

### US Army Corps Of Engineers Missions

1. Flood Damage Reduction
  - a) Down Stream of the dam through monitored release of lake pool (water)
2. Water Storage
  - a) We supply drinking water to local municipalities
    - ❖ At Bardwell we supply Ennis and the cooling water for Tractor Bell Electric.
3. Natural Resource and Recreation Management
  - ❖ Where you come in

### Bardwell Lake

| Team Structure                        |                               |
|---------------------------------------|-------------------------------|
| Trinity Cluster Manager<br>Larry Buck |                               |
| Lake Manager<br>Ken Robinson          |                               |
| Rangers                               | Maintenance                   |
| Doric Murphy                          | Bob Elman                     |
| Volunteers                            | Rusty Hilliard (11)           |
| Steven Riddlehuber                    | Scotty Vyeers/<br>Mark Trojek |
| Gate Attendants                       |                               |
| Scott Tacket (TDY until July)         |                               |
| Tommy Clark – Summer Ranger           |                               |
| Allan Jones - Summer Ranger           |                               |

### Rangers

- ❖ Do not Carry Guns or Handcuffs and are not Law Enforcement Officers
- ❖ Enforce Regulations under Title 36 of the CFR
  - > Try to gain compliance at the lowest possible level
  - > Law Enforcement Agreement for other problems
- ❖ Manage Parks and Natural Resource Areas surrounding Lake
- ❖ Patrol Water via boat or PWC (Jet Ski)
- ❖ Promote fun & safe use of project lands and water resources
- ❖ Are trained in Self Defense and carry Pepper Spray
  - > Do not try to rescue a ranger from confrontation with a park guest
    - “Stand Back” followed by “Spray, Spray, Spray” move down wind and behind park ranger (stay at least 30 feet away and be sure gate house has Sheriff on the way)

### Maintenance

- ❖ Responsible for maintaining the dam & structure
- ❖ Correct problems that occur in parks
  - > Electric (after we check breakers)
  - > Water Leaks (check that hose fitting has been tightly closed)
  - > Shower Water Temp (It is preset and should not be adjusted)
  - > Other mechanical problems
- ❖ Maintenance Requests should be filled out and left with Gate House for the next ranger for anything you can not fix yourself

### Gate Attendants

- ❖ Contracted to collect fees and oversee daily operation of park – Work 4 days On 4 Days Off
- ❖ Only People authorized to accept money
- ❖ May ask you to:
  - > Check sites for availability
  - > Check on a reported site problem
  - > Watch gate for a few minutes (this should not be a regular practice)

## Park Hosts

- ❖ Ambassador – That is YOU
- ❖ Maintenance – Primarily in winter months
- ❖ Office – Help out office staff with telephones filing, copying and so forth
- ❖ Trail Steward – Monitor trail use and conditions

## Park Rules

- ❖ All Animals must be secured or on a < 6ft leash
  - > If tied out must be attended and on lead < 6ft
- ❖ Parking
  - > Not on Grass
  - > If cars do not fit on site send to overflow lot
  - ❖ park 2 blocks on park 2 on pavement, outside passage for emergency vehicles at all times (cars all cars park on same side of road)
- ❖ Quiet Hours 10Pm - 6Am Daily
- ❖ Check Out Time 2PM
- ❖ 2 Camping Units per site (an RV and 1 Tent or 2 Tents)
- ❖ Keep sites clean and free of debris
- ❖ No Dogs, No Glass & No BBQs in Swim Beach Areas
- ❖ No cutting of vegetation or activities that would harm vegetation
  - > Sticks and dead limbs on ground may be gathered for firewood
- ❖ No Metal Detectors or digging

## Verbal Judo

### Talking to Visitors

- 1) Introduce yourself with title
  - ✓ Hi, My name is Dorie. I'm the park Host in this area. (be friendly and respectful)
- 2) Give the reason your there
  - ✓ I stopped by :
    - ❑ To welcome you and be sure you received a map with a copy of our park rules
    - ❑ To remind you all dogs must be on a 6ft leash
    - ❑ To ask you to park your cars off the grass in the overflow lot

## Options

- 1) They comply or make moves toward compliance
    - ✓ Thank them and move on
  - 2) They give excuses
    - ✓ That maybe true but...
    - ✓ I understand but the rules are...
    - ✓ I still need you to help me by...
  - 3) They still do not comply
    - ✓ Move on and make a note of it
- ❖ Do not commit a Ranger or other team member to a future action
  - ❖ Do not argue with the Park Guest (It is not worth the risks)

## Safety

### Reasons not to approach a group

- > If you have the weebeegeebees (yes that is a technical term)
- > Loud obnoxious and drinking
- > Odd looking tattoos displayed
- > Fighting of any kind

### Pass by and notify Gate House immediately

- ✓ Give specifics of situation but do not add conjecture

## Radios

- Use simple but clear wording
- keep it short
- Be patient with those on the other end
- If asked "is your radio secure" we want to know if you are with park guests at that time
- Everyone can here you
  - Rangers Gate houses and Office

### **First Aid**

- Provide only if Certified
- Get Persons: name, address, and what happened  
And guardian name if they are under 18
- Report to Ranger so incident report can be filed

### **Emergencies**

- Ambulance – Call 911
  - Notify Gate House and then a Ranger
  - Or use radio to request help
- Sheriff – Call 911 or 972-937-6060
  - Notify Gate House and Ranger
- Other- Call Gate House
  - They will notify appropriate authority

### **Paper Work**

- Cleaning Inspections - Turn in at weekly meeting
- Customer Survey - Turn in at Weekly meeting
- Maintenance Requests – Turn in to Gate
- Monthly Hours- Turn in at weekly meeting

## Individual Training Plan

**Volunteer Name** \_\_\_\_\_

**Date** \_\_\_\_\_

**Supervisor Name** \_\_\_\_\_

**Date** \_\_\_\_\_

**Office Symbol** \_\_\_\_\_

| Position  | Work Description  | Training Requirement                            | Date Provided | Volunteer Initials | Volunteer Coordinator Signature |
|-----------|---|---|---------------|--------------------|---------------------------------|
| Park Host | Primary: Provide Hospitality and customer service to park guests, collecting use fees, organizing paperwork from park to office, maintain campsite occupancy list, operate office equipment including internet reservation program  | First Aid and CPR (ARC)                         |               |                    |                                 |
|           | Secondary: Assist in upkeep of park facilities and promoting safe use of Corps facilities. Provide valuable information on how to improve our parks by maintaining open communication with Rangers and Managers, passing on ideas for improvement gathered during daily contact with visitors | Proper Lifting Techniques (ARC)                 |               |                    |                                 |
|           |   | Driver Safety (on-line through District Office) |               |                    |                                 |
|           |   | NRRS System Training                            |               |                    |                                 |
|           |   | Equipment Safety, Use and Upkeep                |               |                    |                                 |

**Volunteer Signature** \_\_\_\_\_

**Date** \_\_\_\_\_

**Volunteer Supervisor Signature** \_\_\_\_\_

**Date** \_\_\_\_\_

# Restroom Inspection

Park : High View Park

Day/Date: \_\_\_\_\_

Time: \_\_\_\_\_

Scheduled Cleaning: \_\_\_\_\_

## Inspect:

- Showers

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| Clean | Yes | No |
|-------|-----|----|
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## Toilet stall

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| Clean | Yes | No |
|-------|-----|----|
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- Floors

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| Clean | Yes | No |
|-------|-----|----|
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- Sink & mirror

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| Clean | Yes | No |
|-------|-----|----|
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## Urinals

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## Park / Campsite Volunteer Cleaning Guide

1. Clean Grills and Fire-rings  
Grill should be thoroughly cleaned after each use!  
Fire-rings do not need to be completely clean out each time. Remove any trash and be sure ash level is low enough to allow a safe fire to be built without escaping out over the rim. Please take care with hot coals - dumpster fires are possible.
2. Sweep or Wash tables, seats and table pad.  
If fish cleaning residue or bird droppings are on the concrete camping or wooden utility table or seats, it may require a wire brush to clean it properly.
3. Trash Collection  
Pick up all trash around the campsite to include the small items: cigarette butts, plastic ware, tin foil, etc.
4. Leaves and Small Limbs  
Rake leaves and small limbs off the camping pad and disburse outside the immediate campsite. Large amounts of leaves can be burned, (if safe), or bagged for mulching. Consult your ranger or volunteer supervisor before any burning!
5. Tree Care
  - a. Look closely and remove all nails, screws, wire, string or cord from tree trunks and limbs. Remove in the way that causes the least damage to the tree.
  - b. Remove dead or broken branches to improve both safety and aesthetics.
6. Shoreline Care  
Walk and clean the shoreline weekly. The terrain will vary tremendously and care should be taken to collect all trash safely. The presence of poisonous plants, spiders and snakes should be taken into account!
7. Restrooms, Outhouses, Playgrounds and Mowed Open Areas  
These area are not to be cleaned by the volunteers, they are under contract care.
8. Wild Areas  
Remove any visible trash from wild areas. These areas need not be searched for low-lying non-visible trash.
9. Record Keeping  
Volunteer Supervisor will provide forms and explain their use.
10. Seasonal Emphasis  
Early emphasis is on cleaning all sites before the camping public starts to use the park after 1 April. Cleaning vacated sites before the next arrival is the emphasis as the season progresses.
11. We do not clean an occupied campsite unless requested by the occupants. Consider contacting your ranger supervisor if unsure of how to proceed after such a request.

# VOLUNTEERING FOR THE U.S. ARMY CORPS OF ENGINEERS

## HISTORY OF THE CORPS

US Army Corps of Engineers®

## JOBS FOR VOLUNTEERS

## VOLUNTEER ENROLLMENT

## VOLUNTEER QUALIFICATIONS

• A volunteer agreement will determine the necessary qualifications for each volunteer assignment

• A volunteer's health and physical condition must be good enough to permit volunteered activities without undue hazard to anyone

## TIMEKEEPING

### SUPERVISION AND WORK PERFORMANCE

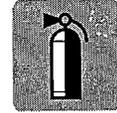


The volunteer's responsibility is to perform the work as described and agreed to in the volunteer's agreement.



The Corps responsibility is to provide adequate supervision and the recommend termination of a volunteer if his or her service is unsatisfactory.

### SAFETY





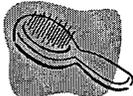
### INJURIES




Length of volunteer service must be agreed on by the prospective volunteer and the Corps before finalizing a work agreement.

