))

FLAMMABILITY (solids): NE
AUTO FLAMMABILITY C(F): NA
EXPLOSIVE PROPERTIES: NA
OXIDIZING PROPERTIES: NA
VAPOR PRESSURE-mmHg 20 C: < 0.1
VAPOR DENSITY: NE
EVAPORATION RATE: NE
RELATIVE DENSITY, 15/4 C: 0.914
SOLUBILITY IN WATER: Negligible
PARTITION COEFFICIENT: > 3.5
VISCOSITY AT 40 C, cSt: 220.0
VISCOSITY AT 100 C, cSt: > 16.0
POUR POINT C(F): NA
FREEZING POINT C(F): NE
VOLATILE ORGANIC COMPOUND: NE
NOTE: MOST PHYSICAL PROPERTIES FOR OIL COMPONENT.
DMSO EXTRACT, IP-346 (WT.%): <3, for mineral oil only
NA=NOT APPLICABLE NE=NOT ESTABLISHED D=DECOMPOSES

FOR FURTHER TECHNICAL INFORMATION, CONTACT YOUR MARKETING REPRESENTATIVE

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10. STABILITY AND REACTIVITY

STABILITY (THERMAL, LIGHT, ETC.): Stable.
CONDITIONS TO AVOID: Extreme heat and high energy sources of ignition.
INCOMPATIBILITY (MATERIALS TO AVOID): Strong oxidizers.
HAZARDOUS DECOMPOSITION PRODUCTS: Product does not decompose at ambient temperatures.
HAZARDOUS POLYMERIZATION: Will not occur.

---

11. TOXICOLOGICAL DATA

---ACUTE TOXICOLOGY---

ORAL TOXICITY (RATS): Practically non-toxic (LD50: greater than 2000 mg/kg). ---Based on testing of similar products and/or the components.
DERMAL TOXICITY (RABBITS): Practically non-toxic (LD50: greater than 2000 mg/kg). ---Based on testing of similar products and/or the components.
INHALATION TOXICITY (RATS): Practically non-toxic (LC50: greater than 5 mg/l). ---Based on testing of similar products and/or the components.
EYE IRRITATION (RABBITS): Practically non-irritating. (Draize score: greater than 6 but 15 or less). ---Based on testing of similar products and/or the components.
SKIN IRRITATION (RABBITS): Practically non-irritating. (Primary Irritation Index: greater than 0.5 but less than 3). ---Based on testing of similar products and/or the components.
OTHER ACUTE TOXICITY DATA: Although an acute inhalation study was not performed with this product, a variety of mineral oils and synthetic base oils, such as those in this product have been tested. These samples had virtually no effect other than a nonspecific inflammatory response in the lung to the aerosolized mineral oil. The presence of additives in other tested formulations (in approximately the same amounts as in the present formulation) did not alter the observed effects.

---SUBCHRONIC TOXICOLOGY (SUMMARY)---

No significant adverse effects were found in studies using repeated dermal applications of similar formulations to the skin of

laboratory animals for 13 weeks at doses significantly higher than those expected during normal industrial exposure. The animals were evaluated extensively for effects of exposure (hematology, serum chemistry, urinalysis, organ weights, microscopic examination of tissues etc.).

---REPRODUCTIVE TOXICOLOGY (SUMMARY)---

No teratogenic effects would be expected from dermal exposure, based on laboratory developmental toxicity studies of major components in this formulation and/or materials of similar composition.

---CHRONIC TOXICOLOGY (SUMMARY)---

Repeated and/or prolonged exposure may cause irritation to the skin, eyes or respiratory tract. For mineral base oils: Base oils in this product are severely solvent refined and/or severely hydrotreated. Chronic mouse skin painting studies of severely treated oils showed no evidence of carcinogenic effects. These results are confirmed on a continuing basis using various screening methods such as Modified Ames Test, IP-346, and/or other analytical methods. For synthetic base oils: The base oils in this product have been tested in the Ames assay and other tests of mutagenicity with negative results. These base oils are not expected to be carcinogenic with chronic dermal exposures.

---SENSITIZATION (SUMMARY)---

Not expected to be sensitizing based on tests of this product, components, or similar products.

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12. ECOLOGICAL INFORMATION

ENVIRONMENTAL FATE AND EFFECTS:

This environmental assessment was conducted using information on the individual components as no test data was available for this specific formulation.

ECOTOXICITY: The major components in the formulation show no aquatic toxicity at 1000 mg/L loading, therefore long-term adverse effects in the aquatic environment are not expected.

MOBILITY: Not established.

PERSISTENCE AND DEGRADABILITY: This product is expected to be inherently biodegradable, as the principal components have been shown to degrade at slow to moderate rates.

BIOACCUMULATIVE POTENTIAL: Not established.

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13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL: Product is suitable for burning in an enclosed, controlled burner for fuel value. Such burning may be limited pursuant to the Resource Conservation and Recovery Act. In addition, the product is suitable for processing by an approved recycling facility or can be disposed of at an appropriate government waste disposal facility. Use of these methods is subject to user compliance with applicable laws and regulations and consideration of product characteristics at time of disposal.

RCRA INFORMATION: The unused product, in our opinion, is not

specifically listed by the EPA as a hazardous waste (40 CFR, Part 261D), nor is it formulated to contain materials which are listed hazardous wastes. It does not exhibit the hazardous characteristics of ignitability, corrosivity, or reactivity. The unused product is not formulated with substances covered by the Toxicity Characteristic Leaching Procedure (TCLP). However, used product may be regulated.

---

14. TRANSPORT INFORMATION

USA DOT: NOT REGULATED BY USA DOT.

RID/ADR: NOT REGULATED BY RID/ADR.

IMO: NOT REGULATED BY IMO.

IATA: NOT REGULATED BY IATA.

---

15. REGULATORY INFORMATION

US OSHA HAZARD COMMUNICATION STANDARD: When used for its intended purposes, this product is not classified as hazardous in accordance with OSHA 29 CFR 1910.1200.

EU Labeling: Product is not dangerous as defined by the European Union Dangerous Substances/Preparations Directives. EU labeling not required.

Governmental Inventory Status: All components comply with TSCA, EINECS/ELINCS and AICS.

U.S. Superfund Amendments and Reauthorization Act (SARA) Title III: This product contains no "EXTREMELY HAZARDOUS SUBSTANCES".

SARA (311/312) REPORTABLE HAZARD CATEGORIES: None.

This product contains the following SARA (313) Toxic Release Chemicals:

CHEMICAL NAME	CAS NUMBER	CONC.
PHOSPHORODITHOIC ACID, O,O-DI C1-14-ALKYL ESTERS, ZINC SALTS (2:1) (ZDDP)	68649-42-3	1.3%

The following product ingredients are cited on the lists below:

CHEMICAL NAME	CAS NUMBER	LIST CITATIONS *
LITHIUM HYDROXIDE MONOHYDRATE (0.05%)	1310-66-3	22
ZINC (ELEMENTAL ANALYSIS) (0.18%)	7440-66-6	22
LITHIUM-SOAP THICKENER (6.14%)	7620-77-1	22
ZINC DINONYLNAPHTHALENE SULFONATE (0.40%)	28016-00-4	22
PHOSPHORODITHOIC ACID, O,O-DI C1-14-ALKYL ESTERS, ZINC SALTS (2:1) (ZDDP) (1.29%)	68649-42-3	18, 20, 21, 22, 24, 25
FATTY ACIDS, C16-22, LITHIUM SALTS (0.76%)	68783-36-8	22

--- REGULATORY LISTS SEARCHED ---

1=ACGIH ALL	6=IARC 1	11=TSCA 4	16=CA P65 CARC	21=LA RTK
2=ACGIH A1	7=IARC 2A	12=TSCA 5a2	17=CA P65 REPRO	22=MI 293
3=ACGIH A2	8=IARC 2B	13=TSCA 5e	18=CA RTK	23=MN RTK
4=NTP CARC	9=OSHA CARC	14=TSCA 6	19=FL RTK	24=NJ RTK
5=NTP SUS	10=OSHA Z	15=TSCA 12b	20=IL RTK	25=PA RTK
				26=RI RTK

* EPA recently added new chemical substances to its TSCA Section 4 test rules. Please contact the supplier to confirm whether the ingredients in this product currently appear on a TSCA 4 or TSCA 12b list.
Code key:CARC=Carcinogen; SUS=Suspected Carcinogen; REPRO=Reproductive

---

16. OTHER INFORMATION

USE: AUTOMOTIVE GREASE

NOTE: PRODUCTS OF EXXON MOBIL CORPORATION AND ITS AFFILIATED COMPANIES ARE NOT FORMULATED TO CONTAIN PCBS.

Health studies have shown that many hydrocarbons pose potential human health risks which may vary from person to person. Information provided on this MSDS reflects intended use. This product should not be used for other applications. In any case, the following advice should be considered:

INDUSTRIAL LABEL

Under normal conditions of intended use, this product does not pose a risk to health. Excessive exposure may result in eye, skin or respiratory irritation. Always observe good hygiene measures. First Aid: Wash skin with soap and water. Flush eyes with water. If overcome by fumes or vapor, remove to fresh air. If ingested do not induce vomiting. If symptoms persist seek medical assistance. Read and understand the MSDS before using this product.

****

For Internal Use Only: MHC: 1* 1* 1* 1* 1*, MPPEC: A, TRN: 530550-00, CMCS97: 97G870, REQ: US - MARKETING, SAFE USE: L
EHS Approval Date: 21AUG2001

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Information given herein is offered in good faith as accurate, but without guarantee. Conditions of use and suitability of the product for particular uses are beyond our control; all risks of use of the product are therefore assumed by the user and WE EXPRESSLY DISCLAIM ALL WARRANTIES OF EVERY KIND AND NATURE, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE IN RESPECT TO THE USE OR SUITABILITY OF THE PRODUCT. Nothing is intended as a recommendation for uses which infringe valid patents or as extending license under valid patents. Appropriate warnings and safe handling procedures should be provided to handlers and users. Alteration of this document is strictly prohibited. Except to the extent required by law, republication or retransmission of this document, in whole or in part, is not permitted. Exxon Mobil Corporation and its affiliated companies assume no responsibility for accuracy of information unless the document is the most current available from an official ExxonMobil distribution system. Exxon Mobil Corporation and its affiliated companies neither represent nor warrant that the format, content or product formulas contained in this document compiy with the laws of any other country except the United States of America.

Prepared by: ExxonMobil Oil Corporation
Environmental Health and Safety Department, Clinton, USA

ExxonMobil

530170-00 MOBILGREASE MOLY 52
MATERIAL SAFETY DATA BULLETIN

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1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: MOBILGREASE MOLY 52
SUPPLIER: EXXONMOBIL OIL CORPORATION
3225 GALLOWS RD.
FAIRFAX, VA 22037

24 - Hour Health and Safety Emergency (call collect): 609-737-4411

24 - Hour Transportation Emergency:
CHEMTREC: 800-424-9300 202-483-7616
LUBES AND FUELS: 281-834-3296

Product and Technical Information:
Lubricants and Specialties: 800-662-4525 800-443-9966
Fuels Products: 800-947-9147
MSDS Fax on Demand: 713-613-3661
MSDS Internet Website: http://www.exxon.com, http://www.mobil.com

2. COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL NAMES AND SYNONYMS: PET. HYDROCARBONS AND ADDITIVES

GLOBALLY REPORTABLE MSDS INGREDIENTS:

Substance Name	Approx. Wt%
MOLYBDENUM DISULFIDE (1317-33-5)	5-15
PHOSPHORODITHOIC ACID, O,O-DI C1-14-ALKYL ESTERS, ZINC SALTS (2:1) (ZDDP) (68649-42-3)	1-5
HYDROXYALKYL LONG-CHAIN ALKENYL IMIDAZOLINE (27136-73-8)	<1

OTHER INGREDIENTS:

Substance Name	Approx. Wt%
ALKYLATED DIPHENYL AMINES (68411-46-1)	1-5

See Section 8 for exposure limits (if applicable).

3. HAZARDS IDENTIFICATION

Under normal conditions of use, this product is not considered hazardous according to regulatory guidelines (See section 15).

EMERGENCY OVERVIEW: Gray to Black Grease. DOT ERG No. : NA

POTENTIAL HEALTH EFFECTS: Under normal conditions of intended use, this product does not pose a risk to health. Excessive exposure may result in eye, skin or respiratory irritation.

POTENTIAL ENVIRONMENTAL EFFECTS: Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

For further health effects/toxicological data, see Section 11.

4. FIRST AID MEASURES

EYE CONTACT: Flush thoroughly with water. If irritation occurs, call a physician.

SKIN CONTACT: Wash contact areas with soap and water. Remove and clean oil soaked clothing daily and wash affected area.
INJECTION INJURY WARNING: If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

INHALATION: Remove from further exposure. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with mechanical device or use mouth-to-mouth resuscitation.

INGESTION: Not expected to be a problem. Seek medical attention if discomfort occurs. Do not induce vomiting.

5. FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA: Carbon dioxide, foam, dry chemical and water fog.

SPECIAL FIRE FIGHTING PROCEDURES: Water or foam may cause frothing. Use water to keep fire exposed containers cool. Water spray may be used to flush spills away from exposure. Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply.

SPECIAL PROTECTIVE EQUIPMENT: For fires in enclosed areas, fire fighters must use self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS: None.

COMBUSTION PRODUCTS: Fumes, smoke, carbon monoxide, sulfur oxides, aldehydes and other decomposition products, in the case of incomplete combustion.

Flash Point C(F): > 204(400) (ESTIMATED FOR OIL, ASTM D-92 (COC)).
Flammable Limits (approx.% vol.in air) - LEL: NE, UEL: NE
NFPA HAZARD ID: Health: 0, Flammability: 1, Reactivity: 0

6. ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES: Report spills/releases as required to appropriate authorities. U.S. Coast Guard and EPA regulations

require immediate reporting of spills/releases that could reach any waterway including intermittent dry creeks. Report spill/release to Coast Guard National Response Center toll free number (800)424-8802. In case of accident or road spill notify CHEMTREC (800) 424-9300.

PROCEDURES IF MATERIAL IS RELEASED OR SPILLED:
LAND SPILL: Shut off source taking normal safety precautions. Take measures to minimize the effects on ground water. Recover by pumping or contain spilled material with sand or other suitable absorbent and remove mechanically into containers. If necessary, dispose of adsorbed residues as directed in Section 13.
WATER SPILL: Confine the spill immediately with booms. Warn other ships in the vicinity. Notify port and other relevant authorities. Remove from the surface by skimming or with suitable absorbents. If permitted by regulatory authorities the use of suitable dispersants should be considered where recommended in local oil spill procedures.

ENVIRONMENTAL PRECAUTIONS: Prevent material from entering sewers, water sources or low lying areas; advise the relevant authorities if it has, or if it contaminates soil/vegetation.

PERSONAL PRECAUTIONS: See Section 8

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7. HANDLING AND STORAGE

HANDLING: High pressure injection under the skin may occur due to the rupture of pressurized lines. Always seek medical attention. No special precautions are necessary beyond normal good hygiene practices. See Section 8 for additional personal protection advice when handling this product.

STORAGE: Keep containers closed when not in use. Do not store in open or unlabelled containers. Store away from strong oxidizing agents and combustible materials. Do not store near heat, sparks, flame or strong oxidants.

SPECIAL PRECAUTIONS: Prevent small spills and leakages to avoid slip hazard.

EMPTY CONTAINER WARNING: Empty containers retain residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to refill or clean container since residue is difficult to remove. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.

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8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Substance Name (CAS-No.)	Source	---TWA--- ppm	mg/m3	----STEL--- ppm	mg/m3	NOTE
MOLYBDENUM DISULFIDE (1317-33-5)						
as Mo Sol Cmpds	OSHA		5			
as Mo Insol Cmpds Tot Dust	OSHA		10			
as Mo Sol Cmpds	ACGIH		5			
as Mo Insol Cmpds	ACGIH		10			

NOTE: Limits shown for guidance only. Follow applicable regulations.

VENTILATION: Use adequate ventilation.
RESPIRATORY PROTECTION: No special requirements under ordinary conditions of use and with adequate ventilation.
EYE PROTECTION: Generally eye contact is unlikely with this type material. If eye contact is likely, safety glasses with side shields or chemical type goggles should be worn.
SKIN PROTECTION: If prolonged or repeated skin contact is likely, oil impervious gloves should be worn. Good personal hygiene practices should always be followed.

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9. PHYSICAL AND CHEMICAL PROPERTIES

Typical physical properties are given below. Consult Product Data Sheet for specific details.

APPEARANCE: Grease
COLOR: Gray to Black
ODOR: Mild
ODOR THRESHOLD-ppm: NE
pH: NA
BOILING POINT C(F): NE
DROP POINT C(F): > 246(475)
FLASH POINT C(F): > 204(400) (ESTIMATED FOR OIL, ASTM D-92 (COC))
FLAMMABILITY (solids): NE
AUTO FLAMMABILITY C(F): NA
EXPLOSIVE PROPERTIES: NA
OXIDIZING PROPERTIES: NA
VAPOR PRESSURE-mmHg 20 C: NE
VAPOR DENSITY: NE
EVAPORATION RATE: NE
RELATIVE DENSITY, 15/4 C: 0.941
SOLUBILITY IN WATER: Negligible
PARTITION COEFFICIENT: > 3.5
VISCOSITY AT 40 C, cSt: 320.0
VISCOSITY AT 100 C, cSt: NE
POUR POINT C(F): NA
FREEZING POINT C(F): NE
VOLATILE ORGANIC COMPOUND: NE
NOTE: MOST PHYSICAL PROPERTIES FOR OIL COMPONENT.
DMSO EXTRACT, IP-346 (WT.%): <3, for mineral oil only
NA=NOT APPLICABLE NE=NOT ESTABLISHED D=DECOMPOSES

FOR FURTHER TECHNICAL INFORMATION, CONTACT YOUR MARKETING REPRESENTATIVE

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10. STABILITY AND REACTIVITY

STABILITY (THERMAL, LIGHT, ETC.): Stable.
CONDITIONS TO AVOID: Extreme heat and high energy sources of ignition.
INCOMPATIBILITY (MATERIALS TO AVOID): Strong oxidizers.
HAZARDOUS DECOMPOSITION PRODUCTS: Product does not decompose at ambient temperatures.
HAZARDOUS POLYMERIZATION: Will not occur.

---

11. TOXICOLOGICAL DATA

---ACUTE TOXICOLOGY---
ORAL TOXICITY (RATS): Practically non-toxic (LD50: greater than 2000

mg/kg). ---Based on testing of similar products and/or the components.

DERMAL TOXICITY (RABBITS): Practically non-toxic (LD50: greater than 2000 mg/kg). ---Based on testing of similar products and/or the components.

INHALATION TOXICITY (RATS): Practically non-toxic (LC50: greater than 5 mg/l). ---Based on testing of similar products and/or the components.

EYE IRRITATION (RABBITS): Practically non-irritating. (Draize score: greater than 6 but 15 or less). ---Based on testing of similar products and/or the components.

SKIN IRRITATION (RABBITS): Practically non-irritating. (Primary Irritation Index: greater than 0.5 but less than 3). ---Based on testing of similar products and/or the components.

OTHER ACUTE TOXICITY DATA: Although an acute inhalation study was not performed with this product, a variety of mineral oils and synthetic base oils, such as those in this product have been tested. These samples had virtually no effect other than a nonspecific inflammatory response in the lung to the aerosolized mineral oil. The presence of additives in other tested formulations (in approximately the same amounts as in the present formulation) did not alter the observed effects.

---SUBCHRONIC TOXICOLOGY (SUMMARY)---

No significant adverse effects were found in studies using repeated dermal applications of similar formulations to the skin of laboratory animals for 13 weeks at doses significantly higher than those expected during normal industrial exposure. The animals were evaluated extensively for effects of exposure (hematology, serum chemistry, urinalysis, organ weights, microscopic examination of tissues etc.).

---REPRODUCTIVE TOXICOLOGY (SUMMARY)---

No teratogenic effects would be expected from dermal exposure, based on laboratory developmental toxicity studies of major components in this formulation and/or materials of similar composition.

---CHRONIC TOXICOLOGY (SUMMARY)---

Repeated and/or prolonged exposure may cause irritation to the skin, eyes or respiratory tract. For mineral base oils: Base oils in this product are severely solvent refined and/or severely hydrotreated. Chronic mouse skin painting studies of severely treated oils showed no evidence of carcinogenic effects. These results are confirmed on a continuing basis using various screening methods such as Modified Ames Test, IP-346, and/or other analytical methods. For synthetic base oils: The base oils in this product have been tested in the Ames assay and other tests of mutagenicity with negative results. These base oils are not expected to be carcinogenic with chronic dermal exposures.

---SENSITIZATION (SUMMARY)---

Not expected to be sensitizing based on tests of this product, components, or similar products.

---

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL FATE AND EFFECTS:

This environmental assessment was conducted using information on the individual components as no test data was available for this specific formulation.

ECOTOXICITY: This product is expected to be harmful to aquatic organisms. May cause long-term adverse effects in the aquatic environment.

MOBILITY: Not established.

PERSISTENCE AND DEGRADABILITY: This product is expected to be inherently biodegradable, as the principal components have been shown to degrade at slow to moderate rates.

BIOACCUMULATIVE POTENTIAL: Not established.

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13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL: Product is suitable for burning in an enclosed, controlled burner for fuel value. Such burning may be limited pursuant to the Resource Conservation and Recovery Act. In addition, the product is suitable for processing by an approved recycling facility or can be disposed of at an appropriate government waste disposal facility. Use of these methods is subject to user compliance with applicable laws and regulations and consideration of product characteristics at time of disposal.

RCRA INFORMATION: The unused product, in our opinion, is not specifically listed by the EPA as a hazardous waste (40 CFR, Part 261D), nor is it formulated to contain materials which are listed hazardous wastes. It does not exhibit the hazardous characteristics of ignitability, corrosivity, or reactivity. The unused product is not formulated with substances covered by the Toxicity Characteristic Leaching Procedure (TCLP). However, used product may be regulated.

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14. TRANSPORT INFORMATION

USA DOT: NOT REGULATED BY USA DOT.

RID/ADR: NOT REGULATED BY RID/ADR.

IMO: NOT REGULATED BY IMO.

IATA: NOT REGULATED BY IATA.

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15. REGULATORY INFORMATION

US OSHA HAZARD COMMUNICATION STANDARD: When used for its intended purposes, this product is not classified as hazardous in accordance with OSHA 29 CFR 1910.1200.

EU Labeling: Product is dangerous as defined by the European Union Dangerous Substances/Preparations Directives.

Symbol: Not applicable.

Risk Phrase(s): R52/53.
Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrase(s): S61.
Avoid release to the environment. Refer to special instructions/Safety data sheets.

Governmental Inventory Status: All components comply with TSCA, EINECS/ELINCS and AICS.

U.S. Superfund Amendments and Reauthorization Act (SARA) Title III:
This product contains no "EXTREMELY HAZARDOUS SUBSTANCES".

SARA (311/312) REPORTABLE HAZARD CATEGORIES: None.

This product contains the following SARA (313) Toxic Release Chemicals:

CHEMICAL NAME	CAS NUMBER	CONC.
PHOSPHORODITHOIC ACID, O,O-DI C1-14-ALKYL ESTERS, ZINC SALTS (2:1) (ZDDP)	68649-42-3	1.3%

The following product ingredients are cited on the lists below:

CHEMICAL NAME	CAS NUMBER	LIST CITATIONS *
LITHIUM HYDROXIDE (0.05%)	1310-65-2	22
MOLYBDENUM (IV) SULFIDE	1317-33-5	1, 10, 18, 20, 21, 23
ZINC (ELEMENTAL ANALYSIS) (0.15%)	7440-66-6	22
LITHIUM-SOAP THICKENER (6.14%)	7620-77-1	22
PHOSPHORODITHOIC ACID, O,O-DI C1-14-ALKYL ESTERS, ZINC SALTS (2:1) (ZDDP) (1.29%)	68649-42-3	18, 20, 21, 22, 24, 25
FATTY ACIDS, C16-22, LITHIUM SALTS (0.76%)	68783-36-8	22

--- REGULATORY LISTS SEARCHED ---

1=ACGIH ALL	6=IARC 1	11=TSCA 4	16=CA P65 CARC	21=LA RTK
2=ACGIH A1	7=IARC 2A	12=TSCA 5a2	17=CA P65 REPRO	22=MI 293
3=ACGIH A2	8=IARC 2B	13=TSCA 5e	18=CA RTK	23=MN RTK
4=NTP CARC	9=OSHA CARC	14=TSCA 6	19=FL RTK	24=NJ RTK
5=NTP SUS	10=OSHA Z	15=TSCA 12b	20=IL RTK	25=PA RTK
				26=RI RTK

* EPA recently added new chemical substances to its TSCA Section 4 test rules. Please contact the supplier to confirm whether the ingredients in this product currently appear on a TSCA 4 or TSCA 12b list.
Code key:CARC=Carcinogen; SUS=Suspected Carcinogen; REPRO=Reproductive

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16. OTHER INFORMATION

USE: EXTREME PRESSURE GREASE

NOTE: PRODUCTS OF EXXON MOBIL CORPORATION AND ITS AFFILIATED COMPANIES ARE NOT FORMULATED TO CONTAIN PCBS.

Health studies have shown that many hydrocarbons pose potential human health risks which may vary from person to person. Information provided on this MSDS reflects intended use. This product should not be used for other applications. In any case, the following advice should be considered:

INDUSTRIAL LABEL

Under normal conditions of intended use, this product does not pose a risk to health. Excessive exposure may result in eye, skin or respiratory irritation. Always observe good hygiene measures. First Aid: Wash skin with soap and water. Flush eyes with water. If overcome by fumes or vapor, remove to fresh air. If ingested do not induce vomiting. If symptoms persist seek medical assistance. Read and understand the MSDS before using this product.

****
For Internal Use Only: MHC: 1* 1* 1* 1* 1*, MPPEC: A, TRN: 530170-00, CMCS97: 97E099, REQ: US - MARKETING, SAFE USE: L
EHS Approval Date: 20OCT2003
****

Information given herein is offered in good faith as accurate, but without guarantee. Conditions of use and suitability of the product for particular uses are beyond our control; all risks of use of the product are therefore assumed by the user and WE EXPRESSLY DISCLAIM ALL WARRANTIES OF EVERY KIND AND NATURE, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE IN RESPECT TO THE USE OR SUITABILITY OF THE PRODUCT. Nothing is intended as a recommendation for uses which infringe valid patents or as extending license under valid patents. Appropriate warnings and safe handling procedures should be provided to handlers and users. Alteration of this document is strictly prohibited. Except to the extent required by law, republication or retransmission of this document, in whole or in part, is not permitted. Exxon Mobil Corporation and its affiliated companies assume no responsibility for accuracy of information unless the document is the most current available from an official ExxonMobil distribution system. Exxon Mobil Corporation and its affiliated companies neither represent nor warrant that the format, content or product formulas contained in this document comply with the laws of any other country except the United States of America.

Prepared by: ExxonMobil Oil Corporation
Environmental Health and Safety Department, Clinton, USA

ExxonMobil

525238-00 MOBIL MULTIPURPOSE ATF
MATERIAL SAFETY DATA BULLETIN

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: MOBIL MULTIPURPOSE ATF
SUPPLIER: EXXONMOBIL OIL CORPORATION
3225 GALLOWS RD.
FAIRFAX, VA 22037

24 - Hour Health and Safety Emergency (call collect): 609-737-4411

24 - Hour Transportation Emergency:
CHEMTREC: 800-424-9300 202-483-7616
LUBES AND FUELS: 281-834-3296

Product and Technical Information:
Lubricants and Specialties: 800-662-4525 . 800-443-9966
Fuels Products: 800-947-9147
MSDS Fax on Demand: 713-613-3661
MSDS Internet Website: http://www.exxon.com, http://www.mobil.com

2. COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL NAMES AND SYNONYMS: BASE OIL AND ADDITIVES

GLOBALLY REPORTABLE MSDS INGREDIENTS:

None.

OTHER INGREDIENTS:

Substance Name	Approx. Wt%
SOLVENT DEWAXED LIGHT PARAFFINIC DISTILLATE (PETROLEUM) (64742-56-9)	30-40

See Section 8 for exposure limits (if applicable).

3. HAZARDS IDENTIFICATION

Under normal conditions of use, this product is not considered hazardous according to regulatory guidelines (See section 15).

EMERGENCY OVERVIEW: Red Liquid. DOT ERG No. : NA

POTENTIAL HEALTH EFFECTS: Under normal conditions of intended use, this product does not pose a risk to health. Excessive exposure may result in eye, skin or respiratory irritation.

For further health effects/toxicological data, see Section 11.

4. FIRST AID MEASURES

EYE CONTACT: Flush thoroughly with water. If irritation occurs, call a physician.

SKIN CONTACT: Wash contact areas with soap and water. Remove and clean oil soaked clothing daily and wash affected area. (See Section 16 - Injection Injury)

INHALATION: Not expected to be a problem. However, if respiratory irritation, dizziness, nausea, or unconsciousness occurs due to excessive vapor or mist exposure, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or mouth-to-mouth resuscitation.

INGESTION: Not expected to be a problem. Seek medical attention if discomfort occurs. Do not induce vomiting.

5. FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA: Carbon dioxide, foam, dry chemical and water fog.

SPECIAL FIRE FIGHTING PROCEDURES: Water or foam may cause frothing. Use water to keep fire exposed containers cool. Water spray may be used to flush spills away from exposure. Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply.

SPECIAL PROTECTIVE EQUIPMENT: For fires in enclosed areas, fire fighters must use self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS: None.

COMBUSTION PRODUCTS: Fumes, smoke, carbon monoxide, sulfur oxides, aldehydes and other decomposition products, in the case of incomplete combustion.

Flash Point C(F): 204(399) (ASTM D-92).

Flammable Limits (approx.% vol.in air) - LEL: 0.9%, UEL: 7.0%

NFPA HAZARD ID: Health: 0, Flammability: 1, Reactivity: 0

6. ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES: Report spills/releases as required to appropriate authorities. U.S. Coast Guard and EPA regulations require immediate reporting of spills/releases that could reach any waterway including intermittent dry creeks. Report spill/release to Coast Guard National Response Center toll free number (800)424-8802. In case of accident or road spill notify CHEMTREC (800) 424-9300.

PROCEDURES IF MATERIAL IS RELEASED OR SPILLED:

LAND SPILL: Shut off source taking normal safety precautions. Take measures to minimize the effects on ground water. Recover by pumping or contain spilled material with sand or other suitable absorbent and remove mechanically into containers. If necessary, dispose of adsorbed residues as directed in Section 13.

WATER SPILL: Confine the spill immediately with booms. Warn other ships in the vicinity. Notify port and other relevant authorities. Remove from the surface by skimming or with suitable absorbents. If permitted by regulatory authorities the use of suitable dispersants should be considered where recommended in local oil spill procedures.

ENVIRONMENTAL PRECAUTIONS: Prevent material from entering sewers, water sources or low lying areas; advise the relevant authorities if it has, or if it contaminates soil/vegetation.

PERSONAL PRECAUTIONS: See Section 8

7. HANDLING AND STORAGE

HANDLING: No special precautions are necessary beyond normal good hygiene practices. See Section 8 for additional personal protection advice when handling this product.

STORAGE: Keep containers closed when not in use. Do not store in open or unlabelled containers. Store away from strong oxidizing agents and combustible materials. Do not store near heat, sparks, flame or strong oxidants.

SPECIAL PRECAUTIONS: Prevent small spills and leakages to avoid slip hazard.

EMPTY CONTAINER WARNING: Empty containers retain residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to refill or clean container since residue is difficult to remove. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

OCCUPATIONAL EXPOSURE LIMITS:

When mists/aerosols can occur, the following are recommended: 5 mg/m3 (as oil mist)- ACGIH Threshold Limit Value (TLV), 10 mg/m3 (as oil mist) - ACGIH Short Term Exposure Limit (STEL), 5 mg/m3 (as oil mist) - OSHA Permissible Exposure Limit (PEL)

VENTILATION: If mists are generated, use adequate ventilation, local exhaust or enclosures to control below exposure limits.

RESPIRATORY PROTECTION: If mists are generated, and/or when ventilation is not adequate, wear approved respirator.

EYE PROTECTION: If eye contact is likely, safety glasses with side shields or chemical type goggles should be worn.

SKIN PROTECTION: Not normally required. When splashing or liquid contact can occur frequently, wear oil resistant gloves and/or other protective clothing. Good personal hygiene practices should always be followed.

9. PHYSICAL AND CHEMICAL PROPERTIES

Typical physical properties are given below. Consult Product Data Sheet for specific details.

APPEARANCE: Liquid
COLOR: Red
ODOR: Mild
ODOR THRESHOLD-ppm: NE
pH: NA
BOILING POINT C(F): NE
MELTING POINT C(F): NA
FLASH POINT C(F): 204(399) (ASTM D-92)
FLAMMABILITY (solids): NE
AUTO FLAMMABILITY C(F): NA
EXPLOSIVE PROPERTIES: NA
OXIDIZING PROPERTIES: NA

VAPOR PRESSURE-mmHg 20 C: < 0.1
VAPOR DENSITY: > 2.0
EVAPORATION RATE: NE
RELATIVE DENSITY, 15/4 C: 0.871
SOLUBILITY IN WATER: Negligible
PARTITION COEFFICIENT: > 3.5
VISCOSITY AT 40 C, cSt: 37.0
VISCOSITY AT 100 C, cSt: 7.2
POUR POINT C(F): < -34(-30)
FREEZING POINT C(F): NE
VOC: < 8.00 (Wt. %); 0.574 lbs/gal
DMSO EXTRACT, IP-346 (WT.%): <3, for mineral oil only
NA=NOT APPLICABLE NE=NOT ESTABLISHED D=DECOMPOSES

FOR FURTHER TECHNICAL INFORMATION, CONTACT YOUR MARKETING REPRESENTATIVE

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10. STABILITY AND REACTIVITY

STABILITY (THERMAL, LIGHT, ETC.): Stable.
CONDITIONS TO AVOID: Extreme heat and high energy sources of ignition.
INCOMPATIBILITY (MATERIALS TO AVOID): Strong oxidizers.
HAZARDOUS DECOMPOSITION PRODUCTS: Product does not decompose at ambient temperatures.
HAZARDOUS POLYMERIZATION: Will not occur.

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11. TOXICOLOGICAL DATA

---ACUTE TOXICOLOGY---

ORAL TOXICITY (RATS): Practically non-toxic (LD50: greater than 2000 mg/kg). ---Based on testing of similar products and/or the components.
DERMAL TOXICITY (RABBITS): Practically non-toxic (LD50: greater than 2000 mg/kg). ---Based on testing of similar products and/or the components.
INHALATION TOXICITY (RATS): Practically non-toxic (LC50: greater than 5 mg/l). ---Based on testing of similar products and/or the components.
EYE IRRITATION (RABBITS): Practically non-irritating. (Draize score: greater than 6 but 15 or less). ---Based on testing of similar products and/or the components.
SKIN IRRITATION (RABBITS): Practically non-irritating. (Primary Irritation Index: greater than 0.5 but less than 3). ---Based on testing of similar products and/or the components.
OTHER ACUTE TOXICITY DATA: Although an acute inhalation study was not performed with this product, a variety of mineral and synthetic oils, such as those in this product, have been tested. These samples had virtually no effect other than a nonspecific inflammatory response in the lung to the aerosolized mineral oil. The presence of additives in other tested formulations (in approximately the same amounts as in the present formulation) did not alter the observed effects.

---SUBCHRONIC TOXICOLOGY (SUMMARY)---

No significant adverse effects were found in studies using repeated dermal applications of similar formulations to the skin of laboratory animals for 13 weeks at doses significantly higher than those expected during normal industrial exposure. The animals were evaluated extensively for effects of exposure (hematology, serum chemistry, urinalysis, organ weights, microscopic examination of tissues etc.).

---REPRODUCTIVE TOXICOLOGY (SUMMARY)---

No teratogenic effects would be expected from dermal exposure, based on laboratory developmental toxicity studies of major components in this formulation and/or materials of similar composition.

---CHRONIC TOXICOLOGY (SUMMARY)---

Repeated and/or prolonged exposure may cause irritation to the skin, eyes or respiratory tract. Overexposure to oil mist may result in oil droplet deposition and/or granuloma formation. For mineral base oils: Base oils in this product are severely solvent refined and/or severely hydrotreated. Chronic mouse skin painting studies of severely treated oils showed no evidence of carcinogenic effects. These results are confirmed on a continuing basis using various screening methods such as Modified Ames Test, IP-346, and/or other analytical methods. For synthetic base oils: The base oils in this product have been tested in the Ames assay and other tests of mutagenicity with negative results. These base oils are not expected to be carcinogenic with chronic dermal exposures.

---SENSITIZATION (SUMMARY)---

Not expected to be sensitizing based on tests of this product, components, or similar products.

---

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL FATE AND EFFECTS:

In the absence of specific environmental data for this product, this assessment is based on information for representative products.

ECOTOXICITY: Available ectoxicity data (LL50 >1000 mg/L) indicates that adverse effects to aquatic organisms are not expected from this product.

MOBILITY: When released into the environment, adsorption to sediment and soil will be the predominant behavior.

PERSISTENCE AND DEGRADABILITY: This product is expected to be inherently biodegradable.

BIOACCUMULATIVE POTENTIAL: Bioaccumulation is unlikely due to the very low water solubility of this product, therefore bioavailability to aquatic organisms is minimal.

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13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL: Product is suitable for burning in an enclosed, controlled burner for fuel value. Such burning may be limited pursuant to the Resource Conservation and Recovery Act. In addition, the product is suitable for processing by an approved recycling facility or can be disposed of at an appropriate government waste disposal facility. Use of these methods is subject to user compliance with applicable laws and regulations and consideration of product characteristics at time of disposal.

RCRA INFORMATION: The unused product, in our opinion, is not specifically listed by the EPA as a hazardous waste (40 CFR, Part 261D), nor is it formulated to contain materials which

are listed hazardous wastes. It does not exhibit the hazardous characteristics of ignitability, corrosivity, or reactivity. The unused product is not formulated with substances covered by the Toxicity Characteristic Leaching Procedure (TCLP). However, used product may be regulated.

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14. TRANSPORT INFORMATION

USA DOT: NOT REGULATED BY USA DOT.

RID/ADR: NOT REGULATED BY RID/ADR.

IMO: NOT REGULATED BY IMO.

IATA: NOT REGULATED BY IATA.

STATIC ACCUMULATOR (50 picosiemens or less): YES

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15. REGULATORY INFORMATION

US OSHA HAZARD COMMUNICATION STANDARD: When used for its intended purposes, this product is not classified as hazardous in accordance with OSHA 29 CFR 1910.1200.

EU Labeling: Product is not dangerous as defined by the European Union Dangerous Substances/Preparations Directives. EU labeling not required.

Governmental Inventory Status: All components comply with TSCA, AICS, DSL, KOREA and PHILIPPINES.

U.S. Superfund Amendments and Reauthorization Act (SARA) Title III: This product contains no "EXTREMELY HAZARDOUS SUBSTANCES".

SARA (311/312) REPORTABLE HAZARD CATEGORIES: None.

This product contains no chemicals subject to the supplier notification requirements of SARA (313) toxic release program.

The following product ingredients are cited on the lists below:

CHEMICAL NAME	CAS NUMBER	LIST CITATIONS *
NAPHTHALENE (COMPONENT ANALYSIS)	91-20-3	16
TOLUENE (COMPONENT ANALYSIS) (0.12%)	108-88-3	22, 24
DIPHENYLAMINE	122-39-4	1

--- REGULATORY LISTS SEARCHED ---

1=ACGIH ALL	6=IARC 1	11=TSCA 4	16=CA P65 CARC	21=LA RTK
2=ACGIH A1	7=IARC 2A	12=TSCA 5a2	17=CA P65 REPRO	22=MI 293
3=ACGIH A2	8=IARC 2B	13=TSCA 5e	18=CA RTK	23=MN RTK
4=NTP CARC	9=OSHA CARC	14=TSCA 6	19=FL RTK	24=NJ RTK
5=NTP SUS	10=OSHA Z	15=TSCA 12b	20=IL RTK	25=PA RTK
				26=RI RTK

* EPA recently added new chemical substances to its TSCA Section 4 test rules. Please contact the supplier to confirm whether the ingredients in this product currently appear on a TSCA 4 or TSCA 12b list.
Code key:CARC=Carcinogen; SUS=Suspected Carcinogen; REPRO=Reproductive

16. OTHER INFORMATION

USE: AUTOMATIC TRANSMISSION FLUID

NOTE: PRODUCTS OF EXXON MOBIL CORPORATION AND ITS AFFILIATED COMPANIES ARE NOT FORMULATED TO CONTAIN PCBS.

Health studies have shown that many hydrocarbons pose potential human health risks which may vary from person to person. Information provided on this MSDS reflects intended use. This product should not be used for other applications. In any case, the following advice should be considered:

INJECTION INJURY WARNING: If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

INDUSTRIAL LABEL

Under normal conditions of intended use, this product does not pose a risk to health. Excessive exposure may result in eye, skin or respiratory irritation. Always observe good hygiene measures. First Aid: Wash skin with soap and water. Flush eyes with water. If overcome by fumes or vapor, remove to fresh air. If ingested do not induce vomiting. If symptoms persist seek medical assistance. Read and understand the MSDS before using this product.

Precautionary Label Text:

This warning is given to comply with California Health and Safety Code 25249.6 and does not constitute an admission or a waiver of rights. This product contains a chemical known to the State of California to cause cancer.

****

For Internal Use Only: MHC: 1* 1* 1* 1* 1*, MPPEC: A, TRN: 525238-00, CMCS97: 971582, REQ: US - MARKETING, SAFE USE: L
EHS Approval Date: 24APR2003

****

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Prepared by: ExxonMobil Oil Corporation
Environmental Health and Safety Department, Clinton, USA

PUT IN:
OID ICE HAMMER & NEW ICE HAMMER
And BH62, BH66, BH79, BH76, BH51

Lyondell LUBRICANTS

Aquamarine® Oil 46

Material Safety Data Sheet

Lyondell Lubricants
12000 Lawndale Avenue
P.O. Box 2451
Houston, TX 77252-2451

MSDS No. 669401003

Revision Date 08/30/2001

IMPORTANT: Read this MSDS before handling or disposing of this product and pass this information on to employees, customers and users of this product.

Hazard Rankings

	HMIS	NFPA
Health Hazard *	0	0
Fire Hazard	1	1
Reactivity	0	0

* = Chronic Health Hazard

Emergency Overview

Physical State Liquid.

Color Light green. Odor Faint Odor

WARNING!
Oil injected into the skin from high-pressure leaks in hydraulic systems can cause severe injury.
Most damage occurs during the first few hours.
Seek medical attention immediately.
Surgical removal of oil may be necessary.
Spills may create a slipping hazard.

Protective Equipment

Minimum Requirements
See Section 8 for Details

SECTION 1: IDENTIFICATION

Trade Name	Aquamarine® Oil 46	Technical Contact	(918) 495-5933
Product Number	669401003	Medical Emergency	(918) 495-4700
CAS Number	Mixture.	CHEMTREC Emergency (United States Only)	(800) 424-9300
Product Family	Hydraulic Oil		
Synonyms	Hydraulic Oil; Former Lyondell Lubricants Product Code: 11134; SAP Product Code No.: 669401003		

SECTION 2: COMPOSITION

Component Name(s)	CAS Registry No.	Concentration (%)
1) White Mineral Oil	8042-47-5	95 - 100
2) Proprietary Ingredients	Proprietary Mixture	0 - 5

SECTION 3: HAZARDS IDENTIFICATION

Also see Emergency Overview and Hazard Ratings on the top of Page 1 of this MSDS.

Major Route(s) of Entry Skin contact.

Signs and Symptoms of Acute Exposure

Inhalation No significant adverse health effects are expected to occur upon short-term exposure.

Eye Contact No significant eye irritation is expected upon short-term exposure.

Skin Contact	No significant irritation is expected to occur upon short-term exposure. Injection under the skin can cause inflammation, swelling and mild central nervous system depression. Injection of pressurized hydrocarbons can cause severe, permanent tissue damage. Initial symptoms may be minor. Injection of petroleum hydrocarbons requires immediate medical attention.
Ingestion	If swallowed, large volumes of material can cause generalized depression, headache, drowsiness, nausea, vomiting and diarrhea. Smaller doses can cause a laxative effect. If aspirated into the lungs, liquid can cause lung damage.
Chronic Health Effects Summary	No significant signs or symptoms indicative of any adverse health effects are expected to occur.
Conditions Aggravated by Exposure	None known.
Target Organs	Contains material which causes damage to the following organs: skin.
Carcinogenic Potential	This product does not contain any components at concentrations above 0.1% which are considered carcinogenic by OSHA, IARC or NTP.

OSHA Hazard Classification is indicated by an "X" in the box adjacent to the hazard title. If no "X" is present, the product does not exhibit the hazard as defined in the OSHA Hazard Communication Standard (29 CFR 1910.1200).

OSHA Health Hazard Classification				OSHA Physical Hazard Classification					
Irritant		Toxic		Combustible		Explosive		Pyrophoric	
Sensitizer		Highly Toxic		Flammable		Oxidizer		Water-reactive	
Corrosive		Carcinogenic		Compressed Gas		Organic Peroxide		Unstable	

SECTION 4: FIRST AID MEASURES

Take proper precautions to ensure your own health and safety before attempting rescue or providing first aid. For more specific information, refer to Exposure Controls and Personal Protection in Section 8 of this MSDS.

Inhalation	Move victim to fresh air. If victim is not breathing, immediately begin rescue breathing. If breathing is difficult, 100 percent humidified oxygen should be administered by a qualified individual. Seek medical attention immediately. Keep the affected individual warm and at rest.
Eye Contact	Check for and remove contact lenses. Flush eyes with cool, clean, low-pressure water while occasionally lifting and lowering eyelids. Seek medical attention if excessive tearing, redness, or pain persists.
Skin Contact	Remove contaminated shoes and clothing. Wipe off excess material. Wash exposed skin with mild soap and water. Seek medical attention if tissue appears damaged or if pain or irritation persists. Thoroughly clean contaminated clothing before reuse. Discard contaminated leather goods. If material is injected under the skin, seek medical attention immediately.
Ingestion	Do not induce vomiting unless directed to by a physician. Do not give anything to drink unless directed to by a physician. Never give anything by mouth to a person who is not fully conscious. Seek medical attention immediately.
Notes to Physician	In the event of injection in underlying tissue, immediate treatment should include extensive incision, debridement and saline irrigation. Inadequate treatment can result in ischemia and gangrene. Early symptoms may be minimal.

SECTION 5: FIRE FIGHTING MEASURES

NFPA Flammability Classification	NFPA Class-IIIB combustible material. Slightly combustible!		
Flash Point Method	OPEN CUP: 204°C (399°F) (Cleveland.).		
Lower Flammable Limit	No data.	**Upper Flammable Limit**	No data.
Autoignition Temperature	Not available.		

Hazardous Combustion Products	Carbon dioxide, carbon monoxide, smoke, fumes, and/or unburned hydrocarbons.
Special Properties	This material can burn but will not readily ignite. This material will release vapors when heated above the flash point temperature that can ignite when exposed to a source of ignition. In enclosed spaces, heated vapor can ignite with explosive force. Mists or sprays may burn at temperatures below the flash point.
Extinguishing Media	Use dry chemical, foam, Carbon Dioxide or water fog.
Fire Fighting Protective Clothing	Firefighters must use full bunker gear including NIOSH-approved positive pressure self-contained breathing apparatus to protect against potential hazardous combustion or decomposition products and oxygen deficiencies.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Take proper precautions to ensure your own health and safety before attempting spill control or clean-up. For more specific information, refer to the Emergency Overview on Page 1, Exposure Controls and Personal Protection in Section 8 and Disposal Considerations in Section 13 of this MSDS.

Do not touch damaged containers or spilled material unless wearing appropriate protective equipment. Slipping hazard; do not walk through spilled material. Stop leak if you can do so without risk. For small spills, absorb or cover with dry earth, sand, or other inert non-combustible absorbent material and place into waste containers for later disposal. Contain large spills to maximize product recovery or disposal. Prevent entry into waterways or sewers. In urban area, cleanup spill as soon as possible. In natural environments, seek cleanup advice from specialists to minimize physical habitat damage. This material will float on water. Absorbent pads and similar materials can be used. Comply with all laws and regulations.

SECTION 7: HANDLING AND STORAGE

Handling	Avoid water contamination and extreme temperatures to minimize product degradation. Empty containers may contain product residues that can ignite with explosive force. Do not pressurize, cut, weld, braze solder, drill, grind or expose containers to flames, sparks, heat or other potential ignition sources. Consult appropriate federal, state and local authorities before reusing, reconditioning, reclaiming, recycling or disposing of empty containers and/or waste residues of this product.
Storage	Keep container closed. Do not store with strong oxidizing agents. Do not store at temperatures above 120° F or in direct sunlight for extended periods of time. Consult appropriate federal, state and local authorities before reusing, reconditioning, reclaiming, recycling or disposing of empty containers or waste residues of this product.

SECTION 8: EXPOSURE CONTROLS AND PERSONAL PROTECTION

Engineering Controls	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of mists and/or vapors below the recommended exposure limits (see below). An eye wash station and safety shower should be located near the work-station.
Personal Protective Equipment	Personal protective equipment should be selected based upon the conditions under which this material is used. A hazard assessment of the work area for PPE requirements should be conducted by a qualified professional pursuant to OSHA regulations. The following pictograms represent the minimum requirements for personal protective equipment. For certain operations, additional PPE may be required.

Eye Protection	Safety glasses equipped with side shields should be adequate protection under most conditions of use. Wear goggles and/or face shield if splashing or spraying is anticipated. Wear goggles and face shield if material is heated above 125°F (51°C). Have suitable eye wash water available.

========== **Product Identification** ==========

roduct ID:AIRLINE SYSTEM ANTIFREEZE
MSDS Date:09/14/1992
FSC:6850
NIIN:00N050213
MSDS Number: BVJPF
=== Responsible Party ===
Company Name:POWER SERVICE PRODUCTS INC
Box:1089
City:WEATHERFORD
State:TX
ZIP:76086
Country:US
Info Phone Num:817-599-9486
Emergency Phone Num:800-643-9089
CAGE:PWRSE
=== Contractor Identification ===
Company Name:POWER SERVICE PRODUCTS INC
Box:City:WEATHERFORD
State:TX
ZIP:76086-5000
Country:US
Phone:817-599-9486/800-643-9089
CAGE:PWRSE

========== **Composition/Information on Ingredients** ==========

Ingred Name:METHANOL; (METHYL ALCOHOL)
\S:67-56-1
RTECS #:PC1400000
Fraction by Wt: 99%
OSHA PEL:200PPM;250STEL,S
ACGIH TLV:200PPM;250STEL,S
EPA Rpt Qty:5000 LBS
DOT Rpt Qty:5000 LBS

Ingred Name:ADDITIVES
Fraction by Wt: <1%
OSHA PEL:N/K
ACGIH TLV:N/K

Ingred Name:FIRST AID PROC: DOWN THROAT. CALL PHYS.
RTECS #:9999999ZZ

Ingred Name:OTHER PREC: STATIC SPARK. CORROSIVE TO LEAD AND ALUMINUM.
RTECS #:9999999ZZ

Ingred Name:VENT: SMOKING/OPEN FLAMES.
RTECS #:9999999ZZ

========== **Hazards Identification** ==========

LD50 LC50 Mixture:LD50:(ORAL,RAT)12,9000 MG/KG
Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO

Health Hazards Acute and Chronic:AVOID BREATHING VAPOR. INHALATION OF HIGH VAPOR CONCENTRATIONS MAY HAVE RESULTS RANGING FROM DIZZINESS AND HEADACHES TO UNCONSCIOUSNESS. PROLONGED OR REPEATED LIQUID CONTACT WILL DRY AND DEFAT SKIN LEADING TO IRRITATION AND DERMATITIS.
Explanation of Carcinogenicity:NOT RELEVANT
Effects of Overexposure:SEE HEALTH HAZAWRDS.
Medical Cond Aggravated by Exposure:MAY BE FATAL/CAUSE BLINDNESS IF SWALLOWED. CANNOT BE MADE NON-POISONOUS. HARMFUL IF INHALED. MAY IRRITATE EYES. REPEATED CONTACT MAY IRRITATE SKIN.

========== **First Aid Measures** ==========

First Aid:EYE: FLUSH W/LG AMTS OF WATER FOR @ LST 15 MIN, LIFT LIDS OCCAS, GET MED ATTN. SKIN: THORO WASH EXPOSED AREA W/SOAP & WATER. REMOVE CONTAMD CLTHG. LAUNDER CONTAMD CLTHG BEFORE RE-USE. INHAL: REMOVE TO FRESH AIR. IF BRTHG IS DFCLT, ADMINISTER OXYGEN. IF BRTHG HAS STOPPED GIVE ARTF RESP. KEEP WARM, QUIET & GET MED ATTN. INGEST: GIVE 2 GLASSES OF WATER, INDUCE VOMIT IMMED BY STICKING FINGER (ING 3)

========== **Fire Fighting Measures** ==========

Flash Point Method:TCC
Flash Point:54.0F,12.2C
Lower Limits:5.5%
Upper Limits:36.5%
Extinguishing Media:DRY CHEM, ALCOHOL TYPE FOAM, CO*2. WATER MAY BE INEFTIVE. USE WATER SPRAY TO COOL FIRE EXPOSED CONTRS. USE (SUPDAT)
Fire Fighting Procedures:NIOSH/MSHA APPRVD SCBA & FULL PROT EQUIP. CLASS 1B FLAMM LIQ. AVOID WATER STREAMS WHICH MAY SPLASH & SPREAD FLAMING LIQ. COOL EXPOSED CONTRS W/WATER.
Unusual Fire/Explosion Hazard:REACTS VIOLENTLY TO OXIDIZERS. VAPS ARE HVR/AIR BUT MAY TRAVEL IN VENT SYS COMING IN CONT W/SPARKS/OPEN FLAME. KEEP AWAY FROM HEAT & SOURCES OF IGNIT. (SUPDAT)

========== **Accidental Release Measures** ==========

Spill Release Procedures:REMOVE ALL SOURCES OF IGNIT SOURCES. KEEP PEOPLE AWAY. RECOVER FREE LIQUID. ADD ABSORBENT TO SPILL AREA. AVOID BREATHING VAPORS. VENTILATE ENCLOSED SPACES. OPEN ALL WINDOWS AND DOORS. KEEP PRODUCTS OU T OF PUBLIC SEWERS, STREAMS & WATERWAYS.
Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

========== **Handling and Storage** ==========

Handling and Storage Precautions:KEEP CONTAINERS CLOSED. KEEP AWAY FROM HEAT, SPARKS & OPEN FLAME. STORE IN COOL PLACE.
Other Precautions:CONTRS ARE STRICTLY "SINGLE TRIP CONTRS" THEY ARE NOT TO BE USED FOR ANY REASON AFTER EMPTIED. NO SMOKING ALLOWED IN AREAS OF USE/STOR. USE EXPLO PROOF FIXTURES. CONTRS SHOULD BE ELECTRICALLY GROUNDED /BONDED DURING TRANSFER TO PVNT (ING 4)

========== **Exposure Controls/Personal Protection** ==========

Respiratory Protection:IN CASE OF CONDITIONS WHERE POTENTIAL FOR VAPOR CONCENTRATION IS NEAR EXPOSURE LIMITS, USE NIOSH/MSHA APPROVED SCBA.
Ventilation:LOC EXHST: FACE VELOCITY > 60FPM; MECH(GEN): EXPLO-PROOF VENT EQUIP; SPECIAL: USE ONLY W/ADEQ VENT; OTHER: NO (ING 5)

Protective Gloves:CHEMICAL RESISTANT GLOVES.
Eye Protection:ANSI APPVD CHEM SPLASH GOGGS & (SUPDAT)
Other Protective Equipment:HYDROCARBON-INSOLUBLE APRON IF NEEDED. RUBB CLTHG. EYE WASH & SFTY SHOWER SHOULD BE PROVIDED IN AREA OF USE.
Work Hygienic Practices:NONE SPECIFIED BY MANUFACTURER.
Supplemental Safety and Health
EXTING MEDIA:ALCOHOL RESIST FOAM TO EXTING LG FIRES/TO BLANKET SPILL TO REDUCE VAPS. EXPLO HAZ: BURNS W/A CLEAR ALMOST INVISIBLE FLAME, ESP HARD TO SEE IN STRONG SUNLIGHT. EMPTY CONTRS CNTN FLAMM VAPS : "DO NOT USE TORCH CUTTING EQUIP/ANY OTHER FLAME ON ANY EMPTY CONTRS". EYE PROT: FULL LGTH FACESHIELD .

