

5 RESTORATION & MITIGATION

Midas Gold, on a voluntary basis and pursuant to cooperative agreements, has already supplemented the previous targeted restoration and clean-up efforts conducted by the Forest Service, Tribes, U.S. Environmental Protection Agency (EPA), IDL, Idaho Department of Environmental Quality (DEQ) and various private companies.

While these ongoing clean-up efforts have somewhat reduced environmental impacts and improved water quality, extensive legacy mining-related surface disturbances and environmental impacts persist at the site. Past work to partially isolate legacy tailings/development rock and improve sediment control from disturbed ground represent only the initial stages of the necessary cleanup of the Stibnite site. Remaining issues needing attention include un-reclaimed and unrestored mine and mill sites, impacted waterways, sediment sources and water quality impacts, and resultant degraded aquatic and terrestrial wildlife conditions (URS, 2000). These legacy conditions have been compounded by the extensive forest fires over the past several decades, which have caused severe damage from soil erosion, landslides and debris flows, and resultant sediment transport into local waterways.

Midas Gold will work closely with the Forest Service, cooperating agencies and interested parties to maintain a high level of public transparency in the implementation of mitigation policies and best management practices (BMPs), ensure that there are measurable performance standards at the project and program level, and clearly identify which parties are responsible for which aspects of a mitigation plan. In this manner, measurable environmental benefits of restoration and mitigation will be sustained for as long as the mining takes place, and beyond as long-term environmental management.

The restoration components detailed in this PRO include numerous mitigation, site enhancement and restoration projects that would offset planned disturbance associated with the Project. Examples of the various mitigation components identified in the PRO include: fisheries recovery, sediment reduction, stream rehabilitation, and improvements in water quality, wetlands, and stream function. Additional details of specific mitigation projects are included in the Draft Conceptual Wetland and Stream Mitigation Plan (**Mitigation Plan**) included in Appendix F of this PRO. The Mitigation Plan summarizes existing conditions, lists anticipated Project wetland and stream impacts, and presents Midas Gold's conception of how best to mitigate those impacts with a comprehensive set of stream, wetland, revegetation, fisheries and water quality improvement efforts. The Mitigation Plan will evolve throughout the permitting process, in consultation with Agencies and interested stakeholders and as Midas Gold continues design work and identifies additional on-site mitigation opportunities. The Mitigation Plan presented in Appendix F is a "first draft" from which to open negotiations for mitigation requirements.

Midas Gold has also considered the Project in light of principles contained in the recently issued November 3, 2015 Presidential Memorandum: *"Mitigating Impacts on Natural Resources from Development, and Encouraging Related Private Investment"* (the "**Presidential Memorandum**"). Midas Gold believes that the information provided in this Plan clearly demonstrates the Operator's intent to avoid and minimize harmful effects to the land, water, wildlife and other natural resources at the Stibnite site but, more importantly, to restore the site to a self-sustaining, productive natural ecosystem. The "net benefit policy" aspirational goal set out in the Presidential Memorandum will be achieved by implementation of the Project, as outlined herein, not solely by avoiding and/or minimizing harmful effects related to the Project, but also through the extensive restoration of legacy impacts at the site, which will provide net benefits to the natural environment.

As an example of the net benefits related to the Project, Figure 5-1 illustrates Midas Gold’s restoration concept for the Yellow Pine pit, which has prevented fish migration upstream into the headwaters of the EFSFSR since 1938.

Figure 5-1, Restoration Concept for the Yellow Pine Pit



5.1.1 Restoration and Mitigation Plan

Midas Gold has designed a large-scale and comprehensive restoration plan for the Stibnite site, which would be undertaken in conjunction with, and is integral to, the redevelopment and operational plans for the Project. The work would restore and re-establish an enhanced natural environment at many of the historically impacted brownfield sites, generating more sustainable conditions than currently exist. This restoration plan includes the following activities:

