

7.3 Technology Safety Data Sheet

TECHNOLOGY SAFETY DATA SHEET

Aqua Miser Ultra Boss, Model D-115

SECTION 1: TECHNOLOGY IDENTITY	
Manufacturer's Name and Address:	Emergency Contact:
Carolina Equipment 7251 Cross Country Road N. Charleston, SC 29418	1-888-88MISER
Department of Energy Technology Management System Number: None	Information Contact:
Aqua Miser Ultra Boss D-115	1-843-760-3000
Date Prepared:	Prepared by:
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SECTION 2: PROCESS DESCRIPTION

The Aqua Miser Ultra Boss Model D-115 consists of a diesel engine-driven ultra-high pressure water pump with variable pressures up to 40,000 psi combined with the patented B.O.S.S. abrasive injection system. The pump and engine are mounted on a trailer for easy movement to and on a job site. The Aqua Miser Ultra Boss needs only a water hose connection to be fully ready for operation. High-pressure water hoses are connected to the Aqua Miser Ultra Boss and an appropriate nozzle for the task is chosen and connected to the end of the hose. The high-pressure hoses are available in 50-ft sections and are assembled at the site to create the length required for the job.

The operator manually inserts a high-pressure water hose into the open end of an obstructed piping system in preparation for high-pressure water activation. The throttle allows the use of water pressures up to 40,000 psi. Actual operating pressures depend upon the length and diameter of hose used and the size of orifice used. The operator steps on a foot switch to engage the pneumatic clutch on the high-pressure water pump. The foot switch is a dead-man type switch, when depressed the foot switch is closed allowing electricity to flow from a 12-volt lead-acid battery which activates a hydraulic valve. The hydraulic pressure created by activating the valve, engages the clutch on the high-pressure water pump. This unit incorporates the use of relatively small-diameter, lightweight hoses. The high-pressure hose is designed for use with a hose grip. The hose is threaded through this shield before the nozzle is attached. The nozzle on the end of the high-pressure water hose is designed to create a forward thrust to pull the hose through the piping system. The operator guides the hose through the piping system until a resistance is encountered. The high-pressure water begins to break up the obstruction and the operator flushes the obstruction from the pipe using a reciprocating action with the hose.

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SECTION 3: TECHNOLOGY DIAGRAMS OR PICTURES



Figure 1: Foot Switch



Figure 2: Hose Grip



Figure 3: Aqua Miser Ultra Boss Model D-115.

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SECTION 4: CONTAMINANTS AND MEDIA	
The Aqua Miser Ultra Boss does not produce any contaminants. The possible contaminants must be identified as part of a site characterization prior to the beginning of a job.	
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: 2
<ul style="list-style-type: none"> • Foot switch should be approved for use in wet locations. • Removal of the key from ignition before performing maintenance must be a standard operating procedure. • Disconnect battery before performing any electrical maintenance. 	
B. FIRE AND EXPLOSION	RISK RATING: 1
<ul style="list-style-type: none"> • There is minimal risk from fire and explosion depending upon the contents of the blocked pipeline. • Vapors, gases, liquids, and solids could all be found within the blocked piping. • The contents of the blocked pipeline must be identified before any work begins. 	
C. CONFINED SPACE ENTRY	RISK RATING: N/A
<ul style="list-style-type: none"> • No confined spaces are associated with the Aqua Miser technology. • Use of the Aqua Miser in a confined space must be carefully planned and compliance with OSHA standards is essential to protect workers. 	
D. MECHANICAL HAZARDS	RISK RATING: 1
<ul style="list-style-type: none"> • The diesel engine and high-pressure water pump are sources of mechanical movement. • All moving parts must be guarded. • Apply procedures for control of hazardous energy. 	
E. PRESSURE HAZARDS	RISK RATING: 3
<ul style="list-style-type: none"> • The air and water hoses present a potential struck-by hazard if ruptured or disconnected. • Frequent inspection is advised. • Proper hose selection and assembly are required. • Water pressures at the nozzle can be highly hazardous. • Prior to contact with or proximity to the nozzle, remove the key from the ignition and maintain control of the key. 	

