

918-0504 AM-04 Compensatory Mitigation Plan

The stream ecosystem integrities for the unnamed tributaries containing the stormwater control pond impacts for which mitigation is being proposed for were evaluated using the Functional Capacity Index (FCI) Protocol to quantify the anticipated impacts and ensure no net loss of aquatic resources would occur. Overall, the anticipated temporary stream impacts would be compensated for by restoration efforts. Anticipated and prior impact losses include 444 linear feet of intermittent stream and 248.64 HGM's. It is anticipated that replacing and restoring the stream will occur by the applicant making watershed improvements after the impacts in unnamed tributaries to Eatin Fork, as seen on the attached Impacts and Mitigation mapping. HGM scores are expected to increase over 39.3% after 5 years; having an approximate total of 346.32 HGM's after mitigation efforts are complete. On-site stream mitigations will be provided in mitigation reaches.

Stream and Wetland Restoration Plan

Compensatory mitigation will be provided by the establishment and maintenance of the mitigation areas illustrated on location maps contained in the supporting information. The following provides a description of (1) mitigation construction specifications and projected time frames for the restored ephemeral channels, (2) criteria for determining mitigation success (3) a monitoring plan for mitigation efforts, (4) a maintenance and contingency plan should monitoring determine that the mitigation is not adequate and (5) a listing of responsible parties for mitigation and monitoring efforts.

Stream Restoration Construction

The following section describes the mitigation construction to be implemented to obtain a no net loss of stream values and functions. The best possible channel will be restored and created based on conditions in the areas at the time of mitigation efforts. Stream restoration and monitoring tasks will be performed by qualified personnel. All dimension and typical structure drawing for stream mitigation are contained in the additional

information section. After stream restoration efforts are complete the riparian vegetation will be planted beginning at the OHWM which will promote stability in the stream ecosystem as well as help reduce sedimentation. Hydro-mulch may also be used to promote the success of this process.

All work should be performed during low or, no flow conditions, and proceed in a downstream direction to avoid re-suspension of sediment into restored reaches.

A minimum riparian corridor of 50 feet (or until natural forest limits are encountered) will be established in all mitigation areas. The suggested tree species provided by the State Division of Water will be the guide for canopy coverage, with an emphasis on native species currently growing in the zones for re-vegetation efforts. Canopy coverage will be provided by the riparian corridor at the maturity of mitigation.

Stream Riparian Zone

The riparian zone plantings will aid in the reduction and prevention of the sedimentation of streams, provide nutrients for the stream system organisms, and provide cooler temperatures with canopy coverage. Hydro-mulch may be used and will also provide immediate erosion control. The riparian zone will extend 50 feet or until natural canopy is reached.

The stream riparian zone will be monitored and, if needed, managed to control the colonization of invasive exotic plant species (IES) in the area. Chemical herbicides, manual and mechanical labor, and prescribed burning are all effective methods on controlling the IES of the mined lands. The final vegetation community in the area should not be comprised of more than 5% of invasive species. All invasives will be removed from the riparian area during the monitoring assessment as needed.

Grasses, Trees, and Shrubs

The grasses to be used during re-vegetation will include temporary and permanent plantings. See the table below for a breakdown of the revegetation plan. The temporary

species will provide quick ground coverage and begin providing nitrogen back into the areas. Trees will be replanted based on what's available at the time of planting but is recommended to include those native to the area. A list of potential trees is included in the typical restoration design.

Proposed PMLU: FISH AND WILDLIFE HABITAT	Rate per Acre	Acreage
Permanent Grass:		
Timothy	2#	579.41
Tall Fescue	10#	579.41
Legumes:		
White Clover	2#	386.27
Red Clover	2#	386.27
Alsike	1#	386.27
Temporary Plants:		
Annual Rye Grasss	50#	386.27
Mulch:		
Paper/Wood	1500#	386.27

Shrubs will also be planted in the early successional phase of the forest reclamation project; providing food and cover for wildlife encourages a more rapid development of the functional and structural diversity of the ecosystem. A variety of native species can be used, including but not limited to: Black chokeberry (*Aronia melanocarpa*), Bristly locust (*Robinia hispida*), Ninebark (*Physocarpus opulifolius*), Red mulberry (*Morus rubra*) and Eastern Redbud (*Cercis Canadensis*). During the monitoring phase, a target planting/survival rate for trees will be 300 stems per acre with a minimum survival rate of 80% and shrubs of 100 stems per acre with a minimum survival rate of 80% will be the goal for the restoration.

