

WOOD CHIP MINE SITE RECLAMATION PROJECT

GRANT SUBMISSION PACKAGE



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Wood Chip Mine Site Reclamation Project
Submitted to the Sierra Nevada Conservancy
by
Tahoe National Forest
Yuba River Ranger District
Contact: Gary Cline gcline@fs.fed.us, 478-6290
September 2, 2014

Narrative Descriptions

A. Detailed Project Description

The project proposes the use of wood chips generated from fuels reduction projects as a soil amendment and soil stabilizer to accomplish mine site reclamation. Wood chips that are a by-product from the Western Nevada County Community Defense Project (WNCCDP) will be transported to two abandoned mines sites, Alpha Diggins (Alpha) and Buckeye Mine (Buckeye), located on the Tahoe National Forest. Approximately 5,445 cubic yards of wood chips will be available for use in this proposed project. The wood chips will be placed approximately 2-3 inches thick on unvegetated areas and either incorporated into the existing substrate or placed on the top the growth media. At this point, the physical addition of the wood chips will aid in the prevention of offsite movement of sediments from the site. The wood chips will intercept precipitation and slow infiltration of water, preventing sheet flow.

Both sediments and sediment containing mercury will be immobilized on site instead of entering the watershed. When the wood chips are mixed with mercury that occurs in the soil, the mercury will not become methylmercury, a toxic substance. The process of methylation converts inorganic mercury to methylmercury and requires an anoxic or oxygen depleted environment. Methylmercury is formed from inorganic mercury by the action of anaerobic organisms that live in aquatic systems including lakes, rivers, wetlands, sediments, and soils. The wood chips will not be placed near areas that are likely to become saturated and anoxic. Riparian Conservation Area (RCA) guidelines prohibit the placement of any material within the required riparian buffer zones.

As the wood chips decompose, the site will be seeded with Tahoe National Forest (TNF) approved native seed mix, such as native grasses and herbaceous perennial species. The increase in vegetation will further decrease offsite movement of sediments by the physical barrier of vegetation to precipitation and the structural foundation of the root system. The establishment of vegetation on these degraded mined-lands will provide the foundation for a sustainable ecosystem benefiting all biota.

The wood chips generated in these two fuel reduction projects can also be used as a source for the production of biochar. Biochar is a charcoal that is created by the pyrolysis of biomass. The source of biomass in this case is wood chips. Pyrolysis is a treatment that chemically decomposes organic materials, such as wood chips, by heat in the absence of oxygen. Biochar can increase soil fertility and is used as a soil amendment. The TNF hopes to work with a company that will donate the use of a mobile pyrolysis unit to generate biochar. The biochar will be incorporated into areas that have been treated with wood chips to assist in creating a growth media where there was only rock. These areas will act as a pilot study for determining if biochar is a successful and cost effective soil amendment, and in developing a protocol of the continued use of biochar in other areas.

1. Goals and Results

The goal of the project is to improve water quality by stabilizing the soils at two hydraulic mines sites by reducing both the offsite movement of sediments; and reclaim degraded mined-lands to healthy and sustainable ecosystems.

Soil stabilization will occur from the physical addition of wood chips to the soils that will reduce sheet flow of water and slow down the infiltration of water. Wood chips will increase organic matter in the depleted soils, resulting in higher water holding capacity, increased nutrient levels, increased beneficial microbial symbionts, and the establishment of vegetation. The aboveground vegetative parts such as leaves and stems will provide a physical barrier from precipitation. The root system will provide a foundation that will immobilize sediments on site. An additional goal of this project includes improving the hydrologic function by restoring the infiltration of precipitation and preventing sheet-flow.

Where mercury is present in sediments, the addition of wood chips will immobilize mercury-laden sediments and reduce the release of mercury into surface water and eventually the watershed.

A planned result of the proposed project is to reclaim two abandoned mined-lands to sustainable ecosystems. The placement of wood chips on the degraded mined-lands will allow for an increase in soil moisture and plant-available nutrients, which support plant establishment, and consequently an increase in flora and fauna that use the vegetation for food, shelter and reproductive purposes.

The goal of the biochar component of this grant is to test the efficacy of biochar as a soil amendment in the establishment of vegetation in consort with the woodchip project and if effective, to develop a protocol for the use of creation and utilization of biochar in other geographic areas.

2. Scope of Work

The scope of work is to utilize excess wood chips generated by fuels management projects to develop a growth media on abandoned mined-lands that are capable of sustaining vegetation and eventually reclaiming degraded mined-lands to a functioning ecosystem. The vegetation will act as erosion control by immobilizing sediments on site. The TNF plans to apply wood chips from the Western Nevada County Community Defense Project (WNCCDP) to the two abandoned mine sites, Alpha and Buckeye.

After the grant agreement is in place, the treatment area boundaries will be delineated on the ground and mapped for use in a Geographical Information System database. Riparian conservation areas (RCA) will be marked to ensure riparian management guidelines are adhered to protect both hydrologic values and prevent impact to the California red-legged frog (CRLF).

Pre-application monitoring will be done and documented (see monitoring plan).

Any necessary clearing will be done to make sure staging areas are free of obstacles. Some of the sites will be pre-treated by masticating shrubs that are scattered across the site. This will improve operability of the spreading

equipment. Any clearing of staging areas and mastication work would be done by contract or by Forest Service personnel and equipment. Once any mastication work is complete the sites will be ready to accept wood chips.

The next phase of the work will be time dependent on the availability of chips from the Nevada County Community Defense Project – Deer Creek (Deer Creek) but will likely occur within 180 days of the pre-application monitoring. Wood chips will be created through fuels reduction activities on the Deer Creek project by a contractor or purchaser (hence forth referred to as the “contractor”) that will be thinning trees and undergrowth in the Deer Creek project area. Thinning will be done as a fuels reduction treatment but will also result in forest health improvement due to lower inter-tree competition for moisture and nutrients.

The contractor will be cutting trees and transporting them to landings for processing. The trees less than 10 inches in diameter and limbs and tops of larger trees will be processed through a large chipper. Some of these chips will be “blown” into chip vans for transport to electric cogeneration plants. The chips that will be used in the Wood Chip project will be deposited in a pile in the landing. The processed chips will be purchased from the contractor for use in the Wood Chip project.

Transport of the chips to the work sites would be done by Forest Service personnel and equipment or by contract. Transport will depend on the workload of Forest Service personnel at the time of need. Chip vans cannot be used to transport the chips as the equipment used to empty the chip vans once at the Wood Chip sites cannot be transported to the job site. The chips will be loaded into dump trucks using a front-end loader. This will result in not only chips, but also a small amount of soil from the landing being deposited in the dump trucks. The dump trucks will be used to transport the material to the Wood Chip mine sites. The material will be dumped at the staging area locations shown on the site maps.

