

**Idaho Panhandle National Forests  
Coeur d'Alene River Ranger District  
Environmental Assessment  
Silver Strand Underground Lode Mine Project**

**September 2004**

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**U.S.D.A. Forest Service**

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## Acronyms:

ARD	Acid Rock Drainage
ATF	Alcohol, Tobacco, and Firearms
AWQC	Ambient Water Quality Criteria
BMPs	Best Management Practices
cfs	cubic feet per second
cms	cubic meters per second
COPC	Contaminants of Potential Concern
DN	Decision Notice
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FONSI	Finding of No Significant Impact
FR	Forest Road
FS	Forest Service
GANDA	Garcia and Associates
gpm	gallons per minute
HDPE	High Density Polyethylene
HSI	Habitat Suitability Index
ICDC	Idaho Conservation Data Center
IDEQ	Idaho Department of Environmental Quality
IDFG	Idaho Department of Fish and Game
IDL	Idaho Department of State Lands
INFISH	Inland Native Fish Strategy Environmental Assessment
IPNF	Idaho Panhandle National Forests
LAUs	Lynx Analysis Units
LHD	Load-haul-dump
lpm	liters per minute
MAs	Management Areas
MGL	milligrams per liter
GWPCS	Ground Water Pollution Control System (Stream Alteration Permit)
MIS	Management Indicator Species
NPDES	National Pollutant Discharge Elimination System (Surface Water Discharge Permit)
MSD	Mine Systems Design
MSHA	Mine Safety and Health Administration
NEPA	National Environmental Policy Act
NFMA	National Forest Management Act
NHPA	National Historic Protection Act
NIOSH	National Institute of Occupational Safety and Health
NJMC	New Jersey Mining Company
NNP	Net Neutralizing Potential

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NP/MPA	Neutralizing Potential/Maximum Acid Potential
POO	Plan of Operations
ppb	parts per billion
ROD	Record of Decision
RSS	Rock Storage Site
SOPA	Schedule of Proposed Actions
TL	Total Length
TMDL	Total Maximum Daily Load
µg/l	micro-milligrams per liter
UIC	Underground Injection Control
USDA	United States Department of Agriculture
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WEPP	Water Erosion Prediction Project

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# **CHAPTER 1. Proposed Action and Purpose and Need**

## **1.1 Introduction**

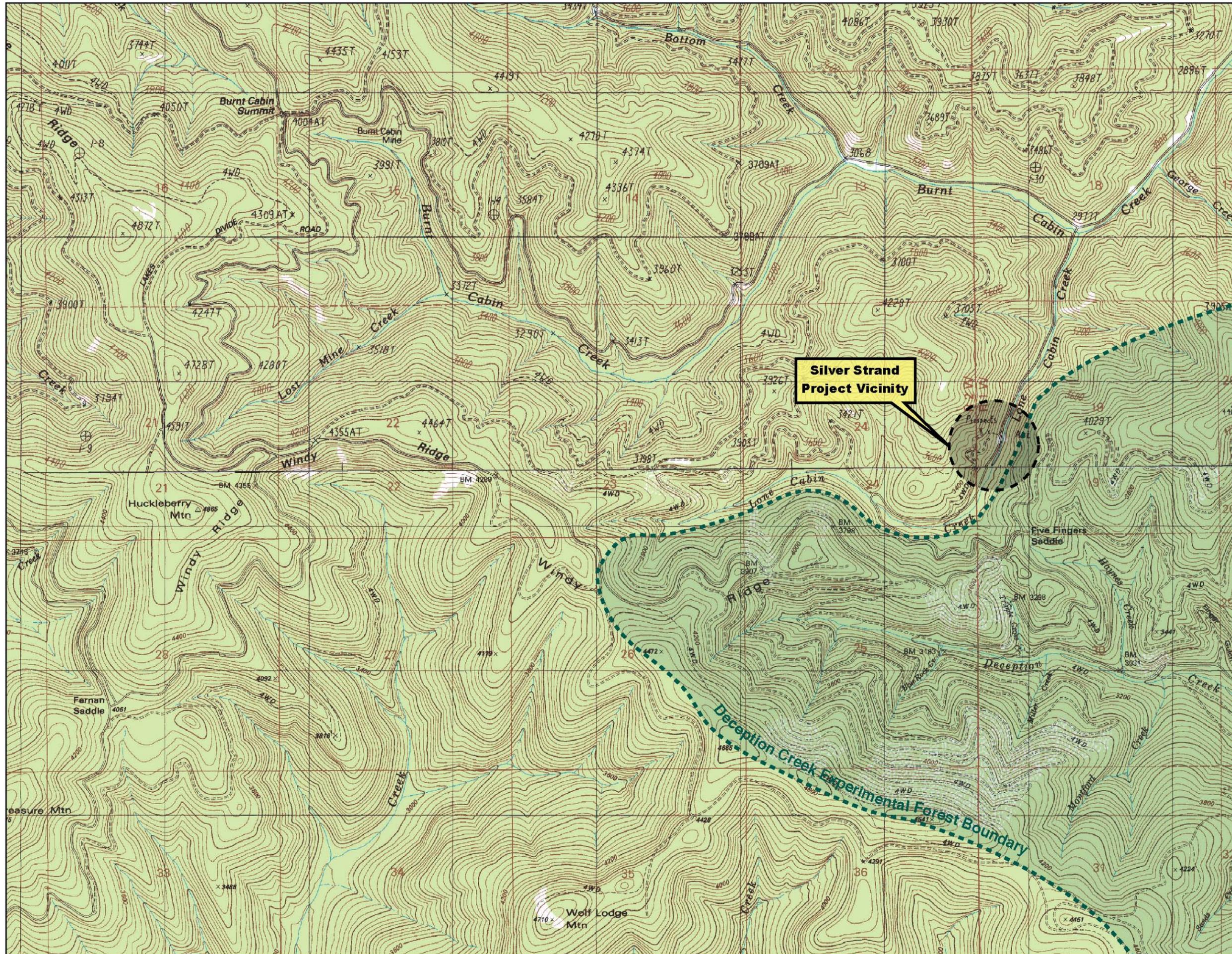
This Environmental Assessment (EA) discloses the analysis of the potential environmental consequences of approving a Plan of Operations (POO) dated April 3, 2003 submitted by the New Jersey Mining Company (NJMC) for development of the Silver Strand lode deposit located adjacent to Lone Cabin Creek on the Coeur d'Alene River Ranger District, Idaho Panhandle National Forests (IPNF). The portion of the Lone Cabin Creek drainage downstream of the proposed mining site, which is contained within Sections 18 and 19, T51N, R1W, Boise Meridian, Kootenai County, Idaho, was determined to be the appropriate project area (Figures 1 and 2). An EA is a concise public document that serves to provide sufficient evidence and analysis to determine whether to prepare an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI) (40 CFR 1508.9).

This prospect has undergone nearly continuous exploration activities ranging from underground development to drilling over a period of twenty years, including several Environmental Assessment-National Environmental Policy Act (NEPA) reviews in 1981 and in 1988. Drilling operations have been conducted intermittently from 1997 through 2002 from both surface and underground platforms and were approved with Categorical Exclusion Decision Memorandum. The site has been the focus of a long-term groundwater study by the former Bureau of Mines (November 1991-September 1995) and is currently utilized occasionally by the National Institute of Occupational Safety and Health (NIOSH) staff for underground mine safety training.

This EA focuses on providing sufficient information to determine whether the proposed action will result in a significant impact to the human environment. If the decision maker concludes that impacts are not significant, and an Environmental Impact Statement (EIS) is not prepared, this EA will be used in making the decision on a course of action for the proposed development as described in Section 1.2. In such a case, a Decision Notice (DN) will be prepared and signed by the District Ranger, which will identify the chosen alternative and the rationale for its selection. This EA will analyze, in addition to the no action alternative and the Proposed Action, five additional alternatives, each designed to address specific issues with the Proposed Action.

## **1.2 Proposed Action**

The proposed mine site is located along the north side of an existing mine access road approximately 0.64 kilometer (0.4 miles) northeast from the access road's intersection with Forest Road (FR) 411, approximately 73 vertical meters (240 feet) and 29 to 121 horizontal meters (96 to 400 feet) from Lone Cabin Creek. The proposed mine development plan includes underground mine ramp and heading development, access trail rehabilitation and construction, portal excavation, waste rock dump construction, construction of a temporary pole building for maintenance and tool storage, drilling and completion of a waste water injection well system, various storm water and erosion control barriers and installation of other mine-related structures.



--- Approximate Boundary for Deception Creek Experimental Forest



0 1/2  
Miles

Base Map: USGS 7.5 Minute-series Spades Mountain and Wolf Lodge, Idaho, quadrangles

Figure 1. Silver Strand Project Vicinity.



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Ore will be stored in a steel bin located approximately 30 meters (98 feet) from Lone Cabin Creek. Stockpiling of ore on the ground near the creek as was done in the previous operation will not be necessary. The bin will significantly reduce the risk of ore entering the creek. Ore is to be processed via a flotation circuit at an offsite mill with spent tailings returned to the underground mine site and utilized as paste backfill. The NJMC mill is located approximately two miles east of Kellogg, Idaho on private land. The mill has a 100-ton per day capacity. Additional details are provided on the Proposed Action in Chapter 2, Alternative 2 and on the mill site in Appendix A.

### **1.3 Purpose and Need for Action**

New Jersey Mining Company has proposed this action to develop a mineralized ore body as outlined in their Plan of Operations submitted to the Coeur d'Alene River Ranger District, Idaho Panhandle National Forests in their letter dated April 3, 2003. The proposal is made under the authority of the United States mining laws (30 U.S.C. 21-54), which confer a statutory right to enter upon the public lands to search for minerals. The 1897 Organic Act authorized the Secretary of Interior (now, the Secretary of Agriculture) to manage the forest reserves and to regulate mining activities. At 16 U.S.C. 479, the Act states, "Nor shall anything herein prohibit any person from entering upon such national forest for all proper and lawful purposes, including that of prospecting, locating, and developing the mineral resources thereof: Such persons must comply with the rules and regulations covering such national forests." The 1955 Surface Resource Act, also known as the Multiple Use Mining Act and Public Law 167, (30 U.S.C. 612) gave additional authority to the United States Forest Service (USFS) to regulate these activities. Among other things, it provided that mining claims shall not be used prior to issuance of patent for any purposes other than prospecting, mining or processing operations, and uses reasonably incident thereto.

The courts have repeatedly confirmed the Forest Service authority based on the 1897 and 1955 Acts to reasonably regulate prospecting, exploration, development, and other mining activities and uses reasonably incidental to these activities. However, in *U.S. v. Weiss*, 642 F. 2d 296 (9<sup>th</sup> Cir. 1981), the court also cautioned there are limits to Forest Service authority: "*While prospecting, locating, and developing of mineral resources in the national forest may not be prohibited nor so unreasonably circumscribed as to amount to a prohibition...*"

The Forest Service has the responsibility to make sure activities are conducted so as to minimize adverse environmental impacts on National Forest System surface resources (Title 36 Code of Federal Regulations) (CFR 228, Subpart A) and that the activities are reasonably incidental to the stage of the mining operations. The Forest Service has no legal right to deny exploration and mining proposals.

#### **1.3.1 Determination of Reasonableness of Proposed Activities**

Questions sometimes arise as to whether a proposed or existing use or activity is required for, or reasonably incident to, mining operations conducted under the 1872 Mining Law. The authority for the Forest Service to insure that National Forest System lands, including those under mining claim locations, are used only for purposes required for and reasonably incidental to mining and in a manner that minimizes adverse environmental impacts, falls under the agency's broad authorities from the following statutes and case law, specifically:

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- (1) Multiple Use Mining Act of July 23, 1955 (30 USC 612).
  - (2) U.S. v. Richardson, 599 F. 2d 290 (1979); Cert. denied, 444 U.S. 1014 (1980).
  - (3) The Organic Act of 1897 (16 USC 478, 551).
  - (4) Title 36 Code of Federal Regulations, Part 228, Subpart A - Locatable Minerals.

The 1955 Multiple Use Mining Act (30 USC 612) restricts mining operators to using reasonable methods of surface disturbance that are appropriate to their stage of operation (U.S. v. Richardson (supra)). This legal principle is reinforced by the Forest Service 36 CFR 228 Subpart A regulations, which provide procedures for authorizing operations on the National Forests which are reasonably incidental to mining, but requires that such operations be conducted so as to minimize adverse environmental impacts. For a use to be reasonably incidental, the type and level of use must be justified as being appropriate to the stage of mining activity in which the operation is legitimately engaged (i.e., prospecting, exploration, development, production, abandonment, or reclamation). In turn, the stage of mining activity with the related use must be required, justified, and appropriate, based on the nature and extent of the mineral resource present.

The IPNF Forest Service Minerals Specialist, in consultation with other engineering and minerals staff, reviewed the proposed project and concluded that the proposed operations, consisting of the driving of a new portal, development of ramp, and other underground development work described in more detail in the POO, is within the late stage of development - early stage of production of a mining operation. The specialist reviewed the project's exploration and engineering design data provided by the operator, including the preliminary resource estimates and engineering plans and recommended the District Ranger continue to process the submitted POO, and the operator be required to submit additional information to assist in the environmental review process. Given the advanced stage of the project, the Minerals Specialists, after consultation with forest and regional engineering and minerals staff, a review of the proponent's data, and a review of historic data in the public record, concluded that the placement of ancillary structures on National Forest system lands as proposed in the POO and subsequent submittals was appropriate as outlined in the proponents POO.

### **1.3.2 Consistency with Forests Plan and Other Laws and Regulations**

The IPNF Forests Plan (USFS 1987) directs that habitat for vertebrate populations, other than threatened, endangered, and sensitive species, will be managed to maintain viable populations (greater than 40% of maximum potentials). Viable populations will be maintained through management indicator species. The goal for the federally listed species is to contribute to the conservation and recovery of the listed species on the forests. Habitat for species harvested, other than elk, will be managed to meet goals as outlined by the Regional Guides. Elk habitat will be managed to provide for a potential population increase in striving to meet the Idaho Fish and Game population goals. Without management, the project area will continue to provide some components for the species analyzed in this document. Since the Action Alternative was found to constitute a "may affect Coeur d'Alene salamander, northern goshawk, and westslope cutthroat

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trout, but would not lead to a trend towards the listing of the species,” the Action Alternative is consistent with the 1987 Forests Plan and the 1995 INFISH amendment (USFS 1995).

IPNF Forests Plan direction with regards to noxious weeds is based on an integrated pest management program, which includes, but is not limited to, the current practices of inventory, monitoring, some hand pulling, and some biological control. Noxious weed control will be conducted in cooperation with counties, agencies, and private landowners. Many weed species are widespread and control would require major cooperative effort with counties and private landowners. Priority will be given to small infestations of species new to an area where moderate control actions have a good chance of preventing the establishment of new problems.

All Alternatives would be consistent with soil and mineral standards in the Forests Plan at the cessation of post-reclamation monitoring (generally 5 years after the completion of revegetation). All Alternatives other than Alternative 1 would be consistent with the Forests Plan.

The Proposed Action falls under the guidance of the 1872 Mining Law, the Organic Administration Act of 1897, the Multiple Use Mining Act of 1955, and the Forest Service mining regulations at 36 CFR Part 228, Subpart A.

Laws and regulations applicable to this action and analysis include: the National Forest Management Act (NFMA) and its implementing regulations at 36 CFR 219; NEPA and the Council on Environmental Quality regulations at 40 CFR 1500-1508; the National Historic Preservation Act (NHPA) and its accompanying regulations at 36 CFR 800; the Federal Water Pollution Control Act (Clean Water Act) together with regulations at 40 CFR 130; the Clean Air Act, as amended; and the Endangered Species Act (ESA) and its regulations at 50 CFR 402.12 that require biological assessments to evaluate the effects on listed and proposed species.

## **1.4 Scope of the Proposed Action**

The scope of the actions addressed in this EA is limited to the proposed actions as described in the POO. The Forest Service has no authority to direct or control activities occurring on non-federal lands. The construction and operation of the mill and the hauling of ore are related to the Proposed Action, even though they are not occurring on federal land. Since these are related actions, this EA also considers the potential effects of these actions on public resources. The U.S. Environmental Protection Agency (EPA) has no responsibility through the NEPA to address environmental effects occurring solely on private lands that do not otherwise affect public resources.

The State of Idaho has the authority to issue a license or permit to anybody engaging in mining activities on lands within the State of Idaho, including federal, state, and private lands (Indian lands are excluded). The Idaho Department of State Lands (IDL) issues permits for surface mining activities ranging from a Small Miners Exclusion to an Operating Permit.

The Idaho Department of Environmental Quality (IDEQ) is charged with protection of water quality under the Clean Water Act. IDEQ reviews all permit applications as part of the permitting process and provides feedback and conditions to the IDL. IDEQ evaluates groundwater impacts also. Currently, IDEQ does not issue Surface Water Discharge Permits

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(NPDES), these are issued directly from the EPA. Other permits that may be required for the Proposed Action include, an Injection Well Permit, Stream Alteration Permit and securing a water right, all from the Idaho Department of Water Resources, and an Air Quality Permit from IDEQ. The State of Idaho's rules and regulations apply to all state lands, including mining operations on private lands.

The Coeur d'Alene River District Ranger is the official responsible for analyzing the proposed plan as it relates to activities on Forest Service administered lands and in accordance with 36 CFR 228.5. The decision before the District Ranger is whether or not to approve the POO as submitted or whether to notify the operator that changes in, or additions to, the plan are deemed necessary to meet the intent of the regulations at 36 CFR 228, Subpart A.

### **1.4.1 Potential Cumulative Activities**

NEPA requires consideration of "cumulative effects". Cumulative effects are the effects on the environment that result from the incremental effect of the proposed action when added to other past, present, or reasonably foreseeable future actions (40 CFR 1508.7). The first step in a cumulative effects analysis is to determine if the proposed action is related to other actions in the area in terms of additive effects to various resources. Because the mill site is located on private land, the Forest Service did not identify any direct or indirect effects from the mill that may result in additive effects with mining operations occurring on National Forest. The IDEQ is responsible for permitting and regulating the mill site on private land. Further information on the mill site, pertinent permits, and agency responsibilities is included in Appendix A.

Cumulative actions considered in this EA differ slightly between issues, depending on the spatial and temporal boundaries used for each resource. Past, present, and reasonably foreseeable actions and their effects, in conjunction with the actions proposed, are discussed in detail for each issue in Chapter 4.

### **1.4.2 Incorporating By Reference and Project Files**

The IPNF Forests Plan (USFS 1987) provides broad direction for management of the Forest and general discussions of associated environmental effects. Specialist reports for the following resources: Fisheries (GANDA 2004a); Wildlife (GANDA 2004c); Botany (GANDA 2004b); and Hydrology, Soils, Geology & Geotechnical (MacDonald and Schick 2004); as well as a Biological Assessment and a Biological Evaluation were prepared for this project and are in the project record. In order to eliminate repetition and focus on site-specific analysis, material from these documents is incorporated into this document by reference. An important consideration in preparation of this EA has been to reduce paperwork as specified in 40 CFR 1550.4. In general, the objective is to furnish enough site-specific information to demonstrate a reasoned consideration of the environmental impacts of the alternatives. More detailed information is on file in the Coeur d'Alene River Ranger District's planning records and is available for public review.

## **1.5 Decision to Be Made**

This EA is not a decision document and does not describe the decision to be made by the deciding officer. This EA discloses the analysis and environmental consequences associated with implementing the proposed action and alternatives to it. The proposal is not a general

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management plan for the area; general management direction is found in the IPNF Forests Plan (USFS 1987). This EA is the final site-specific NEPA documentation for the Proposed Action, and is not a programmatic analysis. Specifically, this EA:

1. evaluates *what* levels of mining can take place;
2. evaluates *where* mining activities will take place within the analysis area;
3. evaluates *when* mining activities will take place (timing and duration) and;
4. evaluates *whether or not* mining-related road and facilities construction can be done and, if so, what kind and where it will be located.

After reviewing this document, the District Ranger may decide that an EIS is required to further analyze issues and alternatives. If an EIS is not required, a Decision Notice and a Finding of No Significant Impact (FONSI), prepared by the Responsible Official, the Coeur d'Alene River District Ranger, will document the decision and the rationale for it.

## **1.6 Permits and Approvals**

Federal and State of Idaho permits, approvals, and regulations that apply to the proposed project include the following:

1. Decision Notice and Finding of No Significant Impact by the Coeur d'Alene River District Ranger.
2. Approval of the Plan of Operations by the Coeur d'Alene River District Ranger.
3. Consultation with U.S. Fish and Wildlife Service on threatened and endangered species and compliance with Section 7 of the Endangered Species Act.
4. Cultural Resource clearance from the State Historic Preservation Officer.
5. Sensitive plant and bat surveys.
6. Injection Well Permit issued in consultation with the Idaho Department of Water Resources.
7. Permit to land-apply mine waste water, including review of design, approach, potential impacts to surface and groundwaters, and monitoring from the U.S. Environmental Protection Agency.
8. Stream Alteration Permit for working in or near a stream from the Idaho Department of Water Resources.
9. Approval from Shoshone County to haul on the portion of the haul route they maintain.
10. Stormwater construction general and multi-sector general industrial permits from the U.S. Environmental Protection Agency, Region 10.
11. Registration of Underground Injection Control system with the Idaho Department of Environmental Quality. Registration and permit required for use of injection well to dispose of mine wastewater. May require reclassification of regional aquifer. Registration alone may be required for land application of mine wastewater if a shallow subsurface water distribution system is used to facilitate year-round application.

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12. Clean Water Act Section 404 permit (removal/fill permit) from the U.S. Army Corps of Engineers if any activities occur in wetlands (e.g., culvert across from portal is replaced). This permit would also require Section 401 water quality certification by IDEQ.

## **1.7 Availability of Project Files**

The Silver Strand Mining project file, which contains the planning records, meeting notes, specialist reports, maps, and letters received during the process, is located at the Coeur d'Alene River Ranger District office, Coeur d'Alene, Idaho.

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## CHAPTER 2. Issues and Alternative Development

This chapter contains four parts: a description of the scoping process conducted prior to beginning analysis; a description of the issues identified; a description of each alternative in detail, along with mitigation and monitoring requirements; and a comparison of the alternatives. NEPA requires federal agencies to “*identify and assess the reasonable alternatives to proposed actions that will avoid or minimize adverse effects of these actions upon the quality of the human environment*” (40CFR 1500.2(e)). Alternatives were developed in response to the significant environmental issues identified through scoping. This chapter discusses seven alternatives in detail, including a “no action” alternative. Discussion is also provided on the scoping and public involvement process and alternatives considered but eliminated.

### 2.1 Scoping and Public Involvement

NEPA requires “an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action” (40 CFR 1501.7). The issues are then used to define and formulate alternatives to the proposed action that specifically address the issues. Issues raised by the public and Federal and State agencies serve as a basis for comparison of the alternatives. Laws, regulations, and land management directives are also considered in order to frame issues, formulate alternatives, and determine the overall scope of the evaluation.

The public and Federal and State agencies were notified of this project in several ways:

- pre-proposal project description letter via email dated January 22, 2003 to collaborating agencies;
- pre-proposal interagency information sharing meeting in Coeur d’Alene with operator, February 26, 2003;
- "Quarterly Schedule of Proposed Actions" for the IPNFs (Posted on the IPNF website beginning April 4, 2003);
- interagency plan review letter dated May 28, 2003; and
- legal ad in the newspaper of record (Spokesman-Review) dated October 20, 2003.

During scoping, letters were received from John Robison (Idaho Conservation League), and Mike Mihelich (Kootenai Environmental Alliance). Copies of their letters are provided in Appendix B (Public Involvement). The team has considered concerns identified by the public and incorporated their ideas whenever possible. The comments received from the public have been incorporated in the development of the issues surrounding this project.

### 2.2 Issue Identification

What follows is a list of issues identified by internal and external scoping. The significant issues, as defined at 40 CFR 1501.7 (a)(2), guide the range of alternatives. The issues focused the environmental disclosure on site-specific, direct, indirect, and cumulative effects that could occur under any alternative.

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### 2.2.1 Significant Issues

The purpose of scoping is not only to identify a list of issues and concerns over a proposal, but also to determine the significant issues to be analyzed in depth and to eliminate from detailed study those that are not significant (40 CFR 1501.7). It is the significant issues that become the focus of interdisciplinary interaction and alternative development. Based on the assessment of effects and public comments, the agency has determined the following factors are significant to this decision.

**Issue #1. Concern that the proposed mine exploration and subsequent mining activities could increase sedimentation in the project area, resulting in water quality degradation.**

The proposal includes excavation and storage of ore, waste material, construction and maintenance of roads, and increased traffic on existing roads. All of these activities can result in increased sediment levels in streams and could negatively impact water quality in Lone Cabin Creek. Reductions in water quality could adversely impact fisheries, potentially the sensitive westslope cutthroat trout population in Lone Cabin Creek. This was brought up as an issue by both public responses to scoping as well as Forest Service personnel.

**Issue #2. Concern that mining activities could release acid-generating toxins via mine seepage or groundwater contamination from the underground workings and/or mining chemicals, resulting in pollution of surface water.** The ore body being mined includes sulfides, which when exposed to air and water, can result in acidic conditions. In addition, mining chemicals, fuels, oils, hydraulic fluid, and lubricants could also be introduced into springs, streams, and rivers. This was brought up as an issue by both public responses to scoping as well as agency scoping.

**Issue #3. Concern that noxious weeds could be introduced and spread.** The use of equipment and vehicles brought from sites off-forest could result in the introduction and spread of noxious weeds. This issue was brought up by one response to public scoping as well as Forest Service personnel.

**Issue #4. Concern that closing FR 411 would affect recreationists.** Snowmobile usage, recreational fishing, hunting, and camping are all recreational activities in the area. A part of this recreational use depends on access using FR 411. There is concern that closing this road and the increased traffic on other Forest Service roads could create safety problems and user conflicts when the proposed mine is active. When the mine reaches full production, it is estimated vehicles hauling ore on FR 411 will make several round trips per day. Hazardous conditions could develop from conflicts between recreational trail users and the mining-related traffic. This issue was brought up by Forest Service personnel and response to public scoping.

**Issue #5. Concern that water withdrawals from Lone Cabin Creek could adversely affect the fishery and aquatic ecology.** The operator has proposed to divert water from Lone Cabin Creek to use in mining operations. The issue of obtaining water rights for the water use and the issue of the effects on the Lone Cabin Creek fishery were brought up by the public and by Forest Service personnel.

**Issue #6. Concern that road building on steep slopes could result in slope failures or landslides.** The roads required for internal mine access may be prone to erosion as designed in the POO. This issue was brought up by agency scoping.

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## 2.2.2 Other Environmental Issues

The following issues were found not to be significant factors in the decision for this proposal. NEPA provides for identification of, and elimination from detailed study, the issues which are not significant or which have been covered by prior environmental review, narrowing the discussion of these to a brief presentation of why they will not have a significant effect on the human environment or providing a reference to their coverage elsewhere (40 CFR 1501.7(3)). While these concerns are important, they were either unaffected or mildly affected by the Proposed Action or the effects could be adequately mitigated.

**1. Concern that the proposed road building and mining will adversely impact the project area.** The Proposed Action would have no direct effect on the natural integrity and apparent naturalness of the project area. There would be very minor effects on the feeling of remoteness and solitude. These effects would be temporal and limited to the duration of the development, mining, and reclamation stages of operation. This issue was brought up during scoping by the public and Forest Service personnel.

**2. The concern that clearing for the rock storage site could result in wasting of valuable timber.** The Forest Service Manual, (FSM 2813.13b.2.) states that a claimant has the “*Right to cut timber on the claim for mining uses and for necessary clearing, except that timber cut in the process of clearing cannot be sold by the claimant. The United States has the right to dispose of timber and other vegetative resources.*” The cutting of timber will be very minimal (estimated to be less than 6,000 board feet). Trees cut in the proposed rock storage site would be utilized in the mining operation, for erosion control, and in final reclamation. Excess slash would be piled and burned when weather conditions permit. Any cleared timber would not be wasted; therefore, this issue will not be discussed further. This issue was brought up in one response to public scoping.

**3. The IDEQ has identified streams in the area as being impaired and has completed Total Maximum Daily Load (TMDL) work on some of them. Concern that if there are any TMDLs in the project area, then additional coordination may be necessary to comply with the TMDL implementation plans.** Both Burnt Cabin and Lone Cabin creeks are included in the North Fork Coeur d’Alene Sub-basin Assessment. This issue is discussed in Chapter 3 and coordination activities are outlined. This issue was brought up in one response to public scoping.

**4. Concern that the reclamation bond might not be sufficient to cover the reclamation of the site under the “worst possible impacts to the ecosystem.”** The Forest Service has established practices for estimating bond amounts and enforcing reclamation activities. It is not within the scope of this document to evaluate that process or the amounts calculated using the established methods.

**5. Concern that the miners’ living situation on-site may incur unacceptable impacts to the project area.** The POO does imply that miners may be camping on-site and appropriate mitigation measures have been identified as part of the requirements for their presence. However, the Forest Service cannot impose additional requirements on campers who otherwise comply with Forest camping regulations regarding duration, maintenance, and placement of campsites.

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## **2.3 Alternatives Studied In Detail**

Significant issues were identified as part of the scoping and project evaluation process. Internal Forest Service meetings and interagency consultation and review were conducted prior to GANDA's field work and subsequent analysis. As noted above, the significant issues, as defined at 40 CFR 1501.7 (a)(2), guide the range of alternatives. The significant issues related to the Silver Strand POO included water quality, noxious weeds, slope stability and associated impacts of roads and mine-related structures, and the closure of FR 411. Seven management alternatives were identified for the Silver Strand project in consultation with the Coeur d'Alene River District Ranger and in collaboration with state and federal agency staff, the New Jersey Mining Company, and in response to comments from the public. These are described below.