Stream Monitoring and Management Program and Success Criteria

The monitoring and management plan will evaluate the success of the mitigation as described in the previous section as well as Table 1 and 2. It will include inspection and

grading of mitigation sites in the beginning of the following year after mitigation efforts are initially completed. Those items listed above will be examined and the results provided to the USACE/DMP in a timely manner, annual report, (before December 31 of the current monitoring year)) for a period extending through 5 years after the mitigation efforts commence. The reports will include photographs and assessment locations noted on site plan views and will follow the 2008 mitigation guidelines as well as those set forth by the USACE through regulatory guidance letter 08-03. Successes and/or failures of the mitigation effort will be noted and any maintenance efforts performed the previous year will be described. The reports will also include an assessment of the degree to which performance standards are being met and any proposed corrective actions. Stream restoration will be considered successful if the restored HGMs are likely to exceed the existing HGM score.

Ferroglobe USA Mining, LLC
Upper Cumberland River Watershed
Nationwide 49 Permit

Table 1. Stream Restoration Reporting Parameter		
Parameter	Success	Method
Riparian Corridor	Riparian zone with a variety of species alive and healthy	Measure replanted width and estimated stem count
Specific Conductance	Report only for monitoring	Field Meter
Epifaunal Substrate	Minimum 40-70% favorable substrate	Habitat Assessment/Pebble Count
Embeddedness	Maximum 25-50% embeddedness	Habitat Assessment
Sediment Deposition	Little or no enlargement of islands or point bars and <40% of bottom affected by sediment deposition	Habitat Assessment/Pebble Count in Pools
Channel Flow Status	Maintain width/depth ratio	Habitat Assessment/Cross-sections
Channel Alteration	Maintain minimal channelization	Habitat Assessment
Frequency of Riffles	Maintain step-pool or riffle-pool sequences similar to approved plans	Habitat Assessment/Longitudinal Profile
Bank Stability	Banks stable	Habitat Assessment
Vegetative Protection	Approved width of riparian zone planted with minimum tree count 300 stems/ acres with 80% surviving and shrub count of 100 stems/acre with 80% surviving	Stem count survey

Stream Geomorphological, Hydrological, Habitat Performance Standards		
Performance Category and Criteria	As-Built	Year 1-5 Monitoring
Geomorphological		
Geometry	Within target range	<20% change from as-built
Vertical Stability	Report	BEHI Score of Low or Very Low
OHWM (RGL 05-05)	N/A	Present and continuous
Bed and Banks	Present	
Bankfull Events	2 within 5 years (intermittent streams)	
Hydrological		
Stream Flow Type	JD	Consistent with JD or increase
Habitat		
HGM	Report	Meet or exceed baseline by Year 5
Stream Vegetation Performance Standards and Success Criteria		
Planting Rate (Trees)	Minimum 300 native tree stems/acre – 80% survival	
Planting Rate (Shrubs)	Minimum 100 native shrub stems/acre – 80% survival	
Invasive/Exotic Species	≤ 5% invasive/exotic species present	
Wetland Performance Standards and Success Criteria		
Vegetation	Based on latest version of Regional Supplement	
Hydrology	Based on latest version of Regional Supplement	
Soils	Based on latest version of Regional Supplement	
Invasive/Exotic Species	≤ 5% invasive/exotic species present	

Table 2 Performance Standards

Contingency Plan

If the degree of success criteria for the mitigation effort is found to be inadequate, the permittee shall prepare an analysis of the causes of the failure and propose remedial action for approval. If compensatory mitigation cannot be successfully completed, an alternate plan will be provided to the appropriate district.

Responsible Parties and Financial Assurances

Parties responsible for implementation of the stream restoration and mitigation efforts include:

- (1) The Applicant: Ferroglobe USA Mining, LLC
332 West Cumberland Gap Parkway, Suite 100
Corbin, KY 40701

Responsible for overseeing consultants and providing financial assurances. At this time, no bonds other than that required by SMCRA are proposed or anticipated.

- (2) Preparer of Environmental Information Document:

Aquatic Resource Management
2554 Palumbo Dr.
Lexington, KY 40509