Recreation Tech Tips

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SCAT Machine—An Alternate Technology for Sanitizing Waste Containers

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Introduction

Many rivers and lakes are seeing an increase in recreational use. Clean Water Act Regulations give more control to states for watershed management. State regulations for watershed management and waste disposal are becoming more restrictive. Available sites suitable for pit toilets along rivers are dwindling. These are some reasons that River Managers adopt a carry-out program for human waste management on popular wild rivers. Managers of popular lakes may also require human waste containers on recreational boats.

Carry-Out Programs

An effective carry-out program is one way that Managers are minimizing pollution. River and lake users are requested (voluntary) or required (mandatory) to carry out all of their waste, including fecal matter. A variety of containers are available to boaters and rafters for this purpose. Containers range from five dollar "pickle pails" (plastic pails with tight fitting lids) to sophisticated commercially manufactured units costing $500 or more. (See figure 1.)

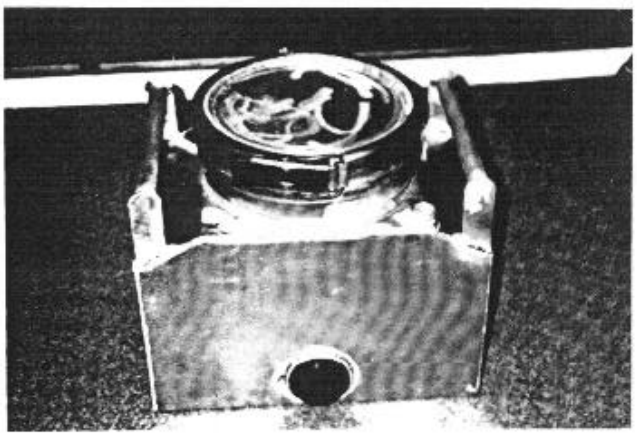

Figure 1.—Commercial container.

These containers must be emptied and cleaned at the end of the trip. Users frequently empty the containers in vault toilets if no other disposal method is provided. Waste material splashes on the seat and/or toilet riser when the containers are emptied this way. A SCAT Machine is a more sanitary method of disposal.

SCAT Machines

The SCAT Machine is a cross between a hospital bedpan hopper and an industrial dishwasher. The first SCAT (Sanitizing Containers with Alternative Technology) Machine was installed and operated as a pilot project in 1992, on the Snake River near Asotin, Washington. SCAT Machines were installed in Riggins, ID and Meadview, AZ for the 1993 field season. (See figure 2 on page 2)

The SCAT Machine will flush a variety of containers. "Pickle pails," "Rocket boxes," the Green Machine, Jon-ny Partner, and similar commercially available containers will fit in the machine.

SCAT Machine Requirements

The SCAT Machine requires grid electrical service. The power supply needed is 220 Volt, 30 Amp. A water supply, with 1-inch service delivering 15 gallons per minute, is required. The machine uses 30 gallons per minute at 90 PSI. The water is stored in a reservoir and pumped to the machine to achieve the flow rate and pressure required. The standard reservoir size needs to be increased in heavy use areas.

The SCAT Machine needs a 4-inch sewage connection. It uses 46.5 gallons of water per cycle, which makes a sewage holding tank impractical. It can be connected to a municipal sewer line or to a package treatment plant that is sized to accept the anticipated usage. In areas of well drained soil and a deep water table, a septic tank and leach field may be used.

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Figure 2.—SCAT Machine at Meadview, Arizona near Grand Canyon National Park.

Riggins, Idaho Success Story

An Interagency River Task Force installed a SCAT Machine behind a gas station/convenience store in Riggins, ID in the spring of 1993. The machine is equipped with a token slot, water reservoir tank, and sanitizing chemical tank. Users buy tokens at the store to operate the machine. The store owner provides maintenance on the machine. (See figure 3.)

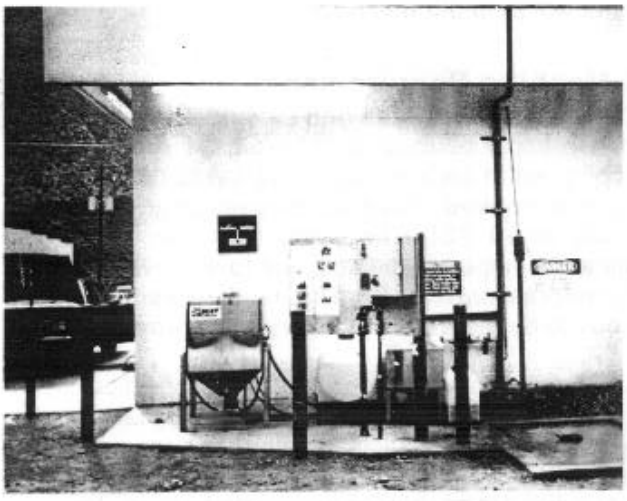

Figure 3.—SCAT Machine at Riggins, Idaho.

