SECTION 6 - TECHNOLOGY SAFETY DATA SHEET

TECHNOLOGY SAFETY DATA SHEET
PETROGEN
Oxy-gasoline Torch
(Equipment Dismantlement)

<table>
<tr><th colspan="2">SECTION 1: TECHNOLOGY IDENTITY</th></tr>
<tr><td rowspan="3">Manufacturer’s Name and Address:

Petrogen International, Ltd.
P.O. Box 1592
Richmond, CA 94802</td><td>Emergency Contact:

Milt Heft, General Manager

(510)237-7274</td></tr>
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<tr><td>Date Prepared:</td></tr>
<tr><td>Other Names:

Oxy-gasoline Cutting Torch
Oxy-gasoline Safety Torch</td><td>Signature of Preparer:

Operating Engineers National Hazmat Program
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Under cooperative agreement DE-FC21-95 MC 32260</td></tr>
</table>

SECTION 2: PROCESS DESCRIPTION

The oxy-gasoline torch is a thermal method for cutting metal. The torch is fueled by a mixture of oxygen and gasoline. Any grade gasoline can be used but the system will not operate with kerosene, diesel fuel, or gasohol. The fuel is delivered to the torch via a hose connected to a pressurized gasoline tank and an oxygen cylinder. The gasoline tank is pressurized by a built-in hand pump, or an external source of compressed air may be used. The gasoline and oxygen are combined in a mixer in the head of the torch. The fuel, a mixture of gasoline and oxygen, travels through separate hoses to the tip of the torch where it is lit. After a few seconds of pre-heating, the tip of the torch becomes warm enough to vaporize the gasoline in the tip. The rapid expansion results in a high velocity stream of highly combustible oxygen/gasoline vapor that fuels the cutting flame of the torch. Vaporization of the fuel in the tip is an endothermal process that reduces overheating of the tip.

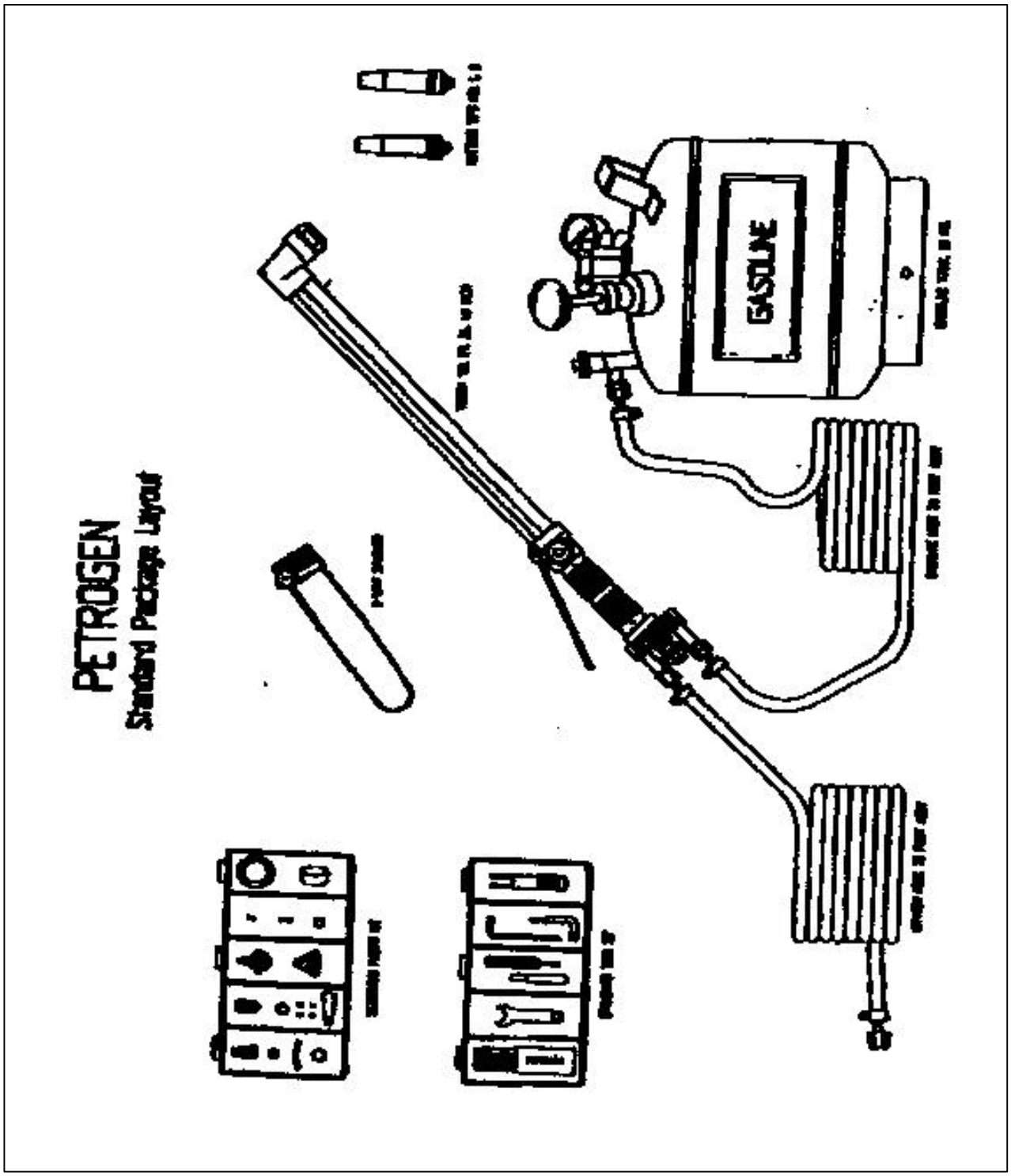
The oxy-gasoline torch system components include a three-gallon fuel tank, supply hoses, and cutting torch. The pressurized gasoline tank has been tested and approved by Underwriter's Laboratory (UL). The gasoline tank consists of the tank, pressure gauge, filler cap assembly, hand pressure pump, and the tank gasoline shutoff valve. The tank is a 3-gallon gasoline tank that has been manufactured to ASME standards for unfired pressure vessels. During operation of the torch the tank is filled to about 2-inches from the top (approximately 2.5-gallons) to allow room for air which is required to pressurize the tank. The opening of the tank is designed to accept ordinary supply nozzles found at gas-stations. The pressure gauge fits into an adapter which contains a check valve that is designed to prevent fuel from escaping if the gauge is broken off. The filler cap assembly is designed with a slot at the end of the threads to permit tank pressure to be released before the cap is completely unscrewed and a pressure relief valve that is set to release at a pressure of 35 psi. The hand pump is used to pressurize the system. The system is pressurized to a minimum of 10 psi for operation. The gasoline shutoff valve is a fast-flow ball check that shuts off the flow of the fuel if there is a sudden surge of fuel flow from the hose being cut, ruptured, or punctured.