Once material is staged at the treatment areas, the material will be spread on the mine site soil surface by using an excavator or front-end loader. Material will need to be spread out across the soil surface both mechanically and by hand depending on topography and distance from RCA's.

Where material is to be incorporated into the soil, this will generally be done with an excavator although a cultivator or subsoiler could also be used to incorporate chips into the soil. The equipment used will depend on operability of the site and equipment available at the time. Material will be worked into the soil to an approximate depth of 8 to 12 inches.

The spreading of material, either by manual or mechanical means would be done by Forest Service personnel and equipment, or by contract depending on workload. It should be noted that application is intended to occur between June and October during the dry season.

During pre-application examination of the site, it will be determined where erosion fencing is advisable. Forest Service personnel will install the erosion fencing following application of the material. If there were reason to apply weed free straw, such as access areas with bare soil, this would also be done by Forest Service personnel. Preparation of any erosion control measures or materials will be done prior to the onset of the wet season.

The application of wood chips will be a source of organic matter that provides nutrients for plant establishment and growth, and a basis for the soil's water holding capacity. As the wood chips decompose, they provide food for beneficial microbes that aid in the availability of nitrogen and other nutrients needed for plant growth. A year after the woodchip application, the areas that received a woodchip application will be checked to determine if there is enough organic matter to support vegetation. If there is ½ to 1 inch or more of fine material or composted wood chips, then seeding will commence in mid-October of that year. A native seed mix that has been approved by the Tahoe National Forest will be used. The origin of the seeds should be from as close to western Nevada County as possible. If seed cannot be located from that area, then seed collected from the western slope of the Sierra Nevada, between the elevations

of 3,000-6,000', should be used. A total of 26 pounds per acre of Pure Live Seed (PLS) will be applied by a broadcast seeder such as a "belly grinder". The seeds will be either raked in or followed by a 4-6 inch application of certified weed-free straw. The "raking in" or mulching with straw will prevent predation by hungry wildlife and protect the seeds from desiccation or being blown away. The seeds used in this seed mix have been successfully used at Alpha in previous projects and have been observed growing at Buckeye.

The following seed mix will be used:

Scientific Name	Common Name	Pounds per Acre (PLS)
<i>Achillea millefolium</i>	Yarrow	3
<i>Bromus carinatus</i>	California brome	10
<i>Elymus glaucus</i>	Blue or Western wild-rye	5
<i>Acmispon americanus</i> <i>var. americanus (Lotus purshianus)</i>	Pursh's lotus	3
<i>Festuca microstachys (Vulpia microstachys)</i>	Small fescue	5
	Total pounds per acre PLS	26 pounds per acre PLS

*Pure Live Seed – the percentage of seed that is viable (will germinate) in a seed lot

3. Location

The two project areas together comprise approximately 60 acres of degraded mined-lands on the Tahoe National Forest in Nevada County, California (Figure 1 Wood Chip Map). The TNF Land Resource Management Plan (LRMP) places the Alpha project area in the South Yuba Management Area -#42. This area has many interspersed private parcels but few with residences. This site is within the Scotchman Creek drainage, a tributary of the South Yuba River.

The TNF Land Resource Management Plan (LRMP) places the Buckeye project area in the Buckeye Management Area – #065 Chalk. The Buckeye site is within the Greenhorn Creek drainage, a tributary of the Bear River.

This project is located on the Tahoe National Forest. The Alpha site is also located east of Nevada City and north of State Highway 20 in Township 17 North, Range 11 East, Section 18 in the MDBM. The Buckeye site is located south of State Highway 20 in Township 16 North, Range 10 East, Sections 17, 18 and 19 in the MDBM.

4. Purpose

The purpose of this grant is to obtain funding to be able to purchase excess wood chips generated from fuels management projects to two degraded and abandoned mined-lands. The objectives are to improve water quality by immobilizing sediments and sediments that would enter the watershed; and build a growth media that is capable of supporting a sustainable ecosystem. The application of wood chips will assist in infiltration of precipitation therefore decreasing the severity of sheet flow erosion that carries sediment and mercury into the watershed. As the wood chips compost, they will provide a basis for soil building and the subsequent establishment of vegetation.

2. Project Summary:

The proposed project is located in Nevada County, California on National Forest System lands under the jurisdiction, custody and control for the United States Department of Agriculture, Forest Service (Forest Service), Pacific Southwest Region with the Tahoe National Forest (TNF). The two locations, Alpha Diggins Hydraulic Mine site (Alpha) and Buckeye mine site (Buckeye) are located east of Nevada City, California in Nevada County, California (Figure 1). The purpose of this document is to meet the requirements of the Sierra Nevada Conservancy Proposition 84 Grant Program. The project proposes the use of wood chips generated from fuels reduction projects from the WNCCDP as a soil amendment and soil stabilizer to accomplish mine site reclamation. The proposed treatment sites are historic hydraulic mine site with severely degraded soils, erosion issues, sparse to no vegetation and known mercury toxicity.

This project improves the health of the forest, and utilizes forest biomass removed as part of restoration activities. In addition, the implementation of this project contributes to improved water quality by immobilizing sediments and mercury-laden associated with historic abandoned mine lands from waters and preventing them from entering watersheds.

Matching dollars for this project are provided from the Forest Service through: pre-application monitoring and soil testing; consultation with U.S. Fish and Wildlife to determine management requirements as it pertains to the California Red-Legged frog; wildlife surveys, contract preparation, mapping and posting; preparing the site for chip placement; application of this soil amendment; and follow up monitoring, seeding, and soil testing.

3. Environmental Setting

Alpha Diggins is approximately 90 acres in area and approximately 20 acres will be treated. Buckeye site is approximately 45 acres in four separate pieces on TNF acres and approximately 40 acres will be treated. The total acreage treated will be approximately 60 acres. The mines are located at elevations between 3,800 and 4,000' in mixed coniferous forest.

3.1 Vegetation

The vegetation that has established on the mine sites is sparse consisting of Ponderosa pine (*Pinus ponderosa*), Sugar pine (*Pinus lambertiana*), Whiteleaf manzanita (*Arctostaphylos viscida*), Bilberry (*Vaccinium cespitosum*), Gaultheria (*Gaultheria ovalifolia*), Western Labrador tea (*Rhododendron columbianum*), Western azalea (*Rhododendron occidentale*), Common rush (*Juncus effusus* subsp. *effusus*), and Water beard grass (*Polypogon virides*). Though the vegetation on proposed project sites is compromised by lack of soil nutrients and organic matter, the surrounding dominant vegetation consists of a tree layer of Ponderosa Pine (*Pinus ponderosa*), Sugar pine (*Pinus lambertiana*), Incense cedar (*Calocedrus decurrens*), White Fir (*Abies concolor*), Douglas fir (*Pseudotsuga menziesii*), Black Oak (*Quercus kelloggii*) and Eastwood's willow (*Salix*

eastwoodiae). The shrub layer consists of whiteleaf manzanita (*Arctostaphylos viscida*), and Mountain whitethorn (*Ceanothus cordulatus*). Where mining has resulted in depressions in the bedrock, seasonal ponding of water occurs. Wetland plants such as common rush, gaultheria, western Laborador tea, and common azalea have established.