========== **Physical/Chemical Properties** ==========

Boiling Pt:B.P. Text:147F,64C
Vapor Pres:96@68F
Vapor Density:1.11
Spec Gravity:0.792 (H*2O=1)
Evaporation Rate & Reference:4.6
Solubility in Water:TOTALLY MISCIBLE
Appearance and Odor:CLEAR, WATER WHITE LIQUID, ALCOHOL ODOR
Percent Volatiles by Volume:100

========== **Stability and Reactivity Data** ==========

Stability Indicator/Materials to Avoid:YES
STRONG CHLORINE ANHYDRIDE, LEAD PERCHLORATE AND PERCHLORIC ACID.
Stability Condition to Avoid:PRLNGD/RPTD BRTHG OF VAPS. CONT W/EYES. PRLNG/RPTD CONT W/SKIN.
Hazardous Decomposition Products:OCCURS FROM HEAT AND REACTION WITH MATERIALS. CARBON MONOXIDE AND CARBON DIOXIDE.

========== **Disposal Considerations** ==========

Waste Disposal Methods:DISPOSE OF WASTE BY SUPERVISED INCINERATION OR IN A CHEMICAL DISPOSAL AREA IN COMPLIANCE WITH LOCAL, FEDERAL AND STATE REGULATIONS. EPA HAZ WASTE # U154.

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========== Product Identification ==========

Product ID:THRUST QUICK STARTING FLUID, M38-15
MSDS Date:08/01/1996
FSC:6850
NIIN:00N003365
MSDS Number: CHDZB

=== Responsible Party ===

Company Name:RADIATOR SPECIALTY CO
Address:1900 WILKINSON BLVD
City:CHARLOTTE
State:NC
ZIP:28208
Country:US
Info Phone Num:704-377-6555
Emergency Phone Num:704-377-6555
CAGE:77628

=== Contractor Identification ===

Company Name:RADIATOR SPECIALTY COMPANY
Address:1900 WILKINSON BLVD.
Box:34689
City:CHARLOTTE
State:NC
ZIP:28208
Country:US
Phone:704-377-6555/303-623-5716
CAGE:77628

========== Composition/Information on Ingredients ==========

Ingred Name:ETHANE, 1,1'-OXYBIS-; (DIETHYL ETHER) (CERCLA)
CAS:60-29-7
RTECS #:KI5775000
Fraction by Wt: 27-30%
OSHA PEL:400 PPM
ACGIH TLV:400 PPM/500 STEL
EPA Rpt Qty:100 LBS
DOT Rpt Qty:100 LBS

Ingred Name:HEPTANE; (ALIPHATIC PETROLEUM DISTILLATE)
CAS:142-82-5
RTECS #:MI7700000
Fraction by Wt: 50-65%
OSHA PEL:500 PPM
ACGIH TLV:400 PPM/500 STEL

Ingred Name:CARBON DIOXIDE (PROPELLANT)
CAS:124-38-9
RTECS #:FF6400000
Fraction by Wt: 1-5%
OSHA PEL:5000 PPM
ACGIH TLV:5000 PPM/30000 STEL

========== Hazards Identification ==========

LD50 LC50 Mixture:NONE SPECIFIED BY MANUFACTURER.
Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:ACUTE: EYE CONTACT: IRRITANT. SKIN CONTACT: IRRITANT. INHALATION: MAY CAUSE HEADACHE, DIZZINESS, NARCOSIS, OVER-EXPOSURE; UNCONSCIOUSNESS. INGESTION: HARMFUL OR FATAL IF SWALLOWED. OTHER: CAUTION: EXT REMELY FLAMMABLE.
Explanation of Carcinogenicity:NOT RELEVANT.

Effects of Overexposure:SEE HEALTH HAZARD.
Medical Cond Aggravated by Exposure:NONE SPECIFIED BY MANUFACTURER.

========== **First Aid Measures** ==========

First Aid:EYE CONT: FLUSH W/WATER THOROUGHLY FOR @ LST 15 MINS WHILE LIFTING EYELIDS. IF ADVERSE EFTS PERSIST, CONSULT PHYS. SKIN CONT: WASH W/SOAP & WATER THOROUGHLY. REMOVE CONTAMD CLOTHING & LAUNDER BEFORE R EUSE. INHAL: MOVE TO FRESH AIR. IF BREATHING IS DFCLT, APPLY ARTF RESP. GET MED ATTN IMMED. INGEST: DO NOT INDUCE VOMIT! GET MED ATTN IMMED. DO NOT ADMINISTER EPINEPHRINE OR ADRENALINE!

========== **Fire Fighting Measures** ==========

Flash Point Method:TCC
Flash Point:-15F,-26C
Extinguishing Media:EXTREMELY FLAMMABLE! FOAM, CO*2, DRY CHEMICAL.
Fire Fighting Procedures:USE NIOSH APPROVED SCBA & FULL PROTECTIVE EQUIPMENT . WATER SPRAY TO COOL CONTAINERS. SHIELD TO PROTECT EYES FROM VENTING, RUPTURING OR BURSTING CANS.
Unusual Fire/Explosion Hazard:CONTENTS UNDER PRESSURE! AT ELEVATED TEMPERATURES CONTAINERS MAY VENT, RUPTURE OR BURST, EVEN VIOLENTLY.

========== **Accidental Release Measures** ==========

Spill Release Procedures:OBSERVING HEALTH HAZARDS DESCRIBED, REMOVE IGNITION SOURCES, VENTILATE AREA, FLUSH WITH WATER AND WIPE UP WITH RAGS. TRANSFER TO WASTE DRUM.
Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

========== **Handling and Storage** ==========

Handling and Storage Precautions:STORE IN A COOL PLACE BELOW 120F AWAY FROM ACIDS, IGNITION SOURCES AND OXIDIZING AGENTS.
Other Precautions:WEARING CONTACT LENSES IS INADVISABLE! DO NOT PUNCTURE OR INCINERATE CONTAINERS! KEEP AWAY FROM CHILDREN AND ANIMALS.

========== **Exposure Controls/Personal Protection** ==========

Respiratory Protection:NOT APPLICABLE. BULK HANDLING (PROLONGED EXPOSURE): IF TLV IS EXCEEDED, WEAR NIOSH APPROVED SELF-CONTAINED BREATHING APPARATUS.
Ventilation:USE WITH ADEQUATE VENTILATION.
Protective Gloves:SOLVENT-RESISTANT GLOVES.
Eye Protection:ANSI APPRVD CHEM WORKERS GOGGLES .
Other Protective Equipment:ANSI APPRVD EYE WASH & DELUGE SHOWER . APRON.
Work Hygienic Practices:NONE SPECIFIED BY MANUFACTURER.
Supplemental Safety and Health
SPEC GRAV: 0.67-0.70 (H*2O =1).

========== **Physical/Chemical Properties** ==========

Spec Gravity:SUPDAT
pH:6-7
Evaporation Rate & Reference:NOT KNOWN
Solubility in Water:2.6%
Appearance and Odor:COLORLESS VOLATILE LIQUID.
Percent Volatiles by Volume:99(WT)

========== Stability and Reactivity Data ==========

Stability Indicator/Materials to Avoid:YES
HIGH TEMPERATURES, OXIDIZING AGENTS, ACIDS AND ALKALIES.
Stability Condition to Avoid:HIGH TEMPERATURES.
Hazardous Decomposition Products:FIRE: NORMAL PRODUCTS OF COMBUSTION:
CARBON MONOXIDE, CARBON DIOXIDE AND ACRID SMOKE.

========== Disposal Considerations ==========

Waste Disposal Methods:DISPOSE OF IN ACCORDANCE WITH ALL APPLICABLE
GOVERNMENT, STATE AND LOCAL LAWS AND REGULATIONS.

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========== Product Identification ==========

Product ID:DIESEL FUEL SUPPLEMENT
MSDS Date:08/14/1996
FSC:6810
NIIN:00F040685
Status Code:A
MSDS Number: CJMSB

=== Responsible Party ===

Company Name:POWER SERVICE PRODUCTS INC
Address:513 PEASTER HWY
Box:1089
City:WEATHERFORD
State:TX
ZIP:76086
Country:US
Info Phone Num:817-599-9486
Emergency Phone Num:800-643-9089/817-599-9486
CAGE:08QT9

=== Contractor Identification ===

Company Name:POWER SERVICE PRODUCTS INC
Address:513 PEASTER HWY
Box:1089
City:WEATHERFORD
State:TX
ZIP:76086
Country:US
Phone:817-599-9486
CAGE:08QT9

========== Composition/Information on Ingredients ==========

Ingred Name:HYDROCARBONS
Minumum % Wt:10.
Maxumum % Wt:20.

Ingred Name:HYDROXY COMPOUNDS
Minumum % Wt:50.
Maxumum % Wt:80.

Ingred Name:AROMATICS
Minumum % Wt:5.
Maxumum % Wt:50.

========== Hazards Identification ==========

Routes of Entry: Inhalation:YES Skin:NO Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:SKIN: PROLONGED/REPEATED CONTACT TENDS TO REMOVE OILS LEADING TO IRRITATION & DERMATITIS. INHALATION: CONCENTRATIONS OF HIGH VAPORS. INGESTION: ASPIRATED INTO THE LUNGS MAY CAUSE SEVERE PULMONARY INJU RY/DEATH.
Explanation of Carcinogenicity:NONE
Effects of Overexposure:IRRITATION, DIZZINESS, HEADACHES, UNCONSCIOUSNESS, DRYNESS, DEFATTING.

========== First Aid Measures ==========

First Aid:EYES: FLUSH W/LARGE AMOUNTS OF WATER. SKIN: FLUSH W/LARGE AMOUNTS OF WATER, USE SOAP. INHALATION: IMMEDIATELY REMOVE TO FRESH AIR. GIVE CPR IF NEEDED. KEEP AT REST. INGESTION: DON'T INDUCE VOMITING. K EEP AT REST. OBTAIN MEDICAL ATTENTION IN ALL CASES.

========== **Fire Fighting Measures** ==========

Flash Point Method:TCC
Flash Point:=11.7C, 53.F
Lower Limits:2
Upper Limits:12
Extinguishing Media:ALCOHOL RESISTANT FOAM, DRY CHEMICAL, CO2, WATERSPRAY/FOG
Fire Fighting Procedures:USE AIR SUPPLIED RESCUE EQUIPMENT FOR ENCLOSED AREAS. COOL EXPOSED CONTAINERS W/WATER.
Unusual Fire/Explosion Hazard:EMPTY CONTAINERS CONTAIN FLAMMABLE VAPORS. DON'T STORE/MIX W/COMBUSTIBLE LIQUIDS. DON'T USE TORCH CUTTING EQUIPMENT/ANY OTHER FLAME ON ANY EMPTY CONTAINER.

========== **Accidental Release Measures** ==========

Spill Release Procedures:REMOVE IGNITION SOURCES. EVACUATE. RECOVER FREE LIQUID. ADD ABSORBENT TO AREA. VENTILATE ENCLOSED SPACES. OPEN ALL WINDOWS & DOORS. KEEP PETROLEUM PRODUCTS OUT OF PUBLIC SEWERS, STREAMS & WATERWAYS.

========== **Handling and Storage** ==========

Handling and Storage Precautions:KEEP CONTAINERS CLOSED. KEEP AWAY FROM HEAT, SPARKS & OPEN FLAMES. CONTAINERS ARE STRICTLY SINGLE TRIP CONTAINERS, DON'T USE AFTER EMPTIED.
Other Precautions:AVOID BREATHING VAPORS. AVOID PROLONGED/REPEATED CONTACT W/SKIN. EMPTY CONTAINERS CONTAIN FLAMMABLE VAPORS: DON'T USE TORCH CUTTING EQUIPMENT/ANY OTHER FLAME ON ANY EMPTY CONTAINER. DON'T STORE/MIX W/ STRONG OXIDANTS OF COMBUSTIBLE LIQUIDS.

========== **Exposure Controls/Personal Protection** ==========

Respiratory Protection:HYDROCARBON VAPOR CANISTER/SUPPLIED AIR HOSE IF NEEDED.
Ventilation:LOCAL EXHAUST: FACE VELOCITY >60 FPM. MECHANICAL (GENERAL): EXPLOSION-PROOF VENTILATION EQUIPMENT.
Protective Gloves:CHEMICAL RESISTANT
Eye Protection:NORMALLY NOT NEEDED.
Other Protective Equipment:HYDROCARBON INSOLUBLE APRON.
Work Hygienic Practices:REMOVE/LAUNDER CONTAMINATED CLOTHING/SHOES BEFORE REUSE. WASH SKIN W/SOAP & WATER AFTER CONTACT. DON'T SMOKE.
Supplemental Safety and Health
USE ONLY W/ADEQUATE VENTILATION. NO SMOKING/OPEN FLAMES.

========== **Physical/Chemical Properties** ==========

Boiling Pt:=80.C, 176.F
Vapor Pres:32
Vapor Density:2.1
Spec Gravity:0.82
Evaporation Rate & Reference:(WATER = 1): 1.4
Solubility in Water:PARTIAL
Appearance and Odor:CLEAR LIQUID SOLVENT
Percent Volatiles by Volume:100

========== **Stability and Reactivity Data** ==========

Stability Indicator/Materials to Avoid:YES
STRONG OXIDANTS.
Stability Condition to Avoid:HEAT, SPARKS, OPEN FLAME.

========== **Ecological Information** ==========

Ecological:THIS PRODUCT DOES NOT CONTAIN ANY OZONE DEPLETING CHEMICALS

========== **Disposal Considerations** ==========

Waste Disposal Methods:DISPOSE OF WASTE IAW/FEDERAL, STATE & LOCAL REGULATIONS. UN1193.

========== **MSDS Transport Information** ==========

Transport Information:PROPER SHIPPING NAME: RQ WASTE FLAMMABLE LIQUID N.O.S. UN1993.RCRA WASTE NUMBER D001.

========== **Regulatory Information** ==========

State Regulatory Information:RIGHT TO KNOW TIER II REPORTING INFORMATION SECTION 311-312. CHEMICAL DESCRIPTION: HYDROXY COMPOUNDS & HYDROCARBONS. COMMON NAME: DIESEL FUEL SUPPLEMENT. PHYSICAL HAZARD: FIRE.

========== **Other Information** ==========

Disclaimer (provided with this information by the compiling agencies): This information is formulated for use by elements of the Department of Defense. The United States of America in no manner whatsoever, expressly or implied, warrants this information to be accurate and disclaims all liability for its use. Any person utilizing this document should seek competent professional advice to verify and assume responsibility for the suitability of this information to their particular situation.

WD-40

MATERIAL SAFETY DATA SHEET

I. PRODUCT IDENTIFICATION

Manufacturer:	WD-40 Company	Telephone:	
		Emergency only:	1-(800) 424-9300 (CHEMTREC)
Address:	1061 Cudahy Place (92110) P.O. Box 80607 San Diego, California 92138-0607	Information:	(619) 275-1400
		Chemical Name:	Organic Mixture
		Trade Name:	WD-40 Aerosol

II. HAZARDOUS INGREDIENTS

Chemical Name	CAS Number	%	Exposure Limit ACGIH/OSHA
Aliphatic Petroleum Distillates	8052-41-3	45-50	100 ppm PEL
Petroleum Base Oil	64742-65-0	15-25	5 mg/M^3 TWA (mist)
LVP Hydrocarbon Fluid	64742-47-8	12-18	1200 mg/M^3 TWA
Carbon Dioxide	124-38-9	2-3	5000 ppm PEL
Non-hazardous Ingredients		‹ 10	

III. PHYSICAL DATA

Boiling Point:	323°F (minimum)	Evaporation Rate:	Not determined
Vapor Density (air=1):	Greater than 1	Vapor Pressure:	110 ±5 PSI @ 70°F
Solubility in Water:	insoluble	Appearance:	Light amber
Specific Gravity (H_2O=1):	0.832 @ 72°F	Odor:	Characteristic odor
Percent Volatile (volume):	74%	VOC:	412 grams/liter (49.5%)

IV. FIRE AND EXPLOSION

Flash Point:	131°F Tag Closed Cup
Flammable Limits:	(Solvent Portion) [Lel] 1.0% [Uel] 6.0%
Extinguishing Media:	CO_2, Dry Chemical, Foam.
Special Fire Fighting Procedures:	Contents Under Pressure
Unusual Fire and Explosion Hazards:	FLAMMABLE - U.F.C. level 3 AEROSOL

V. HEALTH HAZARD / ROUTE(S) OF ENTRY

Threshold Limit Value	Aliphatic Petroleum Distillates (Stoddard Solvent) lowest TLV (ACGIH 100 ppm.)
Symptoms of Overexposure	
Inhalation (Breathing):	May cause anesthesia, headache, dizziness, nausea and upper respiratory irritation.
Skin contact:	May cause drying of skin and/or irritation.
Eye contact:	May cause irritation, tearing and redness.
Ingestion (Swallowed):	May caused irritation, nausea, vomiting and diarrhea.
First Aid Emergency Procedures	
Ingestion (Swallowed):	Do not induce vomiting, seek medical attention.
Eye Contact:	Immediately flush eyes with large amounts of water for 15 minutes.
Skin Contact:	Wash with soap and water.
Inhalation (Breathing):	Remove to fresh air. Give artificial respiration if necessary. If breathing is difficult, give oxygen.
	Pre-existing medical conditions such as eye, skin and respiratory disorders may be aggravated by exposure.
DANGER!	
Aspiration Hazard:	If swallowed, can enter lungs and may cause chemical pneumonitis. Do not induce vomiting. Call Physician immediately.
Suspected Cancer Agent Yes___ No_X_	The components in this mixture have been found to be noncarcinogenic by NTP, IARC and OSHA

VI. REACTIVITY DATA

Stability:	Stable _X_	Unstable____
Conditions to avoid:	NA	
Incompatibility:	Strong oxidizing agents	
Hazardous decomposition products:	Thermal decomposition may yield carbon monoxide and/or carbon dioxide.	
Hazardous polymerization:	May occur ____	Will not occur_X_

VII. SPILL OR LEAK PROCEDURES

Spill Response Procedures

Spill unlikely from aerosol cans. Leaking cans should be placed in plastic bag or open pail until pressure has dissipated.

Waste Disposal Method

Empty aerosol cans should not be punctured or incinerated; bury in land fill. Liquid should be incinerated or buried in land fill. Dispose of in accordance with local, state and federal regulations.

VIII. SPECIAL HANDLING INFORMATION

Ventilation:	Sufficient to keep solvent vapor less than TLV.
Respiratory Protection:	Advised when concentrations exceed TLV.
Protective Gloves:	Advised to prevent possible skin irritation.
Eye Protection:	Approved eye protections to safeguard against potential eye contact, irritation or injury.
Other Protective Equipment:	None required.

IX. SPECIAL PRECAUTIONS

Keep from sources of ignition. Avoid excessive inhalation of spray particles, do not take internally. Do not puncture, incinerate or store container above 120°F. Exposure to heat may cause bursting. Keep can away from electrical current or battery terminals. Electrical arcing can cause burn-through (puncture) which may result in flash fire, causing serious injury. Keep from children.

X.TRANSPORTATION DATA (49 CFR 172.101)

Domestic Surface

Description:	Consumer Commodity
Hazard Class:	ORM-D
ID No:	None
Label Required:	Consumer commodity (ORM-D)

XI. REGULATORY INFORMATION

All ingredients for this product are listed on the TSCA inventory.

SARA Title III chemicals:	None
California Prop 65 chemicals:	None
CERCLA reportable quantity:	None
RCRA hazardous waste no:	D001 (Ignitable)

SIGNATURE: R. Miles R Miles TITLE: Technical Director

REVISION DATE: NOVEMBER 2003 SUPERSEDES: MARCH 2001

NA: Not applicable NDA: No data available < = Less than > = More than

We believe the statements, technical information and recommendations contained herein are reliable. However, the data is provided without warranty, expressed or implied. It is the user's responsibility both to determine safe conditions for use of this product and assume loss, damage or expense, direct or consequential, arising from its use. Before using product, read label.

Material Safety Data Sheet

24 Hour Assistance:
1-847-367-7700
Rust-Oleum Corp.
www.rustoleum.com

Section 1 - Chemical Product / Company Information

203032 Fluorescent Green
203036 Fluorescent Orange

Product Name:	Industrial Choice Aerosol - Water Based Fluroescent Marking	Revision Date:	08/31/2004
Identification Number:	1861838, 1862838, 1869838. 203032, 203036, 203037		
Product Use/Class:	Water Based Fluorescent Marking Aerosol		
Supplier:	Rust-Oleum Corporation 11 Hawthorn Parkway Vernon Hills, IL 60061 USA	Manufacturer:	Rust-Oleum Corporation 11 Hawthorn Parkway Vernon Hills, IL 60061 USA
Preparer:	Cziczo, Ray		

Section 2 - Composition / Information On Ingredients

Chemical Name	CAS Number	Weight % Less Than	ACGIH TLV-TWA	ACGIH TLV-STEL	OSHA PEL-TWA	OSHA PEL-CEILING
Liquified Petroleum Gas	68476-86-8	30.0	1000 PPM	N.E.	1000 PPM	N.E.
Toluene	108-88-3	15.0	50 PPM	150 PPM	200 PPM	300 PPM
Aliphatic Petroleum Distillates	64742-89-8	10.0	400 PPM	N.E.	400 PPM	N.E.
Polymer Anchored Green Dye Dispersion	MIXTURE	10.0	N.E.	N.E.	N.E.	N.E.
Polymer Anchored Violet Dye Dispersion	MIXTURE	10.0	N.E.	N.E.	N.E.	N.E.
Hydrotreated Light Distillate	64742-47-8	5.0	N.E.	N.E.	N.E.	N.E.
Stoddard Solvents	8052-41-3	5.0	100 PPM	N.E.	500 PPM	N.E.
Ethylbenzene	100-41-4	1.0	100 PPM	125 PPM	100 PPM	N.E.

Section 3 - Hazards Identification

*** Emergency Overview ***: Harmful if inhaled. May affect the brain or nervous system causing dizziness, headache or nausea. Contents Under Pressure. Vapors may cause flash fire or explosion. Extremely flammable liquid and vapor. Harmful if swallowed.

Effects Of Overexposure - Eye Contact: Causes eye irritation.

Effects Of Overexposure - Skin Contact: Prolonged or repeated contact may cause skin irritation. Substance may cause slight skin irritation.

Effects Of Overexposure - Inhalation: High vapor concentrations are irritating to the eyes, nose, throat and lungs. Avoid breathing vapors or mists. High gas, vapor, mist or dust concentrations may be harmful if inhaled. Harmful if inhaled.

Effects Of Overexposure - Ingestion: Aspiration hazard if swallowed; can enter lungs and cause damage. Substance may be harmful if swallowed.

Effects Of Overexposure - Chronic Hazards: IARC lists Ethylbenzene as a possible human carcinogen (group 2B). May cause central nervous system disorder (e,g.,narcosis involving a loss of coordination, weakness, fatigue, mental confusion, and blurred vision) and/or damage. Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage. Overexposure to xylene in laboratory animals has been associated with liver abnormalities, kidney, lung, spleen, eye and blood damage as well as reproductive disorders. Effects in humans, due to chronic overexposure, have included liver, cardiac abnormalities and nervous system damage. Overexposure to toluene in laboratory animals has been associated with liver abnormalities, kidney, lung and spleen damage. Effects in humans have included liver and cardiac abnormalities.

Primary Route(s) Of Entry: Skin Contact, Skin Absorption, Inhalation, Eye Contact

Section 4 - First Aid Measures

First Aid - Eye Contact: Hold eyelids apart and flush with plenty of water for at least 15 minutes. Get medical attention.

First Aid - Skin Contact: Wash with soap and water. Get medical attention if irritation develops or persists.

First Aid - Inhalation: If you experience difficulty in breathing, leave the area to obtain fresh air. If continued difficulty is experienced, get medical assistance immediately.

First Aid - Ingestion: Aspiration hazard: Do not induce vomiting or give anything by mouth because this material can enter the lungs and cause severe lung damage. Get immediate medical attention.

Section 5 - Fire Fighting Measures

Flash Point: -156 F
(Setaflash)

LOWER EXPLOSIVE LIMIT: 1.0 %
UPPER EXPLOSIVE LIMIT : 11.2 %

Extinguishing Media: Dry Chemical, Foam, Water Fog

Unusual Fire And Explosion Hazards: Vapors can travel to a source of ignition and flash back. Vapors may form explosive mixtures with air. Closed containers may explode when exposed to extreme heat. Water spray may be ineffective. FLASH POINT IS LESS THAN 20 °. F. - EXTREMELY FLAMMABLE LIQUID AND VAPOR! Perforation of the pressurized container may cause bursting of the can. Isolate from heat, electrical equipment, sparks and open flame. Keep containers tightly closed.

Special Firefighting Procedures: Evacuate area and fight fire from a safe distance.

Section 6 - Accidental Release Measures

Steps To Be Taken If Material Is Released Or Spilled: Contain spilled liquid with sand or earth. DO NOT use combustible materials such as sawdust. Remove all sources of ignition, ventilate area and remove with inert absorbent and non-sparking tools. Dispose of according to local, state (provincial) and federal regulations. Do not incinerate closed containers.

Section 7 - Handling And Storage

Handling: Wash thoroughly after handling. Wash hands before eating. Use only in a well -ventilated area. Follow all MSDS/label precautions even after container is emptied because it may retain product residues. Avoid breathing vapor or mist.

Storage: Keep containers tightly closed. Isolate from heat, electrical equipment, sparks and open flame. Do not store above 120 ° F. Store large quantities in buildings designed and protected for storage of NFPA Class I flammable liquids. Contents under pressure. Do not expose to heat or store above 120 ° F.

Section 8 - Exposure Controls / Personal Protection

Engineering Controls: Use explosion-proof ventilation equipment. Prevent build -up of vapors by opening all doors and windows to achieve cross-ventilation. Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.

Respiratory Protection: A respiratory protection program that meets OSHA 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions warrant a respirator's use. A NIOSH/MSHA approved air purifying respirator with an organic vapor cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits.

Protection provided by air purifying respirators is limited. Use a positive pressure air supplied respirator if there is any potential for an uncontrolled release, exposure levels are not known, or any other circumstances where air purifying respirators may not provide adequate protection.

Skin Protection: Use impervious gloves to prevent skin contact and absorption of this material through the skin. Nitrile or Neoprene gloves may afford adequate skin protection.

Eye Protection: Use safety eyewear designed to protect against splash of liquids.

Other protective equipment: Refer to safety supervisor or industrial hygienist for further information regarding personal protective equipment and its application.

Hygienic Practices: Wash thoroughly with soap and water before eating, drinking or smoking.

Section 9 - Physical And Chemical Properties

Boiling Range:	201 - 410 F	Vapor Density:	Heavier than air
Odor:	Solvent Like	Odor Threshold:	ND
Appearance:	Liquid	Evaporation Rate:	Faster than Ether
Solubility in H2O:	Slight		
Freeze Point:	ND	Specific Gravity:	
Vapor Pressure:		PH:	NE
Physical State:	Liquid		

(See section 16 for abbreviation legend)

Section 10 - Stability And Reactivity

Conditions To Avoid: Avoid all possible sources of ignition. Avoid temperatures above 120 ° F.

Incompatibility: Incompatible with strong oxidizing agents, strong acids and strong alkalies.

Hazardous Decomposition: When heated to decomposition it emits acrid smoke and irritating fumes. By open flame, carbon monoxide and carbon dioxide.

Hazardous Polymerization: Will not occur under normal conditions.

Stability: This product is stable under normal storage conditions.

Section 11 - Toxicological Information

Product LD50: ND

Product LC50: ND

Chemical Name	LD50	LC50
Liquified Petroleum Gas	N.D.	N.D.
Toluene	N.D.	N.D.
Aliphatic Petroleum Distillates	N.D.	N.D.
Polymer Anchored Green Dye Dispersion	N.D.	N.D.
Polymer Anchored Violet Dye Dispersion	N.D.	N.D.
Hydrotreated Light Distillate	N.D.	N.D.
Stoddard Solvents	N.D.	N.D.
Ethylbenzene	3500 mg/kg (ORAL, RAT)	N.D.

Section 12 - Ecological Information

Ecological Information: Product is a mixture of listed components.

Section 13 - Disposal Information

Disposal Information: Dispose of material in accordance to local, state and federal regulations and ordinances. Do not allow to enter storm drains or sewer systems.

Section 14 - Transportation Information

DOT Proper Shipping Name:	Aerosol	Packing Group:	---
DOT Technical Name:	---	Hazard Subclass:	1
DOT Hazard Class:	2	Resp. Guide Page:	126
DOT UN/NA Number:	UN 1950		

Section 15 - Regulatory Information

CERCLA - SARA Hazard Category

This product has been reviewed according to the EPA "Hazard Categories" promulgated under Sections 311and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

IMMEDIATE HEALTH HAZARD, CHRONIC HEALTH HAZARD, FIRE HAZARD

SARA Section 313:

Listed below are the substances (if any) contained in this product that are subject to the reporting requirements of

Section 313 of Title III of the Superfund Amendment and Reauthorization Act of 1986 and 40 CFR part 372:

Chemical Name	CAS Number
Toluene	108-88-3
Ethylbenzene	100-41-4

Toxic Substances Control Act:

Listed below are the substances (if any) contained in this product that are subject to the reporting requirements of TSCA 12(B) if exported from the United States:

None known

U.S. State Regulations: As follows -

New Jersey Right-to-Know:

The following materials are non-hazardous, but are among the top five components in this product.

Chemical Name	CAS Number
Water	7732-18-5
Calcium Carbonate	1317-65-3

Pennsylvania Right-to-Know:

The following non-hazardous ingredients are present in the product at greater than 3%.

Chemical Name	CAS Number
Water	7732-18-5
Calcium Carbonate	1317-65-3
Polymer Anchored Pink Dye Dispersion	MIXTURE
Polymer Anchored Red Dye Dispersion	MIXTURE
Barium Sulfate	7727-43-7
Polymer Anchored Orange Dye Dispersion	MIXTURE
Polymer Anchored Orange Dye Dispersion	MIXTURE

California Proposition 65:

Warning: The following ingredients present in the product are known to the state of California to cause Cancer:

Chemical Name	CAS Number
Ethylbenzene	100-41-4
Microcrystalline Silica	14808-60-7
Lead Compounds	NOT SPECIFIED
Formaldehyde	50-00-0
Ethylene Oxide	75-21-8
Benzene	71-43-2
Cadmium Compounds	NOT SPECIFIED

Warning: The following ingredients present in the product are known to the state of California to cause birth defects, or other reproductive hazards.

Chemical Name	CAS Number
Toluene	108-88-3
Lead Compounds	NOT SPECIFIED
Ethylene Oxide	75-21-8
Benzene	71-43-2
Cadmium Compounds	NOT SPECIFIED

International Regulations: As follows -

CANADIAN WHMIS:

This MSDS has been prepared in compliance with Controlled Product Regulations except for the use of the 16 headings.

CANADIAN WHMIS CLASS: AB5 D2A D2B

Section 16 - Other Information

HMIS Ratings:

Health: 2* Flammability: 4 Reactivity: 0 Personal Protection: X

VOLATILE ORGANIC COMPOUNDS, g/l: NA

REASON FOR REVISION:

Legend: N.A. - Not Applicable, N.E. - Not Established, N.D. - Not Determined

The information contained on this MSDS has been checked and should be accurate. However, it is the responsibility of the user to comply with all Federal, State, and Local laws and regulations.

Material Safety Data Sheet

24 Hour Assistance:
1-847-367-7700
Rust-Oleum Corp.
www.rustoleum.com

Section 1 - Chemical Product / Company Information

203031 Caution Blue
203039 White

Product Name:	Industrial Choice Aerosol - Water Based Marking Paint	Revision Date:	08/31/2004
Identification Number:	1834838, 1868838, 1875838, 203035, 203031, 203033, 203034, 203038, 203039		
Product Use/Class:	Water Based Inverted Marking/Aerosol		
Supplier:	Rust-Oleum Corporation 11 Hawthorn Parkway Vernon Hills, IL 60061 USA	Manufacturer:	Rust-Oleum Corporation 11 Hawthorn Parkway Vernon Hills, IL 60061 USA
Preparer:	Cziczo, Ray		

Section 2 - Composition / Information On Ingredients

Chemical Name	CAS Number	Weight % Less Than	ACGIH TLV-TWA	ACGIH TLV-STEL	OSHA PEL-TWA	OSHA PEL-CEILING
Liquified Petroleum Gas	68476-86-8	25.0	1000 PPM	N.E.	1000 PPM	N.E.
Toluene	108-88-3	25.0	50 PPM	150 PPM	200 PPM	300 PPM
Xylene	1330-20-7	20.0	100 PPM	150 PPM	100 PPM	N.E.
Acetone	67-64-1	15.0	500 PPM	750 PPM	750 PPM	N.E.
Titanium Dioxide	13463-67-7	15.0	10 mg/m3	N.E.	10 mg/m3	N.E.
Naphtha	8032-32-4	10.0	300 PPM	N.E.	N.E.	N.E.
Ethylbenzene	100-41-4	5.0	100 PPM	125 PPM	100 PPM	N.E.
Magnesium Silicate	14807-96-6	5.0	10 mg/m3	N.E.	15 mg/m3	N.E.
Aliphatic Hydrocarbon	64742-89-8	5.0	300 PPM	N.E.	300 PPM	N.E.
Pigment Yellow 73	13515-40-7	5.0	2 mg/m3	N.E.	2 mg/m3	N.E.
Pigment Green 7	1328-53-6	5.0	N.E.	N.E.	N.E.	N.E.
Pigment Black 7	1333-86-4	5.0	3.5 mg/m3	N.E.	3.5 mg/m3	N.E.
Pigment Yellow 194	82199-12-0	1.0	N.E.	N.E.	N.E.	N.E.
Pigment Red 122	980-26-7	1.0	15mg/m3	N.E.	5mg/m3	N.E.

Section 3 - Hazards Identification

*** Emergency Overview ***: Harmful if inhaled. May affect the brain or nervous system causing dizziness, headache or nausea. Contents Under Pressure. Vapors may cause flash fire or explosion. Extremely flammable liquid and vapor. Harmful if swallowed.

Effects Of Overexposure - Eye Contact: Causes eye irritation.

Effects Of Overexposure - Skin Contact: Prolonged or repeated contact may cause skin irritation. Substance may cause slight skin irritation.

Effects Of Overexposure - Inhalation: High vapor concentrations are irritating to the eyes, nose, throat and lungs. Avoid breathing vapors or mists. High gas, vapor, mist or dust concentrations may be harmful if inhaled. Harmful if inhaled.

Effects Of Overexposure - Ingestion: Aspiration hazard if swallowed; can enter lungs and cause damage. Substance may be harmful if swallowed.

Effects Of Overexposure - Chronic Hazards: IARC lists Ethylbenzene as a possible human carcinogen (group 2B). May cause central nervous system disorder (e,g.,narcosis involving a loss of coordination, weakness, fatigue, mental confusion, and blurred vision) and/or damage. Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage. Overexposure to xylene in laboratory animals has been associated with liver abnormalities, kidney, lung, spleen, eye and blood damage as well as reproductive disorders. Effects in humans, due to chronic overexposure, have included liver, cardiac abnormalities and nervous system damage. Overexposure to toluene in laboratory animals has been associated with liver abnormalities, kidney, lung and spleen damage. Effects in humans have included liver and cardiac abnormalities.
Contains carbon black. Chronic inflammation, lung fibrosis, and lung tumors have been observed in some rats experimentally exposed for long periods of time to excessive concentrations of carbon black and several insoluble fine dust particles. Tumors have not been observed in other animal species (i.e., mouse and hampster) under similar circumstances and study conditions. Epidemiological studies of North American workers show no evidence of clinically significant adverse health effects due to occupational exposure to carbon black.
Carbon black is listed as a Group 2B-"Possibly carcinogenic to humans" by IARC and is proposed to be listed as A4- "not classified as a human carcinogen" by the American Conference of Govermental Industrial Hygienists. Significant exposure is not anticipated during brush application or drying. Risk of overexposure depends on duration and level of exposure to dust from repeated sanding of surfaces or spray mist and the actual concentration of carbon black in the formula.

Primary Route(s) Of Entry: Skin Contact, Skin Absorption, Inhalation, Eye Contact

Section 4 - First Aid Measures

First Aid - Eye Contact: Hold eyelids apart and flush with plenty of water for at least 15 minutes. Get medical attention.

First Aid - Skin Contact: Wash with soap and water. Get medical attention if irritation develops or persists.

First Aid - Inhalation: If you experience difficulty in breathing, leave the area to obtain fresh air. If continued difficulty is experienced, get medical assistance immediately.

First Aid - Ingestion: Aspiration hazard: Do not induce vomiting or give anything by mouth because this material can enter the lungs and cause severe lung damage. Get immediate medical attention.

Section 5 - Fire Fighting Measures

Flash Point: -156 F
(Setaflash)

LOWER EXPLOSIVE LIMIT: 11.2 %
UPPER EXPLOSIVE LIMIT : 11.2 %

Extinguishing Media: Dry Chemical, Foam, Water Fog

Unusual Fire And Explosion Hazards: Vapors can travel to a source of ignition and flash back. Vapors may form explosive mixtures with air. Closed containers may explode when exposed to extreme heat. Water spray may be ineffective. FLASH POINT IS LESS THAN 20 °. F. - EXTREMELY FLAMMABLE LIQUID AND VAPOR! Perforation of the pressurized container may cause bursting of the can. Isolate from heat, electrical equipment, sparks and open flame. Keep containers tightly closed.

Special Firefighting Procedures: Evacuate area and fight fire from a safe distance.

Section 6 - Accidental Release Measures

Steps To Be Taken If Material Is Released Or Spilled: Contain spilled liquid with sand or earth. DO NOT use combustible materials such as sawdust. Remove all sources of ignition, ventilate area and remove with inert absorbent and non-sparking tools. Dispose of according to local, state (provincial) and federal regulations. Do not incinerate closed containers.

Section 7 - Handling And Storage

Handling: Wash thoroughly after handling. Wash hands before eating. Use only in a well-ventilated area. Follow all MSDS/label precautions even after container is emptied because it may retain product residues. Avoid breathing vapor or mist.

Storage: Keep containers tightly closed. Isolate from heat, electrical equipment, sparks and open flame. Do not store above 120 ° F. Store large quantities in buildings designed and protected for storage of NFPA Class I flammable liquids. Contents under pressure. Do not expose to heat or store above 120 ° F.

Section 8 - Exposure Controls / Personal Protection

Engineering Controls: Use explosion-proof ventilation equipment. Prevent build-up of vapors by opening all doors and windows to achieve cross-ventilation. Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.

Respiratory Protection: A respiratory protection program that meets OSHA 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions warrant a respirator's use. A NIOSH/MSHA approved air purifying respirator with an organic vapor cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits.

Protection provided by air purifying respirators is limited. Use a positive pressure air supplied respirator if there is any potential for an uncontrolled release, exposure levels are not known, or any other circumstances where air purifying respirators may not provide adequate protection.

Skin Protection: Use impervious gloves to prevent skin contact and absorption of this material through the skin. Nitrile or Neoprene gloves may afford adequate skin protection.

Eye Protection: Use safety eyewear designed to protect against splash of liquids.

Other protective equipment: Refer to safety supervisor or industrial hygienist for further information regarding personal protective equipment and its application.

Hygienic Practices: Wash thoroughly with soap and water before eating, drinking or smoking.

Section 9 - Physical And Chemical Properties

Boiling Range:	- 410 F	Vapor Density:	Heavier than air
Odor:	Solvent Like	Odor Threshold:	ND
Appearance:	Liquid	Evaporation Rate:	Faster than Ether
Solubility in H2O:	Slight		
Freeze Point:	ND	Specific Gravity:	
Vapor Pressure:		PH:	NE
Physical State:	Liquid		

(See section 16 for abbreviation legend)

Section 10 - Stability And Reactivity

Conditions To Avoid: Avoid all possible sources of ignition. Avoid temperatures above 120 ° F.

Incompatibility: Incompatible with strong oxidizing agents, strong acids and strong alkalies.

Hazardous Decomposition: When heated to decomposition it emits acrid smoke and irritating fumes. By open flame, carbon monoxide and carbon dioxide.

Hazardous Polymerization: Will not occur under normal conditions.

Stability: This product is stable under normal storage conditions.

Section 11 - Toxicological Information

Product LD50: ND

Product LC50: ND

Chemical Name	LD50	LC50
Liquified Petroleum Gas	N.D.	N.D.
Toluene	N.D.	N.D.
Xylene	N.D.	N.D.
Acetone	N.D.	N.D.
Titanium Dioxide	>7500 mg/kg (ORAL, RAT)	N.D.
Naphtha	>5000 mg/kg (ORAL, RAT)	N.D.
Ethylbenzene	3500 mg/kg (ORAL, RAT)	N.D.
Magnesium Silicate	N.D.	TCLo:11mg/m3 inh.
Aliphatic Hydrocarbon	N.D.	N.D.
Pigment Yellow 73	N.D.	N.D.
Pigment Green 7	>5000 mg/kg (ORAL, RAT)	N.D.
Pigment Black 7	>8000 mg/kg (ORAL, RAT)	N.D.
Pigment Yellow 194	N.D.	N.D.
Pigment Red 122	N.D.	N.D.

Section 12 - Ecological Information

Ecological Information: Product is a mixture of listed components.

Section 13 - Disposal Information

Disposal Information: Dispose of material in accordance to local, state and federal regulations and ordinances. Do

not allow to enter storm drains or sewer systems.

Section 14 - Transportation Information

DOT Proper Shipping Name:	Aerosol	Packing Group:	---
DOT Technical Name:	---	Hazard Subclass:	1
DOT Hazard Class:	2	Resp. Guide Page:	126
DOT UN/NA Number:	UN 1950		

Section 15 - Regulatory Information

CERCLA - SARA Hazard Category

This product has been reviewed according to the EPA "Hazard Categories" promulgated under Sections 311and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

IMMEDIATE HEALTH HAZARD, CHRONIC HEALTH HAZARD, FIRE HAZARD

SARA Section 313:

Listed below are the substances (if any) contained in this product that are subject to the reporting requirements of Section 313 of Title III of the Superfund Amendment and Reauthorization Act of 1986 and 40 CFR part 372:

Chemical Name	CAS Number
Toluene	108-88-3
Xylene	1330-20-7
Ethylbenzene	100-41-4
Pigment Green 7	1328-53-6

Toxic Substances Control Act:

Listed below are the substances (if any) contained in this product that are subject to the reporting requirements of TSCA 12(B) if exported from the United States:

None known

U.S. State Regulations: As follows -

New Jersey Right-to-Know:

The following materials are non-hazardous, but are among the top five components in this product.

Chemical Name	CAS Number
Water	7732-18-5

Pennsylvania Right-to-Know:

The following non-hazardous ingredients are present in the product at greater than 3%.

Chemical Name	CAS Number
Water	7732-18-5
Calcium Carbonate	1317-65-3
Modified Alkyd	PROPRIETARY

California Proposition 65:

Warning: The following ingredients present in the product are known to the state of California to cause Cancer:

Chemical Name	CAS Number
Ethylbenzene	100-41-4
Microcrystalline Silica	14808-60-7
Lead Compounds	NOT SPECIFIED
Cadmium Compounds	NOT SPECIFIED
Acetaldehyde	75-07-0
Nickel Compounds	NOT SPECIFIED
Benzene	71-43-2
Arsenic Compounds	NOT SPECIFIED
Ethylene Oxide	75-21-8
Formaldehyde	50-00-0

Warning: The following ingredients present in the product are known to the state of California to cause birth defects, or other reproductive hazards.

Chemical Name	CAS Number
Toluene	108-88-3
Lead Compounds	NOT SPECIFIED
Cadmium Compounds	NOT SPECIFIED
Mercury Compounds	NOT SPECIFIED
Benzene	71-43-2
Arsenic Compounds	NOT SPECIFIED
Ethylene Oxide	75-21-8

International Regulations: As follows -

CANADIAN WHMIS:

This MSDS has been prepared in compliance with Controlled Product Regulations except for the use of the 16 headings.

CANADIAN WHMIS CLASS: AB5 D2A D2B

Section 16 - Other Information

HMIS Ratings:

Health: 2* Flammability: 4 Reactivity: 0 Personal Protection: X

VOLATILE ORGANIC COMPOUNDS, g/l: NA

REASON FOR REVISION:

Legend: N.A. - Not Applicable, N.E. - Not Established, N.D. - Not Determined

The information contained on this MSDS has been checked and should be accurate. However, it is the responsibility of the user to comply with all Federal, State, and Local laws and regulations.

Appendix C

Maxymillian Technologies, Inc.

Hazard Communication Program

Hazard Communication Standard

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1.0 OVERVIEW

The Hazard Communication Standard is intended to satisfy requirements of various federal and state agencies. In particular, the Occupational Safety and Health Administration (OSHA) 29 CFR part 1926 and state Right-To-Know laws require us to make this information available to you. This standard contains information about categories of potentially hazardous materials with which workers might come in contact on a jobsite. Be sure you understand how to find information about hazardous materials.

We will make a copy of this standard available to each jobsite supervisor. It is your right to review this standard. Master copies of this standard will be maintained at the home office. This standard and the Material Safety Data Sheets (MSDSs) that represent each category are intended for use at all company jobsites; each jobsite may also have specific MSDSs.

Determination of hazardous materials is made by the manufacturer or importer of the material, not by this company. If doubt exists about the accuracy of a hazard evaluation, a qualified person may make the determination, using the guidelines set forth by the Occupational Safety and Health Administration (OSHA) and the written procedures for the evaluation included in this standard, as per 48 Federal Register (FR) 53296-66 through 5335-36. The determinations of qualified persons regarding hazard evaluations shall not preclude state or federal hazardous materials lists.

1.1 Training

It is your right as an employee to be trained to recognize hazardous materials and to understand the importance of performing your job safely. You should be trained before you begin working at a jobsite in how to safely work with hazardous materials in general and those specific to the jobsite. This provision for being trained before beginning work applies especially to the performance of non-routine tasks. It is the joint responsibility of the Safety Engineer and the jobsite supervisor to ensure that such training is provided. You will be requested to sign a copy of a training verification form that indicates when, where, and by whom you were trained; copies of this form are maintained at the home office.

1.2 Definitions

The following abbreviations and terms are used throughout this standard:

Hazard Warning

- Any picture, symbol, or combination of pictures and/or symbols that convey the hazard(s) of the substance(s) in the container(s). These hazard warnings are provided by the manufacturer of the substance.

MSDS/MSDSs
- Material Safety Data Sheets; A printed form that provides information about health, fire, and safety risks associated with a particular substance of compound. These forms are provided by the manufacturer of the substance.

NFPA
- National Fire Protection Agency; a non-profit organization whose aim is to safeguard against fires. The NFPA is responsible for the nationally accepted NFPA 704 Fire Hazard Marking System.

OSHA
- Occupational Safety and Health Administration; the federal agency responsible for the establishment and enforcement of safety and health standards in industry.

UN Classification Numbers
- Those numbers located on some hazard warnings to identify the type and degree of a particular hazard.

UN ID Numbers
- The four-digit identification system used for shipping hazardous materials. For details on this identification system, refer to the Emergency Response Guide Book (Department of Transportation Publication Number 5800.4).

2.0 IDENTIFYING AND LABELING HAZARDOUS MATERIALS

IMPORTANT: DO NOT remove the label from any container. If a label is removed accidentally or is missing, be sure to notify the jobsite supervisor.

2.1 Responsibilities and Requirements

Jobsite supervisors are responsible for ensuring that all containers in which hazardous materials are stored or transported are labeled properly. If a label is accidentally removed, promptly transfer the information and affix a new label to the container. At a minimum, the label must be written in English and must identify the material and the appropriate hazard warning(s).

Original labels will list the chemical identity, appropriate hazard warnings and the name and address of the manufacturer. Referral will be made to the corresponding MSDS to assist in verifying label information. Original labels should not be defaced or removed.

If chemicals are transferred from a labeled container to a portable container that is intended only for immediate use, no labels are required on the portable container. However, no hazardous materials or chemicals should be permanently used or stored in unlabeled containers.

2.2 More than 1 gallon or 5 pounds

It is the responsibility of the manufacturer or distributor of a substance to label, tag, or mark each container that holds more than one (1) gallon or five (5) pounds of hazardous material. The label will contain, at a minimum:

- Identity of the material or substance
- Hazard warning(s) appropriate for the material(s) or substance(s)
- Name and address of the manufacturer (and/or other responsible party).

The label will be diamond-shaped, not less than four (4) inches per side, and include the symbol(s) appropriate for the substance.

2.3 More than 5 gallons or 30 pounds

Containers holding more than five (5) gallons or thirty (30) pounds of an NFPA-classified hazardous substance are required to carry an NFPA label, in addition to the basic label.

The exception to the labeling requirement involves solid metal: solid metal need only be identified by label or MSDS during or prior to initial shipment; subsequent loads need not be labeled.

2.4 Less than 1 gallon or 5 pounds

Containers holding less than one (1) gallon or five (5) pounds may provide signs, placards, or written operating procedures instead of labels, as long as the required information is conveyed.

3.0 MSDS - GENERAL INFORMATION

3.1 Suppliers

MSDSs are supplied by the distributor or manufacturer, either with the first or every delivery of the hazardous substance(s). If an MSDS for a substance is not on file, a responsible person appointed by the Safety Engineer will make written request of the distributor for the MSDS. That person will retain a copy of the written request for safety records.

3.2 File Maintenance

An MSDS for each substance with which an employee might come into contact is kept on file at the home office. Each jobsite supervisor is responsible for ensuring that his or her book contains an MSDS for each substance at the jobsite. The Safety Engineer will appoint a responsible person to ensure the proper and accurate maintenance of MSDS files.

3.3 Distribution Responsibility

Responsibility for MSDSs is shared by the person who accepts shipment, the person who delivers shipment, and the person who maintains MSDS files. If you accept or deliver a shipment that includes an MSDS, it is your responsibility to deliver the MSDS to the home office. A responsible person at the home office will file and distribute the MSDS.

3.4 Availability at Jobsites

The jobsite supervisor or an appointed employee will be responsible for making this standard available to all employees at that jobsite. In the event the individual who maintains the standard is unavailable, copies of this standard, as well as a complete set of MSDSs, can be found at the home office.

3.5 Contents

The specific content and format of MSDSs may vary. At a minimum, they must include the following information:

1. Product identification
   - material name
   - synonyms and trade names
   - chemical formula (unless proprietary)

1. Hazardous ingredients
   - percentage of hazardous substances

   - toxicological data

1. Physical data
   - vapor pressure
   - solubilities
   - specific gravity
   - vapor density

1. Fire and explosion data

- autoignition temperature
- flash point
- flammability limits in ark
- precautions

1. Reactivity data

2. Health hazard and first aid information

3. Special protection requirements and recommendations

4. Special precautions

5. Point of contact and manufacturer information

4.0 INFORMATION AND TRAINING

All employees who may come in contact with hazardous materials will be provided with general training in how to safely work with hazardous materials. Training also discusses employee rights about working with hazardous substances. OSHA and state Right-To-Know laws require us to maintain records of your training sessions.

4.1 Supervisory Responsibility

Job supervisors are responsible for ensuring that all members of their work crews are trained according to the provisions outlined below. Job supervisors should check with each new member of the crew or with the home office to ensure that the employee has been trained before the employee begins work at the jobsite.

4.2 General Training

You will be trained before your assignment to a jobsite. After this general training, you will receive updated and refresher training annually. Training will be documented by a sign-in sheet recording each employee's attendance, the date and the training topics covered. Training will cover:

1. Health and physical hazards of chemicals in the work area
2. Methods for detecting the presence or release of hazardous chemicals in the workplace
3. Interpreting MSDSs and labels
4. Protective measures
5. Understanding this standard
6. Operations at worksites with hazards chemicals
7. Right to request MSDSs
8. Right to refuse to work with a substance
9. Standard location and availability, including lists of chemicals and MSDSs

4.2.1 Non-Routine Tasks

Non-routine tasks at jobsites require special training. Be sure you are trained before you begin to perform any non-routine task. It is the responsibility of the jobsite supervisor to ensure that employees are trained to safely perform non-routine tasks before they begin performance of the non-routine task.

5.0 PROTECTIVE MEASURES

The use of splash goggles, gloves, protective clothing boots and possibly respiratory protection may be required during certain site activities. If respiratory protection is used, it will be in full compliance with OSHA Regulations 29 CFR 1910.134 and 29 CFR 1926.103. All personnel protective equipment used will be in accordance with Subpart I of OSHA Regulations 29 CFR 1910 and Subpart E of OSHA Regulations 29 CFR 1926. Any emergencies involving hazardous chemicals of potentially contaminated samples must be reported to the jobsite supervisor or Safety Engineer.

6.0 MULTI-EMPLOYER WORKSITES

OSHA regulations and state Right-To-Know laws require us to coordinate information about hazardous materials used by our workers and those of subcontractors at a jobsite.

We recognize the importance of making this information available to all persons who may come in contact with hazardous materials, and we will make available to our contractors and subcontractors copies of this Hazard Communication Standard. Other contractors and subcontractors at a jobsite are required to provide for use of all employees at a jobsite their own hazard communication standard, or material safety data sheets for all hazardous substances used by their crews.

To this end, a responsible person appointed by the Safety Engineer will make a written request for MSDSs from each subcontractor or contractor whose employees will share our jobsite.

7.0 HEALTH/SAFETY EMERGENCY INFORMATION

Emergency procedures may be unique to each site, but all jobsites should include these standard practices in their emergency procedures:

- Emergency telephone numbers must be prominently displayed near a working telephone. These numbers include:
  - Fire
  - Ambulance
  - Police

Additional emergency phone numbers should be posted before any non-routine task involving hazardous materials begins.

- First aid kits and eye wash stations will be maintained in a convenient location on each site. These locations will be identified to all employees.

- Emergency evacuation procedures should be developed for each jobsite, as necessary. Such procedures should include evacuation routes and designated meeting spots for employee check-in. It is the responsibility of the jobsite supervisor to notify the appropriate authorities in the event any employee does not check in at the designated meeting spot.

Appendix D

MaxymillianTechnologies, Inc.

Control of Hazardous Energy (Lockout/Tagout) Program

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1.0 OVERVIEW

This program establishes policies and provides guidelines to ensure standardized implementation of the OSHA Lockout/Tagout Standard.