- Removing barriers to fish migration and re-establishing passage for salmon, steelhead and bull trout into Meadow Creek and the headwaters of the EFSFSR.
- Barrier removal at the Yellow Pine pit will initially be accomplished by construction of a tunnel for the EFSFSR around the Yellow Pine pit (see Section 8.10.1) until it is backfilled and re-contoured to re-establish the EFSFSR in its approximate pre-1938 location (see Figure 5-1 above for restoration concept and also Section 14.2.6). The design will emulate the natural pre-disturbance gradient and characteristics, and coupled with stream channel enhancements along the EFSFSR and Meadow Creek will support permanent fish passage to the headwaters, where fish habitat will also be enhanced. Additional details of the EFSFSR and Meadow Creek restoration are contained in the Mitigation Plan in Appendix F.
- Clean up legacy tailings currently contaminating the Meadow Creek drainage by removing the tailings from their current location beneath the Spent Ore Disposal Area (**SODA**) in the Meadow Creek drainage and surrounding valley (see Section 9.1.4), then reprocess the tailings in the

Midas Gold ore processing facility to recover residual antimony and gold (see Section 10.1.3). The reprocessed tailings will be stored in a modern, fully lined, properly engineered tailings storage facility (**TSF**) (see Section 11).

- Preferential use of suitable crushed rock from the spent ore stockpiles (both from the Hecla heap leach pad and the material overlying the legacy tailings in the SODA area) as construction material to build the new Midas Gold TSF (see Section 11.2).
- Removing old and unstable development rock dumps, and reusing the material for new construction or processing the material to recover gold, antimony and silver. Existing unconstrained and un-engineered development rock dumps currently lie alongside the margins of the EFSFSR in the Yellow Pine pit area. The development rock is variably sized and may be reused for construction projects requiring this variety of rock sizing, if it is suitably durable and suitably geochemically inert. Some of the rock in the legacy development rock dumps contains ore-grade gold, antimony and silver values and may be removed and transported to the ore processing plant to recover the metals.
- Identifying and properly disposing of contaminated soil and fill material. Contaminated soils and other legacy materials may be encountered during excavation work, including the former mill and smelter sites and heap leach facility areas (see Section 4.2).
- Repairing the East Fork of Meadow Creek (locally known as **Blowout Creek**). As mitigation for Project stream and wetland impacts, Midas Gold will rehabilitate this significant and troublesome sediment source by constructing a new properly engineered channel for the creek flow and by constructing a sediment settling waterbody in the location of the Hangar Flats Pit for long-term sediment management (see Section 8.10.2 and Appendix F for additional details of the Blowout Creek restoration).
- As mitigation for Project stream and wetland impacts, Midas Gold will construct new and enhance existing stream channels, riparian areas and wetlands in the valleys of the EFSFSR and Meadow Creek. This effort will improve the local fish habitat and water quality historically impacted by past mining practices (see Section 8.10.3 and Appendix F for additional details of stream restoration and wetland mitigation projects).
- Midas Gold will work cooperatively with the Forest Service to plant lodgepole pine seedlings and other native plant species, where appropriate, and monitor their growth in order to accelerate the reforestation of the Stibnite area. This will help improve habitat for the local wildlife, bird and fish populations as well as improve water and air quality throughout the Project site, with resulting positive downstream effects.

Restoring the site and enhancing vegetative cover will work to stabilize greenhouse gas concentrations at the watershed level. In this manner, economic development can proceed in a sustainable fashion.

A summary of planned restoration and enhancement projects is provided in Table 5-1. The presence of mining equipment combined with active development in early years (and operations, reclamation and closure in later years) provides numerous opportunities to enhance and restore the various site features and improve environmental conditions at the site. Many of these restoration projects also provide mitigation for disturbance of wetlands and stream channels for mine project development. The Mitigation Plan, detailing proposed mitigation projects, is included as Appendix F.

