



CUSTER NATIONAL FOREST, SIOUX RANGER DISTRICT RILEY PASS NEWSLETTER

MARCH 2013

IN THIS NEWSLETTER

- 2012 bluffs I-1, I-3 and F Reclamation.
- 2012 bluff B Sediment pond fencing.
- 2012 Brown's Pond and Schleichart Reservoir repair.
- Riley Pass bluffs reclamation design.
- Tronox bankruptcy and litigation.
- Closure Order in effect for portions of site.

This newsletter provides information regarding ongoing reclamation work at the Riley Pass Abandoned Uranium Mines Site. Riley Pass is in the North Cave Hills portion of the Custer National Forest's Sioux Ranger District, approximately 25 miles north of Buffalo, SD.

The site consists of 12 bluffs first mined in the 1950s (Figure 2). Tronox LLC has been determined to be the potentially responsible party for reclamation across approximately 205 acres and is legally required to pay for work in areas referred to as Tronox bluffs. The Forest Service is funding work at other bluffs, which are referred to as non-Tronox bluffs. Mined bluffs range in size from a few acres to 150 acres and contain mine wastes with hazardous substances including arsenic, molybdenum, thorium, radium, and uranium. Human health and environmental concerns are related to levels of arsenic and gamma radiation from radium 226. Risk-based clean-up levels have been established for the Riley Pass site.