### **2.3.1 Alternative 1: No Action Alternative**

Development of this alternative is required by Forest Service Handbook 1909.15 (23.1) and the Council on Environmental Quality Regulations (40 CFR 1502.14(d)). In this alternative, the District Ranger would not approve the submitted Plan of Operations. No mining would occur, and thus, no trees would be harvested, as there would be no need to stockpile the waste rock or construct the temporary access roads. There would be no hauling of ore, thus road and trail maintenance and upgrading would not be necessary. No additional new portal would be opened; the wastewater injection well or wastewater land application infiltration gallery would not be installed. This alternative would result in no additional impacts to forest resources. However, the Forest Service has no legal right to deny exploration and mining proposals, so the no action alternative provides a means to describe the baseline environmental conditions and how the environment would persist in the absence of the proposed actions and for evaluating the effects of the various alternatives under consideration.

### **2.3.2 Alternative 2: Permit Operation as Proposed April 3, 2003**

The proposed mine development plan includes an underground mine ramp and heading development, access trail rehabilitation and construction, portal excavation, waste rock dump construction, construction of a temporary pole building for maintenance and tool storage, drilling and completion of a waste water injection well system, various storm water and erosion control barriers, and installation of other mine-related structures (NJMC, 2003a, 2003b, 2004).

NJMC proposes to access the site via an existing mine access trail spurring off of FR 411. The underground workings are accessed from three levels, although the upper level is significantly caved. All entry portals are currently locked and gated. Primary equipment presently proposed for use on site includes a diesel powered load-haul-dump 'LHD' (for underground haulage), a front end loader (for mucking and truck loading), a 30-cubic yard haul truck and pup trailer (for haulage), an air compressor (for underground ventilation), diesel generator (for lights and power), and an underground drill rig (for blasting and underground development drilling). A plan view of the proposed mine development is presented in Figure 2.

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The company intends to mine approximately 500-1,000 tons of ore per month utilizing standard cut and fill mining procedures. Development rock from excavation of the ramp used to reach the ore body will be removed to a rock storage site (RSS) with 20,000 tonnes (22,000 tons) of capacity. Ore will not be processed on site, but will be trucked to a crushing, grinding and flotation mill on private property near Kellogg. The flotation tails will be backhauled to the site and used as paste backfill in the underground operation. NJMC proposes to store any tailings that cannot be used for backfill at the mill site (NJMC, 2003e).

The old open stopes left by historic mining operations will be filled with paste when time and materials permit. When groundwater is encountered underground, grouting may be used to reduce the inflows. These practices should reduce the volume of water flowing into the mine from the surface and subsequently, the volume leaving the No. 3 portal (adit). Approximately 142 cubic meters (185 cubic yards) of tailings will be stockpiled on the No. 2 Level each month to accommodate the paste backfill operation. These will be stored adjacent to the backslope of the No. 2 Level bench, and retained using a two-sided timber crib wall.

About 0.3 hectare (0.7acre) will need to be cleared for the RSS. Approximately 0.7 hectare (1.7 acre) will be cleared for the right-of-way of the roads to the RSS and ore bin/paste backfill plant. Another 0.15 hectares (0.3 acre) will be cleared for the injection well site. Clearing will be accomplished by falling merchantable trees. Merchantable trees standing on NJMC lode claims will be retained for use as mine timbers as permitted by law. Some of the trees will be hauled off the site to a small mobile-sawmill setup to be sawn into the proper dimensions for various mine timbers. Brush and unmerchantable trees will be cleared by a dozer or excavator. Some of this material will be piled at the toe of the RSS to provide a slash filter windrow while the rest will be piled for burning at an appropriate time.

Topsoil will be inventoried prior to clearing for volume and reclamation suitability. Topsoil found suitable for reclamation will be stockpiled at the RSS. If present at the site, a quantity of topsoil to cover the disturbed area at the RSS with 30 centimeters (12 inches) of soil will be stripped and stockpiled. The use of other growth media may be required if sufficient topsoil is not available at the site. Topsoil stockpiles will be sheltered from wind and water erosion and seeded with an approved grass seed mixture for a temporary vegetative cover.

The operation will require several small surface structures including an air compressor site, a temporary ore stockpile storage and loading facility, a small sediment settling pond/sump site for mine waste water storage and possible treatment, and a dump for mine waste rock. Fuel and associated oil products will be stored either underground or at the No. 225 pole building. One 2000-liter (528 gallon) diesel fuel tank is reported to be sufficient for the entire operation. Either diesel fuel location will have secondary containment equal to 110% of the tank volume. Explosives magazines will be located in the mine and regulated by Mine Safety and Health Administration (MSHA) and Bureau of Alcohol Tobacco and Firearms (ATF) rules. A concrete sump is planned to be constructed near the current No. 3 portal (adit) to collect a portion of the solids from the mine water discharge pipes. The sump will be covered with a steel grate to prevent persons, vehicles or animals from falling into it. The sump will be approximately 1.2 meters x 1.2 meters x 2.4 meters (width x depth x length) (4 feet x 4 feet x 8 feet). The capacity

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will be about 1.7 cubic meters (450 gallons) or 60 minutes of capacity at a flow rate of 0.44 liters/second.

Overflow from the No. 3 portal (adit) sump will be gravity fed down Lone Cabin Creek via a buried 50 millimeter (2 inch) diameter HDPE pipe to a Lamella inclined-plate clarifier at the location indicated on Figure 2. At the expected peak flow rate of 190 liters (50 gallons) per minute, the water velocity is 1.46 meters per second (0.45 feet/second). The pipeline will be buried in the Lone Cabin Creek Road ditch for a distance of about 520 meters (568 yards). Overflow from the Lamella clarifier will be injected into the groundwater by a well. It is planned to locate the injection well in a fracture zone capable of consuming up to 190 liters (50 gallons) per minute. In 1997, a previous operator drilled surface core holes at the Silver Strand site and loss of drilling fluid return occurred in each of the four drill holes, thus indicating the concept of an injection well is possible at the Silver Strand site. At least 40 to 60 liters (10.5 to 16 gallons) per minute were consumed by these drill holes. These core holes were drilled to the north of the Silver Strand ore body but did not intercept the ore body. A second drilling program was completed in 2002, which did intercept a significant silicified and fractured zone of rock.

A new road would be constructed from the No. 3 Level portal (adit) to the proposed RSS and continue up the hill to the No. 225 Level. From the existing No. 225 Level road, the new road will traverse to the top of the proposed RSS (Figure 1). This road will be primarily used as a haul road by the underground mine trucks and/or trailers. This road will also provide access to the top of the ore storage bin. The road will be constructed using a combination of cuts and fills. The grade of the road will be 10% with a width of four meters (13 feet). A berm would be placed on the outboard edge of the road, as required by the Mine Safety and Health Administration. Rolling dips will be placed about every 50 meters (164 feet). Additionally, a new road about 90 meters (295 feet) long will be constructed to access the proposed injection well site. Design parameters are identical to the RSS road except that the road will be constructed at a grade of about 2.0% (Figure 1). Erosion and sediment control best management practices (BMPs) proposed for the roads also include the placement of brush windrows at the base of fill slopes.

The permanent structures on the site include a waste rock dump, concrete sump, injection well pipeline, and concrete foundations (the latter will be covered after reclamation). The current plan is to conduct underground mining on a seasonal basis from April to November. Expected mine life of the presently defined resources is 4-5 years at the proposed production rate. Reclamation of the site after permanent closure will include:

- Re-contour the RSS to the final slope (1.7 horizontal (H) to 1.0 vertical (V)). Stockpiled topsoil will be applied to cover the disturbed area at the RSS. If the quantity of topsoil necessary to cover the disturbed area with 30 centimeters (12 inches) of stockpiled soil is not present, the use of other growth media may be required.
- Dismantle the ore bin, injection well plant and No. 225 pole building and remove materials from the site. Concrete foundations will be covered with soil at the site.
- Re-contour the old waste dumps by pulling material up slope to achieve a flatter slope.
- Seed the RSS and old waste dumps with a USFS approved grass seed mixture. NJMC also plans to plant native conifers throughout the reclaimed slopes.

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- Plug the No. 225 and No. 3 portals (adits) with a cemented paste backfill plug 3 meters (10 feet) in length. Remove portal ground supports, re-contour portal areas and seed with grass and trees.
  - Remove steel grate from No. 3 sump and fill sump with rock and cover with soil.
  - Fill the No. 1 Level “glory hole” with non-acid generating rock to fill the existing depression.
  - Plug the injection well pipeline on both ends.
  - Remove the 1.2 meter (48 inch) culvert in Lone Cabin Creek, which provides access to the staging area. Widen the channel by pulling fill material from the creek bed back up onto the western slope. Place any riprap if necessary.
  - Re-contour the first 100 meters (330 feet) of the existing and proposed mine roads to match surrounding topography. Scarify the remaining road lengths with a bulldozer and plant with grass and conifers. Remove any road culverts and pull fill material from those draws back onto the roadbed.

The following mitigation measures have been identified and are hereby incorporated into this alternative:

1. As stated above, the NJMC proposes to remove the existing 1.2 meter (48 inch) culvert from Lone Cabin Creek when the mine is permanently closed. However, the material used to fill in and set the culvert was derived from mine wastes on site (C. Dail pers. comm. 2003). Therefore, care should be taken when the culvert is removed to minimally disturb this material while removing it, and ensure that all of the mine waste material is removed from the creek area and disposed of as part of the mine backfill or transported off site.
2. Large equipment work in the stream channel during culvert removal or stream reconstruction will be limited to crossing the channel when absolutely necessary to access the far side and putting in grade controls. Lone Cabin Creek is a fairly narrow stream and much of the reconstruction work should be able to be accomplished from the FR 411 side of the channel.
3. Removal of the culvert will take place during base flow periods (late summer-early fall) to avoid spawning and embryo development season for resident fish (westslope cutthroat trout) and to minimize channel disturbance and sediment transport. No stream-disturbing work will occur before July 15.
4. NJMC will stabilize the streambed with the removal of channel fill and the placement of channel stabilization structures including riparian plantings. NJMC will consult with the USFS fisheries biologist on the types of structures and plantings required.
5. Best Management Practices for watershed resources (Section III, IV, & V) will be used to minimize introductions of sediment into Lone Cabin Creek (ID Department of State Lands 1992).

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6. During surface disturbing work, such as road reconstruction and other facility construction (injection well drilling, pole building construction, etc.), sediment retention devices will be installed and inspected frequently to ensure proper function. If straw bales are used, they must be certified weed-free. When activities are complete, these devices will be removed and sediments will be stabilized and reseeded with a certified weed-free seed mix approved after consultation with the District botanist.
  7. The buried culvert in the dip in the road that will be filled as part of the POO will be removed to prevent the direct conveyance of the mine drainage onto the creek banks. Direct drainage was observed by GANDA during the site visit on 9/17 and 9/18 /2003.
  8. The sump and settling container will be periodically monitored during the inactive season on a schedule agreed upon by the District Ranger and the operator to ensure that mine drainage is not generating sediments or contaminants that could enter Lone Cabin Creek. Monitoring will include visual inspection of the sump and drainage ditch for sediment accumulation and capacity, water quality testing similar to that conducted by NJMC and submitted with the POO, and visual road inspection to ensure that the mine drainage is not being conveyed directly into the creek due to a road failure.
  9. Sediments collected in the sump will need to be periodically removed and disposed of as part of the paste backfill. Under no circumstances will this sludge be stored outside of the sump or dumped on the surface on-site unless the sediment is determined to be non-hazardous under the State of Idaho Hazardous Materials guidelines (IDEQ 1997). Onsite disposal cannot be in a location or manner that could increase sediment loading to Lone Cabin Creek.
  10. No trees or down logs will be removed or introduced into the riparian area in association with this activity without approval by an aquatic biologist.
  11. If NJMC crew members elect to camp on-site, they will have self-contained shower facilities and grey water systems for all cooking or cleaning. Under no circumstances will any camp waste water be introduced into Lone Cabin Creek or dumped on the ground in the project area or on the “staging area” on the southeast side of Lone Cabin Creek. Portable bathroom facilities will be provided at the camp site and at the 225 dump (as proposed in the POO) if campers are dispersed beyond the No. 225 site.
  12. The sump pump used to divert water from Lone Cabin Creek will be situated inside a spill containment device, such as a stock tank, to minimize potential fuel contamination of the riparian area in the event of a spill. The device should be situated as far from the riparian zone as practicable to minimize foot traffic/disturbance of riparian vegetation and stream banks and to reduce the potential that fuel spills enter the creek. The pump intake will be screened with material sized to exclude aquatic organisms (~ 8 millimeter (3/8 inch) mesh).
  13. A water storage tank(s) will be used to collect water for use in mining activities in order to reduce the peak demand for diversion from the creek in low flow periods. The tank(s) will have a capacity sufficient to meet the water needs of the mine for two days at actual peak consumption for the mining activities as stated in the POO. The rate of water diversion will

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be at or below the minimal withdrawal stated in the POO, and excess diversion will be used to fill the tank during periods of little or no mine-related water use.

14. The injection well proposed for the disposal of mine drainage water must be located in an area that is demonstrated to be hydrologically separate from the aquifer feeding Lone Cabin Creek (i.e. bedrock of sufficient depth and integrity). This would be done using a hydrogeologic investigation that would include drilling to ascertain the elevation of seasonal high phreatic surface and a dye test to determine whether a connection to surface water is present. The injection well and any other mine water or tailings discharge disposal actions will be certified and permitted by the IDEQ.
15. All areas that currently contain noxious weeds that will be disturbed during mining activity, including but not limited to roads, building sites, excavated areas, and drill pads, will be sprayed with appropriate herbicides as required. Spraying of existing weed populations may be necessary before operations begin.
16. All existing roads and new roads utilized during mining operations will be monitored in spring and fall for weed infestations. Developing infestations will be sprayed regularly if determined appropriate by a qualified botanist.
17. Heavy equipment being used off road will be cleaned prior to entering and upon leaving the project area.
18. To the extent practicable, equipment will be operated in weed free areas before working in weed-infested areas to decrease the risk of weed seed spread on equipment.
19. Disturbed areas will be immediately reclaimed, upon completion of specific activity in each area, with an appropriate native seed mixture, approved by the District Botanist. To increase spatial and temporal competition with the weedy species, the reclamation mix should include a diversity of grass, forb, and shrub species that grow at varying times of year (spring, summer, and fall).
20. Certified weed-free mulch and seed will be used in reclamation activities.
21. Use of erosion control methods (as mentioned in #5 above), in combination with stockpiling excavated soils away from current weed populations and out of the stream run-off pathway in contaminated areas, will reduce the migration of weed seeds throughout the project area.
22. Additional characterization of the ramp development rock for acid rock drainage (ARD) potential is required. This information should be used to complete the design of the RSS. Samples selected for this evaluation should be derived from the area of the ramp (either as the ramp is advanced or from additional drill holes in the vicinity of the ramp), and should be subjected to kinetic column tests for ARD potential. Specifically, testing should evaluate whether carbonate within the siltite will remain available for long-term buffering of ARD that is likely to develop locally from mineralized areas within the siltite. If the carbonate is not expected to be present for a sufficient duration (i.e., because it is easily dissolved rather

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than disseminated throughout the matrix), the applicant shall develop a binding mitigation plan to ensure that there is a continuous supply during mining of sufficient buffering material within the RSS. Once the basalt dike material is encountered, the applicant may modify this mitigation plan if subsequent kinetic tests with this material mixed with appropriately representative siltite samples and volumes demonstrate the presence of sufficient long-lived carbonate or other buffering material to ensure elimination of ARD. In addition to acid-base accounting, dissolved metals concentrations in leachate should also be monitored periodically during the course of kinetic testing.

23. Provide USFS with updated geological and topographic mapping for the mine, wastewater disposal system, and RSS at the end of each mining season, including all geologic or core logs (and (x,y,z) coordinates of endpoints), analytical results, and geotechnical data.
24. Continue quarterly ambient water quality monitoring program during mining at all stations. If injection well is used, add a station on Lone Cabin Creek downstream of the injection well site. Should seeps develop at the base of the RSS, include these in surface water monitoring.
25. Institute ongoing monitoring of ARD potential during mining. Because the acid-generating potential of the materials away from the ore body (including a disseminated sulfide zone to the north) are not well characterized spatially in the subsurface, it is imperative that the applicant continue quarterly water quality monitoring and regularly sample both ore and waste rock for acid generating potential. Sampling should be stratified by rock type (as below, but with added categories as needed), multiple samples should be collected by rock type, and the volume of the rock type placed in the RSS tracked. If metals concentrations in surface water exceed current values within the range of analytical uncertainty (e.g.,  $\pm 35\%$ ) for two consecutive quarters or the cumulative volume-weighted net neutralizing potential (NNP) and Neutralizing Potential/Maximum Acid Potential (NP/MPA) values for bulk material in the RSS drop below 5, the applicant should be required to develop and implement a plan to further mitigate the quality of the mine drainage water.
26. Complete and submit a geotechnical investigation to properly characterize the subsurface conditions in the vicinity of the RSS and confirm assumptions described in Appendix B of the hydrologist's report (MacDonald and Schick 2004). If a retaining wall is required to ensure stability of the RSS because subsurface conditions are not consistent with those described in Appendix B of the hydrologist's report, design and submit plans stamped by an Idaho Professional Engineer to the District Ranger for approval and inclusion in the project record.
27. Plans for the proposed ore bin will be stamped by a registered Idaho Professional Engineer and submitted to the District Ranger for approval and inclusion in the project record. Copies of record drawings for all structures will also be submitted to the District Ranger within 90 days of the end of construction. Plans will show how the ore bin will be configured relative to the site access road fill slopes.
28. Design and install the selected mine access road system in accordance with MSHA standards to minimize erosion and the potential for road prism failure.

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29. On the main access road, beyond proposed measures, hydroseed the fill slope and apply tackifier, maintain a cover with biodegradable erosion control fabric to the fill and cut slopes, or provide equivalent level of erosion control for life of the road. Reclaim by re-grading to approximate original contour and covering slope with downed or grubbed woody material and planted woody native vegetation adapted to drier forest sites. Actively remove sediment deposited on the road while mining; dispose of suitably. Maintain FR 411 as necessary to prevent sediment-laden drainage from being deposited on the Lone Cabin Creek floodplain. Have an erosion control plan (required for stormwater permit) prepared by a certified professional in erosion and sediment control (CPESC), or professional engineer (P.E.) or landscape architect with specialized erosion control experience.
  30. Do not purposefully stockpile tailings prior to scheduled interruption of mining activity without providing for appropriate erosion and sediment control measures; if stockpile is present during an unscheduled interruption of mining lasting more than two weeks, visually inspect tailings stockpile at two week intervals during the interruption. Make corrective actions to eliminate erosion of tailings as needed.
  31. To minimize impacts to wildlife from miners camping onsite, miners shall follow standard FS camping rules and restrictions, not create excessive noise, avoid the creek and riparian corridor, follow FS bear safe camping practices, and remove garbage from the work area daily.
  32. Bat surveys will be conducted prior to commencement of operations. If no bats are found, then doors or similar devices to exclude bats will be constructed and employed nightly for the duration of operations to prevent bats from colonizing the mine. If bats are found, the District Biologist will work with the operators to devise a mitigation plan to reduce impacts to bats during operations. This mitigation will consider the effect of incremental paste backfilling over the course of the project.
  33. Upon termination of the project, the District Biologist will determine the availability of bat habitat remaining in the mine. If the entire mine has been occluded with paste backfill or if exclusionary doors or other devices will remain in place, no further mitigation is necessary. If neither occurs and bat habitat exists, then either the adits must be closed off completely, or bat-friendly gates installed in consultation with the District Biologist.

### **2.3.3 Alternative 3: Additional Onsite Mine Discharge Water Storage**

The POO currently states that discharge water from the mine will be used for drilling and in the paste backfill process. During times when there are insufficient water supplies, the POO details extracting water from Lone Cabin Creek. This would most likely occur during the late summer and fall when water levels in the creek are near base line levels. During the fall 2003 site visit, streamflow in Lone Cabin Creek was measured at 0.03 meter<sup>3</sup>/second (cms; 1.2 cubic feet per second [cfs]). This is equivalent to approximately 2,040 liters per minute (lpm) or 540 gallons per minute (gpm). Peak flows necessary for mine operations are anticipated to be 8 lpm (2 gpm). This would cause a slight decrease in flow in Lone Cabin Creek.

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Alternative 3 recommends placing a water storage tank at the Number 2 level, the same level as the paste backfill system. The tank would be sufficiently sized to accommodate a minimum of two days of paste backfill and other mine-related water needs at the maximum rate of use (tank size needed is estimated at approximately 90,900 liters (20,000 gallons)). This tank would be initially filled in the spring, which would reduce the amount of water to be disposed of during the annual mine opening activities in the spring. The tank would be kept full during the summer months by flow exiting the mine. Consumption rates could be monitored such that the cessation of tank filling could be timed to match the anticipated needs of water that season. Thus, the tank would be emptied at the end of mine operations each season. Multiple tanks in other locations could be used with no additional impact as long as the area of ground disturbance is not increased.

The following mitigation measures have been identified and are hereby incorporated into Alternative 3:

All of the mitigation measures listed under Alternative 2, except for #13.

### **2.3.4 Alternative 4: Land Disposal of Mine Discharged Water**

The proposed water treatment and discharge system includes a Lamella inclined-plate clarifier and injection well. Mine discharge waters would passively flow through the filter and into injection wells located approximately 520 meters (1,706 feet) north of the No. 3 portal. The potential for the injection wells to handle the peak discharge rate of 200 lpm (53 gpm) is based on previous drilling experience in the area. Previous exploration drilling programs noted significant water loss to the formation during drilling (40 to 60 lpm or 11 to 22 gpm) and a highly fractured bedrock system.

The potential for the injection well to handle the proposed flows has not been demonstrated at this time and groundwater conditions in the vicinity of the proposed injection well are unknown. In addition, the proposed filtration system may not be effective at removing the contaminants of potential concern (COPC) to sufficiently low concentrations needed to meet applicable water quality criteria. Injected waters that have not been appropriately filtered will receive limited amounts of natural filtration once discharged to the bedrock due to the inert nature of the bedrock. This could lead to discharges of mine waters to Lone Cabin Creek.

An alternative to, or to be used in addition to, the injection well disposal is land application of the mine waters. Mine discharge waters would still be settled in the proposed concrete sump, but would then be distributed using a series of garden hoses or pipes. Mine water would be discharged to the soil via soaker hoses or perforated pipes. These hoses or pipes could be shallowly buried or placed on the land surface, as operational needs dictate. The placement and linear dimensions could be varied such that steep slopes were avoided and the area of discharge was great enough to avoid creating saturated conditions along the slope. As with the injection well proposed in Alternative 2, the land application of the mine discharge would need to be approved by the IDEQ. In addition, a monitoring plan would need to be developed and approved by the State and USFS prior to commencement of either mine discharge disposal system. In the event that a shallow subsurface system is installed, an IDEQ Underground Injection Control

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registration must be submitted. Any area of surface disturbance from the system would be reclaimed.

The following mitigation measures have been identified and are hereby incorporated into Alternative 4:

All of the mitigation measures listed under Alternative 2 and the following:

1. Hoses or pipes will be placed over areas covered with dense groundcover. Under no circumstances will hoses be placed on bare ground.
2. Hoses or pipes will be inspected on a weekly basis to determine if they need to be moved to prevent soil saturation and potential isolated erosion. The distribution system will be moved immediately if any exposed soil is noted during an inspection.
3. Threshold water discharge quantities shall be identified by the District Biologist, beyond which the application hoses/pipes will be consistently monitored during spring and fall for Coeur d'Alene salamander presence. If individuals are found, they will be documented by the District Biologist, and appropriate mitigation measures developed by the biologist will be implemented by NJMC.

### **2.3.5 Alternative 5: Modified Development Rock Storage**

The proposed development RSS would have a final face grade of 1.7 units of horizontal run to 1 unit vertical rise. Alternative 5 would reduce the final grade slightly (e.g., 1.65:1), crown the face of the rock storage area to disperse precipitation toward the margins, and add a dike rock drain at the base. Upon completion of filling activities, the development rock storage would be regraded to produce a convex shape to the face and a crown on the top. This would improve drainage away from the surface of the development rock to the contacts with the native soils to either side. Infiltration and the potential for generating acidified waters would be reduced with this regrading plan.

The original design includes using the dike rock to buffer the quartz rock and prevent the development of ARD. However, most of the dike rock will not be extracted until after most of the development rock (primarily from the ramp) has been extracted and placed in the RSS area. Consequently, the largest proportion of the dike rock will not be located at the base of the RSS. Alternative 5 includes the addition of a drain at the base that would be backfilled with dike rock as it becomes available. Water that infiltrated through the development rock would flow through this drain. If these waters have been acidified by the development rock, the drain rock would neutralize these waters.

If Alternative 5 is selected, it will require a geotechnical investigation to confirm the stability of this configuration. The investigation should include an analysis to confirm that there is sufficient dike rock in the drain to buffer the RSS over time.

The following mitigation measures have been identified and are hereby incorporated into Alternative 5:

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All of the mitigation measures listed under Alternative 2.

### **2.3.6 Alternative 6: Alternative Site Access**

This alternate alignment for the main access road deviates slightly from the Proposed Action (Alternative 2) by extending the switchback location into the RSS, thereby increasing the length and decreasing the average slope of the road from 10% to 9%. No additional net land disturbance would occur with Alternative 6 since the additional length would be accommodated within the footprint of the proposed RSS. This alternative was evaluated because it eliminates some of the steeper portions of the access route and still allows access to the RSS during all phases of its development.

The following mitigation measures have been identified and are hereby incorporated into Alternative 6:

All of the mitigation measures listed under Alternative 2.

### **2.3.7 Alternative 7: Maintain FR 411 Open**

Under Alternative 7, FR 411 would remain open to public use during mining activity. This alternative would eliminate the need for some signage, gates and detours; however, it would add the need for signage alerting the public to the presence of trucks and mining activity and may lead to additional risks to public safety due to public use of the road during active mining. No other aspect of Alternative 2 would be altered.

The following mitigation measures have been identified and are hereby incorporated into Alternative 7:

All of the mitigation measures listed under Alternative 2.

## **2.4 Alternatives Dropped From Consideration**

### **2.4.1 No Approval of the Plan of Operations**

Under this alternative, the POO for continued mineral exploration submitted by the proponent would not be approved. The 1872 United States Mining Law entitles a claimant reasonable access to explore for mineral deposits on lands open to mineral entry. No authority exists for the Forest Service to deny a plan of operations that meets the purpose of its locatable mining regulations, including compliance with applicable state and federal laws and regulations relating to air, water, and solid waste. Adoption of this alternative is outside the legal authority of the Forest Service and, therefore, was not analyzed in detail.

### **2.4.2 Wastewater Treatment Alternative**

Portal discharge is known to have concentrations of dissolved metals (particularly arsenic and copper) that do not meet relevant water quality criteria. A wastewater treatment plant could be built based on filtration or chelation technology (e.g., iron oxides) that would remove dissolved metals from the portal flow prior to discharge to groundwater or surface water. Relatively low

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cost, easy-to-operate batch systems have been developed recently that remove arsenic from drinking water in developing countries (Murcott et al. 2002). Their effectiveness at removing metal cations, however, is rarely described. This alternative was eliminated from further study because it would unnecessarily increase the complexity of the Silver Strand operation.

### **2.4.3 Full Bench Road Alternative**

A full bench road was considered as an alternative to the partial bench road to access the 225 Level. This was primarily due to the high impact of a partial bench road cut on soils and the marginal stability of a partial bench on the steep slopes at the site. This alternative was not further analyzed because Alternative 6 (Alternative Site Access) was deemed to be more practical.

### **2.4.4 Conveyor System Alternative**

A conveyor system was considered to transport the tailings up to the No. 2 Level for paste backfill processing. This would have eliminated the need for a road up to the No. 2 Level. However, the use of a road would have been necessary to get the paste backfill batch plant to the No. 2 Level. In addition, construction of the conveyor would require additional clearing directly on the unstable area over the shear zone and it would be difficult to construct solid structural footings in the broken ground without significant construction on the steep slope. A conveyor would require significantly more power to operate, and would likely require a larger generator and a significantly larger amount of fuel to be hauled to and stored on site, which might increase the likelihood and potential severity of fuel spills. This alternative was not further analyzed because Alternative 6 (Alternative Site Access) was deemed to be more practical.

### **2.4.5 Elimination of New Portal and Use of No. 3 Portal**

Use of the existing portal was considered as an alternative to constructing a new portal. Use of the existing portal was considered rather than construction of a new portal. However, the existing portal is so poorly aligned relative to bedrock fractures and the later intrusive dike that it is not geotechnically stable (Springer, 1973). Repeated ground repair efforts have made this opening too small for mine equipment to enter. The proposed new portal crosses the key geologic features (rather than paralleling these features) to improve the geotechnical stability of this main mine access point.

### **2.4.6 Additional Alternative Site Access**

The Proposed Action (Alternative 2) mine road layout includes building a new road up from the proposed portal to the 225 Level. Included in this plan is the construction of a proposed ore bin and associated retaining wall and fill to serve as a loading area for the ore. The proposed road would traverse slopes in excess of 35 degrees, including some areas near the 225 Level that are currently waste rock piles at their angle of repose.