The gasoline hose is a ¼-inch 2-braid hose designed specifically for gasoline. The oxygen hose is 5/16-inch 1-braid type "S", grade "T" designed to be resistant to abrasion, fire, and oil.

Torches are hand-held or machine-mounted and consist of hose connectors, a cutting lever, a high pressure oxygen valve, a gasoline valve, a mixer, the tip nut, the cutting tip, and the heating tip. The hose connectors are threaded brass tubes which connect the hoses to the base of the torch. The oxygen connector has a right hand thread and the gasoline connector has a left hand thread. The cutting lever operates the high pressure oxygen valve which permits the oxygen to enter the work head. The gasoline valve runs the entire length of the torch and controls the gasoline flow at the torch head. The mixer which is located in the torch head receives the pre-heat oxygen and the gasoline and combines them into a fuel mixture which is then fed into

SECTION 2: PROCESS DESCRIPTION
the tip assembly. The cutting tip is a 2-piece assembly where the liquid fuel is vaporized, directed down to the base of the core, and re-directed out of the tip through the flutes of the core.

SECTION 3: PROCESS DIAGRAMS



SECTION 4: CONTAMINANTS AND MEDIA

Smoke and fume are generated during thermal cutting with the oxy-gasoline torch. Consideration needs to be given to the contaminants of the metal being cut, any contaminants of coatings on the metal, and contamination in the area where the torch is being used for D&D activities. An air sampling plan will need to be developed, as appropriate for the site where the torch is used.

SECTION 5: ASSOCIATED SAFETY HAZARDS

Probability of Occurrence of Hazard:

1 Hazard may be present but not expected over background level
2 Some level of hazard above background level known to be present
3 High hazard potential
4 Potential for imminent danger to life and health

A. ELECTRICAL (LOCKOUT/TAGOUT)	RISK RATING: N/A

Not part of this technology.