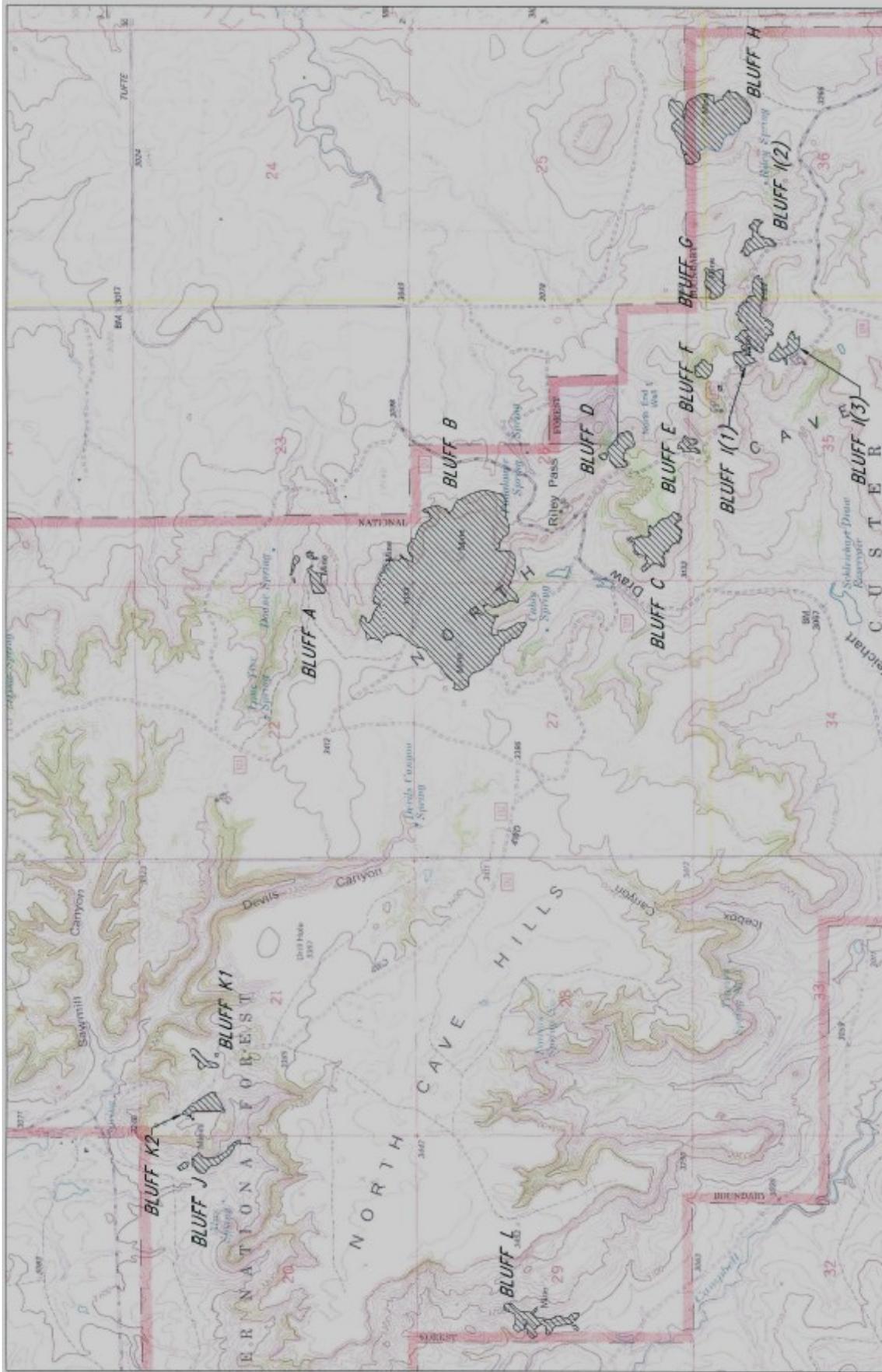
RILEY PASS RECLAMATION

Reclamation measures focus on consolidating, burying and stabilizing mine waste and stabilizing and revegetating mine spoils. Materials containing greater than 142 mg/kg arsenic and/or greater than 30 pCi/g radium 226 are considered mine waste. Mine spoils are native materials that were disturbed by mining activities. Spoils have lower contaminant levels than waste and undesirable geotechnical or agronomic properties that prevent re-vegetation. To reclaim these mine sites, mine waste and spoils are graded and brought up to the highwall (unexcavated face) of each bluff. Mine waste is then compacted and capped with spoils to reduce exposure to hazardous substances and prevent water from infiltrating through the waste. The area of capped and compacted waste is referred to as a waste repository.

The final step is to cover disturbed areas with clean soil, compost and seed. In 2010 and 2011, bluffs J and K were the first Riley Pass bluffs to be reclaimed (Figure 2). 2011 and 2012 reclamation has focused on reclaiming portions of the non-Tronox bluff I and bluff F areas and improving site access roads (Figures 1 through 6). Based on post-reclamation monitoring, reclaimed areas are remaining stable and revegetation is successful.

Figure 1 : Preparing the bluff I-1 waste repository . 9/13/2012.





SOURCE: 7.5' USGS QUADS: LANGEF SE & LORLON, SD


 WASTE SOURCE BLUFF
 ACCESS ROAD



RILEY PASS SITE
 SOUTH DAKOTA
 BLUFF IDENTIFICATION MAP
 SCALE: 1"=2000'
 DATE: 10/3/06

FIGURE 2. BLUFF IDENTIFICATION MAP

FOR AN HIGH RESOLUTION MAP: CONTACT DAN SEIFERT (DSEIFERT@FS.FED.US

2012 BLUFFS I-1, I-3 AND F RECLAMATION

Belair Builders, Inc. of New Brighton, Minnesota was awarded the contract for bluffs I-1, I-3 and bluff F reclamation. Work began in September 2012. Materials at the repository were removed down to sandstone bedrock (Figure 1). The bedrock was then lined with compacted bentonite to form the repository base. Mine waste placed in the repository was compacted and covered with spoils to prevent water infiltration. Areas where waste and spoils were removed (Figure 3) were covered with uncontaminated soil from a nearby soil borrow area. Removal areas were then capped with compost, seeded and covered with biodegradable erosion matting (Figure 4).



Figure 3. Removing mine waste at bluff I1-1. 9/26/2012.



Figure 4. Placing erosion control matting (tan-colored material) over dark-colored compost and seed at bluff I1-1. Red material is newly placed, locally sourced scoria used as road surfacing. 10/24/2012.

