

EXECUTIVE SUMMARY

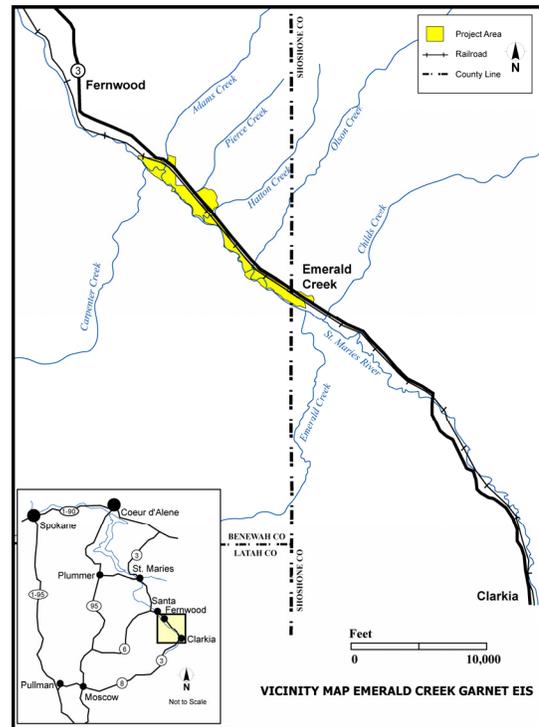
This Final Environmental Impact Statement (FEIS) analyzes a proposal by Emerald Creek Garnet, Ltd. (ECG) to mine 327.5 acres of garnet reserves in and near the St. Maries River floodplain south of Fernwood, Idaho in Benewah and Shoshone Counties. The proposed new mining area contains 193,930 tons of garnet reserves. One hundred thirty-three (133) of the 327.5 acres are wetlands and other waters of the U.S. subject to regulation under §404 of the *Clean Water Act* (CWA). The remaining 194.4 acres are upland. ECG proposes to temporarily discharge dredged and fill material into 133 acres of wetlands and other waters of the U.S. in association with the mining of garnet. To proceed, ECG must obtain a Department of the Army permit under §404 of the CWA.

ECG's proposed action includes mining and reclaiming 327.5 acres, including 133 acres of wetland. Temporal wetland losses would be mitigated by creating an additional 29.4 acres of wetland, by enhancing the St. Maries River top-of-bank, and by planting 16.9 acres of forested wildlife corridors. Wetland protection would be accomplished by providing short-term fencing on all reclaimed and mitigated wetlands, and long-term fencing on 64.4 acres of reclaimed and mitigated wetlands on their own ownership. In addition, ECG would place 79.4 acres of its own land, including ≈47.76 acres of wetlands, under a conservation easement.

The United States Army Corps of Engineers (USACE) has determined that the evaluation and issuance of a §404 permit would be considered a major federal action significantly affecting the quality of the human environment and therefore requires the preparation of an EIS. This EIS has been prepared in compliance with the *National Environmental Policy Act* (NEPA) to identify potential environmental impacts of the proposed action and evaluate reasonable and practical alternatives that meet the purpose and need for the project.

Purpose and Need

ECG has mined garnet in 16 permit areas in the Carpenter Creek and Emerald Creek basins near Fernwood, Idaho since 1992, and continues to mine in these basins, as well as in upland areas near the St. Maries River. Under the current production goal of 30,000 tons per year, ECG has four to seven years of mining remaining in existing permit areas. After one to two years of peak production, the remaining mining areas would be in upper watersheds with limited mining seasons and production would subsequently decrease for the remaining reserves. Consequently, ECG proposes



to dredge mine new areas of alluvial deposits of industrial garnet found in and near the floodplain of the St. Maries River. The need for the project is four-fold:

- 1) To increase total available reserves to meet worldwide market demand for garnet products
- 2) To retain and increase the customer base by showing the capability of market longevity
- 3) To increase availability of specific reserve grades for two target markets, water jet cutting and oil industries; and
- 4) To improve mining efficiency.

ECG has approximately 156,000 tons of proven reserves remaining in eight existing permit areas. Without the additional reserves within the proposed mining areas, full-time mining would end in approximately one to two years; the number of permanent employees would be reduced; seasonal employees would not be hired; some equipment would be sold; and mining would continue at a reduced rate until reserves are depleted.

ECG's customers require a long-term guarantee of garnet availability. For example, ECG provides fine garnet to the water purification industry for use in municipal water filtration systems. The municipalities require a long-term guarantee of garnet availability before designing and constructing these purification facilities. With the current projected mining life of four to seven years under existing permits, ECG would not be able to compete for new customers who require a long-term supply of garnet.