This policy applies to all employees who perform work that involves the unexpected start-up of equipment, as defined in 29 CFR 1910.147. Training will familiarize the employees with this policy so they may work safely and confidently while performing their assigned tasks. This program does not apply to routine service or maintenance, when guards or safety devices are not by passed. When working at a facility with an established Lockout/Tagout program, that facility's program will take precedence. Training as outlined herein will be on an annual basis and will be provided prior to any associated work. This program will be reviewed by the Safety Officer on an annual and as needed basis.

2.0 DEFINITIONS

Affected employee -- An employee whose job requires him/her to operate or use a machine or equipment on which servicing or maintenance is being performed under Lockout or Tagout, or whose job requires him/her to work in an area in which such servicing or maintenance is being performed.

Authorized employee -- A person who locks or implements a Tagout system procedure on machines or equipment to perform the servicing or maintenance on that machine or equipment. An authorized employee and an affected employee may be the same person when the affected employees duties also include performing maintenance or service on machines or equipment that must be locked or tagged out.

Blanking of lines -- When possible, each end of a feed line into a confined space will be blocked and the line drained. Any drains that may be present in the confined space will be locked open so that any spill will drain from the area.

Capable of being locked out -- An energy isolating device will be considered capable of being locked out if it is designed with a hasp or other attachment or internal part to which or through which, a lock can be affixed, or if it has a locking mechanism built into it. Other energy isolating devices will also be considered capable of being locked out, if lockout can be achieved without the need to dismantle, rebuild, or replace the energy isolating device or permanently alter its energy control capability.

Energized -- Connected to an energy source of containing residual or stored energy.

Energy isolating device -- A mechanical device that physically prevents the transmission or release of energy, including but not limited to the following:

- a disconnect switch
- a manually operated switch by which the conductors of a circuit can be disconnected from all ungrounded supply conductors and in addition, no pole can be operated independently:
- a slide gate
- a manually operated electrical circuit breaker
- a slip blind
- a line valve
- a block
- any similar device used to block or isolate energy

The term does not include:

- a push button
- a selector switch
- or other control circuit type devices

Energy source -- Any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other energy.

Hot tap -- A procedure used in repair, maintenance and service activities that involves welding on a piece of equipment (pipelines, vessels or tanks) under pressure, in order to install connections or appurtenances. It is commonly used to replace or add sections of pipelines without the interruption of service for air, gas, water, steam and petrochemical distribution systems.

Lockout -- The placement of a lockout device on an energy isolating device, in occurrence with an established procedure, ensuring that the energy isolating device and the equipment being controlled cannot be operated until the lockout device is removed.

Lockout device -- A device that utilizes a positive mean such as a lock, either key or combination type, to hold an energy isolating device in the safe position and prevent the energizing of a machine or equipment.

Normal production operations -- The utilization of a machine or equipment to perform its intended production function.

Servicing and/or maintenance -- Workplace activities such as construction, installing, setting up, adjusting, inspecting, modifying, and maintaining and/or servicing machines or equipment. These activities include lubrication, cleaning or unjamming of machines or equipment and making adjustment or release of hazardous energy.

Setting up -- Any work performed to prepare a machine or equipment to perform its normal production operation.

Tagout -- The placement of a Tagout device on an energy isolating device, in accordance with an established procedure, to indicate the energy isolating device and the equipment being controlled may not be operated until the Tagout device is removed.

Tagout device -- A prominent warning device, such as a tag and a means of attachment, which can be securely fastened to an energy isolating device in accordance with an established procedure, to indicate that the energy isolating device and the equipment being controlled may not be operated until the Tagout device is removed.

3.0 EMPLOYEES AND TRAINING

Employee training will address the following:

- each authorized employee shall receive training in the recognition or applicable hazardous energy sources, the type and magnitude of the energy and the methods and means necessary for energy isolation and control
- each authorized employee will be furnished with his/her own unique key and lock
- each affected employee shall be instructed in the purpose and use of the energy control procedure
- tags may evoke a false sense of security, and their meaning needs to be understood as part of the overall energy control program; they are essentially working devices fixed to energy isolating devices, and do not provide the physical restraint on those devices that is provided by a lock -- locks are to be used whenever possible.
- when a tag is attached to an energy isolating means, it is not to be removed with authorization of the person responsible for it, and it is never to be bypassed, ignored or otherwise defeated
- tags must be legible and understandable by all authorized employees, affected employees, and all other employees whose work operations are or may be in the area, in order to be effective
- tags must be securely attached to energy isolating devices so that they cannot be inadvertently or accidentally detached during use
- tags will be attached to the lock to identify The Company as the company locking out -- tags will conform to 1910.147 in regards to water and corrosion resistance
- all tags will be attached with nylon ties

3.1 Retraining Employees

Retraining of authorized and affected employees shall be performed annually or whenever there is a change in employee job assignments; whenever a new hazard is introduced due to a change in machines, equipment or process and; whenever a periodic inspection by the employer reveals inadequacies in The Company procedures or in the knowledge of the employees.

4.0 ISOLATION PROCEDURES

- isolation will be initiated by the authorized person or persons
- employees in the facility shall be notified prior to equipment isolation and after all isolation procedures have been removed
- machine shutdown - an authorized person shall turn off or shutdown the machine - a Company Supervisor shall observe and verify that shutdown is complete
- equipment isolation - all isolation devices shall be placed at this time - a Company Supervisor shall observe and verify

4.1 Lockout/Tagout

- devices shall be affixed to each energy isolating device by the authorized employee -- a Company Supervisor shall verify
- no employee may affix a personal Lockout/Tagout device for another employee
- locks shall be affixed in a manner that will hold the energy isolating device in a safe (off) position
- Tagout devices, where used, shall be affixed at the same location as would a lock if such fittings are provided, or shall be affixed in a manner that will clearly indicate that movement of the isolating device is prohibited
- stored energy - all potential stored or residual energy must be released, relieved or disconnected, if there is a potential of reclamation, verification of isolation shall continue throughout the project

4.2 Verification of Isolation

- prior to work, the authorized person(s) shall verify that the equipment has been disengaged and isolated
- The Supervisor will complete Attachment "A". Certification of Inspection and Record of Training

4.3 Release from Lockout/Tagout

- the work area shall be inspected to insure that nonessential items are not left in the work area and to ensure that the equipment is intact
- the work area shall be checked to ensure that all employees are clear
- before Lockout/Tagout devices are removed affected employees shall be notified
- removal of Lockout/Tagout devices shall be performed by the authorized employee
- a Company shall verify - **Exception:** when the employee is not available then the Supervisor shall remove the Lockout/Tagout devices provided that he:
- verifies that the employee is not at the facility
- makes all reasonable efforts to contact the employee and notify him/her that he will remove the devices
- before re-energization, all employees in the machine or equipment area shall be notified that the Lockout/Tagout devices have been removed.

4.4 Group Lockout/Tagout

Each authorized employee performing servicing or maintenance where the release of hazardous energy is possible, shall be protected by his/her personal Lockout/Tagout device and by the company procedure.

4.5 Shift or Personnel Changes

Changes between shifts shall be made in an orderly fashion. The initial authorization person shall remain in control until all of his crew have removed their locks and tags. He will then transfer them to the next shifts authorized person, who will start the entire Lockout/Tagout procedure for his/her crew. If an employee must leave a site and be replaced, he/she must remove his/her lock and turn them into his/her supervisor who shall orient the new employee. The new employee will then place his/her lock and tag on the equipment.

As it applies to confined space (tank entry):

- Electrical boxes, valves and mechanical devices will be tagged and locked out with chains and padlocks when these items pose a potential threat to an employee. Each person working in the work zone will have a unique padlock that he or she will open upon leaving the work zone. Those items that are locked out will remain so until the last person removes his or her padlock.

- Blanking of lines - When possible, each end of a feed line into a confined space will be blocked and the line drained. Any drains that may be present in the confined space will be locked open so that any spill will drain from the area.

- Misalignment of Lines - Feed lines may be misaligned in the event blanking is not possible. Again, any drains in the confined space must be locked in the open position.

- At lease annually, an authorized employee other than the one(s) utilizing the energy control procedure being inspected, is required to inspect and verify the effectiveness of The Company energy control procedures. These inspections shall at least provide for a demonstration of the procedures and may be implemented through random audits and planned visual observations. These inspections are intended to ensure that the energy control procedures are being properly implemented and to provide an essential check on the continued utilization of the procedures.

- When Lockout is used, The Employer's inspection shall include a review of the responsibilities of each authorized employee implementing the procedure with that employee. Group meetings between the authorized employee who is performing the inspection and all authorized employees who implement the procedure would constitute compliance with this requirement.

- When Tagout is used, The Employer shall conduct this review with each affected and authorized employee.

- Energy control procedures used less frequently than once a year need be inspected only when used.

- The periodic inspection must provide for and ensure effective correction of identified deficiencies.

- The Employer is required to certify that the prescribed periodic inspections have been performed. See Attachment "A"., Certification of Inspection and Record of Training.

Attachment 1

CERTIFICATION OF INSPECTION AND RECORD OF TRAINING

Date:_____ Inspection/Training performed by:_____

Supervisor: _____

Crew:_____

Type of work, include name of equipment:_____

Type of controls used:_____If no, why?_____

Were procedures followed?

_____

Were procedures reviewed with authorized and affected employees?

_____

What type of control was used?

_____

Comments:

_____

Supervisors comments:

_____

Supervisors signature:_____

Appendix E

Maxymillian Technologies, Inc.

Respiratory Protection Program

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D: (Non-Mandatory) Information for Employees Using Respirators When Not Required Under the Standard

FOREWORD

No employee will be assigned duties requiring use of a respirator until medical clearance is obtained from a competent authority.

1.0 DEFINITIONS

I.D.L.H. Immediately Dangerous to Life or Health—Used for respirator selection. This represents a maximum concentration of airborne contaminant from which, in the event of respirator failure, one could escape within thirty (30) minutes without experiencing any escape impairing or irreversible health effects.

P.E.L. Permissible Exposure Levels—based on an 8 hour work day as prescribed by OSHA

S.C.B.A. Self Contained Breathing Apparatus

S.O.P. Standard Operating Procedure

T.L.V. Threshold Limit Valve—Airborne concentrations of substance and represent conditions under which it is believed that nearly all workers may be repeatedly exposed for an eight hour day, day after day without adverse effects. As recommended by The American Conference of Governmental Industrial Hygienists.

Whenever possible, atmospheric contamination will be prevented through the use of:

- Engineering Controls
- Administrative Controls
- Work Practices

Respirators need to be used for those environments that cannot be controlled through other means. Respirators referred to here are to be used for respiratory protection, any time a hazard(s) exceeds OSHA MANDATED P.E.L. or T.L.V, where applicable.

This Standard Operating Procedure will be available and utilized as part of the Company's required respirator program. This program shall meet or exceed the minimum requirements as set forth in 29 CFR 1910.124. This S.O.P. consists of the following components:

2.0 SELECTION

Respirators shall be selected by a qualified individual. All respirators shall be approved in the latest edition of *The NIOSH Certified Equipment List* or the specific hazard encountered.

Selection criteria[1] shall include but not be limited to the following factors:

- Oxygen Level
- Contaminant
- Warning Properties
- TLV
- Service Limit of Canister
- Protection Factor
- Successful Fit Test
- Respirator Assembly Approval

3.0 TRAINING

Anyone who uses or can be expected to use a respirator in the course of his/her employment shall be trained in its use.

Respirator training shall include but not be limited to the following:

- hazards, definition
- results of improper use
- engineering and administrative controls on the job
- reason for selection of particular type of respirator
- functions, capabilities and limitations of respirator selected
- donning, checking fit and operation
- proper wearing of respirator
- emergency situations, recognition and action
- decontamination.

[1]See Enclosure # 1

4.0 FIT TESTING

Fit testing shall be performed and recorded[2] for each person[3] to ensure proper selection of respirator (not all masks fit all people). Testing will be conducted initially upon assignments and annually thereafter, or when subject has:

- weight change—approximately 20 pounds;
- significant facial scarring;
- significant dental changes;
- re-constructive or cosmetic surgery;
- any other condition interfering with a proper seal.

> Fit testing will not be conducted if there is hair between the skin and face piece sealing surface. Beards or apparel will be altered or removed to allow a satisfactory fit.

All users or potential users of demand type respiratory protection devices should be fit tested to ensure a proper face piece to face seal. A selection of respirators should be tested with users allowed to choose the most comfortable from those that fit satisfactorily. Fit testing should be performed in accordance with the most appropriate method described by OSHA Respirator Standard, Appendix A, Part 1 (JHM/MT Respirator Program, Enclosure 3: OSHA Respirator Standards, Appendices A – D).

4.1 MAINTENANCE

4.1.1 General Requirements

The purpose of this program is to assure that all respirators are maintained at their original effectiveness. If they are modified in any way, the Protection Factors may be voided. At least one person will be assigned and trained to inspect, clean, repair, and store respirators. However, each individual will be responsible for their assigned respirator except where repairs are concerned. No components will be replaced or repairs made beyond those recommended by the manufacturer.

The program should be based on the number and types of respirators, working conditions, and hazards involved. In general, the program will include:

[2]See Enclosure # 2
[3]See Enclosure # 1

- inspection (including a leak check);
- cleaning and disinfecting;
- repair.

4.1.2 Inspection

Inspect respirator before and after each use. Inspect a respirator that is kept ready for emergency use monthly to assure it will perform satisfactorily.

The following checklist will be used when inspecting respirators:

- Face piece:
  - Cracks, tears, holes
  - Facemask distortion
  - Cracked or loose lenses/faceshield
- Headstrap
  - Breaks or tears
  - Broken buckles
- Valves
  - Residue or dirt
  - Cracks or tears in valve material
- Filters/Cartridges
  - Approval designation
  - Gaskets
  - Cracks or dents in housing

4.1.3 Cleaning and Disinfecting

Respirators assigned to individuals shall be cleaned regularly. Those used by more than one person shall be cleaned and disinfected after each use.

Clean and disinfect respirators in accordance with the most appropriate method described by OSHA Respirator Standard, Appendix B-2 (JHM/MT Respirator Program, Enclosure 3: OSHA Respirator Standards, Appendices A – D).

4.1.4 Repairs

Only a trained person with proper tools and replacement parts should work on respirators. No one should ever attempt to replace components or to make adjustments or repairs beyond the manufacturer's recommendations. It may be necessary to send high-pressure side components of SCBA's to an authorized facility for repairs.

Make repairs as follows:

- Disassemble and hand clean the pressure-demand and exhalation valve assembly (SCBA's only); exercise care to avoid damage to the rubber diaphragm.
- Replace all faulty or questionable parts or assemblies; use parts only specifically designed for the particular respirator.
- Reassemble the entire respirator and visually inspect the completed assembly.
- Insert new filters, cartridges, or canisters as required; make sure that gaskets or seals are in place and tightly sealed.

4.1.5 Storage

Follow manufacturers' storage instructions, which are always furnished with new respirators or affixed to the lit of the carrying case. In addition:

- After respirators have been inspected, cleaned and repaired, store them so as to protect against dust, excessive moisture, damaging chemicals, extreme temperatures and direct sunlight.
- Do not store respirators in clothes lockers, bench drawers, or tool boxes; place them in wall compartments at work stations or in a work area designated for emergency equipment. Store them in the original carton or carrying case.
- Draw clean respirators from storage for each use; each unit can be sealed in a plastic bag, placed in a separate box and tagged for immediate use.

5.0 EXPOSURE MONITORING/SURVEILLANCE

Air monitoring shall be used to identify and quantify levels of hazardous substance in order to determine the appropriate level of employee protection needed.

As a first step, air monitoring shall be conducted to identify any I.D.L.H. conditions and other dangerous situations, i.e., flammable atmospheres, oxygen deficient environment, or toxic levels of air borne contaminants.

Periodic monitoring shall be conducted when:

- work begins on a different portion of the site;
- contaminants other than those previously identified are being handled;
- a different type of operation is initiated;
- employees are working in areas of obvious liquid contamination, i.e., a spill or lagoon;
- prior to change in protective posture, i.e., upgrade/downgrade.

Whenever possible, real time monitoring will be utilized, i.e., photoionizer, explosimeter. It is recognized, however, that there will be occasions where laboratory tests must be made. On these occasions a qualified person and laboratory facilities shall be utilized.

5.1 Medical Program

Employees are not permitted to wear respirators until a physician or other licensed healthcare professional (PLHCP) has determined that they are medically able to do so. Any employee refusing the medical evaluation will not be allowed to work in an area requiring respirator use.

A licensed physician or other licensed healthcare professional at Berkshire Occupational Health will provide the medical evaluations. Medical evaluation procedures are as follows:

- The medical evaluation will be conducted using the questionnaire provided in Appendix C of the OSHA Respirator Standard (JHM/MT Respirator Program, Enclosure 3: OSHA Respirator Standards, Appendices A – D). The program administrator will provide a copy of this questionnaire to all employees requiring medical evaluations.
- Follow up medical exam will be granted to employees as required by the standard, and/or as deemed necessary by the physician.
- All employees will be granted the opportunity to speak with the physician/PLHCP about their medical evaluation if they so request.
- The physician will be provided with a copy of this respirator program, a copy of the Respiratory Protection Standard, the list of hazardous substances by work area, and for each employee requiring evaluation:
  - their work area or job title;
  - proposed respirator type and weight;
  - length of time required to wear respirator;
  - expected physical work load (light, moderate, heavy);
  - potential temperature and humidity extremes; and
  - any additional protective clothing required.
- Any employee required for medical reasons to wear a positive pressure air purifying respirator, or who requests one, will be provided with a powered air purifying respirator (PAPR).
- After an employee has received medical clearance to wear a respirator, additional medical evaluations will be provided under the following circumstances:
  - The employee reports signs and/or symptoms relating to their ability to use a respirator, such as shortness of breath, dizziness, chest pains, or wheezing.

- The examining physician or supervisor informs the program administrator that the employee needs to be reevaluated.
- Information from this program, including observations made during fit testing and program evaluation, indicates a need for reevaluation.
- A change occurs in workplace conditions that may result in an increased physiological burden on the employee.

The records for employees currently enrolled in a medical surveillance program are on file at company headquarters.

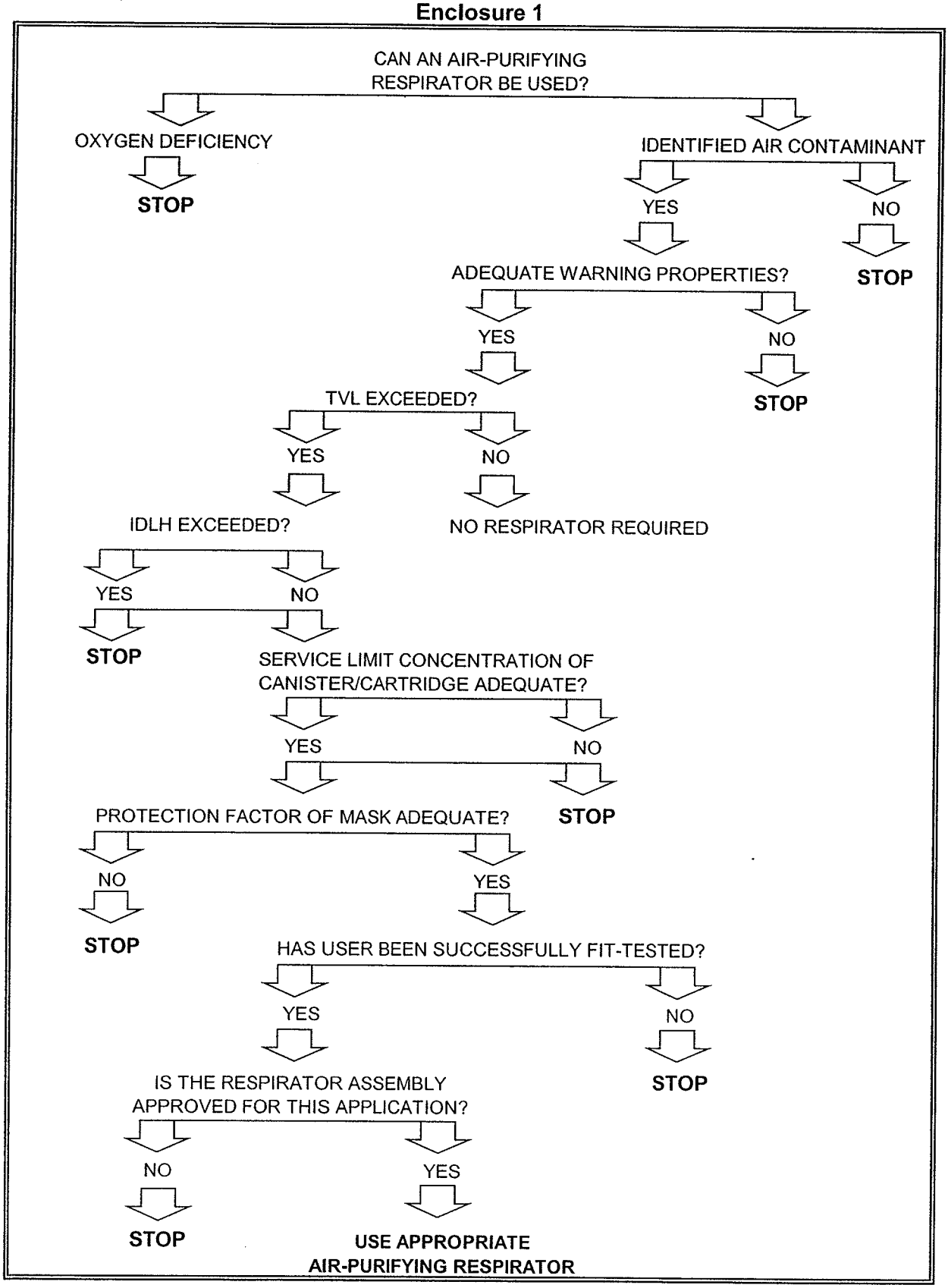
All examinations and questionnaires are to remain confidential between the employee and the physician.

5.2 General

Contact lenses are potentially dangerous on hazardous waste sites. Contaminants, where they could otherwise be removed quickly, may lodge between the lens and eye with serious results. For this reason contact lenses are strictly prohibited on contaminated sites.

Beards or other facial hair that may interfere with the seal of an air purifying respirator are prohibited.

Selection Considerations Flow Chart
Enclosure 1



MAXYMILLIAN TECHNOLOGIES, INC.
RESPIRATOR FIT TEST
ENCLOSURE 2

A. EMPLOYEE INFORMATION

Test Type: Qualitative; Irritant Smoke; Rainbow

Name of Employee: _____ **Date:** _____

Employee's Social Security Number: _____/____/_____

License #: _____ **Company:** _____

B. RESPIRATOR INFORMATION

Respirator Type Selected: _____

Manufacturer: _____ **Model:** _____

Approval #: _____ **Size:** S _____ M _____ L_____

Name of Test Conductor: _____

C. TEST RESULTS

- ☐ Lateral Head Movement Pass
- ☐ Deep Breathing Pass
- ☐ Stationary Jogging Exercise Pass
- ☐ Rainbow Passage Reading Pass
- ☐ Employee Reaction to Agent after Test Pass
- ☐ Proper Performance of Positive and Negative Pressure Valve Checks and Fit

☐ Employee Passes ☐ Employee Fails

EXPIRATION DATE: ____/____/____

RESPIRATOR FIT TESTING PERFORMED IN ACCORDANCE WITH OSHA METHODS AND PROCEDURES

Enclosure 3

OSHA Respirator Standards, Appendices A – D

OSHA Respirator Standards, Appendix A

Fit Testing Procedures (Mandatory)

Appendix A to § 1910.134: Fit Testing Procedures (Mandatory)
Part I. OSHA-Accepted Fit Test Protocols

A. Fit Testing Procedures -- General Requirements

The employer shall conduct fit testing using the following procedures. The requirements in this appendix apply to all OSHA-accepted fit test methods, both QLFT and QNFT.

1. The test subject shall be allowed to pick the most acceptable respirator from a sufficient number of respirator models and sizes so that the respirator is acceptable to, and correctly fits, the user.

2. Prior to the selection process, the test subject shall be shown how to put on a respirator, how it should be positioned on the face, how to set strap tension and how to determine an acceptable fit. A mirror shall be available to assist the subject in evaluating the fit and positioning of the respirator. This instruction may not constitute the subject's formal training on respirator use, because it is only a review.

3. The test subject shall be informed that he/she is being asked to select the respirator that provides the most acceptable fit. Each respirator represents a different size and shape, and if fitted and used properly, will provide adequate protection.

4. The test subject shall be instructed to hold each chosen facepiece up to the face and eliminate those that obviously do not give an acceptable fit.

5. The more acceptable facepieces are noted in case the one selected proves unacceptable; the most comfortable mask is donned and worn at least five minutes to assess comfort. Assistance in assessing comfort can be given by discussing the points in the following item A.6. If the test subject is not familiar with using a particular respirator, the test subject shall be directed to don the mask several times and to adjust the straps each time to become adept at setting proper tension on the straps.

6. Assessment of comfort shall include a review of the following points with the test subject and allowing the test subject adequate time to determine the comfort of the respirator:

(a) Position of the mask on the nose

(b) Room for eye protection

(c) Room to talk

(d) Position of mask on face and cheeks

7. The following criteria shall be used to help determine the adequacy of the respirator fit:

(a) Chin properly placed;

(b) Adequate strap tension, not overly tightened;

(c) Fit across nose bridge;

(d) Respirator of proper size to span distance from nose to chin;

(e) Tendency of respirator to slip;

(f) Self-observation in mirror to evaluate fit and respirator position.

8. The test subject shall conduct a user seal check, either the negative and positive pressure seal checks described in Appendix B-1 of this section or those recommended by the respirator manufacturer which provide equivalent protection to the procedures in Appendix B-1. Before conducting the negative and positive pressure checks, the subject shall be told to seat the mask

on the face by moving the head from side-to-side and up and down slowly while taking in a few slow deep breaths. Another facepiece shall be selected and retested if the test subject fails the user seal check tests.

9. The test shall not be conducted if there is any hair growth between the skin and the facepiece sealing surface, such as stubble beard growth, beard, mustache or sideburns which cross the respirator sealing surface. Any type of apparel which interferes with a satisfactory fit shall be altered or removed.

10. If a test subject exhibits difficulty in breathing during the tests, she or he shall be referred to a physician or other licensed health care professional, as appropriate, to determine whether the test subject can wear a respirator while performing her or his duties.

11. If the employee finds the fit of the respirator unacceptable, the test subject shall be given the opportunity to select a different respirator and to be retested.

12. Exercise regimen. Prior to the commencement of the fit test, the test subject shall be given a description of the fit test and the test subject's responsibilities during the test procedure. The description of the process shall include a description of the test exercises that the subject will be performing. The respirator to be tested shall be worn for at least 5 minutes before the start of the fit test.

13. The fit test shall be performed while the test subject is wearing any applicable safety equipment that may be worn during actual respirator use which could interfere with respirator fit.

14. Test Exercises. (a) The following test exercises are to be performed for all fit testing methods prescribed in this appendix, except for the CNP method. A separate fit testing exercise regimen is contained in the CNP protocol. The test subject shall perform exercises, in the test environment, in the following manner:

(1) Normal breathing. In a normal standing position, without talking, the subject shall breathe normally.

(2) Deep breathing. In a normal standing position, the subject shall breathe slowly and deeply, taking caution so as not to hyperventilate.

(3) Turning head side to side. Standing in place, the subject shall slowly turn his/her head from side to side between the extreme positions on each side. The head shall be held at each extreme momentarily so the subject can inhale at each side.

(4) Moving head up and down. Standing in place, the subject shall slowly move his/her head up and down. The subject shall be instructed to inhale in the up position (i.e., when looking toward the ceiling).

(5) Talking. The subject shall talk out loud slowly and loud enough so as to be heard clearly by the test conductor. The subject can read from a prepared text such as the Rainbow Passage, count backward from 100, or recite a memorized poem or song.

Rainbow Passage

When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch, with its path high above, and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a man looks for something beyond reach, his friends say he is looking for the pot of gold at the end of the rainbow.

(6) Grimace. The test subject shall grimace by smiling or frowning. (This applies only to QNFT testing; it is not performed for QLFT)

(7) Bending over. The test subject shall bend at the waist as if he/she were to touch his/her toes. Jogging in place shall be substituted for this exercise in those test environments such as shroud type QNFT or QLFT units that do not permit bending over at the waist.

(8) Normal breathing. Same as exercise (1).

(b) Each test exercise shall be performed for one minute except for the grimace exercise which shall be performed for 15 seconds. The test subject shall be questioned by the test conductor regarding the comfort of the respirator upon completion of the protocol. If it has become unacceptable, another model of respirator shall be tried. The respirator shall not be adjusted once the fit test exercises begin. Any adjustment voids the test, and the fit test must be repeated.

B. Qualitative Fit Test (QLFT) Protocols

1. General

(a) The employer shall ensure that persons administering QLFT are able to prepare test solutions, calibrate equipment and perform tests properly, recognize invalid tests, and ensure that test equipment is in proper working order.

(b) The employer shall ensure that QLFT equipment is kept clean and well maintained so as to operate within the parameters for which it was designed.

2. Isoamyl Acetate Protocol

Note: This protocol is not appropriate to use for the fit testing of particulate respirators. If used to fit test particulate respirators, the respirator must be equipped with an organic vapor filter.

(a) Odor Threshold Screening

Odor threshold screening, performed without wearing a respirator, is intended to determine if the individual tested can detect the odor of isoamyl acetate at low levels.

(1) Three 1 liter glass jars with metal lids are required.

(2) Odor-free water (e.g., distilled or spring water) at approximately 25 deg. C (77 deg. F) shall be used for the solutions.

(3) The isoamyl acetate (IAA) (also known at isopentyl acetate) stock solution is prepared by adding 1 ml of pure IAA to 800 ml of odor-free water in a 1 liter jar, closing the lid and shaking for 30 seconds. A new solution shall be prepared at least weekly.

(4) The screening test shall be conducted in a room separate from the room used for actual fit testing. The two rooms shall be well-ventilated to prevent the odor of IAA from becoming evident in the general room air where testing takes place.

(5) The odor test solution is prepared in a second jar by placing 0.4 ml of the stock solution into 500 ml of odor-free water using a clean dropper or pipette. The solution shall be shaken for 30 seconds and allowed to stand for two to three minutes so that the IAA concentration above the liquid may reach equilibrium. This solution shall be used for only one day.

(6) A test blank shall be prepared in a third jar by adding 500 cc of odor-free water.

(7) The odor test and test blank jar lids shall be labeled (e.g., 1 and 2) for jar identification. Labels shall be placed on the lids so that they can be peeled off periodically and switched to maintain the integrity of the test.

(8) The following instruction shall be typed on a card and placed on the table in front of the two test jars (i.e., 1 and 2): "The purpose of this test is to determine if you can smell banana oil at a low concentration. The two bottles in front of you contain water. One of these bottles also contains a small amount of banana oil. Be sure the covers are on tight, then shake each bottle for two seconds. Unscrew the lid of each bottle, one at a time, and sniff at the mouth of the bottle. Indicate to the test conductor which bottle contains banana oil."

(9) The mixtures used in the IAA odor detection test shall be prepared in an area separate from where the test is performed, in order to prevent olfactory fatigue in the subject.

(10) If the test subject is unable to correctly identify the jar containing the odor test solution, the IAA qualitative fit test shall not be performed.

(11) If the test subject correctly identifies the jar containing the odor test solution, the test subject may proceed to respirator selection and fit testing.

(b) Isoamyl Acetate Fit Test

(1) The fit test chamber shall be a clear 55-gallon drum liner suspended inverted over a 2-foot diameter frame so that the top of the chamber is about 6 inches above the test subject's head. If no drum liner is available, a similar chamber shall be constructed using plastic sheeting. The inside top center of the chamber shall have a small hook attached.

(2) Each respirator used for the fitting and fit testing shall be equipped with organic vapor cartridges or offer protection against organic vapors.

(3) After selecting, donning, and properly adjusting a respirator, the test subject shall wear it to the fit testing room. This room shall be separate from the room used for odor threshold screening and respirator selection, and shall be well-ventilated, as by an exhaust fan or lab hood, to prevent general room contamination.

(4) A copy of the test exercises and any prepared text from which the subject is to read shall be taped to the inside of the test chamber.

(5) Upon entering the test chamber, the test subject shall be given a 6-inch by 5-inch piece of paper towel, or other porous, absorbent, single-ply material, folded in half and wetted with 0.75 ml of pure IAA. The test subject shall hang the wet towel on the hook at the top of the chamber. An IAA test swab or ampule may be substituted for the IAA wetted paper towel provided it has been demonstrated that the alternative IAA source will generate an IAA test atmosphere with a concentration equivalent to that generated by the paper towel method.

(6) Allow two minutes for the IAA test concentration to stabilize before starting the fit test exercises. This would be an appropriate time to talk with the test subject; to explain the fit test, the importance of his/her cooperation, and the purpose for the test exercises; or to demonstrate some of the exercises.

(7) If at any time during the test, the subject detects the banana-like odor of IAA, the test is failed. The subject shall quickly exit from the test chamber and leave the test area to avoid olfactory fatigue.

(8) If the test is failed, the subject shall return to the selection room and remove the respirator. The test subject shall repeat the odor sensitivity test, select and put on another respirator, return to the test area and again begin the fit test procedure described in (b) (1) through (7) above. The process continues until a respirator that fits well has been found. Should the odor sensitivity test be failed, the subject shall wait at least 5 minutes before retesting. Odor sensitivity will usually have returned by this time.

(9) If the subject passes the test, the efficiency of the test procedure shall be demonstrated by having the subject break the respirator face seal and take a breath before exiting the chamber.

(10) When the test subject leaves the chamber, the subject shall remove the saturated towel and return it to the person conducting the test, so that there is no significant IAA concentration buildup in the chamber during subsequent tests. The used towels shall be kept in a self-sealing plastic bag to keep the test area from being contaminated.

3. Saccharin Solution Aerosol Protocol

The entire screening and testing procedure shall be explained to the test subject prior to the conduct of the screening test.

(a) Taste threshold screening. The saccharin taste threshold screening, performed without wearing a respirator, is intended to determine whether the individual being tested can detect the taste of saccharin.

(1) During threshold screening as well as during fit testing, subjects shall wear an enclosure about the head and shoulders that is approximately 12 inches in diameter by 14 inches tall with at least the front portion clear and that allows free movements of the head when a respirator is worn. An enclosure substantially similar to the 3M hood assembly, parts # FT 14 and # FT 15 combined, is adequate.

(2) The test enclosure shall have a 3/4-inch (1.9 cm) hole in front of the test subject's nose and mouth area to accommodate the nebulizer nozzle.

(3) The test subject shall don the test enclosure. Throughout the threshold screening test, the test subject shall breathe through his/her slightly open mouth with tongue extended. The subject is instructed to report when he/she detects a sweet taste.

(4) Using a DeVilbiss Model 40 Inhalation Medication Nebulizer or equivalent, the test conductor shall spray the threshold check solution into the enclosure. The nozzle is directed away from the nose and mouth of the person. This nebulizer shall be clearly marked to distinguish it from the fit test solution nebulizer.

(5) The threshold check solution is prepared by dissolving 0.83 gram of sodium saccharin USP in 100 ml of warm water. It can be prepared by putting 1 ml of the fit test solution (see (b)(5) below) in 100 ml of distilled water.

(6) To produce the aerosol, the nebulizer bulb is firmly squeezed so that it collapses completely, then released and allowed to fully expand.

(7) Ten squeezes are repeated rapidly and then the test subject is asked whether the saccharin can be tasted. If the test subject reports tasting the sweet taste during the ten squeezes, the screening test is completed. The taste threshold is noted as ten regardless of the number of squeezes actually completed.

(8) If the first response is negative, ten more squeezes are repeated rapidly and the test subject is again asked whether the saccharin is tasted. If the test subject reports tasting the sweet taste during the second ten squeezes, the screening test is completed. The taste threshold is noted as twenty regardless of the number of squeezes actually completed.

(9) If the second response is negative, ten more squeezes are repeated rapidly and the test subject is again asked whether the saccharin is tasted. If the test subject reports tasting the sweet taste during the third set of ten squeezes, the screening test is completed. The taste threshold is noted as thirty regardless of the number of squeezes actually completed.

(10) The test conductor will take note of the number of squeezes required to solicit a taste response.

(11) If the saccharin is not tasted after 30 squeezes (step 10), the test subject is unable to taste saccharin and may not perform the saccharin fit test.

Note to paragraph 3. (a): If the test subject eats or drinks something sweet before the screening test, he/she may be unable to taste the weak saccharin solution.

(12) If a taste response is elicited, the test subject shall be asked to take note of the taste for reference in the fit test.

(13) Correct use of the nebulizer means that approximately 1 ml of liquid is used at a time in the nebulizer body.

(14) The nebulizer shall be thoroughly rinsed in water, shaken dry, and refilled at least each morning and afternoon or at least every four hours.

(b) Saccharin solution aerosol fit test procedure.

(1) The test subject may not eat, drink (except plain water), smoke, or chew gum for 15 minutes before the test.

(2) The fit test uses the same enclosure described in 3. (a) above.

(3) The test subject shall don the enclosure while wearing the respirator selected in section I. A. of this appendix. The respirator shall be properly adjusted and equipped with a particulate filter(s).

(4) A second DeVilbiss Model 40 Inhalation Medication Nebulizer or equivalent is used to spray the fit test solution into the enclosure. This nebulizer shall be clearly marked to distinguish it from the screening test solution nebulizer.

(5) The fit test solution is prepared by adding 83 grams of sodium saccharin to 100 ml of warm water.

(6) As before, the test subject shall breathe through the slightly open mouth with tongue extended, and report if he/she tastes the sweet taste of saccharin.

(7) The nebulizer is inserted into the hole in the front of the enclosure and an initial concentration of saccharin fit test solution is sprayed into the enclosure using the same number of squeezes (either 10, 20 or 30 squeezes) based on the number of squeezes required to elicit a taste response as noted during the screening test. A minimum of 10 squeezes is required.

(8) After generating the aerosol, the test subject shall be instructed to perform the exercises in section I. A. 14. of this appendix.

(9) Every 30 seconds the aerosol concentration shall be replenished using one half the original number of squeezes used initially (e.g., 5, 10 or 15).

(10) The test subject shall indicate to the test conductor if at any time during the fit test the taste of saccharin is detected. If the test subject does not report tasting the saccharin, the test is passed.

(11) If the taste of saccharin is detected, the fit is deemed unsatisfactory and the test is failed. A different respirator shall be tried and the entire test procedure is repeated (taste threshold screening and fit testing).

(12) Since the nebulizer has a tendency to clog during use, the test operator must make periodic checks of the nebulizer to ensure that it is not clogged. If clogging is found at the end of the test session, the test is invalid.

4. Bitrex™ (Denatonium Benzoate) Solution Aerosol Qualitative Fit Test Protocol

The Bitrex™ (Denatonium benzoate) solution aerosol QLFT protocol uses the published saccharin test protocol because that protocol is widely accepted. Bitrex is routinely used as a taste aversion agent in household liquids which children should not be drinking and is endorsed by the American Medical Association, the National Safety Council, and the American Association of Poison Control Centers. The entire screening and testing procedure shall be explained to the test subject prior to the conduct of the screening test.

(a) Taste Threshold Screening.

The Bitrex taste threshold screening, performed without wearing a respirator, is intended to determine whether the individual being tested can detect the taste of Bitrex.

(1) During threshold screening as well as during fit testing, subjects shall wear an enclosure about the head and shoulders that is approximately 12 inches (30.5 cm) in diameter by 14 inches (35.6 cm) tall. The front portion of the enclosure shall be clear from the respirator and allow free movement of the head when a respirator is worn. An enclosure substantially similar to the 3M hood assembly, parts #14 and #15 combined, is adequate.

(2) The test enclosure shall have a \3/4\ inch (1.9 cm) hole in front of the test subject's nose and mouth area to accommodate the nebulizer nozzle.

(3) The test subject shall don the test enclosure. Throughout the threshold screening test, the test subject shall breathe through his or her slightly open mouth with tongue extended. The subject is instructed to report when he/she detects a bitter taste.

(4) Using a DeVilbiss Model 40 Inhalation Medication Nebulizer or equivalent, the test conductor shall spray the Threshold Check Solution into the enclosure. This Nebulizer shall be clearly marked to distinguish it from the fit test solution nebulizer.

(5) The Threshold Check Solution is prepared by adding 13.5 milligrams of Bitrex to 100 ml of 5 % salt (NaCl) solution in distilled water.

(6) To produce the aerosol, the nebulizer bulb is firmly squeezed so that the bulb collapses completely, and is then released and allowed to fully expand.

(7) An initial ten squeezes are repeated rapidly and then the test subject is asked whether the Bitrex can be tasted. If the test subject reports tasting the bitter taste during the ten squeezes, the screening test is completed. The taste threshold is noted as ten regardless of the number of squeezes actually completed.

(8) If the first response is negative, ten more squeezes are repeated rapidly and the test subject is again asked whether the Bitrex is tasted. If the test subject reports tasting the bitter taste during the second ten squeezes, the screening test is completed. The taste threshold is noted as twenty regardless of the number of squeezes actually completed.

(9) If the second response is negative, ten more squeezes are repeated rapidly and the test subject is again asked whether the Bitrex is tasted. If the test subject reports tasting the bitter taste during the third set of ten squeezes, the screening test is completed. The taste threshold is noted as thirty regardless of the number of squeezes actually completed.

(10) The test conductor will take note of the number of squeezes required to solicit a taste response.

(11) If the Bitrex is not tasted after 30 squeezes (step 10), the test subject is unable to taste Bitrex and may not perform the Bitrex fit test.

(12) If a taste response is elicited, the test subject shall be asked to take note of the taste for reference in the fit test.

(13) Correct use of the nebulizer means that approximately 1 ml of liquid is used at a time in the nebulizer body.

(14) The nebulizer shall be thoroughly rinsed in water, shaken to dry, and refilled at least each morning and afternoon or at least every four hours.

(b) Bitrex Solution Aerosol Fit Test Procedure.

(1) The test subject may not eat, drink (except plain water), smoke, or chew gum for 15 minutes before the test.

(2) The fit test uses the same enclosure as that described in 4. (a) above.

(3) The test subject shall don the enclosure while wearing the respirator selected according to section I. A. of this appendix. The respirator shall be properly adjusted and equipped with any type particulate filter(s).

(4) A second DeVilbiss Model 40 Inhalation Medication Nebulizer or equivalent is used to spray the fit test solution into the enclosure. This nebulizer shall be clearly marked to distinguish it from the screening test solution nebulizer.

(5) The fit test solution is prepared by adding 337.5 mg of Bitrex to 200 ml of a 5 % salt (NaCl) solution in warm water.

(6) As before, the test subject shall breathe through his or her slightly open mouth with tongue extended, and be instructed to report if he/she tastes the bitter taste of Bitrex..

(7) The nebulizer is inserted into the hole in the front of the enclosure and an initial concentration of the fit test solution is sprayed into the enclosure using the same number of squeezes (either 10, 20 or 30 squeezes) based on the number of squeezes required to elicit a taste response as noted during the screening test.

(8) After generating the aerosol, the test subject shall be instructed to perform the exercises in section I. A. 14. of this appendix.

(9) Every 30 seconds the aerosol concentration shall be replenished using one half the number of squeezes used initially (e.g., 5, 10 or 15).

(10) The test subject shall indicate to the test conductor if at any time during the fit test the taste of Bitrex is detected. If the test subject does not report tasting the Bitrex, the test is passed.

(11) If the taste of Bitrex is detected, the fit is deemed unsatisfactory and the test is failed. A different respirator shall be tried and the entire test procedure is repeated (taste threshold screening and fit testing).

5. Irritant Smoke (Stannic Chloride) Protocol

This qualitative fit test uses a person's response to the irritating chemicals released in the "smoke" produced by a stannic chloride ventilation smoke tube to detect leakage into the respirator.

(a) General Requirements and Precautions

(1) The respirator to be tested shall be equipped with high efficiency particulate air (HEPA) or P100 series filter(s).

(2) Only stannic chloride smoke tubes shall be used for this protocol.

(3) No form of test enclosure or hood for the test subject shall be used.

(4) The smoke can be irritating to the eyes, lungs, and nasal passages. The test conductor shall take precautions to minimize the test subject's exposure to irritant smoke. Sensitivity varies, and certain individuals may respond to a greater degree to irritant smoke. Care shall be taken when performing the sensitivity screening checks that determine whether the test subject can detect irritant smoke to use only the minimum amount of smoke necessary to elicit a response from the test subject.

(5) The fit test shall be performed in an area with adequate ventilation to prevent exposure of the person conducting the fit test or the build-up of irritant smoke in the general atmosphere.

(b) Sensitivity Screening Check

The person to be tested must demonstrate his or her ability to detect a weak concentration of the irritant smoke.

(1) The test operator shall break both ends of a ventilation smoke tube containing stannic chloride, and attach one end of the smoke tube to a low flow air pump set to deliver 200 milliliters per minute, or an aspirator squeeze bulb. The test operator shall cover the other end of the smoke tube with a short piece of tubing to prevent potential injury from the jagged end of the smoke tube.

(2) The test operator shall advise the test subject that the smoke can be irritating to the eyes, lungs, and nasal passages and instruct the subject to keep his/her eyes closed while the test is performed.

(3) The test subject shall be allowed to smell a weak concentration of the irritant smoke before the respirator is donned to become familiar with its irritating properties and to determine if he/she can detect the irritating properties of the smoke. The test operator shall carefully direct a small amount of the irritant smoke in the test subject's direction to determine that he/she can detect it.

(c) Irritant Smoke Fit Test Procedure

(1) The person being fit tested shall don the respirator without assistance, and perform the required user seal check(s).

(2) The test subject shall be instructed to keep his/her eyes closed.

(3) The test operator shall direct the stream of irritant smoke from the smoke tube toward the faceseal area of the test subject, using the low flow pump or the squeeze bulb. The test operator shall begin at least 12 inches from the facepiece and move the smoke stream around the whole perimeter of the mask. The operator shall gradually make two more passes around the perimeter of the mask, moving to within six inches of the respirator.

(4) If the person being tested has not had an involuntary response and/or detected the irritant smoke, proceed with the test exercises.

(5) The exercises identified in section I.A. 14. of this appendix shall be performed by the test subject while the respirator seal is being continually challenged by the smoke, directed around the perimeter of the respirator at a distance of six inches.

(6) If the person being fit tested reports detecting the irritant smoke at any time, the test is failed. The person being retested must repeat the entire sensitivity check and fit test procedure.

(7) Each test subject passing the irritant smoke test without evidence of a response (involuntary cough, irritation) shall be given a second sensitivity screening check, with the smoke from the same smoke tube used during the fit test, once the respirator has been removed, to determine whether he/she still reacts to the smoke. Failure to evoke a response shall void the fit test.

(8) If a response is produced during this second sensitivity check, then the fit test is passed.

C. Quantitative Fit Test (QNFT) Protocols

The following quantitative fit testing procedures have been demonstrated to be acceptable: Quantitative fit testing using a non-hazardous test aerosol (such as corn oil, polyethylene glycol 400 [PEG 400], di-2-ethyl hexyl sebacate [DEHS], or sodium chloride) generated in a test chamber, and employing instrumentation to quantify the fit of the respirator; Quantitative fit testing using ambient aerosol as the test agent and appropriate instrumentation (condensation nuclei counter) to quantify the respirator fit; Quantitative fit testing using controlled negative pressure and appropriate instrumentation to measure the volumetric leak rate of a facepiece to quantify the respirator fit.

1. General

(a) The employer shall ensure that persons administering QNFT are able to calibrate equipment and perform tests properly, recognize invalid tests, calculate fit factors properly and ensure that test equipment is in proper working order.

(b) The employer shall ensure that QNFT equipment is kept clean, and is maintained and calibrated according to the manufacturer's instructions so as to operate at the parameters for which it was designed.

2. Generated Aerosol Quantitative Fit Testing Protocol

(a) Apparatus.

(1) Instrumentation. Aerosol generation, dilution, and measurement systems using particulates (corn oil, polyethylene glycol 400 [PEG 400], di-2-ethyl hexyl sebacate [DEHS] or sodium chloride) as test aerosols shall be used for quantitative fit testing.

(2) Test chamber. The test chamber shall be large enough to permit all test subjects to perform freely all required exercises without disturbing the test agent concentration or the measurement apparatus. The test chamber shall be equipped and constructed so that the test agent is effectively isolated from the ambient air, yet uniform in concentration throughout the chamber.

(3) When testing air-purifying respirators, the normal filter or cartridge element shall be replaced with a high efficiency particulate air (HEPA) or P100 series filter supplied by the same manufacturer.

(4) The sampling instrument shall be selected so that a computer record or strip chart record may be made of the test showing the rise and fall of the test agent concentration with each inspiration and expiration at fit factors of at least 2,000. Integrators or computers that integrate the amount of test agent penetration leakage into the respirator for each exercise may be used provided a record of the readings is made.

(5) The combination of substitute air-purifying elements, test agent and test agent concentration shall be such that the test subject is not exposed in excess of an established exposure limit for the test agent at any time during the testing process, based upon the length of the exposure and the exposure limit duration.

(6) The sampling port on the test specimen respirator shall be placed and constructed so that no leakage occurs around the port (e.g., where the respirator is probed), a free air flow is allowed into the sampling line at all times, and there is no interference with the fit or performance of the respirator. The in-mask sampling device (probe) shall be designed and used so that the air sample is drawn from the breathing zone of the test subject, midway between the nose and mouth and with the probe extending into the facepiece cavity at least 1/4 inch.

(7) The test setup shall permit the person administering the test to observe the test subject inside the chamber during the test.

(8) The equipment generating the test atmosphere shall maintain the concentration of test agent constant to within a 10 percent variation for the duration of the test.

(9) The time lag (interval between an event and the recording of the event on the strip chart or computer or integrator) shall be kept to a minimum. There shall be a clear association between the occurrence of an event and its being recorded.

(10) The sampling line tubing for the test chamber atmosphere and for the respirator sampling port shall be of equal diameter and of the same material. The length of the two lines shall be equal.

(11) The exhaust flow from the test chamber shall pass through an appropriate filter (i.e., high efficiency particulate or P100 series filter) before release.

(12) When sodium chloride aerosol is used, the relative humidity inside the test chamber shall not exceed 50 percent.

(13) The limitations of instrument detection shall be taken into account when determining the fit factor.

(14) Test respirators shall be maintained in proper working order and be inspected regularly for deficiencies such as cracks or missing valves and gaskets.

(b) Procedural Requirements.

(1) When performing the initial user seal check using a positive or negative pressure check, the sampling line shall be crimped closed in order to avoid air pressure leakage during either of these pressure checks.

(2) The use of an abbreviated screening QLFT test is optional. Such a test may be utilized in order to quickly identify poor fitting respirators that passed the positive and/or negative pressure test and reduce the amount of QNFT time. The use of the CNC QNFT instrument in the count mode is another optional method to obtain a quick estimate of fit and eliminate poor fitting respirators before going on to perform a full QNFT.

(3) A reasonably stable test agent concentration shall be measured in the test chamber prior to testing. For canopy or shower curtain types of test units, the determination of the test agent's stability may be established after the test subject has entered the test environment.

(4) Immediately after the subject enters the test chamber, the test agent concentration inside the respirator shall be measured to ensure that the peak penetration does not exceed 5 percent for a half mask or 1 percent for a full facepiece respirator.

(5) A stable test agent concentration shall be obtained prior to the actual start of testing.

(6) Respirator restraining straps shall not be over-tightened for testing. The straps shall be adjusted by the wearer without assistance from other persons to give a reasonably comfortable fit typical of normal use. The respirator shall not be adjusted once the fit test exercises begin.

(7) The test shall be terminated whenever any single peak penetration exceeds 5 percent for half masks and 1 percent for full facepiece respirators. The test subject shall be refitted and retested.

(8) Calculation of fit factors.

(i) The fit factor shall be determined for the quantitative fit test by taking the ratio of the average chamber concentration to the concentration measured inside the respirator for each test exercise except the grimace exercise.

(ii) The average test chamber concentration shall be calculated as the arithmetic average of the concentration measured before and after each test (i.e., 7 exercises) or the arithmetic average of the concentration measured before and after each exercise or the true average measured continuously during the respirator sample.

(iii) The concentration of the challenge agent inside the respirator shall be determined by one of the following methods:

(A) Average peak penetration method means the method of determining test agent penetration into the respirator utilizing a strip chart recorder, integrator, or computer. The agent penetration is determined by an average of the peak heights on the graph or by computer integration, for each exercise except the grimace exercise. Integrators or computers that calculate the actual test agent penetration into the respirator for each exercise will also be considered to meet the requirements of the average peak penetration method.

(B) Maximum peak penetration method means the method of determining test agent penetration in the respirator as determined by strip chart recordings of the test. The highest peak penetration for a given exercise is taken to be representative of average penetration into the respirator for that exercise.

(C) Integration by calculation of the area under the individual peak for each exercise except the grimace exercise. This includes computerized integration.

(D) The calculation of the overall fit factor using individual exercise fit factors involves first converting the exercise fit factors to penetration values, determining the average, and then converting that result back to a fit factor. This procedure is described in the following equation:

$$\text{Overall Fit Factor} = \frac{\text{Number of exercises}}{1/ff_1 + 1/ff_2 + 1/ff_3 + 1/ff_4 + 1/ff_5 + 1/ff_6 + 1/ff_7}$$

Where ff_1, ff_2, ff_3, etc. are the fit factors for exercises 1, 2, 3, etc.

(9) The test subject shall not be permitted to wear a half mask or quarter facepiece respirator unless a minimum fit factor of 100 is obtained, or a full facepiece respirator unless a minimum fit factor of 500 is obtained.

(10) Filters used for quantitative fit testing shall be replaced whenever increased breathing resistance is encountered, or when the test agent has altered the integrity of the filter media.

3. Ambient aerosol condensation nuclei counter (CNC) quantitative fit testing protocol.

The ambient aerosol condensation nuclei counter (CNC) quantitative fit testing (Portacount ™) protocol quantitatively fit tests respirators with the use of a probe. The probed respirator is only used for quantitative fit tests. A probed respirator has a special sampling device, installed on the respirator, that allows the probe to sample the air from inside the mask. A probed respirator is required for each make, style, model, and size that the employer uses and can be obtained from the respirator manufacturer or distributor. The CNC instrument manufacturer, TSI Inc., also provides probe attachments (TSI sampling adapters) that permit fit testing in an employee's own respirator. A minimum fit factor pass level of at least 100 is necessary for a half-mask respirator and a minimum fit factor pass level of at least 500 is required for a full facepiece negative pressure respirator. The entire screening and testing procedure shall be explained to the test subject prior to the conduct of the screening test.

(a) Portacount Fit Test Requirements.

(1) Check the respirator to make sure the respirator is fitted with a high-efficiency filter and that the sampling probe and line are properly attached to the facepiece.

(2) Instruct the person to be tested to don the respirator for five minutes before the fit test starts. This purges the ambient particles trapped inside the respirator and permits the wearer to make certain the respirator is comfortable. This individual shall already have been trained on how to wear the respirator properly.

(3) Check the following conditions for the adequacy of the respirator fit: Chin properly placed; Adequate strap tension, not overly tightened; Fit across nose bridge; Respirator of proper size to span distance from nose to chin; Tendency of the respirator to slip; Self-observation in a mirror to evaluate fit and respirator position.

(4) Have the person wearing the respirator do a user seal check. If leakage is detected, determine the cause. If leakage is from a poorly fitting facepiece, try another size of the same model respirator, or another model of respirator.

(5) Follow the manufacturer's instructions for operating the Portacount and proceed with the test.