B. FIRE AND EXPLOSION	RISK RATING: 4

Heat, sparks, and flame present during thermal cutting has the potential to cause fire or explosion. When fire hazards present in the area cannot be moved, guards must be set up to contain heat, sparks, and slag.

Oxygen itself is not flammable but it supports the burning process. Pure oxygen will drastically increase the speed and force with which burning takes place.

By definition, gasoline is considered a flammable liquid. Flammable liquids present hazards to the worker and the environment where they are used. Appropriate precautions need to be taken for storage, handling, and use.

C. CONFINED SPACE ENTRY	RISK RATING: 1-4

Not part of this technology unless the specific location where the torch is being used is a confined space. Thermal cutting operations can present additional hazards in a confined space. Confined space entry and rescue procedures must be followed and additional consideration given to the limited work space, hazardous atmosphere, slipping hazards, flammability, combustibility, and toxic fumes in relation to their ability to be caused by the thermal cutting process itself.

SECTION 5: ASSOCIATED SAFETY HAZARDS (CONTINUED)	
D. MECHANICAL HAZARDS	RISK RATING: 1
Assembling the cylinders and the cutting torch poses pinch points.	
E. PRESSURE HAZARDS	RISK RATING: 4
The compressed gas cylinder presents hazards which are discussed under "K" of this section.	
F. TRIPPING AND FALLING	RISK RATING: 2
Hoses present potential hazards.	
G. LADDERS AND PLATFORM	RISK RATING: 2
Not part of this technology but may be required for D&D activities. All regulations for working from ladders and platforms, including the OSHA scaffolding standard must be followed.	
H. MOVING VEHICLE	RISK RATING: 2
Not part of this technology but may be required for D&D activities. All precautions and safety requirements for large pieces of equipment will need to be followed. For example, all moving vehicles should have working back-up alarms, warning lights, etc.	
I. BURIED UTILITIES, DRUMS, AND TANKS	RISK RATING: N/A
Not part of this technology.	
J. PROTRUDING OBJECTS	RISK RATING: N/A
Not part of this technology.	
K. GAS CYLINDERS	RISK RATING: 4
The compressed gas cylinder of oxygen accounts for one of the hazards associated with the oxy-gasoline torch. If the compressed gas cylinders are damaged, gas can escape with great force and the cylinder itself can explode causing injury to workers and possibly damaging property. One example of this type of hazard is called “rocketing”. The cylinder acts as a “rocket” if damaged or ruptured. The “rocket” (cylinder) can break through concrete walls or travel through open spaces.	
L. TRENCHING AND EXCAVATIONS	RISK RATING: N/A
Not part of this technology.	
M. OVERHEAD LIFTS	RISK RATING: 2
Not part of this technology but may be required during D&D activities. All applicable standards and precautions must be followed for the type of equipment used. At a minimum, anyone in the work area should be wearing a hard hat.	

SECTION 5: ASSOCIATED SAFETY HAZARDS (CONTINUED)	
N. OVERHEAD HAZARDS	RISK RATING: 2
May be part of this technology if the piece being cut is overhead. At a minimum, anyone working in the area should be wearing a hard hat. It needs to be assured that all workers in the area are aware of the overhead work being done and avoid the area when possible.	

SECTION 6: ASSOCIATED HEALTH HAZARDS	
A. INHALATION HAZARD	RISK RATING: 3
Fumes and gases produced by the thermal cutting process vary widely and are relative to the metal being worked, coatings on the metal, and contaminants inherent in the environment where the metal is located. Gasoline vapors also have the potential to present an inhalation hazard, especially when filling the tank, and must be taken into consideration when developing an air sampling plan.	
B. SKIN ABSORPTION	RISK RATING: 2
Gasoline is a skin hazard. It can irritate the skin, cause rashes, and defatting (severe drying) of the skin. Other skin hazards would be dependent on the contaminants at the site and would be identified by the site characterization.	
C. HEAT STRESS	RISK RATING: 4
Ambient conditions, work rates, and PPE levels must be considered. The worker may be subjected to an increase in heat stress due to the heat generated during thermal cutting operations. The sparking, flame, slag, and hot metal will all add to the heat load.	
D. NOISE	RISK RATING: 2
The technology presents a potential noise hazard.	
E. NON-IONIZING RADIATION	RISK RATING: 1-4
The ultraviolet light produced by the thermal cutting process can damage the eyes. This can be in the form of a “flash” burn or after long term exposure, cataracts. Proper protection for eyes when performing cutting operations using the oxy-gasoline torch is the welding helmet with the correct filter in place. The filter lenses and plates must meet the test for transmission of radiant energy as prescribed in ANSI Z87.1, *Practice for Occupational and Educational Eye and Face Protection*. Filter darkness needs to be chosen in compliance with OSHA 29 CFR Subpart Q Welding, Cutting, Brazing. Other workers in the area must wear safety glasses with an appropriate darkness rating. It is also recommended that dark clothing be worn to reduce reflection under the welding helmet.	
F. IONIZING RADIATION	RISK RATING: 1-4
Not part of this technology, but may be associated with the area where D&D activities are taking place.	

