

Standard, Requirement Criteria Or Limitation	Citation	Description	ARAR Status for the Riley Pass Project
		discharges to surface waters of the state. Non-point sources shall be reviewed as feasible by the board Non-point source discharges shall be controlled utilizing cost-effective methods and reasonable best management practices.	
	ARSD 74:51:01:42	Establishes the beneficial uses of surface waters of the state. The beneficial use classification of surface waters of the state established in this section are not to be construed as limiting the actual use of such waters. The classification designate the minimum quality at which the surface waters of the state are to be maintained and protected.	(See Note# 1 below)
	ARSD 74:51:01:52	Establishes criteria for wildlife propagation and stock watering waters.	(See Note# 1 below)
	ARSD 74:51:01:55	Establishes toxic pollutant criteria. Toxic pollutants at levels which are or may become injurious to public health, safety, or welfare; plant, aquatic, and animal life; or the existing or designated uses of waters may not be present in the surface waters of the state. The toxic pollutants to which this section applies are the priority pollutants and chemicals in 40 C.F.R. Part 131 (July 1, 1995) and any other toxic pollutants or substances determined by the secretary to be of concern at a specific site. Appendix B at the end of this chapter lists the priority pollutants and chemicals for which specific numerical criteria have been adopted by the board. The limits at the site are based on risk based values and may over shadow set levels. However the citation gives guidance for the issue	(See Note# 1 below)
<u>Uses Assigned to Streams</u>	ARSD 74:51:03	Establishes the uses assigned to streams in the state.	

I concur with the recommendation to implement the proposed action as described in this Action Memorandum for the Riley Pass Uranium Mines site:

Rhonda O'Byrne
District Ranger
Sioux Ranger District

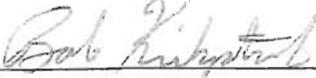
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I concur with the recommendations to implement the proposed action as described in this Action Memorandum for the Riley Pass Uranium Mines site:

Kate Walker
Acting Forest Supervisor
Custer National Forest

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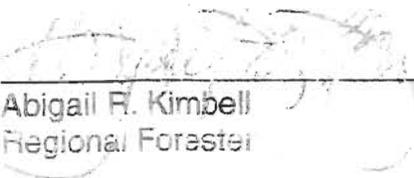


Bob Kirkpatrick
Regional CERCLA Coordinator
USDA-FS Northern Regional Office



Date

I approve of the proposed removal action as outlined in the Action Memorandum and attached Engineering Evaluation/Cost Analysis for the Riley Pass Uranium Mines site Harding County, South Dakota.



Abigail F. Kimbell
Regional Forester



Date

Standard, Requirement Criteria Or Limitation	Citation	Description	ARAR Status for the Riley Pass Project
	ARSD 74:51:03:01	Establishes that the beneficial uses of South Dakota streams include irrigation and wildlife propagation and stock watering. All streams in South Dakota are assigned the beneficial use of irrigation and wildlife propagation and stock watering.	(See Note# 1 below)
<u>Groundwater Quality Standards</u>	ARSD 74:54:01	Establishes the maximum concentration limits for groundwater in the state of South Dakota.	
	ARSD 74:54:01:04	Establishes standards for groundwater of 10,000 mg/L TDS concentration or less.	This ARAR is outside the scope of this removal action so it will not be dealt with during this action.
	ARSD 74:54:01:05	(Applicable) specifies that groundwater shall not contain potential toxic pollutants. Potential toxic pollutants must be non-detectable in groundwater at detection limits of the currently acceptable sampling and analytical techniques as approved by the secretary in § 74:03:15:05 until a maximum contaminant level (MCL) is set by the EPA.	This ARAR is outside the scope of this removal action so it will not be dealt with during this action.