3.2 Mammals

Common mammals of the area include: black bear, white-tailed deer, coyote, red fox, mountain lion, bobcat, striped skunk, northern raccoon, California ground squirrel, western gray squirrel, golden-mantled ground squirrel, lodgepole chipmunk and numerous rodents.

3.3 Birds

Avifauna of the area include: red-tailed hawk, Cooper's hawk, band-tailed pigeon, sharp-shinned hawk, Anna's hummingbird, northern flicker, downy woodpecker, red-breasted sapsucker, western wood-pewee, Hutton's vireo, common raven, American crow, Steller's jay, white-breasted nuthatch, red-breasted nuthatch, American robin, black-capped chickadee, ruby-crowned kinglet, yellow-rumped warbler, western tanager, white-crowned sparrow, purple finch, and dark-eyed junco.

3.4 Fish

Native fish species, such as rainbow trout and minnows, and introduced species are present in the Yuba River and Bear River Watersheds. There are two rainbow trout fisheries identified 1 mile and 1.5 miles downstream of Alpha. (Alpha RAM, 2007).

3.5 Reptiles and Amphibians

Alpha Diggins is within the federally designated critical habitat range for the California red-legged frog. Common herpetofauna of the area include: Pacific treefrog, western fence lizard, northern alligator lizard, western rattlesnake, rubber boa, gopher snake, and common garter snake. The sensitive mountain and yellow-legged frogs occur at elevations of 4,500' and above and are not expected to occur at these sites.

B. Workplan and Schedule Narrative:

The process would commence with pre-application monitoring of the site including soil testing. At this time, the U.S. Fish and Wildlife Service (Service) would be consulted to determine management requirements for California Red-Legged Frog. Protocol surveys would be done within the project area for California Red Legged frog (previous surveys have not shown this species of frog to be present) during the optimal time for detection.

The following activities will be related to the timing of a separate project called the Western Nevada County Community Defense Project (WNCCDP). This is a large-scale fuels reduction project designed to protect the Nevada City, Cascade Shores, and Grass Valley communities from wildfire. This project is using an "all lands" approach attempting to integrate fuels treatments on National Forest System Lands with fuels treatments and proposed fuels treatments on other adjacent ownerships. It is from the fuels reduction activities from this project that wood chips will be generated. Some of these wood chips will be used for electric cogeneration; however, there will be more wood chips generated than the "cogen" market can accommodate. The wood chips used in this project will be procured from the contract logger on the fuels reduction project. The logger or TNF personnel will transport and spread the wood chips at the Alpha and Buckeye mine sites. This activity has many benefits such as: reducing offsite movement of sediments, some with mercury; improve hydrologic function; restore site sustainability; and reduce the smoke emissions that would have occurred from the burning of this wood material.

The transport of the material and application on site will be done by Forest Service personnel and equipment or by contract. Transport will be determined by the availability of Forest Service resources at the time work will occur on the site. The TNF has the personnel and most of the equipment to perform the work but would have to rent the dozer or excavator for the application. However, if TNF personnel are not able to perform the work due to workload issues, the TNF is capable of issuing and administering a contract to complete the work within the grant period.

Table 1 – Project Workplan (**Timeline is shown as time from grant initiation**)

Project Deliverables	Timeline
Pre application monitoring	120 days
Conduct necessary survey and consultation with U.S. Fish and Wildlife to determine management requirements for California Red Legged Frog	120 days Surveys will be conducted according to the USFWS protocol: surveys will be conducted no earlier than April 15 and commence no later than August 15. Timeline will be adjusted according to survey protocol.
Pre-project monitoring of vegetation, soils, and mercury	Within the first year of project funding and at the appropriate time for detection.
Procurement of wood chip material from timber purchaser	1 year 120 days
Transport wood chip material to sites	1 year, 180 days
Spread and incorporate material into soils at sites	1 year, 210 days
Seed areas with Tahoe National Forest approved native seed mix	In the fall of second year post application, or earlier if growth media is sufficiently composted.
Post application monitoring	Year 1 and 3 with grant funding, or as long as funding is available Year 5, TNF will continue to monitor the site

Comment [O1]: Are we going to do this??

C. Restrictions, Technical/Environmental Documents and Agreements Narrative:

a. Restrictions/Agreements:

The Tahoe National Forest Land and Resources Management Plan (TNF LRMP) places the Alpha project area in the South Yuba Management Area -#42 and Buckeye in the Buckeye LRMP Management Area- 065 Chalk.

Management direction for this area emphasizes timber harvest and transitory range opportunities. In areas of residential property, direction is to work closely with neighbors at the project level to minimize conflicts that may occur from differences in objectives (TNF LRMP).

There does not seem to be clear management direction for degraded mined-lands under the Sierra Nevada Framework (2004). However, there is clear direction as it pertains to aquatic systems and riparian areas. Forest Service mandated requirements for a Riparian Conservation Area (RCA) will be implemented to prevent disturbance to streams, ponds, and springs. The requirements utilize the following RCA's:

Perennial streams = 300 feet each side of channel
Intermittent streams = 300 feet each side of channel
Ephemeral streams = 30 feet each side of channel
Special Aquatic Feature (wet meadows, seeps, and ponds) = 300 from feature or riparian vegetation (whichever is greater)

The Riparian buffer, which is the are restricted from all activities is as follows:

Perennial streams = 100 feet each side of channel
Intermittent streams = 100 feet each side of channel
Ephemeral streams = only the channel itself
Special Aquatic Feature (wet meadows, seeps, and ponds) = 100 from feature or riparian vegetation (whichever is greater)

The area outside of these Riparian buffers but within the RCA can be treated by manual means only.

This project proposal is consistent with direction to maintain or improve the systems while minimizing disturbance within those aquatic and riparian systems.

No property restrictions or encumbrances will adversely impact project completion because the private property boundaries will be marked by a certified land surveyor. The TNF will work with adjacent private land owners to develop planned treatments that enhance or compliment work done on adjacent private lands as it relates to forest and ecosystem health.

b. Regulatory Requirements/Permits:

Permits will not be required by the Regional Water Quality Control Board, Central Valley Region (CVRWQCB) for the application of wood chips. The application of wood chips does not meet the regulatory requirement for a waste discharge permit. Normally a waste discharge permit would be required for land application if biosolids or a similar material were used with the wood chips. Woods chips alone will be applied to the proposed sites and therefore permitting by the CVRWQCB will not be necessary.

