United States Department of Agriculture • Forest Service • 0371-2802-MTDC

TECHNOLOGY AND DEVELOPMENT PROGRAM

TD NEWS

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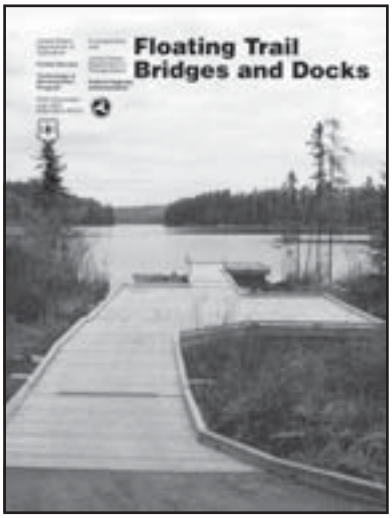
Floating Trail Bridges and Docks

If you are constructing a trail across marshes or swamps that are too wet for traditional bridge or dock construction, you may be interested in a new report on floating trail bridges. The Missoula Technology and Development Center's (MTDC) report, *Floating Trail Bridges and Docks* (0023-2812-MTDC), describes devices that allow docks and bridges to adjust to varying water levels. The report includes lists of dock and float suppliers, wood preservative resources, and other materials on the subject. The report has been distributed to all U.S. Department of Agriculture (USDA) Forest Service and U.S. Department of the Interior (USDI) Bureau of Land Management (BLM) offices.



For more information on the report, contact Brian Vachowski, program leader (phone: 406–329–3935, fax: 406–329–3719, e-mail: bvachowski@fs.fed.us).

To order a copy of the report, contact Jody Faircloth, MTDC publications (phone: 406–329–3978, fax: 406–329–3719, e-mail: jfaircloth@fs.fed.us).

Backpack Archeology Screen

Archeologists often have to backpack their equipment and supplies into remote areas. Once there, they search for artifacts using a screen mounted in a frame to sift dirt and debris. The traditional screen and its supporting frame are bulky and difficult to carry by hand. The San Dimas Technology and Development Center (SDTDC) created a lightweight, collapsible, compact aluminum screen that disassembles into a few main components for transport. Setup takes only a few minutes and requires no tools. The screens are easily replaced.

Alternative screens of different mesh sizes can be rolled up and carried with the kit. San Dimas will fabricate the screens.

Backpack Archeology Screen

(continued)

AutoCAD drawings of the collapsible screen are available on the Internet at: *http://www.fs.fed.us/cgi-bin/enter.pl?link=programs/rec/heritage/screen/*

For more information, contact Ellen Eubanks, project leader (phone: 909–599–1267, ext. 225, fax: 909–592–2309, e-mail: eeubanks@fs.fed.us).

Wildlife Crossings Toolkit

The Wildlife Crossings Toolkit can help managers reduce the effects of highways on wildlife. The San Dimas center developed the toolkit in partnership with Utah State University, the Western Transportation Institute, and the U.S. Department of Transportation, Federal Highway Administration. The toolkit is the major online source of material for new training on innovative solutions to reduce the effects of highways on wildlife. Training sessions will be offered to biologists and engineers this fiscal year and a Tech Tip will be available later.

The toolkit has a fully searchable database of case histories from around the world, resource links, a large illustrated glossary, and standard terminology.

The Wildlife Toolkit can be found at: *http://www.wildlifecrossings.info*

For more information, contact Sandy Jacobson, wildlife biologist (phone: 707–826–1276, fax: 707–825–2901, e-mail: sjacobson@fs.fed.us) or Jim Bassel, civil engineer (phone: 909–599–1267, ext. 259, fax: 909–592–2309, e-mail: jbassel@fs.fed.us).

Retardant Drop Test of the Hatfield Gate on an AT-502B Air Tractor

With the advent of turbine power and 500- to 800-gallon (1,900- to 3,030-liter) retardant tanks on larger single-engine agricultural aircraft, State and Federal agencies are taking a new look at these aircraft. Their maneuverability allows them to place retardant precisely in difficult terrain.

Retardant Drop Test of the Hatfield Gate on an AT-502B Air Tractor

(continued)

Single-engine airtankers can also operate from unimproved short airstrips closer to a fire, shortening their turnaround time.