Note# 1- South Dakota has designated uses (wildlife and livestock watering) and as such establishes certain water standards for Schleichart Draw and Pete's Creek. Consolidating and capping waste material at the Project area will reduce storm-related non-point source loading to these tributaries. However, achieving and designated uses and stream standards are likely beyond the scope of this source control removal action. Furthermore construction-related impacts will be minimized to the extent practicable

STATE- LOCATION SPECIFIC

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<u>Wetlands as</u> <u>Surface</u> <u>Waters</u>	ARSD 74:51:01:11	Established for the protection of wetlands as surface waters of the state. The discharge of pollutants from any source, including indiscriminate use of fill material, may not cause destruction or impairment of wetlands	(See Note# 1 below)
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STATE- ACTION SPECIFIC

Standard, Requirement Criteria Or Limitation	Citation	Description	ARAR Status for the Riley Pass Project
<u>Mined Land Reclamation</u>	SDCL 45-6B-37	Final grading requirements.	Relevant and Appropriate
	SDCL 45-6B-39	In those areas where revegetation is part of the reclamation plan, land shall be revegetated in such a way as agreed upon by the operator, the local conservation district and the landowner which establishes a diverse, effective and long-lasting vegetative cover that is capable of self-regeneration and at least equal in extent of cover to the natural vegetation of the surrounding area.	Relevant and Appropriate
	SDCL 45-6B-40	Requirements for the removal and handling of topsoil.	Relevant and Appropriate
	SDCL 45-6B-41	Reclamation operations must be planned and conducted to minimize disturbance to the prevailing hydrologic balance and to prevent material damage to the prevailing hydrologic balance.	Relevant and Appropriate
	SDCL 45-6B-42	Protection from slides subsidence or damage and control of high walls.	Relevant and Appropriate
	SDCL 45-6B-43	All surface areas shall be stabilized and protected to effectively control erosion and air and water pollution.	Relevant and Appropriate
	SDCL 45-6B-44	Establishes requirements for the proposed reclamation plan, including copies to adjacent landowners, approval of the plan, consultation with the landowner and local authorities and the reclamation of of all affected land	Relevant and Appropriate
	SDCL 45-6B-45	Establishes the choices of reclamation.	Relevant and Appropriate

<u>Solid Wastes</u>	ARSD 74:27:15:03	This Criteria sets standards that all solid waste disposal sites must meet. These requirements apply to any person involved in any aspect of the management of solid waste and rubble sites, including recycling, processing transporting, storing, or disposing of solid waste.	This is not an ARAR for the Project area

<u>Reclamation of Tailings Which Cannot Meet Treatment Standards</u>	ARSD 74:29:05:12	Establishes criteria for the reclamation of tailings which cannot meet treatment standards. Tailings which have been treated and cannot meet the criteria established in § 74:29:05:08 or which cannot feasibly be treated shall be reclaimed so that infiltration into, percolation through, and discharge from such tailings are minimized. Discharges from tailings must comply with the provisions of a groundwater discharge plan pursuant to chapter 74:54:02 or a surface water discharge permit pursuant to chapter 74:54:01, as applicable. The reclamation plan for such tailings disposal sites and tailings disposal practices shall be based on a detailed pathway and fate analysis augmented by engineering plans and specifications and monitoring data. Revegetation must comply with the general reclamation requirements of § 74:29:07:06.	This is not an ARAR for the Project area
<u>Minimum Reclamation Requirements</u>	ARSD 74:29:07:01	Establishes the general requirements for all reclamation types.	Relevant and Appropriate
	ARSD 74:29:07:03, and 04	Gives general backfilling, and grading requirements.	Relevant and Appropriate
	ARSD 74:29:07:06	Specifications for the vegetative cover and performance are provided.	Relevant and Appropriate
	ARSD 74:29:07:07	Establishes the requirements for topsoil management during mining activities in addition to SDCL 45-6B-40.	Relevant and Appropriate
	ARSD 74:29:07:08	Reclamation operations must be planned and conducted to minimize disturbance to the prevailing hydrologic balance and to prevent material damage to the prevailing hydrologic balance.	Relevant and Appropriate
	ARSD 74:29:07:18	Establishes the requirements for specific types of reclamation.	Relevant and Appropriate
	ARSD 74:29:07:20	Rangeland planting requirements.	Relevant and Appropriate
	ARSD 74:29:07:22	Post mining wildlife requirements.	Relevant and Appropriate
	ARSD 74:29:07:23	Post mining reclamation requirements.	Relevant and Appropriate

	ARSD 74:29:07:27	Post mining permanent surface impoundment.	Relevant and Appropriate
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7. Project Schedule

As summarized in Section VIII, implementation of the proposed action will begin immediately following execution of this Action Memorandum. Preliminary field data evaluation, and design activities leading to the development of a series of engineering design plans, revegetation plans, and operations, monitoring, and maintenance plans are expected to begin by February 2007. Work plans and engineering designs will be submitted for Agency review and approval. Upon approval, these plans will be implemented and initial construction are anticipated to commence by the late summer of 2007. Completion of the construction activities required to implement the proposed action will require at least an additional two years.