This alternative consists primarily of using the existing No. 2 road up from FR 411 for access to the 225 Level and paste backfill facility and staging the ore north of the proposed portal, near the existing No. 3 portal. Ore would be stored beneath a pole barn, as proposed in the POO, and

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loaded using a conveyor belt with sides to prevent accidental release of the ore during loading of trucks. Rock would be hauled south on FR 411 and around to the new spur access road to the top of the RSS. From the end of that spur road, temporary roads would switchback down the swale that contains the RSA, staying within the footprint of the RSS.

The existing No. 2 road, which accesses the 225 Level from the south, leaves FR 411 approximately 850 meters (2,800 feet) from the proposed portal and traverses gradually upslope to the 225 Level. Slopes along this existing roadway are typically less than 8 percent with a few short reaches that are steeper. Alternative 6 would require widening FR 411 and building berms to meet MSHA standards. Although the road is marked on topographic maps as a 4-wheel drive road, it is currently in passable condition for passenger vehicles with little or no modification.

The distance from FR 411 to the 225 portal is approximately 890 meters (2,900 feet) feet. While the No. 2 road is 600 meters (1,960 feet) longer than the proposed main access road, it avoids the soil disturbance associated with placing a new road on steep and marginally stable slopes. The proposed main access road has a slope of approximately 10 percent; observations made along the existing roadway indicate that a 10% slope would cause erosion of the road surface. This alternative was eliminated because mine haul vehicles (e.g., LHDs) that are not rated for highway use would be traversing approximately 1 km (0.6 mi) of FR 411 between the mine portal and the junction with the No. 2 road. Therefore, this segment of FR 411 would have to meet MSHA standards for road construction. Specifically, a berm of suitable height would be required on the outboard edge of the road. To accommodate this safety feature while still maintaining required road width, the berm would have to be constructed in the riparian zone of Lone Cabin Creek. This alternative was eliminated for a variety of reasons including:

1. Construction of the berm within the riparian zone was deemed an unacceptable disturbance to the creek.
2. The creek bottom is very narrow north of the portal and there is little room for a storage facility of appropriate size in this area.
3. The ore storage bin proposed by NJMC is gravity fed with no energy requirements. Using a conveyor, or front end loader would be required if another site is utilized which would increase fuel requirements.
4. By building the dump from the bottom up, the RSS will be left in a more manageable configuration for reclamation should mining cease unexpectedly.
5. This alternative also would mean significantly longer haul distance, requiring more fuel and a longer duration of disturbance.
6. Construction of the RSS from the top down would entail an unmanageable set of switchbacks within the footprint of the RSS or a 42 meter (138 feet) drop from the top if top dumped.

For these reasons, and because the selection of Alternatives 2 or 6 provided sufficient internal site access with minimal impact as mitigated, this alternative was not carried forward.

## **2.4.7 Alternative Haul Route**

An alternative haul route was proposed that used FR 411 to Five Finger Saddle, proceeding east on FR612 to the road along the Little North Fork of the Coeur d'Alene (FR209). If this haul is coupled with Alternative 4, Modified Access Road, the proposed total haul between Interstate 90

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(I-90) and the No. 225 portal would be shorter by 2.6 kilometers (1.6 miles). This alternative was eliminated because it required the loaded trucks to haul uphill on steeper terrain and negotiate sharp turns to reach Five Finger Saddle.

## 2.5 Comparison of Alternatives

A blank box indicates that there are no additional impacts anticipated beyond those listed under the “Common to All Alternatives” column.

Table 1. Comparison of mining alternatives considered and carried forward for the Silver Strand Project.

Environmental Impact or Issue	Alternative 1: No Action	Common to All Action Alternatives	Alternative 2:	Alternative 3:	Alternative 4:	Alternative 5: Modified	Alternative 6:	Alternative 7:
			Permit as Proposed	Onsite Mine Discharge Water Storage	Land Disposal of Mine Discharge Water	Development Rock Storage	Alternative Site Access	Maintain FR 411 Open
<b>Water Quality/Hydrology</b>								
Water withdrawals	No impacts expected	—	Potential withdrawal of water from Lone Cabin Creek.	May reduce need to withdraw water from Lone Cabin Creek to zero	Same as Alternative 2	Same as Alternative 2	Same as Alternative 2	Same as Alternative 2
Mine discharge disposal	Continued low level of mine discharge flowing in roadside ditch and percolating into soils.	Potential increase in the amount of mine discharge generated.	Injection well would need to demonstrate separation from aquifer that feeds Lone Cabin Creek and be permitted by IDEQ	Majority of discharge would be incorporated in paste backfill. Excess would be disposed of as in Alternative 2.	Mine discharge would be filtered by soils and vegetation.	Same as Alternative 2	Same as Alternative 2	Same as Alternative 2
Sedimentation and erosion	Continued potential for sediment delivery from material around culvert, road erosion from FR 411, and stormflow sediment delivery.	Removal of mine-based sediments surrounding culvert at removal. Potential increased sediment delivery due to increased traffic and ground disturbance (minimal). Likely increase in sediment delivery to FR411 without aggressive erosion and sediment control BMPs on RSS and access road, and sediment control on FR411.	—	Decreased potential for direct contamination of waters with mine sediments	Decreased potential for direct contamination of waters with mine sediments, possible contamination of soils. No elevation in sediment delivery rates from access road.	—	—	Potential increased sediment load from roads due to additive use by public.
Channel alterations	No impacts expected	Removal of culvert in Lone Cabin Creek and reconstruction of channel (beneficial impact) at close of active mining.	—	—	—	—	—	—
Water Quality	Continued seepage from mine into Lone Cabin Creek and potential introduction of mine wastes from fill around culvert across Lone Cabin Creek	Potential for increased sediment introduction into Lone Cabin Creek and Burnt Cabin Creek from truck traffic (minimal). Camping onsite could affect Lone Cabin Creek.	Injection well would need to demonstrate separation from aquifer that feeds Lone Cabin Creek. Greater potential for mine discharge to receive some level of filtration/treatment prior to reaching surface waters.	Potential decrease in the net amount of mine waste water generated	Would allow waters to be filtered by soils and incorporated into groundwater.	Reduced potential for infiltration of runoff from RSS into surface waters.	Same as Alternative 2	—

Environmental Impact or Issue	Alternative 1: No Action	Common to All Action Alternatives	Alternative 2:	Alternative 3:	Alternative 4:	Alternative 5: Modified	Alternative 6:	Alternative 7:
			Permit as Proposed	Onsite Mine Discharge Water Storage	Land Disposal of Mine Discharge Water	Development Rock Storage	Alternative Site Access	Maintain FR 411 Open
<b>Wildlife Habitat/ Botanical Resources</b>								
Direct removal of vegetation <ul style="list-style-type: none"> <li>• Alteration of plant community structure through mature tree removal</li> <li>• Result in early successional stage favoring weeds</li> </ul>	No impacts expected	Removal of vegetation at new portals, for road brushing, construction, and at pole building site.	---	---	---	---	Total area of soil disturbance reduced by 0.4 ha.	---
Indirect impacts to adjacent plant community structure and subsequent community succession due to migration of noxious weed populations and fugitive dust	No impacts expected	No impacts expected			Indirect impacts to adjacent plant community structure and subsequent community succession due to additional water source.	---	---	---
Effects to sensitive, and threatened plant species	No impacts expected	Early season surveys necessary to determine impacts to forest- and district-listed sensitive species.	---	---	Potential effect from additional water source if forest and district-listed sensitive species occur in project area.	---	---	---
Indirect impacts to community structure in undisturbed areas and subsequent community succession due to invasion of exotic plants and fugitive dust	No impacts expected	Potential increase in invasive weeds due to ground disturbance and truck traffic. Potential suppression of native community from fugitive dust.	---	---	Indirect impacts to community structure in undisturbed areas and subsequent community succession due to additional water source.	---	Total area of soil disturbance reduced by 0.4 ha.	---
Effects to rare, threatened and endangered wildlife species	No impacts expected	May affect Coeur d'Alene salamander, northern goshawk, and Townsend's big-eared bat (see BE). Camping onsite could affect Cd'A salamander individuals or habitat.	No additional impacts expected	No additional impacts expected	Depending upon water quality of discharge, could be a benefit to Cd'A salamander or have a negative impact	No additional impacts expected	No additional impacts expected	No additional impacts expected
Potential indirect impacts include: <ul style="list-style-type: none"> <li>• Temporary avoidance of habitat</li> <li>• Displacement</li> <li>• Disruption of wildlife movements</li> </ul>	No impacts expected	Potential of temporary avoidance of area by wildlife species and disruption of wildlife movements. Camping onsite could affect wildlife.	No additional impacts expected	No additional impacts expected	May attract amphibians to water disposal areas	No additional impacts expected	No additional impacts expected	No additional impacts expected

Environmental Impact or Issue	Alternative 1: No Action	Common to All Action Alternatives	Alternative 2:	Alternative 3:	Alternative 4:	Alternative 5: Modified	Alternative 6:	Alternative 7:
			Permit as Proposed	Onsite Mine Discharge Water Storage	Land Disposal of Mine Discharge Water	Development Rock Storage	Alternative Site Access	Maintain FR 411 Open
<b>Fisheries Resources</b>								
Effects to threatened, endangered, and special status aquatic species	Continued barrier at Lone Cabin Creek culvert.	Increased passage at Lone Cabin Creek culvert.	---	Reduced impacts – less water diverted from Lone Cabin Creek	Lower potential for direct contamination of surface waters.	---	---	---
Potential indirect impacts due to degradation of fish habitat	No impacts expected	Potential increase in road sediment erosion into creeks.	---	Reduced impacts – less water diverted from Lone Cabin Creek	---	None if new RSS is shown to be stable.	---	Slightly greater erosion due to public and truck traffic combination
<b>Earth Resources</b>								
Soil productivity including erosion and compaction	Continued upslope erosion and instability at Levels 3 and 225. Continued surface erosion of existing roads and other disturbed land	Compaction of active work areas. Without aggressive erosion control BMPs, potential for substantial soil erosion in disturbed areas (e.g., 300x current erosion rates on newly-reclaimed and unplanted RSS, 40x current sediment delivery rates on main hillslope face during active use of access road. Reduced soil productivity on disturbed lands until fully reclaimed and woody vegetation re-established.	---	Reduced impacts-less riparian soil disturbance.	Possible contamination of soils by metals-enrichment affected by land application.. Eliminate need for injection well, access road. No soil erosion losses from access road.	Better drainage and lower potential for erosion of RSS	No net change in road surface area.	---
Mass wasting	Gob in stope may further degrade, possibly collapse further.	Potential for sloughing is minimal because most excavation will occur underground.	Greater chance of road failure on steep slopes proposed for access routes.	---	---	Better slope stability post-mining	Increased slope stability for roadway	---
Excavation for mining structures and road building	No impacts expected	Limited surface excavation, excavation of RSS and pole building area.	---	---	---	---	Total area of soil disturbance reduced by 0.4 ha.	---
<b>Hazardous Materials</b>								
Accidental spills resulting from: Spills during onsite equipment fueling Mining equipment collisions/ accidents	No impacts expected	Low potential for spills, spill prevention plan, BMPs and established clean-up protocols reduce probability of spill and potential impacts.	---	---	---	---	---	---
				Slight increase in additional onsite fuel risk could				

Environmental Impact or Issue	Alternative 1: No Action	Common to All Action Alternatives	Alternative 2:	Alternative 3:	Alternative 4:	Alternative 5: Modified	Alternative 6:	Alternative 7:
			Permit as Proposed	Onsite Mine Discharge Water Storage	Land Disposal of Mine Discharge Water	Development Rock Storage	Alternative Site Access	Maintain FR 411 Open
Transport of explosives over public roads and storage on-site	No impacts expected	Potential for vandalism and access of explosives is low as materials will be stored underground. Increased danger of explosion in the case of a collision during transport.	_____	increase either amount of fuel stored onsite or frequency of filling of proposed onsite fuel tank, with resulting increase in risk of fuel spillage. Proposed containment measures keeps this risk low.	_____	_____	_____	Potential slight increase in the likelihood of a collision because of public traffic on road. Potential increase in vandalism due to greater ease of access to site.

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## **2.6 Monitoring**

Monitoring and evaluation will be used to determine if the physical and biological effects of implementing the chosen alternative will occur as predicted. Administration of the operation will assure that the chosen alternative and subsequent approved Plan of Operations is followed in accordance with the District Ranger's decision. The required monitoring is described in detail within the mitigation measures of each of the alternatives. Monitoring is designed to determine the degree of achievement of the Plan of Operations' goals and objectives, and to meet the requirements of the National Environmental Policy Act and Federal Lands Policy and Management Act.

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## CHAPTER 3. Affected Environment

This chapter describes the existing condition of various resources that may be affected by the proposed activity as described in Chapter 2.

### 3.1 Water Quality

The project area contains approximately 2 kilometers (1.2 miles) of fish-bearing stream (Lone Cabin Creek) as measured on the USGS Spades Mountain, Idaho 1:24,000 topographic map. Lone Cabin Creek flows into Burnt Cabin Creek approximately 1.6 km (1 mile) downstream from the lowest adit (#3), and Burnt Cabin Creek joins the Little North Fork of the Coeur d'Alene River approximately 1.6 miles downstream from the Lone Cabin confluence. Both Burnt Cabin Creek and the Little North Fork of the Coeur d'Alene River are listed by the IDEQ as water quality impaired waters and TMDL evaluations have been completed for Burnt Cabin Creek. Lone Cabin Creek is included in Burnt Cabin's 303(d) status using the IDEQ's method of stratification which extends a water quality impairment listing of a second order stream to all first and second order tributaries (G. Rothrock pers. comm. 2004). The Little North Fork and tributaries are listed as impaired for flow alteration, habitat alteration, and siltation (IDEQ 2003b, IDEQ 2000).

Because stream sediment is a major cause of habitat alteration, Burnt Cabin and Lone Cabin creeks were included in the sediment TMDL recently completed for the North Fork Coeur d'Alene River basin by IDEQ (2000). In sediment-rich streams, pools are refilled with sediment rather than water, reducing the depth and volume of pools that would be present at lowest flows (measured as residual pools). In IDEQ's North Fork basin wide assessment, Burnt Cabin Creek was shown to have approximately 35 percent of the residual pool volume per stream mile as a regional reference stream (Independence Creek) of comparable bankfull width (IDEQ 2000). This is the primary indicator of sediment impairment evaluated by IDEQ during the TMDL process. USFS records indicated that both timber harvest and former activities at the Silver Strand site have contributed to elevated sediment loads. The sediment load allocation for the Little North Fork Coeur d'Alene River basin (including Burnt Cabin and Lone Cabin Creek) is approximately 3,000 tons/year, a level estimated to be 50 percent higher than natural sediment loads for the watershed. Of this load, all but 1.6 percent has been allocated to the USFS. The USFS has a memorandum of agreement with IDEQ to prepare TMDL implementation plans; implementation is expected to be limited by budgetary constraints. Burnt Cabin and Lone Cabin creeks are on the 303(d) list for thermal modifications.

Ambient water quality data have been collected by the applicant for Lone Cabin Creek since January 2003 (NJMC 2003a, 2003c, 2003d; see Table A-1 in MacDonald and Schick 2004). The creek was sampled upstream of proposed activities, immediately downstream from the No. 3 portal, and at the mouth of Lone Cabin Creek. All samples were filtered and therefore represent dissolved constituents. The water is alkaline but very soft. With the exception of the first sample collected that contained zinc at a concentration of 0.0053 milligrams per liter (mg/l; 5.3 µg/l, micrograms per liter), heavy metals concentrations were below detection limits in all samples at all locations.

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The applicant has also monitored water quality and flow volumes from flow discharging from the No. 3 portal since January 2003 (MacDonald and Schick 2004). Both filtered and unfiltered samples were collected and analyzed. In addition, the U.S. Bureau of Mines collected water samples from the portal between November 1991 and September 1995 (USBM 1996). This water currently runs down the inboard ditch on FR 411 and either mixes with other road runoff or infiltrates. Garcia and Associates (GANDA) biologists observed mixed road runoff draining into Lone Cabin Creek via a small culvert under FR 411 (Fisheries Specialist Report; GANDA 2004a).

As with surface water in Lone Cabin Creek, the portal discharge is soft, with low total dissolved solids and conductivity, and is weakly acidic to alkaline. This portal discharge has periodically violated ambient water quality criteria (AWQC; usually chronic values) for several trace metal constituents and pH (MacDonald and Schick 2004; IDEQ 2003a). Though this water does not consistently exceed criteria for any single constituent, both arsenic groundwater and copper surface water standards have been consistently exceeded in the 2003 sampling. Detection limits for cadmium, lead, and mercury are generally above relevant standards; in these cases, compliance is assumed to occur.

Limited local groundwater quality data are available from seeps near the No. 2 portal (USBM 1996). Groundwater is weakly acidic to weakly alkaline (pH ranges from 5.52 to 7.69) with low conductivity, and is otherwise similar in major ion chemistry to the No. 3 Portal discharge. Dissolved lead and cadmium are the only constituents that exceeded state groundwater quality criteria. These exceedances are less than an order of magnitude above the criteria and occurred in one-third or fewer of the samples. These seeps are not thought to be influenced by mine workings, but are near the ore body. Therefore, they are best considered representative of local rather than regional groundwater quality.

## 3.2 Hydrology

The Lone Cabin Creek basin is approximately 3.6 kilometers<sup>2</sup> (1.4 miles<sup>2</sup>) in area above the site, and 6.0 kilometers<sup>2</sup> (2.4 miles<sup>2</sup>) at its confluence with Burnt Cabin Creek. Burnt Cabin Creek is a tributary of the Little North Fork of the Coeur d'Alene River, which in turn flows into the North Fork Coeur d'Alene River.<sup>1</sup> No stream gages operate on Lone Cabin or Burnt Cabin creeks or in nearby small drainage basins. Streamflow patterns were estimated based on regional relationships (MacDonald and Schick, 2004). Average annual flow is estimated to be 0.12 meters<sup>3</sup>/second (cms) (4.3 cfs) at the site and 0.2 cms (7.1 cfs) at the mouth. The annual snowmelt peak typically begins in April, is highest in May, is strong in June, and then recedes quickly to the annual low flow period from August through October.

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<sup>1</sup> Usage of river names in the Coeur D'Alene River basin upstream to the north of Enaville is not consistent. IDEQ follows the distinction between the North Fork and Little North Fork described here. USGS and USFS maps refer to the Little North Fork as the North Fork and the North Fork as the mainstem of the Coeur d'Alene River.

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The site is on the edge of the rain-on-snow zone (USFS, 1998), so flood events are likely to have a major component of snowmelt, exacerbating flooding from rainfall alone. Such floods are common in early and late winter, but can occur anytime that snow is on the ground. Peak flows in Lone Cabin Creek were estimated using regional regression equations (MacDonald, and Schick, 2004). The two-year flood is estimated to be 1.1 cms (40 cfs) at the site and 1.8 cms (62 cfs) at the confluence with Burnt Cabin Creek.

The site is dominated by infiltration of rainfall and subsurface drainage. Some subsurface drainage appears to be shallow, as Lone Cabin Creek gains streamflow immediately downstream from the existing mine portal. Evidence of surface drainage can be found in each swale located within the claim boundary, but flow in these swales is intermittent, and, for the northern of the two swales, discontinuous over the land surface. Surface drainage from the claim area is intercepted by the inboard ditch on FR 411, where it is commingled with road drainage and conveyed down-valley and across the road by culverts in two locations: at the mouth of the southern swale, and 40 meters (130 feet) up-valley (south) of the No. 3 portal. The culverts discharge water onto the floodplain of Lone Cabin Creek. Horizontal distance between the end of the culvert and the low flow channel is nearly 30 meters (100 feet) for the southern culvert and 5 meters (16 feet) for the northern culvert.

### **3.3 Fisheries Resources**

#### **Watershed Conditions**

Lone Cabin Creek is a tributary to Burnt Cabin Creek, which flows into the Little North Fork Coeur d'Alene River. Valley side slopes are 30 to 40 percent and vegetated predominately with conifers. Channels of Lone Cabin Creek and Burnt Cabin Creek are severely restricted by roads on the western and northern sides, respectively. The lower 1.6 kilometers (one mile) of Lone Cabin Creek is characterized by a narrow channel with maximum widths ranging from 6 to 9 meters (20 to 30 feet), and only the uppermost headwaters of the creek is unconfined. Field observations suggest that the main channel and a majority of the flood plain have been altered by the streamside road and disturbance of riparian influenced areas.

The riparian area along Lone Cabin Creek is well vegetated and banks appear stable despite the road's encroachment. Over 95% of the stream banks were 85-100% vegetated and less than 5% of streambanks were classified as unstable or unvegetated (Fisheries Specialist Report, GANDA 2004a).

The Lone Cabin Creek watershed has 14.3 kilometers (8.9 miles) of road per square mile and the drainage covers 622 hectares (2.4 square miles); therefore there is 34.75 kilometers (21.6 miles) of road (USFS 1998). The Lone Cabin Creek watershed has 1.4 road crossings per mile, or 30 stream crossings (USFS 1998). Approximately 7 kilometers (4.3 miles) of USFS road and 2 road channel crossings exist in the Lone Cabin Creek drainage in the area surrounding the Proposed Action.

Burnt Cabin and Lone Cabin creeks are on the 303(d) list for thermal modifications (IDEQ 2002).

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## Fisheries

Lone Cabin Creek currently supports fluvial and resident westslope cutthroat trout (*Oncorhynchus clarki lewisi*). Historically, Burnt Cabin Creek and its tributaries most likely supported fluvial and resident bull trout (*Salvelinus confluentus*) and currently support westslope cutthroat trout and shorthead sculpin (*Cottus confusus*) (IDFG 2004, Shepard et al. 2003). The larger stream systems, such as the Little North Fork Coeur d'Alene River, are known to hold torrent sculpin (*Cottus rhotheus*) (E. Lider, USFS, pers. comm. 2003).

Fish habitat in Lone Cabin Creek is varied, but dominated by fast water. Riffles and runs accounted for over 68% of the stream habitat assessed (GANDA 2004a). However, pools (27%) and other slow-water resting areas are interspersed within Lone Cabin Creek, providing a good level of habitat diversity. Cover within the creek is diverse and plentiful with abundant woody debris aggregates, boulders, and undercut banks. GANDA measured the streamflow at 0.034 cms (1.2 cfs) on September 17, 2003. Although this probably represents late season base flow, it does provide some context to evaluate the fish community survey results.

Lone Cabin Creek is a second-order stream, and habitat is limited mainly by water flow and availability. Mean depths across all habitat units were less than 13 centimeters (5 inches) and maximum pool depths were less than 30 centimeters (12 inches). The size and number of pools found in Lone Cabin Creek would limit resident fish size and population density.

Substrate in Lone Cabin Creek was dominated by gravel, with lesser amounts of small cobble and cobble (Fisheries Specialist Report; GANDA 2004a). There was an abundance of spawning quality gravels in the stream, and fines were uncommon except in pools and eddies. Cover within the creek is diverse and plentiful with abundant woody debris aggregates, boulders, and undercut banks.

The existing culvert on Lone Cabin Creek that creates the road access to the staging area is a fish migration barrier (S. DeKome pers. comm. 2003). Restoration work is planned as part of the proposed project clean up with the removal of this culvert and obliteration of the current crossing/access to the staging area across Lone Cabin Creek.

The three-pass electrofishing survey conducted on September 18, 2003, yielded westslope cutthroat trout and sculpin (*Cottus* spp.) (GANDA 2004a). GANDA used Microfish 3.0 to calculate a westslope cutthroat trout population estimate for the area (Van Deventer and Platts 1985). Microfish returned a population estimate of 38 fish for the 115 meter (125 yard) section surveyed. All of the adult westslope cutthroat trout were captured in larger pools with dense cover (rootwads and boulders). The majority of the westslope cutthroat trout captured were young of the year fish.

Macroinvertebrates in Lone Creek include members of the Ephemeroptera (mayflies), Plecoptera (stoneflies), Dipterans (flies) and Tricoptera (caddisflies). Dipteran larvae observed included members of the crane fly family (Tipulidae) and the midge family (Chironomidae).

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**Modeling Results:** A habitat suitability index (HSI) model is available for cutthroat trout (*Oncorhynchus clarki*) (Hickman and Raleigh 1982). Hickman and Raleigh's model is generalized for all species of cutthroat trout and uses seventeen variables to assess suitability for each life stage. Based on the data collected in September 2003 and existing sources of historic data, the HSI score for Lone Cabin Creek was 0.78 on a scale from 0.0 to 1.0, using the equal component value method for the riverine model (Hickman and Raleigh 1982). Details on the model and the data input are included in the Fisheries Specialist Report (GANDA 2004a).

## **Threatened, Endangered, and Sensitive Fish Species**

### **Bull Trout**

The North Fork of the Coeur d'Alene River still has remnant populations of fluvial and resident bull trout and it is part of the critical habitat designated by the Draft Bull Trout Recovery Plan (USFWS 2002). However, the historical land uses in the area such as mining, timber harvest, road building and development have had devastating impacts to the range and status of the species. Historical and recent sightings and surveys confirm that bull trout distribution has been severely curtailed and that the numbers of bull trout may be more representative of scattered individuals rather than cohesive populations (USFWS 2002).

Surveys conducted within Lone Cabin and Burnt Cabin creeks in 1997 found no bull trout present (data provided by E. Lider, USFS). GANDA surveyed Lone Cabin Creek as part of our site visit and found no bull trout. Consultation with Ed Lider of the USFS and Ray Hennekey of IDF&G confirmed that bull trout are assumed absent from Burnt Cabin Creek and the Little North Fork Coeur d'Alene River.

### **Bull Trout Recovery Plan**

The USFWS has released a draft Bull Trout Recovery Plan in compliance with Section 7 of the ESA (available on-line at <http://pacific.fws.gov/bulltrout/>). Each state within the historic range of bull trout has designated core areas, critical habitat units and management directives. In Idaho, the Coeur d'Alene Recovery Unit contains one core area, the Coeur d'Alene Lake Basin Core Area, which encompasses the entire Coeur d'Alene Lake, the St. Joe and Coeur d'Alene River subbasins, and all tributaries within these systems.

The recovery unit team identified priority streams to focus the implementation of recovery activities to areas having the greatest potential for supporting bull trout. Selected priority streams are considered the best of the best-remaining habitat for bull trout. No streams in the Little North Fork Coeur d'Alene River drainage are designated as priority streams (USFWS 2002). The closest priority streams to the Silver Strand area are in the North Fork Coeur d'Alene River system (Trail Creek and Teepee Creek), and in the Lake Pend Oreille sub-unit (Gold Creek, North Gold Creek, and West Gold Creek).

### **Westslope Cutthroat Trout**

GANDA found westslope cutthroat trout in Lone Cabin Creek during an electroshocking survey on September 18, 2003. Because fluvial fish often outmigrate soon after spawning, these fish are almost certainly year-round residents, possibly rearing in Lone Cabin Creek until they reach

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large enough size (age 1-2) to outmigrate to larger waters. (Liknes and Graham 1988, Rieman and Apperson 1989). Although it is impossible to determine the genetic purity of the fish sampled in the field, the appearance of the fish coupled with the upper headwaters location of Lone Cabin Creek would support the assumption that these fish are less likely to be introgressed. However, IDFG has recently taken genetic samples from the Burnt Cabin Creek area (R. Hennekey pers. comm. 2003). When the results of these samples are known, the status of the resident fish in Lone Cabin Creek will be more certain. GANDA also found evidence of westslope cutthroat trout using Lone Cabin Creek as a spawning stream. Out of 23 fish captured, 20 were young-of-the-year/fry. Since westslope cutthroat trout fry often remain in their natal tributaries, particularly if they express the resident life history, these fish were undoubtedly spawned in Lone Cabin Creek. Previous electroshocking surveys in Lone Cabin Creek found similar size classes and population levels, although the surveys from 1994 (pre-1996 flood event) showed a larger population density (data from 1994 and 1997 provided by E. Lider, USFS).

### **Torrent Sculpin**

As noted in the Fisheries Specialist Report (GANDA 2004a), there is not a great deal of information on torrent sculpin distribution or the numbers of torrent sculpin in Idaho streams (Hendricks 1997). Data provided by Ed Lider documents the presence of torrent sculpin in the Little North Fork Coeur d'Alene River above Cascade Creek.

## **3.4 Botanical Resources**

The site is located on an east southeast-facing hillside of 30 to 40% slope. The vegetation is predominantly a mid-seral, mixed-conifer forest with an understory composed of small shrub stands and herb communities. The canopy has few openings and the understory is patchy and depauperate. The area contains a deep layer of forest duff. Habitats consist of moist forest guilds.

The area contains considerable historic and present disturbance. Trampling impacts are evident throughout the site, likely from mineral explorations and surveying. Small excavations, trenches, and berms occur frequently. The site contains evidence of a historic timber harvest, and fire, likely used to remove limbs and brush after harvest.

### **Existing Timber Resources**

The overstory is a moderately dense, second growth, mixed-conifer stand of western hemlock (*Tsuga heterophylla*), grand fir (*Abies grandis*), western redcedar (*Thuja plicata*), white pine (*Pinus monticola*), and Douglas-fir (*Pseudotsuga menziesii*). Under all alternatives, approximately 2.7 acres of timber would be cleared in three locations: the RSS, new road alignments, and the injection well site. Most of the conifers are submerchantable, however some merchantable timber would be harvested. Mining law authorizes the holder of a valid mining claim to cut and use timber from the claim for mining purposes. Timber would not be sold or utilized away from the claim.

### **Threatened, Endangered, and Sensitive Plant Species**

No suitable habitat occurs within the project area for the only federally listed plant species on the IPNF, water howellia (*Howellia aquatilis*), Ute's ladies'-tresses (*Spiranthes diluvialis*), and

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Spalding's catchfly (*Silene spaldingii*), and no populations were located during surveys (GANDA 2004b).