(6) The test subject shall be instructed to perform the exercises in section I. A. 14. of this appendix.

(7) After the test exercises, the test subject shall be questioned by the test conductor regarding the comfort of the respirator upon completion of the protocol. If it has become unacceptable, another model of respirator shall be tried.

(b) Portacount Test Instrument.

(1) The Portacount will automatically stop and calculate the overall fit factor for the entire set of exercises. The overall fit factor is what counts. The Pass or Fail message will indicate whether or not the test was successful. If the test was a Pass, the fit test is over.

(2) Since the pass or fail criterion of the Portacount is user programmable, the test operator shall ensure that the pass or fail criterion meet the requirements for minimum respirator performance in this Appendix.

(3) A record of the test needs to be kept on file, assuming the fit test was successful. The record must contain the test subject's name; overall fit factor; make, model, style, and size of respirator used; and date tested.

4. Controlled negative pressure (CNP) quantitative fit testing protocol.

The CNP protocol provides an alternative to aerosol fit test methods. The CNP fit test method technology is based on exhausting air from a temporarily sealed respirator facepiece to generate and then maintain a constant negative pressure inside the facepiece. The rate of air exhaust is controlled so that a constant negative pressure is maintained in the respirator during the fit test. The level of pressure is selected to replicate the mean inspiratory pressure that causes leakage into the respirator under normal use conditions. With pressure held constant, air flow out of the respirator is equal to air flow into the respirator. Therefore, measurement of the exhaust stream that is required to hold the pressure in the temporarily sealed respirator constant yields a direct measure of leakage air flow into the respirator. The CNP fit test method measures leak rates through the facepiece as a method for determining the facepiece fit for negative pressure respirators. The CNP instrument manufacturer Dynatech Nevada also provides attachments (sampling manifolds) that replace the filter cartridges to permit fit testing in an employee's own respirator. To perform the test, the test subject closes his or her mouth and holds his/her breath,

after which an air pump removes air from the respirator facepiece at a pre-selected constant pressure. The facepiece fit is expressed as the leak rate through the facepiece, expressed as milliliters per minute. The quality and validity of the CNP fit tests are determined by the degree to which the in-mask pressure tracks the test pressure during the system measurement time of approximately five seconds. Instantaneous feedback in the form of a real-time pressure trace of the in-mask pressure is provided and used to determine test validity and quality. A minimum fit factor pass level of 100 is necessary for a half-mask respirator and a minimum fit factor of at least 500 is required for a full facepiece respirator. The entire screening and testing procedure shall be explained to the test subject prior to the conduct of the screening test.

(a) CNP Fit Test Requirements.

(1) The instrument shall have a non-adjustable test pressure of 15.0 mm water pressure.

(2) The CNP system defaults selected for test pressure shall be set at -- 1.5 mm of water (-0.58 inches of water) and the modeled inspiratory flow rate shall be 53.8 liters per minute for performing fit tests.

(**Note:** CNP systems have built-in capability to conduct fit testing that is specific to unique work rate, mask, and gender situations that might apply in a specific workplace. Use of system default values, which were selected to represent respirator wear with medium cartridge resistance at a low-moderate work rate, will allow inter-test comparison of the respirator fit.)

(3) The individual who conducts the CNP fit testing shall be thoroughly trained to perform the test.

(4) The respirator filter or cartridge needs to be replaced with the CNP test manifold. The inhalation valve downstream from the manifold either needs to be temporarily removed or propped open.

(5) The test subject shall be trained to hold his or her breath for at least 20 seconds.

(6) The test subject shall don the test respirator without any assistance from the individual who conducts the CNP fit test.

(7) The QNFT protocol shall be followed according to section I. C. 1. of this appendix with an exception for the CNP test exercises.

(b) CNP Test Exercises.

(1) Normal breathing. In a normal standing position, without talking, the subject shall breathe normally for 1 minute. After the normal breathing exercise, the subject needs to hold head straight ahead and hold his or her breath for 10 seconds during the test measurement.

(2) Deep breathing. In a normal standing position, the subject shall breathe slowly and deeply for 1 minute, being careful not to hyperventilate. After the deep breathing exercise, the subject shall hold his or her head straight ahead and hold his or her breath for 10 seconds during test measurement.

(3) Turning head side to side. Standing in place, the subject shall slowly turn his or her head from side to side between the extreme positions on each side for 1 minute. The head shall be held at each extreme momentarily so the subject can inhale at each side. After the turning head side to side exercise, the subject needs to hold head full left and hold his or her breath for 10 seconds during test measurement. Next, the subject needs to hold head full right and hold his or her breath for 10 seconds during test measurement.

(4) Moving head up and down. Standing in place, the subject shall slowly move his or her head up and down for 1 minute. The subject shall be instructed to inhale in the up position (i.e., when looking toward the ceiling). After the moving head up and down exercise, the subject shall hold his

or her head full up and hold his or her breath for 10 seconds during test measurement. Next, the subject shall hold his or her head full down and hold his or her breath for 10 seconds during test measurement.

(5) Talking. The subject shall talk out loud slowly and loud enough so as to be heard clearly by the test conductor. The subject can read from a prepared text such as the Rainbow Passage, count backward from 100, or recite a memorized poem or song for 1 minute. After the talking exercise, the subject shall hold his or her head straight ahead and hold his or her breath for 10 seconds during the test measurement.

(6) Grimace. The test subject shall grimace by smiling or frowning for 15 seconds.

(7) Bending Over. The test subject shall bend at the waist as if he or she were to touch his or her toes for 1 minute. Jogging in place shall be substituted for this exercise in those test environments such as shroud-type QNFT units that prohibit bending at the waist. After the bending over exercise, the subject shall hold his or her head straight ahead and hold his or her breath for 10 seconds during the test measurement.

(8) Normal Breathing. The test subject shall remove and re-don the respirator within a one-minute period. Then, in a normal standing position, without talking, the subject shall breathe normally for 1 minute. After the normal breathing exercise, the subject shall hold his or her head straight ahead and hold his or her breath for 10 seconds during the test measurement. After the test exercises, the test subject shall be questioned by the test conductor regarding the comfort of the respirator upon completion of the protocol. If it has become unacceptable, another model of a respirator shall be tried.

(c) CNP Test Instrument.

(1) The test instrument shall have an effective audio warning device when the test subject fails to hold his or her breath during the test. The test shall be terminated whenever the test subject failed to hold his or her breath. The test subject may be refitted and retested.

(2) A record of the test shall be kept on file, assuming the fit test was successful. The record must contain the test subject's name; overall fit factor; make, model, style and size of respirator used; and date tested.

Part II. New Fit Test Protocols

A. Any person may submit to OSHA an application for approval of a new fit test protocol. If the application meets the following criteria, OSHA will initiate a rulemaking proceeding under section 6(b)(7) of the OSH Act to determine whether to list the new protocol as an approved protocol in this Appendix A.

B. The application must include a detailed description of the proposed new fit test protocol. This application must be supported by either:

1. A test report prepared by an independent government research laboratory (e.g., Lawrence Livermore National Laboratory, Los Alamos National Laboratory, the National Institute for Standards and Technology) stating that the laboratory has tested the protocol and had found it to be accurate and reliable; or

2. An article that has been published in a peer-reviewed industrial hygiene journal describing the protocol and explaining how test data support the protocol's accuracy and reliability.

C. If OSHA determines that additional information is required before the Agency commences a rulemaking proceeding under this section, OSHA will so notify the applicant and afford the

applicant the opportunity to submit the supplemental information. Initiation of a rulemaking proceeding will be deferred until OSHA has received and evaluated the supplemental information.

OSHA Respirator Standards, Appendix B-1

User Seal Check Procedures (Mandatory)

Appendix B-1 to § 1910.134: User Seal Check Procedures (Mandatory)

The individual who uses a tight-fitting respirator is to perform a user seal check to ensure that an adequate seal is achieved each time the respirator is put on. Either the positive and negative pressure checks listed in this appendix, or the respirator manufacturer's recommended user seal check method shall be used. User seal checks are not substitutes for qualitative or quantitative fit tests.

I. Facepiece Positive and/or Negative Pressure Checks

A. Positive pressure check. Close off the exhalation valve and exhale gently into the facepiece. The face fit is considered satisfactory if a slight positive pressure can be built up inside the facepiece without any evidence of outward leakage of air at the seal. For most respirators this method of leak testing requires the wearer to first remove the exhalation valve cover before closing off the exhalation valve and then carefully replacing it after the test.

B. Negative pressure check. Close off the inlet opening of the canister or cartridge(s) by covering with the palm of the hand(s) or by replacing the filter seal(s), inhale gently so that the facepiece collapses slightly, and hold the breath for ten seconds. The design of the inlet opening of some cartridges cannot be effectively covered with the palm of the hand. The test can be performed by covering the inlet opening of the cartridge with a thin latex or nitrile glove. If the facepiece remains in its slightly collapsed condition and no inward leakage of air is detected, the tightness of the respirator is considered satisfactory.

II. Manufacturer's Recommended User Seal Check Procedures

The respirator manufacturer's recommended procedures for performing a user seal check may be used instead of the positive and/or negative pressure check procedures provided that the employer demonstrates that the manufacturer's procedures are equally effective.

OSHA Respirator Standards, Appendix B-2

Respirator Cleaning Procedures (Mandatory)

Appendix B-2 to § 1910.134: Respirator Cleaning Procedures (Mandatory)

These procedures are provided for employer use when cleaning respirators. They are general in nature, and the employer as an alternative may use the cleaning recommendations provided by the manufacturer of the respirators used by their employees, provided such procedures are as effective as those listed here in Appendix B-2. Equivalent effectiveness simply means that the procedures used must accomplish the objectives set forth in Appendix B-2, i.e., must ensure that the respirator is properly cleaned and disinfected in a manner that prevents damage to the respirator and does not cause harm to the user.

I. Procedures for Cleaning Respirators

A. Remove filters, cartridges, or canisters. Disassemble facepieces by removing speaking diaphragms, demand and pressure-demand valve assemblies, hoses, or any components recommended by the manufacturer. Discard or repair any defective parts.

B. Wash components in warm (43 deg. C [110 deg. F] maximum) water with a mild detergent or with a cleaner recommended by the manufacturer. A stiff bristle (not wire) brush may be used to facilitate the removal of dirt.

C. Rinse components thoroughly in clean, warm (43 deg. C [110 deg. F] maximum), preferably running water. Drain.

D. When the cleaner used does not contain a disinfecting agent, respirator components should be immersed for two minutes in one of the following:

1. Hypochlorite solution (50 ppm of chlorine) made by adding approximately one milliliter of laundry bleach to one liter of water at 43 deg. C (110 deg. F); or,

2. Aqueous solution of iodine (50 ppm iodine) made by adding approximately 0.8 milliliters of tincture of iodine (6-8 grams ammonium and/or potassium iodide/100 cc of 45 % alcohol) to one liter of water at 43 deg. C (110 deg. F); or,

3. Other commercially available cleansers of equivalent disinfectant quality when used as directed, if their use is recommended or approved by the respirator manufacturer.

E. Rinse components thoroughly in clean, warm (43 deg. C [110 deg. F] maximum), preferably running water. Drain. The importance of thorough rinsing cannot be overemphasized. Detergents or disinfectants that dry on facepieces may result in dermatitis. In addition, some disinfectants may cause deterioration of rubber or corrosion of metal parts if not completely removed.

F. Components should be hand-dried with a clean lint-free cloth or air-dried.

G. Reassemble facepiece, replacing filters, cartridges, and canisters where necessary.

H. Test the respirator to ensure that all components work properly.

OSHA Respirator Standards, Appendix C

OSHA Respirator Medical Evaluation Questionnaire (Mandatory)

Appendix C to § 1910.134: OSHA Respirator Medical Evaluation Questionnaire (Mandatory)

To the employer: Answers to questions in Section 1, and to question 9 in Section 2 of Part A, do not require a medical examination.

To the employee:

Can you read (circle one): Yes/No

Your employer must allow you to answer this questionnaire during normal working hours, or at a time and place that is convenient to you. To maintain your confidentiality, your employer or supervisor must not look at or review your answers, and your employer must tell you how to deliver or send this questionnaire to the health care professional who will review it.

Part A. Section 1. (Mandatory) The following information must be provided by every employee who has been selected to use any type of respirator (please print).

1. Today's date:_____

2. Your name:_____

3. Your age (to nearest year):_____

4. Sex (circle one): Male/Female

5. Your height: _____ ft. _____ in.

6. Your weight: _____ lbs.

7. Your job title:_____

8. A phone number where you can be reached by the health care professional who reviews this questionnaire (include the Area Code): _____

9. The best time to phone you at this number: _____

10. Has your employer told you how to contact the health care professional who will review this questionnaire (circle one): Yes/No

11. Check the type of respirator you will use (you can check more than one category):
a. _____ N, R, or P disposable respirator (filter-mask, non-cartridge type only).
b. _____ Other type (for example, half- or full-facepiece type, powered-air purifying, supplied-air, self-contained breathing apparatus).

12. Have you worn a respirator (circle one): Yes/No

If "yes," what type(s):_____

_____

Part A. Section 2. (Mandatory) Questions 1 through 9 below must be answered by every employee who has been selected to use any type of respirator (please circle "yes" or "no").

1. Do you currently smoke tobacco, or have you smoked tobacco in the last month: Yes/No

2. Have you ever had any of the following conditions?
a. Seizures (fits): Yes/No
b. Diabetes (sugar disease): Yes/No
c. Allergic reactions that interfere with your breathing: Yes/No
d. Claustrophobia (fear of closed-in places): Yes/No
e. Trouble smelling odors: Yes/No

3. Have you ever had any of the following pulmonary or lung problems?
a. Asbestosis: Yes/No
b. Asthma: Yes/No
c. Chronic bronchitis: Yes/No
d. Emphysema: Yes/No
e. Pneumonia: Yes/No
f. Tuberculosis: Yes/No
g. Silicosis: Yes/No
h. Pneumothorax (collapsed lung): Yes/No
i. Lung cancer: Yes/No
j. Broken ribs: Yes/No
k. Any chest injuries or surgeries: Yes/No
l. Any other lung problem that you've been told about: Yes/No

4. Do you currently have any of the following symptoms of pulmonary or lung illness?
a. Shortness of breath: Yes/No
b. Shortness of breath when walking fast on level ground or walking up a slight hill or incline: Yes/No
c. Shortness of breath when walking with other people at an ordinary pace on level ground: Yes/No
d. Have to stop for breath when walking at your own pace on level ground: Yes/No
e. Shortness of breath when washing or dressing yourself: Yes/No
f. Shortness of breath that interferes with your job: Yes/No
g. Coughing that produces phlegm (thick sputum): Yes/No
h. Coughing that wakes you early in the morning: Yes/No
i. Coughing that occurs mostly when you are lying down: Yes/No
j. Coughing up blood in the last month: Yes/No
k. Wheezing: Yes/No
l. Wheezing that interferes with your job: Yes/No
m. Chest pain when you breathe deeply: Yes/No
n. Any other symptoms that you think may be related to lung problems: Yes/No

5. Have you ever had any of the following cardiovascular or heart problems?
a. Heart attack: Yes/No
b. Stroke: Yes/No
c. Angina: Yes/No
d. Heart failure: Yes/No
e. Swelling in your legs or feet (not caused by walking): Yes/No
f. Heart arrhythmia (heart beating irregularly): Yes/No
g. High blood pressure: Yes/No
h. Any other heart problem that you've been told about: Yes/No

6. Have you ever had any of the following cardiovascular or heart symptoms?
a. Frequent pain or tightness in your chest: Yes/No
b. Pain or tightness in your chest during physical activity: Yes/No
c. Pain or tightness in your chest that interferes with your job: Yes/No
d. In the past two years, have you noticed your heart skipping or missing a beat: Yes/No
e. Heartburn or indigestion that is not related to eating: Yes/ No
f. Any other symptoms that you think may be related to heart or circulation problems: Yes/No

7. Do you currently take medication for any of the following problems?
a. Breathing or lung problems: Yes/No
b. Heart trouble: Yes/No
c. Blood pressure: Yes/No
d. Seizures (fits): Yes/No

8. If you've used a respirator, have you ever had any of the following problems? (If you've never used a respirator, check the following space and go to question 9:)
a. Eye irritation: Yes/No
b. Skin allergies or rashes: Yes/No
c. Anxiety: Yes/No
d. General weakness or fatigue: Yes/No
e. Any other problem that interferes with your use of a respirator: Yes/No

9. Would you like to talk to the health care professional who will review this questionnaire about your answers to this questionnaire: Yes/No

Questions 10 to 15 below must be answered by every employee who has been selected to use either a full-facepiece respirator or a self-contained breathing apparatus (SCBA). For employees who have been selected to use other types of respirators, answering these questions is voluntary.

10. Have you ever lost vision in either eye (temporarily or permanently): Yes/No

11. Do you currently have any of the following vision problems?
a. Wear contact lenses: Yes/No
b. Wear glasses: Yes/No
c. Color blind: Yes/No
e. Any other eye or vision problem: Yes/No

12. Have you ever had an injury to your ears, including a broken ear drum: Yes/No

13. Do you currently have any of the following hearing problems?
a. Difficulty hearing: Yes/No
b. Wear a hearing aid: Yes/No
c. Any other hearing or ear problem: Yes/No

14. Have you ever had a back injury: Yes/No

15. Do you currently have any of the following musculoskeletal problems?
a. Weakness in any of your arms, hands, legs, or feet: Yes/No
b. Back pain: Yes/No
c. Difficulty fully moving your arms and legs: Yes/No
d. Pain or stiffness when you lean forward or backward at the waist: Yes/No
e. Difficulty fully moving your head up or down: Yes/No
f. Difficulty fully moving your head side to side: Yes/No
g. Difficulty bending at your knees: Yes/No
h. Difficulty squatting to the ground: Yes/No
i. Climbing a flight of stairs or a ladder carrying more than 25 lbs: Yes/No
j. Any other muscle or skeletal problem that interferes with using a respirator: Yes/No

Part B Any of the following questions, and other questions not listed, may be added to the questionnaire at the discretion of the health care professional who will review the questionnaire.

1. In your present job, are you working at high altitudes (over 5,000 feet) or in a place that has lower than normal amounts of oxygen: Yes/No
If "yes," do you have feelings of dizziness, shortness of breath, pounding in your chest, or other symptoms when you're working under these conditions: Yes/No

2. At work or at home, have you ever been exposed to hazardous solvents, hazardous airborne chemicals (e.g., gases, fumes, or dust), or have you come into skin contact with hazardous chemicals: Yes/No
If "yes," name the chemicals if you know them:_____
_____
_____

3. Have you ever worked with any of the materials, or under any of the conditions, listed below:
a. Asbestos: Yes/No
b. Silica (e.g., in sandblasting): Yes/No
c. Tungsten/cobalt (e.g., grinding or welding this material): Yes/No
d. Beryllium: Yes/No
e. Aluminum: Yes/No
f. Coal (for example, mining): Yes/No
g. Iron: Yes/No
h. Tin: Yes/No
i. Dusty environments: Yes/No
j. Any other hazardous exposures: Yes/No
If "yes," describe these exposures:_____
_____
_____

4. List any second jobs or side businesses you have:_____
_____

5. List your previous occupations:_____
_____

6. List your current and previous hobbies:_____
_____

7. Have you been in the military services? Yes/No
If "yes," were you exposed to biological or chemical agents (either in training or combat): Yes/No

8. Have you ever worked on a HAZMAT team? Yes/No

9. Other than medications for breathing and lung problems, heart trouble, blood pressure, and seizures mentioned earlier in this questionnaire, are you taking any other medications for any reason (including over-the-counter medications): Yes/No
If "yes," name the medications if you know them:_____

10. Will you be using any of the following items with your respirator(s)?
a. HEPA Filters: Yes/No
b. Canisters (for example, gas masks): Yes/No
c. Cartridges: Yes/No

11. How often are you expected to use the respirator(s) (circle "yes" or "no" for all answers that apply to you)?:

a. Escape only (no rescue): Yes/No
b. Emergency rescue only: Yes/No
c. Less than 5 hours per week: Yes/No
d. Less than 2 hours per day: Yes/No
e. 2 to 4 hours per day: Yes/No
f. Over 4 hours per day: Yes/No

12. During the period you are using the respirator(s), is your work effort:
a. Light (less than 200 kcal per hour): Yes/No
If "yes," how long does this period last during the average shift:_____hrs._____mins.
Examples of a light work effort are sitting while writing, typing, drafting, or performing light assembly work; or standing while operating a drill press (1-3 lbs.) or controlling machines.

b. Moderate (200 to 350 kcal per hour): Yes/No
If "yes," how long does this period last during the average shift:_____hrs._____mins.
Examples of moderate work effort are sitting while nailing or filing; driving a truck or bus in urban traffic; standing while drilling, nailing, performing assembly work, or transferring a moderate load (about 35 lbs.) at trunk level; walking on a level surface about 2 mph or down a 5-degree grade about 3 mph; or pushing a wheelbarrow with a heavy load (about 100 lbs.) on a level surface.

c. Heavy (above 350 kcal per hour): Yes/No
If "yes," how long does this period last during the average shift:_____hrs._____mins.
Examples of heavy work are lifting a heavy load (about 50 lbs.) from the floor to your waist or shoulder; working on a loading dock; shoveling; standing while bricklaying or chipping castings; walking up an 8-degree grade about 2 mph; climbing stairs with a heavy load (about 50 lbs.).

13. Will you be wearing protective clothing and/or equipment (other than the respirator) when you're using your respirator: Yes/No
If "yes," describe this protective clothing and/or equipment:_____
_____

14. Will you be working under hot conditions (temperature exceeding 77 deg. F): Yes/No

15. Will you be working under humid conditions: Yes/No

16. Describe the work you'll be doing while you're using your respirator(s):

_____
_____

17. Describe any special or hazardous conditions you might encounter when you're using your respirator(s) (for example, confined spaces, life-threatening gases):

_____
_____

18. Provide the following information, if you know it, for each toxic substance that you'll be exposed to when you're using your respirator(s):
Name of the first toxic substance:_____
Estimated maximum exposure level per shift:_____
Duration of exposure per shift_____
Name of the second toxic substance:_____
Estimated maximum exposure level per shift:_____
Duration of exposure per shift:_____

Name of the third toxic substance:_____
Estimated maximum exposure level per shift:_____
Duration of exposure per shift:_____
The name of any other toxic substances that you'll be exposed to while using your respirator:

_____

_____

_____

19. Describe any special responsibilities you'll have while using your respirator(s) that may affect the safety and well-being of others (for example, rescue, security):

_____

OSHA Respirator Standards, Appendix D

(Non-Mandatory) Information for Employees Using Respirators When Not Required Under the Standard

Appendix D to § 1910.134 (Non-Mandatory) Information for Employees Using Respirators When Not Required Under the Standard

Respirators are an effective method of protection against designated hazards when properly selected and worn. Respirator use is encouraged, even when exposures are below the exposure limit, to provide an additional level of comfort and protection for workers. However, if a respirator is used improperly or not kept clean, the respirator itself can become a hazard to the worker. Sometimes, workers may wear respirators to avoid exposures to hazards, even if the amount of hazardous substance does not exceed the limits set by OSHA standards. If your employer provides respirators for your voluntary use, of if you provide your own respirator, you need to take certain precautions to be sure that the respirator itself does not present a hazard.

You should do the following:

1. Read and heed all instructions provided by the manufacturer on use, maintenance, cleaning and care, and warnings regarding the respirators limitations.

2. Choose respirators certified for use to protect against the contaminant of concern. NIOSH, the National Institute for Occupational Safety and Health of the U.S. Department of Health and Human Services, certifies respirators. A label or statement of certification should appear on the respirator or respirator packaging. It will tell you what the respirator is designed for and how much it will protect you.

3. Do not wear your respirator into atmospheres containing contaminants for which your respirator is not designed to protect against. For example, a respirator designed to filter dust particles will not protect you against gases, vapors, or very small solid particles of fumes or smoke.

4. Keep track of your respirator so that you do not mistakenly use someone else's respirator.

ARCADIS BBL

Attachment B

Maxymillian's Operations Plan

OPERATIONS PLAN

General Electric

Selected Phase 2 Floodplain Properties Adjacent to the 1 ½ Mile Reach of Housatonic River; Pittsfield MA

Prepared for:

General Electric Co.
159 Plastics Ave.
Pittsfield MA 01201

and

ARCADIS BBL
6723 Towpath Road
Syracuse NY 13214

Prepared by:

Maxymillian Technologies, Inc.
1801 East Street
Pittsfield MA

May 2007

MAXYMILLIAN TECHNOLOGIES, INC.
Reviewed For Submission

Spec Sect # 6.2 Trans # 3
Date: 05/21/07 By: SJE

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1.0 EROSION AND SEDIMENTATION CONTROL MEASURES 1

2.0 TRAFFIC CONTROL MEASURES 1

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5.0 EXCAVATION APPROACH 3

6.0 MATERIAL HANDLING PLAN 3

7.0 EQUIPMENT DECONTAMINATION PROCEDURES 4

8.0 REMEDIAL ACTION SCHEDULE 4

1.0 EROSION AND SEDIMENTATION CONTROL MEASURES

Maxymillian Technologies, Inc (MT) proposes to utilize silt fence and/or hay bales for the prevention of erosion in removal areas. Erosion and sedimentation control measures will be in place prior to start of remedial activities.

Proposed placement of erosion and sedimentation control measures will be as depicted on Site Preparation Plan, Sheet 2 of the Technical Drawings dated March 2007, prepared by ARCADIS BBL, also as needed and/or directed by General Electric Co. (GE) or GE's representative during remediation.

Daily inspection of the erosion and sedimentation control system will be performed by MT's on-site project manager or designated personnel. The control system will be maintained in proper working condition throughout the remedial activities.

Erosion and sedimentation control measures will remain in place until vegetation is restored to the remedial areas, and removal authorization is provided by GE.

2.0 TRAFFIC CONTROL MEASURES

Prior to the start of any work along public roadways, MT will obtain all necessary road and bridge crossing permits. MT will provide all required traffic warnings and controls. These controls will include, but are not limited to, warning signs and the use of a flagperson(s) or police officer. In areas where the vehicular and/or pedestrian traffic is normally busy, MT will use a police officer to control traffic. MT will determine whether additional traffic controls are necessary depending on the volume of vehicular and pedestrian traffic encountered.

MT will load soils into MT supplied trucks at the Work Site for transport to the approved soil staging area at GE Bldg 65. Traffic control will be provided for all trucks leaving site.

MT will install temporary construction fencing where site activities may disrupt normal pedestrian or vehicular traffic. Appropriate traffic warnings and controls will also be set up at all points of equipment access to the work site.

Traffic control will also be provided for backfill operations.

3.0 PROPERTY PROTECTION PROCEDURES

The methodology of the MT excavation and restoration plan is to prevent work and/or disturbance of property not associated with remedial activities. If execution of the work requires access from properties not associated with the remedial action, permission will be acquired from the property owners [by GE] and all surfaces will be restored to original condition. It is not anticipated that access from any property, other than GE property, which is not associated with the remedial action of the Work Site, will be required.

Staging of equipment and materials will take place on the remedial action property in areas noted on contract drawings or otherwise approved by GE. No equipment or materials will be staged on adjacent properties during the remedial action. Any damage to properties (including structures, utilities, facilities, etc.) will be reported to GE and repaired as soon as possible.

4.0 LIST OF EQUIPMENT TO BE USED ON-SITE

MT will utilize a rubber tire backhoe or loader and trucks for the performance of the work site remedial activities.

A rubber tire backhoe will be used for excavation of impacted soils. Machines used for excavation of soils will be cleaned to remove accumulations of soils on exterior surfaces prior to exiting the work site.

MT supplied trucks will be used for excavation activities and to transport the excavated soils to the approved soil staging area. All trucks and drivers are registered and licensed to haul hazardous waste. On site stockpiles of soils are not anticipated.

GE will supply required paperwork for the transport trucks when transporting to the approved soil staging area. MT will fill out the proper paperwork and ensure loads are properly covered and placarded prior to the trucks leaving site. A daily transportation summary sheet which includes work site, date, load number, truck ID, time of departure from site, time of arrival at temporary stockpile, copy of signed hazardous waste manifest or bill of lading and type of material will be completed each day.

A rubber tire backhoe or loader will be used for spreading and compacting topsoil over completed excavation areas.

MT supplied trucks will be used to support topsoil backfill operations. Trucks will transport materials from GE approved soil locations as needed to support backfill operations.

5.0 EXCAVATION APPROACH

Excavation of impacted soils will be completed to the horizontal and vertical limits of the areas specified on the Contract Drawings. On-site survey will demonstrate that excavation has progressed to the specified limits. Free liquid in soils during excavation is not expected due to the depths of excavation being quite shallow. Dust control will be performed throughout remedial activities using water and/or other means necessary. Noise controls will also be in place throughout the project including, but not limited to, ensuring that all equipment on site is equipped with noise muffling devices.

Upon installation of erosion controls and site preparation activities, excavation of the designated soil removal areas will commence. Removal will start with areas located farthest east, near the top of slope in Parcel 18-4-7, and proceed west. MT will utilize a rubber tire backhoe excavator to perform the excavations. Whenever possible, the excavator will remain on clean soil outside the limits of the removal area. Fabric will be laid down when necessary to prevent the excavator tires from contacting impacted soils. Only the bucket of the excavator will contact impacted soils. Fabric will also be laid out beneath the truck being loaded.

MT supplied trucks will be used to transport the soils to the approved soil staging area at Building 65. Polyethylene will be used to line the beds of the trucks.

Upon completion of excavation of each area, survey will verify the limits and the area will be backfilled with topsoil.

6.0 MATERIAL HANDLING PLAN

The soils requiring excavation are classified as TSCA soils, characterized by soil sampling/analytical results indicating concentrations of PCB at levels of 50 ppm or greater. MT plans to direct-load the soils as they are excavated. Temporary stockpiles are not anticipated.

During excavation, the excavator and trucks will be kept on clean soil as much as possible. In the event the excavator must move into an impacted area, fabric will be laid down for the excavator to run on, thus keeping the tires clean. Fabric or polyethylene will also be laid beneath the trucks to capture any spillage. The fabric and/or polyethylene will be loaded out with the impacted soil.

Open areas of impacted soils will be covered with polyethylene sheeting when not actively being excavated.

Topsoil materials will be brought onto the site from GE approved sources.

MT will also coordinate the T&D of the soils from the approved soil staging area to the final off-site disposal facility with the T&D contractor. All required paperwork will be properly filled out and provided to GE.

7.0 EQUIPMENT DECONTAMINATION PROCEDURES

MT anticipates that only the bucket of the excavator will come in contact with impacted soils. MT will first utilize a "dry decon" method consisting of scraping and brushing bulk soils off of the bucket over the last load of soil to be hauled off-site. Once the bulk soil has been removed from the bucket, a wash with soap and a minimal amount of wash water, typically from a pump sprayer, will be used to clean the bucket more thoroughly. Again, this will be done over the last load of soil. The cleaned surface will then be wipe sampled prior to leaving the site.

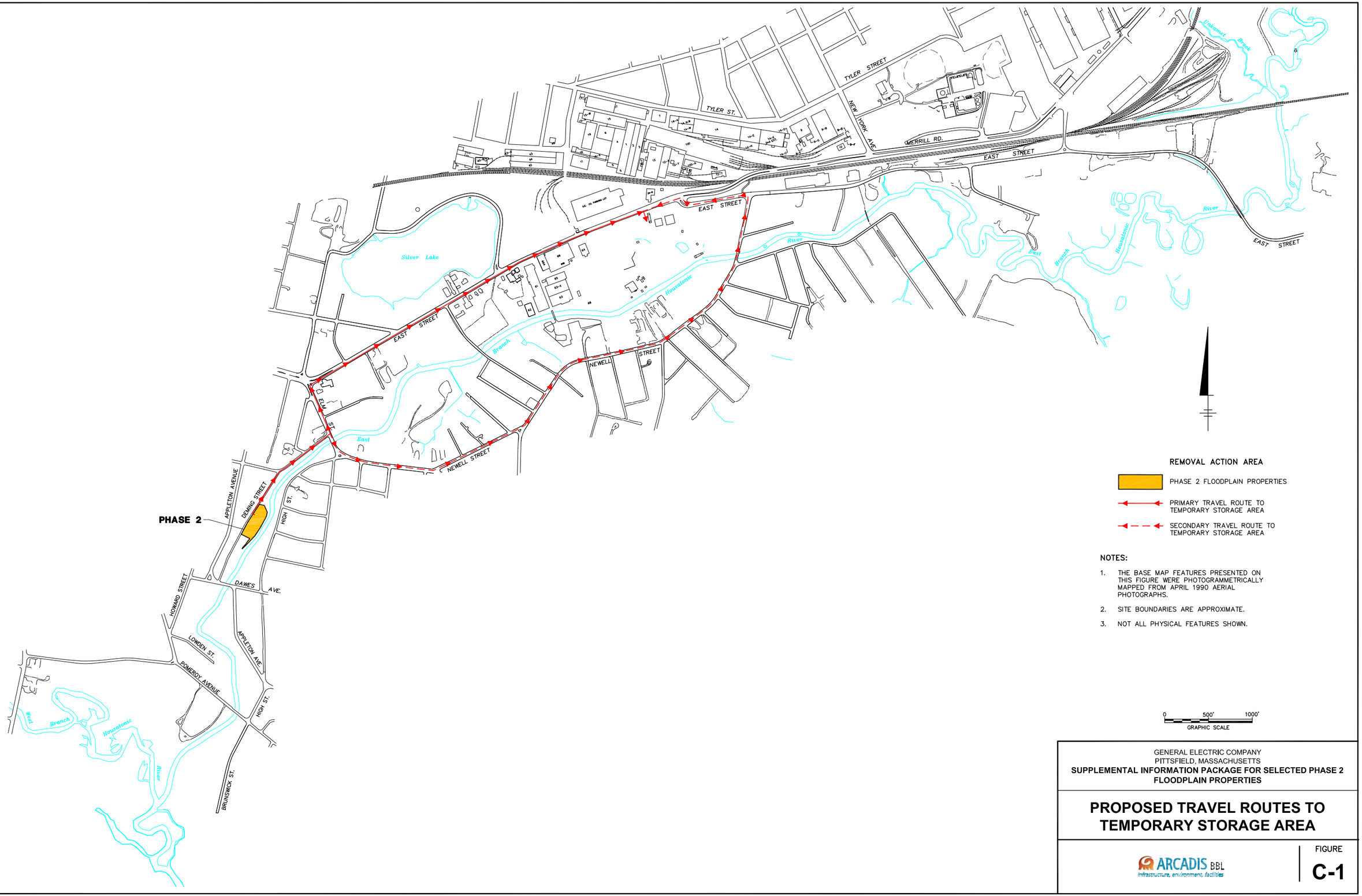
8.0 REMEDIAL ACTION SCHEDULE

It is anticipated that this project will take only several weeks to complete from the designated start date. A more formal schedule can be submitted, if required, once the project start date has been determined.

ARCADIS BBL

Attachment C

Proposed Primary and Secondary Truck Routes to Building 65



REMOVAL ACTION AREA

- PHASE 2 FLOODPLAIN PROPERTIES
- PRIMARY TRAVEL ROUTE TO TEMPORARY STORAGE AREA
- SECONDARY TRAVEL ROUTE TO TEMPORARY STORAGE AREA

NOTES:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE WERE PHOTOGRAMMETRICALLY MAPPED FROM APRIL 1990 AERIAL PHOTOGRAPHS.
2. SITE BOUNDARIES ARE APPROXIMATE.
3. NOT ALL PHYSICAL FEATURES SHOWN.

0 500' 1000'
GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
SUPPLEMENTAL INFORMATION PACKAGE FOR SELECTED PHASE 2 FLOODPLAIN PROPERTIES

PROPOSED TRAVEL ROUTES TO TEMPORARY STORAGE AREA

ARCADIS BBL
Infrastructure, environment, facilities

FIGURE
C-1

SYR-85--LP LAF DWG LAYER: ON=*; OFF=*REF*
G:\CAD\GE-CAD\GE_ACTIVE\VN\40122004\PHASE2\ADDENDUM\40122066.DWG SAVED:5/25/2007 10:27 AM LAYOUT:1 PAGESETUP:---- PENTABLE:PLTFULL.CTB PRINTED:5/25/2007 11:40 AM BY:LPOSENAUER
PROJECTNAME:----
XREFS:
IMAGES:
40122X10
40122X00

ARCADIS BBL

Attachment D

Analytical Results for Proposed Topsoil Source

TABLE D-1

ANALYTICAL RESULTS FOR PROPOSED TOPSOIL SOURCE

SUPPLEMENTAL INFORMATION PACKAGE FOR SELECTED PHASE 2 FLOODPLAIN PROPERTIES ADJACENT TO THE 1-1/2 MILE REACH OF HOUSATONIC RIVER

GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS
(Results are presented in dry weight parts per million, ppm)

Parameter / Sample ID: / Date Collected:	MTI-Topsoil-C1 04/02/07	MTI-Topsoil-Lead-C1 05/16/07
Volatile Organics		
2-Butanone	0.0042 J	NA
Acetone	0.047	NA
Toluene	0.0047 J	NA
Semivolatile Organics		
Benzo(a)anthracene	0.074 J	NA
Benzo(a)pyrene	0.063 J	NA
Chrysene	0.071 J	NA
Fluoranthene	0.13 J	NA
Phenanthrene	0.063 J	NA
Pyrene	0.12 J	NA
Inorganics		
Arsenic	4.97	NA
Barium	57.8	NA
Beryllium	0.363 B	NA
Cadmium	0.159 B	NA
Chromium	12.7	NA
Cobalt	9.56	NA
Copper	16.2	NA
Lead	373	22.4
Mercury	0.0624	NA
Nickel	15.9	NA
Thallium	0.0838 B	NA
Vanadium	15.5	NA
Zinc	92.1	NA

Notes:

1. To further quantify the presence of lead within the proposed topsoil source, GE resampled the proposed source for lead on May 16, 2007. The average lead concentration from the two GE samples is 197.7 ppm (well below the Method 1 S-1 soil standard of 300 ppm). In addition, Maxymillian Technologies, Inc. has advised GE that it collected 5 composite samples from the proposed source and that the highest lead concentration was 26.2 ppm.
2. Samples were collected by ARCADIS BBL, and submitted to SGS Environmental Services, Inc. for analysis of PCBs, volatiles, semivolatiles, and metals,
3. NA - Not Analyzed.
4. Only detected constituents are summarized.

Data Qualifiers:

Organics (PCBs, volatiles, semivolatiles)

J - Indicates an estimated value less than the practical quantitation limit (PQL).

Inorganics

B - Indicates an estimated value between the instrument detection limit (IDL) and PQL.

ARCADIS BBL

Attachment E

Tree/Shrub Inventory and Restoration Plan

TABLE E-1

TREE/SHRUB INVENTORY

SUPPLEMENTAL INFORMATION PACKAGE FOR SELECTED PHASE 2 FLOODPLAIN PROPERTIES ADJACENT TO 1 1/2 MILE REACH OF HOUSATONIC RIVER

GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

Survey Area	Parcel(s)	Type (inches in diameter)	Quantity	Species
1	I8-4-2,-3,-4	--	0	None Observed
2	I8-4-2,-3,-4	Shrub	5	Box Elder (Acer negundo)
3	I8-4-2,-3,-4; 18-4-7	Tree (15")	2	Sugar Maple (Acer saccharum)
		Tree (12")	1	Sugar Maple (Acer saccharum)
4	I8-4-7; 18-4-201/202	--	0	None Observed
5	I8-4-201/202	Tree (16")	1	Black Cherry (Prunus serotina)
		Tree (18")	1	Sugar Maple (Acer saccharum)
		Shrub	9	Sugar Maple (Acer saccharum)
		Shrub	2	Flowering Dogwood (Cornus florida)
		Shrub	1	Box Elder (Acer negundo)
		Shrub	1	Staghorn Sumac (Rhus typhina)

Notes:

1. Inventory of Parcels I8-4-2,-3,-4; I8-4-7; and I8-4-201/202 performed by ARCADIS BBL on behalf of GE in May 2007.
2. Shrubs are defined as plants less than six feet in height.
3. Refer to Figure E-1 for tree/shrub survey areas.
4. -- - Not applicable.

TABLE E-1

TREE/SHRUB INVENTORY

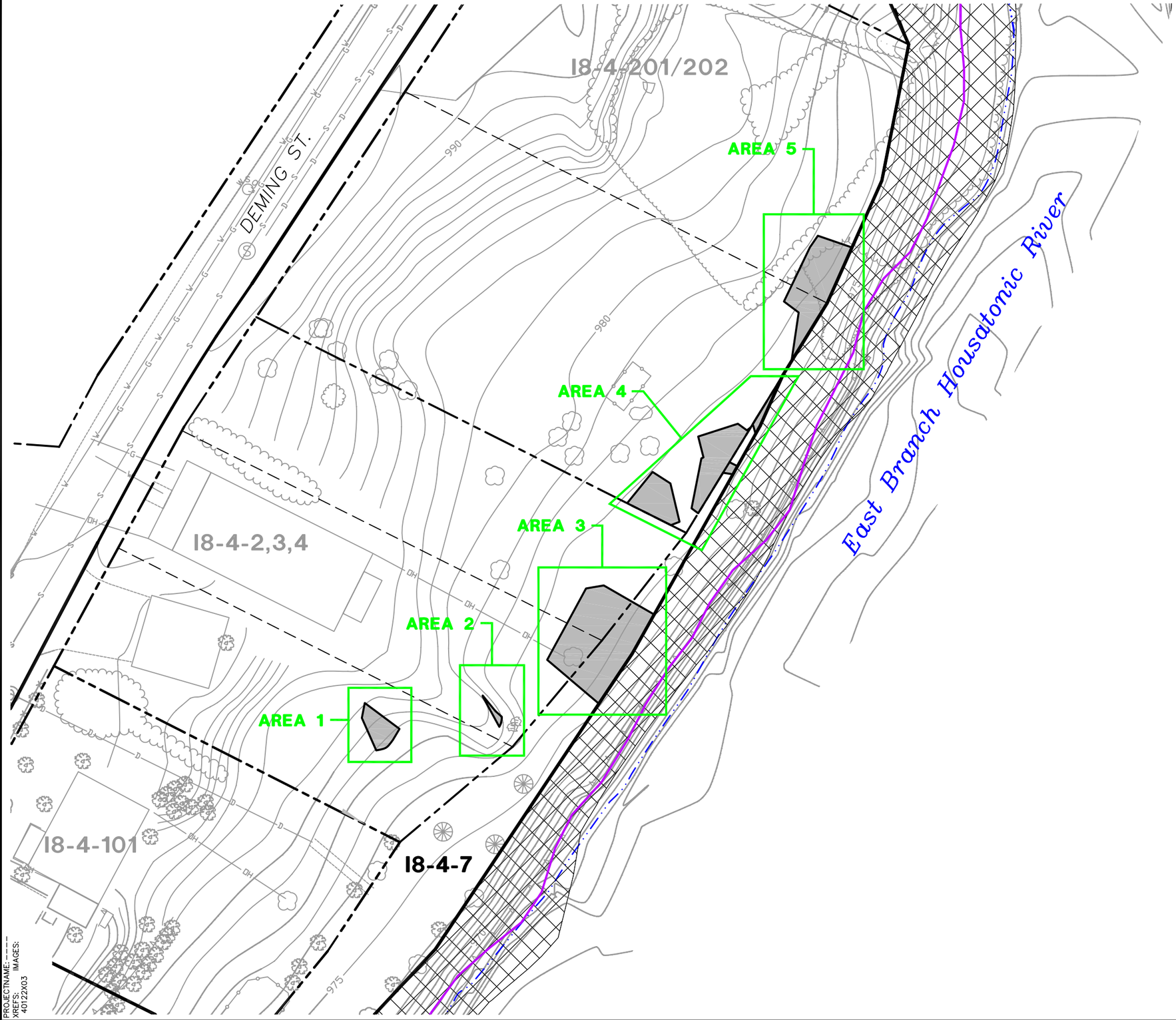
SUPPLEMENTAL INFORMATION PACKAGE FOR SELECTED PHASE 2 FLOODPLAIN PROPERTIES ADJACENT TO 1 1/2 MILE REACH OF HOUSATONIC RIVER

GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

Survey Area	Parcel(s)	Type (inches in diameter)	Quantity	Species
1	I8-4-2,-3,-4	--	0	None Observed
2	I8-4-2,-3,-4	Shrub	5	Box Elder (Acer negundo)
3	I8-4-2,-3,-4; 18-4-7	Tree (15")	2	Sugar Maple (Acer saccharum)
		Tree (12")	1	Sugar Maple (Acer saccharum)
4	I8-4-7; 18-4-201/202	--	0	None Observed
5	I8-4-201/202	Tree (16")	1	Black Cherry (Prunus serotina)
		Tree (18")	1	Sugar Maple (Acer saccharum)
		Shrub	9	Sugar Maple (Acer saccharum)
		Shrub	2	Flowering Dogwood (Cornus florida)
		Shrub	1	Box Elder (Acer negundo)
		Shrub	1	Staghorn Sumac (Rhus typhina)

Notes:

1. Inventory of Parcels I8-4-2,-3,-4; I8-4-7; and I8-4-201/202 performed by ARCADIS BBL on behalf of GE in May 2007.
2. Shrubs are defined as plants less than six feet in height.
3. Refer to Figure E-1 for tree/shrub survey areas.
4. -- - Not applicable.



LEGEND

- BOUNDARY OF FLOODPLAIN PROPERTIES AS REVISED BY EPA (FOR PHASE 2)
- APPROXIMATE PARCEL BOUNDARY
- BOUNDARY BETWEEN COMMONLY OWNED TAX PARCELS
- I8-4-201/202 — RESIDENTIAL PROPERTY PARCEL ID
- I8-4-7 — NON–RESIDENTIAL PROPERTY PARCEL ID
- 10 YEAR FLOODPLAIN
- WIRE FENCE
- CHAIN LINK FENCE
- WATER LINE
- GAS LINE
- SANITARY SEWER
- DRAIN LINE
- OVERHEAD ELECTRIC
- RETAINING WALL
- ELEVATION CONTOUR (1 FOOT CONTOUR INTERVAL)
- ROCK
- EDGE OF BUSHES/HEDGE
- SHRUB
- DECIDUOUS TREE
- CONIFEROUS TREE
- DRAIN MANHOLE
- SANITARY MANHOLE
- WATER SHUTOFF
- APPROXIMATE EDGE OF WATER
- AREA ASSOCIATED WITH EPA'S 1 1/2 MILE REACH REMOVAL ACTION
- LIMITS OF SOIL REMOVAL

NOTES TO FIGURE:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE FROM PHASEIIBASE.DWG BY WESTON SOLUTIONS FOR THE DEPARTMENT OF THE ARMY CORPS OF ENGINEERS DATED 1/15/03.

2. THE 10 YEAR FLOODPLAIN LINE IS APPROXIMATE AND WAS DERIVED USING HYDRAULIC MODELING PERFORMED BY BLASLAND, BOUCK & LEE, INC. (1994) AND AVAILABLE TOPOGRAPHIC MAPPING.

0 30' 60'

GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

SUPPLEMENTAL INFORMATION PACKAGE FOR SELECTED PHASE 2 FLOODPLAIN PROPERTIES

TREE/SHRUB SURVEY AREAS

ARCADIS BBL
infrastructure, environment, facilities

FIGURE
E-1

SYR-85-NES KLS DMW L: ON=* OFF=*REF*
G:\CAD\GE-CAD\GE_ACTIVE\WN\40122004\SIP\40122G67.DWG SAVED:5/25/2007 10:30 AM LAYOUT:E-1 PAGESETUP:----- PENTABLE:PLTFULL.CTB PRINTED:5/25/2007 11:41 AM BY:LPOSENAUER
PROJECTNAME:-----
XREFS: IMAGES:
40122X03

TABLE E-2

TREE/SHRUB PLANTING PLAN

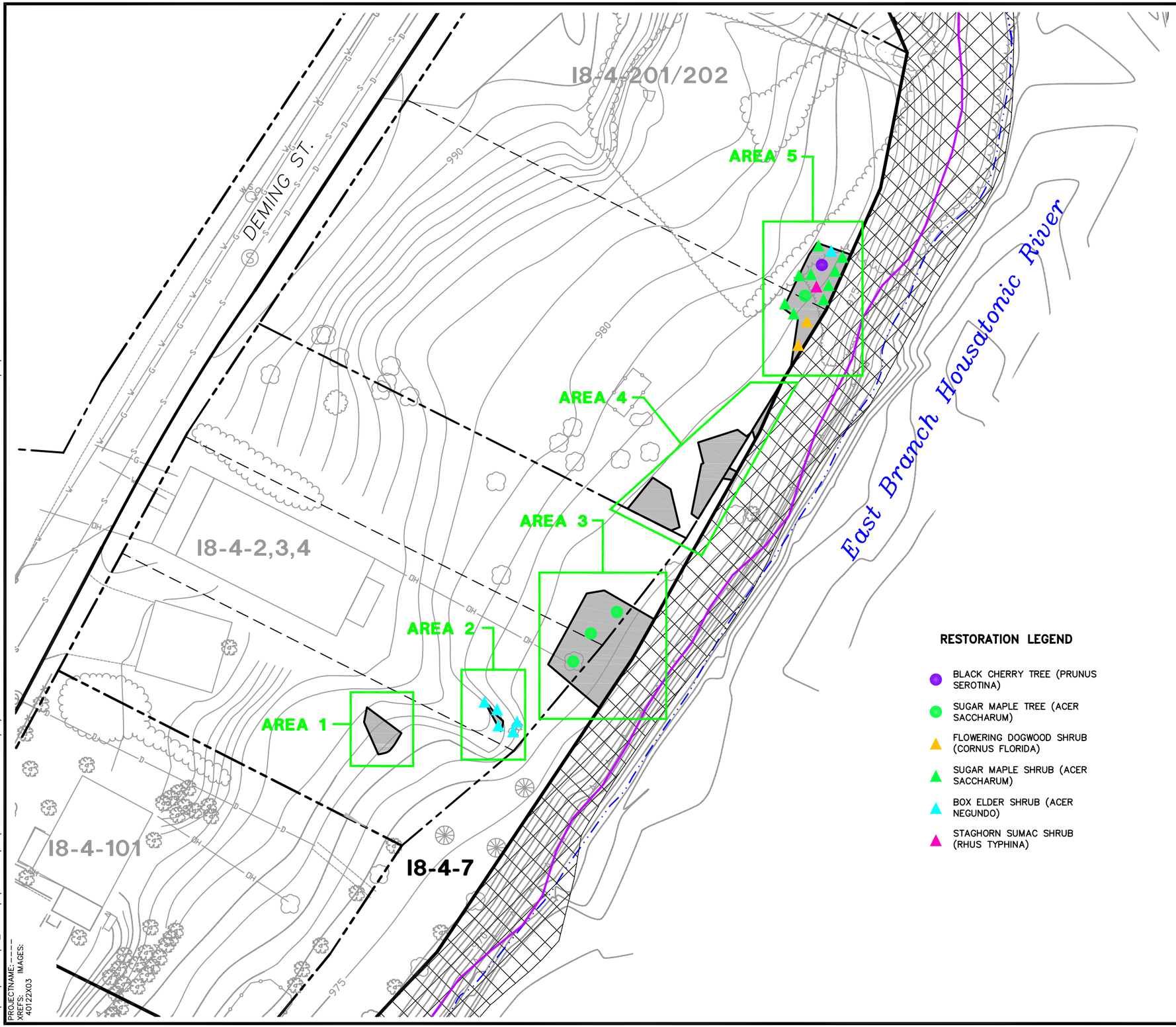
SUPPLEMENTAL INFORMATION PACKAGE FOR SELECTED PHASE 2 FLOODPLAIN PROPERTIES ADJACENT TO 1 1/2 MILE REACH OF HOUSATONIC RIVER

GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

Planting Area	Parcel(s)	Type (inches in diameter)	Quantity	Species
1	I8-4-2,-3,-4	--	0	--
2	I8-4-2,-3,-4	Shrub	5	Box Elder (Acer negundo)
3	I8-4-2,-3,-4; 18-4-7	Tree (1.5 - 2")	3	Sugar Maple (Acer saccharum)
4	18-4-7; I8-4-201/202	--	0	--
5	I8-4-201/202	Tree (1.5 - 2")	1	Black Cherry (Prunus serotina)
		Tree (1.5 - 2")	1	Sugar Maple (Acer saccharum)
		Shrub	9	Sugar Maple (Acer saccharum)
		Shrub	2	Flowering Dogwood (Cornus florida)
		Shrub	1	Box Elder (Acer negundo)
		Shrub	1	Staghorn Sumac (Rhus typhina)

Notes:

1. Replanted shrubs shall be three to four feet in height.
2. Refer to Figure E-2 for tree/shrub planting areas.
3. Tree/shrub restoration activities shall be performed in accordance with Materials and Performance Section 02210 - Floodplain Tree and Shrub Planting.
4. -- - Not applicable.



LEGEND

- BOUNDARY OF FLOODPLAIN PROPERTIES AS REVISED BY EPA (FOR PHASE 2)
- APPROXIMATE PARCEL BOUNDARY
- BOUNDARY BETWEEN COMMONLY OWNED TAX PARCELS
- I8-4-201/202 — RESIDENTIAL PROPERTY PARCEL ID
- I8-4-7 — NON–RESIDENTIAL PROPERTY PARCEL ID
- 10 YEAR FLOODPLAIN
- WIRE FENCE
- CHAIN LINK FENCE
- W — WATER LINE
- G — GAS LINE
- S — SANITARY SEWER
- D — DRAIN LINE
- OH — OVERHEAD ELECTRIC
- RETAINING WALL
- 980 — ELEVATION CONTOUR (1 FOOT CONTOUR INTERVAL)
- ROCK
- EDGE OF BUSHES/HEDGE
- SHRUB
- DECIDUOUS TREE
- CONIFEROUS TREE
- D — DRAIN MANHOLE
- S — SANITARY MANHOLE
- WATER SHUTOFF
- APPROXIMATE EDGE OF WATER
- AREA ASSOCIATED WITH EPA'S 1 1/2 MILE REACH REMOVAL ACTION
- LIMITS OF SOIL REMOVAL

RESTORATION LEGEND

- BLACK CHERRY TREE (PRUNUS SEROTINA)
- SUGAR MAPLE TREE (ACER SACCHARUM)
- FLOWERING DOGWOOD SHRUB (CORNUS FLORIDA)
- SUGAR MAPLE SHRUB (ACER SACCHARUM)
- BOX ELDER SHRUB (ACER NEGUNDO)
- STAGHORN SUMAC SHRUB (RHUS TYPHINA)

NOTES TO FIGURE:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE FROM PHASEIIBASE.DWG BY WESTON SOLUTIONS FOR THE DEPARTMENT OF THE ARMY CORPS OF ENGINEERS DATED 1/15/03.

2. THE 10 YEAR FLOODPLAIN LINE IS APPROXIMATE AND WAS DERIVED USING HYDRAULIC MODELING PERFORMED BY BLASLAND, BOUCK & LEE, INC. (1994) AND AVAILABLE TOPOGRAPHIC MAPPING.

0 30' 60'
GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
SUPPLEMENTAL INFORMATION PACKAGE FOR SELECTED PHASE 2 FLOODPLAIN PROPERTIES

TREE/SHRUB PLANTING AREAS

ARCADIS BBL
infrastructure, environment, facilities

FIGURE
E-2

SYR-85-NES KLS DMW L: ON=* OFF=*REF*
G:\CAD\GE-CAD\GE_ACTIVE\WA40122004\SIP\40122064.DWG SAVED:5/25/2007 11:13 AM LAYOUT:E-2 PAGESETUP:-----
PENTABLE:PLTFULL.CTB PRINTED:5/25/2007 11:42 AM BY:LPOSENAUER
PROJECTNAME:-----
XREFS: IMAGES:
40122X03

MATERIALS AND PERFORMANCE - SECTION 02210

FLOODPLAIN TREE AND SHRUB PLANTING

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Seeding and plant introduction for restored floodplain.