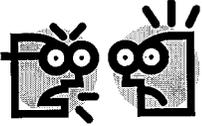


### EXPIRATION OF VOLUNTARY SERVICE





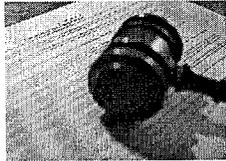
### VOLUNTEER CODE OF CONDUCT

### CODE OF RESPONSIBILITY FOR VOLUNTEERS



## BILL OF RIGHTS FOR VOLUNTEERS



## MEETING THE VISITOR

## GUIDELINES FOR COMMUNICATION

- Ⓞ HANDLING AN EMBARRASSING SITUATION
- Ⓞ EXPLAINING A CORPS OF ENGINEERS RULE OR REGULATION
- Ⓞ MULTIPLE REQUEST SITUATIONS
- Ⓞ HELPING THE VISITOR

## CUSTOMER CARE



- ☛ Be Receptive
- ☛ Be Helpful
- ☛ Be Accurate
- ☛ Be Informed

### ACTIVITY HAZARD ANALYSIS

**ACTIVITY:** Bandsaw Operations

**ANALYZED BY/DATE:** Bill Clevenger  
16 April 2003

**REVIEWED BY/DATE:**

| PRINCIPAL STEPS   | POTENTIAL SAFETY/HEALTH HAZARDS   | RECOMMENDED CONTROLS   |
|---|---|--|
| <i>Inspect saw for defective card, properly working guards, and dull or loose blades.</i>   | <i>Power switch could accidentally be turned "on" causing cuts and abrasions from blade.</i>  | <i>Disconnect power plug prior to performing these checks. Exercise care in checking sharpness of blade.</i>   |
| <i>Setting up saw</i>   | <i>a. Electrical shock<br/>b. Cuts and abrasions</i>  | <i>a. Disconnect power plug<br/>b. Exercise care in setting up blade and don't leave more than 1/4" of the blade showing above the material</i>  |
| <i>Don personal protective equipment such as eye and hearing protection</i>   | <i>Vision may be impaired by safety glasses that are dirty, clouded over or scratched.</i>  | <i>Make sure safety glasses are clean and free from defects and fit properly.</i>  |
| <i>Material handling</i>  | <i>Splinters back and foot injuries.</i>  | <i>Wear gloves and use good lifting techniques. Wear steel-toe shoes.</i>  |
| <i>Cut material</i>   | <i>a. Rotating parts of saw may catch loose clothing, jewelry, or gloves.<br/>b. Personnel may be cut if guards are removed.<br/>c. Forcing material through saw may result in personal injury or equipment damage.<br/>d. Saw dust from cutting operation may cause eye injuries.<br/>e. Hearing may be impaired by high pitch noise.<br/>f. Personnel may be cut by saw blade during sawing.<br/>g. Personnel may be injured by unattended running saw.</i> | <i>a. Personnel shall not wear loose clothing or gloves while cutting material.<br/>b. Keep all guards in place.<br/>c. Don't force material through saw. It will cut better and be safest working at the rate for which the saw was designed.<br/>d. Wear proper eye protection.<br/>e. Wear proper ear protection.<br/>f. Keep hands and all parts of the body clear from path of saw blade.<br/>g. Never leave saw running or unattended. Turn off when not in use.</i> |
|   |   |  |
| EQUIPMENT TO BE USED  | INSPECTION REQUIREMENTS   | TRAINING REQUIREMENTS  |
| <i>Bandsaw<br/>Eye protection<br/>Hearing protection<br/>Stationary feeder rollers or<br/>Suitable stands<br/>Wooden push stick</i> | <i>Inspect bandsaw before each use.<br/>Insure guards and other safety features are in place and operational.</i>   | <i>On the job training<br/>Be checked-out by a qualified, experienced person<br/>Obtain supervisor's/manager's authorization before operating this equipment</i>   |
|   |   |  |

### ACTIVITY HAZARD ANALYSIS

ACTIVITY: Belt sander operation

ANALYZED BY/DATE: Bill Clevenger  
16 April 2003

REVIEWED BY/DATE:

| PRINCIPAL STEPS   | POTENTIAL SAFETY/HEALTH HAZARDS   | RECOMMENDED CONTROLS  |
|---|---|---|
| <i>Check machine for condition of power cord, plug, belt, and belt clearance.</i>       | <ul style="list-style-type: none"> <li><i>a. Sander may be accidentally turned on during check.</i></li> <li><i>b. Personnel may be exposed to electrical shock during use.</i></li> <li><i>c. Defective belt or one that is not properly adjusted may cause personal injury or equipment damage.</i></li> </ul>  | <ul style="list-style-type: none"> <li><i>a. Disconnect power cable.</i></li> <li><i>b. Check power cord for frays, exposed wires, and faulty plug. Make sure ground wire and pin are attached.</i></li> <li><i>c. Check sanding belt for tears, worn pieces, and proper tension. Belt should be turned by hand to insure that it is tracking properly. Check clearance between belt and table.</i></li> </ul>                          |
| <i>Set up machine to include proper angle on table and proper location of backstop.</i> | <i>NONE</i>   | <i>NONE</i>   |
| <i>Sand Material</i>  | <ul style="list-style-type: none"> <li><i>a. Touching abrasive wheel while in operation will cause personal injury.</i></li> <li><i>b. Material may "kick back" if sanding is done against the grain.</i></li> <li><i>c. Gloves or loose clothing may be caught in sanding belt or wheel.</i></li> <li><i>d. Eye injuries may result from dust and grit generated by high-speed sanding.</i></li> <li><i>e. Hearing may be impaired by high-pitched noise.</i></li> <li><i>f. Personnel may be injured by unattended running sander.</i></li> </ul> | <ul style="list-style-type: none"> <li><i>a. Keep hands and body away from abrasive wheel.</i></li> <li><i>b. Always sand with grain of the wood.</i></li> <li><i>c. Never wear gloves or loose clothing while operating this machine.</i></li> <li><i>d. Wear proper eye protection.</i></li> <li><i>e. Wear proper ear protection.</i></li> <li><i>f. Never leave sander running unattended. Turn off when not in use.</i></li> </ul> |
| <b>EQUIPMENT TO BE USED</b>   | <b>INSPECTION REQUIREMENTS</b>  | <b>TRAINING REQUIREMENTS</b>  |
| <i>Belt sander<br/>Eye protection<br/>Hearing protection<br/>Suitable stands</i>        | <i>Inspect before each use.<br/>Insure guards and other safety features are in place and operational.</i>   | <i>On the job training. Be checked-out by a qualified, experienced person and obtain supervisor's/manager's authorization before operating this equipment.</i>  |

## ACTIVITY HAZARD ANALYSIS

**ACTIVITY:** Bench Grinder  
Operation

**ANALYZED BY/DATE:** Bill Clevenger  
16 April 2003

**REVIEWED BY/DATE:**

| PRINCIPAL STEPS                                  | POTENTIAL SAFETY/HEALTH HAZARDS  | RECOMMENDED CONTROLS  |
|--|--|---|
| <p><i>Check bench grinder for condition.</i></p> | <p><i>a. Grinder may be accidentally turned on during check.</i><br/> <i>b. Electrical shock during use.</i><br/> <i>c. Grinding wheel may shatter during use.</i><br/> <i>d. Tool rest may be improperly adjusted.</i><br/> <i>e. Tongue guard (wheel guard) may be improperly adjusted.</i><br/> <i>f. Abrasive wheel may not be rated speed (RPM) of grinder.</i><br/> <i>g. Grinding shield may be missing or loose.</i><br/> <i>h. Loose, defective or missing, guards.</i><br/> <i>i. Abrasive wheel may have worn spots or chips.</i></p> | <p><i>a. Disconnect power cord.</i><br/> <i>b. Check power cord for frays, exposed wires and faulty plug. Make sure ground prong is attached.</i><br/> <i>c. Check abrasive wheels for apparent defects such as cracks, uneven wear and security of mounting. Ring test all replacement wheels prior to their use. <u>To ring test, suspend the wheel with a rod through the center hole, tap the wheel about forty-five degrees on each side of the vertical centerline.</u></i><br/> <i>    <u>i. A dull sound indicates the wheel is cracked and should not be used.</u></i><br/> <i>    <u>ii. A clear "ring" means the wheel is undamaged and usable.</u></i><br/> <i>d. Check clearance between the abrasive wheel and tool rest. This distance should be no more than 1/8". Adjust if necessary.</i><br/> <i>e. If rating of wheels is unknown, determine by removing side plate guard and checking wheel for manufacturer's rating.</i><br/> <i>f. Check shield for security of mounting and condition.</i><br/> <i>g. Check shield for security of mounting and condition.</i><br/> <i>h. Do not operate grinder until all guard deficiencies have been corrected.</i><br/> <i>i. Dress wheel with approved wheel-dressing tool.</i></p> |
| <p><i>Don personal protective equipment.</i></p> | <p><i>a. Vision may be impaired by dirty, clouded or scratched eye protection equipment.</i><br/> <i>b. Hearing may be impaired by loud noise.</i><br/> <i>c. Hands may be injured due to hot or sharp metal.</i></p>  | <p><i>a. Wear eye protection; however, make sure they are clean, free from defects and fit properly.</i><br/> <i>b. Wear ear protection. Make sure of proper fit using caution not to insert earplugs in too tight.</i><br/> <i>c. Wear leather gloves.</i></p>   |

|                              |   |   |
|------------------------------|---|---|
| <p><i>Grind material</i></p> | <p>a. Long hair, neckties jewelry and clothing may be caught in grinding wheel.</p> <p>b. Personnel will be injured if contact is made with abrasive wheel shell running.</p> <p>c. Burns may be received by touching freshly ground material.</p> <p>d. Eye injuries are apt to result from grinding operations.</p> <p>e. Personnel may be injured if material being ground becomes caught between tool rest and wheel.</p> <p>f. Hearing may be impaired by high pitch noise.</p> <p>g. Other personnel may be injured by unattended running grinder.</p> <p>h. Wheel may be damaged by improper use.</p> <p>i. Fire may erupt.</p> <p>j. Work by-product may cause slip and trip hazards.</p> | <p>a. Tie up or net long hair. Do not wear neckties, vulnerable jewelry or loose clothing while operating reciprocating equipment.</p> <p>b. Avoid any contact with rotating abrasive wheels.</p> <p>c. Do not touch as item that has been ground unless it has cooled or gloves are being worn.</p> <p>d. Wear eye protection during all grinding as well as keeping grinder shields properly positioned.</p> <p>e. Firmly grasp or clamp materials being ground to avoid this hazard.</p> <p>f. Wear ear protection that is properly fit.</p> <p>g. Do not leave grinder with power switch on.</p> <p>h. Grind only on the edge of the wheel, never on the side.</p> <p>i. Permit no smoking, sparks, welding, or open flame in the area.</p> <p>j. Keep surrounding floor and area clean and free of debris. Cleanup during and immediately after job is complete.</p> |
|------------------------------|---|---|

| EQUIPMENT TO BE USED   | INSPECTION REQUIREMENTS  | TRAINING REQUIREMENTS   |
|--|--|---|
| <p><i>Bench grinder</i><br/> <i>Eye protection</i><br/> <i>Hearing protection</i><br/> <i>Suitable stands.</i></p> | <p><i>Inspect before each use.</i><br/> <i>Insure guards and other safety features are in place and operational.</i><br/> <i>"Ring- test" replacement wheels prior to use.</i></p> | <p><i>On the job training. Be checked-out by a qualified, experienced person and obtain supervisor's/manager's authorization before operating this equipment.</i></p> |