None of the 31 forest-listed sensitive plant species were found during surveys conducted in September 2003 (GANDA 2004b). However, potential habitat for four of those species: clustered lady's-slipper (*Cypripedium fasciculatum*), Idaho barren strawberry (*Waldsteinia idahoensis*), mingan moonwort (*Botrychium minganense*), and triangle moonwort (*Botrychium lanceolatum*), was found within the project area. Early season plant surveys were conducted in the emergent season during 2004 and populations of these species were not present.

### **Noxious Weeds**

As noted above, the area has been disturbed considerably by historic and current activities. Roads accessing the portals contained large infestations of several noxious weed species. Noxious weed species present on roads, dumps and disturbed areas were yellow toadflax (*Linaria vulgaris*), goatweed (*Hypericum perforatum*), spotted knapweed (*Centaurea maculosa*), meadow hawkweed (*Hieracium pratense*), and Canada thistle (*Cirsium arvense*). Weeds were not currently evident under the forest canopy.

## **3.5 Wildlife Resources**

The analysis area provides habitat for a wide variety of wildlife species. It includes some seasonal ranges for big game such as Rocky Mountain elk (*Cervus elaphus*), black bear (*Ursus americanus*), moose (*Alces alces*), mule deer (*Odocoileus hemionus*), and mountain lion (*Felis concolor*). The project area does not contain ungulate summer range, and is higher in elevation than designated winter range. Small game such as mountain grouse, non-game bird species, and small mammals typically inhabiting Idaho coniferous forests can be found in the project area. Species that received further alternatives analysis were selected based on habitat presence in the project area, and the expected measurable effect of project operations on that species' habitat.

Federally-listed threatened and endangered species, USFS sensitive and Management Indicator Species (MIS) that are known to occur in the Central Zone are evaluated in this document. These species were evaluated for their relevancy to the Coeur d'Alene drainage and the project analysis areas. Relevancy was determined for this project based on habitat characteristics in the project area, associated drainage(s), and species' home range sizes.

### **Threatened and Endangered Species**

Bald eagles (*Haliaeetus leucocephalus*) (threatened species) are not present in the project area. Grizzly bears (*Ursus arctos horribilis*) (threatened species) are not known to inhabit the project area. Gray wolves (*Canis lupus*) (threatened species) are not known to inhabit the project area. Canada lynx (*Lynx canadensis*) (threatened species) are not known to inhabit the project area, and the project area is not located in a Lynx Analysis Unit (LAU). Woodland caribou (*Rangifer tarandus caribou*) occur on the IPNF, but not in the Central Zone.

### **Sensitive Wildlife Species**

Sensitive wildlife such as Coeur d'Alene salamander (*Plethodon idahoensis*), boreal toad (*Bufo boreas boreas*), northern leopard frog (*Rana pipiens*), common loon (*Gavia immer*), harlequin duck (*Histrionicus histrionicus*), northern goshawk (*Accipiter gentilis*), peregrine falcon (*Falco*

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*peregrinus*), flammulated owl (*Otus flammeolus*), black-backed woodpecker (*Picoides arcticus*), Townsend's big-eared bat (*Corynorhinus townsendi*), fisher (*Martes pennanti*), and wolverine (*Gulo gulo*), may occur or have habitat present in the Central Zone.

### **Management Indicator Species**

Management Indicator Species (MIS) for this project include pileated woodpecker (*Dryocopus pileatus*), American marten (*Martes americana*), and Rocky Mountain elk. There are two sightings occurring in the Central Zone (USFS 2002a) for pileated woodpeckers, and none in the project area. The project area is located in relatively poor pileated woodpecker nesting habitat when compared to other parts of the IPNF due to insufficient presence of large (> 63 centimeters (25 inches) dbh) trees for nesting habitat. Therefore, the project will have no impact on pileated woodpeckers or their habitat.

The wildlife sightings database contains 12 sightings in the Central Zone (USFS 2002a) for American marten. The proposed mine site is located in the currently non-productive capable habitat, but is not within suitable habitat polygons. The project area, however, lacks the large diameter downed and woody debris used for denning and foraging in winter, and the project will have no impact on marten.

The IPNF Forests Plan (1987) Winter Range designations place the project area in Management Area 1. The project is located at a higher elevation than most areas in this classification (under 975 meters, 3,200 feet). The Silver Strand project area has little if any suitable habitat, will not increase road densities or human access, and therefore will have no impact on elk.

### **Habitat Analyses**

Suitable and capable (future or potential) habitats were quantified for lynx, flammulated owl, northern goshawk, and fisher in a one mile radius analysis area surrounding the project area. No suitable habitat exists in the project area for boreal toad, northern leopard frog, common loon, harlequin duck, peregrine falcon, flammulated owl, pileated woodpecker, black-backed woodpecker, or wolverine. The one-mile radius analysis area contains some suitable habitat for fisher, but the proposed mine site is located in the currently non-productive capable habitat, and is not within suitable habitat polygons. We did not analyze this species further because the project area lacks the large diameter downed and woody debris used for denning and foraging in winter (limiting factors for suitable fisher winter habitat).

Species that received further alternatives analyses were selected based on suitable habitat presence in the project area, and the expected measurable effect of project operations on that species' habitat. The evaluation process identified three species, the Coeur d'Alene salamander, northern goshawk, and Townsend's big-eared bat, for alternatives analysis. Although no suitable goshawk nesting habitat occurs in the project area, we analyzed effects of overstory removal on this species relative to foraging habitat. The Coeur d'Alene salamander was further evaluated because there is very little information regarding presence or absence in the Central Zone, and the project site contains potentially suitable seasonal habitat which will be affected by project operations. Refer to the Wildlife Specialists Report for details (GANDA 2004c).

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## 3.6 Geology, Soils, and Geotechnical Considerations

### 3.6.1 Geology

Bedrock at the Silver Strand site consists of the Belt Supergroup of the northern Idaho Panhandle. The Belt Supergroup consists of many tens of thousands of feet of sands and silts of Precambrian age that have been metamorphosed to argillites, siltites, and quartzites. Bedrock in the upper Lone Cabin Creek watershed is extensively faulted, with primarily northwest-southeast trending faults present (Lewis et al. 2002). Bedrock exposed at the site is highly fractured quartzite (metamorphosed quartz sand, highly inert) and fractured siltite (i.e., weakly metamorphosed interbedded siltstone and fine sandstone). Basalt dikes are present in the subsurface. Mineralization appears to be along a shear zone that trends to the northwest. This shear zone may be related to the Burnt Cabin fault, located southwest of the site. The mineralization occurs as sulfide stringers and may locally include disseminated sulfides. Elevated heavy metals concentrations occur within mineralized zones (both ore and non-ore grades). The mineralized and/or altered quartzite is net acid generating (net neutralizing potential [NNP] of -14.3 tonnes of calcium carbonate); the siltite and the basalt dikes are acid neutralizing (NNP of 14.8 and 212.7 tonnes of calcium carbonate, respectively).

Previous underground mining at the site began in the 1960s, and continued through the 1970s. In 1981, the USFS obtained permission to use stockpiled mine rock from the eastern side of Lone Cabin Creek for road repair following spring flooding. The total amount of rock used was reportedly 800 cubic yards, however there are no records regarding the exact location where this rock was placed.

Also in 1981, the upper workings of the mine were purposefully blasted to fill the glory hole after mining intentionally stopped to the surface to recover ore. This blasting formed a deep depression at the surface involving an estimated 11,500 to 20,000 cubic meters (15,000 to 25,000 cubic yards) of material. (Dail, pers. comm. 2004). Site activities in 1982 centered on mitigating this slump; the side walls of this slump have since further collapsed. USFS records next documented activity in 1988, when a notice of intent was filed by the Silver Trend Mining company for bulldozer cuts on “geochemical soil anomaly and geologic projections” (USFS 1988).

In the early 1990s the U.S. Bureau of Mines conducted several experiments at the site to investigate fluid flow and associated leaching of metals through gob-backfill (USFS 1991). While some investigation took place, the U.S. Bureau of Mines did not complete any leaching activities. This work was conducted with the assistance of Mine Systems Design [MSD]; MSD had taken over the rights to the Silver Strand Mine by this time. Two exploration drilling programs were completed by in the past six years, one in 1997 (by Silver Trend Mining) and one in 2002 (by New Jersey Mining). The results of the second subsurface investigation were sufficiently positive that a POO was developed to mine the ore.

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### **3.6.2 Topography, Soils, and Geotechnical Conditions**

The headwaters of Lone Cabin Creek are to west-southwest of the site. The creek flows generally eastward, then bends around Lone Knob to the north toward Burnt Cabin Creek approximately 0.6 kilometers (0.4 miles) south of the No. 3 portal. Site slopes are generally straight, with natural slopes ranging from approximately 40 to 75 percent. A weakly defined swale occurs approximately 80 meters (260 feet) south of the existing No. 3 portal, and a more pronounced swale (site of the proposed RSS) is present 190 meters (620 feet) south of the No. 3 portal. The Lone Cabin Creek valley bottom is several tens of meters (few hundred feet) wide upvalley from the site, but constricts opposite the No. 3 portal for nearly 0.5 kilometer (0.3 mile) downvalley to the north.

Slopes across much of the site range from 33 to 36 degrees. Slopes along the existing development rock storage area immediately below the No. 225 Level are approximately 37 degrees. Slope creep, as evidenced by numerous pistol-butted trees, appears to be the dominant process on the native slopes. The existing road system appears to generally be in good condition. Existing grades on the access roads to the upper levels range up to approximately 10 percent. Road cuts in the existing colluvium are stable and have slopes up to 40 to 50 degrees.

Soils consist of a fine-grained sandy colluvium with some gravel and silt overlying bedrock. The thickness of these soils is variable but is typically two to three meters thick. The gravel content increases with depth across the site and the silt content appears to increase with elevation. Productivity of the site is limited due to steep slopes and thin soils (USFS 2003b). A typical surface soil horizon has 10-60 percent rock fragments. Subsurface horizons typically have 35-75 percent rock fragments. Soil horizons grade into weathered bedrock with up to 95 percent rock fragments.

Geotechnical issues associated with the existing mine workings and surrounding topography are related to the shear zone that hosts the ore body. Several significant slope failures have occurred where this shear zone crops out on the land surface. This area is more prone to slope instability due to the highly sheared nature of the bedrock. On the access road to the No. 2 portal, upslope erosion and slope failure associated with the No. 225 portal has reached the outside of this road. Future erosion is likely to impact this road further. The slopes behind the No. 3 portal have failed and the headscarp has eroded and migrated upslope. This does not appear to represent an imminent threat to upslope mine workings; however, it is likely to continue and further erode soils and colluvium upslope. Previous mining activities apparently excavated to the ground surface in the vicinity of the upper level, resulting in necessary blasting to collapse the stope. Roof collapse and adit instabilities have also occurred elsewhere within the mine workings, particularly within the plane of the shear zone.

### **3.7 Cultural Resources**

Cultural surveys have been completed in 2003 by the District Archeologist. No evidence of historical cultural resources were identified and the project is consistent with heritage program laws.

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## **3.8 Additional Resource Areas**

### **3.8.1 Recreation and Trails**

There is substantial recreational use of the lands surrounding the project area and within the cumulative effects area; however, most of the use consists of recreationists traveling through the area using FR 411 or FR 206 to access the areas in the Burnt Cabin drainage. Snowmobile users are active in the area during the winter months and campers travel through and use the staging area as a campsite. There are no existing forest-maintained trails in the project area or within the cumulative effects area.

### **3.8.2 Wilderness**

There are no lands proposed to be, or currently designated, as wilderness within the project area or the cumulative effects area.

### **3.8.3 Experimental Forests**

Deception Creek Experimental Forest is located southeast of the Silver Strand project site in an adjacent watershed. The Forest includes the entire Deception Creek drainage, a tributary of the North Fork of the Coeur d'Alene River. The area encompasses 1,425 ha (3,520 acres) with elevations ranging from 840 to 1,400 m (2,800 to 4,600 ft). Many other small drainages influence the forest's topography by creating predominantly north- and south-facing slopes with slope angles ranging from 35 to 80 percent. When the forest was established in 1933, large old-age western white pines were important for producing lumber products. Since the 1940's western white pine on the forest has decreased due to white pine blister rust. Research has also included work on site preparation, fire effects, insects and disease, and watershed studies. Other studies on the forest include fire effects on sedimentation and soil nutrients, management effects on overstory and understory species composition, growth and yield, forest genetics, and root disease.

### **3.8.4 Rangelands**

There are no lands considered rangelands within the project area or the cumulative effects area. There is one ongoing grazing allotment that includes portions of the cumulative effects area; however, the character of this portion is timbered and steep and is not currently managed to provide range resources.

### **3.8.5 Roads**

Forest Road (FR) 411 is the main access to the project site, running north-south between the steep project hillside on the west and Lone Cabin Creek to the east. The topography is steep, and few recreational destinations or attractions exist in the area. No developed sites or trailheads are located here. A non-developed landing that is used for camping is located east across Lone Cabin Creek from Adit #3, and is accessed by a short gated road with an underlying culvert.

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FR 411 has been used for timber harvest activities. FR 411 is generally in use through big game season in the fall and normally drifts shut some time in December. FR 411 is maintained for snowmobile use in the winter months. The road usually remains impassible to wheeled traffic until spring. The primary recreation users of the road include firewood gatherers, ATV enthusiasts, and hunters. FR 411 was originally scheduled to be obliterated as part of the Barney Rubble Timber Sale transportation plan, but eventually the Timber Sale was modified and the requirement for road obliteration was recinded. Funding was never obtained for the roads (FR 544-544D) intended to replace FR 411 as an access point to the mine (USDA 1996, addendum USDA 1998b). However, the addendum to the transportation plan does still call for obliteration of the portions of FR 411 from Adit #3 to the junction with FR 206 and from the intersection with FR544 to Five Finger Saddle. If this addendum was still in force, it would require a change in the POO regarding the proposed haul route which currently uses the length of FR 411 for access to FR 206 for hauling ore to the mill site. However, due to engineering and funding constraints and to public input, the 2001 Coeur d'Alene River Ranger District Travel Plan lists Fr 411 as an unrestricted travel route.

Adit #2 is accessed by another FR spur road off of FR 411 that is gated and restricted from standard road vehicle type uses. It has been cleared of brush as far as the adit area, but impassible beyond that point. This road passes above the proposed waste rock dump.

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## CHAPTER 4. Environmental Consequences

The purpose of Chapter 4 is to describe the effects that could occur under each alternative analyzed, including the No Action Alternative. Discussions focus on the most significant effects, while other effects are discussed briefly. This chapter also discusses the potential for cumulative effects, which are the combined effects of an alternative added to the effects of past, present and reasonably foreseeable actions.

The amount of detail presented in this chapter varies, depending on the nature of the resource affected, the relative significance of the potential effects on that resource, and the scale of analysis most informative or relevant for the resource.

The implementation of Alternative 1, the No Action Alternative, would deny approval of the Plan of Operations, thereby denying the operator's ability to explore for and remove minerals. Under the 1872 Mining Law (as amended), lands that have not been withdrawn, appropriated, or segregated from location and entry are open to exploration and mining. Therefore, Alternative 1 will be analyzed only as a point of reference to evaluate the level of environmental consequences comparing the action alternatives to the status quo.

**Direct effects** are caused by the action and occur at the same time and place (40 CFR 1508.8).

**Indirect effects** are caused by the action and occur later than the action or are farther removed geographically (40 CFR 1508.8).

**Cumulative effects** are those affecting the environment as a result of the incremental impact of the action, when considered with other past, present and reasonably foreseeable actions (40 CFR 1508.7).

The estimated effects described in this chapter are based on current knowledge of the environmental conditions, past, present and reasonably foreseeable activities, and the effects of management actions on Federal lands. Activities that will occur off USFS lands (e.g., at the NJMC mill near Kellogg) are analyzed in the Supplement to this EA (Appendix A).

Reasonably foreseeable actions in the project and cumulative effects area for the project known at the time of the preparation of this EA include ongoing activities such as the nearby grazing allotment, routine road use by the public during recreational activities, road maintenance by the Forest Service, normal resource inventory and monitoring activities and mine access. A road reconstruction project along Burnt Cabin Creek is in the planning stages, but no date has been set for implementation nor are sufficient details available to include them in this analysis. No other actions are scheduled in the reasonably foreseeable future. Other activities that could occur, but are not scheduled at this time could include fire and fuels treatments, timber harvest and other management activities conducted under the auspices of the IPNF Forest Plan. Should any of these activities occur, the cumulative effects analyses required under NEPA for those actions will need to include a review of the ongoing mining operations.

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## 4.1 Water Quality

Key issues for water quality are to the potential for sediment delivery from disturbed portions of the watershed, discharge of mine drainage waters to Lone Cabin Creek, and the long-term potential for metals-rich waters to be generated at the base of the RSS and reach Lone Cabin Creek through surface or shallow surface pathways. The operations are designed to minimize these impacts. Based on the proposed POO, sediment delivery remains of greatest concern. Sediment delivery from existing watershed disturbance is sufficient to impair surface waters now; proposed watershed restoration projects and improvement in sediment control from timber harvest activities will reduce sediment delivery over the long term. Relative to the proposed action and alternatives, sediment is expected to be delivered to FR411 from the RSS (common to all alternatives) and the access road (no detectable difference in sediment delivery between the proposed and alternative configurations) at peak rates of 1-2 orders of magnitude over existing rates without aggressive use of erosion and sediment control BMPs. Of lesser concern for sediment delivery is the access road to the injection well site, which would be eliminated by selecting Alternative 4.

### Methodology

Analysis of changes in water quality is based on assessment of stream conditions and potential pollutant sources under the alternatives, as well as knowledge of proposed mining techniques. Modeling of soil erosion and sediment delivery was used to predict the potential for additional sediment delivery to Lone Cabin Creek from project alternatives, as described in MacDonald and Schick (2004).

#### 4.1.1 Direct Effects

##### Alternative 1 - No Action

In the absence of mining activity, the existing mine drainage would continue to drain into the roadside ditch and percolate into the subsurface. Some metals may reach the stream because of the close proximity of the drainage pathway to the creek. FR 411 and other nearby roads in the Lone Cabin Creek drainage would continue to deliver sediment to surface waters at approximately current rates from both surface erosion processes and—where FR411 is adjacent to the stream—potential future erosion of the road fill. These processes would continue until such time as the roads are rehabilitated to include sediment and erosion control best management practices, are closed to traffic, fail catastrophically, or are removed. Both the Forests Plan and the Inland Native Fish Strategy (INFISH) Amendment (USFS 1995) and the TMDL are designed to reduce delivery of sediment to watercourses; the rate of implementation of corrective measures is constrained by available budget. Little monitoring has been done on Lone Cabin Creek regarding the amount of sediment or mine contaminants that enter the creek. Any impacts that currently exist would be expected to continue under this alternative.

##### Alternative 2 – Permit Operation as Proposed April 3, 2003

Potential effects of water quality changes on aquatic communities and their habitat(s) may result from mine operations, including point and non-point source discharges, and changes in flow

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regimes due to disturbance of underground hydrology. Parameters of concern are sediment, pH, and heavy metals.

Existing sediment delivery to surface water from the watershed and forest road network would be unaffected by the proposed action. Therefore, sediment delivery from the proposed action would occur in addition to current and future sediment loading from the watershed. Sediment would be generated by soil erosion associated with mining activities, particularly the construction of the internal access road and, to a lesser extent, the RSS. Of concern for water quality is not that soil would be eroded, but that the eroded soil would be delivered to surface waters. Soil erosion modeling using FS-WEPP (Water Erosion Prediction Project; Elliot et al. 2000), as described in MacDonald and Schick (2004) demonstrates that without aggressive erosion and sediment control BMPs, there is a high likelihood of sediment delivery to FR 411 from project elements. At the RSS, soil erosion on a topsoil-covered and unplanted reclaimed surface without BMPs would be on the order of 300 times natural rates, decreasing to approximately 4 times natural rates by the time shrubby vegetation was established (5-8 years post-planting), and eventually reaching current erosion rates by 20-years post-planting. Sediment delivery from hillslope segments in the vicinity of the access road would be expected to be approximately 40 times natural rates without BMPs while the road is in use, again decreasing following removal and reclamation to something near natural rates by 20-years post-reclamation.

FR 411 provides a buffer between the area disturbed by mining and Lone Cabin Creek limiting sediment delivery from the mine site to the creek, but it is not sufficient to accomplish this without aggressive erosion and sediment control BMPs. BMPs proposed by the applicant for access road construction would be insufficient to control sediment delivery from the access road. However, with the addition of those BMPs described as mitigation measures in Chapter 2, excess sediment delivery to Lone Cabin Creek would be effectively eliminated. Sediment generated by mine truck traffic alone would be controlled with the seasonal or annual application of calcium flake. This material is sufficiently inert and bound by soil to have no inherent impacts on water quality when properly applied.

The Silver Strand POO addresses the waste rock quality and suggests that acid mine drainage should not be a problem. The pH of the mine drainage on September 17, 2003 was 7.1 (Fisheries Specialist Report; GANDA 2004a), but the character and/or quantity of the mine drainage may change once active mining begins because the excavation may disturb deposits that could generate more groundwater or that may have different compositions than the current exposed rocks. Other components of the mine drainage, such as arsenic (As), appear to be generated at low enough levels to meet IDEQ and EPA guidelines for direct discharge to surface water (190 ppb (parts per billion)) (IDEQ 2003a). Flotation reagents would be removed from the mine tailings prior to transport back to the mine site for dumping, and the tailings would be covered and contained to prevent surface runoff prior to the tailings being used as paste backfill.

The injection well proposed to handle excess mine drainage during the active mine season (April to December) would direct water into a zone of fractured quartz downstream from the Silver Strand mine site. The well would have an un-perforated case to a depth of 5.5 meters (18 feet). The well would have to be registered as an underground injection control (UIC) device and

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permitted through IDEQ. In order to meet the State antidegradation clause for water quality, NJMC would need to demonstrate that the well site is hydrologically separate from any aquifers feeding Lone Cabin Creek (G. Harvey, pers. comm. 2003). IDEQ suggested that at a minimum the well would need to be tested using biodegradable fluorescent dye or another acceptable water tracing method prior to active mining and at least once a year during each active season (G. Harvey, pers. comm. 2003). In addition to testing for hydrologic isolation, the receiving water in the well would need to be tested to demonstrate that the mine drainage pumped into the ground water would not degrade existing ground water quality. Mr. Harvey of IDEQ, in consultation with an IDEQ hydrologist, was of the opinion that much of the groundwater in the area carries iron (Fe) and zinc (Zn), but NJMC would need to conduct their own water test to confirm this for the proposed well site. The limited groundwater data from seeps near the No. 2 Portal discussed above suggest that iron and zinc do not exceed groundwater standards, although lead and cadmium do exceed these standards slightly in some samples. Even if not influenced by mine workings, the groundwater sampled by USBM is likely influenced by a mineralized zone and may or may not be representative of regional groundwater quality. Any mine discharge water disposal action would require a monitoring program and would need to be permitted by IDEQ (State of Idaho 2003).

NJMC proposes to disconnect the sump settling tank and injection well during the inactive season (January to March) and allow the mine portal drainage to discharge as it currently does, along the drainage ditch on the west side of FR 411. However, NJMC's mining activities may affect both the quantity and quality of the mine drainage. The nature of these effects cannot be predicted with the accuracy needed to determine whether the portal discharge would comply with ambient water quality criteria, either directly or after filtration through the FR 411 roadbed and adjacent Lone Cabin Creek floodplain sediments. Hence, aggressive monitoring of mine portal discharge and other environmental quality is a required mitigation measure. If the mining activities do change either the quantity or constituents of the mine drainage, allowing it to drain as it does now may constitute a degradation of the surface water quality in Lone Cabin Creek. At least a small portion of the mine drainage was observed to drain via a small culvert under FR 411 onto the banks of Lone Cabin Creek (Fisheries Specialist Report; GANDA 2004a). The culvert is in a dip in the road that would be filled as part of the POO, but the buried culvert would need to be removed to prevent the direct conveyance of the mine drainage into the creek.

It is the operator's responsibility to ensure that no potentially contaminated (e.g. from sediments or metals) mine drainage water reaches Lone Cabin Creek either via surface flow or infiltration into an underground aquifer connected to the creek under the State's antidegradation clause (Harvey, pers. comm. 2003). It is also the operator's responsibility to obtain a stormwater permit from the EPA when they are applying for the other required permits for the proposed mining activities.

Metals-rich drainage water could be generated within the RSS through leaching mineralized portions of waste rock by infiltrating rainwater. This process is exacerbated when rainwater reacts with sulfide minerals in the waste rock to produce sulfuric acid that in turn increases the leaching rate of metals. ARD is rare in the Coeur d'Alene mining district due to the nature of much of the host rock (metamorphosed coarse and moderately coarse-grained marine sediments). The magnitude of these metals-weathering processes at this site cannot be evaluated directly due

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to the lack of appropriate data and limitations of available landfull water balance and effluent models. Even with the proposed runoff controls and reclamation, water would be expected to move through the RSS. It is expected that most of the water would infiltrate into the colluvium lining of the RSS where metals would be physically and chemically retained, and from there into groundwater in the shallow bedrock. This groundwater may or may not be connected to Lone Cabin Creek.

Acid-base accounting shows that the rock types expected in the waste rock are not, in bulk, net acid-generating, but there is insufficient detail on the rock quality that will actually be removed and placed in the RSS to ensure now that ARD might not occur at some point in the progression of mining. An aggressive testing and monitoring program for waste rock quality, with appropriate corrective actions if necessary, is a required mitigation measure to overcome this data gap. Based on the ambient quality of the portal discharge, low concentrations of metals could occur in waters draining the RSS even without ARD. Mitigation testing and monitoring would also improve the prediction of what these metals concentrations would be. It is expected that these metals would be subsequently bound in subsurface geologic materials during infiltration, and would not result in levels exceeding surface or groundwater quality standards.

Tailings stockpiled onsite in preparation for incorporation into the paste backfill are expected to be inert. To avoid erosion and downslope delivery of sediment from these monthly stockpiles, the tailings would be contained by a timber crib wall and would be covered by a tarp.

As with any activity involving vehicles and machinery in close proximity to a stream, there is the potential for spills of stored fuel and other toxic chemicals that could adversely affect aquatic communities and their habitat. NJMC's POO has provided for secondary containment of fuel and the explosives would be stored within the mine; minimizing the risk of on-site spills. In addition, NJMC has filed a spill response plan as part of their POO.

If there is a need for the placement of fill material associated with the culvert removal, a Section 404 permit would be required under the Clean Water Act. The 404 permit is issued by the U.S. Army Corps of Engineers. Although similar activities such as culvert replacements are typically considered as maintenance activities which are permitted under Nationwide Permit 3, IDEQ would need to certify the culvert work under Section 401 of the Clean Water Act (G. Rayner, U.S. Army Corps of Engineers, pers. comm. 2003), since Lone Cabin Creek is on the 303(d) list for impaired waters (G. Rothrock, IDEQ, pers. comm. 2004).

### **Alternative 3 – Additional Onsite Mine Discharge Water Storage**

Alternative 3 would potentially decrease the amount of contaminants that could reach Lone Cabin Creek by redirecting the mine discharge and reincorporating it into the mineshaft system as part of the backfill. Other water quality-related impacts due to truck traffic and ground disturbance would be the same as those described in Alternative 2. Alternative 3 would also decrease the need for water diversion from Lone Cabin Creek, potentially to zero. Any reduction in the amount of water diverted from the creek would be considered a beneficial impact to fisheries.

### **Alternative 4 – Land Disposal of Mine Discharged Water**

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Alternative 4 would have a similar potential reduction in water quality impacts due to the redirection of the mine discharge as Alternative 2. Although a specific IDEQ land application of wastewater permit would not be required, NJMC would need to show by virtue of system design, maintenance, and monitoring that all applicable surface water and groundwater criteria would be met for any land application of mine wastewater. Because the water would be distributed on or immediately below the ground surface, a relatively large area of soil would act as a filter to remove metals instead of the relatively inert bedrock at the site of the proposed injection well or the roadbed of FR 411. To the extent that the mine discharge waters contain heavy metals or other pollutants, the soils and vegetation would become enriched as well. Mass balance calculations suggest this enrichment would not be sufficient to contaminate the soils (MacDonald and Schick 2004). Either a shallow buried system analogous to a septic drain field or a surface discharging system could be used. The buried system would have the advantage of functioning year round; it would be a rule authorized UIC requiring only registration with IDEQ. The buried system would require additional ground disturbance to install, and would therefore require appropriate erosion and sediment control BMPs and reclamation to eliminate sediment delivery from this system. The dispersal area for a surface discharging system is more flexible in location, and should be periodically moved so that water discharge does not result in runoff that could introduce contaminants into surface waters. A surface discharging system would have to be disconnected during the winter, and portal discharge would drain to the FR 411 ditch as it does now.

With land disposal, the access road to the injection well site would be eliminated, thereby eliminating a potential source of sediment to Lone Cabin Creek. Other water quality-related impacts due to truck traffic and ground disturbance would be the same as those described in Alternative 2.

### **Alternative 5 - Modified Development Rock Storage**

Alternative 5 is intended to promote the lateral dispersion of water that infiltrates the RSS away from the center of the swale at the base of the RSS, allowing metals released by weathering of the development rock to be dispersed at the base of the RSS rather than concentrated in the axis of the swale. Placement of dike rock preferentially at the base of the RSS would concentrate acid-neutralizing material closest to sensitive receptors (i.e., the inboard ditch of FR 411 and the aquatic system) to provide a final “polishing” of vadose-zone and shallow groundwater, with the intent of buffering any ARD that would develop and further reinforcing the binding of metals within the soil column. All other direct effects of this alternative are the same as those described for Alternative 2.