B. Maintenance of restored areas.

1.02 QUALIFICATIONS

A. Planting Stock Supplier: Obtain planting stock only from established vendors capable of providing plant stocks in quantities and at quality levels adequate to complete the project.

B. Installer: Company specializing in work of this Section with minimum 5 years experience in planting and establishing natural plant communities with documented references. Personnel used to perform the installation of plant materials shall also have occupational experience in vegetation restoration projects.

PART 2 - PRODUCTS AND PRODUCT HANDLING

2.01 PLANT STOCK

A. The shrub and sapling species, plant types, sizes, and planting locations for the floodplain restoration are presented on Figure E-2.

B. Plants shall be true to their name as specified.

C. Plants shall be free of insects and diseases and shall show the appearance of healthy growth and vigor. Root stocks shall display evidence of new growth prior to planting.

D. All plant materials, including collected stock, shall comply with state and federal laws with respect to inspection for plant diseases and insect infestations.

E. Each species shall be handled and placed in a manner that is consistent with good trade practice to insure the arrival of the plants at site in good condition. Plants that arrive dried out, exposed to excessive heat, or that have been in storage for extended periods of time, will not be accepted. If, upon inspection, the plants or root stocks display mold or decay, the material will not be accepted.

F. All woody shrubs and trees shall have a heavy fibrous root system that has been developed by proper horticultural treatment, transplanting, and root pruning. All shrubs and saplings shall be container grown.

G. All plant stock shall be stored in aboveground locations in non-construction areas approved by the Engineer if not transplanted directly into the ground. All plant stock shall have soil placed about roots sufficient to protect from desiccation and to provide nourishment during storage. All plants stored in the field prior to installation shall be kept cool and shall be sheltered from the drying effects of direct sunlight and prevailing winds. Plants should not be subject to freezing, drying, or warming. It is the Contractor's responsibility to supply adequate water for all plant stock in order to maintain it in a healthy and vigorous state suitable for transplanting.

PART 3 - EXECUTION

3.01 PLANTING OF TREES AND SHRUBS

A. Use species, plant types, sizes, and spacing densities as presented on Figure E-2.

B. Dig pits and beds at least 6 inches larger than the plant root system to be installed in that location.

C. Remove non-biodegradable containers prior to planting.

D. Set plants into their final locations following recommended horticultural practice for that species.

E. Support plants as follows:

1. One-inch diameter: one stake and one tie.
2. Two-inch diameter: two stakes and two ties.

F. Provide and install wood chip mulch by hand to form a continuous blanket over the soil surrounding the plant, approximately 2 inches uniform thickness at loose measurement.

G. An initial watering of planted areas will be performed and repeated after the second and fourth weeks following seeding if natural rainfall is less than 1 inch per week. The contractor shall avoid creating rills and furrows as a result of watering and must repair and reseed any rills and furrows resulting from over watering.

H. Environmental Requirements of Seeding and Planting

1. Do not install plant life when the temperature may drop below 35 degrees F or rise above 90 degrees F.

2. Do not install plant life when the wind velocity exceeds 30 miles per hour.

I. Sequencing and Scheduling

1. Trees and shrubs planted in the floodplain shall be container-grown and installed after September 1 and before June 30.

MATERIALS AND PERFORMANCE - SECTION 02210

FLOODPLAIN TREE AND SHRUB PLANTING

PART 4 - MAINTENANCE

A. Maintain planted areas until accepted by the Engineer. Maintenance responsibilities begin immediately after planting.

B. Maintenance responsibilities include control of herbivores and other vectors which threaten the establishment of the plant community; acts of vandalism resulting in tree or shrub damage; acts of nature which result in erosions, fires, wind damage, ice storms, and similar situations. The Contractor shall take necessary action to correct and restore the system.

C. Notify the Engineer prior to and following any maintenance activity.

D. At a minimum, maintenance shall be performed in the spring and fall before optimal planting and seeding season.

E. Replace dead or unhealthy plants with plants of the same size and species as specified and planted in the next growing season and subject to maintenance efforts to assure their survival.

- END OF SECTION -

ARCADIS BBL

Attachment F

Revised PCB Spatial Averaging Evaluation Tables and Polygon Maps – Parcels I8-4-2,-3,-4 and I8-4-7

Parcels I8-4-2, -3, -4

TABLE F-1
EXISTING CONDITIONS
PARCELS I8-4-2, -3, & -4: 0- TO 1-FOOT DEPTH INCREMENT

SUPPLEMENTAL INFORMATION PACKAGE FOR SELECTED PHASE 2 FLOODPLAIN PROPERTIES ADJACENT TO THE 1-1/2 MILE REACH OF HOUSATONIC RIVER

GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

0- TO 1-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
2-SB-6	1, 1A	37	0 - 1	0.49	1.35	0.49	0.66
I8-4-2,3,4-3	11, 11A	323	0 - 0.5	0.64	11.96	0.45	5.32
			0.5 - 1	0.25			
I8-4-2,3,4-4	12	429	0 - 0.5	0.128	15.88	0.09	1.41
			0.5 - 1	**0.05**			
I8-4-2,3,4-5	13	467	0 - 0.5	0.716	17.28	0.59	10.18
			0.5 - 1	0.462			
I8-4-2,3,4-8	14	157	0 - 0.5	3.31	5.80	3.30	19.11
			0.5 - 1	3.28			
I8-4-2,3,4-9	15	41	0 - 0.5	31.2	1.50	53.35	80.17
			0.5 - 1	75.5			
I8-4-2,3,4-11	4	244	0 - 0.5	0.198	9.05	0.26	2.38
			0.5 - 1	0.327			
I8-4-2,3,4-12	5	11	0 - 0.5	19.6	0.40	10.46	4.15
			0.5 - 1	1.32			
I8-4-2,3,4-13	6	31	0 - 0.5	0.171	1.16	0.11	0.13
			0.5 - 1	**0.05**			
I8-4-2,3,4-15	7	134	0 - 0.5	0.745	4.95	0.47	2.32
			0.5 - 1	0.193			
I8-4-2,3,4-16	8	42	0 - 0.5	3.27	1.54	2.82	4.36
			0.5 - 1	2.37			
I8-4-2,3,4-18	9	187	0 - 0.5	1.61	6.92	1.13	7.82
			0.5 - 1	0.65			
I8-4-2,3,4-19	10	224	0 - 0.5	5.68	8.29	4.40	36.49
			0.5 - 1	3.12			
R93A000	17	667	0 - 0.5	**0.25**	24.70	0.28	6.79
			0.5 - 1	**0.3**			
R93A025	18	565	0 - 0.5	**0.25**	20.92	0.25	5.23
			0.5 - 1	**0.25**			
R93A050	19	514	0 - 0.5	**0.25**	19.02	0.28	5.23
			0.5 - 1	**0.3**			
R93A075	20	408	0 - 0.5	**0.25**	15.10	0.25	3.78
			0.5 - 1	**0.25**			
R93A100	21, 37	721	0 - 0.5	0.7	26.70	0.60	16.02
			0.5 - 1	0.5			
R93A125	38	318	0 - 0.5	0.1485	11.78	0.20	2.35
			0.5 - 1	**0.25**			
R93B000	22	723	0 - 0.5	10	26.76	5.70	152.54
			0.5 - 1	1.4			
R93B025	23	540	0 - 0.5	1	20.00	0.63	12.50
			0.5 - 1	**0.25**			
R93B050	24	430	0 - 0.5	0.5	15.94	0.38	5.98
			0.5 - 1	**0.25**			
R93B075	25	479	0 - 0.5	0.4	17.74	0.28	5.00
			0.5 - 1	0.164			
R93B100	26, 39	762	0 - 0.5	**0.25**	28.23	0.25	7.06
			0.5 - 1	**0.25**			
R93B125	40	320	0 - 0.5	27	11.86	51.50	611.03
			0.5 - 1	76			
R93C000	27	630	0 - 0.5	6.6	23.34	3.45	80.51
			0.5 - 1	0.3			
R93C075	28	681	0 - 0.5	1.5	25.22	0.95	23.95
			0.5 - 1	**0.4**			
R93C100	29, 46, 47	397	0 - 0.5	**0.3**	14.70	0.33	4.78
			0.5 - 1	**0.35**			
R93C125	41	280	0 - 0.5	**0.3**	10.37	0.28	2.85
			0.5 - 1	**0.25**			

TABLE F-1
EXISTING CONDITIONS
PARCELS I8-4-2, -3, & -4: 0- TO 1-FOOT DEPTH INCREMENT

SUPPLEMENTAL INFORMATION PACKAGE FOR SELECTED PHASE 2 FLOODPLAIN PROPERTIES ADJACENT TO THE 1-1/2 MILE REACH OF HOUSATONIC RIVER

GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

0- TO 1-FOOT DEPTH INCREMENT CONTINUED

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
R93D000	30	635	0 - 0.5	**0.25**	23.50	0.25	5.88
			0.5 - 1	**0.25**			
R93D050	31	1,042	0 - 0.5	**0.3**	38.61	0.28	10.62
			0.5 - 1	**0.25**			
R93D075	32	450	0 - 0.5	0.4	16.67	0.33	5.42
			0.5 - 1	**0.25**			
R93D100	43	673	0 - 0.5	**0.25**	24.94	0.25	6.24
			0.5 - 1	**0.25**			
R93D125	44	250	0 - 0.5	**0.25**	9.26	0.25	2.32
			0.5 - 1	**0.25**			
R93E000	33	324	0 - 0.5	**0.3**	11.99	0.28	3.30
			0.5 - 1	**0.25**			
R93E025	34	268	0 - 0.5	**0.3**	9.93	0.28	2.73
			0.5 - 1	**0.25**			
R93E050	35	166	0 - 0.5	0.1395	6.15	0.22	1.35
			0.5 - 1	**0.3**			
R93E075	36	66	0 - 0.5	0.6	2.46	0.45	1.11
			0.5 - 1	**0.3**			
R93E100	45	5	0 - 0.5	**0.3**	0.20	0.28	0.05
			0.5 - 1	**0.25**			
Totals:	--	14,640	--	--	542.22	--	1,159.13
					Volume Weighted Average:		**2.14**

Notes:

1. Non-detectable PCBs included as one-half the detection limit in calculations and shown in bold.
2. For instances where a duplicate sample was available, the average of the samples was included in table.
3. All calculations and rounding are performed by the computer software. Therefore, certain quantities in above table are displayed as rounded numbers for table clarity.

TABLE F-2
EXISTING CONDITIONS
PARCELS I8-4-2, -3, & -4: 1- TO X-FOOT (X=5) DEPTH INCREMENT

SUPPLEMENTAL INFORMATION PACKAGE FOR SELECTED PHASE 2 FLOODPLAIN PROPERTIES ADJACENT TO THE 1-1/2 MILE REACH OF HOUSATONIC RIVER

GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

1- TO 1.5-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
2-SB-6	1	37	1 - 1.5	0.068	0.68	0.07	0.05
I8-4-2,3,4-2	13	137	1 - 1.5	13.1	2.53	13.10	33.12
I8-4-2,3,4-5	14	488	1 - 1.5	0.349	9.04	0.35	3.15
I8-4-2,3,4-6	15	20	1 - 1.5	1.06	0.38	1.06	0.40
I8-4-2,3,4-7	16	74	1 - 1.5	6.9	1.37	6.90	9.47
I8-4-2,3,4-8	17	222	1 - 1.5	0.724	4.12	0.72	2.98
I8-4-2,3,4-9	18	82	1 - 1.5	30.4	1.52	30.40	46.11
I8-4-2,3,4-10	4	1	1 - 1.5	798	0.01	798.00	11.62
I8-4-2,3,4-12	5	260	1 - 1.5	0.408	4.81	0.41	1.96
I8-4-2,3,4-13	6	333	1 - 1.5	**0.05**	6.17	0.05	0.31
I8-4-2,3,4-14	7	92	1 - 1.5	**0.05**	1.71	0.05	0.09
I8-4-2,3,4-15	8	181	1 - 1.5	**0.05**	3.35	0.05	0.17
I8-4-2,3,4-16	9	122	1 - 1.5	0.173	2.27	0.17	0.39
I8-4-2,3,4-17	10	96	1 - 1.5	1.12	1.78	1.12	1.99
I8-4-2,3,4-18	11	372	1 - 1.5	0.185	6.89	0.19	1.27
I8-4-2,3,4-19	12	334	1 - 1.5	**0.05**	6.19	0.05	0.31
R93A000	20	667	1 - 1.5	**0.35**	12.35	0.35	4.32
R93A025	21	565	1 - 1.5	**0.25**	10.46	0.25	2.62
R93A050	22	581	1 - 1.5	**0.3**	10.75	0.30	3.23
R93A075	23	441	1 - 1.5	**0.25**	8.16	0.25	2.04
R93A100	24, 42	492	1 - 1.5	**0.35**	9.11	0.35	3.19
R93A125	43	318	1 - 1.5	**0.25**	5.89	0.25	1.47
R93B000	25	723	1 - 1.5	0.3	13.38	0.30	4.01
R93B025	26	540	1 - 1.5	**0.3**	10.00	0.30	3.00
R93B050	27	578	1 - 1.5	**0.25**	10.71	0.25	2.68
R93B075	28	638	1 - 1.5	**0.3**	11.82	0.30	3.55
R93B100	29, 44	452	1 - 1.5	**0.25**	8.38	0.25	2.09
R93B125	45	320	1 - 1.5	53	5.93	53.00	314.43
R93C000	30	630	1 - 1.5	**0.25**	11.67	0.25	2.92
R93C075	31	723	1 - 1.5	**0.3**	13.39	0.30	4.02
R93C100	32, 49, 50	227	1 - 1.5	0.181	4.20	0.18	0.76
R93C125	33, 46	244	1 - 1.5	**0.25**	4.52	0.25	1.13
R93D000	34	635	1 - 1.5	**0.3**	11.75	0.30	3.53
R93D050	35	1,042	1 - 1.5	**0.25**	19.31	0.25	4.83
R93D075	36	619	1 - 1.5	**0.3**	11.45	0.30	3.44
R93D100	37, 51, 53	335	1 - 1.5	**0.25**	6.20	0.25	1.55
R93D125	47	193	1 - 1.5	**0.3**	3.58	0.30	1.07
R93E000	38	324	1 - 1.5	**0.3**	6.00	0.30	1.80
R93E025	39	268	1 - 1.5	**0.3**	4.96	0.30	1.49
R93E050	40	166	1 - 1.5	**0.3**	3.08	0.30	0.92
R93E075	41	66	1 - 1.5	**0.25**	1.23	0.25	0.31
R93E100	48	1	1 - 1.5	**0.25**	0.01	0.25	0.00
Totals:	--	14,640	--	--	271.11	--	487.77
					Volume Weighted Average:		**1.80**

1.5- TO 2-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
2-SB-6	1	37	1.5 - 2	0.068	0.68	0.07	0.05
I8-4-2,3,4-2	10	327	1.5 - 2	1.44	6.06	1.44	8.72
I8-4-2,3,4-5	11	493	1.5 - 2	0.146	9.12	0.15	1.33
I8-4-2,3,4-6	12	20	1.5 - 2	46.1	0.38	46.10	17.41
I8-4-2,3,4-7	13	74	1.5 - 2	9.8	1.37	9.80	13.45

TABLE F-2
EXISTING CONDITIONS
PARCELS I8-4-2, -3, & -4: 1- TO X-FOOT (X=5) DEPTH INCREMENT

SUPPLEMENTAL INFORMATION PACKAGE FOR SELECTED PHASE 2 FLOODPLAIN PROPERTIES ADJACENT TO THE 1-1/2 MILE REACH OF HOUSATONIC RIVER

GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

1.5- TO 2-FOOT DEPTH INCREMENT CONTINUED

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
I8-4-2,3,4-8	14	302	1.5 - 2	**0.05**	5.59	0.05	0.28
I8-4-2,3,4-9	46	431	1.5 - 2	3.33	7.99	3.33	26.60
I8-4-2,3,4-10	5	1	1.5 - 2	195	0.01	195.00	2.85
I8-4-2,3,4-12	6	261	1.5 - 2	0.116	4.84	0.12	0.56
I8-4-2,3,4-13	7	333	1.5 - 2	**0.05**	6.17	0.05	0.31
I8-4-2,3,4-14	8	93	1.5 - 2	**0.05**	1.73	0.05	0.09
I8-4-2,3,4-15	9	216	1.5 - 2	**0.05**	3.99	0.05	0.20
R93A000	16	667	1.5 - 2	**0.25**	12.35	0.25	3.09
R93A025	17	565	1.5 - 2	**0.25**	10.46	0.25	2.62
R93A050	18	581	1.5 - 2	**0.25**	10.75	0.25	2.69
R93A075	19	441	1.5 - 2	**0.3**	8.16	0.30	2.45
R93A100	20, 38	492	1.5 - 2	**0.3**	9.11	0.30	2.73
R93A125	39	318	1.5 - 2	**0.25**	5.89	0.25	1.47
R93B000	21	723	1.5 - 2	**0.3**	13.38	0.30	4.01
R93B025	22	540	1.5 - 2	**0.25**	10.00	0.25	2.50
R93B050	23	578	1.5 - 2	**0.25**	10.71	0.25	2.68
R93B075	24	701	1.5 - 2	**0.3**	12.99	0.30	3.90
R93B100	25, 40	640	1.5 - 2	**0.25**	11.85	0.25	2.96
R93B125	41	320	1.5 - 2	8.2	5.93	8.20	48.65
R93C000	26	630	1.5 - 2	**0.3**	11.67	0.30	3.50
R93C075	27	776	1.5 - 2	**0.25**	14.37	0.25	3.59
R93C100	28, 42	352	1.5 - 2	**0.35**	6.52	0.35	2.28
R93C125	29, 43	244	1.5 - 2	**0.25**	4.52	0.25	1.13
R93D000	30	635	1.5 - 2	**0.25**	11.75	0.25	2.94
R93D050	31	1,042	1.5 - 2	**0.3**	19.31	0.30	5.79
R93D075	32	648	1.5 - 2	**0.3**	12.00	0.30	3.60
R93D100	33, 47	242	1.5 - 2	**0.1335**	4.48	0.13	0.60
R93D125	44	93	1.5 - 2	0.6	1.71	0.60	1.03
R93E000	34	324	1.5 - 2	**0.25**	6.00	0.25	1.50
R93E025	35	268	1.5 - 2	**0.3**	4.96	0.30	1.49
R93E050	36	166	1.5 - 2	**0.25**	3.08	0.25	0.77
R93E075	37	66	1.5 - 2	**0.3**	1.23	0.30	0.37
Totals:	--	14,640	--	--	271.11	--	180.17
					Volume Weighted Average:		**0.66**

2- TO 2.5-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
2-SB-6	1, 15, 16	4,003	2 - 2.5	0.068	74.12	0.07	5.04
2-SB-16	13	1,398	2 - 2.5	0.219	25.89	0.22	5.67
I8-4-1-5	2	44	2 - 2.5	0.251	0.81	0.25	0.20
I8-4-1-9	4	247	2 - 2.5	0.408	4.57	0.41	1.87
I8-4-2,3,4-2	8	360	2 - 2.5	1.37	6.67	1.37	9.14
I8-4-2,3,4-6	9	309	2 - 2.5	10.4	5.72	10.40	59.47
I8-4-2,3,4-7	10	834	2 - 2.5	10.3	15.45	10.30	159.10
I8-4-2,3,4-9	14	4,748	2 - 2.5	3.54	87.93	3.54	311.28
I8-4-2,3,4-10	5	1	2 - 2.5	24.8	0.01	24.80	0.36
I8-4-2,3,4-12	6	1,991	2 - 2.5	1.17	36.87	1.17	43.13
I8-4-2,3,4-14	7	631	2 - 2.5	0.112	11.68	0.11	1.31
I8-4-5-4	11	35	2 - 2.5	1.34	0.65	1.34	0.87
I8-4-7-21	12	40	2 - 2.5	8.17	0.75	8.17	6.11
Totals:	--	14,640	--	--	271.11	--	603.55
					Volume Weighted Average:		**2.23**

TABLE F-2
EXISTING CONDITIONS
PARCELS I8-4-2, -3, & -4: 1- TO X-FOOT (X=5) DEPTH INCREMENT

SUPPLEMENTAL INFORMATION PACKAGE FOR SELECTED PHASE 2 FLOODPLAIN PROPERTIES ADJACENT TO THE 1-1/2 MILE REACH OF HOUSATONIC RIVER

GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

2.5- TO 3-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
2-SB-6	1	3,990	2.5 - 3	0.068	73.88	0.07	5.02
2-SB-16	13	837	2.5 - 3	0.219	15.50	0.22	3.39
I8-4-1-9	3	290	2.5 - 3	0.356	5.37	0.36	1.91
I8-4-2,3,4-1	4	2	2.5 - 3	14.5	0.05	14.50	0.65
I8-4-2,3,4-2	8	360	2.5 - 3	3.45	6.67	3.45	23.02
I8-4-2,3,4-6	9	492	2.5 - 3	4.64	9.12	4.64	42.31
I8-4-2,3,4-7	10	1,032	2.5 - 3	4.48	19.12	4.48	85.64
I8-4-2,3,4-9	15	4,749	2.5 - 3	4.87	87.94	4.87	428.27
I8-4-2,3,4-10	5	1	2.5 - 3	78.7	0.02	78.70	1.70
I8-4-2,3,4-12	6	2,102	2.5 - 3	0.5	38.93	0.50	19.46
I8-4-2,3,4-14	7	631	2.5 - 3	**0.05**	11.68	0.05	0.58
I8-4-5-4	11	88	2.5 - 3	**0.05**	1.63	0.05	0.08
I8-4-7-21	12	65	2.5 - 3	5.34	1.21	5.34	6.46
Totals:	--	14,640	--	--	271.10	--	618.52
					Volume Weighted Average:		**2.28**

3- TO 3.5-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
2-SB-6	3	4,403	3 - 3.5	0.032	81.54	0.03	2.61
2-SB-13	1, 18, 19	686	3 - 3.5	0.097	12.71	0.10	1.23
2-SB-16	10	500	3 - 3.5	0.027	9.27	0.03	0.25
I8-4-1-7	6	32	3 - 3.5	15.8	0.59	15.80	9.28
I8-4-2,3,4-1	12	877	3 - 3.5	12.4	16.24	12.40	201.35
I8-4-2,3,4-6	14	1,331	3 - 3.5	8.2	24.65	8.20	202.16
I8-4-2,3,4-9	15	6,486	3 - 3.5	0.18	120.12	0.18	21.62
I8-4-2,3,4-10	7	119	3 - 3.5	14.605	2.20	14.61	32.13
I8-4-7-21	8	205	3 - 3.5	1.99	3.79	1.99	7.54
Totals:	--	14,640	--	--	271.11	--	478.18
					Volume Weighted Average:		**1.76**

3.5- TO 4-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
2-SB-6	3	4,403	3.5 - 4	0.032	81.54	0.03	2.61
2-SB-13	1, 13	538	3.5 - 4	0.097	9.97	0.10	0.97
2-SB-16	5A	2	3.5 - 4	0.027	0.03	0.03	0.00
I8-4-1-7	6	32	3.5 - 4	11.6	0.59	11.60	6.81
I8-4-2,3,4-1	7	1,087	3.5 - 4	1.84	20.13	1.84	37.03
I8-4-2,3,4-6	9	1,539	3.5 - 4	1.3	28.49	1.30	37.04
I8-4-2,3,4-9	14	6,486	3.5 - 4	3.85	120.12	3.85	462.46
I8-4-2,3,4-10	8	119	3.5 - 4	28.5	2.20	28.50	62.70
I8-4,2,3,4-20	5	143	3.5 - 4	4.87	2.65	4.87	12.90
I8-4-7-4	11	85	3.5 - 4	83.2	1.57	83.20	130.21
I8-4-7-21	10	207	3.5 - 4	6.58	3.83	6.58	25.18
Totals:	--	14,640	--	--	271.11	--	777.92
					Volume Weighted Average:		**2.87**

TABLE F-2
EXISTING CONDITIONS
PARCELS I8-4-2, -3, & -4: 1- TO X-FOOT (X=5) DEPTH INCREMENT

SUPPLEMENTAL INFORMATION PACKAGE FOR SELECTED PHASE 2 FLOODPLAIN PROPERTIES ADJACENT TO THE 1-1/2 MILE REACH OF HOUSATONIC RIVER

GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

4- TO 5-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
2-SB-6	4	4,403	4 - 5	0.032	163.09	0.03	5.22
2-SB-13	1	460	4 - 5	0.097	17.02	0.10	1.65
2-SB-15	2	115	4 - 5	0.032	4.25	0.03	0.14
2-SB-16	2A	12	4 - 5	0.027	0.45	0.03	0.01
I8-4-1-7	6	32	4 - 4.5	2.4	1.17	5.08	5.96
			4.5 - 5	7.75			
I8-4-2,3,4-1	7	1,087	4 - 4.5	3.12	40.25	1.97	79.48
			4.5 - 5	0.829			
I8-4-2,3,4-6	9	1,556	4 - 4.5	0.129	57.65	0.36	20.84
			4.5 - 5	0.594			
I8-4-2,3,4-9	13	6,486	4 - 4.5	0.563	240.24	0.90	215.37
			4.5 - 5	1.23			
I8-4-2,3,4-10	8	197	4 - 4.5	1.19	7.31	3.05	22.30
			4.5 - 5	4.91			
I8-4-7-4	11	85	4 - 4.5	11.5	3.13	6.99	21.86
			4.5 - 5	2.47			
I8-4-7-21	10	207	4 - 4.5	3.64	7.65	2.47	18.91
			4.5 - 5	1.3			
Totals:	--	14,640	--	--	542.22	--	391.74
					Volume Weighted Average:		**0.72**

SUMMARY - 1- TO X-FOOT (X=5') DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
Totals:	--	14,640	--	--	2,168.89	--	3,537.84
					Volume Weighted Average:		**1.63**

Notes:

1. Non-detectable PCBs included as one-half the detection limit in calculations and shown in bold.
2. For instances where a duplicate sample was available, the average of the samples was included in table.
3. All calculations and rounding are performed by the computer software. Therefore, certain quantities in above table are displayed as rounded numbers for table clarity.

TABLE F-3
POST-REMEDIATION CONDITIONS
PARCELS I8-4-2, -3, & -4: 0- TO 1-FOOT DEPTH INCREMENT

SUPPLEMENTAL INFORMATION PACKAGE FOR SELECTED PHASE 2 FLOODPLAIN PROPERTIES ADJACENT TO THE 1-1/2 MILE REACH OF HOUSATONIC RIVER

GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

0- TO 1-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
2-SB-6	1, 1A	37	0 - 1	0.49	1.35	0.49	0.66
I8-4-2,3,4-3	11	282	0 - 0.5	0.64	10.43	0.45	4.64
			0.5 - 1	0.25			
I8-4-2,3,4-3	11A	41	0 - 0.5	***0.021***	1.53	0.02	0.03
			0.5 - 1	***0.021***			
I8-4-2,3,4-4	12	429	0 - 0.5	0.128	15.88	0.09	1.41
			0.5 - 1	**0.05**			
I8-4-2,3,4-5	13	467	0 - 0.5	0.716	17.28	0.59	10.18
			0.5 - 1	0.462			
I8-4-2,3,4-8	14	157	0 - 0.5	3.31	5.80	3.30	19.11
			0.5 - 1	3.28			
I8-4-2,3,4-9	15	41	0 - 0.5	***0.021***	1.50	0.02	0.03
			0.5 - 1	***0.021***			
I8-4-2,3,4-11	4	244	0 - 0.5	0.198	9.05	0.26	2.38
			0.5 - 1	0.327			
I8-4-2,3,4-12	5	11	0 - 0.5	***0.021***	0.40	0.02	0.01
			0.5 - 1	***0.021***			
I8-4-2,3,4-13	6	31	0 - 0.5	0.171	1.16	0.11	0.13
			0.5 - 1	**0.05**			
I8-4-2,3,4-15	7	134	0 - 0.5	0.745	4.95	0.47	2.32
			0.5 - 1	0.193			
I8-4-2,3,4-16	8	42	0 - 0.5	3.27	1.54	2.82	4.36
			0.5 - 1	2.37			
I8-4-2,3,4-18	9	187	0 - 0.5	1.61	6.92	1.13	7.82
			0.5 - 1	0.65			
I8-4-2,3,4-19	10	224	0 - 0.5	5.68	8.29	4.40	36.49
			0.5 - 1	3.12			
R93A000	17	667	0 - 0.5	**0.25**	24.70	0.28	6.79
			0.5 - 1	**0.3**			
R93A025	18	565	0 - 0.5	**0.25**	20.92	0.25	5.23
			0.5 - 1	**0.25**			
R93A050	19	514	0 - 0.5	**0.25**	19.02	0.28	5.23
			0.5 - 1	**0.3**			
R93A075	20	408	0 - 0.5	**0.25**	15.10	0.25	3.78
			0.5 - 1	**0.25**			
R93A100	21, 37	721	0 - 0.5	0.7	26.70	0.60	16.02
			0.5 - 1	0.5			
R93A125	38	318	0 - 0.5	0.1485	11.78	0.20	2.35
			0.5 - 1	**0.25**			
R93B000	22	723	0 - 0.5	10	26.76	5.70	152.54
			0.5 - 1	1.4			
R93B025	23	540	0 - 0.5	1	20.00	0.63	12.50
			0.5 - 1	**0.25**			
R93B050	24	430	0 - 0.5	0.5	15.94	0.38	5.98
			0.5 - 1	**0.25**			
R93B075	25	479	0 - 0.5	0.4	17.74	0.28	5.00
			0.5 - 1	0.164			
R93B100	26, 39	762	0 - 0.5	**0.25**	28.23	0.25	7.06
			0.5 - 1	**0.25**			
R93B125	40	320	0 - 0.5	***0.021***	11.86	0.02	0.25
			0.5 - 1	***0.021***			
R93C000	27	630	0 - 0.5	6.6	23.34	3.45	80.51
			0.5 - 1	0.3			
R93C075	28	681	0 - 0.5	1.5	25.22	0.95	23.95
			0.5 - 1	**0.4**			
R93C100	29, 46, 47	397	0 - 0.5	**0.3**	14.70	0.33	4.78
			0.5 - 1	**0.35**			
R93C125	41	280	0 - 0.5	**0.3**	10.37	0.28	2.85
			0.5 - 1	**0.25**			

TABLE F-3
POST-REMEDIATION CONDITIONS
PARCELS I8-4-2, -3, & -4: 0- TO 1-FOOT DEPTH INCREMENT

SUPPLEMENTAL INFORMATION PACKAGE FOR SELECTED PHASE 2 FLOODPLAIN PROPERTIES ADJACENT TO THE 1-1/2 MILE REACH OF HOUSATONIC RIVER

GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

0- TO 1-FOOT DEPTH INCREMENT CONTINUED

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
R93D000	30	635	0 - 0.5	**0.25**	23.50	0.25	5.88
			0.5 - 1	**0.25**			
R93D050	31	1,042	0 - 0.5	**0.3**	38.61	0.28	10.62
			0.5 - 1	**0.25**			
R93D075	32	450	0 - 0.5	0.4	16.67	0.33	5.42
			0.5 - 1	**0.25**			
R93D100	43	673	0 - 0.5	**0.25**	24.94	0.25	6.24
			0.5 - 1	**0.25**			
R93D125	44	250	0 - 0.5	**0.25**	9.26	0.25	2.32
			0.5 - 1	**0.25**			
R93E000	33	324	0 - 0.5	**0.3**	11.99	0.28	3.30
			0.5 - 1	**0.25**			
R93E025	34	268	0 - 0.5	**0.3**	9.93	0.28	2.73
			0.5 - 1	**0.25**			
R93E050	35	166	0 - 0.5	0.1395	6.15	0.22	1.35
			0.5 - 1	**0.3**			
R93E075	36	66	0 - 0.5	0.6	2.46	0.45	1.11
			0.5 - 1	**0.3**			
R93E100	45	5	0 - 0.5	**0.3**	0.20	0.28	0.05
			0.5 - 1	**0.25**			
Totals:	--	14,640	--	--	542.22	--	463.41
					Volume Weighted Average:		**0.85**

Notes:

1. Non-detectable PCBs included as one-half the detection limit in calculations and shown in bold.
2. For instances where a duplicate sample was available, the average of the samples was included in table.
3. All calculations and rounding are performed by the computer software. Therefore, certain quantities in above table are displayed as rounded numbers for table clarity.
4. Shaded numbers in bold and italics represent the placement of clean backfill material following the performance of the proposed remediation. The backfill concentration corresponds to the average PCB concentration as presented in the CD Sites Backfill Data Set.

TABLE F-4
POST-REMEDIATION CONDITIONS
PARCELS I8-4-2, -3, & -4: 1- TO X-FOOT (X=5) DEPTH INCREMENT

SUPPLEMENTAL INFORMATION PACKAGE FOR SELECTED PHASE 2 FLOODPLAIN PROPERTIES ADJACENT TO THE 1-1/2 MILE REACH OF HOUSATONIC RIVER

GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

1- TO 1.5-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
2-SB-6	1	37	1 - 1.5	0.068	0.68	0.07	0.05
I8-4-2,3,4-2	13	137	1 - 1.5	13.1	2.53	13.10	33.12
I8-4-2,3,4-5	14	488	1 - 1.5	0.349	9.04	0.35	3.15
I8-4-2,3,4-6	15	20	1 - 1.5	1.06	0.38	1.06	0.40
I8-4-2,3,4-7	16	74	1 - 1.5	6.9	1.37	6.90	9.47
I8-4-2,3,4-8	17	222	1 - 1.5	0.724	4.12	0.72	2.98
I8-4-2,3,4-9	18	82	1 - 1.5	***0.021***	1.52	0.02	0.03
I8-4-2,3,4-10	4	1	1 - 1.5	798	0.01	798.00	11.62
I8-4-2,3,4-12	5	260	1 - 1.5	0.408	4.81	0.41	1.96
I8-4-2,3,4-13	6	333	1 - 1.5	**0.05**	6.17	0.05	0.31
I8-4-2,3,4-14	7	92	1 - 1.5	**0.05**	1.71	0.05	0.09
I8-4-2,3,4-15	8	181	1 - 1.5	**0.05**	3.35	0.05	0.17
I8-4-2,3,4-16	9	122	1 - 1.5	0.173	2.27	0.17	0.39
I8-4-2,3,4-17	10	96	1 - 1.5	1.12	1.78	1.12	1.99
I8-4-2,3,4-18	11	372	1 - 1.5	0.185	6.89	0.19	1.27
I8-4-2,3,4-19	12	334	1 - 1.5	**0.05**	6.19	0.05	0.31
R93A000	20	667	1 - 1.5	**0.35**	12.35	0.35	4.32
R93A025	21	565	1 - 1.5	**0.25**	10.46	0.25	2.62
R93A050	22	581	1 - 1.5	**0.3**	10.75	0.30	3.23
R93A075	23	441	1 - 1.5	**0.25**	8.16	0.25	2.04
R93A100	24, 42	492	1 - 1.5	**0.35**	9.11	0.35	3.19
R93A125	43	318	1 - 1.5	**0.25**	5.89	0.25	1.47
R93B000	25	723	1 - 1.5	0.3	13.38	0.30	4.01
R93B025	26	540	1 - 1.5	**0.3**	10.00	0.30	3.00
R93B050	27	578	1 - 1.5	**0.25**	10.71	0.25	2.68
R93B075	28	638	1 - 1.5	**0.3**	11.82	0.30	3.55
R93B100	29, 44	452	1 - 1.5	**0.25**	8.38	0.25	2.09
R93B125	45	320	1 - 1.5	***0.021***	5.93	0.02	0.12
R93C000	30	630	1 - 1.5	**0.25**	11.67	0.25	2.92
R93C075	31	723	1 - 1.5	**0.3**	13.39	0.30	4.02
R93C100	32, 49, 50	227	1 - 1.5	0.181	4.20	0.18	0.76
R93C125	33, 46	244	1 - 1.5	**0.25**	4.52	0.25	1.13
R93D000	34	635	1 - 1.5	**0.3**	11.75	0.30	3.53
R93D050	35	1,042	1 - 1.5	**0.25**	19.31	0.25	4.83
R93D075	36	619	1 - 1.5	**0.3**	11.45	0.30	3.44
R93D100	37, 51, 53	335	1 - 1.5	**0.25**	6.20	0.25	1.55
R93D125	47	193	1 - 1.5	**0.3**	3.58	0.30	1.07
R93E000	38	324	1 - 1.5	**0.3**	6.00	0.30	1.80
R93E025	39	268	1 - 1.5	**0.3**	4.96	0.30	1.49
R93E050	40	166	1 - 1.5	**0.3**	3.08	0.30	0.92
R93E075	41	66	1 - 1.5	**0.25**	1.23	0.25	0.31
R93E100	48	1	1 - 1.5	**0.25**	0.01	0.25	0.00
Totals:	--	14,640	--	--	271.11	--	127.39
					Volume Weighted Average:		**0.47**

1.5- TO 2-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
2-SB-6	1	37	1.5 - 2	0.068	0.68	0.07	0.05
I8-4-2,3,4-2	10	327	1.5 - 2	1.44	6.06	1.44	8.72
I8-4-2,3,4-5	11	493	1.5 - 2	0.146	9.12	0.15	1.33
I8-4-2,3,4-6	12	20	1.5 - 2	46.1	0.38	46.10	17.41
I8-4-2,3,4-7	13	74	1.5 - 2	9.8	1.37	9.80	13.45

TABLE F-4
POST-REMEDIATION CONDITIONS
PARCELS I8-4-2, -3, & -4: 1- TO X-FOOT (X=5) DEPTH INCREMENT

SUPPLEMENTAL INFORMATION PACKAGE FOR SELECTED PHASE 2 FLOODPLAIN PROPERTIES ADJACENT TO THE 1-1/2 MILE REACH OF HOUSATONIC RIVER

GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

1.5- TO 2-FOOT DEPTH INCREMENT CONTINUED

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
I8-4-2,3,4-8	14	302	1.5 - 2	**0.05**	5.59	0.05	0.28
I8-4-2,3,4-9	46	431	1.5 - 2	3.33	7.99	3.33	26.60
I8-4-2,3,4-10	5	1	1.5 - 2	195	0.01	195.00	2.85
I8-4-2,3,4-12	6	261	1.5 - 2	0.116	4.84	0.12	0.56
I8-4-2,3,4-13	7	333	1.5 - 2	**0.05**	6.17	0.05	0.31
I8-4-2,3,4-14	8	93	1.5 - 2	**0.05**	1.73	0.05	0.09
I8-4-2,3,4-15	9	216	1.5 - 2	**0.05**	3.99	0.05	0.20
R93A000	16	667	1.5 - 2	**0.25**	12.35	0.25	3.09
R93A025	17	565	1.5 - 2	**0.25**	10.46	0.25	2.62
R93A050	18	581	1.5 - 2	**0.25**	10.75	0.25	2.69
R93A075	19	441	1.5 - 2	**0.3**	8.16	0.30	2.45
R93A100	20, 38	492	1.5 - 2	**0.3**	9.11	0.30	2.73
R93A125	39	318	1.5 - 2	**0.25**	5.89	0.25	1.47
R93B000	21	723	1.5 - 2	**0.3**	13.38	0.30	4.01
R93B025	22	540	1.5 - 2	**0.25**	10.00	0.25	2.50
R93B050	23	578	1.5 - 2	**0.25**	10.71	0.25	2.68
R93B075	24	701	1.5 - 2	**0.3**	12.99	0.30	3.90
R93B100	25, 40	640	1.5 - 2	**0.25**	11.85	0.25	2.96
R93B125	41	320	1.5 - 2	8.2	5.93	8.20	48.65
R93C000	26	630	1.5 - 2	**0.3**	11.67	0.30	3.50
R93C075	27	776	1.5 - 2	**0.25**	14.37	0.25	3.59
R93C100	28, 42	352	1.5 - 2	**0.35**	6.52	0.35	2.28
R93C125	29, 43	244	1.5 - 2	**0.25**	4.52	0.25	1.13
R93D000	30	635	1.5 - 2	**0.25**	11.75	0.25	2.94
R93D050	31	1,042	1.5 - 2	**0.3**	19.31	0.30	5.79
R93D075	32	648	1.5 - 2	**0.3**	12.00	0.30	3.60
R93D100	33, 47	242	1.5 - 2	**0.1335**	4.48	0.13	0.60
R93D125	44	93	1.5 - 2	0.6	1.71	0.60	1.03
R93E000	34	324	1.5 - 2	**0.25**	6.00	0.25	1.50
R93E025	35	268	1.5 - 2	**0.3**	4.96	0.30	1.49
R93E050	36	166	1.5 - 2	**0.25**	3.08	0.25	0.77
R93E075	37	66	1.5 - 2	**0.3**	1.23	0.30	0.37
Totals:	--	14,640	--	--	271.11	--	180.17
					Volume Weighted Average:		**0.66**

2- TO 2.5-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
2-SB-6	1, 15, 16	4,003	2 - 2.5	0.068	74.12	0.07	5.04
2-SB-16	13	1,398	2 - 2.5	0.219	25.89	0.22	5.67
I8-4-1-5	2	44	2 - 2.5	0.251	0.81	0.25	0.20
I8-4-1-9	4	247	2 - 2.5	0.408	4.57	0.41	1.87
I8-4-2,3,4-2	8	360	2 - 2.5	1.37	6.67	1.37	9.14
I8-4-2,3,4-6	9	309	2 - 2.5	10.4	5.72	10.40	59.47
I8-4-2,3,4-7	10	834	2 - 2.5	10.3	15.45	10.30	159.10
I8-4-2,3,4-9	14	4,748	2 - 2.5	3.54	87.93	3.54	311.28
I8-4-2,3,4-10	5	1	2 - 2.5	24.8	0.01	24.80	0.36
I8-4-2,3,4-12	6	1,991	2 - 2.5	1.17	36.87	1.17	43.13
I8-4-2,3,4-14	7	631	2 - 2.5	0.112	11.68	0.11	1.31
I8-4-5-4	11	35	2 - 2.5	1.34	0.65	1.34	0.87
I8-4-7-21	12	40	2 - 2.5	8.17	0.75	8.17	6.11
Totals:	--	14,640	--	--	271.11	--	603.55
					Volume Weighted Average:		**2.23**

TABLE F-4
POST-REMEDIATION CONDITIONS
PARCELS I8-4-2, -3, & -4: 1- TO X-FOOT (X=5) DEPTH INCREMENT

SUPPLEMENTAL INFORMATION PACKAGE FOR SELECTED PHASE 2 FLOODPLAIN PROPERTIES ADJACENT TO THE 1-1/2 MILE REACH OF HOUSATONIC RIVER

GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

2.5- TO 3-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
2-SB-6	1	3,990	2.5 - 3	0.068	73.88	0.07	5.02
2-SB-16	13	837	2.5 - 3	0.219	15.50	0.22	3.39
I8-4-1-9	3	290	2.5 - 3	0.356	5.37	0.36	1.91
I8-4-2,3,4-1	4	2	2.5 - 3	14.5	0.05	14.50	0.65
I8-4-2,3,4-2	8	360	2.5 - 3	3.45	6.67	3.45	23.02
I8-4-2,3,4-6	9	492	2.5 - 3	4.64	9.12	4.64	42.31
I8-4-2,3,4-7	10	1,032	2.5 - 3	4.48	19.12	4.48	85.64
I8-4-2,3,4-9	15	4,749	2.5 - 3	4.87	87.94	4.87	428.27
I8-4-2,3,4-10	5	1	2.5 - 3	78.7	0.02	78.70	1.70
I8-4-2,3,4-12	6	2,102	2.5 - 3	0.5	38.93	0.50	19.46
I8-4-2,3,4-14	7	631	2.5 - 3	**0.05**	11.68	0.05	0.58
I8-4-5-4	11	88	2.5 - 3	**0.05**	1.63	0.05	0.08
I8-4-7-21	12	65	2.5 - 3	5.34	1.21	5.34	6.46
Totals:	--	14,640	--	--	271.10	--	618.52
					Volume Weighted Average:		**2.28**

3- TO 3.5-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
2-SB-6	3	4,403	3 - 3.5	0.032	81.54	0.03	2.61
2-SB-13	1, 18, 19	686	3 - 3.5	0.097	12.71	0.10	1.23
2-SB-16	10	500	3 - 3.5	0.027	9.27	0.03	0.25
I8-4-1-7	6	32	3 - 3.5	15.8	0.59	15.80	9.28
I8-4-2,3,4-1	12	877	3 - 3.5	12.4	16.24	12.40	201.35
I8-4-2,3,4-6	14	1,331	3 - 3.5	8.2	24.65	8.20	202.16
I8-4-2,3,4-9	15	6,486	3 - 3.5	0.18	120.12	0.18	21.62
I8-4-2,3,4-10	7	119	3 - 3.5	14.605	2.20	14.61	32.13
I8-4-7-21	8	205	3 - 3.5	1.99	3.79	1.99	7.54
Totals:	--	14,640	--	--	271.11	--	478.18
					Volume Weighted Average:		**1.76**

3.5- TO 4-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
2-SB-6	3	4,403	3.5 - 4	0.032	81.54	0.03	2.61
2-SB-13	1, 13	538	3.5 - 4	0.097	9.97	0.10	0.97
2-SB-16	5A	2	3.5 - 4	0.027	0.03	0.03	0.00
I8-4-1-7	6	32	3.5 - 4	11.6	0.59	11.60	6.81
I8-4-2,3,4-1	7	1,087	3.5 - 4	1.84	20.13	1.84	37.03
I8-4-2,3,4-6	9	1,539	3.5 - 4	1.3	28.49	1.30	37.04
I8-4-2,3,4-9	14	6,486	3.5 - 4	3.85	120.12	3.85	462.46
I8-4-2,3,4-10	8	119	3.5 - 4	28.5	2.20	28.50	62.70
I8-4,2,3,4-20	5	143	3.5 - 4	4.87	2.65	4.87	12.90
I8-4-7-4	11	85	3.5 - 4	83.2	1.57	83.20	130.21
I8-4-7-21	10	207	3.5 - 4	6.58	3.83	6.58	25.18
Totals:	--	14,640	--	--	271.11	--	777.92
					Volume Weighted Average:		**2.87**

TABLE F-4
POST-REMEDIATION CONDITIONS
PARCELS I8-4-2, -3, & -4: 1- TO X-FOOT (X=5) DEPTH INCREMENT

SUPPLEMENTAL INFORMATION PACKAGE FOR SELECTED PHASE 2 FLOODPLAIN PROPERTIES ADJACENT TO THE 1-1/2 MILE REACH OF HOUSATONIC RIVER

GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

4- TO 5-FOOT DEPTH INCREMENT

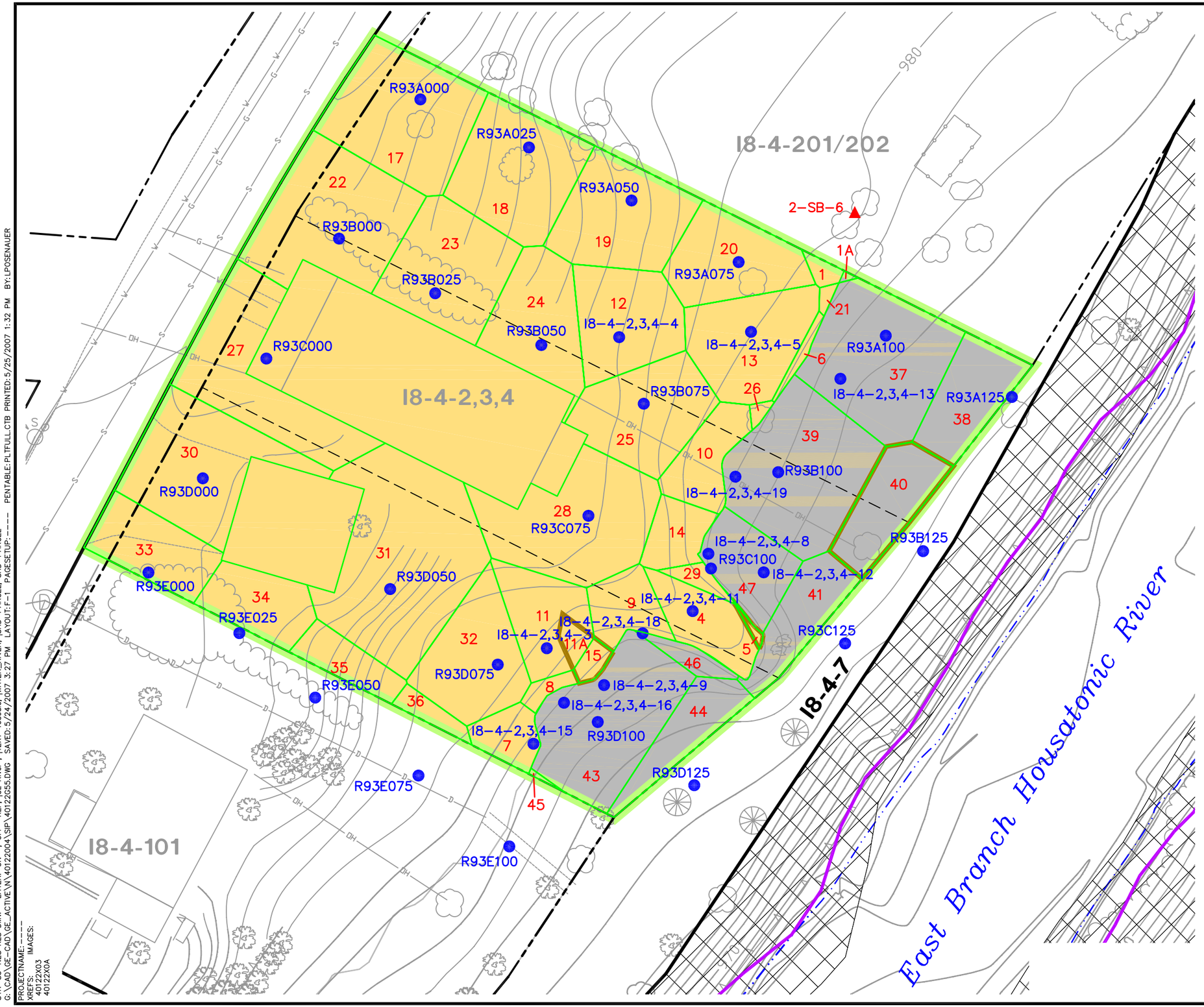
Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
2-SB-6	4	4,403	4 - 5	0.032	163.09	0.03	5.22
2-SB-13	1	460	4 - 5	0.097	17.02	0.10	1.65
2-SB-15	2	115	4 - 5	0.032	4.25	0.03	0.14
2-SB-16	2A	12	4 - 5	0.027	0.45	0.03	0.01
I8-4-1-7	6	32	4 - 4.5	2.4	1.17	5.08	5.96
			4.5 - 5	7.75			
I8-4-2,3,4-1	7	1,087	4 - 4.5	3.12	40.25	1.97	79.48
			4.5 - 5	0.829			
I8-4-2,3,4-6	9	1,556	4 - 4.5	0.129	57.65	0.36	20.84
			4.5 - 5	0.594			
I8-4-2,3,4-9	13	6,486	4 - 4.5	0.563	240.24	0.90	215.37
			4.5 - 5	1.23			
I8-4-2,3,4-10	8	197	4 - 4.5	1.19	7.31	3.05	22.30
			4.5 - 5	4.91			
I8-4-7-4	11	85	4 - 4.5	11.5	3.13	6.99	21.86
			4.5 - 5	2.47			
I8-4-7-21	10	207	4 - 4.5	3.64	7.65	2.47	18.91
			4.5 - 5	1.3			
Totals:	--	14,640	--	--	542.22	--	391.74
					Volume Weighted Average:		**0.72**

SUMMARY - 1- TO X-FOOT (X=5') DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
Totals:	--	14,640	--	--	2,168.89	--	3,177.46
					Volume Weighted Average:		**1.47**

Notes:

1. Non-detectable PCBs included as one-half the detection limit in calculations and shown in bold.
2. For instances where a duplicate sample was available, the average of the samples was included in table.
3. All calculations and rounding are performed by the computer software. Therefore, certain quantities in above table are displayed as rounded numbers for table clarity.
4. Shaded numbers in bold and italics represent the placement of clean backfill material following the performance of the proposed remediation. The backfill concentration corresponds to the average PCB concentration as presented in the CD Sites Backfill Data Set.



LEGEND

- BOUNDARY OF FLOODPLAIN PROPERTIES DESIGNATED IN SOW (FOR PHASE 2)
- APPROXIMATE PARCEL BOUNDARY
- APPROXIMATE HORIZONTAL LIMITS OF AVERAGING AREA
- BOUNDARY BETWEEN COMMONLY OWNED TAX PARCELS
- I8-4-2,3,4 — RESIDENTIAL PROPERTY PARCEL ID
- I8-4-7 — NON-RESIDENTIAL PROPERTY PARCEL ID
- I8-4-2,3,4-9 — PRE-2000 SOIL BORING LOCATION
- 2-SB-6 — PRE-DESIGN (2003) SOIL BORING LOCATION
- 10 YEAR FLOODPLAIN
- WIRE FENCE
- CHAIN LINK FENCE
- WATER LINE
- GAS LINE
- SANITARY SEWER
- DRAIN LINE
- OVERHEAD ELECTRIC
- RETAINING WALL
- 980 — ELEVATION CONTOUR (1 FOOT CONTOUR INTERVAL)
- ROCK
- EDGE OF BUSHES/HEDGE
- SHRUB
- DECIDUOUS TREE
- CONIFEROUS TREE
- DRAIN MANHOLE
- WATER SHUTOFF
- APPROXIMATE EDGE OF WATER
- AREA ASSOCIATED WITH EPA'S 1 1/2 MILE REACH REMOVAL ACTION
- AREA OF PRIOR EXCAVATION (TO DEPTHS RANGING BETWEEN 1 AND 4 FEET)
- PROPERTY PREVIOUSLY REMEDIATED
- HORIZONTAL LIMITS OF AREA ASSOCIATED WITH GIVEN SAMPLE, DEVELOPED USING THE THEISSEN POLYGON APPROACH.
- 15 — POLYGON ID
- AREA PROPOSED FOR SOIL REMOVAL

NOTES TO FIGURE:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE FROM PHASEIIBASE.DWG BY WESTON SOLUTIONS FOR THE DEPARTMENT OF THE ARMY CORPS OF ENGINEERS DATED 1/15/03.
2. THE 10 YEAR FLOODPLAIN LINE IS APPROXIMATE AND WAS DERIVED USING HYDRAULIC MODELING PERFORMED BY BLASLAND, BOUCK & LEE, INC. (1994) AND AVAILABLE TOPOGRAPHIC MAPPING.
3. SAMPLE LOCATIONS ARE APPROXIMATE.
4. SEE FIGURES 4, 5, AND 7 FOR ADDITIONAL INFORMATION RELATED TO ADJACENT PARCELS I8-4-201/202, I8-4-101, AND I8-4-7, RESPECTIVELY.