### ACTIVITY HAZARD ANALYSIS

**ACTIVITY:** Biological Blower  
Repair

**ANALYZED BY/DATE:** Bill Clevenger  
20 April 2002

**REVIEWED BY/DATE:**

| PRINCIPAL STEPS  | POTENTIAL SAFETY/HEALTH HAZARDS   | RECOMMENDED CONTROLS   |
|--|---|--|
| <i>Turn off main breaker</i>   | <ul style="list-style-type: none"> <li>a. <i>Electric shock</i></li> <li>b. <i>Insects, wasps, bees, ants, and spiders</i></li> </ul>   | <ul style="list-style-type: none"> <li>a. <i>Perform lockout/tagout procedures</i></li> <li>b. <i>Wear gloves and use a pesticide spray</i></li> </ul>   |
| <i>Place ladders securely against building</i>   | <i>Slips, falls and loss of ladder</i>  | <i>Inspect and clean ladder, cock bottom tie off top of ladder, and use ladder of proper length</i>  |
| <i>Test circuit</i>  | <i>Circuit may still be hot</i>   | <i>Treat all circuits as hot until tested</i>  |
| <i>Inspect, remove and replace faulty parts</i>  | <i>Hand injury, back injury and falls</i>   | <i>Use proper tools, check for burrs, use proper lifting techniques, and use a rope lower and raise parts and tools</i>  |
|  |   |  |
| EQUIPMENT TO BE USED   | INSPECTION REQUIREMENTS   | TRAINING REQUIREMENTS  |
| <ul style="list-style-type: none"> <li><i>Hand tools</i></li> <li><i>Circuit tester</i></li> <li><i>Gloves</i></li> <li><i>Rope</i></li> </ul> | <ul style="list-style-type: none"> <li><i>Open each blower cover and visually inspect blower and motor for mechanical malfunction</i></li> <li><i>Check blower oil by opening petcock</i></li> <li><i>Oil motor bearings</i></li> <li><i>Check ventilators</i></li> <li><i>Clean filter, replace as needed</i></li> </ul> | <ul style="list-style-type: none"> <li><i>Hazardous Energy Control</i></li> <li><i>Proper use of ladders</i></li> <li><i>Proper lifting techniques</i></li> <li><i>On the job training.</i></li> <li><i>Be checked-out by a qualified, experienced person</i></li> <li><i>Obtain supervisor's/manager's authorization</i></li> </ul> |
|  |   |  |

### ACTIVITY HAZARD ANALYSIS

**ACTIVITY:** Bit Sharpening

**ANALYZED BY/DATE:** Bill Clevenger  
16 April 2003

**REVIEWED BY/DATE:**

| PRINCIPAL STEPS  | POTENTIAL SAFETY/HEALTH HAZARDS   | RECOMMENDED CONTROLS  |
|--|---|---|
| Check sharpener for condition.   | <ul style="list-style-type: none"> <li>a. Power cord may be frayed or damaged causing potential shock hazard.</li> <li>b. Guards may be damaged or missing causing exposure to grinding wheel or flying debris.</li> <li>c. Grinding wheel may be loose, worn or uneven.</li> <li>d. Selector switch may be in "D" (dress) position.</li> </ul>                                 | <ul style="list-style-type: none"> <li>a. Check power cord and plug for condition. Repair or replace any deficiency noted.</li> <li>b. Check all guards for condition and security of mounting.</li> <li>c. Check grinding wheel for condition and security of mounting.</li> <li>d. Refer to Owner's Manual for proper procedures in repositioning dress/sharpen switch to avoid causing damage to machine.</li> </ul>   |
| Position swinghead to load bit.  | None  | None  |
| Load bit in swinghead  | <ul style="list-style-type: none"> <li>a. Bit flute may not be positioned so that it is flat against the straight edge of the locator.</li> <li>b. Bit tip may extend too far below or above end of locator.</li> <li>c. Bit may be loose in chuck causing damage to chuck, grinding wheel or locator.</li> <li>d. Broken bits may cause grinding wheel to fragment.</li> </ul> | <ul style="list-style-type: none"> <li>a. Exercise care in flute alignment with straight edge of locator.</li> <li>b. Position bit so that tip is approximately 1/16" below end of locator. This will provide an adequate grinding surface on tip of bit without allowing locator point to contact grinding wheel.</li> <li>c. Fasten bit in chuck by turning chuck nut clockwise until it is securely in place.</li> <li>d. Broken bits will be more easily and safely sharpened if they are first rounded into shape by hand on a bench grinder.</li> </ul> |
| Lower swinghead to sharpening position   | None  | None  |
| Turn feed control knob clockwise until bit is almost touching wheel as swinghead is rocked back and forth.   | None  | None  |
| Turn motor on, gently rock swinghead back and forth, moving feed control knob clockwise to feed bit into grinding wheel to sharpen. Note setting of feed knob when 1st cutting lip is sharp. | <ul style="list-style-type: none"> <li>a. Grinding particles may be thrown and cause eye injuries.</li> <li>b. Bit may be fed into grinding wheel enough for the locator to make contact with grinding wheel.</li> </ul>  | <ul style="list-style-type: none"> <li>a. Wear eye protection while sharpening bits. Make sure eye shield is installed on sharpener.</li> <li>b. Be sure bit is properly set for depth in chuck. Closely monitor during sharpening.</li> </ul>  |
| Turn sharpener off when 1st cutting lip is properly sharpened.   | Tip of bit may be hot.  | Do not touch tip of bit until allowed to cool.  |

| Return feed control to zero by turning counter clock-wise.  | None  | None  |
|---|---|---|
| Move swinghead down and back to rest position.  | None  | None  |
| Return swinghead to sharpening position.  | None  | None  |
| Turn motor switch on and gently roll swinghead back and forth moving feed control knob clockwise one mark at a time to sharpen 2nd cutting lip. Turn feed control knob one setting past the mark stopped at while sharpening 1st cutting lip. | <p>a. Grinding particles may be thrown and cause eye injuries.</p> <p>b. Bit may be fed into grinding wheel enough for the locator to make contact with grinding wheel.</p> | <p>a. Wear eye protection while sharpening bits. Make sure eye shield is installed on sharpener.</p> <p>b. Be sure bit is properly set for depth in chuck. Closely monitor during sharpening.</p> |
| Turn shear 180 degrees clockwise without disturbing feed control knob position. This returns bit to 1st cutting lip for final sharpening. Grind 1st cutting lip until sparks are no longer produced as bit is swung past grinding wheel.      | <p>a. Grinding particles may be thrown and cause eye injuries.</p> <p>b. Bit may be fed into grinding wheel enough for the locator to make contact with grinding wheel.</p> | <p>a. Wear eye protection while sharpening bits. Make sure eye shield is installed on sharpener.</p> <p>b. Be sure bit is properly set for depth in chuck. Closely monitor during sharpening.</p> |
| Turn power switch off, raise swinghead to loading position and remove bit from chuck.   | <p>a. Contact may be made with grinding wheel while still rotating.</p> <p>b. Tip of bit will be hot immediately after sharpening.</p>                                      | <p>a. Don not touch grinding wheel that is turning.</p> <p>b. Allow bit to cool a couple of minutes prior to removal from chuck or wear gloves.</p>   |
| Turn feed control knob to zero by turning counter clockwise.  | None  | None  |
|   |   |   |
| EQUIPMENT TO BE USED  | INSPECTION REQUIREMENTS   | TRAINING REQUIREMENTS   |
| Bit sharpener<br>Eye protection<br>Hearing protection   | Inspect before each use.<br>Insure guards and other safety features are in place and operational.   | On the job training.<br>Be checked-out by a qualified, experienced person<br>Obtain supervisor's/manager's authorization before operating this equipment.   |
|   |   |   |

## ACTIVITY HAZARD ANALYSIS

ACTIVITY: Boat Operation

ANALYZED BY/DATE: Bill Clevenger  
16 April 2003

REVIEWED BY/DATE:

| PRINCIPAL STEPS  | POTENTIAL SAFETY/HEALTH HAZARDS  | RECOMMENDED CONTROLS   |
|--|--|--|
| <p><i>Check boat and trailer for condition and availability of safety equipment.</i></p> | <p><i>a. Boat navigational lights, gages, pumps, electrical circuits, and engine may not function properly.</i></p> <p><i>b. Warning horn may not work.</i></p> <p><i>c. Fire extinguisher may not have full charge.</i></p> <p><i>d. Life preservers may not be in good repair or the supply adequate for number of persons to be on board.</i></p> <p><i>e. Boat tie downs may not be properly secured.</i></p> <p><i>f. Boat may be overloaded causing it to sink.</i></p> <p><i>g. Trailer tires may be badly worn or improperly pressurized.</i></p> <p><i>h. Boat may not have radio or distress-signaling device.</i></p> | <p><i>a. Check engine readiness, navigational lights, gages, pumps, and electrical circuits for proper operation. Repair all defects.</i></p> <p><i>b. Check warning horn for proper operation and repair as necessary.</i></p> <p><i>c. Check fire extinguisher for serviceability and replace if not fully charged.</i></p> <p><i>d. Check jackets for condition of straps, ties and ensure that the supply is adequate to provide one for each person to be on board.</i></p> <p><i>e. Check boat tie downs to ensure that they will not dislodge from trailer during transport.</i></p> <p><i>f. Be sure capacities as specified by manufacturer are not exceeded.</i></p> <p><i>g. Check trailer for conditions and pressure.</i></p> <p><i>h. Corps personnel should never go out on the lake without a Corps frequency radio unit and an emergency distress-signaling device.</i></p>   |
| <p><i>Check vehicle to be used for towing.</i></p>                                       | <p><i>a. Vehicles driven without proper amounts of oil and coolant may cause damage to engine.</i></p> <p><i>b. Vehicles driven with defective tires may result in an accident.</i></p> <p><i>c. Impaired front, rear and side visibility may result in an accident.</i></p> <p><i>d. Defective exhaust system may induce carbon monoxide into cab area.</i></p> <p><i>e. Vehicles driven at night without proper lights may cause accidents.</i></p> <p><i>f. Vehicles driven with defective brakes may cause an accident.</i></p> <p><i>g. Vehicles used for towing may have a defective or improper size hitch.</i></p>       | <p><i>a. Check engine oil and coolant levels prior to starting engine.</i></p> <p><i>b. Visually check tires for tread wear, defects and inflation. If tire appears low check with gauge. Also check condition of spare.</i></p> <p><i>c. Check windshield, windows and mirrors for cracks, distortions and cleanliness. Clean as necessary to assure good visibility. Adjust seat and rear view mirror for optimum visibility and comfort.</i></p> <p><i>d. Visually check exhaust system. Any defects noted or any evidence of exhaust fumes entering cab must be reported immediately.</i></p> <p><i>e. Check vehicle headlights, taillights, turn signals, parking and clearance lights for proper operation.</i></p> <p><i>f. Check brakes for adequate pedal, sponginess or grabbing. Have all defects corrected prior to use of vehicle. Also check parking brake for proper operation.</i></p> <p><i>g. Check hitch for security of mounting and make sure it is the proper size to mate with trailer.</i></p> |