Other permitting for water quality would not be applicable because the context of the proposed actions are considered limited to minor, local, short-term effects within the project area and no significant effects either long or short term, regional or societal, are anticipated.

The CVRWQCB has adopted a resolution, which provides for a conditional waiver of the requirement to file a report of waste discharge and obtain waster discharge requirements for timber harvest activities on USFS lands within the Central Valley Region. To be eligible for coverage under this waiver category, the project must meet the definition of timber harvest activities and comply with all of the applicable eligibility criteria and conditions. Eligibility criteria include conducting: a multi-disciplinary review of the timber harvest proposal including review by watershed specialists and inclusion of Best Management Procedures (BMPs); a cumulative watershed effects (CWE) analysis; and provided the public and other interested parties reasonable opportunity to comment on the proposals. All of these criteria will be completed in this project. The WNCCDP project from which chips will be obtained will have obtained silvicultural waivers through the CVRWQCB prior to timber harvesting operations on those projects.

c. California Environmental Quality Act (CEQA):

Alpha Diggins Site

This environmental analysis will be CEQA compliant because it will include a Negative Declaration, a Mitigated Negative Declaration, and/or an Environmental Impact Report will be done. The Alpha project will be subject to CEQA analysis and the adopted environmental documentation and the filed and date-stamped Notice of Determination is attached (see Final Alpha RAM, 2007). Compliance with CEQA is met through the CERCLA process (see CERCLA Definition), which meets NEPA compliance requirements.

Buckeye Site

An environmental analysis was conducted in August 1999 for applying compost and planting trees on the Buckeye site (see Appendix section in Supporting Documentation section). The analysis found that project would have no adverse effects on the following: steep slopes or highly erosive soils; sensitive plant or animal species; wetland or municipal watersheds; Congressionally designated wilderness; wilderness study areas, or National Recreation

Areas; inventoried roadless areas; Research Natural Areas; or Native American religious or cultural sites; archeological sites or historic properties or areas. Archeology surveys were completed and nothing was identified. The project will take place entirely on National Forest System lands. The Buckeye Project will be compliant with CEQA since a NEPA equivalent analysis was conducted.

d. National Environmental Policy Act (NEPA):

Alpha Diggins Site

CERCLA documents have been prepared including Remediation Action Memorandums for reclamation activities that occur at the Alpha Mine (TNF Alpha, 2007). The proposed wood chip project is an activity that is allowed under the NEPA-equivalent CERCLA documentation.

Buckeye Site

The Buckeye site, as a result of the environmental analysis performed in 1999 for a similar project, a determination was made that the action (application of biosolids) is in a category of actions that are excluded from documentation in an Environmental Assessment or Environmental Impact Statement (TNF Decision Memo for the Buckeye Mine, 1999). That category of exclusion was established by the Chief, Forest Service, and is listed as: FSH 1909.15, Chapter 31.2, category 5 and is as following:

Regeneration of an area to native tree species, including site preparation which does not involve the use of herbicides or result in vegetation type conversion.

The proposed woodchip project is compliant with NEPA because the original project included the application of wood chips, along with biosolids. The proposed Woodchip Project will adhere to the mitigation measures cited in the Decision Memo (TNF Decision Memo for the Buckeye Mine, 1999). Since the application of biosolids is not a part of this proposal, and wood chips are a result of chipped trees, the return of this material to the forest is not an impact.

e. Endangered Species Act

The federally-listed as threatened California red-legged frog (CRLF) is the only sensitive species known from the vicinity of the proposed project sites. Once the proposed project is funded, consultation with the US Fish and Wildlife Service (USFWS) will commence. Protocol surveys for this species will be conducted during the required time period at the sites. The TNF has developed a Riparian Conservation Area (RCA) No Treatment Area, which are referred to as Riparian Buffers that prevent adverse impacts to the CRLF. The RCA No Treatment Area restricts both mechanical and handwork from the following areas within the CRLF habitat:

Riparian Conservation Area Guidelines.

Perennial streams = 100 feet each side of channels and no mechanical work within 300 feet

Intermittent streams = 100 feet each side of channel and no mechanical work within 300 feet

Ephemeral stream channels = pruning and cutting are allowed, but piles cannot be created within the channel. Machines such as masticators and excavators may reach into these areas with their buckets or cutter heads but no ground disturbing activity should occur.

Special Aquatic features (wet meadows, seeps, and ponds) = 300 feet from feature and no mechanical work within 300 feet.

In summary, within the CRLF habitat, there will be no work, mechanical or hand work, allowed with 100 feet of a perennial or intermittent stream; and no mechanical work allowed with 300 feet of a Special Aquatic feature.

D. Organizational Capacity Narrative:

The Tahoe National Forest, Yuba River Ranger District has completed projects beyond the size and complexity of the proposed project and has a very good track record of success. The Forest has completed two mine rehabilitation projects using composted material including carrying out a complex monitoring program. The Forest Service has been pioneers in fuels reduction work and exploration of new forms of utilization of wood fiber. We have the expertise on staff to complete the project therefore bypassing the need to outsource work, other than possibly contracting of some of the material transport, spreading, and incorporation into the soil. The forest also has the personnel with background in contract law, preparation, and administration to handle any contract work needs.

E. Cooperation and Community Support Narrative:

The cooperators and collaborators in the WNCCDP include adjacent private property owners including the largest private landowner in the state of California, Sierra Pacific Industries). In addition, cooperators include Nevada County, the Nevada County Fire Safe Council, local fire districts, the Western Nevada County Bio Mass Task Force, California State Department of Parks, and local businesses.

F. Long-term Management and Sustainability Narrative:

Long-term management objectives in this project area include:

a. Vegetation: The long-term management objective is a productive ecosystem with high biodiversity that is sustainable. The addition of wood chips to these degraded mine sites will increase the organic matter and nutrients in the soil. The increase in nutrients will aid in the establishment of vegetation. As site productivity improves, biodiversity will increase. Forest structure and function are in line to resemble old forest conditions on adjacent lands. Forest stands are diverse in species and structure, and resilient in light of climate change forecasts. The goal is to convert an abandoned mined-land to a sustainable ecosystem capable of supporting a range of seral stages present across the landscape.

b. Water: The long-term management objective is water quality that meets the goals of the Clean Water Act and Safe Drinking Water Act. Only acceptable levels of sediment and mercury would be present. There would be an aquatic system that supports healthy aquatic plant, vertebrate, and invertebrate populations. Species composition and structural diversity of plant and animal communities in riparian areas, wetlands, and meadows will provide desired habitat conditions and function. Spatial and temporal connectivity will be maintained for riparian and aquatic dependent species. The physical structure and condition of stream banks and shorelines will minimize erosion and sustains desired habitat diversity. Riparian areas and meadow environments become more hydrologically functional.

c. Soils: The long-term management objective is a soil that is capable of supporting a sustainable ecosystem without human or edaphic inputs. The soil will have a balanced combination of water holding capacity and plant available nutrients. The soil will be capable of supporting a diverse vegetative cover with favorable infiltration characteristics that absorb and filter precipitation. The streambanks will be covered with enough vegetation to prevent erosion and sustain favorable conditions for stream flows.

d. Wildlife: The long-term management objective would be a healthy ecosystem with a range of conditions that would allow for maintenance of existing wildlife populations and perpetuation of species.

e. Fuels: The long-term management objective is to reduce the size and severity of wildfire in the wildland urban interface (WUI). The WNCCDP will result in stand densities necessary for healthy forests during drought conditions by implementing fuel treatments on adjacent lands that have been analyzed to maintain, create and compliment WUI objectives.