2012 BLUFFS I-1, I-3 AND F RECLAMATION

To date 9,423 cubic yards of mine wastes were excavated, consolidated and compacted into the bluff I-1 repository (Figures 5 and 6). An additional 18,097 cubic yards of mine spoils were also placed in the repository. Contracted work was completed by late October 2012 for a total \$436,322 cost. While mine waste placed in the repository was compacted, it was not capped or covered. The repository will be capped and re-vegetated either after it is filled to capacity or upon completion of all reclamation in the vicinity of bluff I-1. Current plans call for placing additional mine waste and mine spoils into this repository area as future funding allows. This will include removing additional waste and spoils from bluffs I-1, F, and G and placing it in the I-1 repository.



Figure 5. Placing mine waste in the bluff I-1 waste repository . 9/25/2012.



Figure 6. Placing mine waste and spoils in the bluff I-1 waste repository. 10/24/2012.

2012 BLUFFS I-1, I-3 AND F RECLAMATION

To ensure that mine waste was adequately removed and to minimize future human health risks, clean-up quality assurance surveys were conducted through a contract by TetraTech of Fort Collins, Colorado and DJA Consulting Engineers of Missoula, Montana. Surveys were conducted after Belair Builders had removed waste and prior to placement of topsoil, compost, seed and erosion matting. Based on survey data, the initial removal action successfully remediated bluffs I-1, I-3 and F and reduced residual radium 226 and arsenic concentrations to acceptable levels. Figure 7 shows measured bluff I-1 gamma radiation levels prior to reclamation in 2009 and after reclamation in 2012.

Survey data at bluff F1 revealed some areas where clean-up requirements were not met. To address these areas, Belair Builders completed additional cleanup efforts, including removing additional mine wastes and placing additional cover soil. It was decided that some small areas of bluff F1 with elevated radium 226 levels did not warrant additional cleanup work, as they are vegetated with grass and trees and are immediately adjacent to a cliff edge, which could make cleanup difficult and dangerous. Small areas surrounding bluff F2 did not meet the human health and safety criteria, as there were significant unreclaimed portions of the bluff that had both arsenic and radium 226 concentrations above the established limit. Because these areas were outside the identified contract removal areas, they will be addressed through future contract construction actions.