When the store owner was asked about how the SCAT Machine was working out for him, he was very enthusiastic about it. Most people who use the machine buy soft drinks, snacks, or gas. It's good for the town (an ailing timber community). It's good for his business and it's good for the Salmon River. The increased popularity of Salmon River floating trips is what has kept the town alive.

Several minor problems have been overcome. Users would occasionally buy one token to open the SCAT Machine, then dump the contents of three or four waste containers in it. The SCAT Machine would plug and need to be cleaned out before it could be used again.

Users also disposed of ashes and charcoal from their fire pans (which must also be carried out) in the waste containers. Large pieces of charcoal and wood sticks jam the machine and must be cleaned out before the machine can be used again.

The store manager found a solution for both problems. He asks for the name and address of a responsible party when he sells the tokens. If the next user reports the machine plugged or jammed, he knows whom to contact. Abuse slowed dramatically when he began taking names and addresses.

The locking mechanism needed to be replaced with a heavy-duty model, which the manufacturer provided for the 1994 season.

One problem has not been solved yet. When rafters open the waste containers before the container is loaded into the SCAT Machine, a strong odor permeates the air. The store's air conditioner intake was at the back of the building, near the SCAT Machine, and picked up this odor. This was partially solved by moving the air conditioner intake to the building side. There is still some odor problem when wind conditions are just right.

The partnership has worked out very well for all the parties involved. Carry out compliance is increased by having a waste disposal facility available near the take out spot. Government personnel do not have to clean and maintain the unit. Vandalism is kept to a minimum by having the machine at an attended site. The store/gas station owner realized an increase in business.

The SCAT Machine at Riggins received 850 uses in 1994 through August 31. Twenty four gallons of pine sanitizer has been used. The use has been light during the latter part of the year due to fires in the area. During peak use a one to two hour waiting line may be encountered. The rafting outfitters use a new container each day of a five-day rafting trip. To empty five containers takes from one-half hour to one hour. Up to eight trips are allowed to start each day. They may finish the last day within a few hours of each other.

Installation Costs

The initial cost of the machine is $17,200 (1994 price for M393 River and Marina size). Delivery and setup costs depend on location. They are generally $1,000 to $2,000. Sewer, water, electrical hookup fees, and site work costs must be added.

Operation and Maintenance

Directions for using the machine are posted on the control panel. The user inserts the proper amount of money or tokens into the machine and opens the hopper door. One container is loaded and strapped in place. The container lid is removed and loaded, along with toilet seat or other accessories into the accessory tray and the door is closed. The START button on the control panel is pushed to start the wash cycle. Each wash cycle takes about two minutes. When the wash cycle is complete, the door is opened and the container and accessories are removed. The door is then shut to finish the flushing cycle before the next container can be loaded. It takes five to ten minutes to load, cycle, remove the container, and flush the machine.

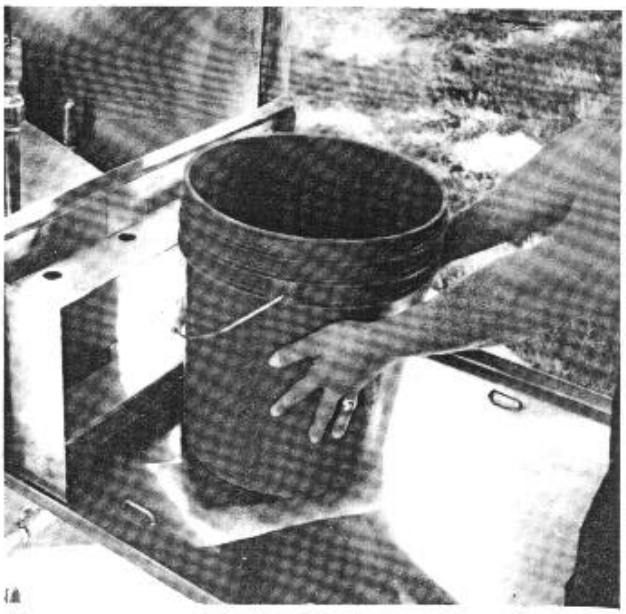

Figure 4.—Loading the "Pickle Pail."