G. Performance Measures Narrative:

Performance measures would be counted as acres treated for vegetation improvement, wildlife habitat improvement, and watershed improvement activities. Other measures could include reduction in tons of forest fuels burned, tons of carbon sequestered, jobs created, and financial input into the local economy.

Performance measure	Accomplishment in project
Number of people reached	>2,000 through jobs, news media, adjacent landowners
Dollar value of resources leveraged for the Sierra Nevada	>\$94,000.00 in project funds from other sources and major in kind contributions
Number and type of jobs created	10 to 15 forestry related jobs
Number of new, improved, or preserved economic activities	Boost to the local community through improved water quality for both the Greenhorn and South Yuba drainages
Linear feet of stream bank protected	Enhancement of riparian habitat for aquatic fauna and flora
Number of special significance site protected	Protection of valuable fish and amphibian habitat
Tons of carbon sequestered or emissions avoided	A reduction of approximately 500 metric tons of carbon per year from use of chips rather than burning. Emissions avoided are harder to measure but is very significant
Increase in percent vegetative cover and plant diversity	Determination of the best treatment for increasing the percent cover of native plants and number of native plant species present.
Decrease in the amount of sediment leaving the site	Determination of the best treatment for decreasing sedimentation
Acres of land improved or restored	60
Number of collaboratively developed plans and assessments	1 adjacent landowner, possibly more.
Percent of pre-project and planning efforts resulting in project implementation	100%

Appendix B1 Full Application Checklist

Project Name: Wood Chip Mine Site Reclamation Project

Applicant: Karen Hayden, Tahoe National Forest

Submission requirements for all Category One and Category Two Grant Applications

1. Completed Application Checklist (*EFN: Appendix B_1_WOOD CHIPt.doc*)
2. Table of Contents (*EFN: Table of contents.docx*)
3. Full Application Project Information Form (*EFN AppendixB2_WOOD CHIP.doc*)
4. Authorization to Apply or Resolution (*EFN: Auth_to_Apply_WOOD CHIP.doc*)
5. Narrative Descriptions - Submit a single document that includes each of the following narrative descriptions (*EFN Wood Chip Narrative Descriptions.docx*)
 - a. Detailed Project Description
 - Project Description including Goals/Results, Scope of Work, Location, Purpose, etc.
 - Project Summary
 - Environmental Setting
 - b. Workplan and Schedule (*EFN Work Plan and Schedule WOOD CHIP.docx*)
 - c. Restrictions, Technical/Environmental Documents and Agreements (*EFN Restrictions_Technical_Environmental Documents_WOOD CHIP.docx*)
 - d. Organizational Capacity (*EFN Organizational Capacity_WOOD CHIP.docx*)
 - e. Cooperation and Community Support (*Cooperation and Community Support_WOOD CHIP.docx*)
 - f. Long Term Management and Sustainability (*Long Term Managment and Sustainability_WOOD CHIP.docx*)
 - g. Performance Measures (*Performance Measures_WOOD CHIP.docx*)
6. Supplemental and Supporting documents
 - a. Detailed Budget Form (*EFN Wood Chip appendix B3.*)
 - b. Restrictions, Technical/Environmental Documents and Agreements, as applicable (*Restrictions_Technical_Environmental Documents_WOOD CHIP.docx*)
 - Restrictions / Agreements (N/A Category Two Pre-Project Activities)
 - Regulatory Requirements / Permits (N/A Category Two Pre-Project Activities)
 - California Environmental Quality Act (CEQA) documentation (N/A Category Two Pre-Project Activities)

National Environmental Policy Act (NEPA) documentation (N/A Category Two Pre-Project Activities)
Cooperation and Community Support

Letters of Support (*EFN Letter of Support_Wood Chip.pdf*)

c. Long-Term Management and Sustainability

Long-Term Management Plan (*Long Term Management Plan_WOOD CHIP.docx*)

d. Maps and Photos

Project Location Map (*EFN WoodChipMineRehabProjectVicinityMap.pdf*)

Parcel Maps showing County Assessor's Parcel Number(s) (*EFN WoodChipMineRehabProject_BuckeyeParcels.pdf and WoodChipMineRehabProject_AlphaParcels.pdf*)

Topographic Map (*EFN: (same as those for Site Plan)*)

Photos of the Project Site (*EFN Photographs_WOOD CHIP.docx*),

e. Additional submission requirements for Conservation Easement Acquisition applications only N/A this is not a conservation easement project

Acquisition Schedule (*EFN: acqSched.doc,.docx,.rtf,.pdf*)

Willing Seller Letter (*EFN: WillSell.pdf*)

Real Estate Appraisal (*EFN: Appraisal.pdf*)

Conservation Easement Language (*EFN: CE.pdf*)

f. Additional submission requirements for Site Improvement / Restoration Project applications only N/A - refer to authorization to apply (#4)

Land Tenure Documents – attach only if documentation was not included with Pre-application (*EFN: Tenure.pdf*)

Site Plan (*EFN: WoodChipMineRehabProject_BuckeyeSite.pdf and WoodChipMineRehabProject_AlphaSite.pdf*)

NEPA/CERCLA documentation (*Alpha RAM.doc and Buckeye Diggings DM.pdf*)

Additional Mercury Testing documentation (*EFN: Buckeye Mercury testing.pdf*)

I certify that the information contained in the Application, including required attachments, is accurate.