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|--|--|---------------------------|
|  |  | <i>unit to be pulled.</i> |
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Boat Operation

|   |   |   |
|---|---|---|
| <p>Hook up boat trailer to towing vehicle</p> | <p>a. Back strain may develop from attempting to mate hitch with ball.<br/> b. While hooking up trailer, hands and fingers may be mashed.<br/> c. Lights on trailer may not function properly on trailer when hooked up to towing vehicle.</p>  | <p>a. Use good lifting techniques. Get help if tongue weight is more than can safely be handled.<br/> b. Wear gloves and keep hands and fingers clear of hazardous locations.<br/> c. Check all lights (clearance, tail, sign and stop) for operation. Repair all defects found.</p>  |
| <p>Service boat and towing vehicle</p>        | <p>Fire may erupt during fueling operations</p>   | <p>All vehicles and boats shall be shut down prior to and during fueling operations. Smoking and all other sources of ignition shall be prohibited within 50 feet of fuel operations. Fuel nozzle will not be left unattended during fuel dispensing operations.</p>  |
| <p>Tow boat to ramp</p>                       | <p>a. Vehicle operator and passengers may be ejected from vehicle or thrown into dash or windshield during accident or sudden stop.<br/> b. Vehicles operating at excessive speed are prone to accidents.<br/> c. Traffic approaching from rear may strike vehicle, sideswipe while passing, cut in front or attempt to pass with on-coming traffic present.<br/> d. Vehicles may be struck while crossing railroad crossing.<br/> e. Vehicles stopped on roadways or shoulder may be struck by other vehicles.</p> | <p>a. Vehicle operators and passengers shall be required to fasten and properly adjust seat belts prior to vehicle being put into motion and during entire time of travel. No one will be allowed to ride in a boat while being towed.<br/> b. Vehicles will be operated at no greater than posted speed. When road and weather conditions dictate, vehicle speed will be reduced for conditions.<br/> c. Vehicle operators will continually monitor the rear view mirror for traffic approaching from the rear and drive defensively.<br/> d. Vehicles approaching railroad crossing shall be driven at such a speed to permit stopping before reaching nearest track will proceed only if clear.<br/> e. Vehicles shall not be stopped, parked or left standing in such a manner as to endanger the vehicle, other traffic or personnel using or passing that road or area.</p> |
| <p>Put boat in water</p>                      | <p>a. Tow vehicle or Boat may be damaged or sink, jeopardizing safety of occupants.<br/> b. Driver may back into another vehicle, guardrail or walkway.<br/> c. Tow vehicle may roll down ramp into water.<br/> d. Tow vehicle may roll down ramp into water while attempting to exit ramp.</p>   | <p>a. When preparing to launch, check weather conditions and drain plug and down window.<br/> b. Check ramp prior to backing to ensure that adequate clearance is available; use spotter where needed.<br/> c. Vehicle operator shall remain in vehicle and keep breaks applied. Additionally parking break shall be set.<br/> d. With parking break set and engine running, place gearshift in low gear, shift</p>   |

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|  |  | release clutch while accelerating and release parking break. |
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**Boat Operation**

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| <i>Park vehicle</i>                   | <i>Boat trailer may extend beyond parking space and impede traffic</i>   | <i>Select a parking location that will allow adequate clearance.</i>  |
| <i>Operate boat</i>                   | <p><i>a. Skipper may not be able to operate boat safely or may need help to do so.</i></p> <p><i>b. Persons in boat are subject to falling or being thrown overboard from rough water or sudden movement of boat.</i></p> <p><i>c. Explosion may occur when engine is started due to fume build up in engine compartment.</i></p> <p><i>d. During operation, boat may collide with another boat or make contact with an underwater hazard.</i></p> <p><i>e. Persons on skis and other types of water sports may be encountered during boat operation.</i></p>  | <p><i>a. No boat will be operated, except by a licensed, qualified employee accompanied by a capable assistant.</i></p> <p><i>b. All persons on board are required to wear approved life jackets. Also everyone on board will know locations of ring bu During travel, movement within boat will be kept to an absolute minimum.</i></p> <p><i>c. Engine exhaust fan must be operated one minute prior to cranking engine.</i></p> <p><i>d. Be aware of other boats operating in same area, slow down and yield. Do not operate boat at a high rate of speed in unfamiliar waters. Watch stumps, logs treetops that could damage or capsize t boat.</i></p> <p><i>e. Yield right of way to persons participating in water sports.</i></p>   |
| <i>Put trailer in water</i>           | <p><i>a. Backing trailer into another vehicle, guard rail or walkway</i></p> <p><i>b. Vehicle may roll down ramp into water while trailer is in water</i></p>  | <p><i>a. Check ramp prior to backing to ensure that adequate clearance is available. Use spotter where needed.</i></p> <p><i>b. Vehicle operator shall remain in vehicle and keep brakes applied, parking brake set, engine running and shift in low gear</i></p>   |
| <i>Tie down boat and tow to yard.</i> | <p><i>a. Boat may come loose during transport.</i></p> <p><i>b. Vehicle operator and passengers may be ejected from vehicle or thrown into dash or windshield during accident or sudden stop.</i></p> <p><i>c. Vehicles operating at excessive speed are prone to accidents.</i></p> <p><i>d. Traffic approaching from rear may strike vehicle, sideswipe while passing, cut in front or attempt to pass with on-coming traffic present.</i></p> <p><i>e. Vehicles may be struck while crossing railroad crossing.</i></p> <p><i>f. Vehicles stopped on roadways or shoulders may be struck by other vehicles.</i></p> | <p><i>a. Securely fasten all tie-down straps.</i></p> <p><i>b. Vehicle operators and passengers shall be required to fasten and properly adjust seat belts prior to vehicle being put into motion and during entire time of travel. No one will be allowed to ride in a boat while being towed.</i></p> <p><i>c. Vehicle operators will continually monitor the rear view mirror or traffic approaching from the rear and drive defensively.</i></p> <p><i>d. Vehicles approaching railroad crossing shall be driven at such a speed to permit stopping before reaching nearest track. No one will proceed only if clear.</i></p> <p><i>e. Vehicles approaching railroad crossing shall be driven at such a speed to permit stopping before reaching nearest track. No one will proceed only if clear.</i></p> <p><i>f. Vehicles shall not be stopped, parked</i></p> |

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|  |  | <i>left standing in such a manner as to endanger the vehicle, other traffic or personnel using or passing that road or area.</i> |
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**Boat Operation**

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|------------------------------|--|---|
| <i>Park boat and trailer</i> | <i>While backing into parking space equipment or other objects may be hit.</i>   | <i>Check area carefully and use a spotter needed.</i>   |
| <i>Unhook trailer</i>        | <i>a. Back strain may develop while trying to disconnect trailer.<br/>b. While disconnecting trailer, hands, fingers and feet may be mashed.</i> | <i>a. Use good lifting techniques. Get help, tongue weight is more than can safely be handled.<br/>b. Wear gloves and steel toe shoes. Keep hands, fingers and feet clear of hazardous locations.</i> |
|                              |  |   |

| <b>EQUIPMENT TO BE USED</b>  | <b>INSPECTION REQUIREMENTS</b>  | <b>TRAINING REQUIREMENTS</b>                                       |
|--|---|--|
| <i>Boat<br/>Tow vehicle<br/>Boat trailer<br/>Personal Floatation Devices<br/>Fire extinguisher<br/>Required safety equipment<br/>Radio</i> | <i>Check:<br/>Weather conditions<br/>Engine compartments for fuel and oil accumulations<br/>Engine readiness<br/>Fire extinguishers<br/>Lights<br/>Gages<br/>Pumps<br/>Electrical circuits<br/>Drain plugs<br/>PFDs</i> | <i>Defensive driving<br/>Motorboat Operator's Licensing Course</i> |
|  |   |  |

**ACTIVITY HAZARD ANALYSIS**

**ACTIVITY:** Breaker panel replacement of components

**ANALYZED BY/DATE:** Bill Clevenger  
07April 2002

**REVIEWED BY/DATE:**

| PRINCIPAL STEPS                               | POTENTIAL SAFETY/HEALTH HAZARDS  | RECOMMENDED CONTROLS   |
|---|--|--|
| <i>Kill main breaker, tag or lockout.</i>     | <ul style="list-style-type: none"> <li>a. Short circuits may cause electrical shock.</li> <li>b. Stinging insects may inhabit breaker box.</li> <li>c. Hand slipping off handle due to difficulty of throwing breaker.</li> <li>d. Slippery surface such as oil, grease or water on floor may create slip and trip hazards.</li> </ul> | <ul style="list-style-type: none"> <li>a. Wear lineman's gloves and use insulated tools.</li> <li>b. Use pest control spray to eliminate hazard.</li> <li>c. Use good housekeeping practices and keep all spills cleaned up.</li> <li>d. Use good housekeeping practices and keep all spills cleaned up.</li> </ul>                |
| <i>Test circuit to ensure it is not live.</i> | <i>Exposed wiring may still be hot.</i>  | <i>Treat all circuits as hot until testing has proven otherwise. Use insulated tools.</i>  |
| <i>Remove faulty breaker.</i>                 | <ul style="list-style-type: none"> <li>a. Breaker may shatter while being removed causing potential eye injuries.</li> <li>b. Breaker may become free suddenly causing hand to strike sharp edges.</li> <li>c. wires disconnected from breaker may cause puncture wound.</li> </ul>  | <ul style="list-style-type: none"> <li>a. Wear eye protection.</li> <li>b. Keep puller handles free of grease and oil. Firmly grip handle prior to attempting to remove breaker.</li> <li>c. Secure loose wires with cable ties.</li> </ul>  |
| <i>Inspect and clean box.</i>                 | <i>Debris in breaker box may cause eye injury.</i>   | <i>Wear proper eye protection.</i>   |
| <i>Install new breaker.</i>                   | <ul style="list-style-type: none"> <li>a. Breaker may shatter while being installed causing potential eye injury.</li> <li>b. Breaker may slip during installation causing hand to strike sharp edges.</li> <li>c. Wires to be connected to new breaker may cause puncture wounds.</li> </ul>  | <ul style="list-style-type: none"> <li>a. Wear proper eye protection.</li> <li>b. Firmly grip breaker during installation. Exercise care.</li> <li>c. Wear eye protection and use extreme care.</li> </ul>   |
| <i>Restore power and test circuit.</i>        | <ul style="list-style-type: none"> <li>a. Short circuit may cause electrical shock.</li> <li>b. Hand may slip and contact sharp edges.</li> <li>c. Contact may be made with live circuit causing electrical shock.</li> </ul>  | <ul style="list-style-type: none"> <li>a. Wear lineman's gloves and use insulated tools.</li> <li>b. Keep hands clean and dry to reduce possibility of slipping.</li> <li>c. Use insulated tools for testing circuit and lineman's gloves.</li> </ul>  |
| <i>Kill main breaker</i>                      | <ul style="list-style-type: none"> <li>a. Short circuits may cause electrical shock.</li> <li>b. Hand slipping off handle due to difficulty of throwing breaker.</li> <li>c. Slippery surface such as oil, grease or water on floor may create slip and trip hazards.</li> </ul>   | <ul style="list-style-type: none"> <li>a. Wear lineman's gloves and use insulated tools.</li> <li>b. Ensure that gloves and/or hands are free of grease and oil, firmly grip handle.</li> <li>c. Use good housekeeping practices and keep all spills cleaned up.</li> </ul>  |
| <i>Reinstall cover</i>                        | <ul style="list-style-type: none"> <li>a. Short circuits may cause electrical shock.</li> <li>b. Screwdriver may slip causing cuts and/or puncture wounds.</li> <li>c. Cover may slip when being removed from breaker box causing leg and foot injuries.</li> </ul>  | <ul style="list-style-type: none"> <li>a. Wear lineman's gloves and use insulated tools.</li> <li>b. Use screwdriver only for its intended purpose, exercising care not to point blade at self or others.</li> <li>c. Wear steel toe shoes. Firmly grip cover when removing and be prepared to support its full weight.</li> </ul> |