8. References

Pioneer Technical, 2006. Final Engineering Evaluation/Cost Analysis (EE/CA), Riley Pass Uranium Mines, Harding County, South Dakota. Prepared for the U.S.D.A.-Forest Service, October, 2006.

Portage Environmental Incorporated, 2006. Final Human Health and Ecological Risk Assessment, Riley Pass Uranium Mines, South Dakota. Prepared for U.S.D.A. Forest Service, May, 2006.

EPA, 1993. Guidance on Conducting Non-Time-Critical Removal Actions Under CERCLA. EPA/540-R-93-057. Office of Emergency and Remedial Response. Washington D.C.

EPA, 2005 Ecological Soil Screening Levels for Arsenic Interim Final OSWER Directive 9285.7-62, March 2005.

USFS, 1964. U. S. Department of Agriculture, Forest Service Northern Region, April 1964, Impact Report Surface Mining Activity in Custer National Forest South Dakota

USFS, 2006 Community Involvement Plan, Riley Pass Abandoned Uranium Mines, Sioux Ranger Dist, Custer National Forest, April 2006.

B. Estimated Costs

The preliminary estimated cost to implement this action as described under Section V.A.1 Proposed Action Description is \$17,639,000. The total cost of the Removal Action, including design, construction oversight, and post-removal site control is estimated at \$18.5 million.

VI. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN.

If no action is taken to stabilize and isolate acutely contaminated materials and to eliminate surface exposures of wastes with concentrations of contaminants the Forest Service has determined exceed risk-protective levels from water, contaminated sediment from the Project area will continue to impact the surrounding drainages. This situation along with the continued exposure of human and environmental receptors to these materials will continue to present an unacceptable risk to human and ecological receptors.

VII. OUTSTANDING POLICY ISSUES

None

VIII. ENFORCEMENT

Although the USDA Forest Service specifically denies any liability in this situation, it will be the "lead agency" for all response actions occurring on National Forest System Lands, as defined by the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR part 300, and all response actions will be undertaken in a manner not inconsistent with the NCP. Tronox has been identified as a Responsible Party under CERCLA for the Project area and has agreed to undertake at its cost all elements of the proposed action as set forth in this Action Memorandum. An Administrative Settlement Agreement (Order on Consent) between the USDA Forest Service and Tronox is the legal mechanism that outlines the responsibilities of the parties to the agreement, and the processes to be followed. It will be executed immediately upon the approval and issuance of this Action Memorandum. The Settlement Agreement incorporates a detailed description of the scope of work to be performed for the removal action, including preparation and submittal of planning, site control, and engineering design, and QA/CC documents, the schedule for the work, the reporting and documentation procedures and requirements, and the performance standards for conducting the work. It also incorporates requirements for post-reclamation monitoring and maintenance. The Settlement Agreement and associated documents is not part of this Action Memorandum for purposes of consistency with the NCP.

