

New Accessible Handpump for Campgrounds

**Tyler Kuhn, Mechanical Engineer, and
Bob Beckley, Project Leader**

The Forest Service is committed to making our campgrounds and recreation sites accessible to individuals of all abilities. National and regional accessibility coordinators have been working with the Forest Service Technology and Development program to identify accommodation needs.

One recurring need has been an accessible handpump (figure 1) for potable water in Forest Service campgrounds and recreation sites.



Figure 1—The first Forest Service accessible handpump was installed on the Lolo National Forest in the fall of 2002.

The Missoula Technology and Development Center (MTDC) conducted an in-depth market search and found no hand-operated water pumps meeting the Americans With Disabilities Act (ADA) standards. The *ADA Accessibility Guidelines* (14.15.4) require that an accessible handpump must operate with a maximum force of 5 pounds. The pump's control heights should be between 28 and 40 inches from the ground. Industrial managers contacted by the center felt that private development of an accessible handpump was not economically feasible because the market was too limited.

MTDC designed and built an accessible handpump that meets ADA requirements. It operates with no more than 5 pounds of force (figure 2) and its handle is easy to reach and operate from a wheelchair.



Figure 2—Lightweight fiberglass pump sucker rods help the accessible handpump meet the 5-pound maximum force requirement of the Americans With Disabilities Act.

The center built 12 accessible handpumps for field testing and they are installed at these locations:

- **Tioga Lake Campground**
Inyo National Forest, Lee Vining, CA
Contact Steve O'Connor, phone: 760-937-8427
- **Bonfils-Stanton Outdoor Recreation Center**
Winter Park, CO
Contact Beth Fox, phone: 970-726-1646
- **Grouse Campground**
Payette National Forest, McCall, ID
Contact Wayne Hersel, phone: 208-634-0740
- **Norton Campground Lolo**
National Forest, Rock Creek, MT
Contact Joe Kipphut, phone: 406-329-3970
- **Holy Ghost Campground**
Santa Fe National Forest, Pecos, NM
Contact Carol Linn, phone: 505-438-7879
- **Elizabeth Furnace Campground**
George Washington National Forest, Edinburg, VA
Contact Barry Stata, phone: 540-265-5192
- **Woodbine Recreation Area**
Monongahela National Forest, Richwood, WV
Contact Mary M. Smakula, phone: 304-636-1800, ext. 260

- **Five campgrounds** (Rawlings Field Station, BLM)
Rawlings, WY
Contact Mike Jensen, phone: 307-328-4380

All of the pumps were installed (figure 3) between the fall of 2002 and the summer of 2004. They have performed with few problems.



Figure 3—The accessible handpump is easily installed on standard well casings.

The accessible handpump uses a rotary crank that has an offset weight to ease its operation. When the weight is going down, the pump's piston is coming up. When the weight is going up, the piston is going down. As a result, although 10 pounds of force is available when the water is being lifted, the user applies an even 5 pounds of force throughout the rotation of the pump's handle. The pump has relatively few moving parts.

The pump needs to be adjusted based on the water depth at a particular site. The deeper the water, the more force that is required to lift water to the surface. A pin allows the pump to be adjusted to determine how much force is generated with each rotation of the handle. The deeper the well, the more times the handle will have to be rotated to pump a given amount of water. The pump works best when the well is less than 60 feet deep. The pump can produce an average flow rate of about 1.5 gallons a minute (figure 4).



Figure 4—Water flows an average of 1.5 gallons per minute.

The pump's handle has been approved for use with a closed fist. A demonstration of the pump in use can be viewed at the T&D Internet site: <http://www.fs.fed.us/t-d/programs/eng/handpump.htm> (username: t-d, password: t-d).

The Forest Service received a patent on the pump (figure 5). Other Federal agencies have expressed a need for an accessible handpump, not only for public lands and sites in the United States, but also for use in developing countries.

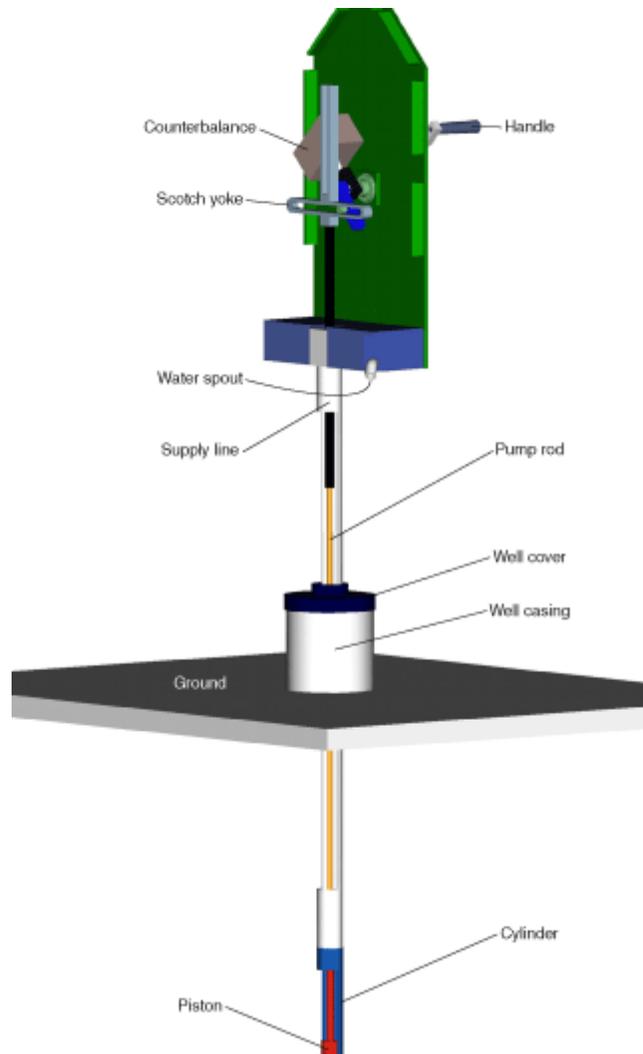


Figure 5—The inner workings of the patented prototype of the accessible handpump. The ADA 100 handpump looks slightly different, but works the same way.

Forest Service units hoping to use an accessible hand- pump should ensure that the selected sites are accessible. For further information on the accessible handpump, contact the Missoula Technology and Development Center.

Ordering an Accessible Handpump—The Simple Pump Co. is now manufacturing an accessible handpump, the ADA 100 Handpump. To contact the company:

Simple Pump Co.
 1140 Amarillo Drive Gardnerville, NV 89460
 Phone: 877-492-8711
 Web site: <http://www.simplepump.com>

Other companies have expressed an interest in manufacturing an accessible handpump.