Additionally, ECG has targeted markets requiring fine garnet. Natural fine garnet is not available in many mining areas. ECG needs the natural fine garnet found in the proposed permit areas so it can provide the most competent product to the water jet industry. Garnet found in the proposed St. Maries River mining areas is primarily fine. Because it is a naturally fine product, it is the world's best garnet for the water jet industry. It is efficiently processed simply by sizing and washing. ECG is the only domestic supplier with the ability to produce a natural, competent, washed product. To date, crushing of larger sizes of garnet has occurred to meet the water jet industry demand. This reduces the limited large-product reserves too quickly, and restricts the ability to provide coarse garnet to the oil industry and other coarse product end-users. With St. Maries River garnet, highly competent coarse garnet also would be available for the oil industry. The reserves within the proposed St. Maries River permit areas provide the exact product demanded by the water jet and oil industries.

At full production capacity of 30,000 tons per year, mining, concentrating, and milling occur at the highest possible efficiency; below capacity, inefficiencies occur. With additional reserves, ECG would be able to operate at capacity, providing the most garnet products at the lowest cost of production. Additionally, approximately 20 percent of the garnet is lost when coarse garnet is crushed to provide a fine garnet product. The waste is typically unrecoverable very fine garnet. This has traditionally required ECG to mine an extra 25 percent of its coarse garnet to provide a fine product, increasing the costs of operation and causing additional acreage to be mined each year.

To identify potential environmental impacts of the proposed mining action and evaluate reasonable and practical alternatives that meet the purpose and need for the project, USACE analyzed six

alternatives in this EIS: Alternative 1 – No Action (mining in existing permit areas only); Alternative 2 – Twelve Month Wet Panel Mining, 133 Acres of Wetland Mined; Alternative 3 – Twelve Month Wet and /Dry Panel Mining, 133 Acres of Wetland Mined; Alternative 8 – Oxbow Avoidance, 84.3 Acres of Wetland Mined; Alternative 9 – Oxbow Avoidance, 96.9 Acres of Wetland Mined; and Alternative 10 – Oxbow Avoidance, 108.9 Acres of Wetland Mined.

Alternatives Carried Forward for Evaluation

Alternative 1: No Action. The No Action alternative consists of: 1) no USACE permit issued; and 2) no mining of 133.0 acres of jurisdictional wetlands. Mining of 77.8 upland acres within the project area under existing permits would continue. There are approximately 41,000 tons of reserves remaining in the current upland permit areas on the St. Maries. Mining would continue for one to two years when full-time production would cease. At that time, equipment would be sold, manpower requirements would decrease, the labor force would shift to a less skilled, seasonal force, and the number of mining days per year would decrease. The No Action alternative would result in increasing costs per ton for existing permit areas once production rates decrease, and in an overall decrease in total annual revenue. The lack of additional reserves would result in a decrease in profitability of the current operation in the next one to two years, and a loss in gross revenue of \$35,480,000 over a nine to 15-year period. The No Action alternative would not permit ECG to respond to the world garnet market. This alternative is not consistent with ECG's Purpose and Need.

Alternative 2: Twelve Month Wet Panel Mining, 133 Acres of Wetland Mined. This alternative would permit ECG to mine 12 months of the year using wet panel mining techniques within the 327.5 acres proposed for mining, including 133.0 acres of jurisdictional wetland. Alternative 2 is technically practical because the rate of extraction is less than 145 tons per day, the equipment requirement is less than 35 pieces of equipment per day, the labor requirement is a permanent workforce of less than 20 field workers per day, and the number of mining days per year is greater than 208 days. With a Cost/Valuation (CV) index of 0.82, it is economically practical to mine. The hauling requirement is the most efficient among the alternatives, with the fewest hauling trips required. ECG would be able to respond to short-term changes in the market in less than four weeks. Continued operation would be practical under this alternative. Alternative 2 is consistent with Available Reserves, Market Longevity, Grade Requirement, and Mining Efficiency criteria because all 193,930 tons of reserves would be available for mining.

Alternative 3: Twelve Month Wet and Dry Panel Mining, 133 Acres of Wetland Mined (Preferred Alternative). Under the Preferred Alternative, mining would be permitted for 12 months of the year using wet and dry panel mining techniques in all 327.5 acres of the areas proposed for mining, including 133.0 acres of jurisdictional wetland. The area proposed for mining would be mined using a combination of wet and dry mining panels. Dry panels would be used within 70 feet of the St. Maries River, and wet panels would be used in all other locations. Alternative 3 is technically practical because the rate of extraction is less than 145 tons per day, the equipment requirement is less than 35 pieces of equipment per day, the labor requirement is a permanent workforce of less than 20 field workers per day, and the number of mining days per year is greater than 208 days. With a CV index of 0.84, it is economically practical to mine. Alternative 3 is logistically practical. The hauling requirement is the fourth most efficient among the alternatives. ECG is able to respond to short-term changes in the market in less than four weeks. Alternative 3 is

consistent with Available Reserves, Market Longevity, Grade Requirement, and Mining Efficiency criteria because all 193,930 tons of reserves would be available for mining.