Recently, Wildland Fire Chemical Systems personnel at the MTDC conducted a series of drop tests on a Hatfield Gate made by Turbine Conversions. The gate was installed on a single-engine AT-502B Air Tractor. The objectives of the tests were to measure flow rates and negative internal pressures at different door openings, to check door opening variations and split-load capabilities, and to estimate the ground pattern coverage of the retardant at different airspeeds. Both inflight and static (on the tarmac) drops were made during this test.

Drop guides are also available on the Internet at:
http://www.fs.fed.us/cgi-bin/enter.pl?link=../cgi-bin/search.pl?category%3DTitle%26srchword%3Dground%20pattern

Printed copies of the drop guides for other aircraft are available from Jody Faircloth, MTDC publications (phone: 406–329–3978, fax: 406–329–3719, e-mail: jfaircloth@fs.fed.us).

For more information on the drop guides and testing, contact Greg Lovellette, project leader (phone: 406–329–4815, fax: 406–329–3719, e-mail glovellette@fs.fed.us).

Remote Water Quality Monitoring Project

Two remote water quality stations were installed on the East and West Forks of the Jarbidge River in Nevada during October 2002. The Jarbidge River is important because of its population of bull trout, a threatened species in some areas of the West. The stations are now transmitting data through the Geostationary Operational Environmental Satellite. The East Fork station is a mile from the nearest road, just outside of a wilderness area. The two monitoring stations were manufactured by Forest Technology Systems, Inc. Both stations will transmit current air temperature, solar radiation, specific conductivity, conductivity, pH, dissolved oxygen, and cell and battery voltages.

For more information on remote water quality reporting systems, contact Brenda Land, project leader (phone: 909–599–1267, ext. 219, fax: 909–592–2309, e-mail: bland@fs.fed.us).

Windshields for Precipitation Gauges and Improved Measurement Techniques for Snowfall

Meteorologists study the chemistry of snow water by collecting snowfall and analyzing the melted snow, usually in a glycol mixture. But almost any wind reduces the efficiency of existing precipitation gauges for collecting snow, reducing the validity of pollution-concentration estimates that depend on collection efficiency. Windshields for precipitation gauges are ineffective and must be monitored frequently.

The Tech Tip, *Windshields for Precipitation Gauges and Improved Measurement Techniques for Snowfall* (0225-2325-MTDC), describes various windshields and their precipitation catch efficiency at different wind speeds. Some researchers have begun to abandon the bucket-type precipitation gauges that are protected by windshields. A hotplate snow gauge that melts snow as it hits the plate does not require protection from the wind. It is still in development and shows promise.

The Eastern Cereal and Oilseed Research Center in Ottawa, ON, Canada has developed a rotating ball gauge that requires no windshield. The Missoula center, in cooperation with the Ottawa center, will install two rotating ball gauges in Montana during the winter of 2003 to evaluate their efficiency.

This Tech Tip is available on the Internet at:
http://www.fs.fed.us/cgi-bin/enter.pl?link=pubs/htmlpubs/htm02252325/

For more information, contact Mary Ann Davies, project leader (phone: 406–329–3981, fax: 406–329–3719, e-mail: mdavies@fs.fed.us).

Take Care of Your Hardhat So It Can Take Care of You

The general service life of a hardhat is 2 to 5 years, but a hardhat won't last that long if you don't take care of it. The Tech Tip, *Your Hardhat: Inspection and Maintenance* (0267-2331-MTDC), has the latest information on hardhats. You will learn how to inspect and maintain the three components of a hardhat: the shell, suspension system, and chinstrap.

The Tech Tip includes information on full-brim and cap-style hardhats. It also includes information on the limitations of hardhats and some additional restrictions on their use.

Take Care of Your Hardhat So It Can Take Care of You

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This Tech Tip is available on the Internet at: *http://www.fs.fed.us/cgi-bin/enter.pl?link=pubs/htmlpubs/htm02672331/*

To order a copy of this Tech Tip, contact Jody Faircloth, MTDC publications (phone: 406–329–3978, fax: 406–329–3719, e-mail: jfaircloth@fs.fed.us).

For more information on the Tech Tip, contact Chuck Whitlock, project leader (phone: 406–329–3924, fax: 406–329–3719, e-mail: cwhitlock@fs.fed.us).