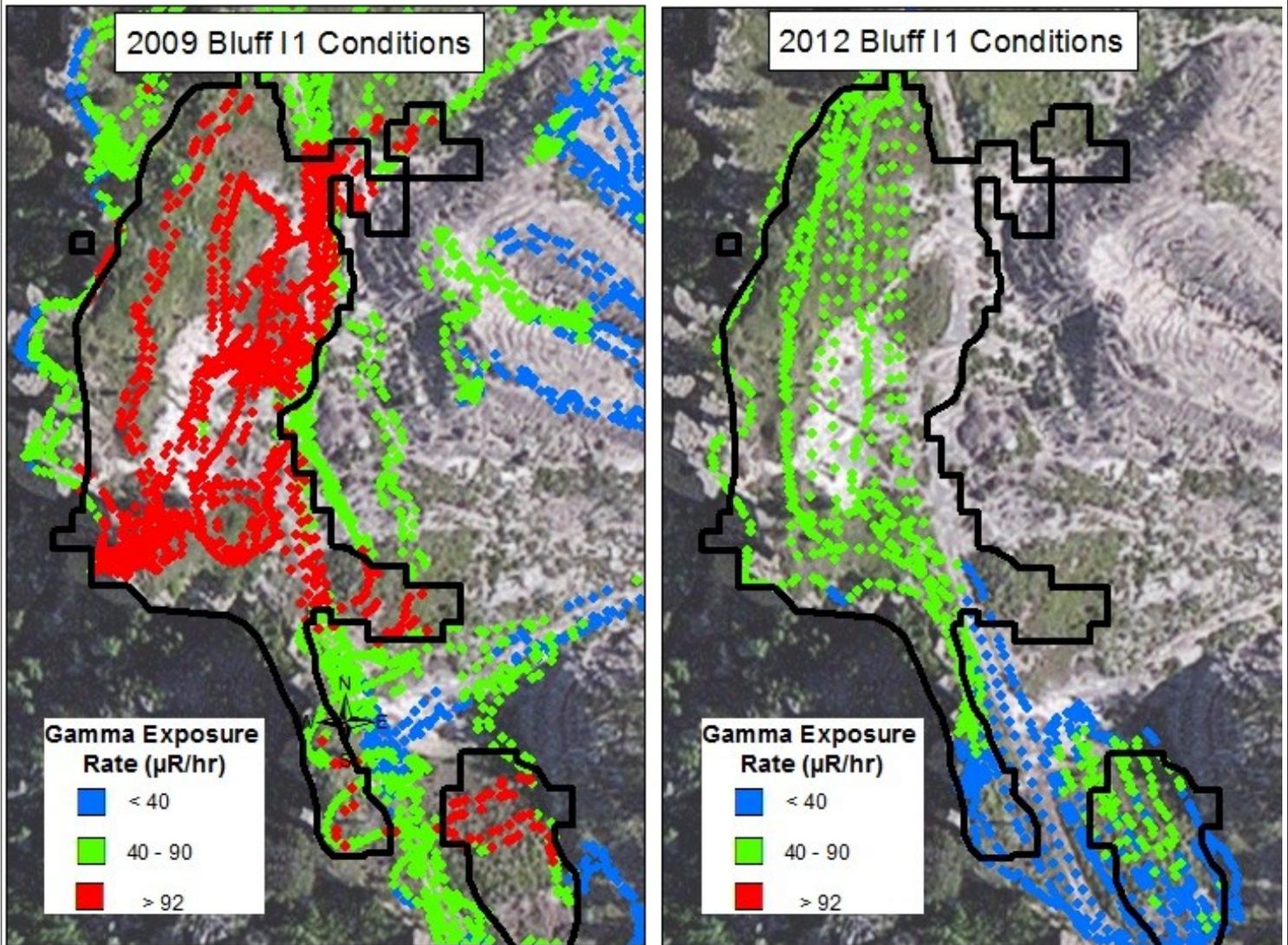


Figure 7: Bluff I1-1 estimated 2009 soil radiation concentrations prior to reclamation and 2012 post-reclamation concentrations.

2012 BLUFF B SEDIMENT POND FENCING

Five sediment ponds were previously constructed to capture contaminated materials in storm runoff from Tronox bluff B (Figure 2). The ponds allow some sediments to settle from storm water before it drains down slope. Water sample analysis indicates that pond water contains high concentrations of arsenic and uranium. To prevent livestock from drinking this water, a contract to install fencing around these sediment pond was implemented in 2012. Hafner Construction, Inc. of Ludlow, South Dakota completed contract work for an estimated \$24,302.

2012 BROWN'S POND & SCHLEICHART RESERVOIR DAM REPAIR



Figure 8. Placing rock rip-rap along the Brown's Pond dam face. 9/30/2013.

Brown's Pond and Schleichart Reservoir also capture water and sediment draining from bluff B. Dam stabilization work was completed at both these structures in 2012 (Figure 8). Work included spillway repair and placement of rock rip-rap, both intended to stabilize the dams so they can continue to function. Hafner Construction, Inc. completed contract work for an estimated \$59,324.