Alternative 8: Oxbow Avoidance, 84.3 Acres of Wetland Mined. Alternative 8 would permit mining of 84.3 acres of wetland, and would prohibit mining of oxbow complexes 1, 2, 3, 4, and 5. All other proposed mineable areas would be mined as under Alternative 3. Under Alternative 8, the proposed mining area has a CV index of 0.94, making it economically impractical to mine. Approximately 20 percent of the proposed mining area (64.1 acres) is in the oxbow complexes and would not be available to ECG. Additionally, approximately 11 percent of the proposed mining area (35.2 acres) is in areas made inaccessible by oxbow avoidance. The loss of this acreage creates a patchwork mining approach rather than an efficient, continuous upstream to downstream approach. This necessitates additional roads within the mining areas and more frequent shutdown periods to move mining equipment around oxbow complexes. These additional activities add to the cost of operations, making this alternative not logistically practical. Alternative 8 would reduce the total available reserves by 65,576 tons, approximately 33.8 percent of the available reserves. This alternative would constrain ECG's longevity in the market place, would constrain garnet products for target markets, and would limit ECG's ability to improve mining efficiency.

Alternative 9: Oxbow Avoidance, 96.9 Acres of Wetland Mined. Alternative 9 would permit mining of 96.9 acres of wetland and would prohibit mining of oxbow complexes 1, 2, and 3. All other proposed mineable areas would be mined as under Alternative 3. Under Alternative 9, the proposed mining area has a CV index of 0.91, making it economically impractical to mine. Approximately 14 percent of the proposed mining area (44.6 acres) is in the oxbow complexes and would not be available to ECG. Additionally, approximately 7 percent of the proposed mining area (21.6 acres) is in other areas made inaccessible by oxbow avoidance. The loss of this acreage creates a patchwork mining approach rather than an efficient, continuous upstream to downstream approach. This necessitates additional roads within the mining areas and more frequent shutdown periods to move mining equipment around oxbow complexes. These additional activities add to the cost of operations, making this alternative not logistically practical. Alternative 9 would reduce the total available reserves by 45,132 tons, approximately 23.3 percent of the available reserves. This alternative would constrain ECG's longevity in the market place, would constrain garnet products for target markets, and would limit ECG's ability to improve mining efficiency.

Alternative 10: Oxbow Avoidance, 108.9 Acres of Wetland Mined. Alternative 10 would permit mining of 108.9 acres of wetland and would prohibit mining of oxbow complexes 2 and 4. All other proposed mineable areas would be mined as under Alternative 3. Under Alternative 10, the proposed mining area has a CV index of 0.83, making it economically practical to mine. However, Alternative 10 constrains ECG's longevity in the marketplace and limits mining efficiency. Approximately 10 percent of the proposed mining area (32.1 acres) is in the oxbow complexes and would not be available to ECG under this alternative. Additionally, approximately 4 percent of the proposed mining area (13.6 acres) is in areas made inaccessible by oxbow avoidance. The loss of this acreage creates a patchwork mining approach rather than an efficient, continuous upstream to downstream approach. This necessitates additional roads within the mining areas and more frequent shutdown periods to move mining equipment around oxbow complexes. These additional activities add to the cost of operations making this alternative not logistically practical. Alternative 10 would reduce the total available reserves by 22,228 tons, approximately 11.5 percent of the available reserves. This alternative would constrain ECG's longevity in the market place, would constrain garnet products for target markets, and would limit ECG's ability to improve mining efficiency.

Environmental Consequences

Thirteen resources or issue areas were evaluated for potential environmental consequences under the No Action alternative and five action alternatives. These included: water, wetlands, fisheries, wildlife habitat, wildlife, fisheries, earth, land use/ownership, traffic/transportation/access, cultural, socioeconomics, visual, noise/air quality, and hazardous materials.

Water. The likelihood of impacts resulting from water withdrawal and releases, sedimentation and erosion, and floodplain alterations under all alternatives is low. Annual water withdrawal would range from 588,000 to 1,764,000 cubic feet (0.20 cubic feet per second [cfs] in spring and 0.4 cfs in summer), reducing instream flow 0.4 and 0.6 percent respectively. This level of withdrawal constitutes an insignificant impact to the hydrologic regime of the St. Maries River. Sedimentation would be controlled by sedimentation basins and other Best Management Practices (BMPs) designed and constructed for 25-year flows.