|   |   |   |
|---|---|---|
| <i>Restore power and remove tag or lock</i> | <i>a. Short circuit may cause electrical shock.</i><br><i>b. Hand may slip and contact sharp edges.</i> | <i>a. Wear lineman's gloves and use insulated tools.</i><br><i>b. Keep hands clean and dry to reduce possibility of slipping.</i> |
|   |   |   |

| <b>EQUIPMENT TO BE USED</b>  | <b>INSPECTION REQUIREMENTS</b> | <b>TRAINING REQUIREMENTS</b>   |
|--|--------------------------------|--|
| <i>Lineman's gloves</i><br><i>Circuit tester</i><br><i>Insulated tools</i><br><i>Eye protection</i><br><i>Lockout/Tagout devices</i> | <i>Test circuits</i>           | <i>On the job training. Be checked-out by a qualified, experienced person and obtain supervisor's/manager's authorization.</i> |
|  |                                |  |

### ACTIVITY HAZARD ANALYSIS

**ACTIVITY:** Clearing brush-  
Hand Tools

**ANALYZED BY/DATE:** Bill Clevenger  
08 April 2002

**REVIEWED BY/DATE:**

| PRINCIPAL STEPS  | POTENTIAL SAFETY/HEALTH HAZARDS  | RECOMMENDED CONTROLS   |
|--|--|--|
| Prepare cutting tools  | <i>Dull tools can slip or rebound</i>  | <i>Ensure that cutting tools are sharp</i>   |
| <i>Be aware of other party members when walking through brush. Clear area of low limbs and vines. Be aware of surroundings. Ensure good footing before cutting. Cut or remove brush.</i> | <i>Rebounding branches can cause eye injuries. A machete, axe, or brush hook can get caught in low limbs or vines causing the tool to fly out of your hand or strike your body. Sharp edges of previously cut limbs and small trees. Trip, fall or slip.</i> | <i>Maintain a minimum distance of ten feet between party members. Remove low limbs and vines before clearing brush. ensure good footing and check for tripping hazards or embankments.</i>                                 |
| <i>Loading of tools and transporting to jobsite and return. Add the hazard and control measure.</i>  | <i>Machete or other tools could fly out of your hands and/or strike your body or other party member.</i>   | <i>Use gloves and wrist straps as required. Make sure station machete users are no closer than ten feet apart. Lean forward and chop away from the body while cutting.</i>   |
|  |  |  |
| EQUIPMENT TO BE USED   | INSPECTION REQUIREMENTS  | TRAINING REQUIREMENTS  |
| <i>Cutting tools<br/>Machete<br/>Axe<br/>Brush hook<br/>Gloves<br/>Wrist straps</i>  | <i>Check area for tripping hazards or embankments</i>  | <i>Training on operating on inclined surfaces<br/>On the job training<br/>Be checked-out by a qualified, experienced person<br/>Obtain supervisor's/manager's authorization.<br/>Training on proper lifting techniques</i> |

**ACTIVITY HAZARD ANALYSIS**

**ACTIVITY:** Brush Cutter  
Operation

**ANALYZED BY/DATE:** Bill Clevenger  
08 April 2002

**REVIEWED BY/DATE:**

| PRINCIPAL STEPS                         | POTENTIAL SAFETY/HEALTH HAZARDS  | RECOMMENDED CONTROLS   |
|---|--|--|
| <i>Check brush cutter for condition</i> | <p><i>a. Cutting tool may be loose, dull or defective exposing operator to undue hazards.</i></p> <p><i>b. Cutting tool guard may be loose or defective.</i></p> <p><i>c. Handlebars may be loose or improperly positioned.</i></p> <p><i>d. Harness and handgrip may be improperly adjusted causing undue fatigue to operator.</i></p> <p><i>e. Throttle may stick and not allow engine to idle properly.</i></p> <p><i>f. Engine muffler may be defective or missing causing undue noise and fire hazard.</i></p> <p><i>g. Fuel tank or filler cap may leak causing fire hazard.</i></p> | <p><i>a. Check cutting blade for looseness and tighten as necessary. Cutting tool that is dull or defective (cracked or severely worn) must not be used. Replace only with cutting tool recommended for that particular brush cutter.</i></p> <p><i>b. Tighten, repair or replace guard assembly as necessary.</i></p> <p><i>c. Align the handlebar (gear box should face downward and handlebar upward) and then secure in position.</i></p> <p><i>d. Adjust harness and hand grip to suit operator's stature. The machine, if properly balanced by harness, will be safer and less tiresome to operate.</i></p> <p><i>e. Check throttle to assure that it moves freely and springs back to idle position when released.</i></p> <p><i>f. Check muffler for condition. If defects are found, replace muffler to reduce noise and fire hazards.</i></p> <p><i>g. Check fuel tank and filler cap for leaks. Repair as necessary before use.</i></p> |
| <i>Fuel brush cutter</i>                | <i>Fire may erupt during fueling operation.</i>  | <i>The brush cutter will not be filled while running, hot, near open flame or spark producing operations. If fuel is spilled while fueling, wipe up immediately. Fuel cutter only in well ventilated area.</i>   |

|                                |   |  |
|--------------------------------|---|--|
| <p><i>Start engine</i></p>     | <p><i>a. Brush cutter operations may produce injuries to all parts of the body due to sharp, rotating cutting tool and the hazard of flying debris.</i></p> <p><i>b. Engine operations produce hazardous fumes.</i></p> <p><i>c. Other persons in area may be injured from brush cutter operation.</i></p> <p><i>d. Upon initial start, the cutting tool may strike ground or other objects.</i></p> <p><i>e. Upon release of throttle, the cutting tool may continue to turn.</i></p>  | <p><i>a. Operators will wear eye and face protection, hearing protection, hard hat, steel toe shoes and gloves. Do not wear loose fitting clothing, scarf, necktie, jewelry, etc., which could get caught in wood or shrub.</i></p> <p><i>b. The brush cutter must not be started or operated in confined spaces.</i></p> <p><i>c. Brush cutters are designed for one-man operation only. Make sure that nobody is standing within a 16-foot radius of your own position when starting. Be particularly aware of children and animals.</i></p> <p><i>d. Start machine on even ground. The cutting tool must be clear of the ground and other obstructions. Make sure you have a firm and safe foothold and grip the machine firmly while starting.</i></p> <p><i>e. The cutting tool will continue to rotate for a short period after the throttle is released. However, if after idle speed is reached and cutting tool continues to operate, idle adjustment is necessary.</i></p>   |
| <p><i>Use brush cutter</i></p> | <p><i>a. Brush cutter may get out of control and strike other objects or cause personal injury.</i></p> <p><i>b. Cutting tool will pick up and propel loose objects (rocks, wire, nails, sticks, etc.) at great velocity and distance.</i></p> <p><i>c. Operation of brush cutter during hours of poor visibility may be hazardous.</i></p> <p><i>d. Cutting tool may be damaged if it strikes a large rock or heavy object.</i></p> <p><i>e. Slips and falls may occur on slopes, uneven ground or slippery conditions.</i></p> <p><i>f. During operation in thick grass or heavy vines, the guard may become clogged.</i></p> | <p><i>a. Always hold brush cutter firmly with both hands so that you have it safely under control at all times. Make sure you have a firm foothold while working.</i></p> <p><i>b. Area should be cleared of such items and then operated with extreme caution. Bystanders must not be allowed within a 32-foot radius during cutting operations. Operator will wear all personal protective equipment shown in Step 3, above.</i></p> <p><i>c. Work only when visibility and light are good. Work calmly and carefully; stay alert in order not to endanger others.</i></p> <p><i>d. Check condition of cutting tool at regular short intervals. If behavior of tool changes suddenly, check it immediately for any signs of cracks in particular. Replace damages or dull cutting tool.</i></p> <p><i>e. Take care in slippery conditions, on slopes and uneven ground. Keep a lookout for hidden obstacles such as tree stumps, roots and ditches to avoid stumbling.</i></p> <p><i>f. If the cutting attachment or guard becomes clogged, always switch off engine before attempting to clean.</i></p> |

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| <p><i>Stop engine</i></p>          | <p><i>a. Leaves may ignite from contact with hot muffler.</i><br/> <i>b. Burns may be received if contact is made with a hot muffler.</i><br/> <i>c. Cutting tool may contact object when brush cutter is placed on the ground.</i></p> | <p><i>a. Do not lay brush cutter down so that the muffler will make contact with leaves or other highly combustible materials.</i><br/> <i>b. Exercise care and do not touch muffler.</i><br/> <i>c. Cutting tool will continue to rotate for a short period after engine shutdown. Wait until it has stopped before laying brush cutting down.</i></p> |
| <p><b>EQUIPMENT TO BE USED</b></p> | <p><b>INSPECTION REQUIREMENTS</b></p>   | <p><b>TRAINING REQUIREMENTS</b></p>   |
| <p><i>Brush cutter</i></p>         | <p><i>Check cutter blade</i></p>  | <p><i>On the job training.</i><br/> <i>Be checked-out by a qualified, experienced person</i><br/> <i>Obtain supervisor's/manager's authorization.</i></p>   |
|                                    |   |   |

## ACTIVITY HAZARD ANALYSIS

ACTIVITY: Brush Hog Operation      ANALYZED BY/DATE: Bill Clevenger  
08 April 2002