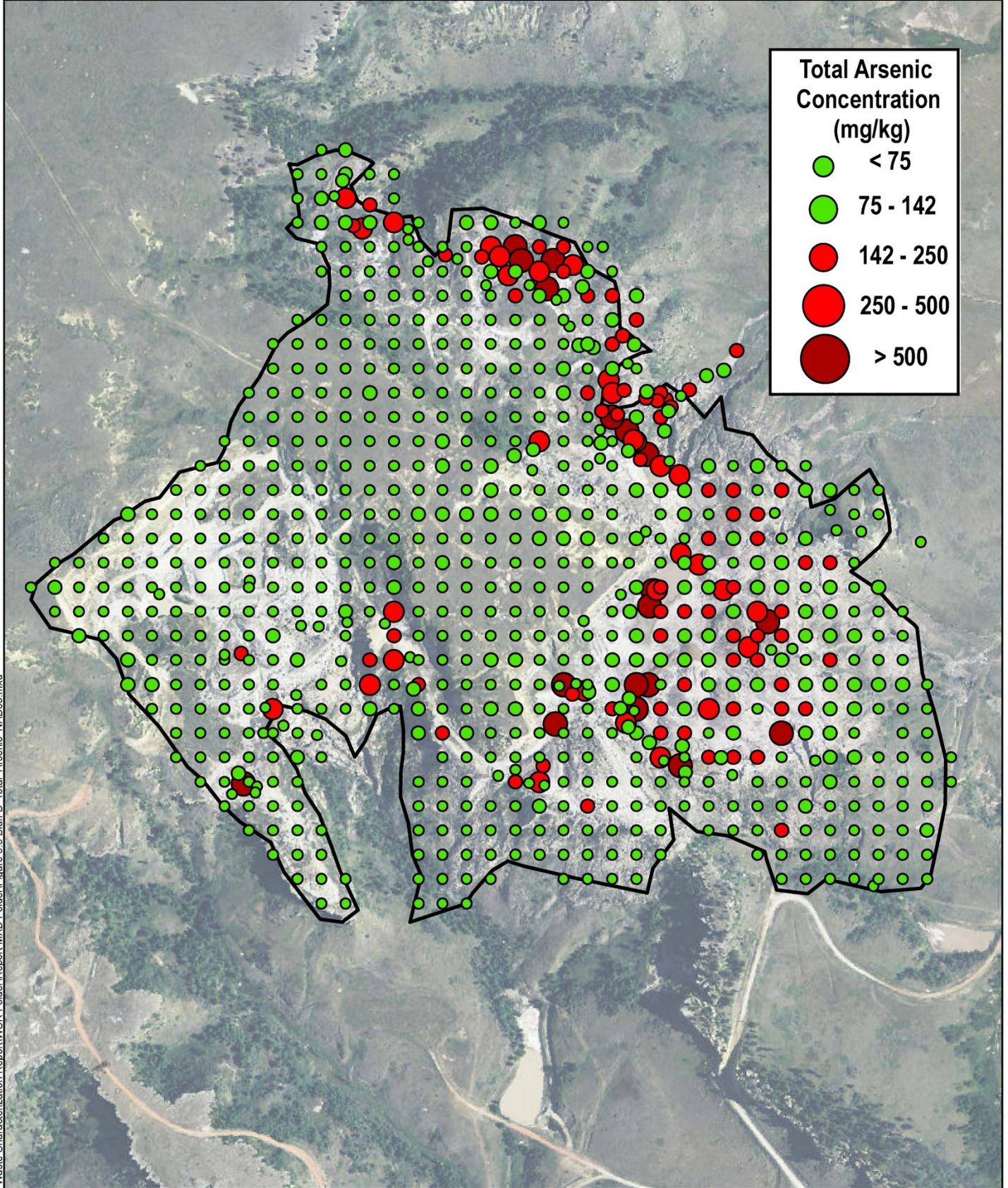
RILEY PASS BLUFFS RECLAMATION DESIGN

Tronox bluffs reclamation needs are being further identified and engineering design work is underway. To accomplish this, the Forest Service has issued several task orders on an existing contract with TetraTech EC of Denver, Colorado. Work completed to date includes an extensive waste characterization program at the Tronox bluffs. Waste characterization work included : 1) Collecting 1,350 in-situ X-ray fluorescence (XRF) measurements and 69 soil confirmation samples; 2) collecting more than 167,000 individual gamma radiation exposure rate measurements and 11 soil correlation plot samples; 3) collecting 25 sediment samples from sediment ponds; 4) evaluating erosion impacts and vegetation status; and 5) estimating the areal extent of contaminated soils. Figures 9 and 10 provide an example of how XRF sample point data is used to determine areas of arsenic contamination at bluff B. Gamma radiation levels (Figure 11) and metals concentrations will be combined to map the contaminated areas at each bluff. Additional metals levels will also be considered and utilized to ensure that reclamation is designed to address areas contaminated by other potentially hazardous substances, such as molybdenum, selenium, and uranium. TetraTech and the Forest Service will use waste characterization information to guide removal design and management of contaminated materials at the Tronox bluffs. Due to the size and complexity of the Tronox bluffs, engineering design work could take several months.