Fence Testing

In cooperation with personnel from the Dillon and Phillipsburg Ranger Districts, Beaverhead-Deerlodge National Forest, MTDC has installed three types of fencing to protect an overgrazed aspen grove from elk, deer, and moose.

The three types of fencing are: polypropylene mesh, high-tensile seven-wire electric, and poly rope (seven-rope) electric. The polypropylene mesh fence is 7 1/2 feet high, supported by 10-foot-long metal T-posts spaced every 21 feet. The high-tensile electric fence is 6 feet high, supported by 6-inch-diameter wooden posts at the corners with fiberglass posts and stays between the corners. The poly rope electric fence is 6 feet high, supported by 8-foot-long metal T-posts equipped with insulators. The posts are spaced every 21 feet. The two electric fences are connected to a remote satellite telemetry unit that transmits fence voltage and battery voltages to a Web page. Readings can be monitored every 2 hours.

The ability of the three different kinds of fencing to exclude moose and withstand the weather is being studied, along with the economics of installing each fencing system. All three types of fencing were installed at the Dillon site, near the Continental Divide on the Idaho-Montana border in high-elevation moose habitat. Only the polypropylene mesh fencing was installed at the Phillipsburg site near the Middle Fork of Rock Creek.

For more information on wildlife fencing, contact Gary Kees, project leader (phone: 406–329–6753, fax: 406–329–3719, e-mail: gkees@fs.fed.us). A Tech Tip on the project will be prepared.

Osborne Fire Finder Parts Source

The Osborne Fire Finder has been used for nearly a century to pinpoint fire locations. Over the years, misfortune and vandalism have taken their toll on the few remaining Osborne Fire Finders. Fire lookouts have asked for a replacement parts source. Leupold & Stevens, Inc., the last manufacturer of the Fire Finder, has not produced parts for many years. The company no longer has casting patterns or production drawings.

The San Dimas center tried to find a source for new Osborne Fire Finders and replacement parts. The models produced between 1920 and 1935 differed mostly in minor modifications. Many of the parts are interchangeable. Comments from the fire lookouts helped the center determine which model to reproduce. The reproduction is similar to the 1935 model and shares most of its vulnerable components with the other models. A set of AutoCAD drawings has been created to document the preferred design, and casting patterns have now been fabricated. San Dimas will coordinate the orders for replacement parts and assemble the replacement Fire Finders. The pilot production run of two complete units should be complete by February. There is no minimum order quantity but there is a significant price break if replacement parts are ordered in lots of 12 or more.

For more information on the Osborne Fire Finder, contact Joe Fleming, project leader (phone: 909–599–1267, ext. 263, fax: 909–592–2309, e-mail: jdfleming@fs.fed.us).

Remote Telemetry System for Particulate Monitoring

Commercial real-time instruments are used to monitor smoke particulate concentrations from prescribed burns and wildfires. Working with a small telecommunications firm, Applied Digital Security, Inc., MTDC has developed a remote data retrieval system for the MIE DataRam 2000 and 4000 particulate monitors. Forest Service, BLM, and State and county air quality specialists can access data from these portable air quality monitors over the Internet.

The telemetry unit uses a system of low-altitude orbiting satellites to transmit particulate concentrations, temperature, and relative humidity information from the smoke monitors to a Web server where these data are graphically displayed along with 1-, 8-, and 24-hour averages. A GPS receiver records the location of each monitor.

Remote Telemetry System for Particulate Monitoring

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This Tech Tip is available on the Internet at:
http://www.fs.fed.us/cgi-bin/enter.pl?link=pubs/htmlpubs/htm02252329/

To order the Tech Tip, *Remote Telemetry System for Particulate Monitoring* (0225-2329-MTDC), contact Jody Faircloth, MTDC publications (phone: 406–329–3978, fax: 406–329–3719, e-mail: jfaircloth@fs.fed.us).

For more information on particulate monitoring, contact Andy Trent, project leader (phone: 406–329–3912, fax: 406–329–3719, e-mail: atrent@fs.fed.us).

Road Management Maintenance System

National Forests need a road maintenance management system flexible enough for a variety of road maintenance projects. The San Dimas center reviewed road maintenance management systems on 17 different forests from 6 regions.