REVIEWED BY/DATE:

| PRINCIPAL STEPS                      | POTENTIAL SAFETY/HEALTH HAZARDS   | RECOMMENDED CONTROLS   |
|--------------------------------------|---|--|
| <i>Check tractor for condition</i>   | <p>a. Engine may be damaged if operated without a sufficient quantity of oil.</p> <p>b. Engine may be damaged if operated without a sufficient quantity of engine coolant.</p> <p>c. Injury may result when removing radiator cap.</p> <p>d. Tires may be worn or under-inflated.</p> <p>e. Operator may not be familiar with tractor to be used.</p>   | <p>a. Check engine oil level and add if needed.</p> <p>b. Check engine coolant level and add if needed.</p> <p>c. Do not remove the radiator filler cap unless the engine is cool. Then loosen cap slowly to stop, wait for pressure to be released and then remove the cap.</p> <p>d. Check tires for condition and proper inflation.</p> <p>e. Tractor operators must be qualified by experience or training on the particular machine to be operated. The operator must familiarize himself with the operator's manual for the unit involved.</p> |
| <i>Check brush hog for condition</i> | <p>a. Lift pins may be loose.</p> <p>b. Oil level in gearbox may be low.</p> <p>c. Blades may be damaged, loose or dull.</p> <p>d. Safety chain shielding may have damage or missing sections allowing rock and other debris to be thrown from under brush hog.</p>   | <p>a. Check lift pins for security of mounting. Tighten if loose.</p> <p>b. Check quantity of oil in gearbox. Replenish if required.</p> <p>c. Check blades for condition, security of mounting and sharpness.</p> <p>d. Check safety chain shielding for condition and completeness. Repair all damaged or missing sections.</p>  |
| <i>Start engine</i>                  | <p>a. Operator may be under influence of alcohol, drugs, medication or not physically capable of tractor operation.</p> <p>b. Operator may not be qualified or "checked out" on unit to be operated.</p> <p>c. Operator may be attired in loose clothing.</p> <p>d. Operator may be exposed to noise levels above the acceptable level.</p> <p>e. Operator may not have the proper personal protective equipment for brush hog operation.</p> | <p>a. Do not operate a tractor if you are not in good physical and mental condition.</p> <p>b. Tractor operators must be thoroughly familiar with equipment to be operated. At a minimum, he must read the operator's manual.</p> <p>c. Clothing worn by the operator must not be loose enough to be caught up in moving sprockets, belts, drive shafts and gears.</p> <p>d. Wear ear protection.</p> <p>e. Wear hardhat, steel toe shoes, gloves and eye protection.</p>  |
| <i>Refuel tractor</i>                | <p>Fire may erupt during refueling operations.</p>  | <p>Tractor will not be fueled while running near open flame or spark producing operations.</p>   |
| <i>Hook up brush hog</i>             | <p>a. While backing, person standing between tractor and brush hog could be injured.</p> <p>b. Lifting brush hog to hook draft links to lift pins may cause back, foot or hand injuries.</p>  | <p>a. Do not allow anyone to stand between tractor and brush hog while backing.</p> <p>b. Get assistance when lifting heavy loads and use good lifting techniques. Wear steel toe shoes and gloves.</p>  |

Brush Hog Operation

|  |   |  |
|--|---|--|
| <p>Road tractor and brush hog to work site</p> | <p>a. Slow moving vehicles on the highway can impede traffic flow.<br/> b. Tractor operator may be thrown from seat due to rough terrain.<br/> c. While descending a hill or steep incline, tractor may get out of control if placed in neutral or clutch is disengaged.<br/> d. Tractor may upset during high-speed turns.<br/> e. Using single rear wheel brakes at high speed may cause upset.</p>                   | <p>a. Display a slow moving vehicle sign so that it is clearly visible to all traffic approaching from the rear. Also use accessory light to help warn other vehicles of your presence. Travel on the extreme right portion of right lane yielding all roadway possible. When traffic begins to back up (3 or more) behind tractor operator should pull to the shoulder and allow traffic to proceed.<br/> b. Tractor operators driving units equipped with Roll Over Protective Structure (ROPS) will wear seat belts. When on rough terrain, tractor speed will be reduced to a safe limit.<br/> c. Tractor will be kept in gear when descending hills or steep inclines.<br/> d. Reduce speed prior to making sharp turns.<br/> e. Couple the brake pedals before traveling at high speeds to assure that both brakes are used.</p> |
| <p>Use brush hog</p>                           | <p>a. Area to be mowed may have large rocks, stumps, limbs and/or wire that could be hit.<br/> b. Cutter blades may get into ground in rough terrain.<br/> c. Tractor and brush hog may lug down when cutting in dense areas.<br/> d. Other persons may be struck by rocks, limbs, etc., thrown by the operating brush hog.<br/> e. Tractor may upset while operating along the side of ditch, gully or excavation.</p> | <p>a. Carefully survey area to be mowed for these hazards. Operate tractor at slow enough ground speed to detect obstacles missed before.<br/> b. Adjust cutter blades to highest position possible to attain the desired cutting height.<br/> c. Operate tractor in a gear that will exert enough power to turn blades at full power.<br/> d. Clear area of all other persons prior to commencing brush hog operations.<br/> e. Do not operate on the edge of a ditch, gully or excavation. Wear seat belts.</p>  |

Brush Hog Operation

| <p>Road tractor and brush hog to maintenance yard.</p>   | <p>a. Slow moving vehicles on the highway can impede traffic flow.<br/> b. Tractor operator may be thrown from seat due to rough terrain.<br/> c. While descending a hill or steep incline, tractor may get out of control if placed in neutral or clutch is disengaged.<br/> d. Tractor may upset during high-speed turns.<br/> e. Using single rear wheel brakes at high speeds may cause upset.</p> | <p>a. Display a slow moving vehicle sign so that it is clearly visible to all traffic approaching from the rear. Also, use accessory lights to help warn other vehicles of your presence. Travel on the extreme right portion of right lane yielding all roadway possible. When begin to back up behind (3 or more), tractor operator should pull to the shoulder and allow traffic to proceed.<br/> b. Tractor operators driving units equipped with ROPS will wear seat belts. When on rough terrain, tractor speed will be reduced to a safe limit.<br/> c. Tractor will be kept in gear when descending hills or steep inclines.<br/> d. Reduce speed prior to making sharp turns.<br/> e. Couple the brake pedals before traveling at high speeds to assure that both brakes are used.</p> |
|--|--|---|
| <p>Unhook brush hog</p>  | <p>a. Detached brush hog may be hazardous to personnel in area.<br/> b. Personal injuries such as back strain and bruises to the hands and feet may occur while detaching implement.</p>   | <p>a. Please implement in an area so that it will not present a hazard to personnel or traffic. Do not block or crib under implement unless it is necessary for detachment or maintenance.<br/> b. Use good lifting techniques while detaching brush hog and get help if needed. Keep hands and feet clear of areas where crushing injuries could occur. Wear gloves and steel toe shoes.</p>   |
| <p>Park tractor</p>  | <p>When parked and unattended, tractor may roll and strike other equipment and objects.</p>  | <p>Before dismounting tractor, move range selector to park or engage parking brake, if equipped; lower implement to the ground, if attached; disengage Power Take Off, if equipped; stop engine; and release hydraulic pressure by operating steering wheel a few times.</p>  |
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| EQUIPMENT TO BE USED   | INSPECTION REQUIREMENTS  | TRAINING REQUIREMENTS   |
| <p>Tractor<br/> Brush hog<br/> Hearing protection<br/> Eye protection<br/> Personal protective clothing:<br/> Hardhat, steel toe boots, and gloves</p> | <p>Safety inspection of all equipment and tractors<br/> Check equipment, tractors, and vehicles for proper tire inflation, fuel, oil, engine coolant, etc.<br/> Check lift pin and blades</p>  | <p>Training on operating on inclined surfaces<br/> On the job training<br/> Be checked-out by a qualified, experienced person<br/> Obtain supervisor's/manager's authorization.<br/> Read operator's manuals<br/> Training on use of fire extinguisher<br/> Lifting techniques</p>  |



### ACTIVITY HAZARD ANALYSIS

**ACTIVITY:** Brush Trimming Operations

**ANALYZED BY/DATE:** Bill Clevenger  
08 April 2002

**REVIEWED BY/DATE:**

| PRINCIPAL STEPS  | POTENTIAL SAFETY/HEALTH HAZARDS   | RECOMMENDED CONTROLS   |
|--|---|--|
| Operation of Trimmers  | <i>Objects thrown by cutting head</i>   | <i>Operators are required to wear protective clothing, gloves, and face shield</i>   |
| Hand trimming with sickles, sling blades, clippers, and shears | Mashed fingers, cuts to extremities, and falls  | Operators instructed in proper and safe work habits  |
| <i>Operation of riding and push mowers</i>                     | <i>Objects or particles thrown by mower</i>   | <i>Operators instructed to stay a safe distance away from other workers &amp; members of the public when performing mowing</i>   |
| <i>Operation of tractors</i>                                   | <ul style="list-style-type: none"> <li><i>a. Roll over</i></li> <li><i>b. Operation or traveling on or near public road</i></li> <li><i>c. Objects thrown by mower</i></li> </ul> | <ul style="list-style-type: none"> <li><i>a.1. Operators required to be trained in techniques and hazards of operating on inclined surfaces</i></li> <li><i>a.2. Operators required to wear seat belts at all times</i></li> <li><i>b.1. All tractors required to have slow moving vehicles triangle</i></li> <li><i>b.2. All tractors will be hauled on trailers between non adjacent areas</i></li> <li><i>b.3. All wings on bat wing securely fastened and locked in the vertical position when traveling</i></li> <li><i>b.4. Operators instructed in hazards associated with roadways and proper operating techniques when on or near roadways</i></li> <li><i>c.1. Operators are instructed in proper operation of equipment</i></li> <li><i>c.2. Operators instructed to stay away from other workers and members of the public and or keep these individuals a safe distance away from mowing operations</i></li> <li><i>c.3. Operators required to wear eye protection and protective clothing</i></li> </ul> |

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|---------------------------------------|---|--|
| <p><i>Motor vehicle operation</i></p> | <p><i>a. Untrained and/or unqualified operators</i></p> <p><i>b. Unsafe equipment</i></p> <p><i>c. Unsecured passengers</i></p> <p><i>d. Stopping on curves, over hilltops and other hazardous areas</i></p> <p><i>e. Pedestrians on roadways</i></p> | <p><i>a.1. Operators required to be familiar with equipment, trained in the operation of the equipment, and possess a valid operators license</i></p> <p><i>a.2. Operators required to be familiar with and practice "defensive driving" techniques</i></p> <p><i>b.1. All equipment and vehicles are to be routinely inspected for safety features including windshields, windshield wipers, brakes, tires, lights, stop signals, turn signals, horn, and seat belts</i></p> <p><i>b.2. All motor vehicles required to have valid state motor vehicle inspection sticker</i></p> <p><i>c.1. All operators and passengers are required to wear seatbelts while in vehicles</i></p> <p><i>c.2. Transportation of personnel on running boards, fenders, bumpers, and tailgates is prohibited</i></p> <p><i>d.1. Operators of all vehicles are instructed to stop only where sufficient rear sight distance is provided for rear approaching vehicles to safely stop</i></p> <p><i>d.2. Trash collection vehicles subject to sudden stop will bear a large sign on rear warning motorists of such operation</i></p> <p><i>d.3. All operators are instructed to pull vehicles off of road in safe location for all but momentary stops</i></p> <p><i>e.1. Instruct operators to watch for pedestrians, cyclists, bicyclists, and children in public use areas and to proceed slowly in these areas</i></p> |
| <p><i>All phases of work</i></p>      | <p><i>Fall and cuts to extremities</i></p>  | <p><i>Employees are instructed</i></p>   |