The probability of a 25-year or greater flood occurrence event is 4 percent or less in any given year. Construction of temporary and haul roads, project site BMPs, and mine operations may generate sediment. Sedimentation berms around the mining units would contain all storm water within the mining unit. These berms would prevent all flows, up to and including the five-year event, from reaching the actively mined floodplain within the mining units. Although this could alter the localized hydrologic regime within the mining units, the impact would be localized and the duration would be brief. The berms would not prevent flood waters from reaching floodplains outside the active mining units.

There would be no discharge of pollutants to the St. Maries River or to other surface waters except possibly when the river floods out of its banks. To compensate for sediment impacts to a TMDL stream, DEQ would require that ECG implement on- and/or off-site watershed improvements to reduce sediment in the river by more than the operation would be predicted to discharge (during flood events) over its entire lifetime.

Wetlands. Direct impacts to wetlands would occur under all action alternatives as a result of temporary stockpiling of topsoil in wetlands and temporary placement of fill in wetlands for roads, equipment pods, and siltation berms. Dredged material would be sidecast into wetland areas in the construction of diversion channels and sediment basins. Impacts would occur to forested wetland, scrub shrub wetland habitat, and emergent wetlands. Alternatives 2 and 3 would both impact 133 acres of wetlands, including 64.1 acres of oxbow complex. Alternative 8 would impact 84.3 acres of wetland and would avoid mining all oxbow complexes. Alternative 9 would impact 96.6 acres of wetland, while avoiding three oxbow complexes. Alternative 10 would impact 108.9 acres of wetland, while avoiding two oxbow complexes.

Potential indirect impacts to wetlands could occur under all action alternatives as a result of alteration of wetland hydrology from changes in drainage patterns, changes in runoff volumes, and/or changes to local alluvial groundwater flow gradients. Increased delivery of nonpoint source pollution to adjacent wetland areas could include temporary increases in sediment loads from land-clearing activities, seasonal pulses of sediment from winter road maintenance, and petroleum distillates, metals, and rubber contained in storm water from ordinary machinery wear.

Wildlife Habitat. Direct impacts to wildlife habitat would occur under all action alternatives through removal of vegetation during mining activities, resulting in alteration of plant community structure through mature tree and shrub removal. A total of 693 trees would be incrementally removed over the mining period and would be incrementally replaced with 4,140 trees over the same period. The action alternatives may affect, but are not likely to adversely affect, water howellia habitat. The potential for impact on water howellia habitat would be less under Alternative 8 than under Alternatives 2, 3, 9 and 10 because Alternative 8 avoids all oxbows.

Wildlife. Direct impacts to wildlife would occur under all the action alternatives because of loss of habitat during mining. This could include temporary loss of bird nesting, foraging, roosting, and wintering habitat. Potential indirect impacts under all action alternatives would include temporary avoidance of habitat by wildlife due to noise activities associated with mining; disruption of wildlife movement; and displacement of habitat. Impacts would increase with an increase in the area of impact until reclamation and mitigation activities matured and habitat is replaced. Alternatives 2 and 3 would have a greater potential for direct and indirect impacts to wildlife than Alternatives 8, 9, and 10 because more total acreage would be mined.

Fisheries. Direct, but temporary, impacts to fisheries could occur under the action alternatives as a result of mining oxbows. Mining could result in temporary loss of oxbow habitat for several fish species; damage to eggs or disturbance to spawning fish; and temporary loss of the oxbows as travel corridors to reach important habitat. Potential temporary indirect impacts to fisheries could occur as a result of incidental sedimentation of fish habitat during mining. Alternatives 2 and 3 would have greater potential for temporary direct and indirect impacts to fisheries because they would include mining all the oxbows. Alternative 8 would have the least potential for impacts to fisheries habitat due to avoidance of five oxbows.

Earth. Excavation for mining would temporarily displace soil under all alternatives. Excavated material would be used as part of project BMPs and would be contained within mining units. Road building and mining activity could cause temporary erosion and compaction. There would be a very low soil sloughing risk. Slopes in the area range from 0 to 4 percent and ratings for shrink/swell and erosion are low. No permanent impacts to earth resources are expected to result from any of the action alternatives.

Land Use and Ownership. Impacts to land use or ownership are not expected under any of the alternatives, with one exception, as noted below. Mining is an established land use in the region and all action alternatives would be consistent with all applicable plans and ordinances. Land ownership would not change. Under the preferred alternative, a total of 79.4 acres owned by ECG, including ≈47.76 acres of wetlands, would be removed from cattle grazing and other uses and permanently protected by a conservation easement.