### **Alternative 6 - Alternative Site Access**

Alternative 6 would not appreciably change the direct water quality related impacts of the POO because it would not change the overall area of disturbance outside of the footprint of the RSS. Soil erosion modeling indicates that there would be no significant decrease in predicted sediment delivery from Alternative 2 because of the decrease in overall slope of the access route.

### **Alternative 7 - Maintain FR 411 Open**

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Alternative 7 basically combines the amount of traffic generated sediments under the No Action Alternative, with the additional traffic due to the POO as proposed (Alternative 2). There would be no additional direct impacts to water quality under this alternative.

#### **4.1.2 Indirect Effects**

Analysis of indirect effects was based on assessments of project-related activities likely to occur outside of the project area and evaluation of potential long-term impacts due to alterations in water quality caused by project actions, as well as knowledge of existing and past projects that have used similar mining techniques. The area of indirect effects evaluated for water and soil resources for this project includes the direct effects area, the entire haul route, and areas downslope of the haul route to surface water bodies. There are no predicted indirect effects on water quality, except for those associated with the existing artificially collapsed stope above the No. 1 level (common to all alternatives) and haulage of materials to and from the site (common to Alternatives 2 through 7).

Indirect effects of the current stope collapse are associated with water moving through the existing mine workings. The relationship between water transport through the soils and migration of waters into the bedrock has not been established. If significant waters are infiltrating rapidly to the bedrock system from the soils rather than flowing through the soil overburden, metals-rich and/or ARD impacted waters could reach the bedrock groundwater system and potentially impact bedrock groundwater quality. To the extent that the current stope collapse is moderated by the paste backfill used in the proposed mining activities, any indirect effects of this feature would be moderated. These effects are not quantifiable with available data, and could only begin to be quantified with an extensive additional site investigation program.

Indirect effects of haulage under the proposed action include the potential for increased: fine sediment generation on road surfaces due to truck traffic; spills of ore into surface water bodies on the outbound trips; and spills of and tailings, fuel, or explosives on the inbound trip. Proposed trips are not so high as to affect overall traffic on the proposed haul route, so there would not be an expected detectable increase in sediment loading or increase in spills due to traffic considerations. However, a heightened sensitivity to spill potential exists because a substantial portion of the proposed haul route is located close to surface water bodies, many of which have a TMDL for sediment (B. Schuld, pers. comm. 2003). Of the 53.1 kilometers (33.2 miles) between the No. 3 portal and I-90, fully 20 percent of the distance is within approximately 65 feet laterally of riverbanks, as shown on U.S. Geological Survey (USGS) quadrangle maps. In several locations along the Little North Fork in particular, the fill slope of the road *is* the riverbank. The most likely effect of a spill would be to add up to 1 load (approximately 6-12 cubic meters (or cubic yards)) of sediment to a river system that is already impaired by excess sediment.

#### **4.1.3 Cumulative Effects**

A determination of the cumulative effects analysis area is based on each fish species' ability and likelihood to migrate seasonally within a drainage area in relation to available habitat, and life stage, and boundaries that represent the point of diminishing potential effects. Because we are

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focused on waterborne sediments and potential pollutants, the extent of the effects area is determined by how far downstream these constituents are likely to travel and have an effect on habitat or aquatic species. For the Silver Strand project, the cumulative effects analysis area was determined to be Lone Cabin Creek, from the headwaters to its confluence with Burnt Cabin Creek and continuing downstream 0.8 kilometers (0.5 miles), equivalent to the area used for evaluation of cumulative effects to fisheries resources (Fisheries Specialist Report; GANDA 2004a).

In addition to the specific activities identified for each alternative, other activities are ongoing or reasonably foreseeable to occur. These activities have the potential to alter various aspects of watershed conditions. Protective measures will be recommended and incorporated into the designs for future projects as part of their environmental review allowing watershed resources to be maintained. Effects to water and soil resources can be expected from these activities, and any action alternative under this analysis is considered to have additive effects when combined with the No Action Alternative. All projects identified as reasonably foreseeable will need to complete informal consultation with the U.S. Fish and Wildlife Service (USFWS) prior to decision, unless the project is found to have no effect on any threatened and endangered species. Evaluation of water quality effects would be required as part of that consultation.

Ongoing actions include a grazing allotment for 45 cow-calf pairs that includes the area north of Cascade Creek along the Little North Fork Coeur d'Alene River (Iron Mokins). These livestock could be in the Lone Cabin/Burnt Cabin area from June to September and are rounded up near the mouth of Burnt Cabin at the end of the season. The Fisheries Specialist Report (GANDA 2004a) documented observed evidence of cattle use along the FR 411 and in the stream channel upstream of the project area during our site visit in September, but not within the project area where the stream channel is incised and probably not easily accessed by cattle. Water is available and grazing forage is much more attractive near the Burnt Cabin confluence downstream of the project area. In addition, NJMC intends to close access to FR 411 during the allotment period, which would prevent most cattle from accessing the area.

The foreseeable future actions in the cumulative effects analysis area (other than the proposed Silver Strand project) related to the road project along Burnt Cabin Creek cannot be evaluated at this time because of a lack of specific project details. The ongoing impacts from the grazing allotment appeared to be minimal in the project area based on our field observations, which would have coincided with the end of the grazing season. However, livestock grazing is a common contributor of sediment due to cattle congregating within riparian areas. There are currently no private lands within the analysis area; therefore, activities and actions on private lands were not considered.

To determine any future activities on National Forest lands, the Forest Service's Schedule of Proposed Actions (SOPA) was reviewed. The Forest Service has one planned future action, a road construction and obliteration project that will affect approximately 1.6 kilometer (1 mile) of riparian area along Burnt Cabin Creek downstream from its confluence with Lone Cabin Creek Fisheries Specialist Report (GANDA 2004a), in the Silver Strand cumulative effects analysis area. The road reconstruction project is still in the very early planning stages and a location for the new road alignment was not available at the time of this report (Fisheries Specialist Report;

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GANDA 2004a). Additionally, the site is located in a management area geared toward timber production. Therefore, wildfire and fire management must be considered within the scope of cumulative effects.

Timber harvest and wildfire/fire management are both reasonably foreseeable actions in the Lone Cabin Creek watershed, although there are no specific plans for either at this time. Conventional (rather than aerial) timber harvest disturbs ground to provide access and to transport logs from where they've been felled to offsite transport. Fire management may include thinning or prescribed burns prior to a wildfire, or construction of fireline following a fire. Potential increases sediment yield or runoff in the watershed from these activities can be controlled or mitigated with appropriate BMPs, including revegetation. The proposed road obliteration project is another type of activity that can reduce long-term sediment yield. There are no additional proposed actions on Federal lands in the project area or cumulative effects area that need to be considered in this analysis.

Cumulative effects under Alternative 1 are those associated with long-term land management in the Lone Cabin Creek drainage for commercial timber production and other forest uses (e.g., recreation), specifically in relation to sediment delivery to Lone Cabin Creek. Active rehabilitation or retirement of roads in the watershed, along with erosion and sediment control BMPs applied to individual timber harvest sales, should, over time, reduce sediment delivery to Lone Cabin Creek, as would watershed restoration options contemplated in either the Barney Rubble's Cabin timber sale or other future timber sales. These activities are expected in the Forests Plan (USFS 1987), plan amendments, and the upcoming plan revision (USFS 2003a). None of these documents now commits to a specific implementation schedule, so beneficial impacts associated with this reduced sediment delivery cannot be quantified. Weathering of rock in the existing mine workings may result in alterations of the metals loading rates and spatial loading patterns within the Lone Cabin Creek drainage. The lack of pre-mining baseline data prevents the nature of this effect, if any, from being understood.

The additional cumulative effects of Alternatives 2 through 6 are primarily related to short and intermediate-term increases in sediment delivery from direct disturbance of slightly over one hectare of thin but moderately productive forest soils. Mine traffic would be expected to be less than the existing recreational traffic because of closure of FR 411 in the vicinity of the mine. Increased releases of metals over geologic rates from the proposed action, if present, are not expected to be detectable even at the local scale due to the releases associated with existing conditions (i.e., presence of existing underground mine workings).

The additional cumulative effect of Alternative 7 would be those listed for Alternatives 2 through 6, except that both existing recreational or land-used based and proposed mine traffic would co-exist. While this could slightly increase the rate of fine sediment generation on road surfaces, overall observed and proposed traffic volumes are so low that any effects of this on sediment delivery could not be detected.

## 4.2 Hydrology

### Methodology

Changes in site hydrology were qualitatively evaluated based on the patterns of proposed disturbance to the existing site drainage.

#### 4.2.1 Direct Effects

Direct effects on site hydrology (i.e., water *quantity* and partitioning of rainfall between surface runoff and subsurface recharge) would be very localized in space. Under Alternative 1, shallow seeps from the hillside that would be most disturbed by mining activities could decrease as the forest canopy becomes more mature due to both increased winter interception and increased evapotranspiration during the rest of the year. Over the period of mining (i.e., <10 years), this effect would be negligible. Under all action alternatives (Alternatives 2 through 7), only limited portions of the site would become impervious (e.g., the pole building site). Therefore, no changes in site runoff would be expected other than a slightly greater occurrence over short distances of surface (vs. subsurface) runoff on disturbed and compacted surfaces such as the access road. This runoff would infiltrate upstream of Lone Cabin Creek. No change in streamflow in Lone Cabin Creek would be expected during the period of mining.

#### 4.2.2 Indirect Effects

No indirect effects on hydrology are expected.

#### 4.2.3 Cumulative Effects

No cumulative effects on hydrology are expected.

## 4.3 Fisheries

Table 2 lists all of the threatened, endangered and sensitive species found on the IPNF. White sturgeon, burbot and redband trout are not known to occur on the Coeur d’Alene River Ranger District, and no potential habitats for these species occur anywhere within the cumulative effects area (IDFG 2004, AFS 2003). Therefore, **no effect** is anticipated on these species. Informal consultation was completed with USFWS for concurrence on the effects determinations for the federally listed species (B. Holt USFWS, pers. comm. 2004). Although several action alternatives have been developed as modifications of the proposed action, no alternative results in elimination of potential impacts to westslope cutthroat trout; therefore, all alternatives result in the same “impact determination,” even though the type and level of impact may differ slightly.

Table 2. Determination of effects/impacts to fish species for the Silver Strand Project.

Species		Habitat Present?	No Effect/ Impact	MIH <sup>2</sup>	WIH <sup>3</sup>	Beneficial Impact
Common Name	Scientific Name					
<b>Threatened and Endangered</b>						
Bull trout	<i>Salvelinus confluentus</i>	Yes	X			

Species		Habitat Present?	No Effect/ Impact	MIH <sup>2</sup>	WIIH <sup>3</sup>	Beneficial Impact
Common Name	Scientific Name					
White sturgeon	<i>Acipenser transmontanus</i>	No	X			
<b>USFS Sensitive</b>						
Westslope cutthroat trout	<i>Oncorhynchus clarki lewisi</i>	Yes		X		
Redband trout	<i>Oncorhynchus mykiss gairdneri</i>	No	X			
Burbot	<i>Lota lota</i>	No	X			
Torrent sculpin <sup>1</sup>	<i>Cottus rhotheus</i>	Yes	X			
<b>Management Indicator Species</b>						
Westslope cutthroat trout	<i>Oncorhynchus clarki lewisi</i>	Yes		X		
Bull trout	<i>Salvelinus confluentus</i>	Yes	X			

1. Torrent sculpin is listed as sensitive by IPNF, but not by the State of Idaho.

2. MIH=May impact individuals or habitat but will not likely contribute to a trend toward federal listing or cause a loss of viability to the population or species.

3. WIIH=Will impact individuals or habitats with consequences that the action may contribute to a trend towards federal listing or cause a loss of viability to the population or species.

A determination of the cumulative effects analysis area is based on each fish species' ability and likelihood to migrate seasonally within a drainage area in relation to available habitat, and life stage, and boundaries that represent the point of diminishing potential effects. Because we are focused on waterborne sediments and potential pollutants, the extent of the effects area is determined by how far downstream these constituents are likely to travel and have an effect on habitat or aquatic species. Sediment travel distance was based on the hydrologist's professional opinion and review of the results of FS-WEPP modeling (MacDonald and Schick 2004). For the Silver Strand project, the cumulative effects analysis area was determined to be Lone Cabin Creek from the headwaters to its confluence with Burnt Cabin Creek and continuing downstream 0.8 kilometers (0.5 miles).

## Bull Trout

There is the potential for small amounts of sediment to be introduced to Lone Cabin Creek and possibly transported downstream into Burnt Cabin Creek. However, the amount of sediment expected given the POO as written is minimal and these sediments should not have measurable impacts on the stream system. All recent surveys indicate that bull trout do not inhabit the Lone Cabin or Burnt Cabin Creek watersheds, nor have any bull trout been documented in the Little North Fork Coeur d'Alene River. ***Consequently, the action alternatives would have no measurable effect on bull trout or their habitat, and no further analysis is provided for the species.***

## Westslope Cutthroat Trout

There are documented occurrences of westslope cutthroat trout within the project area and the cumulative effects area (Lone Cabin Creek from the headwaters to Burnt Cabin Creek). In addition, the area connects to potential westslope cutthroat trout habitat downstream. There is the

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potential for small amounts of sediment to be introduced to Lone Cabin Creek and possibly transported downstream into Burnt Cabin Creek. However, the amount of sediment expected given the POO as written is minimal and these sediments should not have measurable impact on the stream system. All recent surveys indicate that westslope cutthroat trout use the Lone Cabin and Burnt Cabin Creek watersheds year round both as resident and as spawning habitat. The Silver Strand POO as written has the potential to affect individuals and populations, but the level of potential effects on the stream appears to be minimal and the operator has taken steps to reduce the potential. Therefore, the determination of effects on this sensitive species is that *the action alternatives may impact individuals or habitat, but will not likely result in a trend toward federal listing or reduced viability for the population or species.*

### **Torrent Sculpin**

The possible effects on this species are similar to those analyzed for the cold-water management indicator species (MIS), such as westslope cutthroat trout and bull trout. This species may periodically be present downstream of the cumulative effects area, but is likely absent from the project area. Torrent sculpin have been documented in the Little North Fork Coeur d'Alene River downstream of the cumulative effects area (E. Lider USFS pers. com 2003). There is the potential for small amounts of sediment to be introduced to Lone Cabin Creek and possibly transported downstream into Burnt Cabin Creek. However, the amount of sediment expected given the POO as written is minimal and these sediments should not have measurable impacts on the stream system. Because torrent sculpin are unlikely to use Burnt Cabin Creek for any appreciable period, and the effects of the proposed project will be limited to small amounts of fine sediment being introduced into Lone Cabin Creek near the active project area the effects determination for this species is that *the action alternatives would have no measurable effect on torrent sculpin or their habitat.*

#### **4.3.1 Direct Effects**

Potential concerns in the Lone Cabin Creek area are the following:

1. Potential delivery of sediments and mine drainage/contaminated waters to the creek, and transport of these materials downstream.
2. The delivery of sediment to the main channel from potential failures of the existing streamside roads, and confinement of the lower channel by infringement of the road in the riparian area.
3. Removal of water from Lone Cabin Creek for mining operations.

Sediment delivery to Lone Cabin Creek is described in Section 3.1 (Water Quality). The discussion below focuses on the habitat-related impacts of this sediment delivery. Analysis of changes in riparian disturbance is based on assessment of stream conditions and potential ongoing sources of disturbance under the alternatives, as well as knowledge of proposed mining techniques. Analysis of changes in passage and habitat is based on assessment of stream conditions and potential fish barriers under the alternatives.

### **Alternative 1 - No Action**

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In the absence of new mine development, the project area would continue to exist as a road-confined stream with the potential for sediment input from the current mine drainage, road failures, traffic, and livestock. Potential riparian disturbances would be limited to road maintenance, impacts from the on-going grazing allotment, and off-road recreational activities. The existing culvert on Lone Cabin Creek is a fish barrier (S. DeKome USFS, pers. comm. 2003). Under the No Action Alternative this barrier would continue to potentially block migrating westslope cutthroat trout.

## **Alternative 2 - Permit as Proposed**

Direct effects from the Proposed Action would include a potential for increased sediment input from ground disturbance, potential spills and potential road failures. Since the mine will be unattended from December to March, when occurrences of rain-on-snow events are most likely, there is a potential that the proposed sump and settling tank would be overwhelmed with mine drainage sediments.

Sediment could impact westslope cutthroat trout eggs and fry in Lone Cabin and Burnt Cabin Creeks. IDF&G communicated a concern that “no increase is acceptable for sediment in either creek” (R. Hennekey, IDFG pers. comm. 2003). The new main access road would be problematic in terms of sediment delivery. Furthermore, WEPP models run, suggest that the main access road, as proposed, could increase sediment delivery substantially (MacDonald and Schick 2004).

The Proposed Action would not change the channel of Lone Cabin Creek during the mining operation. After mining is terminated, the culvert in Lone Cabin Creek will be removed, and the dimension and profile of the streambed will be stabilized, which will have a positive effect on the channel. These actions will require a permit from the Idaho Department of Water resources and may require a 404 permit from the U.S. Army Corps of Engineers. The sump pump that will be used to divert water from the creek will only require a screened intake hose to be placed in the creek. Therefore, potential effects of physical disturbance or removal of aquatic habitat and associated riparian area should be minimal. However, NJMC does propose to remove water from the creek when mine drainage is insufficient to meet their water needs for operation. Therefore, there is a potential effect due to stream flow changes on aquatic habitat and biota resulting from water withdrawals. The amount of water needed as stated in the POO is small, but because withdrawals will occur during base flow periods the diversion could affect the flow level at times. Therefore, these withdrawals could adversely affect habitat for Sensitive fish species and macroinvertebrate communities. Because of the 303(d) listing of Lone Cabin and Burnt Cabin creeks for thermal effects, any water withdrawal during low-flow periods could increase water temperature by reducing the flow level and depth of pools. Increases in temperature could result in negative impacts to aquatic species. A water right would be required for withdrawal from the creek (IDEQ 2000).

The 1.2-meter (48 inch) culvert that exists on Lone Cabin Creek is a barrier to fish movement during high and low flows (S. DeKomme, USFS, pers. comm. 2003). NJMC proposes to remove this culvert after closing the mine, thus removing the barrier and potentially restoring passage.

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There is the potential for direct disturbance to habitat used by sensitive fish species during life history events such as spawning, rearing, and adult movements due to increased human presence, particularly if the miner's establish camp near the creek. However, no activities are planned that will directly impact the stream banks or channel except for the culvert removal.

NJMC proposes to close FR 411 to public use during the mining season as a safety precaution. This would limit access to Lone Cabin Creek for fishing and recreational use. However, given the size of the creek, Lone Cabin Creek is probably not often fished by recreational anglers. In addition, the public could still access the creek from the north via FR 206.

### **Alternative 3 - Additional Onsite Mine Discharge Water Storage**

Alternative 3 would potentially decrease the amount of sediment that could reach Lone Cabin Creek by redirecting the mine discharge and reincorporating it into the mineshaft system as part of the backfill. Other sediment-related impacts due to truck traffic and ground disturbance would be the same as those described in Alternative 2.

Alternative 3 would not change any aspect of the Proposed Action related to stream and riparian disturbance. If enough mine discharge water is generated to meet all mine-related water needs, this alternative could eliminate the need for the sump pump in Lone Cabin Creek, which could alleviate the potential of minor riparian vegetation and bank disruption from its placement. If this alternative does eliminate the need for water withdrawals from Lone Cabin Creek it would alleviate the potential of short-term water level fluctuations on fish movement.

### **Alternative 4 – Land Disposal of Mine Discharged Water**

If properly installed, Alternative 4 would result in no additional sediment delivery to Lone Cabin Creek than that described in Alternative 2. Alternative 4 would have a similar potential reduction in stream and riparian disturbance impacts to Alternative 3 due to the redirection of the mine discharge and the possible elimination of the sump pump from Lone Cabin Creek. Alternative 4 would have no impacts related to fish passage in Lone Cabin Creek.

### **Alternative 5 – Modified Development Rock Storage**

Alternative 5 would not have any impact on the amount of riparian and stream disturbance associated with the Proposed Action. However, this assertion is based on the geotechnical investigation proving the proposed configuration stable. If the configuration is unstable, then this alternative would create a significant risk of slope failure and potentially result in catastrophic mine waste input to Lone Cabin Creek. Assuming that the slope is found to be stable, Alternative 5 would have no impacts related to fish passage in Lone Cabin Creek.

### **Alternative 6 – Alternative Site Access**

Alternative 6 would not appreciably change the sediment related impacts of the POO as written. Alternative 6 would not change the riparian and stream disturbance related impacts because it does not affect an area near or within the riparian area of Lone Cabin Creek. This alternative would also have no impacts related to fish passage in Lone Cabin Creek.

### **Alternative 7 – Maintain FR 411 Open**

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Alternative 7 combines the amount of traffic-generated sediments under the No Action Alternative with the additional traffic from the Proposed Alternative. Alternative 7 would not have any riparian or stream disturbance-related impacts in addition to those under the Proposed Action, nor would it have any impacts related to fish passage in Lone Cabin Creek.

### **4.3.2 Indirect Effects**

#### **Methodology**

Analysis of indirect effects was based on assessments of project-related activities likely to occur outside of the project area and evaluation of potential long-term impacts due to alterations in habitat caused by proposed project actions, as well as knowledge of existing and past projects that have used similar mining techniques.

#### **Alternative 1 – No Action Alternative**

Under the No Action Alternative there would be no indirect effects to the stream or the fisheries resources.

#### **Alternative 2 – Permit Operation as Proposed April 3, 2003**

Indirect effects of the Proposed Action will include potential for spills of mined materials, petroleum products, and explosives during transport along USFS and other public roads. In addition, because the haul route crosses at least three 303(d) listed streams (Burnt Cabin Creek, Little North Fork Coeur D'Alene River, and South Fork Coeur D'Alene River) there is additional potential for contamination of streams listed by the State as already in need of restoration (B. Schuld 1/28/03 e-mails). Water withdrawals from Lone Cabin Creek could reduce water levels and cause reduced recruitment of westslope cutthroat trout due to stress and increases in water temperature.

#### **Alternative 3 – Additional Onsite Mine Discharge Water Storage**

This alternative could eliminate the need for water withdrawals from Lone Cabin Creek, which could alleviate the potential of indirect effects on westslope cutthroat trout recruitment under the Proposed Action (Alternative 2).

#### **Alternative 4 – Land Disposal of Mine Discharged Water**

Alternative 4 has the potential to introduce small amounts of heavy metals into the soils and vegetation in the discharge areas if the water is not properly filtered and treated to remove such materials. These may work their way into Lone Cabin Creek via runoff over time and cause water quality degradation in the future.

#### **Alternative 5 – Modified Development Rock Storage**

If the RSS in its new configuration proves stable, then Alternative 5 would have no fisheries resource-related indirect impacts beyond those stated for the Proposed Action (Alternative 2).

#### **Alternative 6 – Alternate Site Access**

Alternative 6 would have no fisheries resource-related indirect impacts beyond those stated for the Proposed Action (Alternative 2).

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## **Alternative 7 – Maintain FR 411 Open**

Alternative 7 would have no fisheries resource-related indirect impacts beyond those stated for the Proposed Action (Alternative 2).

### **4.3.3 Cumulative Effects**

A determination of the cumulative effects analysis area is based on each fish species' ability and likelihood to migrate seasonally within a drainage area in relation to available habitat, life stage, and boundaries that represent the point of diminishing potential effects. Focusing on waterborne sediments and potential pollutants, the extent of the effects area is determined by how far downstream these constituents are likely to travel and affect habitat or aquatic species. For the Silver Strand Project, the cumulative effects analysis area was determined to be Lone Cabin Creek from the Silver Strand project area to its confluence with Burnt Cabin Creek and continuing downstream 0.8 kilometer (0.5 mile). Note that this area is different from the cumulative effects area analyzed for some of the other resources, such as botany and wildlife.

In addition to the specific activities identified for each alternative, other past, present and reasonably foreseeable activities are known in the cumulative effects area. These activities have the potential to alter various aspects of watershed conditions. Protective measures will be recommended and incorporated into the designs for future projects as part of their environmental review allowing watershed resources to be maintained. Effects to fisheries resources can be expected from these activities and any action alternative under this analysis may have additive effects. All projects identified as reasonably foreseeable will need to complete consultation with the USFWS prior to the decision, unless consultation has already occurred. There are currently no private lands within the analysis area; therefore activities and actions on private lands were not considered.

Previous activities in the drainage include historic mining and associated road building and timber harvest. As noted in the water quality sections, the impaired status of both Lone Cabin and Burnt Cabin Creeks attests to the impacts that previous activities have had on the watershed (IDEQ 2000, 2002). The impaired status of the creeks increases the cumulative impact of any additional pollutant or alteration to instream or riparian habitat because the fish are already coping with less than ideal conditions.

Present actions include a grazing allotment for 45 cow-calf pairs that includes the area north of Cascade Creek along the Little North Fork Coeur d'Alene River (Iron Mokins). These livestock could be in the Lone Cabin/Burnt Cabin area from June to September and are rounded up near the mouth of Burnt Cabin at the end of the season. GANDA observed evidence of cattle use along the FR 411 and in the stream channel upstream of the project area during their site visit in September, 2003, but not within the project area where the stream channel is incised and probably not easily accessed by cattle. Water is available and grazing forage is much more attractive near the Burnt Cabin confluence downstream of the project area. In addition, NJMC intends to close access to FR 411 during the allotment period, which would prevent most cattle from accessing the area.

To determine any future activities on National Forest lands, the Forest Service's Schedule of Proposed Actions (SOPA) was reviewed. The Forest Service has one planned future action: a

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road construction and obliteration project that will affect approximately 1.6 kilometer (1 mile) of riparian area along Burnt Cabin Creek downstream from its confluence with Lone Cabin Creek (T. Syverson and E. Lider pers. comm. 2003) in the Silver Strand cumulative effects analysis area. The road reconstruction project is still in the early planning stages, and a location for the new road alignment was not available at the time of this report (T. Syverson, pers. comm. 2003).

The foreseeable future actions in the cumulative effects analysis related to the road project along Burnt Cabin Creek cannot be evaluated at this time because of a lack of specifics. Future impacts from the grazing allotment appeared to be minimal in the project area based on our field observations, which coincided with the end of the grazing season. However, livestock grazing is a common contributor of sediment due to cattle congregating within riparian areas, and livestock presence has a definite potential to degrade in-stream habitat.

### **Alternative 1 - No Action**

There will be no cumulative effects under Alternative 1.

### **Alternative 2 – Permit Operation as Proposed April 3, 2003**

If the Silver Strand Project succeeds in excluding the cattle from the Lone Cabin drainage, there could be a beneficial impact to the creek. However, contributions to cumulative effects on native fish populations from some biotic factors will be largely unaffected by the alternative selected. McIntyre and Rieman (1995) report that the elimination or isolation of different life history forms, predation, competition, or hybridization with exotic species, and increased variation of population dynamics are critical mechanisms leading to population declines or extinction. Some of these mechanisms, particularly isolation of life-history forms and competition and hybridization with exotic fish species, may be contributing to cumulative effects for native trout populations within the analysis area. Removing the passage barrier in Lone Cabin Creek will open the upper reaches of the creek to all fish, including potential colonization by rainbow trout. This may increase the potential for introgression of the existing westslope cutthroat trout population. However, providing access to headwaters areas favors locally adapted westslope cutthroat trout, therefore, there may be a small positive cumulative effect on westslope cutthroat trout given that other passage barriers are being removed in the Little North Fork Coeur d'Alene River watershed. Effects from predation, competition, and variation of population dynamics are not expected to be affected by this alternative.

### **Alternative 3 – Additional Onsite Mine Discharge Water Storage**

No additional cumulative effects are associated with Alternative 3, assuming that the mine discharge is fully incorporated into the backfill and does not enter the groundwater system. If the waters enter the groundwater, the cumulative effects would be similar to those described below under Alternative 4.

### **Alternative 4 – Land Disposal of Mine Discharged Water**

Alternative 4 has the potential to introduce small amounts of heavy metals into the soils and vegetation in the discharge areas if the water is not properly filtered and treated to remove such materials. These may work their way into Lone Cabin Creek via runoff over time and cause water quality degradation in the future. Because of the past land use history in the area and the

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current water quality impairment of Lone Cabin and Burnt Cabin creeks, even small amounts of contaminants, including sediments, would constitute a negative cumulative impact.

### **Alternative 5 – Modified Development Rock Storage**

No additional cumulative effects on fisheries are associated with Alternative 5.

### **Alternative 6 – Alternative Site Access**

No additional cumulative effects on fisheries are associated with Alternative 6.

### **Alternative 7 – Maintain FR 411 Open**

No additional cumulative effects on fisheries are associated with Alternative 7.

## **4.4 Botanical Resources**

### **4.4.1 Direct and Indirect Effects**

#### **Alternative 1 – No Action**

Additional early season sensitive plant surveys are necessary to determine impacts to Forest- and District-listed species. Noxious weed infestations are present on the site, and are found on all roads and existing dumpsites. Weed populations within the project area would continue to expand and would likely invade undisturbed areas without active management.

#### **Alternative 2 – Permit Operation as Proposed April 3, 2003**

Alternative 2 involves construction of a new road through the project area, removal of trees, and topsoil and material stockpiling. No sensitive plants or Forest species of concern occurred within the project boundaries. Implementation of Alternative 2 would not have direct or indirect effects on species discussed previously.

