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Report to
STAKEHOLDERS
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Study to keep weeds out of landscape adds character

Recycled tires

Rock mulch

Herbicides

Bark mulch

Hand weeding

Environmental Management's Conservation staff proposed five different ways to keep the weeds out of the landscaped demonstration plot next to Building 2650A. From the proposal, the plot has now become an ongoing study not only to find out what works best against weeds, but also to show the general public the options that are available and the most efficient.

Full coverage on page 4

Stakeholders forum

Q. **I've seen two types of rabbits when my family and I are walking in the desert area behind our house in California City. One type has a white, fluffy tail and is relatively small; the other has a dark tail, huge ears, and looks to be as big as a medium-sized dog. Other than those differences, they look very similar. My kids asked me if the smaller ones are the babies of the black-tailed rabbits, but I'm not sure. Can you answer this question?**

A. Yes, we can! This is an interesting question and we're glad you passed it along. Please let your children know that as much as they look alike in color and body structure, these furry creatures belong to different species. The rabbit with the white, fluffy tail is called a desert cottontail (*Sylvilagus audubonii*). The larger, dark-tailed specimen is not a true rabbit; it is actually a hare known as the black-tailed jackrabbit (*Lepus californicus*).

Desert cottontail rabbit

Jack rabbit

The major differences between rabbits and hares are their body size and offspring. Black-tailed jackrabbits, and hares in general, grow large in size and give birth to babies that have fur and can open their eyes. Rabbits, like the desert cottontail, tend to be smaller in stature than hares, and their young are born with no hair and their eyes closed. The cottontail's young are defenseless and dependent on the mother for food and shelter. A nest is built in which the offspring grow and develop during a three-week time period. Baby jackrabbits, on the other hand, are relatively independent from birth.

An adult desert cottontail reaches 13¾ to 16½ inches in length and averages 1¾ to 2¾ pounds in weight. The more massive black-tailed jackrabbit measures 18¼ to 25 inches and ranges between 3 to 8 pounds. Besides the difference in body size, the animals are fairly easy to tell apart as the jackrabbit has a bold white eyebrow, much longer ears relative to its body size, and does not have a cottontail.

Desert cottontails and black-tailed jackrabbits do share a few things in common. Both are most active at night when temperatures are lower. Their long ears are used not only to listen for predators but also to regulate their body temperatures. This cooling feature is especially useful since both prefer to live in dry, hot climates such as the Mojave Desert.

Animals like the black-tailed jackrabbit and desert cottontail need to be quick. They are hunted by coyotes, bobcats, owls, hawks and snakes. When it comes to evading predators, the cottontail can reach speeds of 19 miles per hour (mph) whereas the longer legs of the jackrabbit clock in at 35 mph! Usually, the only way to tell them apart when they are moving so fast is by the difference in tail color and body size.

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If you have a question about the Edwards Air Force Base Environmental Management program, you may address it to Stakeholders Forum, Attn: Gary Hatch or Miriam Horning, 5 E. Popson Ave., Edwards AFB, CA 93524-8060, or send e-mail to: *gary.hatch@edwards.af.mil*

Next RAB Meeting

Nov. 17, 2005
5:30 p.m. at the Boron Senior Center
27177 20 Mule Team Road

The public is invited.

Report to Stakeholders is a publication of the Edwards AFB Environmental Management Division. Its purpose is to inform and educate the public, base workers and residents about continuing Environmental Management efforts at Edwards AFB. It currently has a circulation of 6,000, including about 2,000 subscribers.

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Comments or questions should be directed to: Gary Hatch, 95 ABW/PAE, 5 E. Popson Ave., Bldg. 2650A, Edwards AFB, CA 93524-8060, (661) 277-1454. **E-mail: gary.hatch@edwards.af.mil**

Report to **STAKEHOLDERS**

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Granular activated carbon a success at most Environmental Restoration Program sites

The following article is the second installment in the Report to Stakeholders series "We've tried it … It works!" The first of the series ran in January on Dual Extraction Systems, cleanup technologies' big guns. The series highlights cleanup technologies that have been tested and have shown promise at Edwards Air Force Base (AFB).