Table 5-1, Restoration and Mitigation Projects and Timing

Project Area		Approximate Quantity	Timing					
			Construction	Operations			Closure	Post-Closure
				Early	Middle	Late		
Mine Development, Operations & Closure	Infrastructure construction							
	TSF Construction							
	Open Pit Mining and Backfill							
	Development Rock Placement							
	Restoration and Reclamation							
Legacy Facilities Cleanup and Water Quality Improvement Projects								
	Reuse of legacy spent ore (SODA, Hecla heap, on/off pads)	7.5 million tons						
	Reprocessing of legacy tailings	3.0 million tons						
	Remediate impacted legacy areas (shop, fuel storage, town site, Monday camp) as encountered during construction	As encountered						
	Reuse existing West End development rock	As encountered						
	Close legacy tunnels and remediate surface impacts	As encountered						
	Remediate impacted materials in Bradley mill/smelter area as encountered during mining of Hangar Flats pit	As encountered						
	Relocate smelter debris repository	As encountered						
	Connect Hennessy Creek to EFSFSR Tunnel							
	Realign Midnight Creek around legacy dumps							
	Blowout Creek Sediment Mitigation							
Restore Fish Passage in the Upper EFSFSR Watershed by Removing Barrier at Yellow Pine Pit								
	EFSFSR from Yellow Pine pit to Meadow Creek	9,080 linear feet						
	Meadow Creek up to Hangar Flats DRSF	7,380 linear feet ⁽²⁾						
	EFSFSR upstream of Meadow Creek confluence ⁽³⁾	13,080 linear feet						
	Total:	29,540 linear feet						
Post-Reclamation Annual Fish Population Estimate (EFSFSR and Meadow Creek)								
	Chinook salmon	33 adults; 11,000 juveniles; 910 smolts						
	Steelhead	49 adults; 4,900 juveniles; 2,400 smolts						
	Bull trout	600 (all age classes)						
Restoration Projects that Improve Fish Passage and Sediment Control								
	Bridges or culverts replaced or installed within Project Area	24 bridges/culverts						
	Bridges or culverts replaced or installed on Burntlog Route	34 bridges/culverts						
	Bridges or culverts replaced or installed on Johnson Creek Route	As needed						
	Road upgrades and gravel placement on Johnson Creek Route	As needed						
	Total:	58+ bridges/culverts						
Stream Channel and Riparian Habitat Restoration ⁽⁴⁾								
	Meadow Creek & Tributaries at Tailings Storage Facility	14,060 linear feet						
	Meadow Creek at Hangar Flats DRSF	5,650 linear feet						
	Meadow Creek at Hangar Flats Pit Area ⁽⁵⁾	1,450 linear feet						
	Blowout Creek at Hangar Flats Pit Area	840 linear feet						
	Blowout Creek Restoration	6,450 linear feet						
	Meadow Creek Enhancement above EFSFSR	2,350 linear feet						
	EFSFSR Restoration/Re-routing at Meadow Creek confluence	970 linear feet						
	Fiddle DRSF	6,380 linear feet						
	EFSFSR restoration at backfilled Yellow Pine pit	3,870 linear feet						
	EFSFSR enhancement near backfilled Yellow Pine pit	2,640 linear feet						
	Hennessy Creek at backfilled Yellow Pine pit	540 linear feet						
	Garnet Creek at Processing Facility	1,160 linear feet						
	Midnight Creek upstream of Yellow Pine pit	510 linear feet						
	West End Creek at West End Pit & West End DRSF	4,480 linear feet						
	Total:	51,350 linear feet						
Wetlands Restoration ⁽⁴⁾								
	Tailings Storage Facility	183 acres						
	Hangar Flats DRSF	62 acres						
	Hangar Flats Pit Area ⁽⁶⁾	33 acres						
	Blowout Creek	16 acres						
	Fiddle DRSF	31 Acres						
	West End DRSF	13 acres						
	Yellow Pine pit	15 Acres						
	West End pit	4 acres						
	Hangar Flats pit lake (open water)	68 acres						
	West End pit lake (open water)	28 acres						
	Total:	454 acres						
	Total excluding open water:	358 acres						
Notes:								
(1) Acronyms used in this table include: TSF = Tailings Storage Facility, DRSF = Development Rock Storage Facility, EFSFSR = East Fork South Fork Salmon River, SODA = Spent Ore Disposal Area.								
(2) Includes straight-line distance from inlet to outlet across Hangar Flats pit lake.								
(3) At present, the lower 600 feet of this reach is readily passable by Chinook salmon upon removal of the barrier at the Yellow Pine pit. Opening the remainder to salmon as opposed to trout may require additional work.								
(4) See Mitigation Plan (Appendix F) for more detailed descriptions and maps of restoration areas.								
(5) Meadow Creek will be reconstructed alongside the Hangar Flats pit to provide spawning and rearing habitat during operations, then restored and connected to the Hangar Flats pit lake at closure. The closure configuration (reported above for portions of both Hangar Flats pit and Hangar Flats DRSF) will be approximately 490 feet shorter than that provided during operations (4,690 linear feet) due to space occupied by the pit lake; however, the pit lake will also provide fish habitat.								
(6) Wetlands creation will be included with the reconstruction of Meadow Creek during operations, and many of those wetlands will remain at closure. Additional wetlands will be constructed at closure along the final restored Meadow Creek and at the fringes of the pit lake. Reported acreage reflects the final closure configuration.								