Signed _____
(Authorized Representative)

August 26, 2014
Date

Garv A. Clone District Cultivist
Name and Title (print or type)

Appendix B2

SIERRA NEVADA CONSERVANCY PROPOSITION 84 - PROJECT INFORMATION FORM

Rev. August 2011

PROJECT NAME

Wood Chip Mine Site Reclamation Project

APPLICANT NAME *(Legal name, address, and zip code)*

Karen Hayden , Yuba River Ranger District, 15924 Highway 49, Camptonville, California 95922

PERSON WITH FISCAL MANAGEMENT RESPONSIBILITY FOR GRANT CONTRACT/INVOICING

Name and title – type or print

Phone

Email Address

Mr. Gary Cline, District Culturist

(530) 478-6290

gcline@fs.fed.us

COUNTY ADMINISTRATOR OR PLANNING DIRECTOR CONTACT INFORMATION *(At least one entry is required)*

Name: Nevada County Board of Supervisors - Nate Beason

Phone Number (530) 265-1480

Email address: cao@co.nevada.ca.us

NEAREST PUBLIC WATER AGENCY (OR AGENCIES) CONTACT INFORMATION *(At least one entry is required)*

Name: Nevada Irrigation District

Phone Number: (530)273-6185

Email address: www.nid.dst.ca.us

Please identify the appropriate project category below and provide the associated details *(Choose One)*

Category One Site Improvement

Category Two Pre-Project Activities

Category One Conservation Easement Acquisition

Site Improvement/Conservation Easement Acquisition

Project area: __60 acres (within project area boundary)___

Total Acres: _____

SNC Portion (if different): _ _____

Total Miles (i.e. river or stream bank): _____

SNC Portion (if different): _____

Select one primary Site Improvement/Conservation Easement Acquisition deliverable

Restoration

Enhancement

Resource Protection

Infrastructure Development / Improvement

Conservation Easement

<p>For Conservation Easement Acquisitions Only</p> <p><input type="checkbox"/> Appraisal Included</p> <p><input type="checkbox"/> Will submit appraisal by _____</p>									
<p><input checked="" type="checkbox"/> Pre-Project Activities</p> <p>Completion of a CERCLA action with associated biological evaluations, BMPs, archeological site reports, and Cumulative watershed impacts analysis to meet NEPA requirements.</p>	<p>Select <u>one</u> primary Pre-Project deliverable</p> <table border="0"> <tr> <td><input type="checkbox"/> Permit</td> <td><input type="checkbox"/> Condition Assessment</td> </tr> <tr> <td><input checked="" type="checkbox"/> CEQA/NEPA Compliance</td> <td><input type="checkbox"/> Biological Survey</td> </tr> <tr> <td><input type="checkbox"/> Appraisal</td> <td><input type="checkbox"/> Environmental Site Assessment</td> </tr> <tr> <td><input type="checkbox"/> Plan</td> <td></td> </tr> </table>	<input type="checkbox"/> Permit	<input type="checkbox"/> Condition Assessment	<input checked="" type="checkbox"/> CEQA/NEPA Compliance	<input type="checkbox"/> Biological Survey	<input type="checkbox"/> Appraisal	<input type="checkbox"/> Environmental Site Assessment	<input type="checkbox"/> Plan	
<input type="checkbox"/> Permit	<input type="checkbox"/> Condition Assessment								
<input checked="" type="checkbox"/> CEQA/NEPA Compliance	<input type="checkbox"/> Biological Survey								
<input type="checkbox"/> Appraisal	<input type="checkbox"/> Environmental Site Assessment								
<input type="checkbox"/> Plan									

Appendix B3
SIERRA NEVADA CONSERVANCY
PROPOSITION 84 - DETAILED BUDGET FORM

Wood Chip Mine Site Reclamation Project

SECTION ONE DIRECT COSTS	Year One	Year Two	Year Three	Year Four	Year Five	Total
						\$0.00
Purchase of chip material		\$40,293.00				\$40,293.00
Transportation of material		\$45,200.00				\$45,200.00
Application of material		\$71,960.00				\$71,960.00
ID Team time		\$0.00				\$0.00
						\$0.00
						\$0.00
						\$0.00
DIRECT COSTS SUBTOTAL:	\$0.00	\$157,453.00	\$0.00	\$0.00	\$0.00	\$157,453.00

SECTION TWO INDIRECT COSTS	Year One	Year Two	Year Three	Year Four	Year Five	Total
Monitoring	\$3,180.00	\$0.00	\$3,180.00			\$6,360.00
Cal. Red Legged Frog Surveys	\$1,500.00					\$1,500.00
Reflag Arch Sites	\$500.00					\$500.00
						\$0.00
INDIRECT COSTS SUBTOTAL:	\$4,680.00	\$0.00	\$3,180.00	\$0.00	\$0.00	\$8,360.00
PROJECT TOTAL:	\$4,680.00	\$157,453.00	\$3,180.00	\$0.00	\$0.00	\$165,813.00

SECTION THREE						Total
Administrative Costs (Costs may not to exceed 15% of total Project Cost) :						
Administration of project	\$2,500.00	\$6,000.00	\$2,540.00			\$11,040.00
						\$0.00
ADMINISTRATIVE TOTAL:		\$6,000.00	\$2,540.00	\$0.00	\$0.00	\$11,040.00
SNC TOTAL GRANT REQUEST:	\$4,680.00	\$163,453.00	\$5,720.00	\$0.00	\$0.00	\$176,853.00

SECTION FOUR	Year One	Year Two	Year Three	Year Four	Year Five	Total
OTHER PROJECT CONTRIBUTIONS						
<i>List other funding or in-kind contributors to project (i.e. Sierra Business Council, Department of Water Resources, etc.)</i>						
Project Layout and mapping	\$5,000.00	\$0.00				\$5,000.00
Contract package preparation	\$5,000.00	\$0.00				\$5,000.00
ID Team Time	\$10,000.00	\$5,000.00	\$4,560.00			\$19,560.00
Soil Testing	\$2,000.00		\$2,000.00		2,000.00	\$6,000.00
Seeding and plant surveys	\$5,000.00	\$5,000.00	\$5,000.00	\$0.00	0.00	\$15,000.00
Grant administration	\$5,000.00	\$5,000.00				\$10,000.00
Site cleanup			\$10,000.00	\$0.00	0.00	\$10,000.00
Erosion Fencing/Install		\$10,000.00				\$10,000.00
Contract Administration	\$10,000.00	\$20,000.00				\$30,000.00
Monitoring				\$5,000.00	\$5,000.00	\$10,000.00
Total Other Contributions:	\$42,000.00	\$45,000.00	\$21,560.00	\$5,000.00	\$7,000.00	\$120,560.00

**STATE OF CALIFORNIA
SIERRA NEVADA CONSERVANCY**

**Sierra Nevada Conservancy Grant Program Safe Drinking Water,
Water Quality and Supply, Flood Control, River and
Coastal Protection Bond Act of 2006 (Proposition 84)**

Applicant: U.S. Forest Service, Tahoe National Forest, Yuba River Ranger District

Project Title: Wood Chip Mine Site Reclamation Project

Subregion: Central

County: Nevada

SNC Funding: \$176,853.00

Total Project Cost: \$297,413.00

Application Number: 809

PROJECT SCOPE

This project is located on the Tahoe National Forest and involves 2 historic hydraulic mine sites. One site is east of Nevada City and north of Highway 20 in the South Yuba river watershed. The second site is east of Nevada City in the Greenhorn Creek watershed which is a tributary of the Bear River. The project will use chipped sub-merchantable wood chips derived from forest fuels reduction treatments to treat approximately 67 acres of degraded mine lands on National Forest System (NFS) lands.