TetraTech is also evaluating the bluff I-1 waste repository to determine capacity for additional waste and spoils. The Forest Service will be completing engineering design work to move contaminated materials from Tronox bluff G and non-Tronox bluff I-1 into the I-1 repository. Once design is completed, construction work at I-1 and G is expected to be completed under a separate contract in 2013 or 2014. Construction contract solicitation information will be available online at the Fed Biz Opps.gov website.

Figure 9 . Draft map of Bluff B arsenic levels at 2012 XRF survey data points

Coordinate System: NAD 1983 StatePlane South Dakota North FIPS 4001 Feet



Total Arsenic Concentration (mg/kg)

- < 75
- 75 - 142
- 142 - 250
- 250 - 500
- > 500

X:\1551083 - Riley Pass\GIS Waste Characterization\Report\WCR_Folder\Report\MXD_Folder\Figure 5.5 Bluff B_Total_Arsenic_NAD83.mxd

Legend:

Bluff B Boundary

0 125 250 500
Feet



Issued by:



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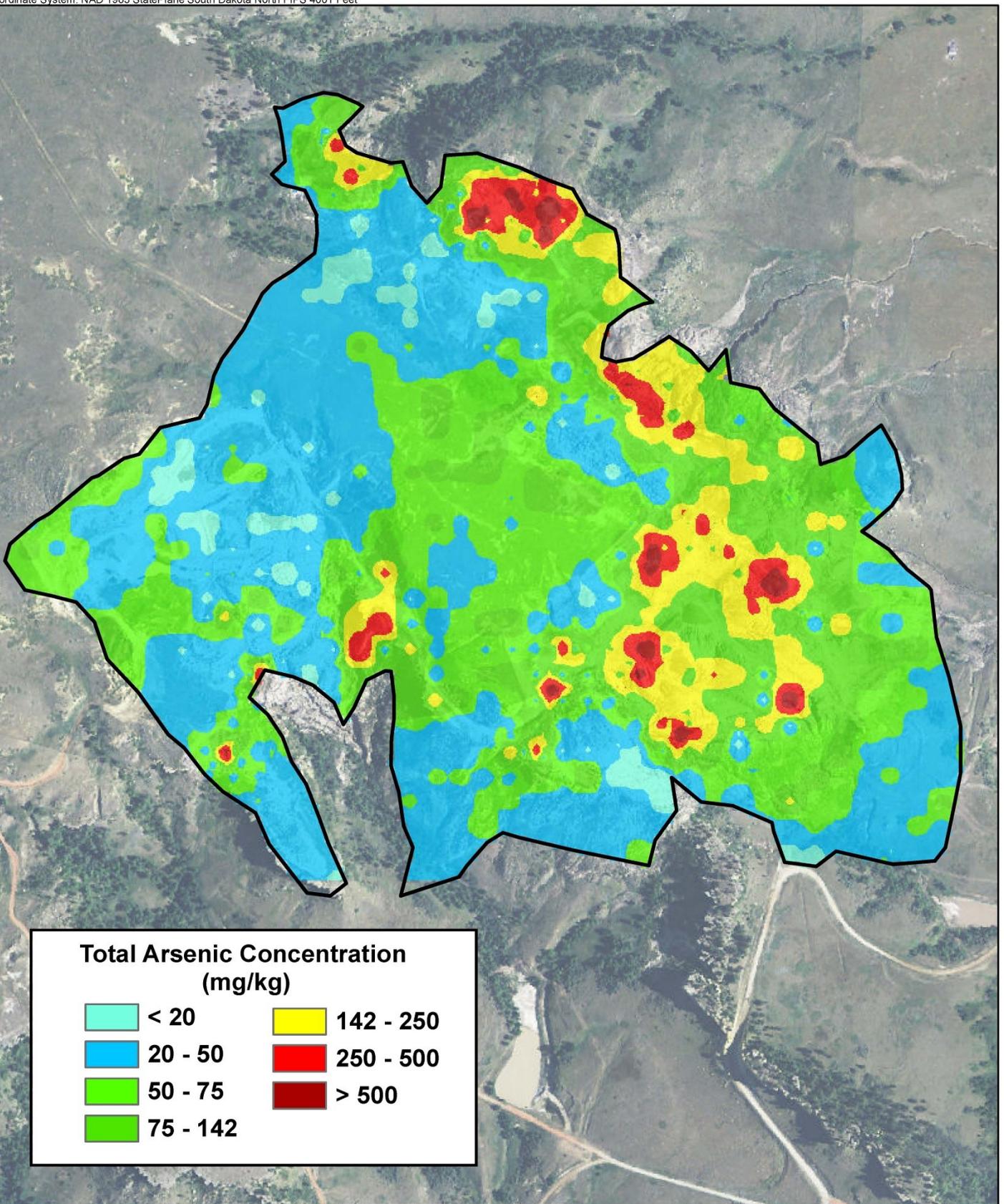
Bluff B Total Arsenic Concentration Map