The Edwards AFB cleanup program prides itself on the many innovative soil and groundwater cleanup solutions tested here over the years. But the base also relies on reliable, time-tested methods to get the job done.

That's true at six Edwards' cleanup sites where granular activated carbon, or GAC, is being used to stop the spread of specific groundwater contamination. At four other sites, GAC is used as a final, polishing step. GAC is not capable of removing all contaminants, but in most cases it ensures the water that has gone through the system is clean. This water is clean enough to put into the sewer or reinject into the ground.

Activated carbon is a technology that's been around for a long time. Ancient Egyptians used it to "adsorb malodorous vapors from putrefying wounds" according to carbon expert Dr. P.J.F. Harris from the University of Reading in Great Britain. You may even use it in your own home to filter tap water before you drink it or to clean the water in your fish tank.

Of course, at Edwards the filters are a little larger than those in a home fish tank. For example, Site 25 near the NASA-Dryden complex has two 2,000-pound canisters of granular activated carbon. The carbon pieces in these tanks are a little larger than kosher salt crystals. These canisters have been working full time since November 2001. They process 10 to 40 gallons of water per minute and have removed 126 pounds of trichloroethene, or TCE: a solvent that at one time was rapidly making its way down the hillside toward NASA.

At Site 25, 10 extraction wells pull contaminated water from the ground and store it in a 1,000-gallon tank. There, the water is filtered to separate out dirt and then it goes through the first 2,000-pound GAC tank. The contaminants stick to the carbon particles, but the water flows through. The first tank is usually enough to clean the water, but it goes through a second tank before it is dumped into the sewer. This water is eventually used to water landscaping throughout the base.

The second tank is there to take over when the first tank becomes saturated with TCE. When that happens, the system is shut down. Technicians reroute the water flow so tank number two becomes tank number one. Finally, the carbon that's full of TCE is swapped out for clean carbon and the system is restarted. Since 2001, carbon has been swapped out four times at Site 25. Saturated carbon is sent off base to a recycler who regenerates the carbon for use again.

"The GAC system is at Site 25 to limit the spread of the TCE," said Tom Merendini, AF program manager for the site. "And it's doing a great job catching the contaminants coming down the hill. However, when the time comes to remediate the source of the spill, we are looking at alternative methods."

That's because GAC is less cost efficient than many other innovative technologies when dealing with very large contamination problems. "GAC is arguably not a good way to clean an entire plume because too many wells would be required for complete remediation," said Rebecca Hobbs, program manager for sites at South Base. "It is a good way, however, to stop downgradient migration of a groundwater contaminant plume."

Hobbs has two sites that have merged into one, where GAC has been used for years to slow down the spread of contaminants. GAC has been working away at Hobbs' Site 14 since December 1998. And it's working as designed. "It has prevented further downgradient migration of the Sites 5/14 groundwater contaminant plume," she said.

Hobbs said cleaning up the plume will take until 2024 … The system at Site 5 is planned to be shut off in 2008. "We will continue to operate the Site 14 GAC system as a barrier to further migration of the plume until the remainder of the Sites 5/14 plume has been remediated" she said.

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ONGOING STUDY — *The demonstration plot next to Environmental Management is more than just a demonstration to show how to conserve water. It also demonstrates what types of weed controls work best. The photo above shows a full view of the demonstration plot and the various types of controls used — recycled tires, rock mulch, wood mulch, hand weeding and herbicides. This plot was constructed in November 2003. The weeding project began March 9, 2005.*

Various weed control methods tested on Environmental Management's landscape plot

Environmental Management's Natural Resources section is in the process of conducting an ongoing study to find out what products work best to keep weeds out of the *Xeriscape* ™ beds built last year.

"We were tasked to approach the demonstration plot with various types of weed control such as hand weeding, herbicides, wood chips, rocks and recycled tires," said Felicia Griego, JT3/CH2M HILL biologist. "We want to find out which method works best."

By doing this study, Natural Resources is trying to control the population of invasive plant species and weeds that keep cropping up throughout the landscaped area. "We are also looking at other natural methods to control the weeds, such as adding more native species to help choke out the weeds," Griego added.