Significant noxious weed infestations occurred in disturbed areas within the project area. Yellow toadflax, spotted knapweed, meadow hawkweed, Canada thistle, and goatweed occurred on all roads and existing dump areas. Additional ground disturbing activities would likely contribute to an expansion of these infestations. Implementation of mitigation measures and monitoring (described in Chapter 2) could reduce the density of the infestations but would not prevent their expansion. Noxious weeds are a significant threat to populations of rare species (Sheley and Petroff 1999). Implementation of the Proposed Action would likely increase the size of existing weed infestations and lead to new infestations.

Reestablishment of timber would occur following replacement of adequate topsoil, followed by introduction of new seedlings. Slope recontouring, replacement of topsoil, and conifer planting, are all detailed in the POO. In addition, natural regeneration is expected since soil would be scarified and adjacent mature conifers would scatter seed. Because total timber harvest would be less than three acres and conifers would be reestablished through both planting and natural seeding, no measurable effects on long-term timber productivity would be expected as a result of activities.

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### **Alternative 3 – Additional Onsite Mine Discharge Water Storage**

Direct and indirect effects are similar to those described for Alternative 2.

### **Alternative 4 – Land Disposal of Mine Discharged Water**

Direct and indirect effects are similar to those described for Alternative 2.

### **Alternative 5 – Modified Development Rock Storage**

Direct and indirect effects are similar to those described for Alternative 2.

### **Alternative 6 – Alternative Site Access**

Direct and indirect effects are similar to those described for Alternative 2.

### **Alternative 7 – Maintain FR 411 Open**

Direct and indirect effects are similar to those described for Alternative 2.

#### **4.4.2 Cumulative Effects**

A determination of cumulative effects was based on population viability for threatened, forest-listed sensitive, and plant species of concern. The area of consideration for the cumulative effects analysis is the area covered by the Proposed Action. No mid- or late- season flowering threatened, sensitive or plant species of concern occurred within the project boundaries, and therefore none of the alternatives would have cumulative effects on these species. Additional early season sensitive plant surveys are necessary to determine impacts to forest- and district-listed plant species; therefore no effects determination for these species can be made at this time.

Extensive noxious weed populations are present at the site. Preventing or limiting ground disturbing activities could help slow the spread of noxious weeds. It is likely the existing noxious weed populations will continue to expand regardless of present and future activities.

Reestablishment of timber would occur following replacement of adequate topsoil, followed by introduction of new seedlings. Slope recontouring, replacement of topsoil, and conifer planting are all detailed in the POO. In addition, natural regeneration is expected since soil will be scarified and adjacent mature conifers will scatter seed. Because total timber harvest would be less than three acres and conifers would be reestablished through both planting and natural seeding, no measurable effects on long-term timber productivity would be expected as a result of activities.

## **4.5 Wildlife Resources**

### **Methodology**

The Proposed Action and alternatives were evaluated to determine what effect or impact they would have on federally-listed threatened and endangered species and USFS sensitive wildlife species that may occur in the project area and habitat attributes important to these species. For details on species' life histories, model results, site visits, and protocol surveys, refer to the Wildlife Specialist Report (GANDA 2004c).

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Analysis of capable and suitable habitat in the project area identified three species for further analysis based on quality and quantity of suitable or capable habitat, district sighting records, and specific habitat attributes required for critical life history needs such as nesting or winter habitat. Results of these analyses indicate that the Coeur d'Alene salamander, northern goshawk, and Townsend's big-eared bat may be affected by the proposed action or one or more of the alternatives. Results are described for each alternative.

#### **4.5.1 Direct Effects**

##### **Alternative 1 – No Action**

Alternative 1 will not change the existing conditions at the site. Under the no action alternative it is expected that the stand will continue to mature and recover from past extraction activities. Considering that the existing conditions will remain unchanged, Alternative 1 will have no direct or indirect effects on these species or their habitats.

##### **Alternative 2 – Permit Operations as Proposed April 3, 2003**

Although no salamanders were found during the survey, nearby sightings and the existence of suitable habitat at the project site indicate they could inhabit the area during mining activities. Coeur d'Alene salamanders have very small home ranges closely associated with their surface water habitat. The proposed action states that the mine will operate during spring, summer, and fall months when salamanders are above ground, and close during winter when they are aestivating below ground. Coeur d'Alene salamanders present on the project site may be killed or displaced during mining activities.

Under Alternative 2, trees will be removed along the proposed haul road and in the ravine in which the waste rock is dumped. The areas cleared of trees will comprise approximately 1.2 hectare (3 acres). Tree removal will reduce the amount of capable nesting habitat for goshawks in the project area.

Under Alternative 2, the existing adits and tunnels would be reopened, and the access shafts extended underground. Any bats utilizing the existing habitat could be killed or displaced.

Miners camping onsite may have an effect on wildlife species by creating higher levels of noise, disturbance, or waste material than the ambient environment. This could cause wildlife to avoid use of the area for foraging, nesting, resting, or travel, or could attract wildlife such as bears or other scavengers to the site. Attraction of wildlife could result in endangerment to humans, to the wildlife attracted, or by bringing predators into the project area that then may impact prey species.

##### **Alternative 3 – Additional Onsite Mine Discharge Water Storage**

This alternative would not change any aspects of the proposed action related to direct effects on wildlife resources.

##### **Alternative 4 – Land Disposal of Mine Discharged Water**

Alternative 4 introduces the option of combining or substituting land application of mine discharge water with the injection well option, creating potential direct or indirect impacts for

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Coeur d'Alene salamanders. There are several unknown factors which this technique introduces: quantity of discharge water, quality of discharge water (i.e. metals, pH.), and the timing of the discharge. If enough water of tolerable quality were discharged during the periods when the species was above ground, salamanders could potentially be drawn to the water source. However, intermittent quantity and/or quality of water, and human activity associated with maintenance of discharge hoses could lead to direct (mortality) effects.

This alternative would not change any aspects of the proposed action related to direct effects on northern goshawks or Townsend's big-eared bats.

### **Alternative 5 – Modified Development Rock Storage Site**

This alternative would not change any aspects of the proposed action related to direct effects on wildlife resources.

### **Alternative 6 – Alternative Site Access**

This alternative would not change any aspects of the proposed action related to direct effects on wildlife resources.

### **Alternative 7 – Maintain FR 411 Open**

This alternative would not change any aspects of the proposed action related to direct effects on wildlife resources.

## **4.5.2 Indirect Effects**

### **Alternative 1 – No Action**

Alternative 1 will not change the existing conditions at the site. Under the no action alternative it is expected that the stand will continue to mature and recover from past extraction activities. Considering that the existing conditions will remain unchanged, Alternative 1 will have no indirect effects on these species or their habitats.

### **Alternative 2 – Permit Operations as Proposed April 3, 2003**

The proposed waste rock haul road would cut into the hillside and bisect the slope between the upper adit and the forest road. This action could indirectly affect the species by reducing spring surface water runoff and thereby the presence or development of seeps over time. Coeur d'Alene salamanders are Plethodons, and absorb oxygen and moisture through their skin. This physiological trait makes them extremely susceptible to toxins in their environment. Indirect effects could occur if pollutants such as metals and acidified mine drainage were increased or released during operations. This would negatively affect water quality, and displace salamanders from habitats at higher concentrations.

The Forest goshawk habitat model results indicate that no suitable habitat exists in the project area of analysis. Model results show 91.3 hectares (225.7 acres) of capable habitat within a one-mile radius of the project site, with all but 10 acres located on the eastern side of Lone Cabin Creek. None of the capable habitat polygons overlap with the project area, although some larger diameter trees would be removed (>30.5 centimeters (12 inches) dbh). Density of larger diameter

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trees is the limiting factor, and removal of these individual trees could delay the potential for the project area to be considered capable or suitable in the future.

As exploration and mining is finished in each vein, paste backfill will be injected into the shafts, effectively removing any potential bat habitat. This alternative may impact Townsend's big-eared bats, but will not likely result in a trend toward federal listing.

### **Alternative 3 – Additional Onsite Mine Discharge Water Storage**

This alternative would not change any aspects of the proposed action related to indirect effects on wildlife resources.

### **Alternative 4 – Land Disposal of Mine Discharged Water**

Alternative 4 introduces the option of combining or substituting land application of mine discharge water with the injection well option, creating potential direct or indirect impacts for Coeur d'Alene salamanders. There are several unknown factors which this technique introduces: quantity of discharge water, quality of discharge water (i.e. metals, pH.), and the timing of the discharge. If enough water of tolerable quality were discharged during the periods when the species was above ground, salamanders could potentially be drawn to the water source. However, intermittent quantity and/or quality of water, and human activity associated with maintenance of discharge hoses could lead to indirect effects on salamanders by reducing available habitat.

This alternative would not change any aspects of the proposed action related to indirect effects on northern goshawks or Townsend's big-eared bats

### **Alternative 5 – Modified Development Rock Storage Site**

This alternative would not change any aspects of the proposed action related to indirect effects on wildlife resources.

### **Alternative 6 – Alternative Site Access**

This alternative would not change any aspects of the proposed action related to indirect effects on wildlife resources.

### **Alternative 7 – Maintain FR 411 Open**

This alternative would not change any aspects of the proposed action related to indirect effects on wildlife resources.

## **4.5.3 Cumulative Effects**

### **Alternative 1 – No Action**

Alternative 1 will not change the existing conditions at the site. Under the no action alternative it is expected that the stand will continue to mature and recover from past extraction activities. Considering that the existing conditions will remain unchanged, Alternative 1 will have no cumulative effect on these species or their habitats.

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### **Alternative 2 – Permit Operations as Proposed April 3, 2003**

Coeur d’Alene salamanders have very small home ranges, and their dispersal and colonization of new habitats is poorly understood. They are difficult to survey for, and no known sightings have been documented near the project area. The proposed action in combination with past, present, and future foreseeable actions may affect Coeur d’Alene salamanders, but affect may be limited because of the limited intensity of above ground activities and the small percentage of area affected.

The proposed action in combination with past, present, and future foreseeable actions may affect northern goshawks, but affect may be limited because of the lack of suitable habitat and small percentage of capable habitat in the project area, and the small percentage of forest area affected.

The proposed action in combination with past, present, and future foreseeable actions may impact Townsend’s big-eared bats because of the removal of capable habitat by mining operations and paste backfilling, but will not likely result in a trend toward federal listing.

### **Alternative 3 – Additional Onsite Mine Discharge Water Storage**

This alternative would not change any aspects of the proposed action related to cumulative effects on wildlife resources.

### **Alternative 4 – Land Disposal of Mine Discharged Water**

Long-term application could begin to affect vegetation and further create suitable seep-like habitats for Coeur d’Alene salamanders. If these temporary habitats attract salamanders, then cessation of a surface water supply at the end of operations could reduce the amount of habitat available in the project area, prompting resident salamanders to search for other habitat outside the project area.

This alternative would not change any aspects of the proposed action related to cumulative effects on northern goshawk or Townsend’s big-eared bat species.

### **Alternative 5 – Modified Development Rock Storage Site**

This alternative would not change any aspects of the proposed action related to cumulative effects on wildlife resources.

### **Alternative 6 – Alternative Site Access**

This alternative would not change any aspects of the proposed action related to cumulative effects on wildlife resources.

### **Alternative 7 – Maintain FR 411 Open**

This alternative would not change any aspects of the proposed action related to cumulative effects on wildlife resources.

## **4.6 Geology, Soils, and Geotechnical Considerations**

### **Methodology**

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Determination of the environmental effects of each alternative on soil resources, including soil productivity, soil erosion, and slope stability, was based on a qualitative evaluation of the pattern of ground disturbance and subsequent reclamation proposed by the applicant, on modeling of soil erosion using the FS-WEPP model, and on analyses of slope stability using the SLOPE/W model (GSI 1998). A more detailed discussion of the application of these models is found in MacDonald and Schick (2004).

#### **4.6.1 Direct Effects**

The area of direct effects for earth resources is the same area as used for water resources (Sections 3.1 and 3.2).

#### **Alternative 1 – No Action Alternative**

Under the No Action Alternative, the site would remain as it appears today. This would include the continued upslope erosion and instability associated with the Level 3 and Level 225 portals and the collapse feature at the top of the mine workings. Because this collapse feature is not capped with the low permeability paste backfill material or recontoured, rainwater will likely continue to drain into the existing depression, and continue to exacerbate any metals mobilization in the old workings.

#### **Alternative 2 – Permit Operation as Proposed April 3, 2003**

This alternative includes the proposed actions outlined in the POO and clarification letters from the New Jersey Mining Company. The following discussions include direct impacts on soil erosion and productivity associated with road building, the rock storage site, and the mine water discharge system.

The POO includes approximately 425 meters (1,394 feet) of new roads to be developed. Assuming a partial bench construction as proposed in the POO, this would include substantial excavation or burial of existing soils. The total area of soil disturbance for new roads would be 1.1 hectares (2.8 acres), consisting of 0.6 hectare (1.5 acre) for the new access road, 0.06 hectare (0.2 acre) for the upper road to the RSS, 0.1 hectare (0.3 acre) for the injection well access road, and 0.3 hectare (0.8 acre) of soil disturbed by the installation of the RSS. Sediment delivery to the FR 411 inboard ditch from these areas has been addressed in Section 3.1.1 above. Upland soil erosion rates are approximately 1.5-3 times sediment delivery rates, depending on the feature. The eroded soil would be trapped elsewhere on the surface of the forest floor. The proposed mine road from the new portal on Level 3 is currently designed to reach the 225 level in one switchback using a 10 percent grade and a partial bench design. Placing a partial bench road on this slope could destabilize the development rock deposit, resulting in a road failure. The road prisms and associated disturbed areas would be reclaimed at the cessation of mining by the spreading of 0.3 meter (12 inches) of topsoil or equivalent growth medium and revegetating the surface. The productivity of this new soil surface would be expected to be reduced for several decades after reclamation.

The current rock storage site is designed for a 1.7:1 slope with a flat regraded face and top. A slope stability analysis was conducted as part of this investigation to assess whether this was a reasonable geometry for the RSS. The results indicate that this geometry is stable for the

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proposed mine site (MacDonald and Schick 2004). However, a geotechnical investigation to be completed prior to development of the RSS to confirm the subsurface conditions and soil parameters used for this analysis is required mitigation for this alternative.

The flat face geometry of this design would allow water to drain directly downslope and into the development rock stored onsite. The majority of the development rock will be produced during the mining of the ramp to the stope area. According to the POO, the RSS would be buffered by the dike rock. However, information regarding the acid generating potential of the ramp rock is very limited. There is the potential for this rock to be acid generating. Furthermore, the ramp rock would be placed on the RSS first, stratigraphically below and downslope of the area where the bulk of the dike rock would most likely be located without explicitly segregating it. Because of these apparent spatial relationships, the ramp rock may not be buffered by the dike rock. Colluvial material at the base of the RSS would be expected to become enriched in metals over time; in fact, this material is an integral part of the proposed water treatment process.

Localized soil erosion rates without aggressive BMPs on the freshly reclaimed RSS surface could exceed natural soil erosion rates by up to five orders of magnitude, based on WEPP model results. Establishment of healthy, dense, sustainable vegetation on the surface of the RSS is crucial. Soil erosion rates would be stabilized at approximately 10 times background rates once a good shrub and ground cover is established on the RSS, and would be at background once even a young (e.g., 20-year old) forest cover is established. Because a growing surface will be reclaimed on the surface of the RSS and protected during and after reclamation by appropriate erosion control BMPs, only a relatively short-lived (e.g., decadal) decrease in soil productivity over the footprint of the RSS is predicted.

This alternative includes the construction of a gabion wall at the temporary ore storage and ore loading location. A typical section for a gabion wall was provided by the NJMC in a letter dated June 9, 2003. URS believes construction of a gabion wall at this location is feasible; however, a site-specific geotechnical investigation and wall design is included as required mitigation for this alternative.

### **Alternative 3 – Additional Onsite Mine Discharge Water Storage**

With this alternative, direct extraction of water from Lone Cabin Creek would be eliminated or, at worst, severely curtailed. This would reduce the need for physical disturbance of soils riparian to Lone Cabin Creek.

### **Alternative 4 – Land Disposal of Mine Discharged Water**

This alternative would result in the diffuse discharge to surface or near-surface soils of mine waters via land application. This would eliminate the need for an injection well and the issues associated with impacts to the groundwater and Lone Cabin Creek because the surface soils represent more favorable materials for trapping metals than bedrock. The land application system could be designed to minimize detrimental impacts to slope stability by controlling flow and maximizing the area over which the discharge occurs.

In the event that acidified and mineralized waters are detected in the underdrain system beneath the RSS (if this alternative is selected), these waters could potentially be discharged as part of the

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land application disposal system as well. Use of this technique for this purpose would need to be confirmed following analysis of analytical data from water samples collected and consultation with IDEQ.

As stated above, the use of land application would eliminate the need to build an access road for the injection well. This would reduce the total amount of soil disturbance by 13 percent, as compared to the original POO. If this alternative were combined with Alternative 4, this would further reduce the area of soil disturbance by 66 percent. Some enrichment of metals within the soils associated with the land application area would occur. This is not expected to affect soil productivity; however, monitoring for vegetation stress (an indication of reduced soil productivity) is included as a mitigation measure.

### **Alternative 5 – Modified Development Rock Storage**

Two modifications to the RSS design are included as part of this alternative. The first modification would require changing the final grade to the RSS so that it is crowned along the centerline to disperse rainwater toward the margins of the RSS. This would slightly reduce the amount of vertical rainwater infiltration by promoting flow to the sides of the RSS. This should reduce the potential for generation of ARD waters.

The POO states that dike rock would be used to buffer the quartzite, which is acid generating. Without the dike rock, the bulk acid-generating potential of the RSS would be much lower. However, as discussed above, much of the development rock will be placed during the installation of the ramp, prior to mining most of the dike rock. Thus, considerable amounts of development rock will not necessarily be mixed with or buffered by the dike rock. The installation of an underdrain system would permit the monitoring of water quality for waters flowing through the RSS and out the toe. The data collected from discharge waters could be used to determine if remedial action such as water treatment is needed at a future date. Preferential placement of dike rock at the toe of the RSS would allow long-term buffering of the underdrain water. If remedial actions are deemed necessary, the underdrain system could be used to capture the impacted water.

### **Alternative 6 – Alternative Site Access**

The direct effects of this alternative are the same as those described for Alternative 2 except that the total area of soil disturbance is reduced to 0.4 hectare because some of the road is contained within the footprint of the RSS. This then allows the road to connect to the southern end of the existing bench at the No. 225 Level, avoiding the steeper hillside. Reduction of the road grade was accomplished by lengthening the road. Soil erosion from the access road would not be significantly different from erosion volumes associated with Alternative 2.

### **Alternative 7 – Maintain FR 411 Open**

The direct effects of this alternative are the same as those described for Alternative 2.

## **4.6.2 Indirect Effects**

Analysis of indirect effects of alternatives on earth resources was based on assessments of project-related activities likely to occur outside of the project area and evaluation of potential long-term impacts due to alterations in soil, hydrology or water quality caused by project actions,

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as well as knowledge of existing and past projects that have used similar mining techniques. The area of indirect effects evaluated for earth resources for this project includes the direct effects area, the entire haul route, and areas downslope of the haul route to surface water bodies. Indirect effects are primarily associated with Alternatives 1 through 4.

### **Alternative 1 – No Action Alternative**

Under alternative 1, potential additional collapse of the stope could occur. This would increase the area of reduced soil productivity due to disruption and erosion of the soil at the margins of the collapse. Because this feature is so far uphill above FR 411, in excess of 80 meters (262 feet), no increase in sediment delivery rates would be expected.

### **Alternative 2 – Permit Operation as Proposed April 3, 2003**

Indirect effects of Alternative 2 on earth resources focus on the continuing evolution of the stope collapse during renewed mining. Information regarding the collapse of the stope and conditions within the waste is not available. Blasting associated with this alternative could cause additional settlement or collapse in these areas. This could result in subsidence that is manifest at the surface, creating a more direct conduit for infiltration of meteoric waters. This increased infiltration could result in an increase in the discharge volumes at the existing No. 3 portal.

### **Alternative 3 – Additional Onsite Mine Discharge Water Storage**

The only indirect effect expected with Alternative 3 would be the presence onsite of a water supply that could be used for firefighting if needed, potentially reducing resulting soil erosion.

### **Alternative 4 – Land Disposal of Mine Discharged Water**

The indirect effect of alternative 4 is compromise in the stability of the slopes where land disposal occurs if the land application system is not properly installed to avoid soil saturation.

### **Alternative 5 – Modified Development Rock Storage**

The indirect effects on earth resources would be the same as with Alternative 2.

### **Alternative 6 – Alternative Site Access**

The indirect effects on earth resources would be the same as with Alternative 2.

### **Alternative 7 – Maintain FR 411 Open**

The indirect effects on earth resources would be the same as with Alternative 2.

## **4.6.3 Cumulative Effects**

For the Silver Strand project, the cumulative effects analysis area was determined to be Lone Cabin Creek from the headwaters to its confluence with Burnt Cabin Creek and continuing downstream 0.8 kilometer (0.5 mile), equivalent to the area used for evaluation of cumulative effects to water and fisheries resources (MacDonald and Schick 2004; Fisheries Specialist Report; GANDA 2004a). Cumulative effect activities analyzed for soil and geologic resources are described in Section 3.1 above under water quality.

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### **Alternative 1 – No Action Alternative**

There will be no cumulative effects under Alternative 1 beyond those associated with long term land management in the Lone Cabin Creek drainage for commercial wood production and other forest uses. Timber harvest and other activities are expected to occur without long-term degradation of soil productivity.

### **Alternative 2 – Permit Operation as Proposed April 3, 2003**

Cumulative effects from Alternative 2 are primarily related to short and intermediate-term increases in sediment delivery from direct disturbance of slightly over one hectare of thin, but moderately productive, forest soils. Increased release of metals over geologic rates from the proposed action, if present, is not expected to be detectable even at the local scale due to the existing conditions (i.e., presence of existing underground mine workings). These effects would occur in addition to any cumulative effects of Alternative 1

### **Alternative 3 – Additional Onsite Mine Discharge Water Storage**

There will be no cumulative effects under this alternative other than those addressed for Alternative 2.

### **Alternative 4 – Land Disposal of Mine Discharged Water**

There will be no cumulative effects under this alternative other than those addressed for Alternative 2.

### **Alternative 5 – Modified Development Rock Storage**

There will be no cumulative effects under this alternative other than those addressed for Alternative 2.

### **Alternative 6 – Alternative Site Access**

There will be no cumulative effects under this alternative other than those addressed for Alternative 2.

### **Alternative 7 – Maintain FR 411 Open**

There will be no cumulative effects under this alternative other than those addressed for Alternative 2.

## **4.7 Cultural Resources**

There will be no cumulative effects under this alternative. Mandatory mitigation measures will be implemented to insure unforeseen discoveries would be addressed.

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## **4.8 Additional Resource Areas**

### **4.8.1 Recreation and Trails**

There is substantial recreational use of the lands surrounding the project area and within the cumulative effects area; however, most of the use consists of recreationists traveling through the area using FR 411 or FR 206 to access the areas in the Burnt Cabin drainage. Snowmobile users are active in the area during the winter months and campers travel through and use the staging area as a campsite. There are no existing forest-maintained trails in the project area or within the cumulative effects area. Therefore, there would be no direct, indirect, or cumulative effects to trail use as a result of any alternative including the no action alternative.

An addendum to the Barney Rubble's Cabin Salvage Timber Sale transportation plan calls for the obliteration of most of FR 411. However, following that decision, field examination and reviews by Forest Service staff indicated the proposed reroute was untenable from the standpoint of geotechnical, engineering and cost factors and the decision was made to keep the road open. It is listed as open to all vehicular traffic on the Coeur d'Alene River Ranger District 2001 Travel Plan which is currently in force. Therefore, the analysis of the impacts to recreation and access is based on maintaining this road open and implementing the Silver Strand POO as submitted on April 3, 2003.

#### **Direct Effects To Recreation:**

##### **Alternative 1 – No Action Alternative**

There will be no direct effects under Alternative 1 beyond those associated with long term land management in the Lone Cabin Creek drainage for commercial wood production and other forest uses.

##### **Alternative 2 – Permit Operation as Proposed April 3, 2003**

Direct effects from Alternative 2 are primarily related to the closure of FR 411 for mine operation season. In addition, the removal of the culvert would remove access to an established, but not forest-maintained, camp site in the staging area. This area is currently problematic because of trash accumulations and un-contained fire ring use.

##### **Alternative 3 – Additional Onsite Mine Discharge Water Storage**

There will be no direct effects under this alternative other than those addressed for Alternative 2.

##### **Alternative 4 – Land Disposal of Mine Discharged Water**

There will be no direct effects under this alternative other than those addressed for Alternative 2.

##### **Alternative 5 – Modified Development Rock Storage**

There will be no direct effects under this alternative other than those addressed for Alternative 2.

##### **Alternative 6 – Alternative Site Access**

There will be no direct effects under this alternative other than those addressed for Alternative 2.

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### **Alternative 7 – Maintain FR 411 Open**

This alternative would alleviate the limitations on access during the mining season. However, it would not change the loss of access to the staging area as a campsite. There would be no additional effects under this alternative other than those addressed for Alternative 2.

### **Indirect Effects to Recreation:**

#### **Alternative 1 – No Action Alternative**

There will be no indirect effects under Alternative 1.

#### **Alternatives 2 – 7**

There may be minor indirect effects under all of the action alternatives. The recreational use of the area should not be affected by the closure of the mine site; however, reclamation of the roads may remove perceived access points for hunters and other recreationists.

### **Cumulative Effects to Recreation:**

There would be no cumulative effect to recreational use of the project area or cumulative effects area under any alternative.

## **4.8.2 Wilderness**

There are no lands proposed to be, or currently designated as wilderness within the project area or the cumulative effects area. Therefore, there will be no direct, indirect or cumulative effects to wilderness resources as the result of the selection of any alternative including the no action alternative.

## **4.8.3 Experimental Forests**

The Deception Creek Experimental Forest is in a watershed separate from the cumulative effects area affected by the proposed action. There may be the potential for some wildlife movements between the two watersheds, but it is unlikely that there will be any direct, indirect, or cumulative effects to the experimental forest due to the selection of any alternative including the no action alternative.

## **4.8.4 Rangelands**

There are no lands considered rangelands within the project area or the cumulative effects area. There is one ongoing grazing allotment that includes portions of the cumulative effects area; however, the character of this portion is timbered and steep and is not currently managed to provide range resources. Therefore, there will be no direct, indirect or cumulative effects to range resources as the result of the selection of any alternative including the no action alternative.

## **4.8.5 Roads**

It is unclear whether the Forest Service intends to comply with the addendum to the Barney Rubble Timber Sale transportation plan which calls for the obliteration of most of FR 411

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(USDA 1998b). Therefore, the analysis of the impacts to roads is based on maintaining the status quo and implementing the Silver Strand POO as submitted on April 3, 2003.

### **Direct Effects To Roads:**

#### **Alternative 1 – No Action Alternative**

There will be no direct effects under Alternative 1 beyond those associated with long term land management in the Lone Cabin Creek drainage for commercial wood production and other forest uses.

#### **Alternative 2 - Permit Operations as Proposed April 3, 2003**

Direct effects from Alternative 2 are primarily related to the use of FR 411 for mine operations. There will be trucks entering and leaving FR 411, but these should be limited to a small number of round trips per day when hauling, and should not affect other road users appreciably. There may be additional wear and tear on FR 411 due to the haul truck use, but this should be dealt with as part of the use/maintenance agreement with the Forest Service. The POO includes approximately 425 meters (1,394 ft) of new roads to be developed. This includes approximately 293 meters (961 ft) for the road from the proposed new No. 3 portal to the 225 level, 44 meters (144 ft) for the access road to the RSS and 88 meters (289 ft) for the access road to the proposed injection well site. The total areas of soil disturbance for road building would be 8,072 square meters (86,044 square feet or 2.0 acres), consisting of 6,020 square meters (64,766 square feet or 1.5 acres) for the new access road, 644 square meters (6,929 square feet or 0.2 acres) for the road to the RSS, and 1,408 square meters (15,150 square feet or 0.3 acres) for the injection well access road.

#### **Alternative 3 – Additional Onsite Mine Discharge Water Storage**

There will be no direct effects under this alternative other than those addressed for Alternative 2.

#### **Alternative 4 – Land Disposal of Mine Discharged Water**

There will be no direct effects under this alternative other than those addressed for Alternative 2.

#### **Alternative 5 – Modified Development Rock Storage**

There will be no direct effects under this alternative other than those addressed for Alternative 2.

#### **Alternative 6 – Alternative Site Access**

There will be no significant direct effects under this alternative other than those addressed for Alternative 2. A slight reduction in the total area disturbed for road building is accomplished by placing approximately 16 percent of the access road footprint within the RSS. This then allows the road to connect to the southern end of the existing bench at the No. 225 Level, avoiding the steeper hillside.

#### **Alternative 7 – Maintain FR 411 Open**

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This alternative would alleviate the limitations on access during the mining season. However, it would not change the loss of access to the staging area as a campsite. There would be no additional effects under this alternative other than those addressed for Alternative 2.

### **Indirect Effects to Roads:**

#### **Alternative 1 - No Action Alternative**

There will be no indirect effects to roads under Alternative 1.

#### **Alternatives 2 – 7**

There may be minor indirect effects under all of the action alternatives. The roads in the area should not experience any long-term impacts due to use of the mine site; however, reclamation of the constructed and improved access roads may remove perceived access points for hunters and other recreationists.

### **Cumulative Effects to Roads:**

There would be no cumulative effect to roads in the project area or cumulative effects area under any alternative.