0 20' 40'

GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

SUPPLEMENTAL INFORMATION PACKAGE
FOR SELECTED PHASE 2 FLOODPLAIN PROPERTIES

PARCELS I8-4-2, -3, -4
THEISSEN POLYGON MAP
0- TO 1-FOOT DEPTH INCREMENT

ARCADIS BBL
infrastructure, environment, facilities

FIGURE
F-1

SYR-85-NES KLS DWG LAYER: ON=*; OFF=*REF,ICL River*,ITEXT 40scale,WATER_RIVER,ISHD-PARCEL,SHD-PARCEL
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PROJECTNAME:----
XREFS: IMAGES:
40122X03
40122X0A

I8-4-201/202

I8-4-2,3,4

I8-4-101

I8-4-7

East Branch Housatonic River

R93A000 R93A025 R93A050 R93A075 R93A100 R93A125 R93B000 R93B025 R93B050 R93B075 R93B100 R93B125 R93C000 R93C075 R93C100 R93C125 R93D000 R93D050 R93D075 R93D100 R93E000 R93E025 R93E050 R93E075 R93E100

I8-4-2,3,4-2 I8-4-2,3,4-4 I8-4-2,3,4-5 I8-4-2,3,4-6 I8-4-2,3,4-7 I8-4-2,3,4-8 I8-4-2,3,4-9 I8-4-2,3,4-10 I8-4-2,3,4-12 I8-4-2,3,4-13 I8-4-2,3,4-14 I8-4-2,3,4-15 I8-4-2,3,4-16 I8-4-2,3,4-17 I8-4-2,3,4-18 I8-4-2,3,4-19

2-SB-6

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 53

980

LEGEND

- BOUNDARY OF FLOODPLAIN PROPERTIES DESIGNATED IN SOW (FOR PHASE 2)
- APPROXIMATE PARCEL BOUNDARY
- APPROXIMATE HORIZONTAL LIMITS OF AVERAGING AREA
- BOUNDARY BETWEEN COMMONLY OWNED TAX PARCELS
- I8-4-2,3,4 RESIDENTIAL PROPERTY PARCEL ID
- I8-4-7 NON-RESIDENTIAL PROPERTY PARCEL ID
- I8-4-2,3,4-9 PRE-2000 SOIL BORING LOCATION
- 2-SB-6 PRE-DESIGN (2003) SOIL BORING LOCATION
- 10 YEAR FLOODPLAIN
- WIRE FENCE
- CHAIN LINK FENCE
- W WATER LINE
- G GAS LINE
- S SANITARY SEWER
- D DRAIN LINE
- OH OVERHEAD ELECTRIC
- RETAINING WALL
- 980 ELEVATION CONTOUR (1 FOOT CONTOUR INTERVAL)
- ROCK
- EDGE OF BUSHES/HEDGE
- SHRUB
- DECIDUOUS TREE
- CONIFEROUS TREE
- D DRAIN MANHOLE
- WS WATER SHUTOFF
- APPROXIMATE EDGE OF WATER
- AREA ASSOCIATED WITH EPA'S 1 1/2 MILE REACH REMOVAL ACTION
- AREA OF PRIOR EXCAVATION (TO DEPTHS RANGING BETWEEN 1 AND 4 FEET)
- PROPERTY PREVIOUSLY REMEDIATED
- HORIZONTAL LIMITS OF AREA ASSOCIATED WITH GIVEN SAMPLE, DEVELOPED USING THE THEISSEN POLYGON APPROACH.
- 3 POLYGON ID
- AREA PROPOSED FOR SOIL REMOVAL

NOTES TO FIGURE:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE FROM PHASEIIBASE.DWG BY WESTON SOLUTIONS FOR THE DEPARTMENT OF THE ARMY CORPS OF ENGINEERS DATED 1/15/03.
2. THE 10 YEAR FLOODPLAIN LINE IS APPROXIMATE AND WAS DERIVED USING HYDRAULIC MODELING PERFORMED BY BLASLAND, BOUCK & LEE, INC. (1994) AND AVAILABLE TOPOGRAPHIC MAPPING.
3. SAMPLE LOCATIONS ARE APPROXIMATE.
4. SEE FIGURES 4, 5, AND 7 FOR ADDITIONAL INFORMATION RELATED TO ADJACENT PARCELS I8-4-201/202, I8-4-101, AND I8-4-7, RESPECTIVELY.

0 20' 40'

GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

SUPPLEMENTAL INFORMATION PACKAGE FOR SELECTED PHASE 2 FLOODPLAIN PROPERTIES

PARCEL I8-4-2, -3, -4 THEISSEN POLYGON MAP 1- TO 1.5-FOOT DEPTH INCREMENT

ARCADIS BBL
infrastructure, environment, facilities

FIGURE F-2

SYR-85-NES KLS DWG LAYER: ON=* OFF=*REF,ICL River,ICL River_STALBL,ITEXT 40scale,WATER_RIVER,*SHD-PARCEL PENTABLE:PLTFULL.CTB PRINTED:5/25/2007 1:32 PM BY:LPOSENAUER
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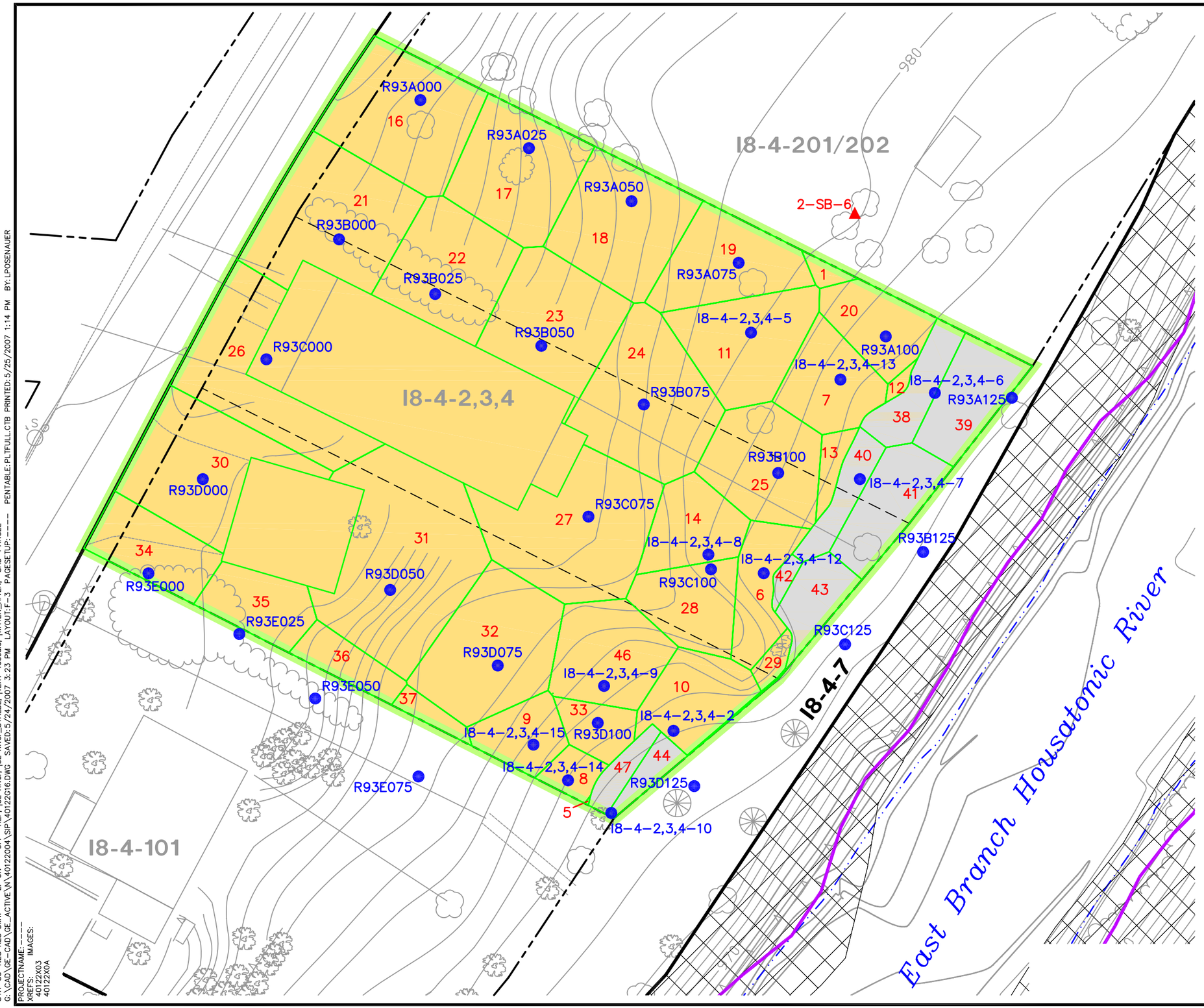
PROJECTNAME:----
XREFS: IMAGES:
40122X03
40122X0A



LEGEND

- BOUNDARY OF FLOODPLAIN PROPERTIES DESIGNATED IN SOW (FOR PHASE 2)
- APPROXIMATE PARCEL BOUNDARY
- APPROXIMATE HORIZONTAL LIMITS OF AVERAGING AREA
- BOUNDARY BETWEEN COMMONLY OWNED TAX PARCELS
- I8-4-2,3,4 — RESIDENTIAL PROPERTY PARCEL ID
- I8-4-7 — NON-RESIDENTIAL PROPERTY PARCEL ID
- I8-4-2,3,4-9 — PRE-2000 SOIL BORING LOCATION
- 2-SB-6 — PRE-DESIGN (2003) SOIL BORING LOCATION
- 10 YEAR FLOODPLAIN
- WIRE FENCE
- CHAIN LINK FENCE
- W — WATER LINE
- G — GAS LINE
- S — SANITARY SEWER
- D — DRAIN LINE
- OH — OVERHEAD ELECTRIC
- RETAINING WALL
- 980 — ELEVATION CONTOUR (1 FOOT CONTOUR INTERVAL)
- ROCK
- EDGE OF BUSHES/HEDGE
- SHRUB
- DECIDUOUS TREE
- CONIFEROUS TREE
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- AREA OF PRIOR EXCAVATION (TO DEPTHS RANGING BETWEEN 1 AND 4 FEET)
- PROPERTY PREVIOUSLY REMEDIATED
- HORIZONTAL LIMITS OF AREA ASSOCIATED WITH GIVEN SAMPLE, DEVELOPED USING THE THEISSEN POLYGON APPROACH.
- 3 — POLYGON ID

NOTES TO FIGURE:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE FROM PHASEIIBASE.DWG BY WESTON SOLUTIONS FOR THE DEPARTMENT OF THE ARMY CORPS OF ENGINEERS DATED 1/15/03.
2. THE 10 YEAR FLOODPLAIN LINE IS APPROXIMATE AND WAS DERIVED USING HYDRAULIC MODELING PERFORMED BY BLASLAND, BOUCK & LEE, INC. (1994) AND AVAILABLE TOPOGRAPHIC MAPPING.
3. SAMPLE LOCATIONS ARE APPROXIMATE.
4. SEE FIGURES 4, 5, AND 7 FOR ADDITIONAL INFORMATION RELATED TO ADJACENT PARCELS I8-4-201/202, I8-4-101, AND I8-4-7, RESPECTIVELY.

0 20' 40'

GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

SUPPLEMENTAL INFORMATION PACKAGE FOR SELECTED PHASE 2 FLOODPLAIN PROPERTIES

PARCEL I8-4-2, -3, -4 THEISSEN POLYGON MAP 1.5- TO 2-FOOT DEPTH INCREMENT

ARCADIS BBL
infrastructure, environment, facilities

FIGURE
F-3

SYR-85-NES KLS DWW L: ON=* OFF=*REF, ICL River, ICL River_STALBL, ITEXT 40scale, IWATER_RIVER, *SHD-PARCEL
G:\CAD\GE-CAD\GE_ACTIVE\NY\40122004\SIP\40122G16.DWG SAVED:5/24/2007 3:23 PM LAYOUT:F-3 PAGESETUP:---- PENTABLE:PLTFULL.CTB PRINTED:5/25/2007 1:14 PM BY:LPOSENAUER
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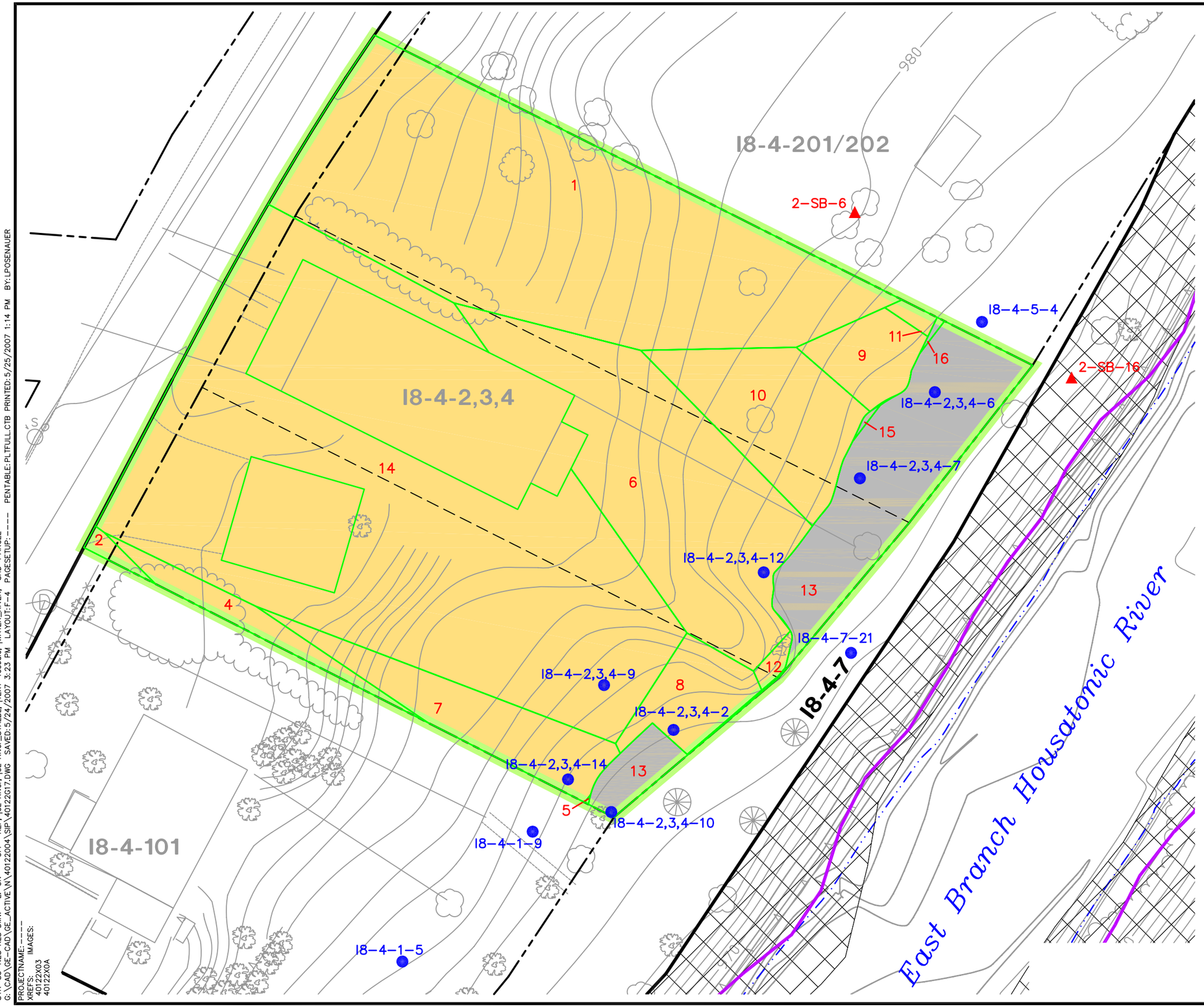
40122X0A



LEGEND

- BOUNDARY OF FLOODPLAIN PROPERTIES DESIGNATED IN SOW (FOR PHASE 2)
- APPROXIMATE PARCEL BOUNDARY
- APPROXIMATE HORIZONTAL LIMITS OF AVERAGING AREA
- BOUNDARY BETWEEN COMMONLY OWNED TAX PARCELS
- I8-4-2,3,4 — RESIDENTIAL PROPERTY PARCEL ID
- I8-4-7 — NON-RESIDENTIAL PROPERTY PARCEL ID
- I8-4-2,3,4-9 — PRE-2000 SOIL BORING LOCATION
- 2-SB-6 — PRE-DESIGN (2003) SOIL BORING LOCATION
- 10 YEAR FLOODPLAIN
- WIRE FENCE
- CHAIN LINK FENCE
- W — WATER LINE
- G — GAS LINE
- S — SANITARY SEWER
- D — DRAIN LINE
- OH — OVERHEAD ELECTRIC
- RETAINING WALL
- 980 — ELEVATION CONTOUR (1 FOOT CONTOUR INTERVAL)
- ROCK
- EDGE OF BUSHES/HEDGE
- SHRUB
- DECIDUOUS TREE
- CONIFEROUS TREE
- D — DRAIN MANHOLE
- WS — WATER SHUTOFF
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- AREA OF PRIOR EXCAVATION (TO DEPTHS RANGING BETWEEN 1 AND 4 FEET)
- PROPERTY PREVIOUSLY REMEDIATED
- HORIZONTAL LIMITS OF AREA ASSOCIATED WITH GIVEN SAMPLE, DEVELOPED USING THE THEISSEN POLYGON APPROACH.
- 3 — POLYGON ID

NOTES TO FIGURE:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE FROM PHASEIIBASE.DWG BY WESTON SOLUTIONS FOR THE DEPARTMENT OF THE ARMY CORPS OF ENGINEERS DATED 1/15/03.
2. THE 10 YEAR FLOODPLAIN LINE IS APPROXIMATE AND WAS DERIVED USING HYDRAULIC MODELING PERFORMED BY BLASLAND, BOUCK & LEE, INC. (1994) AND AVAILABLE TOPOGRAPHIC MAPPING.
3. SAMPLE LOCATIONS ARE APPROXIMATE.
4. SEE FIGURES 4, 5, AND 7 FOR ADDITIONAL INFORMATION RELATED TO ADJACENT PARCELS I8-4-201/202, I8-4-101, AND I8-4-7, RESPECTIVELY.

0 20' 40'

GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

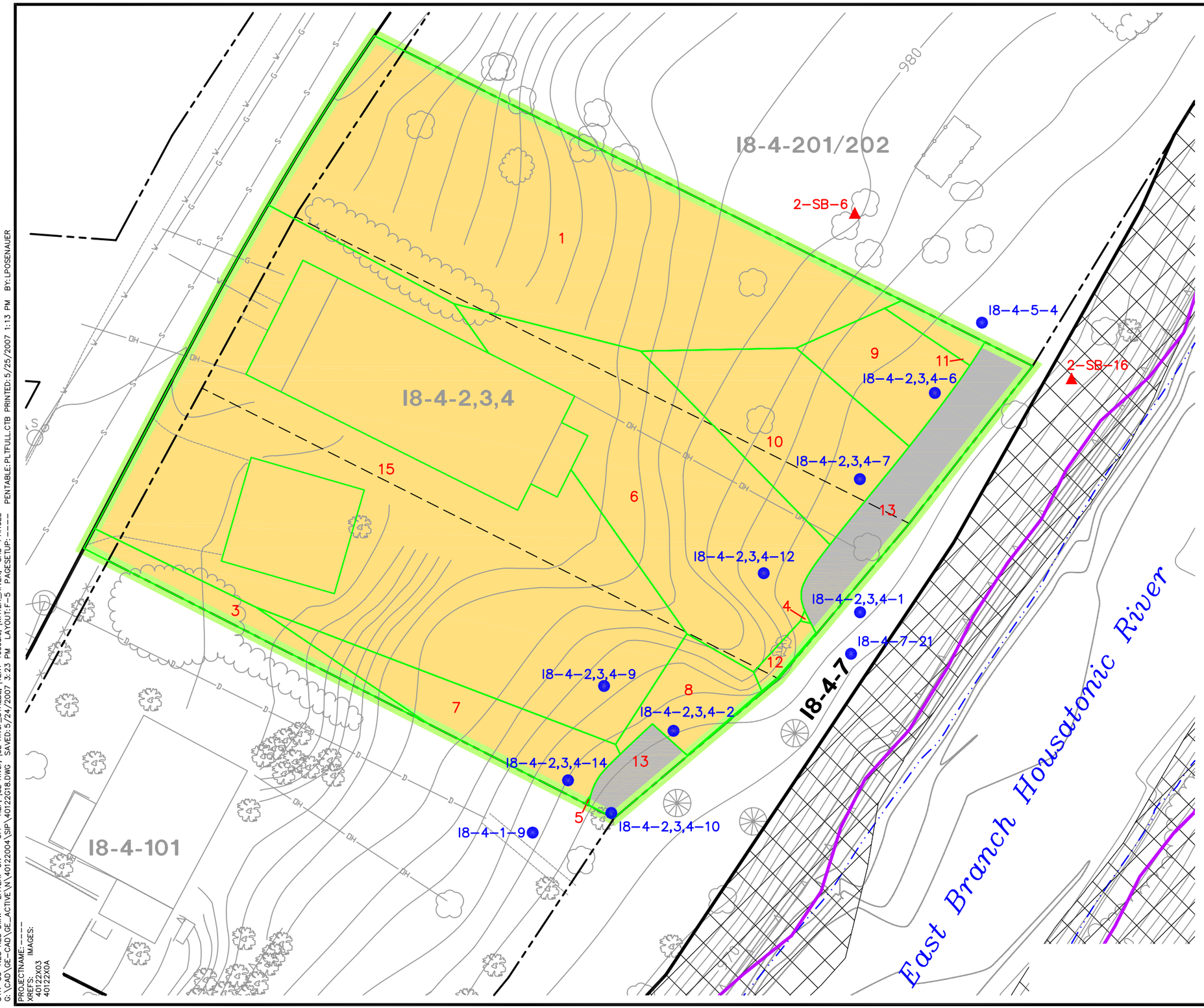
SUPPLEMENTAL INFORMATION PACKAGE FOR SELECTED PHASE 2 FLOODPLAIN PROPERTIES

PARCEL I8-4-2, -3, -4 THEISSEN POLYGON MAP 2- TO 2.5-FOOT DEPTH INCREMENT

ARCADIS BBL
infrastructure, environment, facilities

FIGURE **F-4**

SYR-85-NES KLS DMW L: ON=* OFF=*REF ICL River ICL River_STALBL ITEXT 40scale, IWATER_RIVER, *SHD-PARCEL
G:\CAD\GE-CAD\GE_ACTIVE\N\40122004\SIP\40122G17.DWG SAVED:5/24/2007 3:23 PM LAYOUT:F-4 PAGESETUP:----- PENTABLE:PLTFULL.CTB PRINTED:5/25/2007 1:14 PM BY:LPOSENAUER
PROJECTNAME:-----
XREFS: IMAGES:
40122X03
40122X0A



LEGEND

- BOUNDARY OF FLOODPLAIN PROPERTIES DESIGNATED IN SOW (FOR PHASE 2)
- APPROXIMATE PARCEL BOUNDARY
- APPROXIMATE HORIZONTAL LIMITS OF AVERAGING AREA
- BOUNDARY BETWEEN COMMONLY OWNED TAX PARCELS
- I8-4-2,3,4 — RESIDENTIAL PROPERTY PARCEL ID
- **I8-4-7** — NON-RESIDENTIAL PROPERTY PARCEL ID
- I8-4-2,3,4-9 — PRE-2000 SOIL BORING LOCATION
- 2-SB-6 — PRE-DESIGN (2003) SOIL BORING LOCATION
- 10 YEAR FLOODPLAIN
- WIRE FENCE
- CHAIN LINK FENCE
- W — WATER LINE
- G — GAS LINE
- S — SANITARY SEWER
- D — DRAIN LINE
- OH — OVERHEAD ELECTRIC
- RETAINING WALL
- 980 — ELEVATION CONTOUR (1 FOOT CONTOUR INTERVAL)
- ROCK
- EDGE OF BUSHES/HEDGE
- SHRUB
- DECIDUOUS TREE
- CONIFEROUS TREE
- D — DRAIN MANHOLE
- S — WATER SHUTOFF
- APPROXIMATE EDGE OF WATER
- AREA ASSOCIATED WITH EPA'S 1 1/2 MILE REACH REMOVAL ACTION
- AREA OF PRIOR EXCAVATION (TO DEPTHS RANGING BETWEEN 1 AND 4 FEET)
- PROPERTY PREVIOUSLY REMEDIATED
- HORIZONTAL LIMITS OF AREA ASSOCIATED WITH GIVEN SAMPLE, DEVELOPED USING THE THEISSEN POLYGON APPROACH.
- 3 — POLYGON ID

NOTES TO FIGURE:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE FROM PHASEIIBASE.DWG BY WESTON SOLUTIONS FOR THE DEPARTMENT OF THE ARMY CORPS OF ENGINEERS DATED 1/15/03.
2. THE 10 YEAR FLOODPLAIN LINE IS APPROXIMATE AND WAS DERIVED USING HYDRAULIC MODELING PERFORMED BY BLASLAND, BOUCK & LEE, INC. (1994) AND AVAILABLE TOPOGRAPHIC MAPPING.
3. SAMPLE LOCATIONS ARE APPROXIMATE.
4. SEE FIGURES 4, 5, AND 7 FOR ADDITIONAL INFORMATION RELATED TO ADJACENT PARCELS I8-4-201/202, I8-4-101, AND I8-4-7, RESPECTIVELY.

0 20' 40'

GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

SUPPLEMENTAL INFORMATION PACKAGE FOR SELECTED PHASE 2 FLOODPLAIN PROPERTIES

PARCEL I8-4-2, -3, -4
THEISSEN POLYGON MAP
2.5- TO 3-FOOT DEPTH INCREMENT

ARCADIS BBL
infrastructure, environment, facilities

FIGURE
F-5

SYR-85-NES KLS DWG LAYER: ON=* OFF=*REF ICL River ICL River_STALBL |TEXT 40scale |WATER_RIVER *SHD-PARCEL
G:\CAD\GE-CAD\GE_ACTIVE\W\40122004\SIP\40122G18.DWG SAVED:5/24/2007 3:23 PM LAYOUT:F-5 PAGESETUP:---- PENTABLE:PLTFULL.CTB PRINTED:5/25/2007 1:13 PM BY:LPOSENAUER
PROJECTNAME:----
XREFS: IMAGES:
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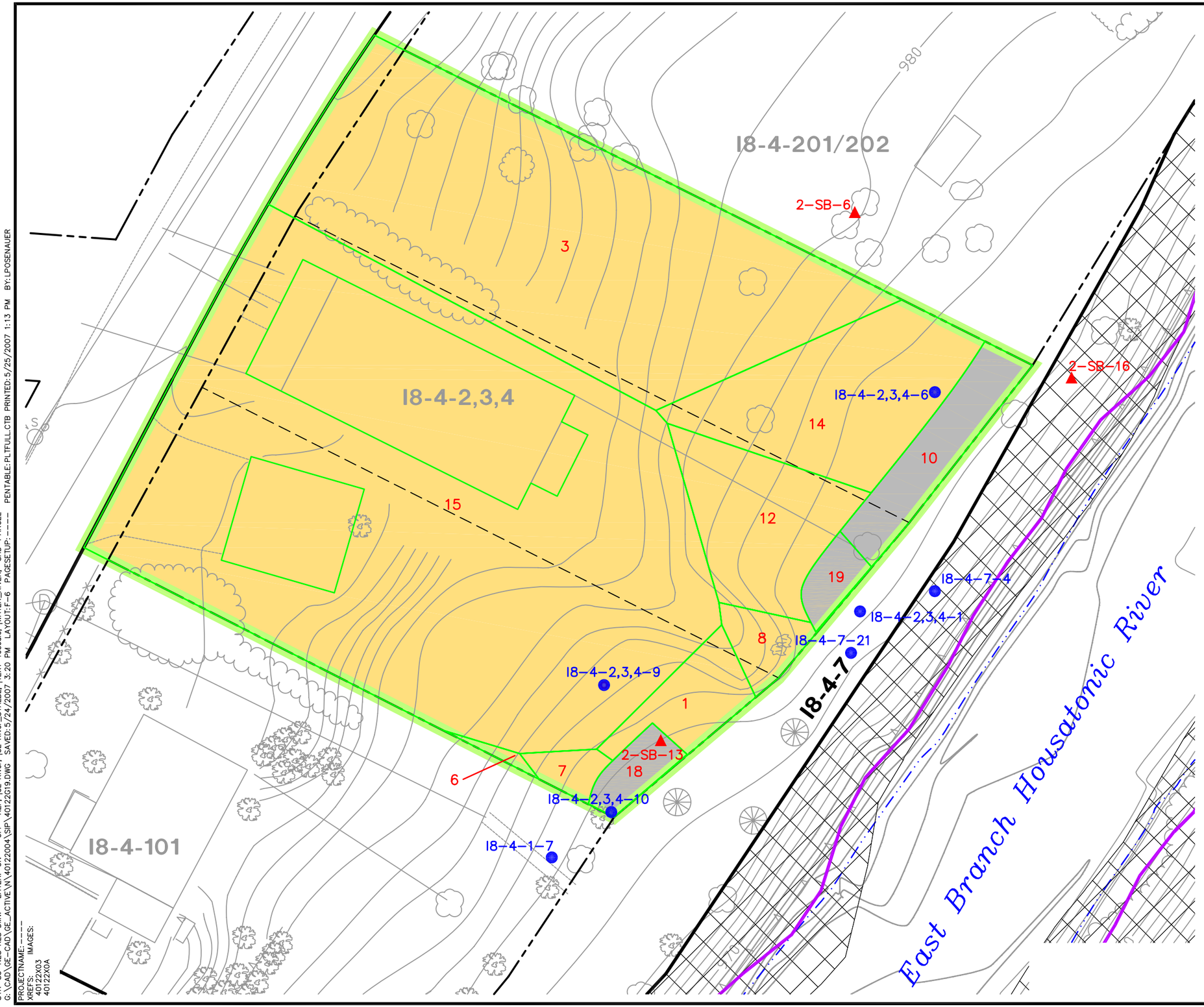
40122X0A



LEGEND

- BOUNDARY OF FLOODPLAIN PROPERTIES DESIGNATED IN SOW (FOR PHASE 2)
- APPROXIMATE PARCEL BOUNDARY
- APPROXIMATE HORIZONTAL LIMITS OF AVERAGING AREA
- BOUNDARY BETWEEN COMMONLY OWNED TAX PARCELS
- I8-4-2,3,4 — RESIDENTIAL PROPERTY PARCEL ID
- **I8-4-7** — NON-RESIDENTIAL PROPERTY PARCEL ID
- I8-4-2,3,4-9 — PRE-2000 SOIL BORING LOCATION
- 2-SB-6 — PRE-DESIGN (2003) SOIL BORING LOCATION
- 10 YEAR FLOODPLAIN
- WIRE FENCE
- CHAIN LINK FENCE
- W — WATER LINE
- G — GAS LINE
- S — SANITARY SEWER
- D — DRAIN LINE
- OH — OVERHEAD ELECTRIC
- RETAINING WALL
- 980 — ELEVATION CONTOUR (1 FOOT CONTOUR INTERVAL)
- ROCK
- EDGE OF BUSHES/HEDGE
- SHRUB
- DECIDUOUS TREE
- CONIFEROUS TREE
- D — DRAIN MANHOLE
- WS — WATER SHUTOFF
- APPROXIMATE EDGE OF WATER
- AREA ASSOCIATED WITH EPA'S 1 1/2 MILE REACH REMOVAL ACTION
- AREA OF PRIOR EXCAVATION (TO DEPTHS RANGING BETWEEN 1 AND 4 FEET)
- PROPERTY PREVIOUSLY REMEDIATED
- HORIZONTAL LIMITS OF AREA ASSOCIATED WITH GIVEN SAMPLE, DEVELOPED USING THE THEISSEN POLYGON APPROACH.
- 3 — POLYGON ID

NOTES TO FIGURE:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE FROM PHASEIIBASE.DWG BY WESTON SOLUTIONS FOR THE DEPARTMENT OF THE ARMY CORPS OF ENGINEERS DATED 1/15/03.
2. THE 10 YEAR FLOODPLAIN LINE IS APPROXIMATE AND WAS DERIVED USING HYDRAULIC MODELING PERFORMED BY BLASLAND, BOUCK & LEE, INC. (1994) AND AVAILABLE TOPOGRAPHIC MAPPING.
3. SAMPLE LOCATIONS ARE APPROXIMATE.
4. SEE FIGURES 4, 5, AND 7 FOR ADDITIONAL INFORMATION RELATED TO ADJACENT PARCELS I8-4-201/202, I8-4-101, AND I8-4-7, RESPECTIVELY.

0 20' 40'

GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

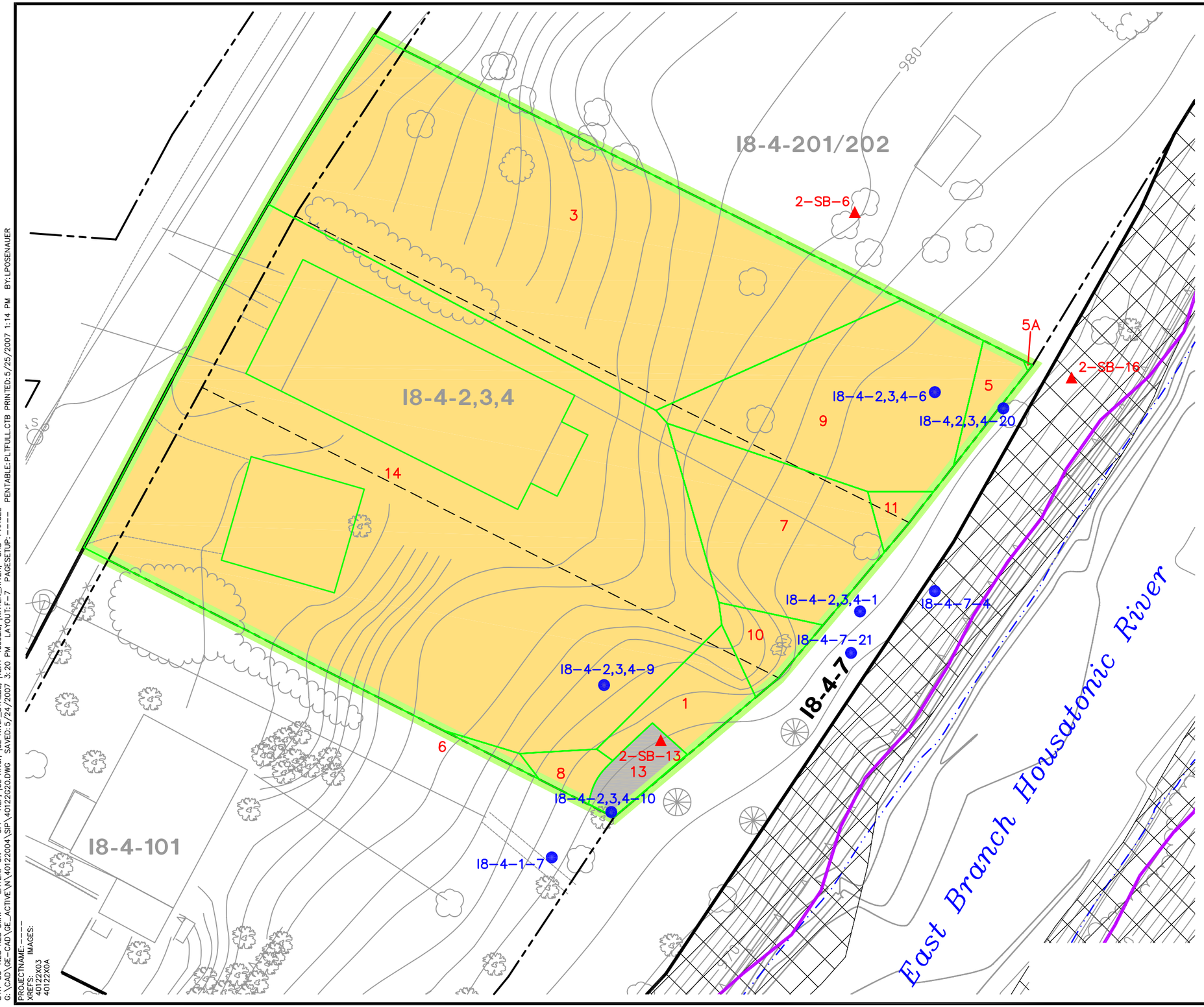
SUPPLEMENTAL INFORMATION PACKAGE
FOR SELECTED PHASE 2 FLOODPLAIN PROPERTIES

PARCEL I8-4-2, -3, -4
THEISSEN POLYGON MAP
3- TO 3.5-FOOT DEPTH INCREMENT

ARCADIS BBL
infrastructure, environment, facilities

FIGURE
F-6

SYR-85-NES KLS DMW LAYER: ON=* OFF=*REF, |CL River, |CL River_STALBL, |TEXT 40scale, |WATER_RIVER, *SHD-PARCEL
G:\CAD\GE-CAD\GE_ACTIVE\N\40122004\SIP\40122G19.DWG SAVED:5/24/2007 3:20 PM LAYOUT:F-6 PAGESETUP:----
PENTABLE:PLTFULL.CTB PRINTED:5/25/2007 1:13 PM BY:LPOSENAUER
PROJECTNAME:----
XREFS: IMAGES:
40122X03
40122X0A



LEGEND

- BOUNDARY OF FLOODPLAIN PROPERTIES DESIGNATED IN SOW (FOR PHASE 2)
- APPROXIMATE PARCEL BOUNDARY
- APPROXIMATE HORIZONTAL LIMITS OF AVERAGING AREA
- BOUNDARY BETWEEN COMMONLY OWNED TAX PARCELS
- I8-4-2,3,4 RESIDENTIAL PROPERTY PARCEL ID
- I8-4-7 NON-RESIDENTIAL PROPERTY PARCEL ID
- I8-4-2,3,4-9 PRE-2000 SOIL BORING LOCATION
- 2-SB-6 PRE-DESIGN (2003) SOIL BORING LOCATION
- 10 YEAR FLOODPLAIN
- WIRE FENCE
- CHAIN LINK FENCE
- W WATER LINE
- G GAS LINE
- S SANITARY SEWER
- D DRAIN LINE
- OH OVERHEAD ELECTRIC
- RETAINING WALL
- 980 ELEVATION CONTOUR (1 FOOT CONTOUR INTERVAL)
- ROCK
- EDGE OF BUSHES/HEDGE
- SHRUB
- DECIDUOUS TREE
- CONIFEROUS TREE
- D DRAIN MANHOLE
- WS WATER SHUTOFF
- APPROXIMATE EDGE OF WATER
- AREA ASSOCIATED WITH EPA'S 1 1/2 MILE REACH REMOVAL ACTION
- AREA OF PRIOR EXCAVATION (TO DEPTHS RANGING BETWEEN 1 AND 4 FEET)
- PROPERTY PREVIOUSLY REMEDIATED
- 3 HORIZONTAL LIMITS OF AREA ASSOCIATED WITH GIVEN SAMPLE, DEVELOPED USING THE THEISSEN POLYGON APPROACH. POLYGON ID

NOTES TO FIGURE:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE FROM PHASEIIBASE.DWG BY WESTON SOLUTIONS FOR THE DEPARTMENT OF THE ARMY CORPS OF ENGINEERS DATED 1/15/03.
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0 20' 40'

GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

SUPPLEMENTAL INFORMATION PACKAGE FOR SELECTED PHASE 2 FLOODPLAIN PROPERTIES

PARCEL I8-4-2, -3, -4 THEISSEN POLYGON MAP 3.5- TO 4-FOOT DEPTH INCREMENT

ARCADIS BBL
infrastructure, environment, facilities

FIGURE
F-7

SYR-85--NES KLS DMW LAYER: ON=* OFF=*REF ICL River ICL River_STALBL ITEXT 40scale IWATER_RIVER *SHD-PARCEL
G:\CAD\GE-CAD\GE_ACTIVE\NY\40122004\SIP\40122G20.DWG SAVED:5/24/2007 3:20 PM LAYOUT:F-7 PAGESETUP:---- PENTABLE:PLTFULL.CTB PRINTED:5/25/2007 1:14 PM BY:LPOSENAUER
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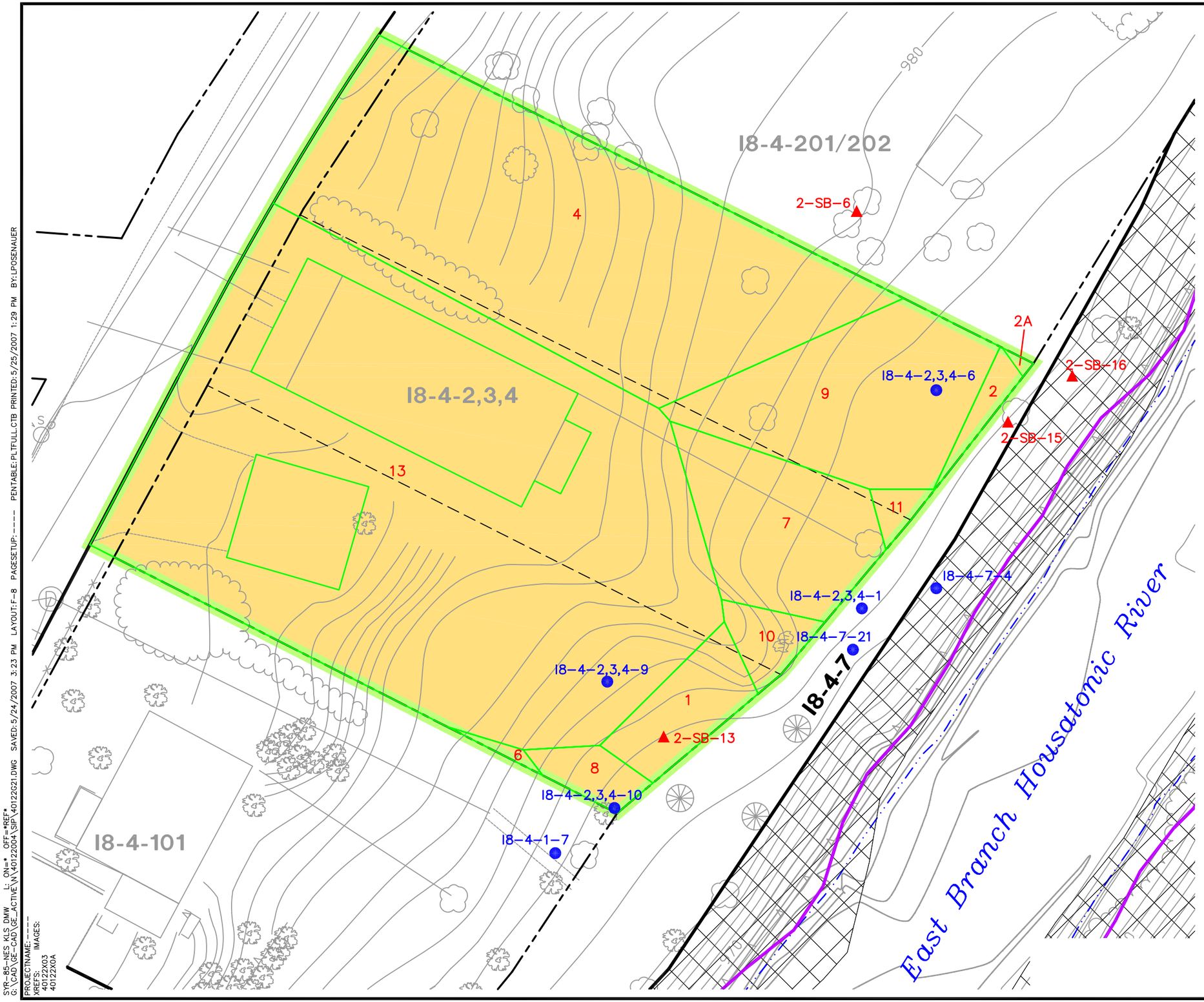

LEGEND

- BOUNDARY OF FLOODPLAIN PROPERTIES DESIGNATED IN SOW (FOR PHASE 2)
- APPROXIMATE PARCEL BOUNDARY
- APPROXIMATE HORIZONTAL LIMITS OF AVERAGING AREA
- BOUNDARY BETWEEN COMMONLY OWNED TAX PARCELS
- I8-4-2,3,4 — RESIDENTIAL PROPERTY PARCEL ID
- I8-4-7 — NON-RESIDENTIAL PROPERTY PARCEL ID
- I8-4-2,3,4-9 — PRE-2000 SOIL BORING LOCATION
- 2-SB-6 — PRE-DESIGN (2003) SOIL BORING LOCATION
- 10 YEAR FLOODPLAIN
- WIRE FENCE
- CHAIN LINK FENCE
- W — WATER LINE
- G — GAS LINE
- S — SANITARY SEWER
- D — DRAIN LINE
- OH — OVERHEAD ELECTRIC
- RETAINING WALL
- 980 — ELEVATION CONTOUR (1 FOOT CONTOUR INTERVAL)
- ROCK
- EDGE OF BUSHES/HEDGE
- SHRUB
- DECIDUOUS TREE
- CONIFEROUS TREE
- D — DRAIN MANHOLE
- WS — WATER SHUTOFF
- APPROXIMATE EDGE OF WATER
- AREA ASSOCIATED WITH EPA'S 1 1/2 MILE REACH REMOVAL ACTION
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- HORIZONTAL LIMITS OF AREA ASSOCIATED WITH GIVEN SAMPLE, DEVELOPED USING THE THEISSEN POLYGON APPROACH.
- 3 — POLYGON ID

NOTES TO FIGURE:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE FROM PHASEIIBASE.DWG BY WESTON SOLUTIONS FOR THE DEPARTMENT OF THE ARMY CORPS OF ENGINEERS DATED 1/15/03.
2. THE 10 YEAR FLOODPLAIN LINE IS APPROXIMATE AND WAS DERIVED USING HYDRAULIC MODELING PERFORMED BY BLASLAND, BOUCK & LEE, INC. (1994) AND AVAILABLE TOPOGRAPHIC MAPPING.
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4. SEE FIGURES 4, 5, AND 7 FOR ADDITIONAL INFORMATION RELATED TO ADJACENT PARCELS I8-4-201/202, I8-4-101, AND I8-4-7, RESPECTIVELY.

0 20' 40'

GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

SUPPLEMENTAL INFORMATION PACKAGE
FOR SELECTED PHASE 2 FLOODPLAIN PROPERTIES

PARCEL I8-4-2, -3, -4
THEISSEN POLYGON MAP
4- TO 5-FOOT DEPTH INCREMENT

ARCADIS BBL
infrastructure, environment, facilities

FIGURE
F-8

SYR-85-NES KLS DMW L: ON=* OFF=*REF*
G:\CAD\GE-CAD\GE_ACTIVE\W\40122004\SIP\40122G21.DWG SAVED:5/24/2007 3:23 PM LAYOUT:F-8 PAGESETUP:----- PENTABLE:PLTFULL.CTB PRINTED:5/25/2007 1:29 PM BY:LPOSENAUER
PROJECTNAME:----
XREFS: IMAGES:
40122X03
40122X0A

Parcel I8-4-7

TABLE F-5
EXISTING CONDITIONS
PARCEL I8-4-7: 0- TO 1-FOOT DEPTH INCREMENT

SUPPLEMENTAL INFORMATION PACKAGE FOR SELECTED PHASE 2 FLOODPLAIN PROPERTIES ADJACENT TO THE 1-1/2 MILE REACH OF HOUSATONIC RIVER

GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

0- TO 1-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
2-SB-5	31	26	0 - 1	2.33	0.96	2.33	2.23
2-SB-16	30, 30A, 30B	86	0 - 1	2	3.19	2.00	6.37
2-SS-12	32	22	0 - 1	50	0.81	50.00	40.26
I7-21-8-13	13	29	0 - 0.5	4.29	1.09	9.30	10.12
			0.5 - 1	14.3			
I8-4-7-23	11	1	0 - 0.5	9.07	0.04	16.73	0.60
			0.5 - 1	24.4			
I8-4-7-25	10	177	0 - 0.5	1.88	6.57	2.73	17.92
			0.5 - 1	3.58			
R54A100	27	746	0 - 0.5	**0.25**	27.63	0.25	6.91
			0.5 - 1	**0.25**			
R54B100	28	328	0 - 0.5	**0.25**	12.15	0.25	3.04
			0.5 - 1	**0.25**			
R54C100	29	373	0 - 0.5	**0.25**	13.82	0.25	3.45
			0.5 - 1	**0.25**			
R54D100	22	1,739	0 - 0.5	**0.25**	64.40	0.25	16.10
			0.5 - 1	**0.25**			
R93A125	23	140	0 - 0.5	0.1485	5.20	0.20	1.04
			0.5 - 1	**0.25**			
R93B125	24	293	0 - 0.5	27	10.85	51.50	558.64
			0.5 - 1	76			
R93C125	25	455	0 - 0.5	**0.3**	16.84	0.28	4.63
			0.5 - 1	**0.25**			
R93D125	26	1,106	0 - 0.5	**0.25**	40.96	0.25	10.24
			0.5 - 1	**0.25**			
Totals:	--	5,521	--	--	204.49	--	681.54
					Volume Weighted Average:		**3.33**

Notes:

1. Non-detectable PCBs included as one-half the detection limit in calculations and shown in bold.
2. For instances where a duplicate sample was available, the average of the samples was included in table.
3. All calculations and rounding are performed by the computer software. Therefore, certain quantities in above table are displayed as rounded numbers for table clarity.

TABLE F-6
EXISTING CONDITIONS
PARCEL I8-4-7: 1- TO 3-FOOT DEPTH INCREMENT

SUPPLEMENTAL INFORMATION PACKAGE FOR SELECTED PHASE 2 FLOODPLAIN PROPERTIES ADJACENT TO THE 1-1/2 MILE REACH OF HOUSATONIC RIVER

GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

1- TO 1.5-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
2-SB-16	30	73	1 - 1.5	0.219	1.35	0.22	0.30
I8-4-5-7	33	16	1 - 1.5	6.26	0.30	6.26	1.90
I8-4-5-8	31, 31A	32	1 - 1.5	0.148	0.59	0.15	0.09
I8-4-7-6	11	1	1 - 1.5	109	0.01	109.00	1.52
I8-4-7-15	32	12	1 - 1.5	11.4	0.22	11.40	2.50
I8-4-7-17	10	24	1 - 1.5	30.8	0.45	30.80	13.87
I8-4-7-23	9	1	1 - 1.5	204	0.02	204.00	3.66
I8-4-7-25	8	182	1 - 1.5	1.2	3.36	1.20	4.04
R54A100	27	746	1 - 1.5	**0.25**	13.81	0.25	3.45
R54B100	28	328	1 - 1.5	**0.25**	6.08	0.25	1.52
R54C100	29	373	1 - 1.5	**0.25**	6.91	0.25	1.73
R54D100	22	1,739	1 - 1.5	**0.25**	32.20	0.25	8.05
R93A125	23	140	1 - 1.5	**0.25**	2.60	0.25	0.65
R93B125	24	293	1 - 1.5	53	5.42	53.00	287.45
R93C125	25	455	1 - 1.5	**0.25**	8.42	0.25	2.11
R93D125	26	1,106	1 - 1.5	**0.3**	20.48	0.30	6.14
Totals:	--	5,521	--	--	102.24	--	338.97
					Volume Weighted Average:		**3.32**

1.5- TO 2-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
2-SB-16	30	73	1.5 - 2	0.219	1.35	0.22	0.30
I8-4-5-7	33	16	1.5 - 2	0.787	0.30	0.79	0.24
I8-4-5-8	31, 31A	32	1.5 - 2	0.258	0.59	0.26	0.15
I8-4-7-6	11	1	1.5 - 2	126	0.01	126.00	1.76
I8-4-7-15	32	12	1.5 - 2	3.92	0.22	3.92	0.86
I8-4-7-17	10	24	1.5 - 2	69	0.45	69.00	31.08
I8-4-7-23	9	1	1.5 - 2	354	0.02	354.00	6.35
I8-4-7-25	8	182	1.5 - 2	0.961	3.36	0.96	3.23
R54A100	27	746	1.5 - 2	25.65	13.81	25.65	354.31
R54B100	28	328	1.5 - 2	**0.25**	6.08	0.25	1.52
R54C100	29	373	1.5 - 2	**0.25**	6.91	0.25	1.73
R54D100	22	1,739	1.5 - 2	**0.25**	32.20	0.25	8.05
R93A125	23	140	1.5 - 2	**0.25**	2.60	0.25	0.65
R93B125	24	293	1.5 - 2	8.2	5.42	8.20	44.47
R93C125	25	455	1.5 - 2	**0.25**	8.42	0.25	2.11
R93D125	26	1,106	1.5 - 2	0.6	20.48	0.60	12.29
Totals:	--	5,521	--	--	102.24	--	469.09
					Volume Weighted Average:		**4.59**

2- TO 2.5-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
I8-4-5-7	8	16	2 - 2.5	5.04	0.30	5.04	1.53
I8-4-7-6	21	1	2 - 2.5	81.2	0.01	81.20	1.13
I8-4-7-15	6	35	2 - 2.5	7.69	0.65	7.69	5.01
I8-4-7-17	20	24	2 - 2.5	29	0.45	29.00	13.06
I8-4-7-21	15	8	2 - 2.5	8.17	0.15	8.17	1.19
I8-4-7-22	7	9	2 - 2.5	700	0.16	700.00	114.41
I8-4-7-23	29	1	2 - 2.5	263	0.02	263.00	4.72
I8-4-7-25	28	182	2 - 2.5	1.15	3.36	1.15	3.87
2-SB-16	4	5,245	2 - 2.5	0.219	97.13	0.22	21.27
Totals:	--	5,521	--	--	102.24	--	166.19
					Volume Weighted Average:		**1.63**

TABLE F-6
EXISTING CONDITIONS
PARCEL I8-4-7: 1- TO 3-FOOT DEPTH INCREMENT

SUPPLEMENTAL INFORMATION PACKAGE FOR SELECTED PHASE 2 FLOODPLAIN PROPERTIES ADJACENT TO THE 1-1/2 MILE REACH OF HOUSATONIC RIVER

GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

2.5- TO 3-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
I8-4-5-7	8	16	2.5 - 3	**0.05**	0.30	0.05	0.02
I8-4-7-6	21	1	2.5 - 3	26.3	0.01	26.30	0.37
I8-4-7-15	6	35	2.5 - 3	6.24	0.65	6.24	4.07
I8-4-7-17	20	24	2.5 - 3	65.4	0.45	65.40	29.46
I8-4-7-21	15	8	2.5 - 3	5.34	0.15	5.34	0.78
I8-4-7-22	7	9	2.5 - 3	6.8	0.16	6.80	1.11
I8-4-7-23	29	1	2.5 - 3	280	0.02	280.00	5.02
I8-4-7-25	28	182	2.5 - 3	15.1	3.36	15.10	50.78
2-SB-16	4	5,245	2.5 - 3	0.219	97.13	0.22	21.27
Totals:	--	5,521	--	--	102.24	--	112.87
					Volume Weighted Average:		**1.10**

SUMMARY - 1- TO 3-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
Totals:	--	5,521	--	--	408.95	--	1,087.13
					Volume Weighted Average:		**2.66**

Notes:

1. Non-detectable PCBs included as one-half the detection limit in calculations and shown in bold.
2. For instances where a duplicate sample was available, the average of the samples was included in table.
3. All calculations and rounding are performed by the computer software. Therefore, certain quantities in above table are displayed as rounded numbers for table clarity.