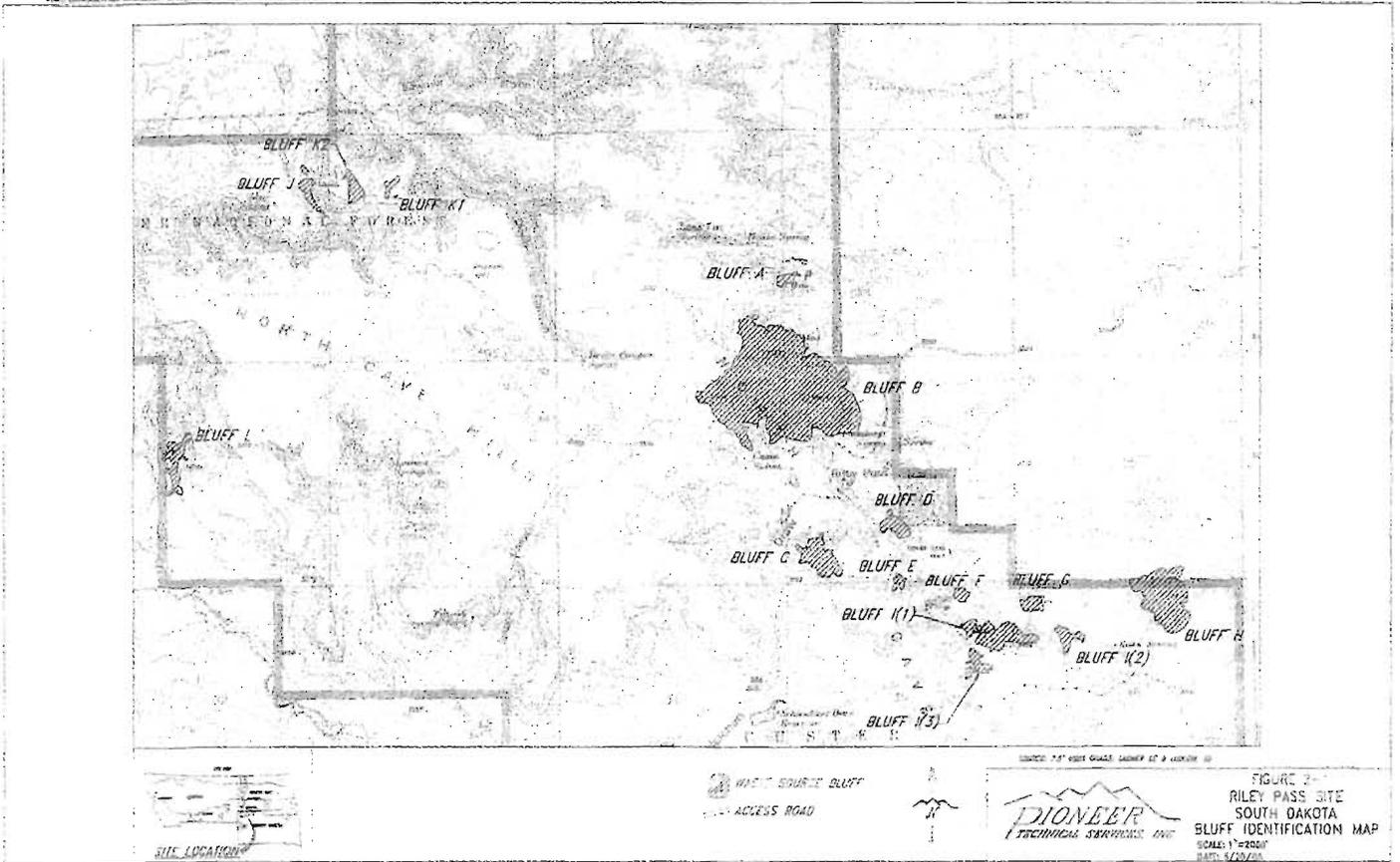
IX. APPROVAL

This decision document represents the selected Removal Action for the Riley Pass Uranium Mines site within the Custer National Forest, Harding County, South Dakota, developed in accordance with CERCLA as amended, and consistent with the NCP. This decision is based upon the administrative record for the Project area.

Conditions at the Riley Pass Uranium Mines site meet the NCP Section 300.415(b)(2) criteria for a Removal, and I recommend your approval of the Removal Action:

Laurie Walters-Clark
On-Scene-Coordinator

Date



ATTACHMENT 1 – Bluff Identification Map

ATTACHMENT 2 – Final EE/CA

ATTACHMENT 3 – Definition and Clarifications of Terms Related to Contaminant Concentration

In the Action Memorandum (and/or in the EE/CA that is the basis for this Action Memorandum), several terms are used to describe or characterize the concentrations of various elements (metals and radionuclides) which are the chemical constituents of concern at the Riley Pass Uranium Mines site. A number of different terms are also used to describe materials at the Project area that will be addressed in various ways by the proposed action. Collectively, these terms are used to describe existing conditions at the Project area, to describe the risks associated with exposures to these contaminants, and to present and describe the cleanup standards that will be applied in implementation of the proposed action set forth in this Action Memorandum. In some cases the definition of these terms overlap. For clarity and consistency, these terms are listed below, defined, and in some cases, clarified. Where a definition contains terms that are defined within this attachment, such terms are shown in italics.