After a review of off-the-shelf software, the center selected RoadTrack, developed by Forsite Forest Management Consultants of British Columbia. This software is designed for management of low-volume roads and should meet the needs of Forest Service managers. Forsite will customize the program so it can use existing data. The program can handle maintenance by force account, contract, and other government agency crews. It can be used in emergency situations, and it can reflect road segment and road user costs. Road maintenance activities can be graphically displayed through the ArcInfo software program.

RoadTrack will be evaluated in the field by:

- The Tahoe National Forest, with contract and force account crews
- The Prescott National Forest, with force account crews
- The Francis Marion-Sumter National Forest, with contract crews

For more information about RoadTrack, contact Misty Alvarez (phone: 909–599–1267, ext. 229, fax: 909–592–2309, e-mail: malvarez@fs.fed.us) or Jim Bassel (phone: 909–599–1267, ext. 259, fax: 909–592–2309, e-mail jbassel@fs.fed.us).

Managing Degraded Off-Highway Vehicle Trails in Wet, Unstable, and Sensitive Environments

Managing off-highway vehicle trails in wet areas such as Alaska can be a challenge. Kevin Meyer, an environmental specialist and soil scientist for the USDI National Park Service (NPS) in Anchorage, AK, explains why off-highway vehicle trails become degraded and offers techniques to prevent degradation in the report, *Managing Degraded Off-Highway Vehicle Trails in Wet, Unstable, and Sensitive Environments* (0223–2821–MTDC). The results of tests comparing different options for hardening off-highway vehicle trails are included, as well as appendixes that provide installation instructions for porous pavement panels and a list of locations where trail-hardening systems are being tested in cooperation with the NPS Rivers, Trails, and Conservation Assistance program.

This report is available on the Internet at: *http://www.fs.fed.us/cgi-bin/enter.pl?link=pubs/htmlpubs/htm02232821/*

To order a copy of the report, *Managing Degraded Off-Highway Vehicle Trails in Wet, Unstable, and Sensitive Environments* (0223-2821-MTDC), contact Jody Faircloth, MTDC publications (phone: 406–329–3978, fax: 406–329–3719, e-mail: jfaircloth@fs.fed.us).

An Accessible Hand Pump for Campgrounds

The Missoula center has designed and built an accessible hand pump that allows individuals with limited physical abilities to get their own potable water for drinking, washing, and other uses. This rotary hand pump complies with federal accessibility guidelines. It can be operated with just 5 pounds of force and its crank is easy to reach from a wheelchair. The pump is designed for shallow wells and works best where water is within 50 feet of the surface. The pump has a flow rate that is at least 1 1/2 gallons per minute. The accessible hand pump is designed to be used in Forest Service campgrounds and recreation sites, but it can be used at any site where water needs to be pumped by hand.

An Accessible Hand Pump for Campgrounds

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The first of these hand pumps has been installed at the Hogback Cabin at the Lolo National Forest in Montana for field testing and refinement. Five more accessible hand pumps will be offered free of charge to forests throughout the Nation. Initial response to the accessible hand pump has been positive. The Forest Service has applied for a patent.

For more information, contact Bob Beckley, project leader (phone: 406–329–3996, e-mail: rbeckley@fs.fed.us) or Tyler Kuhn, project assistant (phone: 406–329–3365, e-mail: tvkuhn@fs.fed.us).

Remotely Activated Fire Protection Pump

A remotely activated pump was ready to protect the historic Thorn Meadows Guard Station from the Wolf Fire that burned more than 20,000 acres of the Los Padres National Forest. The Remotely Activated Protection Pump System wasn't needed, but its deployment and test were successful.

The Remotely Activated Protection Pump System, developed by the San Dimas center, improves on the standard sprinkler system available through the fire cache. The modified pump can be activated from a remote location, even from a helicopter hovering overhead, allowing the pump to be started shortly before a fire reaches a structure. While the system can draw water from lakes, ponds, or creeks, the configuration used at Thorn Meadows consisted of two 1,000-gallon folding tanks hooked in tandem that were connected by 1-inch diameter hoses to eight elevated sprinkler heads surrounding the building.