## **4.9 Environmental Justice and EEO Statement**

No group of people, including racial, ethnic, or socioeconomic groups, would be disproportionately affected by the implementation of the proposed action or any alternative to that proposal.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, and marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14<sup>th</sup> and Independence Avenue, SW, Washington, DC 20250-9410 or call (202) 720-5964 (voice or TDD). USDA is an equal opportunity provider and employer.

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## CHAPTER 5. List of Preparers and Agency Consultation

### List of Preparers

Name	Title	Affiliation
Pamela Spinelli	Project Manager/Wildlife Ecologist	GANDA
Leanne Roulson	Fisheries Biologist	GANDA
Graham Neale	Wildlife Ecologist	GANDA
Anne MacDonald	Hydrologist/Geomorphologist	URS Corp
Jamie Schick	Soils Scientist	URS Corp
Gretchen Meier	Botanist	GANDA
Carl Ritchie	Archaeologist	USDA Forest Service
Chris Dail	Geologist	USDA Forest Service

### Federal Agencies Consulted

United States Army Corps of Engineers  
United States Environmental Protection Agency, Region 10  
United States Department of Labor, Mine Safety Health Administration  
United States Fish and Wildlife Service

### State and County Agencies Consulted

Idaho Department of State Lands  
Idaho Department of Water Resources  
Idaho Fish and Game  
Idaho Department of Environmental Quality

### Individuals, Public Interest Groups and Organizations

The following individuals, organizations, and agencies were contacted during the scoping process for this proposal, and comments received are included in Appendix B:

Coeur d'Alene Tribe  
Ecology Center  
Idaho Conservation League  
Kootenai Environmental Alliance  
Lands Council  
Northwest Mining Association  
George Currier (Added 10/30/03)

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## **Appendices**

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## **Appendix A: Supplemental Effects Disclosure**

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## Appendix A

### Silver Strand Mining Environmental Assessment Supplemental Effects Disclosure

#### A. Introduction

This document supplements the Environmental Assessment for the proposed Silver Strand Mining project to address concerns over the mill site that exists on private lands and has been proposed as the processing site for ores transported from the Silver Strand Mine along FR 411, FR 206, FR209, and County Route 1-C.

The existing mill site will be used to process ore from proposed mining activity on the Idaho Panhandle National Forests. Under the authority of United States mining laws (30 U.S.C.21-54), the applicant has a statutory right to enter upon the public lands to search for, develop, and lay claim to mineral resources. The Forest Service has the responsibility to make sure that the activities are conducted so as to minimize adverse environmental effects on National Forest Service System surface resources (36 CFR 228, Subpart A). While the Forest Service has no regulatory authority over the actions proposed on private land, the development and operation of this mill site may be considered an “effect” of issuing the mining permit. This then results in environmental concerns over the maintenance of air and water quality and the prevention of noxious weed infestation and spread.

The applicant’s purpose for using Forest Route (FR) 411, 206, and 209, and County Route (CR) 1-C is to access his claim and to transport mined ore to the processing facility on private land. The use of CR 1-C falls under the jurisdiction of Shoshone County. The Forest Service has no regulatory authority to permit/not permit use of this road or require the applicant to take measures for public safety and maintenance. However, concerns about road degradation and public safety from hauling activity may be considered an “indirect” effect of approving the Plan of Operations (POO).

#### B. Roles and Authorities

**Silver Strand Mine (New Jersey Mining Company):** The mining proposal located on Forest Service-managed lands is made under the authority of the United States Mining Laws (30 U.S.C.21-54), which confer a statutory right to enter upon the public lands to search for minerals. Under the General Mining Law of 1872, a citizen has a right to access Federal lands to search for, and remove, minerals and obtain title upon discovery. There is also a possessory right associated with mining, including the right to use the surface for mining purposes. Because of the rights associated with mining and mining claims, the claimant has a right to the removal of the mineral resources that he owns.

**Forest Service:** On lands administered by the Forest Service, the Organic Administration Act authorizes the Secretary of Agriculture to regulate the occupancy and use of the National Forest

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System Lands for the protection and management of forest resources. The Forest Service has the responsibility to make sure that the activities are conducted so as to minimize adverse environmental effects on National Forest Service System surface resources (36 CFR 228, Subpart A). The Forest Service has no legal right to deny exploration and mining proposals. Forest Service authority also does not extend beyond National Forest System lands; therefore, the Forest Service has no jurisdiction over the development or operation of a gold mill on private land or use of the County-maintained portion of CR 1-C. The use and maintenance of National Forest roads and trails are covered under the final approved POO.

**State of Idaho:** The State requires surface mining exploration projects have an approved reclamation plan, each approved reclamation plan must have a performance bond, exploration using motorized earth moving equipment requires a notice, water quality must be maintained and affected lands and disturbed watercourses must be reclaimed.

The Idaho Department of Environmental Quality (IDEQ) is also charged with protection of water quality under the Clean Water Act. The IDEQ comments on all mining operation permits received by the Idaho Department of Lands, but also enforces water quality standards when required.

The State of Idaho's rules and regulations apply to private lands; therefore, mining operations, including mills, located on private lands fall under the authority of the State of Idaho.

**Other Federal Agencies:** The National Pollutant Discharge Elimination System (NPDES), Section 402 of the Clean Water Act, provides states with the authority to administer a permit program to issue permits for discharges to navigable waters of the state. To date, Idaho has elected not to apply for the NPDES permitting program. The Environmental Protection Agency (EPA) performs NPDES permitting in Idaho. The U.S. Army Corps of Engineers may also be involved if there are to be any discharges or fill placed in waterbodies or wetlands under their 404 authority.

**Shoshone County:** The County Route 1-C is maintained by Shoshone County. Any haulage or problems related to maintenance on this road are the responsibility of Shoshone County. The Forest Service does not have any maintenance agreements or responsibilities concerning this stretch of road.

### **C. Relevant Consequences of Private Mill Site Operation**

As discussed above, the Forest Service has no authority to regulate activities on private land. While the NJMC's use of a private mill is an imminently foreseeable action related to the proposed exploration and mining activity to occur at the Silver Strand Mine on National Forest Service lands, the analysis of such an action must be done in cooperation with Idaho Department of Lands and the IDEQ. Therefore, the predicted consequences of the mill operation (described below) focuses on understanding whether the applicant has secured the necessary State and federal permits which will adequately maintain air and water quality and prevent the infestation and spread of noxious weeds.

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## Description of the Mill Site

The NJMC mill is located approximately two miles east of Kellogg, Idaho. The mill has a 100-tonne per day capacity. A crushing plant was built and commissioned in 1996. Approximately 5,000 tons of ore were processed at the mill during 1995 through 1996. A decision was made to upgrade the mill to a CIL (Carbon-In-Leach) process during this period. During 2000, NJMC completed constructed a 32- by 48 foot pole type building adjacent to the existing mill building. The NJMC is currently installing flotation circuits at its New Jersey mill (NJMC 2004).

Ore from the Silver Strand Mine will be dumped into a bin or on a pile on the ground. The Run-of-Mine (ROM) ore will pass 300mm size and must pass a 300mm grizzly to allow feeding to the crushing plant. Ore will be fed to the crushing plant, which consists of a jaw crusher, screen, and cone crusher. Ore will be crushed to <50mm in the jaw and to <15mm by the cone. The screen has 13mm openings. The crushing plant can produce 25 tonnes per hour (tph) with the product passing 15mm.

The crushing plant product will be fed by a conveyor belt to the ball mill at 4 tph. A weight belt will control the feed rate. Water will be added to the ore as it is fed into the ball mill. The ball mill is 1.8 meter in diameter by 1.8 meter long. Slurry discharging from the ball mill passes through a trommel screen and flows into the cyclone feed pump sump. The trommel screen will remove trash and large particles.

Water will also be added at the cyclone feed pump sump. The cyclone feed pump will transport the slurry to the hydrocyclone, which then classifies the slurry by particle size. Coarser particles are sent back to the ball mill for further grinding. Cyclone overflow at approximately 30% solids by weight flows by gravity to the flotation circuit. The flotation circuit recovers the sulfide minerals into a clean sulfide concentrate.

The hydrocyclone slurry is fed into a bank of five rougher flotation cells. Each cell is agitated with an impeller which forces air into the slurry. Reagents added to the rougher flotation cells include copper sulfite solution, a frother, and one or more collector chemicals. Sulfide minerals are attached to air bubbles, float to the surface of the cell, and overflow into a steel launder. The copper sulfite coats pyrite particles and make them appear as copper minerals for better recovery. The frother improves formation of bubbles and collectors coat sulfide particles to make them hydrophobic. The rougher flotation concentrate is upgraded to make it saleable for smelting by processing in a bank of three cleaner cells. No further reagents are added to the cleaner cells, but the concentrate is further dewatered and recycled through the rougher flotation circuit. Final rougher tailings are pumped into an impoundment for gravity dewatering.

Cleaner concentrate will be dewatered to a moist filtercake in a plate and frame filter. Filtercake will fall into a concentrate bin and filtrate will flow back to the rougher cells. Trucks will drive under the bin for loading and transport to a regional smelter.

The mass balance for 100 tonnes of ore is approximately 10 tonnes of concentrate ( $6 < X < 25$ ) with the remainder of approximately 90 tons as tailings ( $75 < X < 94$ ). Approximately 50 tons of tailings will be used as backfill to fill the void represented by the 100 tons of extracted ore. Thus from 25 to 44 tons of tailings will remain at the mill site for each 100 tons processed.

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NJMC has used the current mill for other mine projects in the past and has made no comments on the future uses of the site after the Silver Strand Mine is closed. The Idaho Department of Lands requires bonding for mining projects, but the Forest Service has no authority to set the amount of bond for activities that occur on private land, nor can the Forest Service impose any reclamation requirements on these lands.

**Direct and Indirect Effects:**

**Air Quality:**

The NJMC mill site is currently exempt from air quality permitting from IDEQ (NJMC 2/06/04). Air quality could be affected by the stockpile of ore stored on the mill site, the crushing of ore, by drying tailings, and from hauling of ore. The ore stockpile will consist of material that has not yet been crushed and processed. It is not expected that the material would have enough fines to generate extensive air quality problems. The crushing facilities are not contained within a building.

**Water Quality:**

The mill recycles all processed water and any stormwater that falls on the impoundment. No discharge is planned or expected as a result of processing the Silver Strand materials. It is NJMC's responsibility to ascertain whether the IDEQ would require any water quality permits. The mill site currently holds a cyanidization permit, although no cyanidization is planned for the Silver Strand Ore processing.

**Noxious Weeds:**

Any disturbed areas have the potential for noxious weed infestations. The NJMC mill site is inspected regularly, and a weed management plan is on file with the Shoshone County Weed District.

**Cumulative Effects:**

The Federal Action to be decided upon through the Environmental Assessment is whether to approve the mining Plan of Operations, and if so, under what terms and conditions. The Federal Action is limited to the activities proposed on the National Forest. Cumulative effects, as they relate to the Federal Action, involve consideration of the direct/indirect effects in context with any added effects from other past, present, or reasonably foreseeable future actions. Because the mill site is located on private land, any direct or indirect effects from the mill site would not be additive to the direct/indirect effects of mining operations on the National Forest. In other words, there are no cumulative effects from the mill site and the mine because the affected areas of each are geographically distinct and separate.

**Relevant Consequences of Ore Hauling on County Road 1-C**

While the Forest Service does not permit or control the use of County Road 1-C from the intersection with FR 209 to the mill, an approved Plan of Operations for the mine will result in ore hauling along the road, and this may cause road degradation and create public safety concerns. The Forest Service portion of the proposed haul route is approximately 44.6 kilometers (27.9 miles) and use of these roads is evaluated in the EA.

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**Direct and Indirect Effects:****Road Degradation:**

Hauling of ore on this County Road will cause additional road degradation. The equipment used to haul ore will meet County Road specifications for hauling equipment. It is expected that initially one truckload of material will be hauled per day. At full capacity one to two truck loads per day may be hauled to the mill site. Shoshone County does not require additional permitting if the vehicles and haul weights are within County Road standards. In special instances, like a major mine development, additional permitting is required. These sorts of agreements are between Shoshone County and the mining company.

**Public Safety:**

Users of County Road 1-C will notice an increase in traffic from the mining-related activities. The mining-related hauling will not be restricted to the workweek, and maintenance activities may be performed on weekends and may occasionally require truck use (NJMC 2003). Appropriate signage will be needed to call attention to points where trucks will enter and leave public roadways.

**Cumulative Effects:**

As discussed above, the Federal Action to be decided upon through the Environmental Assessment is whether to approve the mining Plan of Operations, and if so, under what terms and conditions. The Federal action is limited to the activities proposed on the National Forest. Cumulative effects as it relates to the Federal action involves consideration of the direct/indirect effects in context with any added effects from other past, present, or reasonably foreseeable future actions. The hauling of ore was considered because approximately 28 miles of the haul route is on Forest Service roads. Within this EA, measures to minimize impacts from the mining proposal are required under Alternative 2, as described in Chapter 2 of the EA. With respect to maintenance of the Forest roads (FR 411, 206, and 209) a road maintenance agreement between the NJMC and the Forest Service will become part of the approved Plan of Operations. Regularly scheduled maintenance on the County Road will protect the surface, and there is little risk to public safety considering the additive effects of road use by the public (recreationists), Forest Service personnel involved in prescribed fire and other administrative tasks, livestock permittees, and the direct effects of hauling ore.

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## **Appendix B: Comments Received During Scoping**

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November 14, 2003

Joseph P. Stringer  
District Ranger  
Coeur d'Alene River Ranger District  
2502 East Sherman Avenue  
Coeur d'Alene  
Idaho 83814-5899.

RE: Idaho Conservation League scoping comments on the Silver Strand project.

Dear Joseph Stringer,

Thank you for allowing us to comment on the Silver Strand project. The Idaho Conservation League has a long history of involvement with mining and water quality issues. As Idaho's largest statewide conservation organization we represent members from around the state -- many of whom have a deep personal interest protecting our land, water, fish, and wildlife from the harmful effects of waste material created by mining operations.

The Idaho Conservation League wants to ensure that this operation will not lead to tragic long-term consequences on water quality and wildlife and that rehabilitation will be effectively enforced. Past experiences with improperly managed and regulated mining operations make it necessary to have heightened vigilance about all mining proposals. As your office conducts further analysis on the issue, we hope that you will fully address our concerns.

Sincerely,

John Robison  
Conservation Associate

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## **Idaho Conservation League scoping comments on the Silver Strand project**

### **Claim Validity**

The Forest Service needs to substantiate the validity of all associated claims. An objective validity analysis, including a marketability and prudent person test, needs to be performed to take into account the following factors:

- the means of access permitted, which will affect the commercial viability of the mining claim (see Clouser vs. Espy)
- current minerals prices
- the increased expense of mitigation and monitoring measures required to comply with all federal and state laws including the National Forest Management Act standards and guidelines, the Panhandle National Forest Plan, Riparian Habitat Conservation Areas, and INFISH
- mitigation of impacts to species that have become threatened or endangered since the last validity test
- mitigation measures for noxious weeds
- current labor costs
- current fuel costs
- bonding requirements and costs

### **Exploration vs. Development**

This project is proposing to develop formerly established ore-containing rocks. All activity must be limited to sites where deposits have already been properly located, documented, and the value determined. No further mineral exploration outside of these specific areas is to be allowed.

### **Link between development and processing**

The Forest Service must describe where and how this material will be tested and processed. Both the extraction and processing are connected and cumulative activities and need to be examined under the same environmental analysis.

### **Access**

The Forest Service needs to describe whether the operation will maintain or construct the 0.32 miles of roads needed. In addition, the Forest Service needs to clarify whether or not this is a system road and conduct a roads analysis with recommendations. The Forest Service also needs to state the history of this road and whether or not RS 2477 applies. Old roadbeds were often situated inappropriately located. In order to minimize erosion, the roadbed needs to be reassessed before use. Additional berms, drains, and culverts may need to be incorporated. This road should be totally obliterated and gated at the conclusion of the project with proper care to prevent sedimentation and OHV use.

The Forest Service should clarify whether or not surface blading and no side-casting will be allowed and what mitigation measures will be in place. We encourage the Forest Service to limit the number of vehicle trips to the minimum needed. Mining operations should be limited to the dry season. The Forest Service needs to discuss whether or not the culverts will allow for fish passage and 100-year flood events.

### **Water Quality Protection**

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Because of anti-degradation laws, the Forest Service must take utmost precautions to protect water quality. Mining has a well-documented history of adversely impacting water quality and fish populations. The Forest Service needs to evaluate the effects of mine operation and road use on fish species inhabiting this watershed. Silt-fences and certified weed-free straw bales should be used to protect streams from sedimentation and be removed upon completion of operations.

The effects of mining activities on surface water and groundwater quantity and quality need to be determined for a full range of flow conditions at the mining site, along the transportation route, and at the processing facility. This geochemical analysis should include the following factors:

- preexisting water quality issues from previous mining activities
- potential for acid mine drainage or other contaminants including thallium and selenium
- continued baseline monitoring and analysis of all new waste rock and tailings
- sedimentation from roads
- transportation of hazardous or toxic materials near streams
- on-site water needs
- source of water
- the depth and flow of water table
- adit depth
- the potential for household chemicals and toxins to leach into surface and ground waters
- water capture and subsequent leakage by trenches
- waste water discharge from site
- storm water runoff

The Forest Service needs to describe in detail the rerouting of existing mine water drainage and releasing any stored mine water. These flows need to be tested for acid mine drainage and heavy metals and cleaned up before action is taken.

### **Riparian Habitat and Conservation Area Protection**

None of the proposed activities should occur within a Riparian Habitat Conservation Area. Any and all operations must comply with the protective standards and regulations stated in the Forest Plan concerning mining, road construction, and tree removal. The Forest Service needs to detail where, how, and for what reasons any tree cutting will be allowed. No tree cutting should occur within RHCAs.

### **Water rights**

Water rights need to be obtained for any and all water use at the mining facility, at the noxious weed washing station, and for all processing at the mill site and tailings impoundment.

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### **Threatened, Endangered, Sensitive, Protected, and Candidate Species**

The US Forest Service must submit a biological assessment on all possible threats to fish and wildlife species. We are interested in knowing whether or not bats inhabit the adits to be closed. In order for the operation to proceed, the USFWS must approve the report with a "no jeopardy" finding. No incidental taking permits should be allowed.

### **Minimum surface disturbance**

The claimant should use the minimum tool with the least discernible impact on the land.

### **Air quality and noise levels**

The environmental analysis needs to evaluate the effects to air quality and intrusive sounds from mining operations. Any generators should be turned off at sunset to minimize noise levels and light levels according to Dark Sky principles.

### **Living situation**

The Forest Service needs to specify whether or not the mine operators will be living on or off-site. If on site, all food must be stored in bear-proof containers to minimize interactions with wildlife. All garbage must be disposed of appropriately in a timely fashion. To avoid contaminating the area with human feces, a portable toilet river-running style toilet will have to be located on the site and serviced regularly.

### **Hazardous materials**

A hazardous material plan needs to be in place in the event of a fuel or solvent leak anywhere from the nearest gas station to the mine site. Hazardous wastes including grease, oil, and fuels need to be disposed off off-site in an environmentally appropriate manner on a weekly basis. Fuel containment equipment, including chemical absorbers and booms to intercept stream transport need to be on site. Regularly inspected fire extinguishers need to be placed in all vehicles. To avoid groundwater contamination, the chemical contents of waste water need to be analyzed before it is injected into groundwater.

### **Waste rock**

The Forest Service needs to evaluate the condition of the old waste rock dump adjacent to the adit. This waste rock pile should be tested for acid mine drainage, heavy metals, and ground water contamination. A liner may need to be placed underneath the old waste rock pile before activities commence.

The new waste rock piled on-site needs to be watered down to contain dust. No valley fill should be allowed. The waste rock pile should be angled to reduce erosion and revegetated. The waste rock and tailings should be fully encapsulated by an impermeable cap on top and a lining beneath.

### **Transport of Bulk Material**

Extracted material needs to be wetted down and covered during transport to the mill site to minimize air pollution from dust.

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### **Reclamation and Bonding**

The reclamation of the area must take place concurrently with the mining operation and return the site to a more natural condition than presently exists. If any topsoil or large woody debris will be moved, they should be salvaged and replaced following operations. This bond should cover refilling all mine shafts, stabilizing waste rock piles, lining and capping mining wastes, recontouring and revegetating the site, removing noxious weeds, obliterating the road, naturalizing the area, and gating the trailhead. Complete reclamation, including road obliteration, must occur after two years of operation. The bond must be substantive enough to cover the worst possible impacts to the ecosystem as well as the area surrounding the transportation route and processing site. These bonding calculations should be included in the environmental review and available for public comment and review.

### **Monitoring**

Monitoring must be conducted on the waste rock piles, groundwater, and adits currently on the site to determine that no acid mine or other toxic drainage is occurring. Monitoring must continue throughout the mining operation and following reclamation. The impacts of the operation on wildlife need to be monitored and amended as needed.

### **Noxious Weeds**

The vehicular traffic will serve as a vector for noxious weeds, an ecological problem of epidemic proportions. According to the Payette National Forest, "These plants are capable of becoming established in pristine or relatively undisturbed areas and can spread quickly over large geographic areas." Roads, trails, and rivers have been identified as the primary conduits for noxious weed species transport and establishment," (Peter Grinde, Noxious Weed Situation Analysis on the Payette National Forest, 8 Jan 2002). "Weed prevention means placing a priority on preserving and protecting lands not presently infested," (Noxious Weeds, AG 500, Utah State University Extension).

If vehicle access is allowed, the tires and undercarriage must be hosed down with pressurized water to dislodge seeds. The wastewater needs to be collected on a tarp and strained to collect seeds for disposal in plastic bags. This stipulation needs to be included in the Plan of Operations.

Disturbed soil and waste rock piles need to be reseeded with native plants, and weeded to prevent expansion of noxious weeds. Work crews trained in noxious weed recognition and removal should patrol the roadbed and the area within 100' on either side of the road and mechanically remove any weeds or microtrash.

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Joseph P. Stringer  
District Ranger  
Coeur d'Alene River Ranger District  
2502 East Sherman Avenue  
Coeur d'Alene, ID 83814-5899

November 14, 2003

Dear Mr. Stringer:

The following concerns are being submitted regarding the Environmental Assessments (EA's) that are being prepared for the Golden Eagle Project Plan of Operations and Silver Strand Mine Plan of Operations.

Code of Federal Regulations/ Idaho WQS:

The Code of Federal Regulations at 36 CFR part 228 describes the rules and procedures that apply to the search for minerals on National Forest System lands. 36 CFR at 228.8(b) has the following language regarding water quality. "Operator shall comply with applicable Federal and State water quality standards, including regulations issued pursuant to the Federal Water Pollution Control Act, as amended (33 U.S.C. 1151 et seq.)."

Idaho Water Quality Standards are described in IDAPA 58 Title 01 Chapter 02. IDAPA at 58.01.02.080.01 contains the following language. "No pollutant shall be discharged from a single source or in combination with pollutants discharged from other sources in concentrations or in a manner that:

- a. Will or can be expected to result in violation of the water quality standards applicable to the receiving water body or downstream waters: or
- b. Will injure designated or existing beneficial uses; or
- c. Is not authorized by the appropriate authorizing agency for those discharges that require authorization."

IDAPA at 58.01.02.054.04 concerns water quality limited water bodies and the TMDL process. These regulations require that there can be no new or increased discharge of pollutants into water bodies where there is an approved TMDL, until the TMDL process is completed. The EPA approved TMDL for the North Fork Coeur d'Alene River Sub-basin includes the Burnt Cabin subwatershed and the Beaver Creek watershed. It appears that both mining project areas are within the boundaries of the North Fork TMDL. The water quality sections in both EA's need to indicate whether a TMDL Implementation Plan has been written that includes the areas where the mining activities are being proposed.

36 CFR 228.8(e) contains the following language. "In addition to compliance with water quality and solid waste disposal standards required by this section, operator shall take all practicable measures to maintain and protect fisheries and wildlife habitat which may be affected by the operations."

The water quality analysis in both EA's needs to provide assurances that the mining activity being proposed in both areas will be in full compliance with the regulations described in 36 CFR 228.8(b) and (e), and will also be in full compliance with applicable Idaho Water Quality Standards and Clean Water Act regulations.

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36 CFR 228.8(g) describes the reclamation requirements that are to be complied with as part of mining operations. Each of the five issues cited in 228.8(g) are of particular concern regarding the proposed mining operations. These five issues are: control of erosions and landslides; control of water runoff; isolation, removal, or control of toxic materials; reshaping and revegetation of disturbed areas, where reasonably practicable; and rehabilitation of fisheries and wildlife habitat. The EA's for each project need to provide expert agency comments that will describe the methods that will be used by the Forest Service to ensure the requirements of 36 CFR 228.2(g) are fully complied with if both mining projects are approved. There also needs to be a full discussion of monitoring issues relating to prevention of environmental damage to the water bodies in both project areas. Specific information needs to be included in each EA concerning the Federal Agencies that will be responsible for water quality monitoring and water quality analysis at each mine site.

There also needs to expert agency comments that will indicate whether there will be sufficient funds to ensure water quality monitoring activities will occur at each mine site.

#### Code of Federal Regulations/Bonds:

36 CFR 228.13 concerns the issue of bonds and mining operations.

The EA's need to include information that will describe the expected dollar amount of bonds that would be needed for each project. There should also be expert agency comments that will describe the process that would use by the Forest Service to perform reclamation work in the event the bond furnished by an operator did not fully cover all necessary reclamation work.

#### Road construction/reconstruction/water quality:

Concerning the Silver Strand project in Lone Cabin Creek, the legal notice listed 0.32 miles of temporary road access that would be required. It was also indicated in the legal notice that up to 20,000 metric tonnes of ore would be hauled to be processed offsite, and up to 20,000 metric tonnes of waste rock material would be placed in a waste rock storage facility.

If Forest Road 411 would be used as part of the mining project, the roads section of the EA needs to provide a detailed description of the work that would be performed to this road.

There needs to be high quality information included in the roads section that will indicate whether the mining project would impact the watershed/fishery enhancement work that was to take place on Forest Road 411, as described in the Fernan District's 1992 Barney Rubble's Cabin DN and FONSI, page D-7. "Road 411 will be eliminated from its junction of Road 206 to approximately 1,500 feet from the Silver Strand Claim, and from where it crosses Lone Cabin Creek, approximately 1,000 feet toward Five Fingers Saddle."

There needs to be a comprehensive discussion in the EA of the activities that would occur on Road 411 and indicate whether the Road should be closed in order to perform mining activities and the watershed/fisheries work.

The roads analysis sections of both EA's need to provide information that will indicate whether any currently closed roads in either analysis area would be opened as part of the mining operations. The roads analysis sections also need to describe the maximum amount of truck traffic that would occur daily and weekly in each Project area when mining operations are operating at full capacity.

The road analysis also needs to discuss the issues that would arise if an accident involving trucks hauling ore material or waste rock were to occur. The potential impacts to water quality and

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fisheries need to be fully discussed if a truck accident would result in ore material or waste material being deposited into a water body.

Water quality/temperature:

The water quality analysis sections of each EA should include information regarding possible temporary increases in water temperature to the water bodies in each area as a result of mining or reclamation activities. If it is expected that there could be a temporary increase in water temperature in any waterbody in either project area due to water withdrawal from a stream or Creek, the water quality section of one or both EA's needs to fully describe the temperature impacts to water bodies that may occur as a result of withdrawing water from a stream or Creek during the months of June, July, or August.

If it has been determined that mining operations would not result in any temporary increases in water temperatures to any water bodies, both EA's need to include the analysis that supports a finding of no increases in water temperature.

Finances:

There should be analysis in both EA's regarding the possibility that mining operations would be suspended in the event of a significant decline in the market prices for gold and/or silver.

If gold and/or silver prices drop significantly, would one or both projects be suspended? If the market prices for gold or silver were to make mining uneconomical after mining operations were underway, would the Plan of Operations be cancelled or suspended? The EA's need to describe the procedures that would be undertaken to protect the environment in the event mining operations were halted due to uneconomical metals prices.

Mining Activities:

The EA's need to include high quality information that will describe the maximum amount of ore materials that will be allowed to be removed with each Plan of Operation. There needs to be specific language in the Golden Eagle Project EA that will describe the procedures that will be required in the event the operator requests to remove more than 8,000 cubic yards of ore from the project site.

There also needs to be specific language in the Silver Strand Mine EA that will describe the procedures that will be required in the event the operator requests to remove more than 20,000 metric tonnes of ore.

We wish to receive a copy of both EA's when they are released.

Sincerely,

Mike Mihelich

Forest Watch Coordinator

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## **Appendix C: Responses to Comments Received During Scoping**

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**COMMENT #1 (Idaho Conservation League - November 14, 2003 letter)**

**Claim validity:** A respondent stated that the Forest Service needed to conduct a validity examination on all associated claims.

**RESPONSE TO COMMENT #1 (USDA FOREST SERVICE)**

As a matter of policy, the USDA Forest Service does not inquire into claim validity before processing and approving proposed plans of operations on National Forest system lands reserved from the public domain and open to entry under the mining law. Consistent with its regulations (36 CFR 228 Subpart A) and the Surface Resources Act (30 U.S.C. 612) the Forest Service will insure proposed activities are required for and reasonably incident to prospecting, mining or processing operations, and ensure operations minimize adverse environmental effect to the extent feasible and reasonable. Frequent periodic site inspections will insure the mining operations are conducted in compliance with applicable state, federal regulations.

**COMMENT #2 (Idaho Conservation League - November 14, 2003 letter)**

**Exploration versus development:** A respondent stated that the Forest Service needed to insure activity was limited to mining and that exploration should not be allowed.