TABLE F-7
EXISTING CONDITIONS
PARCEL I8-4-7: 0- TO 15-FOOT DEPTH INCREMENT

SUPPLEMENTAL INFORMATION PACKAGE FOR SELECTED PHASE 2 FLOODPLAIN PROPERTIES ADJACENT TO THE 1-1/2 MILE REACH OF HOUSATONIC RIVER

GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

SUMMARY - 0- TO 1-FOOT DEPTH INCREMENT (TABLE F-5)

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
Totals:	--	5,521	--	--	204.49	--	681.54
					Volume Weighted Average:		**3.33**

SUMMARY - 1- TO 3-FOOT DEPTH INCREMENT (TABLE F-6)

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
Totals:	--	5,521	--	--	408.95	--	1,087.13
					Volume Weighted Average:		**2.66**

3- TO 4-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
2-SB-5	65	47	3 - 4	**0.023**	1.76	0.02	0.04
2-SB-7	51	334	3 - 4	3.7	12.39	3.70	45.83
2-SB-8	49	625	3 - 4	0.063	23.16	0.06	1.46
2-SB-9	47	414	3 - 4	0.074	15.34	0.07	1.14
2-SB-10	45	400	3 - 4	4.4	14.83	4.40	65.25
2-SB-11	44	417	3 - 4	0.078	15.43	0.08	1.20
2-SB-13	62	153	3 - 4	0.097	5.65	0.10	0.55
2-SB-16	64	93	3 - 4	0.027	3.46	0.03	0.09
I8-4-1-2	59	215	3 - 3.5	1.79	7.98	1.45	11.53
			3.5 - 4	1.1			
I8-4-1-7	60	189	3 - 3.5	15.8	6.98	13.70	95.69
			3.5 - 4	11.6			
I8-4-2,3,4-1	52	144	3 - 3.5	12.4	5.33	7.12	37.95
			3.5 - 4	1.84			
I8-4-2,3,4-10	61	136	3 - 3.5	14.605	5.03	21.55	108.43
			3.5 - 4	28.5			
I8-4-2,3,4-20	54	171	3 - 3.5	20.9	6.35	12.89	81.78
			3.5 - 4	4.87			
I8-4-7-1	58	198	3 - 3.5	32.3	7.32	73.15	535.11
			3.5 - 4	114			
I8-4-7-2	46	397	3 - 3.5	12.8	14.70	42.15	619.70
			3.5 - 4	71.5			
I8-4-7-3	48	333	3 - 3.5	117	12.34	78.80	972.57
			3.5 - 4	41			
I8-4-7-4	63	220	3 - 3.5	16.5	8.13	49.85	405.41
			3.5 - 4	83.2			
I8-4-7-5	50	274	3 - 3.5	4.5	10.13	23.50	238.14
			3.5 - 4	42.5			
I8-4-7-6	22	12	3 - 3.5	27.3	0.45	21.00	9.46
			3.5 - 4	14.7			
I8-4-7-18	57	80	3 - 3.5	38.9	2.97	25.35	75.19
			3.5 - 4	11.8			
I8-4-7-19	56	111	3 - 3.5	13.2	4.12	7.26	29.90
			3.5 - 4	1.32			
I8-4-7-20	55	192	3 - 3.5	108	7.11	82.70	588.16
			3.5 - 4	57.4			
I8-4-7-21	53	365	3 - 3.5	1.99	13.53	4.29	57.96
			3.5 - 4	6.58			
Totals:	--	5,521	--	--	204.48	--	3,982.52
					Volume Weighted Average:		**19.48**

TABLE F-7
EXISTING CONDITIONS
PARCEL I8-4-7: 0- TO 15-FOOT DEPTH INCREMENT

SUPPLEMENTAL INFORMATION PACKAGE FOR SELECTED PHASE 2 FLOODPLAIN PROPERTIES ADJACENT TO THE 1-1/2 MILE REACH OF HOUSATONIC RIVER

GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

4- TO 5-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
2-SB-5	65	47	4 - 5	**0.023**	1.76	0.02	0.04
2-SB-7	52	334	4 - 5	3.7	12.39	3.70	45.83
2-SB-8	51	625	4 - 5	0.063	23.16	0.06	1.46
2-SB-9	50	414	4 - 5	0.074	15.34	0.07	1.14
2-SB-10	49	400	4 - 5	4.4	14.83	4.40	65.25
2-SB-11	54	417	4 - 5	0.078	15.43	0.08	1.20
2-SB-13	62	153	4 - 5	0.097	5.65	0.10	0.55
2-SB-15	53	177	4 - 5	0.032	6.56	0.03	0.21
2-SB-16	64	99	4 - 5	0.027	3.68	0.03	0.10
I8-4-1-2	60	215	4 - 4.5	3.75	7.98	2.23	17.78
			4.5 - 5	0.708			
I8-4-1-7	58A	189	4 - 4.5	2.4	6.98	5.08	35.45
			4.5 - 5	7.75			
I8-4-2,3,4-1	44	144	4 - 4.5	3.12	5.33	1.97	10.52
			4.5 - 5	0.829			
I8-4-2,3,4-10	61	136	4 - 4.5	1.19	5.03	3.05	15.34
			4.5 - 5	4.91			
I8-4-7-1	58	198	4 - 4.5	19.1	7.32	12.70	92.90
			4.5 - 5	6.3			
I8-4-7-2	45	397	4 - 4.5	12.2	14.70	6.73	98.95
			4.5 - 5	1.26			
I8-4-7-3	47	333	4 - 4.5	43.1	12.34	49.60	612.18
			4.5 - 5	56			
I8-4-7-4	63	208	4 - 4.5	11.5	7.71	6.99	53.83
			4.5 - 5	2.47			
I8-4-7-5	48	274	4 - 4.5	19.2	10.13	22.50	228.01
			4.5 - 5	25.8			
I8-4-7-6	59	12	4 - 4.5	1.96	0.45	2.08	0.93
			4.5 - 5	2.19			
I8-4-7-18	57	80	4 - 4.5	0.431	2.97	0.55	1.63
			4.5 - 5	0.67			
I8-4-7-19	56	111	4 - 4.5	0.207	4.12	0.28	1.16
			4.5 - 5	0.354			
I8-4-7-20	55	192	4 - 4.5	0.392	7.12	0.50	3.57
			4.5 - 5	0.611			
I8-4-7-21	46	365	4 - 4.5	1.3	13.53	53.15	718.92
			4.5 - 5	105			
Totals:	--	5,521	--	--	204.49	--	2,006.94
					Volume Weighted Average:		**9.81**

5- TO 6-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
2-SB-7	43	334	5 - 6	3.7	12.39	3.70	45.83
2-SB-8	42	674	5 - 6	0.063	24.96	0.06	1.57
2-SB-9	41	489	5 - 6	0.074	18.11	0.07	1.34
2-SB-10	40	400	5 - 6	4.4	14.83	4.40	65.25
2-SB-11	45	417	5 - 6	0.078	15.43	0.08	1.20
2-SB-13	52	155	5 - 6	**0.0275**	5.73	0.03	0.16
2-SB-14	51	270	5 - 6	0.027	9.99	0.03	0.27
2-SB-15	44	324	5 - 6	0.032	11.99	0.03	0.38
I8-4-7-1	49	198	5 - 5.5	23.7	7.32	16.50	120.70
			5.5 - 6	9.3			
I8-4-7-2	36	397	5 - 5.5	165	14.70	122.60	1,802.50
			5.5 - 6	80.2			
I8-4-7-3	38	468	5 - 5.5	6.79	17.33	33.40	578.85
			5.5 - 6	60			

TABLE F-7
EXISTING CONDITIONS
PARCEL I8-4-7: 0- TO 15-FOOT DEPTH INCREMENT

SUPPLEMENTAL INFORMATION PACKAGE FOR SELECTED PHASE 2 FLOODPLAIN PROPERTIES ADJACENT TO THE 1-1/2 MILE REACH OF HOUSATONIC RIVER

GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

5- TO 6-FOOT DEPTH INCREMENT CONTINUED

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
I8-4-7-4	53	261	5 - 5.5	13.5	9.68	8.36	80.89
			5.5 - 6	3.22			
I8-4-7-5	39	278	5 - 5.5	60.8	10.30	36.35	374.45
			5.5 - 6	11.9			
I8-4-7-6	50	12	5 - 5.5	1.06	0.45	0.62	0.28
			5.5 - 6	0.182			
I8-4-7-18	48	80	5 - 5.5	0.67	2.97	0.64	1.90
			5.5 - 6	0.6095			
I8-4-7-19	47	116	5 - 5.5	0.354	4.31	0.20	0.87
			5.5 - 6	**0.05**			
I8-4-7-20	46	192	5 - 5.5	0.611	7.12	0.33	2.35
			5.5 - 6	**0.05**			
I8-4-7-21	37	456	5 - 5.5	105	16.89	65.00	1,097.91
			5.5 - 6	25			
Totals:	--	5,521	--	--	204.49	--	4,176.70
					Volume Weighted Average:		**20.42**

6- TO 6.5-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
2-SB-7	24	672	6 - 6.5	**0.0195**	12.45	0.02	0.24
2-SB-8	23	1,063	6 - 6.5	**0.02**	19.69	0.02	0.39
2-SB-9	22	981	6 - 6.5	**0.01975**	18.17	0.02	0.36
2-SB-10	21	718	6 - 6.5	**0.0195**	13.29	0.02	0.26
2-SB-11	26	488	6 - 6.5	**0.0185**	9.03	0.02	0.17
2-SB-13	29	173	6 - 6.5	**0.0275**	3.20	0.03	0.09
2-SB-14	28	355	6 - 6.5	0.027	6.57	0.03	0.18
2-SB-15	25	409	6 - 6.5	0.053	7.57	0.05	0.40
I8-4-7-17	27	31	6 - 6.5	0.164	0.57	0.16	0.09
I8-4-7-21	20	632	6 - 6.5	61.1	11.71	61.10	715.26
Totals:	--	5,521	--	--	102.24	--	717.44
					Volume Weighted Average:		**7.02**

6.5- TO 7-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
2-SB-7	22	672	6.5 - 7	**0.0195**	12.45	0.02	0.24
2-SB-8	21	1,063	6.5 - 7	**0.02**	19.69	0.02	0.39
2-SB-9	20	981	6.5 - 7	**0.01975**	18.17	0.02	0.36
2-SB-10	19	722	6.5 - 7	**0.0195**	13.37	0.02	0.26
2-SB-11	24	514	6.5 - 7	**0.0185**	9.52	0.02	0.18
2-SB-13	26	173	6.5 - 7	**0.0275**	3.20	0.03	0.09
2-SB-14	25	355	6.5 - 7	0.027	6.57	0.03	0.18
2-SB-15	23	409	6.5 - 7	0.053	7.57	0.05	0.40
I8-4-7-21	18	632	6.5 - 7	22.9	11.71	22.90	268.08
Totals:	--	5,521	--	--	102.24	--	270.18
					Volume Weighted Average:		**2.64**

TABLE F-7
EXISTING CONDITIONS
PARCEL I8-4-7: 0- TO 15-FOOT DEPTH INCREMENT

SUPPLEMENTAL INFORMATION PACKAGE FOR SELECTED PHASE 2 FLOODPLAIN PROPERTIES ADJACENT TO THE 1-1/2 MILE REACH OF HOUSATONIC RIVER

GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

7- TO 8-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
2-SB-7	20	820	7 - 8	**0.0195**	30.36	0.02	0.59
2-SB-8	19	1,063	7 - 8	**0.02**	39.37	0.02	0.79
2-SB-9	18	981	7 - 8	**0.01975**	36.34	0.02	0.72
2-SB-10	17	722	7 - 8	**0.0195**	26.74	0.02	0.52
2-SB-11	22	514	7 - 8	**0.0185**	19.05	0.02	0.35
2-SB-14	23	365	7 - 8	0.039	13.51	0.04	0.53
2-SB-15	21	409	7 - 8	0.053	15.14	0.05	0.80
I8-4-7-21	16	647	7 - 7.5	7.64	23.97	3.90	93.49
			7.5 - 8	0.16			
Totals:	--	5,521	--	--	204.48	--	97.79
					Volume Weighted Average:		**0.48**

8- TO 9-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
2-SB-7	18	820	8 - 9	**0.0195**	30.36	0.02	0.59
2-SB-8	17	1,063	8 - 9	**0.02**	39.37	0.02	0.79
2-SB-9	16	981	8 - 9	**0.01975**	36.34	0.02	0.72
2-SB-10	15	722	8 - 9	**0.0195**	26.74	0.02	0.52
2-SB-11	19	514	8 - 9	**0.0185**	19.05	0.02	0.35
2-SB-14	20	365	8 - 9	0.039	13.51	0.04	0.53
I8-4-7-21	14	1,056	8 - 8.5	0.349	39.12	0.31	11.97
			8.5 - 9	0.263			
Totals:	--	5,521	--	--	204.49	--	15.47
					Volume Weighted Average:		**0.08**

9- TO 10-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
2-SB-7	13	2,139	9 - 10	**0.0195**	79.22	0.02	1.54
2-SB-8	12	1,165	9 - 10	**0.02**	43.13	0.02	0.86
2-SB-9	11	981	9 - 10	**0.01975**	36.34	0.02	0.72
2-SB-10	10	722	9 - 10	**0.0195**	26.74	0.02	0.52
2-SB-11	14	514	9 - 10	**0.0185**	19.05	0.02	0.35
Totals:	--	5,521	--	--	204.49	--	4.00
					Volume Weighted Average:		**0.02**

10- TO 12-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
2-SB-8	7	3,304	10 - 12	**0.0185**	244.72	0.02	4.53
2-SB-9	6	1,395	10 - 12	**0.019**	103.35	0.02	1.96
2-SB-11	8	822	10 - 12	**0.0185**	60.91	0.02	1.13
Totals:	--	5,521	--	--	408.98	--	7.62
					Volume Weighted Average:		**0.02**

TABLE F-7
EXISTING CONDITIONS
PARCEL I8-4-7: 0- TO 15-FOOT DEPTH INCREMENT

SUPPLEMENTAL INFORMATION PACKAGE FOR SELECTED PHASE 2 FLOODPLAIN PROPERTIES ADJACENT TO THE 1-1/2 MILE REACH OF HOUSATONIC RIVER

GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

12- TO 15-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
2-SB-8	5	3,304	12 - 15	**0.0185**	367.07	0.02	6.79
2-SB-9	4	2,218	12 - 15	**0.019**	246.39	0.02	4.68
Totals:	--	5,521	--	--	613.47	--	11.47
					Volume Weighted Average:		**0.02**

SUMMARY - 0- TO 15-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
Totals:	--	5,521	--	--	3,067.30	--	13,058.80
					Volume Weighted Average:		**4.26**

Notes:

1. Non-detectable PCBs included as one-half the detection limit in calculations and shown in bold.
2. For instances where a duplicate sample was available, the average of the samples was included in table.
3. All calculations and rounding are performed by the computer software. Therefore, certain quantities in above table are displayed as rounded numbers for table clarity.

TABLE F-8
POST-REMEDIATION CONDITIONS
PARCEL I8-4-7: 0- TO 1-FOOT DEPTH INCREMENT

SUPPLEMENTAL INFORMATION PACKAGE FOR SELECTED PHASE 2 FLOODPLAIN PROPERTIES ADJACENT TO THE 1-1/2 MILE REACH OF HOUSATONIC RIVER

GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

0- TO 1-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
2-SB-5	31	26	0 - 1	2.33	0.96	2.33	2.23
2-SB-16	30, 30B	77	0 - 1	2	2.86	2.00	5.72
2-SB-16	30A	9	0 - 1	***0.021***	0.33	0.02	0.01
2-SS-12	32	22	0 - 1	***0.021***	0.81	0.02	0.02
I7-21-8-13	13	29	0 - 0.5	4.29	1.09	9.30	10.12
			0.5 - 1	14.3			
I8-4-7-23	11	1	0 - 0.5	9.07	0.04	16.73	0.60
			0.5 - 1	24.4			
I8-4-7-25	10	177	0 - 0.5	1.88	6.57	2.73	17.92
			0.5 - 1	3.58			
R54A100	27	746	0 - 0.5	**0.25**	27.63	0.25	6.91
			0.5 - 1	**0.25**			
R54B100	28	328	0 - 0.5	**0.25**	12.15	0.25	3.04
			0.5 - 1	**0.25**			
R54C100	29	373	0 - 0.5	**0.25**	13.82	0.25	3.45
			0.5 - 1	**0.25**			
R54D100	22	1,739	0 - 0.5	**0.25**	64.40	0.25	16.10
			0.5 - 1	**0.25**			
R93A125	23	140	0 - 0.5	0.1485	5.20	0.20	1.04
			0.5 - 1	**0.25**			
R93B125	24	293	0 - 0.5	***0.021***	10.85	0.02	0.23
			0.5 - 1	***0.021***			
R93C125	25	455	0 - 0.5	**0.3**	16.84	0.28	4.63
			0.5 - 1	**0.25**			
R93D125	26	1,106	0 - 0.5	**0.25**	40.96	0.25	10.24
			0.5 - 1	**0.25**			
Totals:	--	5,521	--	--	204.49	--	82.24
					Volume Weighted Average:		**0.40**

Notes:

1. Non-detectable PCBs included as one-half the detection limit in calculations and shown in bold.
2. For instances where a duplicate sample was available, the average of the samples was included in table.
3. All calculations and rounding are performed by the computer software. Therefore, certain quantities in above table are displayed as rounded numbers for table clarity.
4. Shaded numbers in bold and italics represent the placement of clean backfill material following the performance of the proposed remediation. The backfill concentration corresponds to the average PCB concentration as presented in the CD Sites Backfill Data Set.

TABLE F-9
POST-REMEDIATION CONDITIONS
PARCEL I8-4-7: 1- TO 3-FOOT DEPTH INCREMENT

SUPPLEMENTAL INFORMATION PACKAGE FOR SELECTED PHASE 2 FLOODPLAIN PROPERTIES ADJACENT TO THE 1-1/2 MILE REACH OF HOUSATONIC RIVER

GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

1- TO 1.5-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
2-SB-16	30	73	1 - 1.5	0.219	1.35	0.22	0.30
I8-4-5-7	33	16	1 - 1.5	6.26	0.30	6.26	1.90
I8-4-5-8	31	23	1 - 1.5	0.148	0.43	0.15	0.06
I8-4-5-8	31A	9	1 - 1.5	***0.021***	0.16	0.02	0.00
I8-4-7-6	11	1	1 - 1.5	109	0.01	109.00	1.52
I8-4-7-15	32	12	1 - 1.5	11.4	0.22	11.40	2.50
I8-4-7-17	10	24	1 - 1.5	30.8	0.45	30.80	13.87
I8-4-7-23	9	1	1 - 1.5	204	0.02	204.00	3.66
I8-4-7-25	8	182	1 - 1.5	1.2	3.36	1.20	4.04
R54A100	27	746	1 - 1.5	**0.25**	13.81	0.25	3.45
R54B100	28	328	1 - 1.5	**0.25**	6.08	0.25	1.52
R54C100	29	373	1 - 1.5	**0.25**	6.91	0.25	1.73
R54D100	22	1,739	1 - 1.5	**0.25**	32.20	0.25	8.05
R93A125	23	140	1 - 1.5	**0.25**	2.60	0.25	0.65
R93B125	24	293	1 - 1.5	***0.021***	5.42	0.02	0.11
R93C125	25	455	1 - 1.5	**0.25**	8.42	0.25	2.11
R93D125	26	1,106	1 - 1.5	**0.3**	20.48	0.30	6.14
Totals:	--	5,521	--	--	102.24	--	51.61
					Volume Weighted Average:		**0.50**

1.5- TO 2-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
2-SB-16	30	73	1.5 - 2	0.219	1.35	0.22	0.30
I8-4-5-7	33	16	1.5 - 2	0.787	0.30	0.79	0.24
I8-4-5-8	31	23	1.5 - 2	0.258	0.43	0.26	0.11
I8-4-5-8	31A	9	1.5 - 2	***0.021***	0.16	0.02	0.00
I8-4-7-6	11	1	1.5 - 2	126	0.01	126.00	1.76
I8-4-7-15	32	12	1.5 - 2	3.92	0.22	3.92	0.86
I8-4-7-17	10	24	1.5 - 2	69	0.45	69.00	31.08
I8-4-7-23	9	1	1.5 - 2	354	0.02	354.00	6.35
I8-4-7-25	8	182	1.5 - 2	0.961	3.36	0.96	3.23
R54A100	27	746	1.5 - 2	25.65	13.81	25.65	354.31
R54B100	28	328	1.5 - 2	**0.25**	6.08	0.25	1.52
R54C100	29	373	1.5 - 2	**0.25**	6.91	0.25	1.73
R54D100	22	1,739	1.5 - 2	**0.25**	32.20	0.25	8.05
R93A125	23	140	1.5 - 2	**0.25**	2.60	0.25	0.65
R93B125	24	293	1.5 - 2	8.2	5.42	8.20	44.47
R93C125	25	455	1.5 - 2	**0.25**	8.42	0.25	2.11
R93D125	26	1,106	1.5 - 2	0.6	20.48	0.60	12.29
Totals:	--	5,521	--	--	102.24	--	469.06
					Volume Weighted Average:		**4.59**

2- TO 2.5-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
I8-4-5-7	8	16	2 - 2.5	5.04	0.30	5.04	1.53
I8-4-7-6	21	1	2 - 2.5	81.2	0.01	81.20	1.13
I8-4-7-15	6	35	2 - 2.5	7.69	0.65	7.69	5.01
I8-4-7-17	20	24	2 - 2.5	29	0.45	29.00	13.06
I8-4-7-21	15	8	2 - 2.5	8.17	0.15	8.17	1.19
I8-4-7-22	7	9	2 - 2.5	***0.021***	0.16	0.02	0.00
I8-4-7-23	29	1	2 - 2.5	263	0.02	263.00	4.72
I8-4-7-25	28	182	2 - 2.5	1.15	3.36	1.15	3.87
2-SB-16	4	5,245	2 - 2.5	0.219	97.13	0.22	21.27
Totals:	--	5,521	--	--	102.24	--	51.79
					Volume Weighted Average:		**0.51**

TABLE F-9
POST-REMEDIATION CONDITIONS
PARCEL I8-4-7: 1- TO 3-FOOT DEPTH INCREMENT

SUPPLEMENTAL INFORMATION PACKAGE FOR SELECTED PHASE 2 FLOODPLAIN PROPERTIES ADJACENT TO THE 1-1/2 MILE REACH OF HOUSATONIC RIVER

GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

2.5- TO 3-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
I8-4-5-7	8	16	2.5 - 3	**0.05**	0.30	0.05	0.02
I8-4-7-6	21	1	2.5 - 3	26.3	0.01	26.30	0.37
I8-4-7-15	6	35	2.5 - 3	6.24	0.65	6.24	4.07
I8-4-7-17	20	24	2.5 - 3	65.4	0.45	65.40	29.46
I8-4-7-21	15	8	2.5 - 3	5.34	0.15	5.34	0.78
I8-4-7-22	7	9	2.5 - 3	6.8	0.16	6.80	1.11
I8-4-7-23	29	1	2.5 - 3	280	0.02	280.00	5.02
I8-4-7-25	28	182	2.5 - 3	15.1	3.36	15.10	50.78
2-SB-16	4	5,245	2.5 - 3	0.219	97.13	0.22	21.27
Totals:	--	5,521	--	--	102.24	--	112.87
					Volume Weighted Average:		**1.10**

SUMMARY - 1- TO 3-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
Totals:	--	5,521	--	--	408.95	--	685.32
					Volume Weighted Average:		**1.68**

Notes:

1. Non-detectable PCBs included as one-half the detection limit in calculations and shown in bold.
2. For instances where a duplicate sample was available, the average of the samples was included in table.
3. All calculations and rounding are performed by the computer software. Therefore, certain quantities in above table are displayed as rounded numbers for table clarity.
4. Shaded numbers in bold and italics represent the placement of clean backfill material following the performance of the proposed remediation. The backfill concentration corresponds to the average PCB concentration as presented in the CD Sites Backfill Data Set.

TABLE F-10
POST-REMEDIATION CONDITIONS
PARCEL I8-4-7: 0- TO 15-FOOT DEPTH INCREMENT

SUPPLEMENTAL INFORMATION PACKAGE FOR SELECTED PHASE 2 FLOODPLAIN PROPERTIES ADJACENT TO THE 1-1/2 MILE REACH OF HOUSATONIC RIVER

GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

SUMMARY - 0- TO 1-FOOT DEPTH INCREMENT (TABLE F-8)

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
Totals:	--	5,521	--	--	204.49	--	82.24
					Volume Weighted Average:		**0.40**

SUMMARY - 1- TO 3-FOOT DEPTH INCREMENT (TABLE F-9)

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
Totals:	--	5,521	--	--	408.95	--	685.32
					Volume Weighted Average:		**1.68**

3- TO 4-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
2-SB-5	65	47	3 - 4	**0.023**	1.76	0.02	0.04
2-SB-7	51	334	3 - 4	3.7	12.39	3.70	45.83
2-SB-8	49	625	3 - 4	0.063	23.16	0.06	1.46
2-SB-9	47	414	3 - 4	0.074	15.34	0.07	1.14
2-SB-10	45	400	3 - 4	4.4	14.83	4.40	65.25
2-SB-11	44	417	3 - 4	0.078	15.43	0.08	1.20
2-SB-13	62	153	3 - 4	0.097	5.65	0.10	0.55
2-SB-16	64	93	3 - 4	0.027	3.46	0.03	0.09
I8-4-1-2	59	215	3 - 3.5	1.79	7.98	1.45	11.53
			3.5 - 4	1.1			
I8-4-1-7	60	189	3 - 3.5	15.8	6.98	13.70	95.69
			3.5 - 4	11.6			
I8-4-2,3,4-1	52	144	3 - 3.5	12.4	5.33	7.12	37.95
			3.5 - 4	1.84			
I8-4-2,3,4-10	61	136	3 - 3.5	14.605	5.03	21.55	108.43
			3.5 - 4	28.5			
I8-4-2,3,4-20	54	171	3 - 3.5	20.9	6.35	12.89	81.78
			3.5 - 4	4.87			
I8-4-7-1	58	198	3 - 3.5	32.3	7.32	73.15	535.11
			3.5 - 4	114			
I8-4-7-2	46	397	3 - 3.5	12.8	14.70	42.15	619.70
			3.5 - 4	71.5			
I8-4-7-3	48	333	3 - 3.5	117	12.34	78.80	972.57
			3.5 - 4	41			
I8-4-7-4	63	220	3 - 3.5	16.5	8.13	49.85	405.41
			3.5 - 4	83.2			
I8-4-7-5	50	274	3 - 3.5	4.5	10.13	23.50	238.14
			3.5 - 4	42.5			
I8-4-7-6	22	12	3 - 3.5	27.3	0.45	21.00	9.46
			3.5 - 4	14.7			
I8-4-7-18	57	80	3 - 3.5	38.9	2.97	25.35	75.19
			3.5 - 4	11.8			
I8-4-7-19	56	111	3 - 3.5	13.2	4.12	7.26	29.90
			3.5 - 4	1.32			
I8-4-7-20	55	192	3 - 3.5	108	7.11	82.70	588.16
			3.5 - 4	57.4			
I8-4-7-21	53	365	3 - 3.5	1.99	13.53	4.29	57.96
			3.5 - 4	6.58			
Totals:	--	5,521	--	--	204.48	--	3,982.52
					Volume Weighted Average:		**19.48**

TABLE F-10
POST-REMEDIATION CONDITIONS
PARCEL I8-4-7: 0- TO 15-FOOT DEPTH INCREMENT

SUPPLEMENTAL INFORMATION PACKAGE FOR SELECTED PHASE 2 FLOODPLAIN PROPERTIES ADJACENT TO THE 1-1/2 MILE REACH OF HOUSATONIC RIVER

GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

4- TO 5-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
2-SB-5	65	47	4 - 5	**0.023**	1.76	0.02	0.04
2-SB-7	52	334	4 - 5	3.7	12.39	3.70	45.83
2-SB-8	51	625	4 - 5	0.063	23.16	0.06	1.46
2-SB-9	50	414	4 - 5	0.074	15.34	0.07	1.14
2-SB-10	49	400	4 - 5	4.4	14.83	4.40	65.25
2-SB-11	54	417	4 - 5	0.078	15.43	0.08	1.20
2-SB-13	62	153	4 - 5	0.097	5.65	0.10	0.55
2-SB-15	53	177	4 - 5	0.032	6.56	0.03	0.21
2-SB-16	64	99	4 - 5	0.027	3.68	0.03	0.10
I8-4-1-2	60	215	4 - 4.5	3.75	7.98	2.23	17.78
			4.5 - 5	0.708			
I8-4-1-7	58A	189	4 - 4.5	2.4	6.98	5.08	35.45
			4.5 - 5	7.75			
I8-4-2,3,4-1	44	144	4 - 4.5	3.12	5.33	1.97	10.52
			4.5 - 5	0.829			
I8-4-2,3,4-10	61	136	4 - 4.5	1.19	5.03	3.05	15.34
			4.5 - 5	4.91			
I8-4-7-1	58	198	4 - 4.5	19.1	7.32	12.70	92.90
			4.5 - 5	6.3			
I8-4-7-2	45	397	4 - 4.5	12.2	14.70	6.73	98.95
			4.5 - 5	1.26			
I8-4-7-3	47	333	4 - 4.5	43.1	12.34	49.60	612.18
			4.5 - 5	56			
I8-4-7-4	63	208	4 - 4.5	11.5	7.71	6.99	53.83
			4.5 - 5	2.47			
I8-4-7-5	48	274	4 - 4.5	19.2	10.13	22.50	228.01
			4.5 - 5	25.8			
I8-4-7-6	59	12	4 - 4.5	1.96	0.45	2.08	0.93
			4.5 - 5	2.19			
I8-4-7-18	57	80	4 - 4.5	0.431	2.97	0.55	1.63
			4.5 - 5	0.67			
I8-4-7-19	56	111	4 - 4.5	0.207	4.12	0.28	1.16
			4.5 - 5	0.354			
I8-4-7-20	55	192	4 - 4.5	0.392	7.12	0.50	3.57
			4.5 - 5	0.611			
I8-4-7-21	46	365	4 - 4.5	1.3	13.53	53.15	718.92
			4.5 - 5	105			
Totals:	--	5,521	--	--	204.49	--	2,006.94
					Volume Weighted Average:		**9.81**

5- TO 6-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
2-SB-7	43	334	5 - 6	3.7	12.39	3.70	45.83
2-SB-8	42	674	5 - 6	0.063	24.96	0.06	1.57
2-SB-9	41	489	5 - 6	0.074	18.11	0.07	1.34
2-SB-10	40	400	5 - 6	4.4	14.83	4.40	65.25
2-SB-11	45	417	5 - 6	0.078	15.43	0.08	1.20
2-SB-13	52	155	5 - 6	**0.0275**	5.73	0.03	0.16
2-SB-14	51	270	5 - 6	0.027	9.99	0.03	0.27
2-SB-15	44	324	5 - 6	0.032	11.99	0.03	0.38
I8-4-7-1	49	198	5 - 5.5	23.7	7.32	16.50	120.70
			5.5 - 6	9.3			
I8-4-7-2	36	397	5 - 5.5	165	14.70	122.60	1,802.50
			5.5 - 6	80.2			
I8-4-7-3	38	468	5 - 5.5	6.79	17.33	33.40	578.85
			5.5 - 6	60			

TABLE F-10
POST-REMEDIATION CONDITIONS
PARCEL I8-4-7: 0- TO 15-FOOT DEPTH INCREMENT

SUPPLEMENTAL INFORMATION PACKAGE FOR SELECTED PHASE 2 FLOODPLAIN PROPERTIES ADJACENT TO THE 1-1/2 MILE REACH OF HOUSATONIC RIVER

GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

5- TO 6-FOOT DEPTH INCREMENT CONTINUED

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
I8-4-7-4	53	261	5 - 5.5	13.5	9.68	8.36	80.89
			5.5 - 6	3.22			
I8-4-7-5	39	278	5 - 5.5	60.8	10.30	36.35	374.45
			5.5 - 6	11.9			
I8-4-7-6	50	12	5 - 5.5	1.06	0.45	0.62	0.28
			5.5 - 6	0.182			
I8-4-7-18	48	80	5 - 5.5	0.67	2.97	0.64	1.90
			5.5 - 6	0.6095			
I8-4-7-19	47	116	5 - 5.5	0.354	4.31	0.20	0.87
			5.5 - 6	**0.05**			
I8-4-7-20	46	192	5 - 5.5	0.611	7.12	0.33	2.35
			5.5 - 6	**0.05**			
I8-4-7-21	37	456	5 - 5.5	105	16.89	65.00	1,097.91
			5.5 - 6	25			
Totals:	--	5,521	--	--	204.49	--	4,176.70
					Volume Weighted Average:		**20.42**

6- TO 6.5-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
2-SB-7	24	672	6 - 6.5	**0.0195**	12.45	0.02	0.24
2-SB-8	23	1,063	6 - 6.5	**0.02**	19.69	0.02	0.39
2-SB-9	22	981	6 - 6.5	**0.01975**	18.17	0.02	0.36
2-SB-10	21	718	6 - 6.5	**0.0195**	13.29	0.02	0.26
2-SB-11	26	488	6 - 6.5	**0.0185**	9.03	0.02	0.17
2-SB-13	29	173	6 - 6.5	**0.0275**	3.20	0.03	0.09
2-SB-14	28	355	6 - 6.5	0.027	6.57	0.03	0.18
2-SB-15	25	409	6 - 6.5	0.053	7.57	0.05	0.40
I8-4-7-17	27	31	6 - 6.5	0.164	0.57	0.16	0.09
I8-4-7-21	20	632	6 - 6.5	61.1	11.71	61.10	715.26
Totals:	--	5,521	--	--	102.24	--	717.44
					Volume Weighted Average:		**7.02**

6.5- TO 7-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
2-SB-7	22	672	6.5 - 7	**0.0195**	12.45	0.02	0.24
2-SB-8	21	1,063	6.5 - 7	**0.02**	19.69	0.02	0.39
2-SB-9	20	981	6.5 - 7	**0.01975**	18.17	0.02	0.36
2-SB-10	19	722	6.5 - 7	**0.0195**	13.37	0.02	0.26
2-SB-11	24	514	6.5 - 7	**0.0185**	9.52	0.02	0.18
2-SB-13	26	173	6.5 - 7	**0.0275**	3.20	0.03	0.09
2-SB-14	25	355	6.5 - 7	0.027	6.57	0.03	0.18
2-SB-15	23	409	6.5 - 7	0.053	7.57	0.05	0.40
I8-4-7-21	18	632	6.5 - 7	22.9	11.71	22.90	268.08
Totals:	--	5,521	--	--	102.24	--	270.18
					Volume Weighted Average:		**2.64**

TABLE F-10
POST-REMEDIATION CONDITIONS
PARCEL I8-4-7: 0- TO 15-FOOT DEPTH INCREMENT

SUPPLEMENTAL INFORMATION PACKAGE FOR SELECTED PHASE 2 FLOODPLAIN PROPERTIES ADJACENT TO THE 1-1/2 MILE REACH OF HOUSATONIC RIVER

GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

7- TO 8-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
2-SB-7	20	820	7 - 8	**0.0195**	30.36	0.02	0.59
2-SB-8	19	1,063	7 - 8	**0.02**	39.37	0.02	0.79
2-SB-9	18	981	7 - 8	**0.01975**	36.34	0.02	0.72
2-SB-10	17	722	7 - 8	**0.0195**	26.74	0.02	0.52
2-SB-11	22	514	7 - 8	**0.0185**	19.05	0.02	0.35
2-SB-14	23	365	7 - 8	0.039	13.51	0.04	0.53
2-SB-15	21	409	7 - 8	0.053	15.14	0.05	0.80
I8-4-7-21	16	647	7 - 7.5	7.64	23.97	3.90	93.49
			7.5 - 8	0.16			
Totals:	--	5,521	--	--	204.48	--	97.79
					Volume Weighted Average:		**0.48**

8- TO 9-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
2-SB-7	18	820	8 - 9	**0.0195**	30.36	0.02	0.59
2-SB-8	17	1,063	8 - 9	**0.02**	39.37	0.02	0.79
2-SB-9	16	981	8 - 9	**0.01975**	36.34	0.02	0.72
2-SB-10	15	722	8 - 9	**0.0195**	26.74	0.02	0.52
2-SB-11	19	514	8 - 9	**0.0185**	19.05	0.02	0.35
2-SB-14	20	365	8 - 9	0.039	13.51	0.04	0.53
I8-4-7-21	14	1,056	8 - 8.5	0.349	39.12	0.31	11.97
			8.5 - 9	0.263			
Totals:	--	5,521	--	--	204.49	--	15.47
					Volume Weighted Average:		**0.08**

9- TO 10-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
2-SB-7	13	2,139	9 - 10	**0.0195**	79.22	0.02	1.54
2-SB-8	12	1,165	9 - 10	**0.02**	43.13	0.02	0.86
2-SB-9	11	981	9 - 10	**0.01975**	36.34	0.02	0.72
2-SB-10	10	722	9 - 10	**0.0195**	26.74	0.02	0.52
2-SB-11	14	514	9 - 10	**0.0185**	19.05	0.02	0.35
Totals:	--	5,521	--	--	204.49	--	4.00
					Volume Weighted Average:		**0.02**

10- TO 12-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
2-SB-8	7	3,304	10 - 12	**0.0185**	244.72	0.02	4.53
2-SB-9	6	1,395	10 - 12	**0.019**	103.35	0.02	1.96
2-SB-11	8	822	10 - 12	**0.0185**	60.91	0.02	1.13
Totals:	--	5,521	--	--	408.98	--	7.62
					Volume Weighted Average:		**0.02**

TABLE F-10
POST-REMEDIATION CONDITIONS
PARCEL I8-4-7: 0- TO 15-FOOT DEPTH INCREMENT

SUPPLEMENTAL INFORMATION PACKAGE FOR SELECTED PHASE 2 FLOODPLAIN PROPERTIES ADJACENT TO THE 1-1/2 MILE REACH OF HOUSATONIC RIVER

GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

12- TO 15-FOOT DEPTH INCREMENT

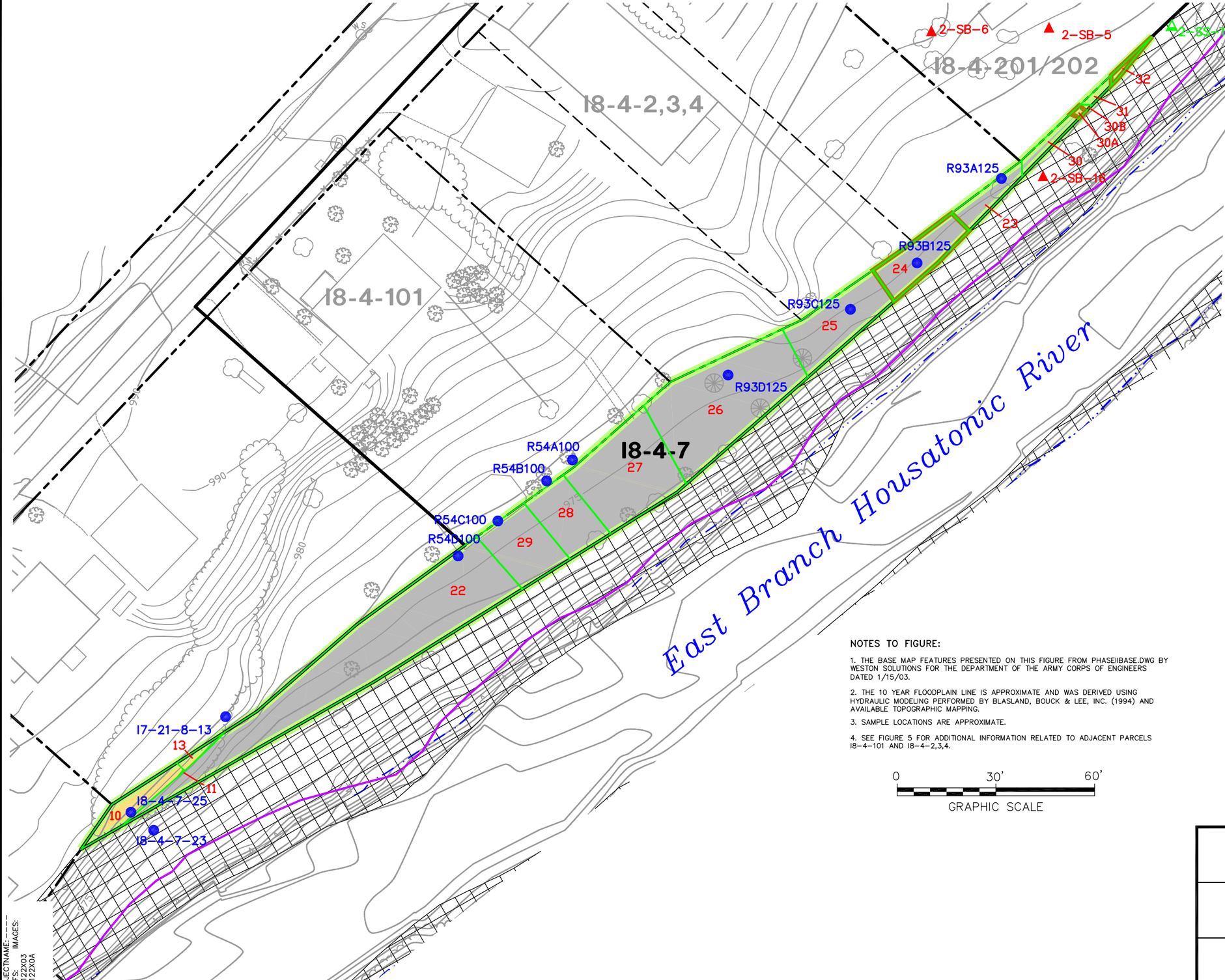
Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
2-SB-8	5	3,304	12 - 15	**0.0185**	367.07	0.02	6.79
2-SB-9	4	2,218	12 - 15	**0.019**	246.39	0.02	4.68
Totals:	--	5,521	--	--	613.47	--	11.47
					Volume Weighted Average:		**0.02**

SUMMARY - 0- TO 15-FOOT DEPTH INCREMENT

Sample ID(s)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	Volume (cumulative) (cy)	Average PCB Concentration Per Foot	Average PCB Conc. TIMES Total Volume
Totals:	--	5,521	--	--	3,067.30	--	12,057.69
					Volume Weighted Average:		**3.93**

Notes:

1. Non-detectable PCBs included as one-half the detection limit in calculations and shown in bold.
2. For instances where a duplicate sample was available, the average of the samples was included in table.
3. All calculations and rounding are performed by the computer software. Therefore, certain quantities in above table are displayed as rounded numbers for table clarity.



LEGEND

- BOUNDARY OF FLOODPLAIN PROPERTIES DESIGNATED IN SOW (FOR PHASE 2)
- APPROXIMATE PARCEL BOUNDARY
- APPROXIMATE HORIZONTAL LIMITS OF AVERAGING AREA
- BOUNDARY BETWEEN COMMONLY OWNED TAX PARCELS
- I8-4-101 — RESIDENTIAL PROPERTY PARCEL ID
- I8-4-7 — NON-RESIDENTIAL PROPERTY PARCEL ID
- I8-4-7-23 — PRE-2000 SOIL BORING LOCATION
- 2-SS-12 — PRE-DESIGN (2003) SURFACE SOIL SAMPLE LOCATION
- 2-SB-5 — PRE-DESIGN (2003) SOIL BORING LOCATION
- 10 YEAR FLOODPLAIN
- WIRE FENCE
- CHAIN LINK FENCE
- WATER LINE
- GAS LINE
- SANITARY SEWER
- DRAIN LINE
- OVERHEAD ELECTRIC
- RETAINING WALL
- 980 — ELEVATION CONTOUR (1 FOOT CONTOUR INTERVAL)
- ROCK
- EDGE OF BUSHES/HEDGE
- SHRUB
- DECIDUOUS TREE
- CONIFEROUS TREE
- D — DRAIN MANHOLE
- WS — WATER SHUTOFF
- APPROXIMATE EDGE OF WATER
- AREA ASSOCIATED WITH EPA'S 1 1/2 MILE REACH REMOVAL ACTION
- AREA OF PRIOR EXCAVATION (TO DEPTHS RANGING BETWEEN 1 AND 3 FEET)
- PROPERTY PREVIOUSLY REMEDIATED
- HORIZONTAL LIMITS OF AREA ASSOCIATED WITH GIVEN SAMPLE, DEVELOPED USING THE THEISSEN POLYGON APPROACH.
- 24 — POLYGON ID
- AREA PROPOSED FOR SOIL REMOVAL

NOTES TO FIGURE:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE FROM PHASEIIBASE.DWG BY WESTON SOLUTIONS FOR THE DEPARTMENT OF THE ARMY CORPS OF ENGINEERS DATED 1/15/03.
2. THE 10 YEAR FLOODPLAIN LINE IS APPROXIMATE AND WAS DERIVED USING HYDRAULIC MODELING PERFORMED BY BLASLAND, BOUCK & LEE, INC. (1994) AND AVAILABLE TOPOGRAPHIC MAPPING.
3. SAMPLE LOCATIONS ARE APPROXIMATE.
4. SEE FIGURE 5 FOR ADDITIONAL INFORMATION RELATED TO ADJACENT PARCELS I8-4-101 AND I8-4-2,3,4.

0 30' 60'
GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
SUPPLEMENTAL INFORMATION PACKAGE
FOR SELECTED PHASE 2 FLOODPLAIN PROPERTIES

PARCEL I8-4-7
THEISSEN POLYGON MAP
0- TO 1-FOOT DEPTH INCREMENT

ARCADIS BBL
infrastructure, environment, facilities

FIGURE
F-9

SYR-85-NES KLS DWN L: ON=* OFF=*REF*
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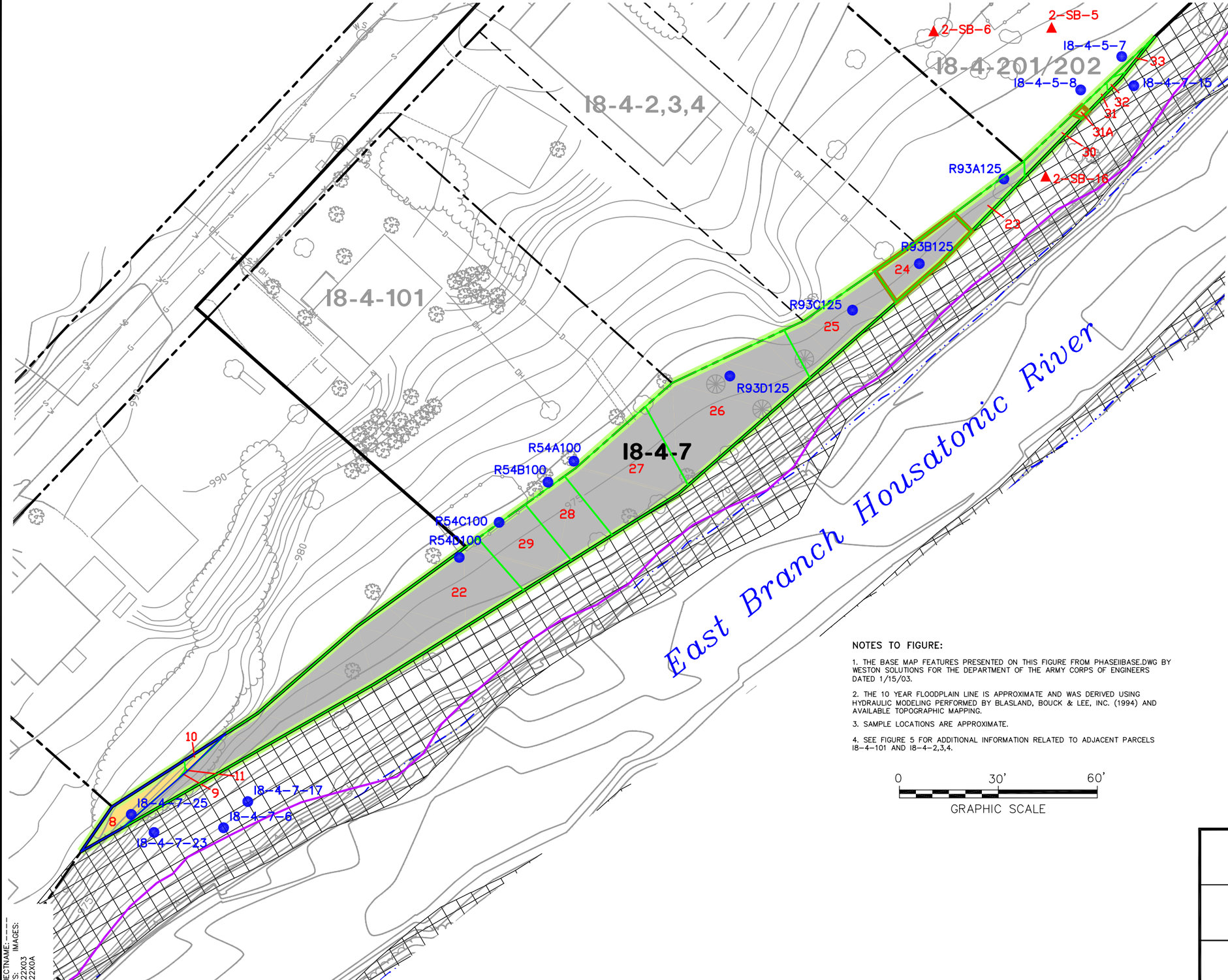
40122X0A



LEGEND

- BOUNDARY OF FLOODPLAIN PROPERTIES DESIGNATED IN SOW (FOR PHASE 2)
- APPROXIMATE PARCEL BOUNDARY
- APPROXIMATE HORIZONTAL LIMITS OF AVERAGING AREA
- BOUNDARY BETWEEN COMMONLY OWNED TAX PARCELS
- I8-4-101 — RESIDENTIAL PROPERTY PARCEL ID
- I8-4-7 — NON-RESIDENTIAL PROPERTY PARCEL ID
- I8-4-7-23 — PRE-2000 SOIL BORING LOCATION
- 2-SB-5 — PRE-DESIGN (2003) SOIL BORING LOCATION
- 10 YEAR FLOODPLAIN
- WIRE FENCE
- CHAIN LINK FENCE
- W — WATER LINE
- G — GAS LINE
- S — SANITARY SEWER
- D — DRAIN LINE
- OH — OVERHEAD ELECTRIC
- RETAINING WALL
- 980 — ELEVATION CONTOUR (1 FOOT CONTOUR INTERVAL)
- ROCK
- EDGE OF BUSHES/HEDGE
- SHRUB
- DECIDUOUS TREE
- CONIFEROUS TREE
- D — DRAIN MANHOLE
- S — WATER SHUTOFF
- APPROXIMATE EDGE OF WATER
- AREA ASSOCIATED WITH EPA'S 1 1/2 MILE REACH REMOVAL ACTION
- AREA OF PRIOR EXCAVATION (TO DEPTHS RANGING BETWEEN 1 AND 3 FEET)
- PROPERTY PREVIOUSLY REMEDIATED
- HORIZONTAL LIMITS OF AREA ASSOCIATED WITH GIVEN SAMPLE, DEVELOPED USING THE THEISSEN POLYGON APPROACH.
- 24 — POLYGON ID
- AREA PROPOSED FOR SOIL REMOVAL

NOTES TO FIGURE:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE FROM PHASEIIBASE.DWG BY WESTON SOLUTIONS FOR THE DEPARTMENT OF THE ARMY CORPS OF ENGINEERS DATED 1/15/03.
2. THE 10 YEAR FLOODPLAIN LINE IS APPROXIMATE AND WAS DERIVED USING HYDRAULIC MODELING PERFORMED BY BLASLAND, BOUCK & LEE, INC. (1994) AND AVAILABLE TOPOGRAPHIC MAPPING.
3. SAMPLE LOCATIONS ARE APPROXIMATE.
4. SEE FIGURE 5 FOR ADDITIONAL INFORMATION RELATED TO ADJACENT PARCELS I8-4-101 AND I8-4-2,3,4.

0 30' 60'

GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
SUPPLEMENTAL INFORMATION PACKAGE
FOR SELECTED PHASE 2 FLOODPLAIN PROPERTIES

PARCEL I8-4-7
THEISSEN POLYGON MAP
1- TO 1.5-FOOT DEPTH INCREMENT

ARCADIS BBL
Infrastructure, environment, facilities

FIGURE
F-10

SYR-85-NES KLS DMW L: ON=* OFF=*REF*
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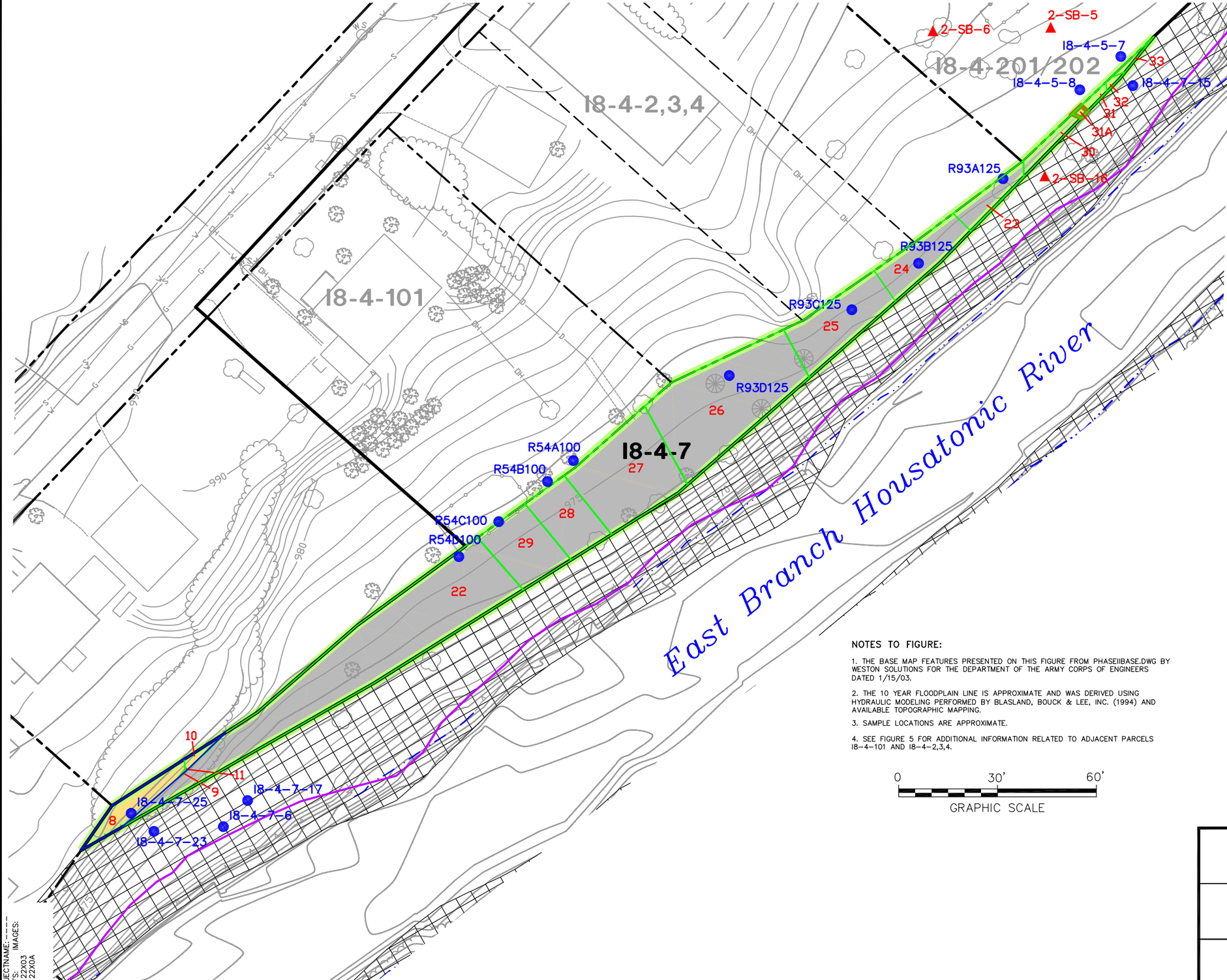

LEGEND

- BOUNDARY OF FLOODPLAIN PROPERTIES DESIGNATED IN SOW (FOR PHASE 2)
- APPROXIMATE PARCEL BOUNDARY
- APPROXIMATE HORIZONTAL LIMITS OF AVERAGING AREA
- BOUNDARY BETWEEN COMMONLY OWNED TAX PARCELS
- I8-4-101 — RESIDENTIAL PROPERTY PARCEL ID
- I8-4-7 — NON-RESIDENTIAL PROPERTY PARCEL ID
- I8-4-7-23 — PRE-2000 SOIL BORING LOCATION
- 2-SB-5 — PRE-DESIGN (2003) SOIL BORING LOCATION
- 10 YEAR FLOODPLAIN
- WIRE FENCE
- CHAIN LINK FENCE
- W — WATER LINE
- G — GAS LINE
- S — SANITARY SEWER
- D — DRAIN LINE
- OH — OVERHEAD ELECTRIC
- RETAINING WALL
- 980 — ELEVATION CONTOUR (1 FOOT CONTOUR INTERVAL)
- ROCK
- EDGE OF BUSHES/HEDGE
- SHRUB
- DECIDUOUS TREE
- CONIFEROUS TREE
- D — DRAIN MANHOLE
- S — WATER SHUTOFF
- APPROXIMATE EDGE OF WATER
- AREA ASSOCIATED WITH EPA'S 1 1/2 MILE REACH REMOVAL ACTION
- AREA OF PRIOR EXCAVATION (TO DEPTHS RANGING BETWEEN 1 AND 3 FEET)
- PROPERTY PREVIOUSLY REMEDIATED
- HORIZONTAL LIMITS OF AREA ASSOCIATED WITH GIVEN SAMPLE, DEVELOPED USING THE THEISSEN POLYGON APPROACH.
- 24 — POLYGON ID
- AREA PROPOSED FOR SOIL REMOVAL

NOTES TO FIGURE:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE FROM PHASEIIBASE.DWG BY WESTON SOLUTIONS FOR THE DEPARTMENT OF THE ARMY CORPS OF ENGINEERS DATED 1/15/03.
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3. SAMPLE LOCATIONS ARE APPROXIMATE.
4. SEE FIGURE 5 FOR ADDITIONAL INFORMATION RELATED TO ADJACENT PARCELS I8-4-101 AND I8-4-2,3,4.