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| <p><i>Check tractor for condition</i></p>   | <p>a. Engine may be damaged if operated without a sufficient quantity of oil.<br/> b. Engine may be damaged if operated without a sufficient quantity of engine coolant.<br/> c. Injury may result when removing radiator cap.<br/> d. Tires may be worn or under-inflated.<br/> e. Operator may not be familiar with tractor to be used.</p>   | <p>a. Check engine oil level and add if needed.<br/> b. Check engine coolant level and add if needed.<br/> c. Do not remove the radiator filler cap unless the engine is cool. Then loosen cap slowly to stop, wait for pressure to be released and then remove the cap.<br/> d. Check tires for condition and proper inflation.<br/> e. Tractor operators must be qualified by experience or training on the particular machine to be operated. The operator must familiarize himself with the operator's manual for the unit involved.</p> |
| <p><i>Check brush hog for condition</i></p> | <p>a. Lift pins may be loose.<br/> b. Oil level in gearbox may be low.<br/> c. Blades may be damaged, loose or dull.<br/> d. Safety chain shielding may have damage or missing sections allowing rock and other debris to be thrown from under brush hog.</p>   | <p>a. Check lift pins for security of mounting. Tighten if loose.<br/> b. Check quantity of oil in gearbox. Replenish if required.<br/> c. Check blades for condition, security of mounting and sharpness.<br/> d. Check safety chain shielding for condition and completeness. Repair all damaged or missing sections.</p>  |
| <p><i>Start engine</i></p>                  | <p>a. Operator may be under influence of alcohol, drugs, medication or not physically capable of tractor operation.<br/> b. Operator may not be qualified or "checked out" on unit to be operated.<br/> c. Operator may be attired in loose clothing.<br/> d. Operator may be exposed to noise levels above the acceptable level.<br/> e. Operator may not have the proper personal protective equipment for brush hog operation.</p> | <p>a. Do not operate a tractor if you are not in good physical and mental condition.<br/> b. Tractor operators must be thoroughly familiar with equipment to be operated. At a minimum, he must read the operator's manual.<br/> c. Clothing worn by the operator must not be loose enough to be caught up in moving sprockets, belts, drive shafts and gears.<br/> d. Wear ear protection.<br/> e. Wear hardhat, steel toe shoes, gloves and eye protection.</p>  |
| <p><i>Unhook brush hog</i></p>              | <p>a. Detached brush hog may be hazardous to personnel in area.<br/> b. Personal injuries such as back strain and bruises to the hands and feet may occur while detaching implement.</p>  | <p>a. Please implement in an area so that it will not present a hazard to personnel or traffic. Do not block or crib under implement unless it is necessary for detachment or maintenance.<br/> b. Use good lifting techniques while detaching brush hog and get help if needed. Keep hands and feet clear of areas where crushing injuries could occur. Wear gloves and steel toe shoes.</p>  |
| <p><i>Refuel tractor</i></p>                | <p>Fire may erupt during refueling operations.</p>  | <p>Tractor will not be fueled while running near open flame or spark producing operations.</p>   |
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| <p>Road tractor and brush hog to work site</p> | <p>a. Slow moving vehicles on the highway can impede traffic flow.<br/> b. Tractor operator may be thrown from seat due to rough terrain.<br/> c. While descending a hill or steep incline, tractor may get out of control if placed in neutral or clutch is disengaged.<br/> d. Tractor may upset during high-speed turns.<br/> e. Using single rear wheel brakes at high speed may cause upset.</p>  | <p>a. Display a slow moving vehicle sign so that it is clearly visible to all traffic approaching from the rear. Also use accessory light to help warn other vehicles of your presence. Travel on the extreme right portion of right lane yielding all roadway possible. When traffic begins to back up (3 or more) behind tractor operator should pull to the shoulder and allow traffic to proceed.<br/> b. Tractor operators driving units equipped with Roll Over Protective Structure (ROPS) will wear seat belts. When on rough terrain, tractor speed will be reduced to a safe limit.<br/> c. Tractor will be kept in gear when descending hills or steep inclines.<br/> d. Reduce speed prior to making sharp turns.<br/> e. Couple the brake pedals before traveling at high speeds to assure that both brakes are used.</p> |
| <p>Hook up brush hog</p>                       | <p>a. While backing, person standing between tractor and brush hog could be injured.<br/> b. Lifting brush hog to hook draft links to lift pins may cause back, foot or hand injuries.</p>   | <p>a. Do not allow anyone to stand between tractor and brush hog while backing.<br/> b. Get assistance when lifting heavy loads and use good lifting techniques. Wear steel toe shoes and gloves.</p>  |
| <p>Park tractor</p>                            | <p><i>When parked and unattended, tractor may roll and strike other equipment and objects.</i></p>   | <p><i>Before dismounting tractor, move range selector to park or engage parking brake, if equipped; lower implement to the ground, if attached; disengage Power Take Off, if equipped; stop engine; and release hydraulic pressure by operating steering wheel a few times.</i></p>  |
|  | <p>a. Slow moving vehicles on the highway can impede traffic flow.<br/> b. Tractor operator may be thrown from seat due to rough terrain.<br/> c. While descending a hill or steep incline, tractor may get out of control if placed in neutral or clutch is disengaged.<br/> d. Tractor may upset during high-speed turns.<br/> e. Using single rear wheel brakes at high speeds may cause upset.</p> | <p>a. Display a slow moving vehicle sign so that it is clearly visible to all traffic approaching from the rear. Also, use accessory lights to help warn other vehicles of your presence. Travel on the extreme right portion of right lane yielding all roadway possible. When begin to back up behind (3 or more), tractor operator should pull to the shoulder and allow traffic to proceed.<br/> b. Tractor operators driving units equipped with ROPS will wear seat belts. When on rough terrain, tractor speed will be reduced to a safe limit.<br/> c. Tractor will be kept in gear when descending hills or steep inclines.<br/> d. Reduce speed prior to making sharp turns.<br/> e. Couple the brake pedals before traveling at high speeds to assure that both brakes are used</p>   |

| <p><i>Use brush hog</i></p>   | <p><i>a. Area to be moved may have large rocks, stumps, limbs and/or wire that could be hit.</i></p> <p><i>b. Cutter blades may get into ground in rough terrain.</i></p> <p><i>c. Tractor and brush hog may lug down when cutting in dense areas.</i></p> <p><i>d. Other persons may be struck by rocks, limbs, etc., thrown by the operating brush hog.</i></p> <p><i>e. Tractor may upset while operating along the side of ditch, gully or excavation.</i></p> | <p><i>a. Carefully survey area to be mowed for these hazards. Operate tractor at slow enough ground speed to detect obstacles missed before.</i></p> <p><i>b. Adjust cutter blades to highest position possible to attain the desired cutting height.</i></p> <p><i>c. Operate tractor in a gear that will exert enough power to turn blades at full power.</i></p> <p><i>d. Clear area of all other persons prior to commencing brush hog operations.</i></p> <p><i>e. Do not operate on the edge of a ditch, gully or excavation. Wear seat belts.</i></p> |
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| EQUIPMENT TO BE USED  | INSPECTION REQUIREMENTS  | TRAINING REQUIREMENTS  |
| <p><i>Brush hog</i></p> <p><i>Trimmers</i></p> <p><i>Sickles</i></p> <p><i>Sling blades</i></p> <p><i>Clippers</i></p> <p><i>Shears</i></p> <p><i>Push mowers</i></p> <p><i>Riding mowers</i></p> <p><i>Tractors</i></p> <p><i>Batwing mowers</i></p> <p><i>Eye protection</i></p> <p><i>Protective clothing</i></p> <p><i>Motor vehicles</i></p> | <p><i>Safety inspection of all equipment and vehicles</i></p> <p><i>Check equipment, tractors, and vehicles for proper tire inflation, fuel, oil, engine coolant, etc.</i></p>   | <p><i>Training on operating on inclined surfaces</i></p> <p><i>Defensive driving</i></p> <p><i>On the job training</i></p> <p><i>Be checked-out by a qualified, experienced person</i></p> <p><i>Obtain supervisor's/manager's authorization.</i></p>  |
|   |  |  |

### ACTIVITY HAZARD ANALYSIS

**ACTIVITY:** Camper Service  
Panel replacement

**ANALYZED BY/DATE:** Bill Clevenger  
15 April 2002

**REVIEWED BY/DATE:**

| PRINCIPAL STEPS   | POTENTIAL SAFETY/HEALTH HAZARDS  | RECOMMENDED CONTROLS  |
|---|--|---|
| <i>Remove old panel.</i>  | <ul style="list-style-type: none"> <li>a. <i>Electric shock.</i></li> <li>b. <i>Scrapes, cuts.</i></li> <li>c. <i>Strained back</i></li> </ul>             | <ul style="list-style-type: none"> <li>a. <i>Turn off power, lock out, tag out<br/>Test with meter, use (tested) rubber gloves,<br/>and remove camper trailers or other hook-<br/>ups to eliminate back surges on circuit.</i></li> <li>b. <i>Check shovels for cracked or damaged<br/>handles; use leather gloves while using<br/>shovels.</i></li> <li>c. <i>Use proper lifting techniques when lifting<br/>panel.</i></li> </ul> |
| <i>Install new panel.</i>   | <i>Same as above.</i>  | <i>Use reverse procedures.</i>  |
|   |  |   |
| EQUIPMENT TO BE USED  | INSPECTION REQUIREMENTS  | TRAINING REQUIREMENTS   |
| <ul style="list-style-type: none"> <li><i>Circuit test meter</i></li> <li><i>Tested rubber gloves</i></li> <li><i>Shovels</i></li> <li><i>Leather gloves</i></li> </ul> | <ul style="list-style-type: none"> <li><i>Test circuit</i></li> <li><i>Insure hook-ups are removed</i></li> <li><i>Check shovels for damage</i></li> </ul> | <ul style="list-style-type: none"> <li><i>Control of hazardous Energy</i></li> <li><i>Training on proper lifting techniques</i></li> <li><i>On the job training</i></li> <li><i>Be checked-out by a qualified, experienced<br/>person</i></li> <li><i>Obtain supervisor's/manager's<br/>authorization.</i></li> </ul>   |