Project:	Riley Pass Tronox Bluffs	Project no.:	114-551083
Location:	Harding County, South Dakota	January, 2013	

Figure 10. Draft map of Bluff B arsenic contamination levels based on 2012 XRF survey data.

Coordinate System: NAD 1983 StatePlane South Dakota North FIPS 4001 Feet



**Total Arsenic Concentration
(mg/kg)**

	< 20		142 - 250
	20 - 50		250 - 500
	50 - 75		> 500
	75 - 142		

Legend:

 **Bluff B Boundary**

0 130 260 520
Feet



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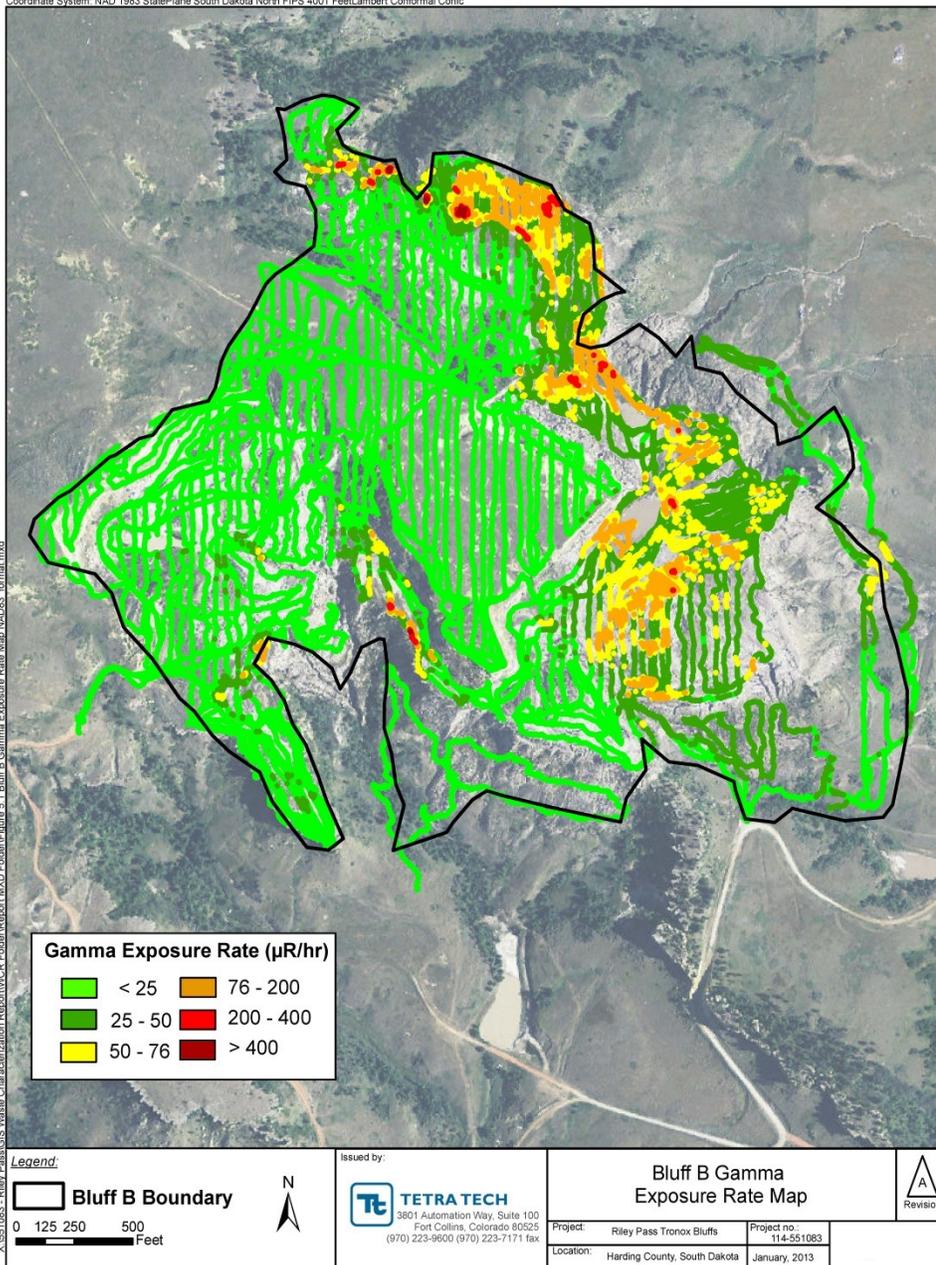
**Bluff B - IDW Map
Total Arsenic Concentration**