Acutely contaminated materials; a specific but non-quantified descriptive term for *materials* that under Preferred Alternative 5 in the EE/CA were to be identified, excavated/removed from their existing location(s) to engineered isolation or containment areas/structures. With the *cleanup criteria* established in this Action Memorandum, these *materials* are now defined and quantified; Criteria 1-Category 3, *materials* (i.e., > 50 pCi/g radium).

Background (or background concentrations); The *concentrations* of naturally occurring chemical *constituents* (including those that have been identified as *contaminants*) in *materials* or water in the vicinity of the Project area that have not been *impacted* by historic mining activity, or the *release* of *contaminants* or *hazardous substances* from or subsequent to mining activity. For clarification, these *concentrations* have been determined by the analysis of samples collected from un-*impacted* areas near the Project area.

Concentrations; the amount of a chemical constituent, *contaminant*, *COC*, or *COPC* measured or modeled in *materials*, vegetation, animal tissue or surface water. For non-radioactive elements/metals, this is expressed as milligrams per kilogram (mg/kg) of *material*, or milligrams/liter (mg/L) of water, and for radioactive elements it is expressed in pico-Curies per gram (pCi/g), where pico-Curies are a measure of radionuclide activity per unit material

Contaminants; i) a specific category of substances defined under CERCLA; substances not included in the CERCLA list of *hazardous substances* “which will or may reasonably be anticipated to cause...serious adverse health affects”, ii) a substance, element, or compound that may harm humans or other forms of life if *released* into the environment in *concentrations* above specified levels, iii) a general descriptive term used in the EE/CA for naturally occurring chemical constituents found in *materials* at *concentrations* above *background*.

Contaminants (or Constituents) of Concern-COCs (or Contaminants/Constituents of Potential Concern-CPOCs); those chemical constituents/*contaminants* in *materials* at the Project area

shown through analysis and comparison with *background concentrations* and/or *risk-protective concentrations* to exist at levels that could pose an *unacceptable risk* to human health and the environment.

Contaminated; (i) a non-quantified descriptive term for a *material* that contains *contaminants, COCs, or COPCs* at *concentrations* that are at least higher than *background concentrations*. Also synonymous with an *impacted material*. For clarification, *materials* described as “*contaminated*” (or “*impacted*”) may or may not contain *contaminants* at *concentrations* that pose an *unacceptable risk*.

Cleanup levels; the maximum average *concentrations* of *COCs* that will be present in *materials* at the land surface after completion of reclamation activities (the proposed action). For clarification, the cleanup levels that have been set for the Project area have been determined to be *risk-protective*.

Criteria (or cleanup criteria); a set of specific numeric and/or performance standards that define the *risk-protective cleanup levels* that are to be achieved by the proposed action. The Action Memorandum presents Criteria 1 standards for Bluffs B, G, and H, defined as follows:

Category 1; *materials* with measured radium²²⁶ concentrations of less than or equal to 30 pCi/g

Category 2; *materials* with measured radium²²⁶ concentrations greater than 30 pCi/g but less than or equal to 50 pCi/g

Category 3; *materials* with measured radium²²⁶ concentrations greater than 50 pCi/g

For clarification, application of these criteria will result in post-reclamation surface *concentrations* of radium²²⁶ and all other identified COPCs that have been determined to be *risk-protective*.

Elevated levels (or elevated concentrations); a descriptive, non-quantified term for *materials* with *concentrations* of *hazardous substances* or *COCs* greater than *background*. For clarification, to statistically allow for the natural variability of *concentrations* in *materials*, the threshold of 3 x *background* is typically used (as in the EE/CA) to identify elevated levels or *concentrations*.

Excess contaminated materials; a descriptive term used to describe *materials* that during the reclamation process may be relocated during grading, and will require placement and stabilization in a new location.

Excess risk; The excess rate of occurrence of a particular health affect related to exposure to *contaminants of concern*. Also used in the risk evaluation process as a descriptive term indicating a particular exposure scenario might represent an *unacceptable risk level*.

Exposure levels; The amount of a *COC* that a receptor incorporates into their body (i.e., inhales, ingests, absorbs). For radioactive substances, this includes the amount of ionizing radiation that strikes a receptor.

Hazard Quotient (HQ); The ratio of the potential exposure to the *COPC* and the level at which no adverse effects are expected. If the Hazard Quotient is calculated to be less than 1, then no adverse health effects are expected as a result of exposure. If the Hazard Quotient is greater than 1, then adverse health effects are possible.