Project goals include increasing effective ground cover, reduction in erosion of potentially mercury laden sediments, and improvement of soil productivity on these lands. Additional goals are to increase flora and fauna biodiversity, reduction of smoke emissions, and sequestration of carbon.

PROJECT SCHEDULE

DETAILED PROJECT DELIVERABLES	TIMELINE
Project initiation letter	January 2015
Pre-application monitoring and soil testing	June 2015
Procurement of wood chips	April 2016
Transport wood chips	June 2016
Application of wood chips	July 2016
Post-application monitoring and soil testing	February 2016
Final Report/Final Payment Request	March 2017

PROJECT COSTS

PROJECT BUDGET CATEGORIES	TOTAL SNC FUNDING
Direct*	
Project Implementation	\$157,453.00
Project Administration	\$11,040.00
Monitoring- Frog surveys –Reflag Arch Sites	\$8,360.00
Administrative***	0
GRAND TOTAL	\$176,853.00

WOOD CHIP HYDRAULIC MINE SITE RECLAMATION PROJECT

STUDY AND MONITORING PLAN

Yuba River Ranger District

Tahoe National Forest

September 2, 2014

Monitoring Objectives and Methods

A. Monitoring Objectives

In addition to the application of wood chips on each site, test plots will be installed to determine the optimum conditions for erosion control and revegetation. The monitoring objectives are as follows:

1. determine baseline conditions for sediment loss and vegetation on both sites (Alpha and Buckeye) by establishing a control plot;
2. determine if the addition of wood chips can reduce sediment loss where applied by comparing the three treatments to the baseline (control); and identifying the best treatment;
3. determine if degraded areas can be reclaimed to support native vegetation by the addition of organic matter in the form of wood chips by measuring the percent vegetative cover and species-richness at the sites and comparing to baseline (control); and developing the best strategy for plant establishment

B. Test Plot Design

Two replicates sites with three treatments, plus a control will be installed along the fall line of a gentle slope. The dimensions of each test plot will be with 15m wide by 6m long (Figure 1). Two replicates of the test plot a design will be created (similar to this figure) at Alpha and Buckeye.

Treatment: wood chips on top of soil	Buffer	Treatment: Wood chips incorporated into soil	Buffer	Treatment: Wood chips incorporated plus soil amendment	Buffer	Treatment: Control
3m wide x 6m long	1m wide x 6m long	3m wide x 6m long	1m wide x 6m long	3m wide x 6m long	1m wide x 6m long	3m wide x 6m long

Figure 1 Test Plot Design (15m x 6m)

Objective 1 Monitoring Method

At each of the 2 replication sites, a control plot will be established to measure the amount of sediment that occurs without a treatment and to collect baseline data on vegetation. A total of 2 control plots, one at each replicate site will be established on a gentle slope. Both control plots will be installed along the fall line of the slope and be approximately 20 feet long and 10 feet wide. At the lowest end of the control plot, a silt fence will be installed and keyed under to provide a pocket to capture any discharge (sediment). The amount of sediment deposition in the pocket will be measured by a ruler and converted to a volumetric measurement.

The amount of sediment deposition in the pockets will be documented to provide a baseline measurement. The treatment will also be inspected for erosional features such as: rills, gully formation and movement of wood chips.

Vegetation will be monitored after the growing season has ceased, approximately mid July. The following data will be gathered in randomly placed belt transects:

1. Percent cover of native perennial plants in a 5m x 1m belt transect within each treatment.
2. Species-richness of each treatment (names of each native and non-native species in a 5 m x 1 m belt transect within each treatment).

The data for soil erosion will be collected at the cessation of the rainy season. Vegetation data will be collected after the major period of the growing season has slowed. The monitoring will continue for 5 years. If additional funding becomes available then monitoring will continue.

Soil erosion data and vegetation data from the three treatments will be compared to the control plots to determine the most effective combination of wood chip and vegetation. If needed, a statistical analysis will be use to analyze data. At the cessation of monitoring, a report will be prepared to summarize the findings.

Objective 2 Monitoring Method

Three treatments, (plus one control described in Objective 1), 2 replications of each treatment will be established on a gentle slope. Each treatment will be installed along the fall line of the slope and be approximately 20 feet long and 10 feet wide. At the lowest end of each treatment, a silt fence will be installed and keyed under to provide a pocket to capture any discharge (sediment). The amount of sediment deposition in the pocket will be measured by a ruler and converted to a volumetric measurement. These measurements will be compared to the other treatments and the control to determine if the treatments are successful in reducing sedimentation. The treatment will also be inspected for erosional features such as: rills, gulley formation and movement of wood chips.

The monitoring will continue for 5 years. If additional funding becomes available then monitoring will continue.

Objective 3 Monitoring Method

Three treatments, (plus one control described in Objective 1), 2 replications of each treatment will be used to determine if native vegetation is establishing on plots established in Objectives 1 and 2. After the growing season has ceased, approximately mid July, and within 2 weeks of last year's measurement, the following data will be gathered:

3. percent cover of native perennial plants in a 5 m x 1 m belt transect within each treatment; and
4. Species-richness of each treatment (names of each native and non-native species in a 5 m x 1 m belt transect within each treatment.

C. Data Analysis

Test plot monitoring will continue for 3 years. If additional funding becomes available then monitoring will continue. If biochar becomes available, then the test plot design may be altered to accommodate more treatments. All data will be compared to the other treatments that year,

and in subsequent years, compared over time to determine what treatment is the most effective. A statistical analysis may be used to analyze findings.

List of Works Cited

- (1) Alpers, C.N., Hunerlach, M.P., May, J.T., Hothem, R.L., Taylor, H.E., Antweiler, R.C., De Wild, J.F., and Lawler, D.A., 2005, Geochemical characterization of water, sediment, and biota affected by mercury contamination and acidic drainage from historical gold mining, Greenhorn Creek, Nevada County, California, 1999–2001, U.S. Geological Survey Scientific Investigations Report 2004-5251, 278 p. <http://pubs.usgs.gov/sir/2004/5251/>
- (2) May, J.T., Hothem, R.L., Alpers, C.N., and Law, M.A., 2000, Mercury bioaccumulation in fish in a region affected by historic gold mining: The South Yuba River, Deer Creek, and Bear River watersheds, California, 1999. U.S. Geological Survey Open-File Report 00-367, 30 p. <http://ca.water.usgs.gov/archive/reports/ofr00367/index.html>

Comment [01]: Not sure if we need this



United States
Department of
Agriculture

Forest
Service

Yuba River
Ranger
District

15924 Highway 49
Camptonville, CA
95922-9707
530-288-3231
530-288-3656 TDD
530-288-0727 FAX

File Code: 1561

Date: June 10, 2014

Sierra Nevada Conservancy,

This letter shall serve as the authorization to apply for the Wood Chip grant proposal. The District has the permission and support to carry out the project proposals as stated if grant funds are made available. The project proposal is located entirely on National Forest System Lands.