0 30' 60'

GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
SUPPLEMENTAL INFORMATION PACKAGE
FOR SELECTED PHASE 2 FLOODPLAIN PROPERTIES

PARCEL I8-4-7
THEISSEN POLYGON MAP
1.5- TO 2.0-FOOT DEPTH INCREMENT

ARCADIS BBL
Infrastructure, environment, facilities

FIGURE
F-11

SYR-85-NES KLS DMW L: ON=* OFF=*REF*
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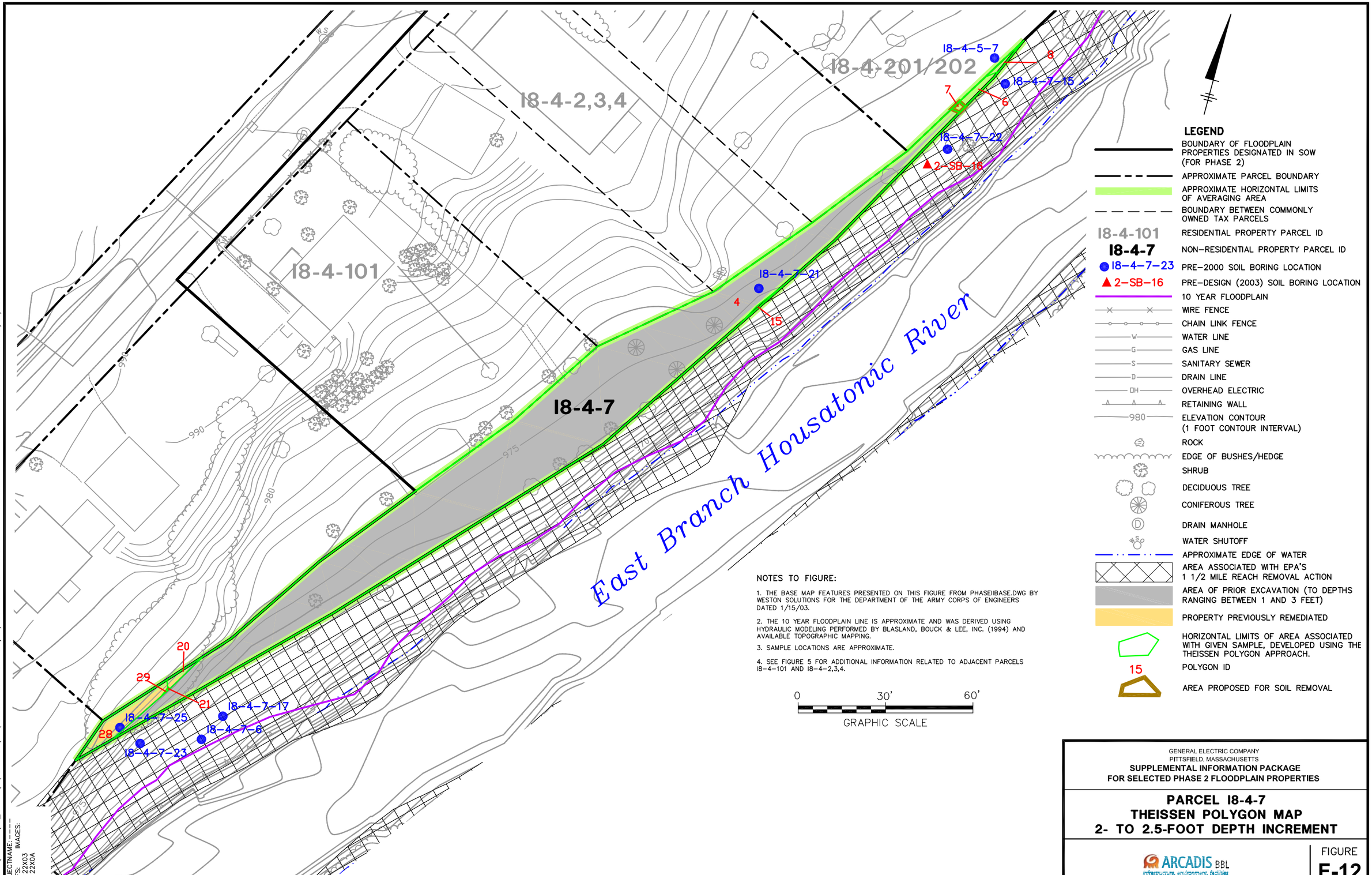

NOTES TO FIGURE:

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3. SAMPLE LOCATIONS ARE APPROXIMATE.
4. SEE FIGURE 5 FOR ADDITIONAL INFORMATION RELATED TO ADJACENT PARCELS I8-4-101 AND I8-4-2,3,4.

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
SUPPLEMENTAL INFORMATION PACKAGE FOR SELECTED PHASE 2 FLOODPLAIN PROPERTIES

PARCEL I8-4-7
THEISSEN POLYGON MAP
2- TO 2.5-FOOT DEPTH INCREMENT

ARCADIS BBL
Infrastructure, environment, facilities

FIGURE
F-12

SYR-85-NES KLS DMW L: ON=*; OFF=*REF*
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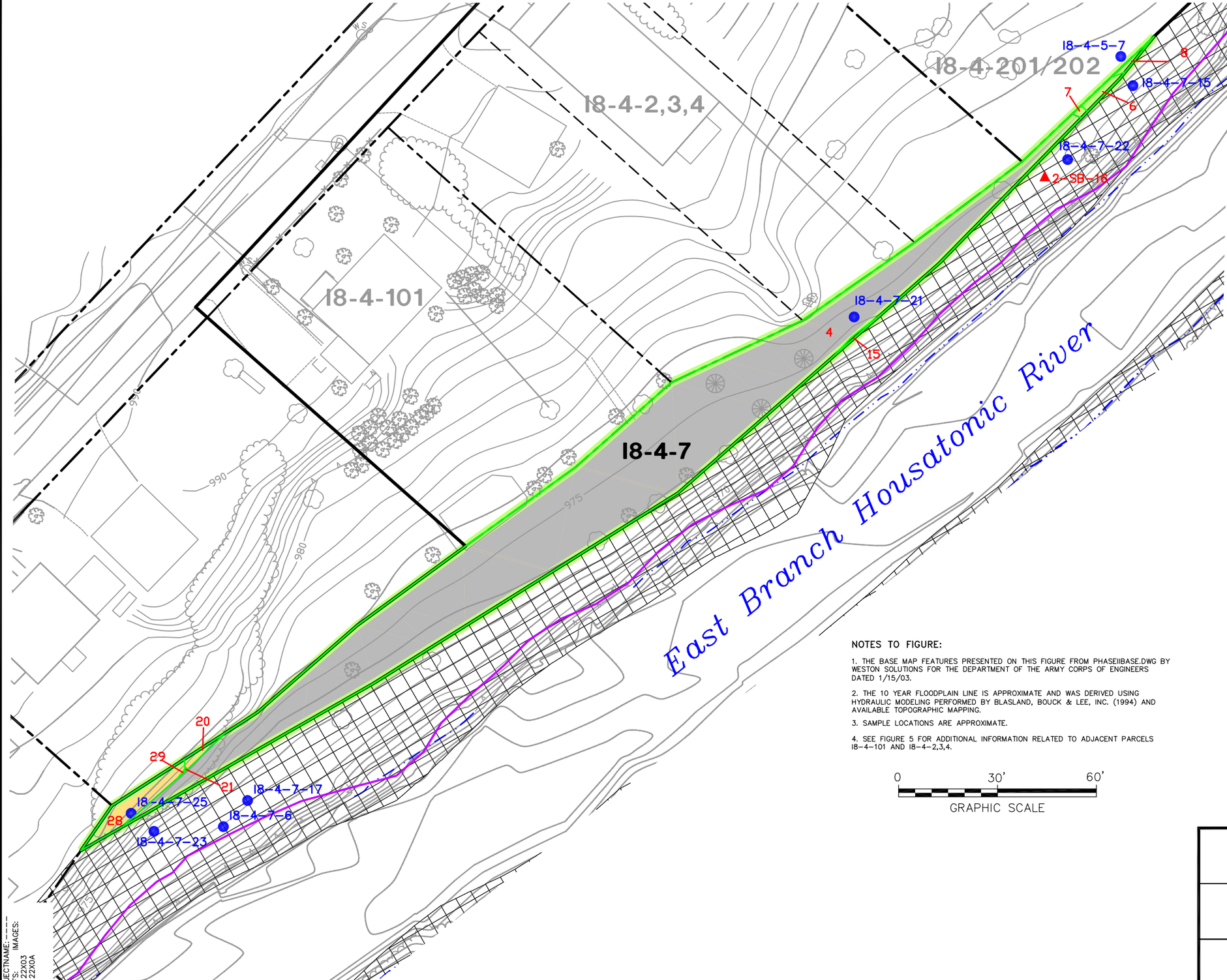

LEGEND

- BOUNDARY OF FLOODPLAIN PROPERTIES DESIGNATED IN SOW (FOR PHASE 2)
- APPROXIMATE PARCEL BOUNDARY
- APPROXIMATE HORIZONTAL LIMITS OF AVERAGING AREA
- BOUNDARY BETWEEN COMMONLY OWNED TAX PARCELS
- I8-4-101 — RESIDENTIAL PROPERTY PARCEL ID
- **I8-4-7** — NON-RESIDENTIAL PROPERTY PARCEL ID
- I8-4-7-23 — PRE-2000 SOIL BORING LOCATION
- 2-SB-16 — PRE-DESIGN (2003) SOIL BORING LOCATION
- 10 YEAR FLOODPLAIN
- WIRE FENCE
- CHAIN LINK FENCE
- W — WATER LINE
- G — GAS LINE
- S — SANITARY SEWER
- D — DRAIN LINE
- OH — OVERHEAD ELECTRIC
- RETAINING WALL
- 980 — ELEVATION CONTOUR (1 FOOT CONTOUR INTERVAL)
- ROCK
- EDGE OF BUSHES/HEDGE
- SHRUB
- DECIDUOUS TREE
- CONIFEROUS TREE
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- S — WATER SHUTOFF
- APPROXIMATE EDGE OF WATER
- AREA ASSOCIATED WITH EPA'S 1 1/2 MILE REACH REMOVAL ACTION
- AREA OF PRIOR EXCAVATION (TO DEPTHS RANGING BETWEEN 1 AND 3 FEET)
- PROPERTY PREVIOUSLY REMEDIATED
- HORIZONTAL LIMITS OF AREA ASSOCIATED WITH GIVEN SAMPLE, DEVELOPED USING THE THEISSEN POLYGON APPROACH.
- 15 — POLYGON ID

NOTES TO FIGURE:

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3. SAMPLE LOCATIONS ARE APPROXIMATE.
4. SEE FIGURE 5 FOR ADDITIONAL INFORMATION RELATED TO ADJACENT PARCELS I8-4-101 AND I8-4-2,3,4.

0 30' 60'
GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
SUPPLEMENTAL INFORMATION PACKAGE
FOR SELECTED PHASE 2 FLOODPLAIN PROPERTIES

PARCEL I8-4-7
THEISSEN POLYGON MAP
2.5- TO 3-FOOT DEPTH INCREMENT

ARCADIS BBL
Infrastructure, environment, facilities

FIGURE
F-13

SYR-85-NES KLS DMW L: ON=*; OFF=*REF*
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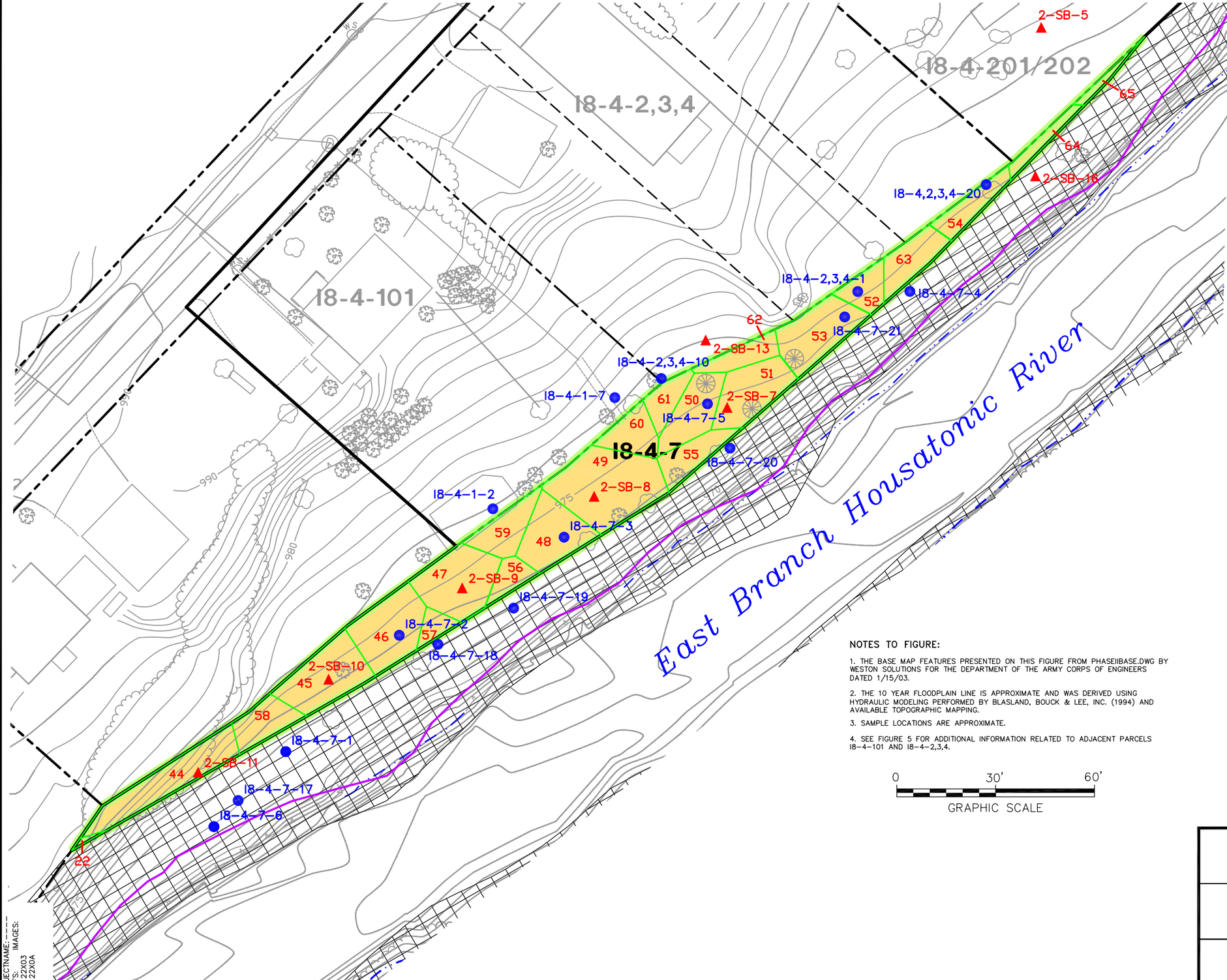

NOTES TO FIGURE:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE FROM PHASEIIBASE.DWG BY WESTON SOLUTIONS FOR THE DEPARTMENT OF THE ARMY CORPS OF ENGINEERS DATED 1/15/03.
2. THE 10 YEAR FLOODPLAIN LINE IS APPROXIMATE AND WAS DERIVED USING HYDRAULIC MODELING PERFORMED BY BLASLAND, BOUCK & LEE, INC. (1994) AND AVAILABLE TOPOGRAPHIC MAPPING.
3. SAMPLE LOCATIONS ARE APPROXIMATE.
4. SEE FIGURE 5 FOR ADDITIONAL INFORMATION RELATED TO ADJACENT PARCELS I8-4-101 AND I8-4-2,3,4.

0 30' 60'
GRAPHIC SCALE

LEGEND

- BOUNDARY OF FLOODPLAIN PROPERTIES DESIGNATED IN SOW (FOR PHASE 2)
- APPROXIMATE PARCEL BOUNDARY
- APPROXIMATE HORIZONTAL LIMITS OF AVERAGING AREA
- BOUNDARY BETWEEN COMMONLY OWNED TAX PARCELS
- I8-4-101 RESIDENTIAL PROPERTY PARCEL ID
- **I8-4-7** NON-RESIDENTIAL PROPERTY PARCEL ID
- I8-4-7-1 PRE-2000 SOIL BORING LOCATION
- 2-SB-16 PRE-DESIGN (2003) SOIL BORING LOCATION
- 10 YEAR FLOODPLAIN
- WIRE FENCE
- CHAIN LINK FENCE
- W WATER LINE
- G GAS LINE
- S SANITARY SEWER
- D DRAIN LINE
- OH OVERHEAD ELECTRIC
- RETAINING WALL
- 980 ELEVATION CONTOUR (1 FOOT CONTOUR INTERVAL)
- ROCK
- EDGE OF BUSHES/HEDGE
- SHRUB
- DECIDUOUS TREE
- CONIFEROUS TREE
- D DRAIN MANHOLE
- WS WATER SHUTOFF
- APPROXIMATE EDGE OF WATER
- AREA ASSOCIATED WITH EPA'S 1 1/2 MILE REACH REMOVAL ACTION
- PROPERTY PREVIOUSLY REMEDIATED
- HORIZONTAL LIMITS OF AREA ASSOCIATED WITH GIVEN SAMPLE, DEVELOPED USING THE THEISSEN POLYGON APPROACH.
- 51 POLYGON ID

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
SUPPLEMENTAL INFORMATION PACKAGE
FOR SELECTED PHASE 2 FLOODPLAIN PROPERTIES

PARCEL I8-4-7
THEISSEN POLYGON MAP
3- TO 4-FOOT DEPTH INCREMENT

ARCADIS BBL
infrastructure, environment, facilities

FIGURE
F-14

SYR-85-NES KLS DMW L: ON=*; OFF=*REF*
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PENTABLE:PLTFULL.CTB PRINTED:5/25/2007 1:29 PM BY:LPOSENAUER
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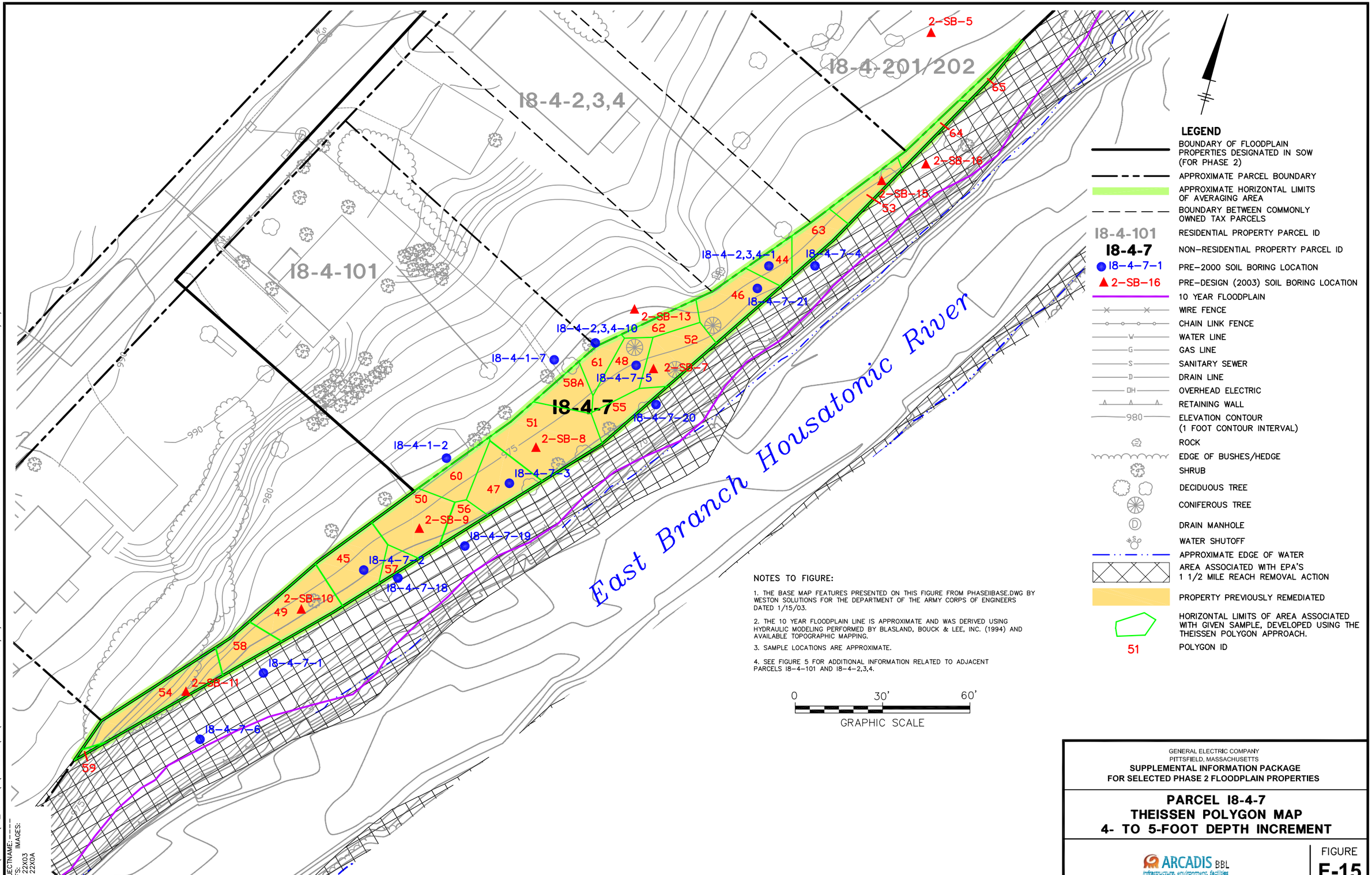

LEGEND

- BOUNDARY OF FLOODPLAIN PROPERTIES DESIGNATED IN SOW (FOR PHASE 2)
- APPROXIMATE PARCEL BOUNDARY
- APPROXIMATE HORIZONTAL LIMITS OF AVERAGING AREA
- BOUNDARY BETWEEN COMMONLY OWNED TAX PARCELS
- I8-4-101 — RESIDENTIAL PROPERTY PARCEL ID
- **I8-4-7** — NON-RESIDENTIAL PROPERTY PARCEL ID
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- 2-SB-16 — PRE-DESIGN (2003) SOIL BORING LOCATION
- 10 YEAR FLOODPLAIN
- WIRE FENCE
- CHAIN LINK FENCE
- W — WATER LINE
- G — GAS LINE
- S — SANITARY SEWER
- D — DRAIN LINE
- OH — OVERHEAD ELECTRIC
- RETAINING WALL
- 980 — ELEVATION CONTOUR (1 FOOT CONTOUR INTERVAL)
- ROCK
- EDGE OF BUSHES/HEDGE
- SHRUB
- DECIDUOUS TREE
- CONIFEROUS TREE
- D — DRAIN MANHOLE
- WATER SHUTOFF
- APPROXIMATE EDGE OF WATER
- AREA ASSOCIATED WITH EPA'S 1 1/2 MILE REACH REMOVAL ACTION
- PROPERTY PREVIOUSLY REMEDIATED
- HORIZONTAL LIMITS OF AREA ASSOCIATED WITH GIVEN SAMPLE, DEVELOPED USING THE THEISSEN POLYGON APPROACH.
- 51 — POLYGON ID

NOTES TO FIGURE:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE FROM PHASEIIBASE.DWG BY WESTON SOLUTIONS FOR THE DEPARTMENT OF THE ARMY CORPS OF ENGINEERS DATED 1/15/03.
2. THE 10 YEAR FLOODPLAIN LINE IS APPROXIMATE AND WAS DERIVED USING HYDRAULIC MODELING PERFORMED BY BLASLAND, BOUCK & LEE, INC. (1994) AND AVAILABLE TOPOGRAPHIC MAPPING.
3. SAMPLE LOCATIONS ARE APPROXIMATE.
4. SEE FIGURE 5 FOR ADDITIONAL INFORMATION RELATED TO ADJACENT PARCELS I8-4-101 AND I8-4-2,3,4.

0 30' 60'
GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
SUPPLEMENTAL INFORMATION PACKAGE
FOR SELECTED PHASE 2 FLOODPLAIN PROPERTIES

PARCEL I8-4-7
THEISSEN POLYGON MAP
4- TO 5-FOOT DEPTH INCREMENT

ARCADIS BBL
infrastructure, environment, facilities

FIGURE
F-15

SYR-85-NES KLS DMW L: ON=* OFF=*REF*
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PENTABLE:PLTFULL.CTB PRINTED:5/25/2007 1:29 PM BY:LPOSENAUER
PROJECTNAME:----
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40122X0A

LEGEND

- BOUNDARY OF FLOODPLAIN PROPERTIES DESIGNATED IN SOW (FOR PHASE 2)
- APPROXIMATE PARCEL BOUNDARY
- APPROXIMATE HORIZONTAL LIMITS OF AVERAGING AREA
- BOUNDARY BETWEEN COMMONLY OWNED TAX PARCELS
- I8-4-101 — RESIDENTIAL PROPERTY PARCEL ID
- I8-4-7 — NON-RESIDENTIAL PROPERTY PARCEL ID
- I8-4-7-1 — PRE-2000 SOIL BORING LOCATION
- 2-SB-15 — PRE-DESIGN (2003) SOIL BORING LOCATION
- 10 YEAR FLOODPLAIN
- WIRE FENCE
- CHAIN LINK FENCE
- W — WATER LINE
- G — GAS LINE
- S — SANITARY SEWER
- D — DRAIN LINE
- OH — OVERHEAD ELECTRIC
- RETAINING WALL
- 980 — ELEVATION CONTOUR (1 FOOT CONTOUR INTERVAL)
- ROCK
- EDGE OF BUSHES/HEDGE
- SHRUB
- DECIDUOUS TREE
- CONIFEROUS TREE
- D — DRAIN MANHOLE
- WATER SHUTOFF
- APPROXIMATE EDGE OF WATER
- AREA ASSOCIATED WITH EPA'S 1 1/2 MILE REACH REMOVAL ACTION
- PROPERTY PREVIOUSLY REMEDIATED
- HORIZONTAL LIMITS OF AREA ASSOCIATED WITH GIVEN SAMPLE, DEVELOPED USING THE THEISSEN POLYGON APPROACH.
- 51 — POLYGON ID

NOTES TO FIGURE:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE FROM PHASEIIBASE.DWG BY WESTON SOLUTIONS FOR THE DEPARTMENT OF THE ARMY CORPS OF ENGINEERS DATED 1/15/03.
2. THE 10 YEAR FLOODPLAIN LINE IS APPROXIMATE AND WAS DERIVED USING HYDRAULIC MODELING PERFORMED BY BLASLAND, BOUCK & LEE, INC. (1994) AND AVAILABLE TOPOGRAPHIC MAPPING.
3. SAMPLE LOCATIONS ARE APPROXIMATE.
4. SEE FIGURE 5 FOR ADDITIONAL INFORMATION RELATED TO ADJACENT PARCELS I8-4-101 AND I8-4-2,3,4.

0 30' 60'

GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
SUPPLEMENTAL INFORMATION PACKAGE
FOR SELECTED PHASE 2 FLOODPLAIN PROPERTIES

PARCEL I8-4-7
THEISSEN POLYGON MAP
5- TO 6-FOOT DEPTH INCREMENT

ARCADIS BBL
Infrastructure, environment, facilities

FIGURE
F-16

SYR-85-NES KLS DMW L: ON=* OFF=*REF*
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PROJECTNAME:----
XREFS: IMAGES:
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LEGEND

- BOUNDARY OF FLOODPLAIN PROPERTIES DESIGNATED IN SOW (FOR PHASE 2)
- APPROXIMATE PARCEL BOUNDARY
- APPROXIMATE HORIZONTAL LIMITS OF AVERAGING AREA
- BOUNDARY BETWEEN COMMONLY OWNED TAX PARCELS
- I8-4-101 — RESIDENTIAL PROPERTY PARCEL ID
- **I8-4-7** — NON-RESIDENTIAL PROPERTY PARCEL ID
- ● I8-4-7-21 — PRE-2000 SOIL BORING LOCATION
- ▲ 2-SB-16 — PRE-DESIGN (2003) SOIL BORING LOCATION
- 10 YEAR FLOODPLAIN
- WIRE FENCE
- CHAIN LINK FENCE
- W — WATER LINE
- G — GAS LINE
- S — SANITARY SEWER
- D — DRAIN LINE
- OH — OVERHEAD ELECTRIC
- RETAINING WALL
- 980 — ELEVATION CONTOUR (1 FOOT CONTOUR INTERVAL)
- ROCK
- EDGE OF BUSHES/HEDGE
- SHRUB
- DECIDUOUS TREE
- CONIFEROUS TREE
- D — DRAIN MANHOLE
- WATER SHUTOFF
- APPROXIMATE EDGE OF WATER
- AREA ASSOCIATED WITH EPA'S 1 1/2 MILE REACH REMOVAL ACTION
- PROPERTY PREVIOUSLY REMEDIATED
- HORIZONTAL LIMITS OF AREA ASSOCIATED WITH GIVEN SAMPLE, DEVELOPED USING THE THEISSEN POLYGON APPROACH.
- 24 — POLYGON ID

NOTES TO FIGURE:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE FROM PHASEIIBASE.DWG BY WESTON SOLUTIONS FOR THE DEPARTMENT OF THE army CORPS OF ENGINEERS DATED 1/15/03.

2. THE 10 YEAR FLOODPLAIN LINE IS APPROXIMATE AND WAS DERIVED USING HYDRAULIC MODELING PERFORMED BY BLASLAND, BOUCK & LEE, INC. (1994) AND AVAILABLE TOPOGRAPHIC MAPPING.

3. SAMPLE LOCATIONS ARE APPROXIMATE.

44. SEE FIGURE 5 FOR ADDITIONAL INFORMATION RELATED TO ADJACENT PARCELS I8-4-101 AND I8-4-2,3,4.

0 30' 60'

GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
SUPPLEMENTAL INFORMATION PACKAGE
FOR SELECTED PHASE 2 FLOODPLAIN PROPERTIES

PARCEL I8-4-7
THEISSEN POLYGON MAP
6- TO 6.5-FOOT DEPTH INCREMENT

ARCADIS BBL
Infrastructure, environment, facilities

FIGURE
F-17

SYR-85-NES KLS DMW L: ON=* OFF=*REF*
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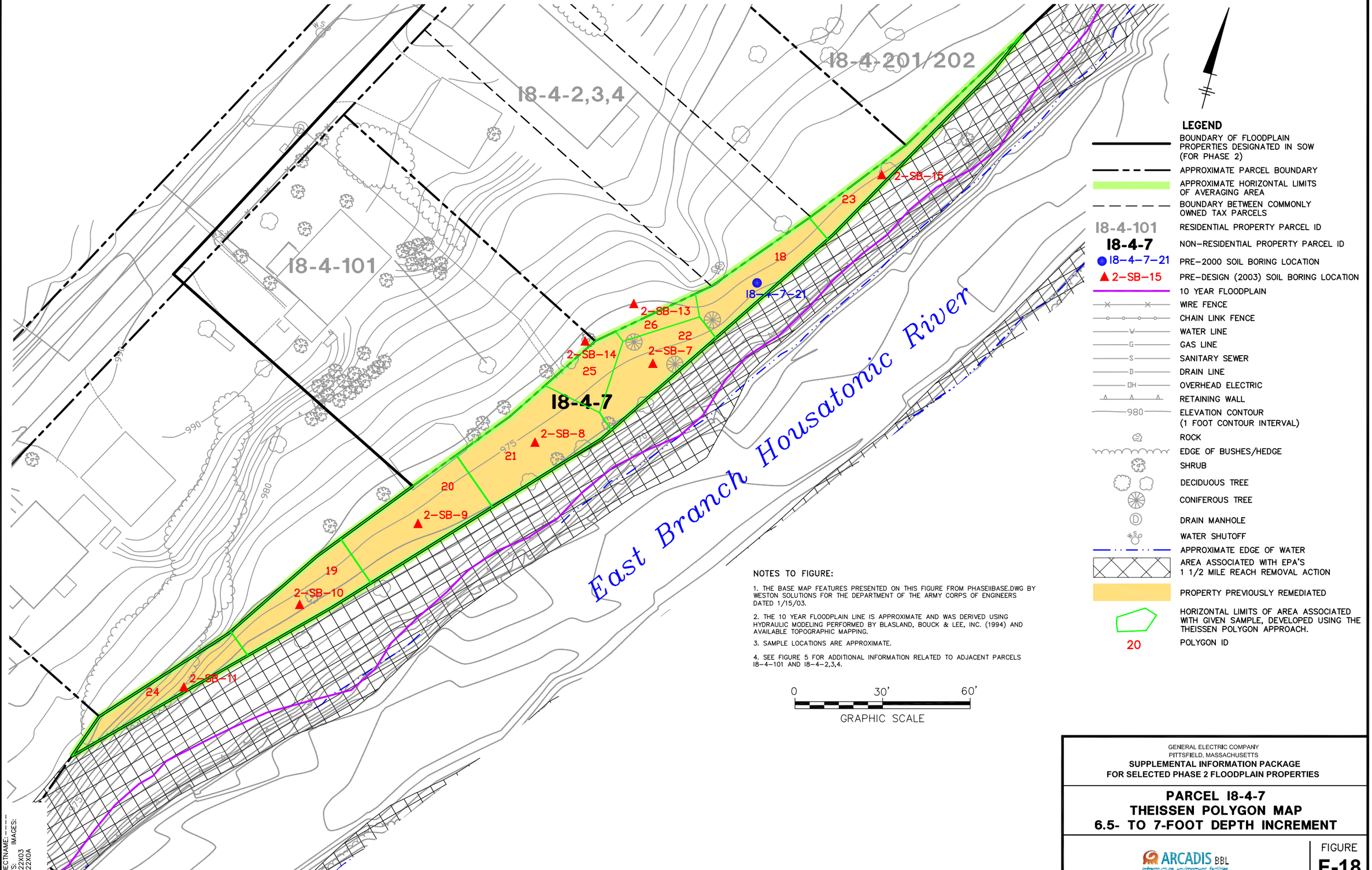

LEGEND

- BOUNDARY OF FLOODPLAIN PROPERTIES DESIGNATED IN SOW (FOR PHASE 2)
- APPROXIMATE PARCEL BOUNDARY
- APPROXIMATE HORIZONTAL LIMITS OF AVERAGING AREA
- BOUNDARY BETWEEN COMMONLY OWNED TAX PARCELS
- I8-4-101 — RESIDENTIAL PROPERTY PARCEL ID
- I8-4-7 — NON-RESIDENTIAL PROPERTY PARCEL ID
- I8-4-7-21 — PRE-2000 SOIL BORING LOCATION
- 2-SB-15 — PRE-DESIGN (2003) SOIL BORING LOCATION
- 10 YEAR FLOODPLAIN
- WIRE FENCE
- CHAIN LINK FENCE
- W — WATER LINE
- G — GAS LINE
- S — SANITARY SEWER
- D — DRAIN LINE
- OH — OVERHEAD ELECTRIC
- RETAINING WALL
- 980 — ELEVATION CONTOUR (1 FOOT CONTOUR INTERVAL)
- ROCK
- EDGE OF BUSHES/HEDGE
- SHRUB
- DECIDUOUS TREE
- CONIFEROUS TREE
- D — DRAIN MANHOLE
- WS — WATER SHUTOFF
- APPROXIMATE EDGE OF WATER
- AREA ASSOCIATED WITH EPA'S 1 1/2 MILE REACH REMOVAL ACTION
- PROPERTY PREVIOUSLY REMEDIATED
- HORIZONTAL LIMITS OF AREA ASSOCIATED WITH GIVEN SAMPLE, DEVELOPED USING THE THEISSEN POLYGON APPROACH.
- 20 — POLYGON ID

NOTES TO FIGURE:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE FROM PHASEIIBASE.DWG BY WESTON SOLUTIONS FOR THE DEPARTMENT OF THE ARMY CORPS OF ENGINEERS DATED 1/15/03.
2. THE 10 YEAR FLOODPLAIN LINE IS APPROXIMATE AND WAS DERIVED USING HYDRAULIC MODELING PERFORMED BY BLASLAND, BOUCK & LEE, INC. (1994) AND AVAILABLE TOPOGRAPHIC MAPPING.
3. SAMPLE LOCATIONS ARE APPROXIMATE.
4. SEE FIGURE 5 FOR ADDITIONAL INFORMATION RELATED TO ADJACENT PARCELS I8-4-101 AND I8-4-2,3,4.

0 30' 60'
GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
SUPPLEMENTAL INFORMATION PACKAGE
FOR SELECTED PHASE 2 FLOODPLAIN PROPERTIES

PARCEL I8-4-7
THEISSEN POLYGON MAP
6.5- TO 7-FOOT DEPTH INCREMENT

ARCADIS BBL
Infrastructure, environment, facilities

FIGURE
F-18

SYR-85-NES KLS DMW L: ON=* OFF=*REF*
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LEGEND

- BOUNDARY OF FLOODPLAIN PROPERTIES DESIGNATED IN SOW (FOR PHASE 2)
- APPROXIMATE PARCEL BOUNDARY
- APPROXIMATE HORIZONTAL LIMITS OF AVERAGING AREA
- BOUNDARY BETWEEN COMMONLY OWNED TAX PARCELS
- I8-4-101 — RESIDENTIAL PROPERTY PARCEL ID
- I8-4-7 — NON-RESIDENTIAL PROPERTY PARCEL ID
- I8-4-7-21 — PRE-2000 SOIL BORING LOCATION
- 2-SB-15 — PRE-DESIGN (2003) SOIL BORING LOCATION
- 10 YEAR FLOODPLAIN
- WIRE FENCE
- CHAIN LINK FENCE
- W — WATER LINE
- G — GAS LINE
- S — SANITARY SEWER
- D — DRAIN LINE
- OH — OVERHEAD ELECTRIC
- RETAINING WALL
- 980 — ELEVATION CONTOUR (1 FOOT CONTOUR INTERVAL)
- ROCK
- EDGE OF BUSHES/HEDGE
- SHRUB
- DECIDUOUS TREE
- CONIFEROUS TREE
- D — DRAIN MANHOLE
- WS — WATER SHUTOFF
- APPROXIMATE EDGE OF WATER
- AREA ASSOCIATED WITH EPA'S 1 1/2 MILE REACH REMOVAL ACTION
- PROPERTY PREVIOUSLY REMEDIATED
- HORIZONTAL LIMITS OF AREA ASSOCIATED WITH GIVEN SAMPLE, DEVELOPED USING THE THEISSEN POLYGON APPROACH.
- 19 — POLYGON ID

NOTES TO FIGURE:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE FROM PHASEIIBASE.DWG BY WESTON SOLUTIONS FOR THE DEPARTMENT OF THE ARMY CORPS OF ENGINEERS DATED 1/15/03.
2. THE 10 YEAR FLOODPLAIN LINE IS APPROXIMATE AND WAS DERIVED USING HYDRAULIC MODELING PERFORMED BY BLASLAND, BOUCK & LEE, INC. (1994) AND AVAILABLE TOPOGRAPHIC MAPPING.
3. SAMPLE LOCATIONS ARE APPROXIMATE.
4. SEE FIGURE 5 FOR ADDITIONAL INFORMATION RELATED TO ADJACENT PARCELS I8-4-101 AND I8-4-2,3,4.

0 30' 60'
GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
SUPPLEMENTAL INFORMATION PACKAGE
FOR SELECTED PHASE 2 FLOODPLAIN PROPERTIES

PARCEL I8-4-7
THEISSEN POLYGON MAP
7- TO 8-FOOT DEPTH INCREMENT

ARCADIS BBL
Infrastructure, environment, facilities

FIGURE
F-19

SYR-85-NES KLS DMW L: ON=* OFF=*REF*
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LEGEND

- BOUNDARY OF FLOODPLAIN PROPERTIES DESIGNATED IN SOW (FOR PHASE 2)
- APPROXIMATE PARCEL BOUNDARY
- APPROXIMATE HORIZONTAL LIMITS OF AVERAGING AREA
- BOUNDARY BETWEEN COMMONLY OWNED TAX PARCELS
- I8-4-101 — RESIDENTIAL PROPERTY PARCEL ID
- **I8-4-7** — NON-RESIDENTIAL PROPERTY PARCEL ID
- I8-4-7-21 — PRE-2000 SOIL BORING LOCATION
- 2-SB-8 — PRE-DESIGN (2003) SOIL BORING LOCATION
- 10 YEAR FLOODPLAIN
- WIRE FENCE
- CHAIN LINK FENCE
- W — WATER LINE
- G — GAS LINE
- S — SANITARY SEWER
- D — DRAIN LINE
- OH — OVERHEAD ELECTRIC
- RETAINING WALL
- 980 — ELEVATION CONTOUR (1 FOOT CONTOUR INTERVAL)
- ROCK
- EDGE OF BUSHES/HEDGE
- SHRUB
- DECIDUOUS TREE
- CONIFEROUS TREE
- D — DRAIN MANHOLE
- WATER SHUTOFF
- APPROXIMATE EDGE OF WATER
- AREA ASSOCIATED WITH EPA'S 1 1/2 MILE REACH REMOVAL ACTION
- PROPERTY PREVIOUSLY REMEDIATED
- HORIZONTAL LIMITS OF AREA ASSOCIATED WITH GIVEN SAMPLE, DEVELOPED USING THE THEISSEN POLYGON APPROACH.
- 16 — POLYGON ID

NOTES TO FIGURE:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE FROM PHASEIIBASE.DWG BY WESTON SOLUTIONS FOR THE DEPARTMENT OF THE ARMY CORPS OF ENGINEERS DATED 1/15/03.
2. THE 10 YEAR FLOODPLAIN LINE IS APPROXIMATE AND WAS DERIVED USING HYDRAULIC MODELING PERFORMED BY BLASLAND, BOUCK & LEE, INC. (1994) AND AVAILABLE TOPOGRAPHIC MAPPING.
3. SAMPLE LOCATIONS ARE APPROXIMATE.
4. SEE FIGURE 5 FOR ADDITIONAL INFORMATION RELATED TO ADJACENT PARCELS I8-4-101 AND I8-4-2,3,4.

0 30' 60'
GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
SUPPLEMENTAL INFORMATION PACKAGE
FOR SELECTED PHASE 2 FLOODPLAIN PROPERTIES

PARCEL I8-4-7
THEISSEN POLYGON MAP
8- TO 9-FOOT DEPTH INCREMENT

ARCADIS BBL
Infrastructure, environment, facilities

FIGURE
F-20

SYR-85-NES KLS DMW L: ON=* OFF=*REF*
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LEGEND

- BOUNDARY OF FLOODPLAIN PROPERTIES DESIGNATED IN SOW (FOR PHASE 2)
- APPROXIMATE PARCEL BOUNDARY
- APPROXIMATE HORIZONTAL LIMITS OF AVERAGING AREA
- BOUNDARY BETWEEN COMMONLY OWNED TAX PARCELS
- I8-4-101 — RESIDENTIAL PROPERTY PARCEL ID
- I8-4-7 — NON-RESIDENTIAL PROPERTY PARCEL ID
- ▲ 2-SB-16 — PRE-DESIGN (2003) SOIL BORING LOCATION
- 10 YEAR FLOODPLAIN
- WIRE FENCE
- CHAIN LINK FENCE
- W — WATER LINE
- G — GAS LINE
- S — SANITARY SEWER
- D — DRAIN LINE
- OH — OVERHEAD ELECTRIC
- RETAINING WALL
- 980 — ELEVATION CONTOUR (1 FOOT CONTOUR INTERVAL)
- ROCK
- EDGE OF BUSHES/HEDGE
- SHRUB
- DECIDUOUS TREE
- CONIFEROUS TREE
- D — DRAIN MANHOLE
- WATER SHUTOFF
- APPROXIMATE EDGE OF WATER
- AREA ASSOCIATED WITH EPA'S 1 1/2 MILE REACH REMOVAL ACTION
- PROPERTY PREVIOUSLY REMEDIATED
- HORIZONTAL LIMITS OF AREA ASSOCIATED WITH GIVEN SAMPLE, DEVELOPED USING THE THEISSEN POLYGON APPROACH.
- 51 — POLYGON ID

NOTES TO FIGURE:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE FROM PHASEIIBASE.DWG BY WESTON SOLUTIONS FOR THE DEPARTMENT OF THE ARMY CORPS OF ENGINEERS DATED 1/15/03.
2. THE 10 YEAR FLOODPLAIN LINE IS APPROXIMATE AND WAS DERIVED USING HYDRAULIC MODELING PERFORMED BY BLASLAND, BOUCK & LEE, INC. (1994) AND AVAILABLE TOPOGRAPHIC MAPPING.
3. SAMPLE LOCATIONS ARE APPROXIMATE.
4. SEE FIGURE 5 FOR ADDITIONAL INFORMATION RELATED TO ADJACENT PARCELS I8-4-101 AND I8-4-2,3,4.

0 30' 60'

GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
SUPPLEMENTAL INFORMATION PACKAGE
FOR SELECTED PHASE 2 FLOODPLAIN PROPERTIES

PARCEL I8-4-7
THEISSEN POLYGON MAP
9- TO 10-FOOT DEPTH INCREMENT

ARCADIS BBL
infrastructure, environment, facilities

FIGURE
F-21

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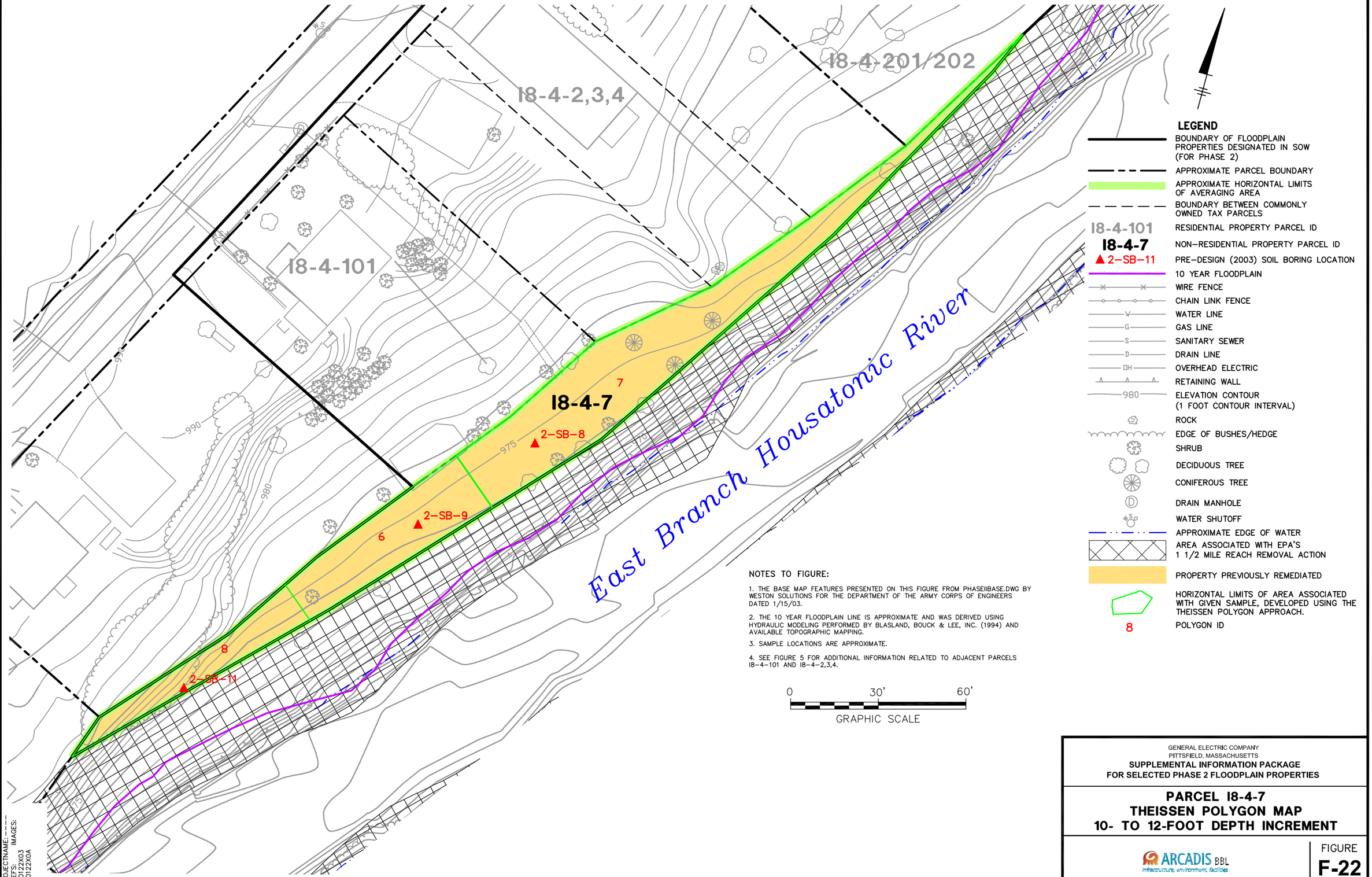

NOTES TO FIGURE:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE FROM PHASEIIBASE.DWG BY WESTON SOLUTIONS FOR THE DEPARTMENT OF THE ARMY CORPS OF ENGINEERS DATED 1/15/03.

2. THE 10 YEAR FLOODPLAIN LINE IS APPROXIMATE AND WAS DERIVED USING HYDRAULIC MODELING PERFORMED BY BLASLAND, BOUCK & LEE, INC. (1994) AND AVAILABLE TOPOGRAPHIC MAPPING.

3. SAMPLE LOCATIONS ARE APPROXIMATE.

4. SEE FIGURE 5 FOR ADDITIONAL INFORMATION RELATED TO ADJACENT PARCELS I8-4-101 AND I8-4-2,3,4.

0 30' 60'

GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
SUPPLEMENTAL INFORMATION PACKAGE
FOR SELECTED PHASE 2 FLOODPLAIN PROPERTIES

PARCEL I8-4-7
THEISSEN POLYGON MAP
10- TO 12-FOOT DEPTH INCREMENT

ARCADIS BBL
infrastructure, environment, facilities

FIGURE
F-22

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PROJECTNAME:----
XREFS: IMAGES:
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LEGEND

- BOUNDARY OF FLOODPLAIN PROPERTIES DESIGNATED IN SOW (FOR PHASE 2)
- APPROXIMATE PARCEL BOUNDARY
- APPROXIMATE HORIZONTAL LIMITS OF AVERAGING AREA
- BOUNDARY BETWEEN COMMONLY OWNED TAX PARCELS
- I8-4-101 — RESIDENTIAL PROPERTY PARCEL ID
- I8-4-7 — NON-RESIDENTIAL PROPERTY PARCEL ID
- ▲ 2-SB-9 — PRE-DESIGN (2003) SOIL BORING LOCATION
- 10 YEAR FLOODPLAIN
- WIRE FENCE
- CHAIN LINK FENCE
- W — WATER LINE
- G — GAS LINE
- S — SANITARY SEWER
- D — DRAIN LINE
- OH — OVERHEAD ELECTRIC
- RETAINING WALL
- 980 — ELEVATION CONTOUR (1 FOOT CONTOUR INTERVAL)
- ROCK
- EDGE OF BUSHES/HEDGE
- SHRUB
- DECIDUOUS TREE
- CONIFEROUS TREE
- D — DRAIN MANHOLE
- WATER SHUTOFF
- APPROXIMATE EDGE OF WATER
- AREA ASSOCIATED WITH EPA'S 1 1/2 MILE REACH REMOVAL ACTION
- PROPERTY PREVIOUSLY REMEDIATED
- HORIZONTAL LIMITS OF AREA ASSOCIATED WITH GIVEN SAMPLE, DEVELOPED USING THE THEISSEN POLYGON APPROACH.
- 5 — POLYGON ID

NOTES TO FIGURE:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE FROM PHASEIIBASE.DWG BY WESTON SOLUTIONS FOR THE DEPARTMENT OF THE ARMY CORPS OF ENGINEERS DATED 1/15/03.
2. THE 10 YEAR FLOODPLAIN LINE IS APPROXIMATE AND WAS DERIVED USING HYDRAULIC MODELING PERFORMED BY BLASLAND, BOUCK & LEE, INC. (1994) AND AVAILABLE TOPOGRAPHIC MAPPING.
3. SAMPLE LOCATIONS ARE APPROXIMATE.
4. SEE FIGURE 5 FOR ADDITIONAL INFORMATION RELATED TO ADJACENT PARCELS I8-4-101 AND I8-4-2,3,4.

0 30' 60'

GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
SUPPLEMENTAL INFORMATION PACKAGE
FOR SELECTED PHASE 2 FLOODPLAIN PROPERTIES

PARCEL I8-4-7
THEISSEN POLYGON MAP
12- TO 15-FOOT DEPTH INCREMENT

ARCADIS BBL
infrastructure, environment, facilities

FIGURE
F-23

SYR-85-NES KLS DWW L: ON=* OFF=*REF*
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