Project:	Riley Pass Tronox Bluffs	Project no.:	114-551083
Location:	Harding County, South Dakota	January, 2013	

X:\551083 - Riley Pass\GIS Waste Characterization Report\WCR\Folder\Report\MXD\Folder\Figure 5.6 Bluff B_As_Spatial_Interpolation_NAD83.mxd

Figure 11. Draft map of Bluff B gamma exposure rates.



TRONOX BANKRUPTCY AND LITIGATION

Tronox, LLC is the responsible party for reclamation of approximately 80 percent of the Riley Pass abandoned uranium mine site. In October 2008, Tronox informed the Forest Service that it was stopping all work on the project, in violation of the consent order Tronox signed the previous year. In January 2009, Tronox filed Chapter 11 bankruptcy. Riley Pass is one of numerous sites included in a recent bankruptcy case Settlement Agreement that created environmental response trusts and provides for Tronox to pay \$270 million and certain other considerations to the environmental response trusts and Governmental Environmental Claimants. The final papers to resolve the Tronox bankruptcy case have been filed with the court and the reorganization plan is effective. An initial \$7 million payment for Riley Pass has been made to the United States as a result of this case.

Additionally, the United States is pursuing a pending fraudulent conveyance lawsuit against Tronox, its former parent, Kerr-McGee Corporation, and Anadarko Petroleum Corporation, which purchased Kerr-McGee. The fraudulent conveyance lawsuit alleges that Kerr-McGee and Anadarko defrauded Tronox and its creditors, including the United States, by imposing on Tronox all of Kerr-McGee's environmental liabilities without sufficient assets to satisfy those liabilities. This case was litigated in trial in the Southern District Court of New York and a ruling is pending. The United States government remains hopeful that it will prevail on the merits of the case. If and when funding becomes available, clean-up of the Tronox bluffs will likely take years to complete.

Sioux Ranger District
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PUBLIC SAFETY CLOSURE ORDER IN EFFECT

Riley Pass mine waste contains hazardous substances including arsenic, molybdenum, thorium, radium and uranium. Due to the human health, safety and environmental concerns related to elevated levels of these substances, the Forest Supervisor has closed the bluffs and some adjacent to all public entry through a special order. The special order has been placed on signs in the Riley Pass area and throughout the North Cave Hills. The order and closure maps are also available upon request.

FOR ADDITIONAL INFORMATION

Documents, maps and photos regarding site history, human health and environmental concerns and ongoing reclamation at Riley Pass are available for download from the Custer National Forest website at:

<http://www.fs.usda.gov/custer>.

A mailing list is also being maintained for this project. You can stay informed by either checking the website at your convenience or signing up for our mailing list to receive future editions of the Riley Pass Newsletter in hard copy or electronic format.

For specific requests, additional information or to be added to the Riley Pass newsletter mailing list, please contact On Scene Coordinator, Dan Seifert at dseifert@fs.fed.us or (406) 446-4520.