**RESPONSE TO COMMENT #2 (USDA FOREST SERVICE)**

Evidence of previous positive exploration results of the site by the operator and previous operators was provided to the Forest Service Mineral Administrator in January 2003, when the Forest Service Minerals Specialist analyzed the reasonableness of the Silver Strand proposal as part of the completeness review for the Plan of Operations. The analysis concluded that the proposed development of the new temporary access road, rehabilitation of the existing access roads, ore storage and loading bin, paste backfill plant, tool storage shed and underground development work, erosion control structures, and other proposed mining-related facilities proposed in the Plan of Operations fall within the late stage of development and early stage of mining and are appropriate under the Forest Service mining regulations and General Mining Laws. A more detailed review of the projects geological information and reserve information was conducted on December 31, 2003 and again on February 20, 2003 as part of the environmental analyses. These reviews included examination of historic and recent company files related to the project including cross-sections, plan-levels, underground and drill hole geologic maps and sample assay results, acid-base accounting data, site water balance estimates, surface and underground water quality information, geotechnical engineering studies, metallurgical data, engineering plans and other pertinent data.

No exploration was proposed within the Plan of Operations and any exploration that could or would produce a significant surface disturbance or impact on the ecosystems at the site would require submittal of a supplemental or new Plan of Operations and would be reviewed and analyzed prior to approval of those operations as per the requirements of 36 CFR228A and other applicable laws and regulations. The administrator recommended the District Ranger continue to process the submitted Plan of Operations, and the operator be required to provide additional information for environmental analyses and implement additional mitigation measures needed to insure potential environmental issues related to the mine development work were addressed. In addition the administrator recommended systematic and regular inspections be conducted and documented to the District Ranger and other involved agencies during development and

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reclamation. The administrator further recommended that any plan approved by the Ranger should contain requirements that if other conditions encountered indicate significantly different conditions than analyzed in this EA, mining will not continue until the Forest Service has reviewed the information and determined if additional environmental mitigation is needed.

**COMMENT #3 (Idaho Conservation League - November 14, 2003 letter)**

**Link between development and processing:** The respondent stated that the Forest Service needed to analyze both the extraction and processing phases of the operation under the same environmental analysis.

**RESPONSE TO COMMENT #3 (USDA FOREST SERVICE)**

On lands administered by the Forest Service the Organic Administration Act authorizes the Secretary of Agriculture to regulate occupancy and use of the National Forest System lands for the protection and management of forest resources. The Forest Service has the responsibility to make sure the activities are conducted so as to minimize adverse environmental impacts on National Forest System surface resources (36 CFR 228, Subpart A). The Forest Service has no legal right to deny exploration and mining proposals. Forest Service authority also does not extend beyond National Forest System lands; therefore, the Forest Service has no jurisdiction over the development and operation of a mineral processing facility on private land or use of county-maintained portions of the road system. The use and maintenance of National Forest roads and trails are covered under the final approved Plan of Operations. Although the Forest Service has no authority to direct or control activities occurring on private land, the construction and operation of the mineral processing facility and hauling of ore are considered “connected actions” as defined by the National Environmental Policy Act (NEPA); however, this proposal is not a federal action. It is the responsibility of the Agency to consider the potential effects of connected actions on public resources. The Agency has no responsibility through NEPA to address environmental effects occurring solely on private lands that do not otherwise affect public resources. A Supplemental Effect Disclosure outlining the known and potential environmental impacts and permitting responsibilities of the “connected actions” mineral processing operations on private lands are described in Appendix A of the EA.

**COMMENT #4 (Idaho Conservation League - November 14, 2003 letter)**

**Access:** The respondent stated that the Forest Service needed to describe whether the operation will maintain or construct the 0.32 miles of roads needed for the operation. Also, the respondent asked whether or not culverts would allow for fish passage or 100-year flood events.

**RESPONSE TO COMMENT #4 (USDA FOREST SERVICE)**

The operator’s Plan of Operations describes in detail the proposed temporary low standard road to be constructed for access to the Rock Storage Site and the improvements to be made to the existing non-system roads located on site. The existing roads are non-system roads constructed in the late 1960’s and early 1970’s and were related to historic prospecting and mining activities on the site. They are not subject to RS 2477. The road prisms will currently require some minor upgrading to meet the requirements for Forest Service temporary low standard road provisions, and guidelines outlined in the Idaho Department of Lands’ Best Management Practices for Mining (November 16, 1992) and current rules governing haul roads established by the Mine

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Safety and Health Administration (MSHA). The new temporary road and older roadbed will be completely recontoured, obliterated and reclaimed (including planting trees and shrubs appropriate to the site) upon completion of the project.

The respondent indicated the Forest Service needed to complete a roads analysis for the project. A formal roads analysis was conducted for this project. Potential alternative access routes and the associated impacts to their use were examined in the EA and specialists reports. There will be a net decrease in open roads in the area upon completion of the project and road beds will be reclaimed the extent reasonable possible and will include self-maintaining drainage structures, and revegetation including planting of trees, shrubs, forbs and grasses appropriate to the individual sites.

A single undersized and partially collapsed culvert along a draw on the upper access road to the paste backfill plant may be replaced as part of the operation. The draw is ephemeral and does not carry sufficient water for fish passage or sustained flow. The culvert will be removed at termination of the operations as part of the reclamation. An undersized culvert in Lone Cabin Creek adjacent to the No. 3 portal is currently a fish barrier will be removed as part of the operation reclamation activities.

**COMMENT #5 (Idaho Conservation League - November 14, 2003 letter)**

**Water quality:** The respondent stated concerns regarding water quality including sedimentation and heavy metals contamination.

**RESPONSE TO COMMENT #5 (USDA FOREST SERVICE)**

The operator's Plan of Operations describes in detail the proposed water management procedures to insure water quality degradation does not occur. No heavy metals are likely to exist on the site, as it is a precious metals placer, not a lode base metal deposit. No household chemicals or reagents are going to be transported, used or stored on site. The operator has provided a spill prevention, control and countermeasures plan (SPCC) to address fuel storage, use and actions in case of a spill. A spill clean-up kit will be present on site as per applicable MSHA and Forest Service regulations.

**COMMENT #6 (Idaho Conservation League - November 14, 2003 letter)**

**Riparian Habitat and Tree Cutting:** The respondent stated concerns regarding potential damage to Riparian Habitat and stated no tree cutting should be allowed.

**RESPONSE TO COMMENT #6 (USDA FOREST SERVICE)**

The operator's Plan of Operations does not include any significant surface disturbing activities within the adjacent riparian area as the site lies entirely in an upland setting. Prior to commencement operations a small sediment settling tank for storm and waste water management and sediment collection will be constructed in the inboard road ditch and will be removed after the site is closed and reclaimed. In addition, an undersized culvert in Lone Cabin Creek that is currently a fish barrier will be removed.

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The operator has a legal right to remove trees as necessary to mine the mineral deposit and may use them for development of the mineral deposit. The operator will only deck timber as required to access the deposit and construct the necessary facilities and will do so in a fashion so as to minimize loss of canopy. No tree cutting will occur in the adjacent riparian area.

**COMMENT #7 (Idaho Conservation League - November 14, 2003 letter)**

**Water Rights:** The respondent stated the operator needed to obtain water rights for water use.

**RESPONSE TO COMMENT #7 (USDA FOREST SERVICE)**

The operator's wash plant is on private property and has an existing water right. Removal of water from Lone Cabin Creek at the mine site will require a water right and the operator is required to obtain the water right from the appropriate state agency (IDWR). The operator has applied for the Water Right in Application No. 94-7399 and IDWR and the Forest Service has provided comments to IDWR in regards to potential issues related to granting of the water right. Specific mandatory stipulations and water withdrawal and use conditions are incorporated into the Plan of Operations to insure that water withdrawals from Lone Cabin Creek are minimized, if required, and withdrawals will not have a detrimental impact on the riparian habitat, resident biota, flow conditions, dissolved oxygen levels or temperature.

**COMMENT #8 (Idaho Conservation League - November 14, 2003 letter)**

**Threatened, Endangered, Sensitive (TSE) Species:** The respondent stated concerns about impacts to TSE species. The respondent noted specific concerns regarding the mine openings suitability for bat habitat.

**RESPONSE TO COMMENT #8 (USDA FOREST SERVICE)**

These concerns regarding known or possible impacts to TSE and other fauna and flora in the project area are addressed in the biological assessment, biological evaluation and supporting environmental review documents.

The Silver Strand Mine was examined by a biologist during the winter of 2003 and the mine had conditions unfavorable to bat hibernation (internal conditions below freezing). An internal bat survey was also completed in 2003 by representatives from the Idaho Department Lands, Bats Conservation International and a Forest Service contractor. No bats, roosts or signs of bat habitation were located during the surveys. In addition, due to the regular and frequent entry by the operators habitation is not likely to occur during operations. Once mining is completed and the project is undergoing reclamation, the mines suitability for bat habitation will be reexamined by the Forest Service or another third-party qualified biologist. If, as a result of the mining operations, the conditions become suitable for bat habitation, suitable bat-friendly mine closures will be installed on the openings.

**COMMENT #9 (Idaho Conservation League - November 14, 2003 letter)**

**Minimum surface disturbance:** The respondent stated concerns about insuring surface disturbance from the operations are kept to a minimum.

**RESPONSE TO COMMENT #9 (USDA FOREST SERVICE)**

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The operator's Plan of Operations and required mitigation measures stipulate that surface disturbance will be kept to the minimum amount reasonably possible.

**COMMENT #10 (Idaho Conservation League - November 14, 2003 letter)**

**Air Quality and Noise Levels:** The respondent stated concerns regarding noise and air quality and evening activities on site.

**RESPONSE TO COMMENT #10 (USDA FOREST SERVICE)**

The Plan of Operations includes measures designed to minimize dust generation including watering and/or tarping of stockpiles, covering and/or wetting down of loaded haul trucks. The respondent had concerns about evening noise. Since the operation is a seasonal operation (summer only) there may be times when the mining operations will continue after dark. Typically these operations will be underground. Equipment operating on site will be required to meet noise levels established by various regulations including those from the Mine Safety and Health Administration (MSHA) and Occupational Safety and Health Administration (OSHA).

**COMMENT #11 (Idaho Conservation League - November 14, 2003 letter)**

**Living situation:** The respondent stated concerns regarding occupancy, sewage disposal, and camping on site.

**RESPONSE TO COMMENT #11 (USDA FOREST SERVICE)**

These issues are discussed in the Plan of Operations. No structures will be constructed on site that are not reasonably incident to the mining operations as per Forest Service guidelines outlined in the Forest Service Manual, Region 1 Supplement No. 2800-92-2, Section 2817.23 and in 36 CFR 228.8.

Portable, self-contained ("port-a-potty") sewage facilities will be utilized on site and waste will be removed from the site and disposed of regularly in an approved disposal facility and garbage and refuse will be removed regularly as described in the Plan of Operations.

**COMMENT #12 (Idaho Conservation League - November 14, 2003 letter)**

**Hazardous Materials and Fire Control:** The respondent stated concerns regarding transport, storage, use and spill prevention of hazardous materials and fire control on site.

**RESPONSE TO COMMENT #12 (USDA FOREST SERVICE)**

The project site will not contain significant quantities of hazardous materials. A limited amount of fuel will be on site and limited to the fuel tanks of the operating equipment and a single storage tank with secondary containment. Major equipment maintenance activities will be conducted off site in an appropriate facility to minimize the risk of incidental or accidental spillage. The Plan of Operations contains an effective spill prevention and response plan that was reviewed by staff from several state and federal agencies and incorporated changes recommended by these agency staff. This plan meets the requirements of the US Department of Transportation Emergency Response Guidebook and Idaho Hazardous Materials Incident Command and Response Plan, and includes emergency reporting contact telephone numbers and reporting procedures as well as specific emergency procedures that must be followed in the case of a spill or release. All equipment will be inspected regularly to insure there are no leaks and all

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equipment will contain a spill response kit (absorbent pads, shovel, etc.). The respondent suggested a boom system for stream spills should be on site. Given the site's location on an upland surface a substantial distance from any live water, this is unreasonable and unnecessary. The Plan or Operations contains procedures to insure prevention of fires and a fire plan meeting the requirements of 36 CFR 228.11, and in addition the operator must meet additional fire control procedures outlined under MSHA regulations. All operating and fire extinguishing equipment will be inspected regularly and served as required.

**COMMENT #13 (Idaho Conservation League - November 14, 2003 letter)**

**Waste rock:** The respondent stated concerns regarding existing conditions and risks from acid rock drainage and heavy metals of waste rock dumps. The respondent suggested a liner may need to be placed under existing waste rock piles.

**RESPONSE TO COMMENT #13 (USDA FOREST SERVICE)**

Extensive characterization of the development and waste rock chemistry, acid-generating capabilities and acid-neutralizing capabilities were completed by the operators and in the past by staff from the former Bureau of Mines. Several binding stipulations have been incorporated into the Plan of Operations to insure that short-term and long-term risks from a metal-release or acid rock discharge are addressed and can be summarized in the EA and respective specialists' reports with more details in the project record.

The existing waste rock dumps on the site are over 20 years old and most are relatively well vegetated and are not currently contributing any significant sediment or metals to the environment. From the standpoint of site disturbance, excavation of these older dumps to construct liners, and removal of timber to do so, would generate a significant amount of unnecessary disturbance. To increase the visual quality and stability of these old dumps the project operator has agreed to place appropriate soil conditioners and plantings on these dumps as time permits as part of their reclamation program for the site.

**COMMENT #14 (Idaho Conservation League - November 14, 2003 letter)**

**Transport of materials:** The respondent stated concerns regarding air quality from haulage operations.

**RESPONSE TO COMMENT #14 (USDA FOREST SERVICE)**

This is covered in the response to Comment #10.

**COMMENT #15 (Idaho Conservation League - November 14, 2003 letter)**

**Reclamation and Bonding:** The respondent stated concerns regarding short-term and long-term reclamation and adequate bonding and suggested reclamation should occur concurrent with operations and that the site should be returned to a more natural condition than presently exists.

**RESPONSE TO COMMENT #15 (USDA FOREST SERVICE)**

Forest Service regulations stipulate that a reclamation performance bond be posted to cover the cost of reclamation of a mining operation at the point of maximum disturbance. This operation will be conducting reclamation concurrent with mining where possible and minimizing active disturbance thus minimizing the need for excess bonding. The mining operation will be inspected

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on a regular basis and the bond calculation assumes that operations will be conducted in compliance with the approved Plan of Operations and other applicable laws and regulations. Other agencies with jurisdiction over mining or related site activities (e.g., MSHA, IDL, IDEQ, IWR and others) may and likely will inspect the mine site periodically. Should those agencies determine operations are in non-compliance with their respective laws and regulations and they advise the Forest Service of these deficiencies the operator will be notified of the issue(s). If the operator fails to complete concurrent reclamation, or comply with the applicable laws and regulations then the Forest Service will require the operator to cease operations and correct the deficiencies and/or conduct the necessary reclamation and rehabilitation work prior to continuing extractive mining operations. The requirements for long-term reclamation consist of complete obliteration of all new and old roads on the site, recontouring, replacement of topsoil and revegetation including planting of trees, shrubs and grasses appropriate to the site. Bonding will be in accordance with the Forest Service bonding regulations at 36 CFR 228.13 and the bond will be updated as necessary should unanticipated environmental impacts or changed conditions become evident at the site. At present the current estimated bond amount, which was calculated assuming assumption of liability by the Forest Service at maximum disturbance, is estimated to be approximately \$63,000.00. This amount is subject to change as final project development work progresses and the Plan is implemented. The bond will be reviewed and updated to reflect final engineering components once construction is completed and at least annually or at any time the operating, ground or environmental conditions change in a significant fashion. The complete bond will not be refunded until final reclamation activities at the site are completed including re-establishment of vegetation. The operator has agreed to complete additional measures to reclaim site disturbance from previous operators as outlined in their reclamation plan.

**COMMENT #16 (Idaho Conservation League - November 14, 2003 letter)**

**Monitoring:** The respondent stated concerns regarding monitoring of waste rock dumps for heavy metals, and site disturbance over the short- and long-term during operations, during reclamation and after reclamation.

**RESPONSE TO COMMENT #16 (USDA FOREST SERVICE)**

Forest Service regulations stipulate that an operation be regularly inspected and monitored for compliance with its Plan of Operations and other environmental regulations (36 CFR 228.7) and for reasonable rehabilitation of the site once operations and reclamation are completed (36 CFR 228.8). The Coeur d'Alene River Ranger District employs a full-time Minerals Specialist who routinely inspects active and inactive mining operations within the forest to insure operations are operating in compliance with applicable laws and regulations. When operations are found to be in non-compliance with their approved Plan of Operations, or other applicable laws and regulations, appropriate administrative and, if necessary, civil or criminal remedies can and are taken to insure deficient operations are brought back into compliance. In addition, other jurisdictional authorities may inspect mining operations for compliance with their respective regulations including the Mine Safety and Health Administration (MSHA) and various state agencies (IDEQ, IDWR, IDHW).

**COMMENT #17 (Idaho Conservation League - November 14, 2003 letter)**

**Noxious Weeds:** The respondent stated concerns regarding the prevention of the spread and proliferation of noxious weeds and non-native plant species as a result of the operations.

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### **RESPONSE TO COMMENT #17 (USDA FOREST SERVICE)**

Mitigation measures outlined in the Plan of Operations to minimize the risk of spread and proliferation of noxious weeds includes use of certified weed-free mulch and seed products, use of covered loads, tarping and/or revegetating of temporary stockpiles and concurrent reclamation procedures, including rapid and active replanting, to minimize the amount of actively disturbed areas which might host weed infestations. Commercial trucks and equipment operating on open public roads will be kept clean and free of loose dirt and debris. There will be minimal equipment operating off-road at the site, primarily at the Rock Storage Site and that equipment will be required to be cleaned of all dirt and debris prior to being brought on site and will be cleaned prior to removal to reduce the risk of spread of noxious weeds. All mulch and seed materials applied to National Forest System lands must be certified as noxious weed-free as per the requirements of 36 CFR 261.58(t).

### **COMMENT #18 (Kootenai Environmental Alliance - November 14, 2003 letter)**

**Water Quality Standards:** The respondent stated concerns regarding the prevention of degradation of water quality as a direct or indirect result of the mining operations including potential issue areas outlined in 36 CFR 228 (g) including: 1) control of landslides and erosion; 2) control of water runoff; 3) isolation, removal or control of toxic materials; 4) reshaping and revegetation of disturbed areas; and 5) and rehabilitation of fisheries and wildlife habitat. The respondent also raised the issue as to whether the operations would be compliant with Total Daily Maximum Load (TMDL) requirements.

### **RESPONSE TO COMMENT #18 (USDA FOREST SERVICE)**

Mitigation measures to protect the environment from unnecessary and unreasonable degradation are outlined in the Plan of Operations, the EA and specialists reports and meet the requirements of 36 CFR 228.8 and other applicable federal and state guidelines. The expected effectiveness of the proposed mitigation measures are described in the EA and supporting documents.

In regards to the 5 areas identified in 36 CFR 228.8 (g) and cited by the respondent:

- 1) Slope stability and erosion control - A slope stability analyses was conducted by the operator and provided in the Plan of Operations. The analyses were verified by the Forest Service NEPA contractor and qualified in-house geotechnical engineering and geologic staff. Additional slope stability analyses were completed after field investigations by the Forest Service Contractor and are summarized in the EA with details provided in the Hydrology Specialist Report. As a result of these analyses an alternative involving modification to the location of the Rock Storage Site (RSS) access road was proposed and is now incorporated into the Plan of Operations to reduce the risk of slope failures in several potentially unstable areas in the project area. Additional changes included modification to the final grade of shape of the RSS to minimize the possibility of runoff ponding and resulting increased hydrostatic pressures that could trigger slope failures. The Watershed Erosion PP model was run to verify effectiveness of the proposed mitigation measures for erosion control and as a result additional stipulations (mandatory mitigation measures) were developed in collaboration with the Forest Service, the operator and other agencies (IDEQ, IDWR) and will be incorporated in to the Plan of Operations to address potential issues. Both the operator and the District Minerals

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Specialist will routinely inspect the site for signs of slope failure and if an area appears to be showing signs of failure additional mitigation measures will be required to stabilize the potential failure site. Water quality monitoring is also incorporated into the Plan of Operations to insure compliance with applicable laws and regulations.

- 2) Water runoff – The operator has proposed a number of procedures to minimize runoff issues from the site. These mitigation measures including rolling dips, use of slash windrows, silt fences and other sediment control structures as required. Examples include modification of the final shape of the RSS to focus and control rainfall and runoff along with a diversion ditch system to control erosion and sediment release. Compliance monitoring will insure the applicable standards are adhered to. In addition, the IDEQ has examined the project files and reviewed the project and determined that there will be no net increase in sediment (and thus violation of the TMDL's) as a result of this project if administered to standard. Because the operation has developed essentially a zero discharge facility by the addition of a sediment sump collection system to collect sediment from the entire site disturbance area no violation of the TMDL's will occur.
- 3) Release and management of toxic materials – The respondent expressed concerns regarding the possibility of discharge of toxic pollutants into the watershed from the operations. The Plan of Operations contains the procedures that will be used to minimize the risk of release of toxic materials. The operator is required to abide by all state and federal regulations applicable to toxic materials including the MSHA and the EPA regulations. Several alternatives were originally considered but dropped because of the associated need to bring more fuel (a hazardous material) on site – and thus a higher level of risk.
- 4) Revegetation and reshaping - The operator has proposed and is required to obliterate all new road construction and rehabilitate other site disturbance to the extent reasonably practical at the completion of the operations and revegetate the site to standard. The details of the reclamation plan, including revegetation procedures are outlined in the operator's Plan of Operations and the EA. In addition, the operating plan includes significant rehabilitation work of older, existing site disturbance from historic operations and closure and rehabilitation of several existing roadbeds that will ultimately result in a net decrease in sediment loading into the watershed. This additional rehabilitation work, beyond that required for the proposed operations includes removal of an old culvert and revegetation of the associated stream crossing currently acting as a barrier to fish, revegetation of historic waste rock dumps, and filling-in of an old stope mined to the surface.
- 5) Rehabilitation of fisheries and wildlife habitat – the site has very little disturbance with the potential to damage fisheries and the features with that potential have been identified in the EA and specialists reports and addresses with mitigation measures or alternative approaches. For example, an old culvert adjacent to the site along FS Road #411 acts as a barrier to fish migrating upstream. The culvert will be removed by the operator, after the appropriate permits and permissions form jurisdictional authorities are obtained) as part of the project. In addition, waste rock used to emplace the culvert will be removed from the active channel and will minimize the risk of the release of metallic contaminants as the material undergoes and weathering and oxidation. The older and new mine openings may make potential habitat for various terrestrial species, including bats, once operations cease. At the time of closure, the airflow and ground conditions of the mine

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openings and workings will be evaluated as potential habitat and will be closed accordingly provided public safety issues are also addressed by the closure mechanisms.

**COMMENT #19 (Kootenai Environmental Alliance - November 14, 2003 letter)**

**Comment regarding bonding:** The respondent sited concerns about adequate bonding, and the process the Forest Service would take to reclaim site if bonding amount is insufficient and operator defaults. The respondent also requested the expected bond amount be furnished in the EA.

**RESPONSE TO COMMENT #19 (USDA FOREST SERVICE)**

See also response to Comment #15 above. The Forest Service has established rules governing that bonding of mining operations as found in 36 CFR 228.13 which will be used to calculate the bond amount for this project. In addition, the agency has recently released an updated bond guidance containing updated approaches to the calculation of accurate bonds. The initial bond calculations are based in part of conceptual drawings and are part of the project record. The project's ultimate bond amount will be recalculated with as-built drawings as the project progresses. A periodic update clause will be included in the Decision Notice and incorporated in to the Plan of Operations along with a stipulation that if any changes in the operations occur that could generate additional liabilities or environmental impacts that a new bond would be calculated and required prior to implementation of those changes. If unforeseeable circumstances arise, the procedures found in 36 CFR 228.4(e) would apply. The procedures established by the Forest Service for dealing with a non-compliance situation or a situation where an the operator failed to post a bond in accordance with the regulations can be found in 36 CFR 228.7 and further detailed in the Forest Service Manual, Region 1 Supplement No. 2800-92-2, Section 2817.3. If a conflict occurs, following exhaustion of various administrative procedures, ultimately civil or criminal legal actions may be taken to remedy the situation.

**COMMENT #20 (Kootenai Environmental Alliance - November 14, 2003 letter)**

**Comment regarding road use and public safety:** The respondent expressed concerns on maintenance requirements for Forest Service system roads utilized by the project. The respondent also sited concerns regarding potential impacts to proposed restoration activities in the site area outlined in the 1992 Barney Rubble's Cabin (BRC) Decision Notice (DN).

**RESPONSE TO COMMENT #20 (USDA FOREST SERVICE)**

Road use and maintenance are discussed in the EA and supporting project documents. The operator will be required to maintain the portion of FS Road #411 that they will be operating on and agree to either maintain or pay for the prorated share of maintenance on other Forest Service roads used during operations via a standard Road Use Agreement attached and incorporated into the Plan of Operations. The operators use of other non-forest system roads (county, state) and maintenance issues related to that use are the responsibility of the respective state and county and state transportation agencies.

The respondent asked how the project would impact watershed and fisheries enhancement work discussed and proposed in the 1992 BRC DN. The respondent also brought this issue up in a

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meeting held with the Forest Service on November 10, 2003. Most of the proposed fisheries and watershed enhancement work in the 1992 BRC DN are not related and are outside the scope of this project and the project would have no impact on those activities if they were to be implemented. The specific DN from which the respondent sited text from was withdrawn by the District Ranger on May 12, 1993 after appeals and meetings with stakeholders led to a revision of the project scope and scale. A subsequent DN, dated July 29, 1993 was released covering the changes as the result of the appeals and public involvement. Subsequently, due to funding issues, Forest priorities and other factors the actions outlined in the 1993 BRC DN were never executed. In July 16, 1996, a DN was signed outlining the implementation of the Barney Rubble's Cabin Salvage Area project covering a much smaller area than the previously outlined projects. In the 1996 BRC Salvage DN, watershed and road restoration activities are provided for on page DN-6 of the 1996 BRC Salvage DN and state, "...Project-related activities may be accomplished under current timber sale contract measures, such as clauses in the timber sale contract, Forest Service resource programs, or with timber sale receipts (K/V funding)." On page DN-11 of the BRC Salvage DN, specific opportunities in the area are outlined and "...could be accomplished depending upon available funding."

One specific item, the removal of the culvert adjacent to the Silver Strand No. 3 portal, will be completed as part of this project. Many of the other items outlined in the 1996 BRC Salvage DN were dependent on K/V and other funding sources and were not mandatory for project implementation and are unrelated to this project.

The proposed operation will be reclaiming all new site disturbances, and in addition revegetating existing dumps and closing existing non-system roads as part of the site rehabilitation efforts that will ultimately improve conditions in the watershed by reducing unauthorized off-road vehicle use and potential sedimentation and erosion issues associated with that use.

The DN for this project includes temporary administrative use restrictions of Forest Service Road #411 during the summer operating season for public safety reasons. This road is currently listed as open all season to all motorized traffic in the District Travel Plan. The timing/use restrictions will reduce the amount of traffic utilizing this road and subsequently reduce noise, dust and sediment associated with the public's use of the road. There are several alternative routes the public can utilize during the seasonal closure of Road #411 and these routes will see increased amounts of traffic and associated impacts. However, these roads are located dominantly in upland areas and will not be significantly impacted by the additional alternative use.

**COMMENT #21 (Kootenai Environmental Alliance - November 14, 2003 letter)**

**Water Quality/temperature:** The respondent stated concerns regarding possible temporary increase of temperature that might result from the proposed operations.

**RESPONSE TO COMMENT #21 (USDA FOREST SERVICE)**

The operations are restricted to an upland area and should not impact water temperature on a short- or long-term basis since there will be no activity near or along a stream course or in areas shading active water courses.

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**COMMENT #22 (Kootenai Environmental Alliance - November 14, 2003 letter)**

**Finances and Metal Prices and interim shutdown of operations:** The respondent stated concerns regarding procedures that would be taken by the Forest Service should the operation undergo an interim or permanent shutdown due to a drop in metal prices.

**RESPONSE TO COMMENT #22 (USDA FOREST SERVICE)**

Should the operations be shut down on an interim or permanent basis for any reason, the operator will be required to submit and implement updated site reclamation procedures to address environmental issues that might result from the interim or permanent closure. If the closure is for a significant time frame additional review and analyses under NEPA may be required depending upon the duration of and reasons for the shutdown. Should the operator default for any reason, the Forest Service would recover the bond and complete site closure and reclamation as per 36 CFR 228.7, 36 CFR 228.8, 36 CFR 228.10 and 36 CFR 228.13.

**COMMENT #23 (Kootenai Environmental Alliance - November 14, 2003 letter)**

**Maximum amount of ore:** The respondent stated concerns regarding what procedures would be utilized should the operator identify additional ore beyond the stated quantities in the operating plan.

**RESPONSE TO COMMENT #23 (USDA FOREST SERVICE)**

Should the operations develop additional reserves that would necessitate additional environmental impacts, the operator will be required to submit an updated supplemental Plan of Operations as per 36 CFR 228.4 (d) detailing proposed extractive, processing and reclamation procedures for the additional materials. Depending on the quantity of additional ore to be mined and processed, expected extent of additional surface disturbance and expected duration of the operation the District Ranger will determine what of any additional environmental analyses and mitigation measures may be required, recompute and collect additional bond and issue a decision regarding the updated Plan of Operations and mining of the additional materials accordingly.