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SECTION 5: ASSOCIATED SAFETY HAZARDS (continued)	
F. TRIPPING AND FALLING	RISK RATING: 2
<ul style="list-style-type: none"> Water hoses should be neatly positioned away from high-traffic areas to avoid creating tripping hazards. 	
G. LADDERS AND PLATFORMS	RISK RATING: N/A
<ul style="list-style-type: none"> Aqua Miser Ultra Boss does not require ladders or scaffolds as observed. It may be necessary to work on ladders occasionally for connection to blocked piping. 	
H. MOVING VEHICLES	RISK RATING: 1
<ul style="list-style-type: none"> The presence of multiple pieces of equipment (which may be needed to unload and load technology) in relationship to a small area of operation may pose a significant danger. Sufficient warning devices such as horns, bells, lights, and back up alarms should be used. 	
I. BURIED UTILITIES, DRUMS, AND TANKS	RISK RATING: N/A
<ul style="list-style-type: none"> Not part of this technology. 	
J. PROTRUDING OBJECTS	RISK RATING: 2
<ul style="list-style-type: none"> The hose connections to the trailer are centrally located at the rear, but could be better marked to reduce tripping hazards. 	
K. GAS CYLINDERS	RISK RATING: N/A
<ul style="list-style-type: none"> Not part of this technology. 	
L. TRENCHING AND EXCAVATIONS	RISK RATING: N/A
<ul style="list-style-type: none"> Not part of this technology. 	
M. OVERHEAD LIFTS	RISK RATING: N/A
<ul style="list-style-type: none"> Not part of this technology. 	
N. OVERHEAD HAZARDS	RISK RATING: N/A
<ul style="list-style-type: none"> Not part of this technology. 	
SECTION 6: ASSOCIATED HEALTH HAZARDS	
A. INHALATION HAZARD	RISK RATING: 2
<ul style="list-style-type: none"> Exhaust fumes from the diesel engine will be present. If operations are taking place inside, air monitoring for diesel exhaust should be performed. Other inhalation hazards will be job-specific and related to the site conditions, not the technology. 	

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SECTION 6: ASSOCIATED HEALTH HAZARDS (continued)	
B. SKIN ABSORPTION	RISK RATING: 1
<ul style="list-style-type: none"> • Diesel fuel is used but exposures are limited and health hazards from skin contact are minimal. • Other skin absorption hazards will be mission-specific. 	
C. HEAT STRESS	RISK RATING: N/A
<ul style="list-style-type: none"> • Technology does not produce a hazard but ambient conditions need to be considered. 	
D. NOISE	RISK RATING: 2
<ul style="list-style-type: none"> • Noise monitoring of the trailer in an unobstructed outdoor location has shown values may exceed the OSHA Permissible Exposure Limit if work is performed within 12 feet of the high-pressure pump or air compressor for an 8-hour work shift. • If the trailer is operated in a confined location where the generated noise is reflected, an increase in noise exposure is expected. • If design or system changes are made, more noise monitoring is warranted. • A hearing conservation program should be in place due to the overexposures projected. • Personnel in the areas of the air compressor and the high-pressure water pump should wear hearing protection. 	
E. NON-IONIZING RADIATION	RISK RATING: N/A
<ul style="list-style-type: none"> • Not part of this technology. 	
F. IONIZING RADIATION	RISK RATING: 3
<ul style="list-style-type: none"> • Technology does not produce a hazard but is being considered by the Department of Energy for use on pipes carrying high-level radioactive wastes. • Personnel exposure is dependent upon the site of operation and the piping contents. 	
G. COLD STRESS	RISK RATING: N/A
<ul style="list-style-type: none"> • Technology does not produce a hazard but ambient conditions should be considered. 	