Firefighters monitoring the advance of the fire from the air were prepared to trigger the Remotely Activated Protection Pump System when the fire reached a predetermined spot near the building. The fire never got there. The tanks held enough water to have wetted the guard station for 4 to 5 hours.

For more information on the Remotely Activated Protection Pump System, contact Joe Fleming, project leader (phone: 909–599–1267, ext. 263, fax: 909–592–2309, e-mail: jdfleming@fs.fed.us).

Treatment Methods for Petroleum-Contaminated Soils

Climate, utility access, and accessibility present serious challenges for treating petroleum-contaminated soils in the Tongass and Chugach National Forests of Alaska. The report, *Treatment of Petroleum-Contaminated Soil in Cold, Wet, Remote Regions* (02711-2801-MTDC), explains the various hazards caused by different petroleum products and discusses effective ways to treat contaminated sites. Sponsored by the Washington Office Environmental Compliance and Protection Program, the report culminates 3 years of study by University of Alaska professors, David Barnes and Shawna Laderach. The treatment technologies covered in the report include: excavation and proper disposal, thermal desorption, incineration, soil washing, ex situ vapor extraction, composting, landfarming, soil vapor extraction,

Treatment Methods for Petroleum-Contaminated Soils

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barometric pumping, and bioventing. Although this report will only be available electronically, a Tech Tip summarizing the findings will be prepared later this year.

The report, *Treatment of Contaminated Soil in Cold, Wet, Remote Regions* (0271–2801–MTDC), is available on the Internet at:
http://www.fs.fed.us/cgi-bin/enter.pl?link=pubs/htmlpubs/htm02712801/

For more information, contact Charlie Showers, program leader (phone: 406–329–3945, fax: 406–329–3719, e-mail: cshowers@fs.fed.us).

Special Newspaper Section

Whether you're interested in peculiar pictures of projects that seemed like a good idea at the time or you're interested in practical projects now underway at MTDC, you will enjoy this special newspaper section.

The issue includes articles on a camera box that allows video footage to be shot inside a fire and on a safety container for storing and transporting bear spray (used to repel bears). In addition, the issue contains background information on the Forest Service's Technology and Development Program and MTDC's role in the program.

Articles include:

- *Camera Cooler's Job is no Picnic*
- *Born of Fire: Forest-Service Technology and Development*
- *The Early Days*
- *Problems Solved by the Missoula Technology and Development Center*
- *Simple Solution Stops Pepper Spray*
- *Patenting Successful Products*
- *Contracts Save Big Bucks*
- *New Building Conserves Resources and Displays Technology*

Special Newspaper Section

(continued)

These articles are available on the Internet at: *www.fs.fed.us/cgi-bin/enter.pl?link=pubs/htmlpubs/htm02712818/*toc.htm

Printed copies of *Missoula Technology and Development Center: Shaping Solutions for the Forest Service* (0271-2818-MTDC) are available from Jody Faircloth, MTDC publications (phone: 406–329–3978, fax: 406–329–3719, e-mail: jfaircloth@fs.fed.us).

New Faces at the Missoula Technology and Development Center

In September, **Maggie Pittman** joined MTDC as the new Operations Support Team Leader. Maggie began her Forest Service career as a seasonal employee at the Mount Saint Helens Ranger Station, Gifford Pinchot National Forest, in 1977. In 1981, she received a forestry degree from the University of Montana. She worked at the Lolo and Gallatin National Forests as a forester and resource assistant in timber, silviculture, recreation, range, and minerals.

In 1991, Maggie moved to the Helena National Forest as a public affairs specialist. While there, she also served as the administrative officer and Montana State Legislative Affairs Coordinator. Maggie transferred to the Regional Office in 2000 and assumed the position of Deputy Director for Public Affairs.

Dave Fallis became MTDC's Operations Program Leader in November. His career with the Federal Government began on a BLM helitack crew while he was attending Utah State University. He graduated with a degree in range and forest science in 1979. He spent 6 years at the Tonto National Forest, Globe Ranger District, as a range conservationist, 4 years at the Carson National Forest, Camino Real Ranger District, as district resource assistant, and 3 years at the Humboldt National Forest, as forest and range substaff. Dave served as district ranger at the Salmon-Challis National Forest, Lost River Ranger District, and as district ranger at the Beaverhead-Deerlodge National Forest, Dillon Ranger District.