This project began on March 9 with a proposal for various types of weed control methods. Work on the site began in early April 2005, just before Environmental Management's Earth Day Environmental Fair. There are five mounds in the demonstration plot and each mound was assigned a different treatment to help reduce the weed populations. Costs for each treatment are broken down in the table on page 5.

Through the ongoing study of various types of weed controls, those working and living on base can see what kinds of methods are helpful and most useful. "Every ground cover that is used on the demonstration plot is recycled," Griego said. "The wood chips come from the landfill, the rocks aren't actually rocks, they are crushed concrete and asphalt, and the tires are not only recycled, but also refined and colored."

The demonstration plot at the Environmental Management office uses and promotes the use of *Xeriscape* ™ landscaping principles at Edwards AFB. The demonstration area was constructed in November 2003. Approximately 5,000 square feet of lawn was removed and replaced with 156 drought-resistant plants. The biologists estimate it conserves about 236,000 gallons of water per year.

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Cost breakdown for each mound and method

TYPE	METHOD	SIZE (Sq. Ft.)	PRICE
Mound 1	Recycled tires	709	$584.26
Mound 2	Hand weed	361	No costs other than man hours
Mound 3	Rock mulch	2,020	$270.99
Mound 4	Bark mulch	477	$101.23
Mound 5	Herbicide	1,250	Has not yet been determined for application

Desert Haven labor: $1,138.92; Current total: $2,095.40

How to take the weeds out

1) Weed the area.
2) Place a pre-emergent herbicide down, once the area has been cleared of weeds. Pre-emergent herbicides stop the growth of any seeds.
3) Place weed matting or fabric over the area. Weed matting or fabric should be thick and not flimsy. It stops light, aides in erosion control and conserves soil moisture.
4) Place ground cover over weed matting or fabric.

WORKING TOGETHER — *Several members of the Atlas V booster land survey team pose for a picture. The group received a "Team of the Quarter" award for its efforts in July.*

Conservation receives "Team of the Quarter" award for Atlas V booster presurvey efforts

Conservation section employees at Edwards Air Force Base (AFB) were presented a team award this July at the basewide 95th Air Base Wing Second Quarter Awards Luncheon for their efforts in surveying and clearing approximately 460 acres of land so that Aerojet's Atlas V Block B solid rocket booster test could be accomplished at the Air Force Research Laboratory, or AFRL.

A clearance survey had to be done by Environmental Management because the rocket test was going to be conducted in desert tortoise critical habitat. Currently, the desert tortoise is listed as threatened under the federal Endangered Species Act of 1973. The U.S. Fish and Wildlife Service (USFWS) designated 6.4 million acres as critical habitat. Critical habitat is defined as an area that contains physical or biological features essential to the conservation of the species, even if the species is not present in those areas. Edwards AFB has about 65,560 acres of designated critical habitat including the AFRL test area.

"Testing of the Atlas V Block B booster has been conducted twice," said Mark Bratton, JT3/CH2M HILL biologist. "The particular test we received an award for was the first test conducted. There will be a final test later this year.

"Whenever the AFRL runs a rocket test, we are responsible for surveying and clearing the area of potential impacts for desert tortoises."

The initial survey was for 340 acres, which was accomplished in two days. However, due to unfavorable winds, there was a delay in the booster rocket test. The EM team was then tasked to survey an additional 120 acres of land on the west side of the test stand site. Survey team members each walked about 13 miles during their surveillance, and the Atlas

SURVEILLANCE — *JT3/CH2MHILL biologist Eric Peffer, a certified desert tortoise handler, gently picks up Crunchy, the desert tortoise. Peffer relocated Crunchy until testing of the Atlas V booster was accomplished.*

V booster test team was able to complete its mission.

With severe field conditions all three days, the government, TYBRIN Corp. and AFRL staff assisted JT3/CH2MHILL employees with the survey. In the first two survey days, wind gusts were between 40 and 50 plus miles per hour.

"Even though the wind gusts were high," Bratton said. "We had to get out there and make sure the land was clear of animals. We were able to cover about 340 acres in two days, and come back the final day to cover about 120 more acres of land because of the wind direction."