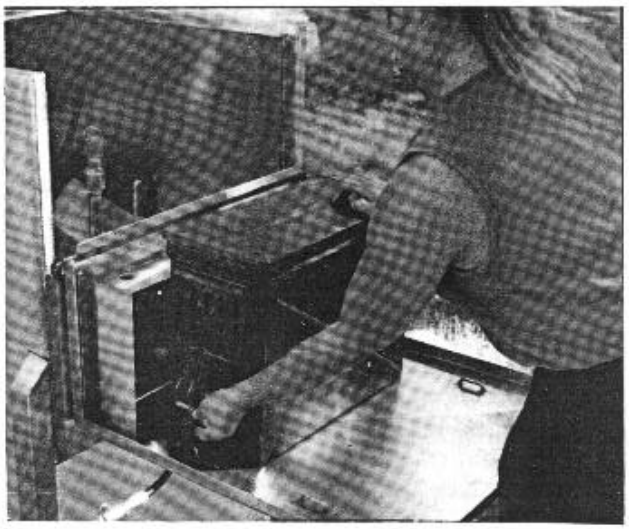

Figure 5.—Loading the "Rocket Box."

Operating costs include monthly utility expenses and the cost of a sanitizing agent, such as Pine-Sol. The equipment requires weekly service in lightly used areas, more often in heavily used areas. Routine service takes about a half hour. Service includes cleaning the machine inside and outside. A pressure wand is provided to facilitate cleaning.

The sanitizing agent reservoir needs to be filled, and the coins, bills, or tokens are removed from the fee box.

Annual maintenance includes winterizing the system, and inspecting for wear and damage. It takes one to two hours to winterize the system. All water lines and reservoirs must be drained and the waste dump trap must be filled with antifreeze.

The annual operations and maintenance cost, including labor, is $2,500 to $3,500. This does not include utility fees. These costs can be offset by the fee collection.

Recommendations

Locate the SCAT Machine at attended locations. The machine occasionally is plugged with woody debris from camp fires that must be removed before the next container can be flushed. Some users dump their waste containers in trash cans or on the ground if the SCAT Machine is not working. Having a person able to clean out the machine or direct users to a suitable alternative dumping location minimizes this abuse.

Select a location convenient to the most popular river takeout locations, docks or marinas. If possible, choose sites at or near trailer dump stations. Some waste containers are designed to be emptied and cleaned at trailer dump stations.

Install the optional coin or token slot, particularly at an attended location. Consider the optional coin slot if tokens cannot be used. The SCAT Machine comes equipped with a standard dollar bill validator or optional coin or token slot. Dollar bill validators prefer crisp, new bills. After a week in a raft, few dollars are crisp.

Coin and dollar bill validators are at high risk from vandalism and theft. Selling tokens at an attended location reduces the risk of the coin box being damaged due to attempted theft. Keeping a record of who buys tokens helps reduce abuse of the machine. Maintaining such a list also results in documentation as to who uses the river and where they come from.

This information provides a user list and can be used by interested persons during Environmental Assessments that may impact the river.

Post adequate signs to the SCAT Machine location. Adequate information about sanitation requirements and waste disposal locations must be posted. Keep in mind that many river and lake users are from out of the area and need good directions to the waste disposal facilities.

Availability

The SCAT Machine is manufactured by:

FRENCHGLEN BLACKSMITHS
Highway 205
Frenchglen, OR 97736
Phone (503) 495-2315

They also make a smaller SCAT Machine designed to handle individual "tube toilets" used by kayakers, hikers, and mountain climbers.

Conclusion

An effective carry-out program is an alternative to building toilets on wild river corridors and flood plains. The SCAT Machine is a new technology designed to clean and sanitize waste containers, dispose of the human waste, and help reduce pollution of rivers and lakes. Providing a method to clean the waste containers helps increase compliance with a carry-out program.

There are still some problems with the SCAT Machine that are being addressed. Controlling the odor associated with the opened waste containers is the biggest problem. The machine does not completely clean itself. Bits of toilet paper and debris can hang up on racks and in crevices. The manufacturer is working on these problems.

This *Tech Tip* was developed in cooperation with the Interagency Task Force on Human Waste Management.