SECTION 6: ASSOCIATED HEALTH HAZARDS	
G. COLD STRESS	RISK RATING: 1
Technology does not produce a hazard, but ambient conditions need to be considered.	

SECTION 6: ASSOCIATED HEALTH HAZARDS (CONTINUED)	
H. ERGONOMIC HAZARDS	RISK RATING: 3
During cutting operations, many ergonomic stressors can be placed on the body from working in awkward and static postures. There is also concern for the manual force and repetitive motions that may be required. In order to make a cut, workers may have to get into tight places by twisting themselves into place or by propping their bodies into awkward positions. Stresses occur from holding the head and arms in unnatural, fixed positions for long amounts of time. This often results in stiffness and soreness in the body. Overhead work can result in a condition know as shoulder tendonitis (inflammation of the tendons of the shoulder) and there is concern for the stress placed on the back from bending to cut pieces located on ground level.	
I. OTHER	RISK RATING: N/A
None noted at this time.	

SECTION 7: PHASE ANALYSIS
A. CONSTRUCTION/START-UP
The set-up/start-up phase presents several hazards including pinch points, struck by hazards slips/trips/falls, muscular/back injury, and exposure to compressed gas and gasoline.
B. OPERATION
The operational phase presents several hazards including exposure to contaminant, muscular/back injury, pinch points, laceration hazards, slips/trips/falls, pinch points, struck by hazards, exposure to noise, eye hazards (ultraviolet and infrared light), burn hazards, fire/explosion hazards, heat stress, and exposure to contaminants.
C. MAINTENANCE
The maintenance phase presents several hazards including pinch points, slips/trips/falls, muscular/back injury, and exposure to contaminants.

SECTION 7: PHASE ANALYSIS (CONTINUED)
D. DECOMMISSIONING
The decommissioning phase presents several hazards, including exposure to the contaminant, pinch points, slips/trips/falls, and muscular/back injury.

SECTION 8: HEALTH AND SAFETY PLAN REQUIRED ELEMENTS
A. AIR MONITORING
Fumes and gases produced by the thermal cutting process vary widely and are relative to the metal being worked, coatings on the metal, and contaminants inherent in the environment where the metal is located. Iron oxide, nickel, cadmium, zinc, lead, oxides of nitrogen, and carbon dioxide are examples of the types of inhalation hazards that may be present during thermal cutting operations. A sampling plan will need to take into consideration the vapors from the gasoline being used, contaminants specific for the site, and the pieces being cut. Noise monitoring will need to be conducted.
B. WORKER TRAINING
Training that may apply in this case may include but not be limited to: HAZWOPER (Hazardous Waste Operations and Emergency Response), HAZCOM (Hazard Communication), Respiratory Protection, PPE (Personal Protective Equipment) Training, Hearing Conservation, Fire Extinguisher, Heat Stress, Working with Compressed Gases, non-ionizing radiation training, Ergonomics (proper lifting, bending, stooping, kneeling), specific training for equipment operation, CPR/First Aid/Emergency Response/Bloodborne Pathogens, Lockout/Tagout, Hand Signal Communication, and Construction Safety (OSHA 500) and/or General Industry Safety (OSHA 501).
C. EMERGENCY RESPONSE
Emergency response planning for a site needs to assure adequate coverage for hazards described in the TSDS. Having at least one person per shift trained in CPR and first aid is recommended.
D. MEDICAL SURVEILLANCE
Evaluation of personnel's general health with emphasis on the cardiovascular and respiratory system and the back. In addition, medical surveillance as required by OSHA standards must be conducted. Initial and annual audiograms may be required.
E. INFORMATIONAL PROGRAM
Workers must be trained in specific operation of equipment before use.

SECTION 9: COMMENTS AND SPECIAL CONSIDERATIONS

Only personnel who have been adequately trained in the operation of this technology should be permitted to operate and/or work with the equipment.