Les Holsapple is the new Program Leader for the Wildland Fire Chemicals Systems group. Les began his Forest Service career as a forestry technician at the Plumas National Forest in 1969. In 1973, he was assigned to Missoula as a smokejumper. He continued his career in fire as a fire management officer at the Helena National Forest, Lincoln Ranger District. In 1981, he accepted a forester position at the Boise National Forest in reforestation, presale, and silviculture. Les moved to the Ochoco National Forest in 1988 serving as district fire management officer and district silviculturist. He was reassigned to the Umatilla National Forest in 1991 as the fire planner and fuels specialist, later serving as the deputy fire staff officer.

Les received a bachelor's degree in forest resource management from the University of Montana and has completed graduate work in forest ecology and silviculture at Northern Arizona University, Utah State University, and Colorado State University.

Charlie Showers is the new Engineering Program Leader for MTDC. Charlie will oversee project work in facilities, roads, environmental compliance and protection, hazardous materials, alternative energy, and law enforcement and investigations. A 1982 civil engineering graduate from the University of Idaho and licensed Professional Engineer, Charlie spent 7 years with the Idaho Department of Highways as a project engineer and contract administrator. He joined the Forest Service in 1989 as zone engineer at the Boise National Forest. In 1991, Charlie moved to the Payette National Forest as a special project engineer where he coordinated the completion of the South Fork of the Salmon River road restoration project. He became the assistant forest engineer at the Payette National Forest in 1993. In 2000, Charlie came to MTDC and served as Operations Program Leader.

Gary Kees joined MTDC in May as a project engineer. Gary will be working in the reforestation and nursery programs. His current projects involve economic fence enclosures, saws to cut hardwood, soil fumigation, remote weather stations, and copper coatings for seedling containers. Gary, who has a degree in mechanical engineering from the University of Idaho, worked for 10 years as a mechanical and structural engineer, project manager, and engineering group leader for Monsanto Co. in Soda Springs, ID.

Jim Olson was assigned to MTDC in January. He is an employee of the BLM, National Interagency Fire Center, but works with MTDC's smokejumper and firefighter equipment specialists to develop better equipment for smokejumpers and firefighters. After graduating from the University of Idaho in 1977 with a degree in business management, Jim started his Federal career in Alaska as a smokejumper and firefighter. In 1994, he transferred to the National Interagency Fire Center in Boise, ID, as loft manager.

Mary Ann Davies, MTDC project engineer, is not a new face at MTDC but is new in world biking competition. She finished second in her age group in the Women's World Masters Mountain Biking Championship held this summer in Canada with a time of 1 hour, 13 minutes, and 26.71 seconds for the 16-kilometer course. Mary Ann's time was the fastest of all U.S. contestants in all age groups.

Technology and Development Reports on the Internet

Anyone with Internet access and a username and password can access electronic versions of the Technology and Development (T&D) Program's reports. These reports and other Web-based materials are on the Internet at:
http://www.fs.fed.us/cgi-bin/enter.pl

The new site combines materials that have been available electronically on internal Web sites maintained by the Missoula and San Dimas Technology and Development Centers. Users can search for materials by title, author, year, key word, pub number, or program (such as fire or recreation).

Normally, Forest Service users accessing the Internet site from their offices will not need to log on. Everyone else will have to log on before using the site.

If this site could benefit your colleagues who work for the National Park Service, the California Department of Forestry and Fire Protection, the Appalachian Mountain Club, or other organizations, let them know the site's address:
http://www.fs.fed.us/cgi-bin/enter.pl

Forest Service Technology & Development Program

PROJECT PROPOSAL

Project Name/Title:

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Date:_____

Submitted by:_____

Unit:_____

Address:_____

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Phone:_____ E-mail:_____

OVERALL PROBLEM/OBJECTIVE STATEMENT *(Describe the problem, how the work is currently being done, and why improvement is needed):*

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PROPOSED TECHNOLOGY & DEVELOPMENT WORK *(Describe your concept of the end product: publications, equipment, techniques to be developed or evaluated, or other suggestions):*

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POTENTIAL BENEFITS *(Describe how this project will reduce costs, save time, improve safety, increase efficiency, or improve resource management):*

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