"The new survey area was done over hilly and rocky terrain and was completed in less than six hours," said Sue Theiss, JT3/CH2MHILL conservation section manager. "As soon as the survey team cleared the area, a one-hour lead up period was initiated and the firing was successful and was actually 30 minutes ahead of schedule."

During the initial survey, a tortoise – nicknamed Crunchy for the cracks and tooth marks on his shell – was found and temporarily relocated. He was later returned to his original capture location after the first test was completed. When the second survey was conducted, Crunchy had moved. But it was still within the rocket test area. Crunchy was, of course, relocated again during the test run and returned afterward.

Team accomplishments included the Geographic Information Systems (GIS) staff providing maps, survey and sample points and loaded global positioning system units to keep the survey team on track. A risk management plan, desert tortoise clearance survey plan and field safety instructions were constructed for the Atlas V booster survey team. All activities were done in compliance with the USFWS biological opinion.

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TEMPORARY DIGS
Crunchy the desert tortoise is placed in a temporary burrow, while the Atlas V booster test went on.

RAB Meeting Highlights

The following report highlights the latest quarterly meeting of the RAB held Aug. 25, 2005 at California City, Calif.

Site 285 update — EarthTech engineer, Todd Battey updated the RAB on activities at Site 285. Site 285 is located in the newly designated Operable Unit 5/10. Site 285 is the location of an Air Force study on removing ammonium perchlorate from the groundwater. A new study was implemented using soil flushing to remove perchlorate in the soil. Goals of this study are to evaluate the effectiveness of infiltration as an alternative to well injection as a means of reintroducing treated groundwater back to the aquifer. Another goal is to evaluate the effectiveness of soil flushing as a soil remediation technique for perchlorate contamination.

The next meeting of the RAB will be at 5:30 p.m. on Nov. 17, 2005 in Boron, Calif. at the Senior Center. The public is invited to attend.

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RAB Members

BORON
Dara English (760) 762-6527 Home
dara.english@Borax.com (760) 762-7867 Work

CALIFORNIA CITY
Bob Smith (760) 373-4317 Home
bsmith@ccis.com

LANCASTER
Larry Hagenauer (661) 277-9133 Work
Larry.Hagenauer@edwards.af.mil
ALTERNATE: Frank Roberts (661) 723-6018 Work

MOJAVE
Victor Yaw (661) 824-2886 Home
(661) 275-4296 Work

NORTH EDWARDS
Ruby Messersmith (760) 769-4357 Home
messersmith@ccis.com

ROSAMOND
David Newman (661) 722-6433 Work
dnewman@ispwest.com
ALTERNATE: Leslie Uhazy (661) 256-8209 Home
luhazy@avc.edu (661) 722-6417 Work

EDWARDS AFB

Housing
Amy Bouchard (661) 258-0190 Home
noelamy@adelphia.net

Main Base Air Base Wing
Vacant

Main Base Test Wing
Vacant

NASA Dryden
William Brandweiner (661) 276-3339 Work
William.Brandweiner@dfrc.nasa.gov

North Base
Vacant

South Base
Julie Newton (661) 275-0551 Work
julie.newton@edwards.af.mil

AF Research Lab/ Propulsion Directorate
Milton McKay (661) 275-5191 Work
milton.mckay@edwards.af.mil

Report to Stakeholders Staff

EDITOR/WEB
Miriam Horning

WRITING AND DESIGN SUPPORT
Writer: Darlene Norwood
Writer: Leilani Richardson
Writer: Patti Kumazawa
Graphic Artist: Paul Rogers

Published data and documents relating to the Environmental Restoration Program are available for public review in information repositories at four locations. The current information repositories are located in the cities of Boron, Lancaster and Rosamond, as well as Edwards AFB. They are updated when new documents are released.

If you have any questions about information in the repositories, please contact Gary Hatch, Environmental Public Affairs at (661) 277-1454 or through e-mail at gary.hatch@edwards.af.mil.

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Col. Vernon P. Saxon, Jr. Aerospace Museum 26962 Twenty Mule Team Road Boron, Calif. (760) 762-6600	Mon-Sun	10 a.m. - 4 p.m.

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