5.1.2 Minimizing Project Impacts

Careful thought and planning have gone into Project design, and Midas Gold has incorporated many suggestions received in discussions with interested parties and during community meetings. The Company has specifically focused on minimizing impacts to local natural resources by locating facilities and infrastructure on previously disturbed sites. In addition to the extensive cleanup and reclamation of legacy disturbance, Midas Gold plans to minimize the impacts of this redevelopment Project by:

- Minimizing the overall disturbance of the Project and impacts to undisturbed areas (including riparian areas) by siting, to the extent practicable, proposed facilities and roads on previously disturbed ground. As proposed, approximately 42% of the Project-related disturbance would be located on historically disturbed lands (see Section 14).
- Accessing the Project site via the upgraded Burntlog and Thunder Mountain roads; moving people, vehicles, supplies and fuel haulage away from rivers and large streams, protecting water quality and reducing the impact on users of the current roads (see Section 7.1).
- Only employing essential personnel at the Project site; locating office, warehouse, laboratory and administrative facilities offsite; thus resulting in less traffic on the access roads into the site and reducing risks to human safety and of environmental impacts (see Section 7.3).
- Re-establishing the Idaho Power Company (**IPCo**) power line to the site to serve as the primary source of electricity for the Project, greatly reducing fuel haulage on the area's existing roadways, substantially reducing greenhouse gas emissions from onsite power generation, and improving the reliability of electric services for the communities and residents along the electric transmission power line corridor (see Section 7.2).
- Planting approximately 3,600 trees annually on burnt-over land and un-reclaimed legacy disturbance adjacent to the Project, expanding the forest to remove greater amounts of carbon dioxide from the atmosphere, thus mitigating climate change.

Key examples of this early planning effort include:

- The Hangar Flats DRSF will be located at the heavily impacted SODA site, which is also the location of the historical tailings disposal site; in addition, this new DRSF will serve as a buttress to the new TSF, substantially enhancing its geotechnical stability;
- The Hangar Flats pit will encompass the former Meadow Creek mine and Bradley Mining Company (**BMC**) ore processing facility and smelter site, and mining of the area will remove any potentially contaminated materials encountered during excavation, which materials will be disposed of in suitably designed permanent storage facilities;
- The ore processing facility will encompass portions of the former Stibnite town site, the current housing facility and the former contractor shop area, likely requiring remediation of historical impacts encountered during construction;
- The Project truck shop and fuel storage area will be located on the area used for the historical heap leach plant site, likely requiring remediation of historical impacts encountered during construction;
- The Yellow Pine, West End and Hangar Flats pits largely lie within areas extensively impacted by historical mining operations, requiring removal of development rock, spent leach ore, debris, and tailings historically placed in and around these pits. Legacy materials that are

excavated during Project development will be stored in fully engineered and designed new facilities, such as the tailings storage facility and development rock storage facilities;

- The EFSFSR Tunnel design will facilitate the protection of the EFSFSR during mining, such that the waters of the EFSFSR are not impacted by ongoing mining operations in the Yellow Pine pit (dust, explosives residue, fuel, potential wall failures, etc.) and with the additional consideration that the Tunnel support fish passage during the operating period;
- The Burntlog Road and Thunder Mountain Road access route will primarily follow an existing forestry road corridor, minimizing the additional disturbance required for road access to the Project and moving traffic away from travel adjacent to major waterways, thereby reducing sedimentation from dust and surface run-off, and eliminating the risk of spillages into these waterways;
- The powerline will follow the existing, previously used powerline corridor and right-of-way, thereby minimizing the incremental impacts related to bringing low emissions grid power to the Project; and,
- Several existing haul roads will be utilized to minimize new disturbance.

5.1.3 Funding for Restoration Work

Midas Gold will incorporate the substantial costs for this large-scale, integrated and comprehensive restoration work into the overall economics of the Project operation, thus creating many synergies by having existing mining equipment and personnel on site, and by designing the engineered facilities that are necessary for mining so that they will accommodate the clean-up and restoration activities.

In order to carry the substantial costs related to the restoration of legacy impacts, Midas Gold needs to have a sufficiently economically robust project to finance the site restoration and to justify its investment.