### ACTIVITY HAZARD ANALYSIS

**ACTIVITY:** Chainsaw Operation

**ANALYZED BY/DATE:** Bill Clevenger  
17 April 2003

**REVIEWED BY/DATE:**

| PRINCIPAL STEPS                                 | POTENTIAL SAFETY/HEALTH HAZARDS  | RECOMMENDED CONTROLS   |
|---|--|--|
| <i>Tree maintenance and removal.</i>            | <i>Injury to personnel and destruction of property.</i>  | <i>Follow requirements and recommendations of EM 385-1-1, Section 31.</i>  |
| <i>Check chain saw for condition</i>            | <ul style="list-style-type: none"> <li><i>a. Hand guards and/or covers may be loose or missing.</i></li> <li><i>b. Handles may be coated with grease or oil.</i></li> <li><i>c. Hand brake for chain may be defective.</i></li> <li><i>d. Sparkplug may spark or accidental start-up may occur.</i></li> <li><i>e. The muffler may be missing or defective.</i></li> <li><i>f. Chain may not be sharp, may not be tight or may be damaged. (An improperly sharpened chain or one that is dull or loose can contribute to "kickback" an upward jump or jerk of the saw.)</i></li> <li><i>g. Carburetor, air filter and cylinder fins may be clogged-up or damaged.</i></li> </ul> | <ul style="list-style-type: none"> <li><i>a. All guards and covers shall be in place and properly adjusted prior to use.</i></li> <li><i>b. Clean handles of all substances that would contribute to unsafe operation of the saw.</i></li> <li><i>c. Check operation of hand brake. Make any repairs necessary to restore it to serviceable condition.</i></li> <li><i>d. Remove sparkplug before making repairs or adjustments.</i></li> <li><i>e. Replace muffler when missing or defective.</i></li> <li><i>f. Check chain for sharpness, proper tension, and chipped or damaged parts.</i></li> <li><i>g. Check carburetor, air filter and cylinder fins: clean if necessary.</i></li> </ul> |
| <i>Sharpen or replace chain if worn or dull</i> | <i>Chain may cause cuts.</i>   | <i>Wear leather gloves when handling chain.</i>  |
| <i>Replace the sprocket if worn.</i>            | <i>Drive link damage and possible chain breakage may occur if a new chain is installed on a worn sprocket.</i>   | <i>Use proper tools correctly and never install a new chain on a worn sprocket.</i>  |
| <i>Fill chain saw with gas and bar oil</i>      | <i>Fire may erupt during fueling and oiling operation.</i>   | <p><i>The chain saw will not be fueled while running, hot, near open flame or spark producing operations.</i></p> <ul style="list-style-type: none"> <li><i>1. Use the oil/gasoline mixture recommended by the manufacturer, never straight gasoline.</i></li> <li><i>2. Carry gasoline only in approved safety cans.</i></li> <li><i>3. Fill saw only in a well-ventilated area away from flammables.</i></li> <li><i>4. Avoid spilling fuel or chain lube by not over-filling and by using a funnel.</i></li> <li><i>5. Smoking is not allowed while mixing or carrying fuel, refueling, or operating the chain saw.</i></li> </ul>  |
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|--------------------------------|---|---|
| <p><i>Transporting saw</i></p> | <p><i>a. Contact with saw may injure driver or passengers if saw is carried in the passenger compartment of a vehicle.</i></p> <p><i>b. Saw may cause fire hazard during transportation.</i></p> <p><i>c. Personnel may be subjected to injury by improperly carrying saw.</i></p>  | <p><i>a. Never transport a chain saw in the passenger compartment of a vehicle.</i></p> <p><i>b. Set saw level with gas-cap up, be sure it cannot tip over and spill gasoline.</i></p> <p><i>c. Carrying the saw with the engine running is extremely dangerous and should only be done for very short distances and only then if saw is to be used immediately.</i></p> <ol style="list-style-type: none"> <li><i>1. When carrying by hand, the engine must be stopped.</i></li> <li><i>2. Grip the front handle and place the muffler at the side away from the body.</i></li> <li><i>3. The bar should be pointed to the rear with the bar guard in place, if available.</i></li> </ol>  |
| <p><i>Start chain saw</i></p>  | <p><i>a. Operator may not be wearing proper personal protective equipment for chain saw operations.</i></p> <p><i>b. Fire may erupt while attempting to start saw.</i></p> <p><i>c. Personal injury may result if saw is drop started.</i></p> <p><i>d. Other persons may be injured while operator is starting saw.</i></p> <p><i>e. Loose clothing, jewelry and long hair may be caught in chain.</i></p> <p><i>f. Kickback may occur during starting if chain makes contact with other objects.</i></p> <p><i>g. Personal injury may occur when engine is running.</i></p> <p><i>h. Chain may continue to turn when engine is set at idle speed.</i></p> | <p><i>a. Chain saw operator will wear eye protection, hearing protection, safety boots, hardhat, chaps, and heavy leather gloves.</i></p> <p><i>b. Wipe off any fuel spilled when filling gas tank and move at least 10 feet away from fueling location and fuel can.</i></p> <p><i>c. The saw should be resting on the ground while starting and until warmed-up enough for the saw to idle without assistance.</i></p> <ol style="list-style-type: none"> <li><i>1. Do not attempt to drop start a chainsaw as this method is very dangerous and responsible for many accidents.</i></li> <li><i>2. Never brace saw against your leg to start.</i></li> <li><i>3. Insure good footing.</i></li> <li><i>4. Hold saw firmly.</i></li> <li><i>5. Pull the cord away from your body. Never wrap the cord around your hand.</i></li> </ol> <p><i>d. Start and operate the chain saw without assistance as it is a one-person saw. Anyone working in close proximity should wear eye, head, and hearing protection.</i></p> <p><i>e. Clothing must be sturdy and snug fitting, but allow complete freedom of movement. Avoid loose fitting jackets, scarves, dangling items, neckties, jewelry, long loose hair, flared or cuffed pants or anything that may become entangled in the saw or brush.</i></p> <p><i>f. Before you start the engine, make sure the saw chain is not contacting anything.</i></p> <p><i>g. Keep all parts of the body away from the saw chain and muffler when engine is running.</i></p> <p><i>h. The idle speed shall be adjusted so that the chain does not work at idle speed.</i></p> |

*Operate chain saw*

- a. Chain may fly off and cause damage or injury.*
- b. Operator may slip, trip, fall or come into contact with the moving chain.*
- c. Small size brush and saplings may become caught in chain and be whipped toward operator.*
- d. Operator may lose his balance and fall*
- e. Kickback, an upward jump or jerk of the saw, may occur.*
- f. Broken or dead limbs may vibrate and fall on operator.*

- a. Keep chain well oiled and tightened properly.*
- b. Always establish good footing and maintain a safe distance.*
- c. Use extreme caution when cutting small size brush and saplings. Wear all prescribed personal protective equipment.*
- d. Never operate the saw while in a tree, on a ladder or any other unstable position.*
- e. To prevent kickback avoid:*
  - 1. Striking a limb with the tip of the moving chain.*
  - 2. Running the engine too slowly at the start of or during the cut.*
  - 3. A dull or loose chain.*
  - 4. Cutting above shoulder height.*
  - 5. Inattention.*
  - 6. Having a loose grip.*
- f. Observe for and be cautious of dead overhead limbs. Watch out for flying or falling limbs as tree falls.*

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| <p><i>Limbing</i></p>   | <p>a. Operator may become entangled in limbs as he approaches trunk of tree.<br/> b. Operator may slip or trip.<br/> c. Operator may be cut when saw goes through limb.<br/> d. Trunk may fall or roll pinning operator.<br/> e. Saw may bind.</p> | <p>a. Work from the bottom end of the tree toward the top.<br/> b. Make sure of good footing.<br/> c. On small logs, stand on the opposite side of the trunk from the limb being cut.<br/> d. On hillsides, work from the uphill side and be careful not to cut limbs propping-up the log.<br/> e. Make cuts from lower side of the limb, not in the crotch.</p>   |
| <p><i>Bucking</i><br/> If possible the log should be raised off the ground.</p> | <p>a. Area may be a dangerous place to work.<br/> b. Logs may roll and pin operator.<br/> c. Saw may bind.<br/> d. Chain may cut into ground.<br/> e. Operator may be cut when saw goes through log.</p>   | <p>a. Clear the area of brush or it may be necessary to move the log to a safer position before working on it<br/> b. Stand on uphill side when making a buck cut or chock log so it cannot roll.<br/> c. Slant the cut so the log will open the cut<br/> 1. If log is supported at one end, underbuck (cut from bottom) one third of log's diameter, finish with overbuck to meet first cut<br/> 2. If log is at both ends, overbuck first about one-third of the diameter, finish with underbuck to meet first cut.<br/> d. Keep chain out off earth.<br/> 1. Overbuck if the log rests on the ground.<br/> 2. If possible the log should be raised off the ground. Until the log is bucked into lengths, do not remove supporting limbs flush with the trunk: use stubs to keep the log off the ground.<br/> e. Slow the motor and hold saw away from your body just before the cut is completed.</p> |
| <p><i>Shut off engine</i></p>   | <p>a. Fire may result when chain saw is set down.<br/> b. Persons may be burned by hot muffler.<br/> c. Persons or objects may be struck by a chain that continues to turn.</p>  | <p>a. Do not set saw in dry leaves or on highly combustible material where the hot muffler could cause a fire.<br/> b. Do not place saw in such a manner that an unsuspecting person would be apt to get burned on the hot muffler. Keep muffler away from your body.<br/> c. Maintain control of saw with both hands until chain is no longer turning prior to setting it down.</p>   |

| <i>Store chain saw</i>  | <i>Saw may become a fire hazard or become hard to start, leading to the injury of the next operator.</i>  | <p><i>Keep chainsaw in good condition and easy to start.</i></p> <ol style="list-style-type: none"> <li><i>1. Wipe off and clean saw and muffler of oil, gasoline and sawdust.</i></li> <li><i>2. Drain fuel tank in a safe area and run engine at idle until it stops.</i></li> <li><i>3. Follow owners manual for cleaning and lubricating.</i></li> <li><i>4. Disconnect spark plug as a final safeguard.</i></li> </ol> |
|---|---|---|
| <b>EQUIPMENT TO BE USED</b>   | <b>INSPECTION REQUIREMENTS</b>  | <b>TRAINING REQUIREMENTS</b>  |
| <i>Chainsaw<br/> Eye protection<br/> Hearing protection<br/> Steel toe boots<br/> Hardhat<br/> Gloves<br/> Chaps<br/> Snug fitting clothing<br/> Safety can for oil/gas mixture recommended by manufacturer</i> | <i>Safety inspection of chainsaw; ensure all guards and handles are in place, controls function properly and muffler is operative<br/> Check chainsaw for fuel, bar oil, etc<br/> Check operation of break<br/> Check chain</i> | <i>Chainsaw operator certification</i>  |



3. Fire/burns

3a. Chainsaw shall not be refueled while running, while engine is hot or near open flames.

3b. Chainsaw shall not be started within 10 feet of fuel container.

4. Damage to hearing/eyes due to noise, dust, exhaust and chips

4a. Chainsaw shall be equipped with proper muffler.

4b. Operator shall wear hearing and eye protection.

5. Head injury

5. Operator and workers in work area shall wear hard hats.

6. Injury from rolling log

6a. Operator and workers shall work from the up-hill side whenever possible.

6b. Block log or object to be cut whenever there is a possibility of rolling.

B. Loading

1. Back injury from improper lifting

1a. Volunteers shall be trained in proper lifting techniques. (See AHA on LIFTING)

1b. Use mechanical lifting device if load is too heavy or cut wood into smaller sizes.