Traffic, Transportation, and Access. Temporary direct impacts would result from the addition of new temporary roads and haul roads and the addition of truck and employee traffic to the existing and proposed roadway system. Traffic service and safety impacts are expected to be low under all action alternatives due to low traffic volumes. Four to seven haul trips per day would occur. Alternatives 2 and 3 have the least potential for impacts from new roads. No new temporary roads or haul roads would be constructed under these alternatives. Alternative 8 has the greatest potential for roads impacts among the action alternatives. This alternative would require the construction of three additional roads.

Cultural. Impacts to cultural resources are not expected under any of the alternatives. National Historic Preservation Act (NHPA) Section 106 compliance, including archaeological survey of all proposed project areas, has been completed. No National Register of Historic Places-eligible resources were identified in the project area. USACE is consulting with interested Native American groups regarding this action.

Socioeconomics. Potential direct employment loss and indirect/induced employment loss could occur within one to two years under the No Action alternative when mining is completed under existing permits. The action alternatives would extend the period of mining without job loss and provide a net benefit to the regional economy due to extended operation. Alternatives 2 and 3 would provide the greatest benefit, with a 12-year extended period of mining. Alternative 8 would provide the least socioeconomic benefit by reducing the overall mining period by 61 months. Potential indirect impacts due to population loss, vacancy rates, reduced retail sales, and tax revenues are expected to be low for all alternatives. Mining constitutes 0.43 percent of the economy in the two-county area.

Visual. Visual impacts are not expected under any of the alternatives. Proposed mining activity would be adjacent to previously existing mining activity. Along State Highway 3, vegetative screening in the foreground would alternate with views of the proposed mining area. Mining would be completed in sections, which would then be reclaimed. The surface of each section would be returned to a natural-appearing landscape following mining.

Noise/Air Quality. Impacts from noise are not expected under any of the alternatives. Noise sources would be intermittent and would mainly occur during daylight hours. Alternative 3 could have a very slightly higher noise level due to use of slightly more equipment. No air quality impacts are expected under any of the alternatives. No standard exceedences are anticipated from project emissions.

Hazardous. Potential impacts could occur under all alternatives as a result of accidental spillage during onsite equipment fueling and from mining equipment accidents or collisions. The likelihood of spills and associated impacts would be reduced by the implementation of a spill prevention plan, BMPs, and established clean-up protocols under all alternatives.

Comparison of Environmental Consequences

A comparison of environmental consequences and purpose and need criteria among the alternatives indicates that Alternatives 2 and 3 would be similar in terms of environmental consequences. Although the mining methods differ, these methods would not produce discernible differences in environmental consequences. In addition, both alternatives are consistent with the project purpose and need in all areas. While Alternative 8 would result in fewer environmental consequences overall, it is not consistent with the project purpose and need, would not be practical logistically, and would have a reduced economic practicality when compared to Alternatives 2 and 3. Alternatives 9 and 10 also would result in fewer environmental consequences than Alternatives 2 and 3, but like Alternative 8 would not be consistent with the project purpose and need, would not be practical logistically, and would have a reduced economic practicality. Table ES-1 provides a summary comparison of environmental consequences by alternative.

Table ES-1. Environmental Consequences Comparison

<i>Resource/ Issue Area</i>	<i>Alternative 1 No Action</i>	ACTION ALTERNATIVES				
		<i>Alternative 2</i>	<i>Alternative 3</i>	<i>Alternative 8</i>	<i>Alternative 9</i>	<i>Alternative 10</i>
Purpose and Need Technical	▲	○	○	○	○	○
Logistic	▲	○	○	▲	▲	▲
Economic	▲	○	●	▲	▲	●
Consistency with Purpose and Need	▲	○	○	▲	▲	▲
Water	○	○	○	○	○	○
Wetlands	○	▲	▲	○	●	●
Wildlife Habitat	○	▲	▲	○	●	●
Wildlife	○	▲	▲	○	●	●
Fisheries	○	▲	▲	○	●	●
Earth	○	○	○	○	○	○
Land Use/ Ownership	○	○	○	○	○	○
Traffic/ Transportation	○	○	○	▲	●	●
Cultural	○	○	○	○	○	○
Socioeconomics	▲	○	○	▲	●	●
Visual	○	○	○	○	○	○
Noise/Air Quality	○	○	○	○	○	○
Hazardous	○	○	○	○	○	○

Key:

Fewer potential impacts ○ ➡ ● ➡ ▲ Greater potential impacts