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SECTION 6: ASSOCIATED HEALTH HAZARDS (continued)	
H. ERGONOMIC HAZARDS	RISK RATING: 2
<ul style="list-style-type: none"> • The ergonomic hazards of the Aqua Miser Ultra Boss greatly depend upon the entry point to the piping system. • The connection to the blocked piping presents increased risk of back problems because of the poor postures involved. • Proper lifting techniques must be a part of personnel training and SOPs. • Correct use of the hose grip is necessary to reduce strain on hands and wrists proper training is required. 	
I. OTHER	RISK RATING: 2
<ul style="list-style-type: none"> • Before work can begin, a site-specific evaluation must be completed due to environmental conditions. Contaminants within the blocked piping must be known so that proper PPE can be used and appropriate exposure monitoring performed. 	
SECTION 7: PHASE ANALYSIS	
A. CONSTRUCTION/START-UP	
<ul style="list-style-type: none"> • A vehicle is required to position the Aqua Miser Ultra Boss trailer. • Muscular/back injury is possible while moving hoses and gaining access to the piping system. • Slips/trips/falls can occur due to the hoses. • Struck by/caught between hazards and pinch points are encountered when lowering the outriggers and when the high-pressure water system is in operation. • All hoses involved must be inspected before assembly/use and proper burst-retention slings need to be used on the high-pressure water hoses. 	
B. OPERATION	
<ul style="list-style-type: none"> • Risks from excessive pressure exist and the key must be removed and controlled by the operator at all times whenever the nozzle is in an exposed condition. • Exposure to contaminants depends upon the location of the blockage within the piping. • Noise hazards depend upon proximity to high-pressure water pump and diesel engine. Hearing protection is required when within a twelve-foot radius of the trailer. When the trailer is operating in a confined location, hearing protection is required. 	

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SECTION 7: PHASE ANALYSIS (continued)
C. MAINTENANCE
<ul style="list-style-type: none"> • Removal and control of the ignition key as part of a lockout/tagout program, will effectively remove hazards associated with unexpected start-up of the unit. • The release of built-up air pressure is a requirement prior to performing maintenance. • Any maintenance work is particularly hazardous if contaminants are within the pump system. Use of an anti-reverse flow device is warranted. • Routine maintenance may require respiratory protection, depending on the nature and toxicity of the contaminant and the part of the system that is being serviced.
D. DECOMMISSIONING
<ul style="list-style-type: none"> • The decommissioning phase presents several hazards including exposure to the contaminants, pinch points, slips/trips/falls, and muscular/back injury.
SECTION 8: HEALTH AND SAFETY PLAN REQUIRED ELEMENTS
A. AIR MONITORING
The possibility of vapor, gas, liquid, and solid contaminants exists. Air monitoring is particularly critical when the blocked piping contains radioactive materials or highly toxic agents. If the trailer is used indoors air monitoring is needed, and the diesel exhaust should be vented to the exterior of the building.
B. WORKER TRAINING
Workers who operate or maintain this equipment should receive the following training: <ul style="list-style-type: none"> • Training on the manufacturer's user's manual for the Aqua Miser Ultra Boss. • Training on manufacturer's maintenance procedures. • High-pressure water usage and hazards as listed with the Water Jet Technology Association (WJTA). • Proper lifting techniques/ergonomic hazards. • Proper lockout/tagout procedures.
C. EMERGENCY RESPONSE
Emergency response planning for a site should assure adequate coverage for hazards described in the TSDS. Having at least one worker per shift trained in CPR and first aid is recommended. The crew should discuss the worst-case scenarios at each site and plans should be made on how to deal with each scenario before work begins. If contaminants are within the piping, actions must be taken to protect all personnel in the event of a pipe rupture.

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SECTION 8: HEALTH AND SAFETY PLAN REQUIRED ELEMENTS (continued)

D. MEDICAL SURVEILLANCE

A good general screening of the crew's health with emphasis on the back and cardiovascular/respiratory system is usually warranted. Depending on the contaminant present, airborne levels, and the need for respiratory protection/PPE, medical surveillance may be required by OSHA standards. A hearing conservation program needs to be in place. In addition, annual audiograms may be warranted depending upon typical daily working conditions.

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 should attempt to operate the technology. Knowledge of the blocked piping including age, condition, contents, composition, size, and prior use is paramount to the safety and health of all personnel.