Hazardous substances; a specific list of substances defined under CERCLA. *COCs*, and *COPCs* identified in the EE/CA are all defined as hazardous substances.

High concentrations; a descriptive, non-quantified term indicating *concentrations* well above *background concentrations*.

Highly contaminated material; a descriptive, non-quantified term indicating higher *concentrations* than those found in *contaminated materials*.

Impacted; i) a descriptive term identifying areas, materials, or features where observations or data indicate that historic mining activities have altered pre-mining conditions, ii) where referring to *concentrations* of constituents in *materials*, a descriptive, non-quantified term, synonymous with *contaminated*.

Included: (as used in Attachment G of the EE/CA describing those materials that “will be included in the removal action”): materials associated with the Project area that will, as appropriate and consistent with the cleanup criteria, be assessed, or moved, or mitigated, or isolated.

Mineralization; The process or processes by which a mineral or minerals are introduced into a rock, resulting in a valuable or potentially valuable deposit. This is a general term, incorporating various types; e.g., fissure filling, impregnation, and replacement.

Materials; an encompassing term for the naturally occurring rock, minerals, *soil*, and *sediment* that make up the North Cave Hills and/or that have been disturbed, exposed, or created by mining activity or subsequent weathering.

The following types of *materials* are present at the Project area, and are described/referred to in the EE/CA. The definitions of these descriptive terms are as follows.

Overburden; a mining term encompassing those *materials* that prior to mining cover the *material* that is being mined by a surface mining operation. The *material* to be mined (in this case the “E-layer” of uraniumiferous lignite) is accessed by removing the overburden.

Sediment(s); a geological term for any *materials* that have been mobilized, and transported from their original location by moving water. For clarification, the location of sediments can vary from immediately adjacent to their original source location to land surfaces and drainage ways a significant distance from the source.

Soil(s); i) a general descriptive term used in the EE/CA for that portion of *overburden*

materials exhibiting the typically recognized physical properties of soils (ii) The unconsolidated mineral or organic *material* on the immediate surface of the earth that serves as a natural medium for the growth of land plants and/or that has been subjected to and shows effects of climate (including water and temperature effects).

Spoil(s); a mining term used to describe *overburden materials* after they have been removed or disturbed by surface mining activity.

Waste(s) (including mining waste, solid waste, or waste materials); general, encompassing, descriptive terms used to describe all of the materials listed above.

Project area; a term that refers to the Bluffs and other features where mitigation activities taken under this action will occur.

Release; a term specifically defined under CERCLA.

Risk-based; Based on a specific risk level (e.g., 1×10^{-5} carcinogenic risk) determined by the Lead Agency for a CERCLA site to be protective of human health and the environment.

Risk levels; Carcinogenic risks or *hazard quotients* calculated by combining potential exposure and intake of *contaminants* for a specific exposure scenario with published toxicity data.

Risk-protective (or risk protective level(s)); Carcinogenic risks within the range of 1×10^{-4} and 1×10^{-6} , and hazard quotients less than 1, as defined by EPA to be protective of human health and the environment. For clarification, the Lead Agency for a CERCLA site establishes site-specific, *risk-protective* levels within this range through the process established under the NCP. For this Project area, the *cleanup criteria* defined above are the *risk-protective levels*.

Significantly contaminated materials; a specific term describing the application of *cleanup criteria*; synonymous with *Criteria 1-Category 2 materials*.

Site; a term that will i) refer to all the areas in the Riley Pass area; ii) refers to a generic location

Unacceptable risk; Estimated or real risks at levels that exceed EPA's established *risk-protective* levels (e.g. $>1 \times 10^{-4}$ carcinogenic risk).

Conditions at the Riley Pass Uranium Mines site meet the NCP Section 300.415(b)(2) criteria for a Removal, and I recommend your approval of the Removal Action:


Laurie Walters-Clark
On-Scene-Coordinator

2-1-07
Date

I concur with the recommendation to implement the proposed action as described in this Action Memorandum for the Riley Pass Uranium Mines site:



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District Ranger
Sioux Ranger District

2/1/07
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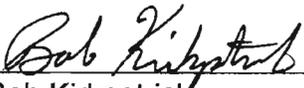
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2/2/07

Date