Any questions can be sent to: District Ranger, Yuba River Ranger Station, 15924 Highway 49, Camptonville, CA 95922. If you would like more information, contact Gary Cline, Project Leader at (530) 478-6290.

Sincerely,

s/s Karen L. Hayden

Karen L. Hayden
District Ranger

(Enclosures)
Map



Sierra Nevada Conservancy
Auburn, California

To Whom It May Concern:

I am writing on behalf of the Nevada County Biomass Task Force to support the Tahoe National Forest's application for grant funding to complete the "Wood Chip Mine Reclamation Project."

We believe this project would have multiple benefits to the local communities, to the affected lands and watersheds, and to local businesses needed for management of forests and processing of associated products. As related to our task force, we are particularly interested in helping maintain the various forest management businesses. Our task force was established with a primary goal of helping promote reduction of fire hazard on both private and public lands in Nevada County. We recognize that having a long-term healthy management infrastructure is essential for completing such work.

Our task force hopes to facilitate the establishment of a local biomass energy facility—a facility that will require a long-term sustainable supply of biomass chips. While much of the supply will come from private forestland and fire safe clearing work in the wildland urban interface, supply from public forestland will also be an important and needed supply component. Projects like the Western Nevada County Community Defense Project that will provide chips for the "Wood Chip Mine Reclamation Project" will be important sources of biomass. Such projects typically include provisions that require contractors to deal with excess biomass that results from forest management work. Having a local outlet for the biomass for use as mine reclamation will increase the likelihood that contractors will be interested in bidding on the project—and this will help maintain the forest management infrastructure that is essential in the long-term.

Please feel free to contact me or any member of our task force if you have any questions about our support for this grant application.

Sincerely,



Steve Eubanks

Chair, Nevada County Biomass Task Force



Buckeye Mine Site



Photograph of gravel covered soils at Buckeye Site. This is some of the worst area in the Buckeye site.



Photograph of Alpha site



This shot of Alpha site shows an area that will not need site preparation prior to application.

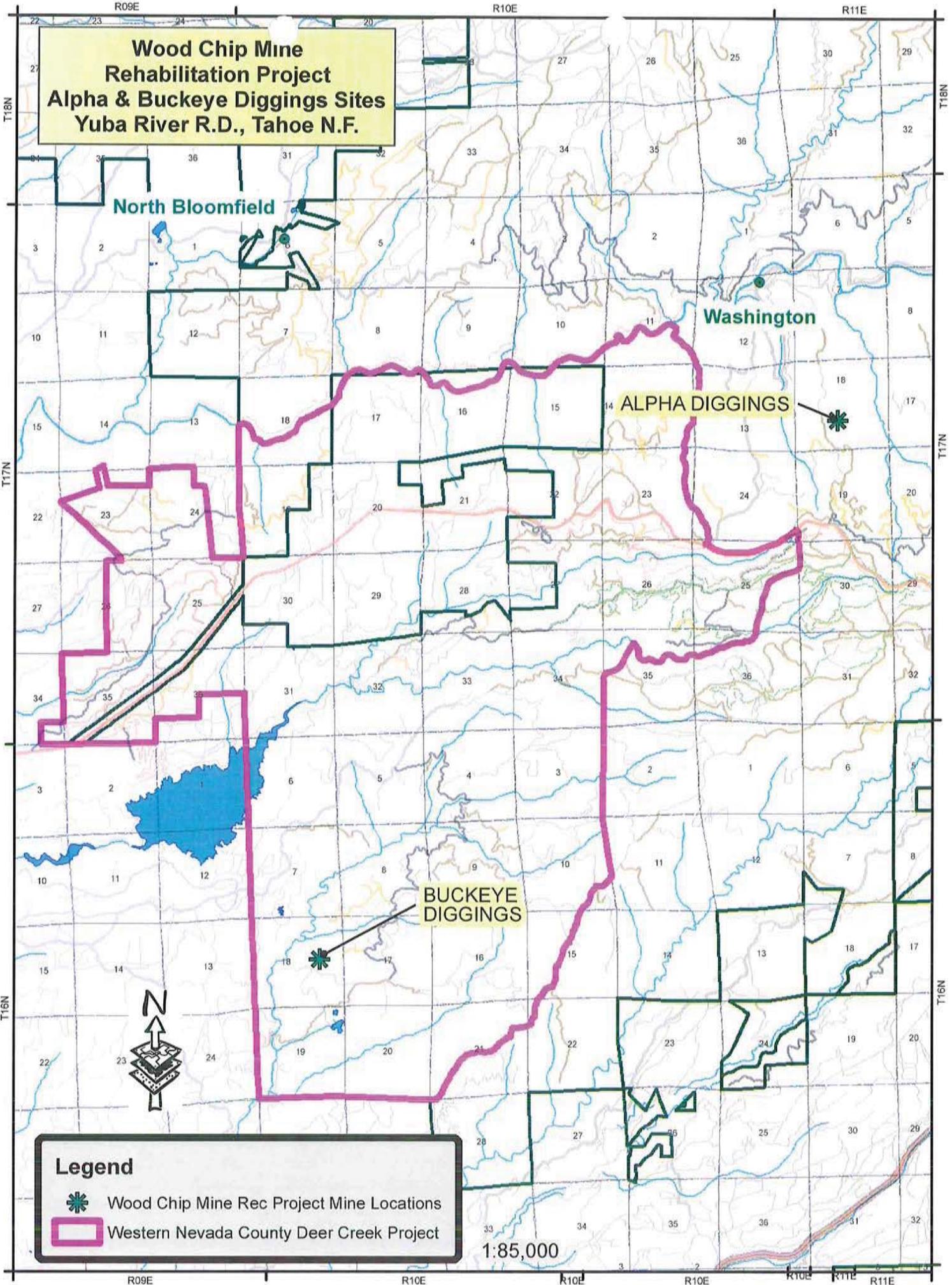


This photo of Alpha shows an area that would need mastication site preparation prior to application of wood chip material.



This photo of the Alpha site shows the edge of the mine area. This area has been soil development and has a great tree growth and a slight increase in plant diversity. This picture is meant to demonstrate what the site may look like in the future as the wood chips decay and soil productivity improves.

**Wood Chip Mine
Rehabilitation Project
Alpha & Buckeye Diggings Sites
Yuba River R.D., Tahoe N.F.**



North Bloomfield

Washington

ALPHA DIGGINGS

BUCKEYE DIGGINGS



Legend

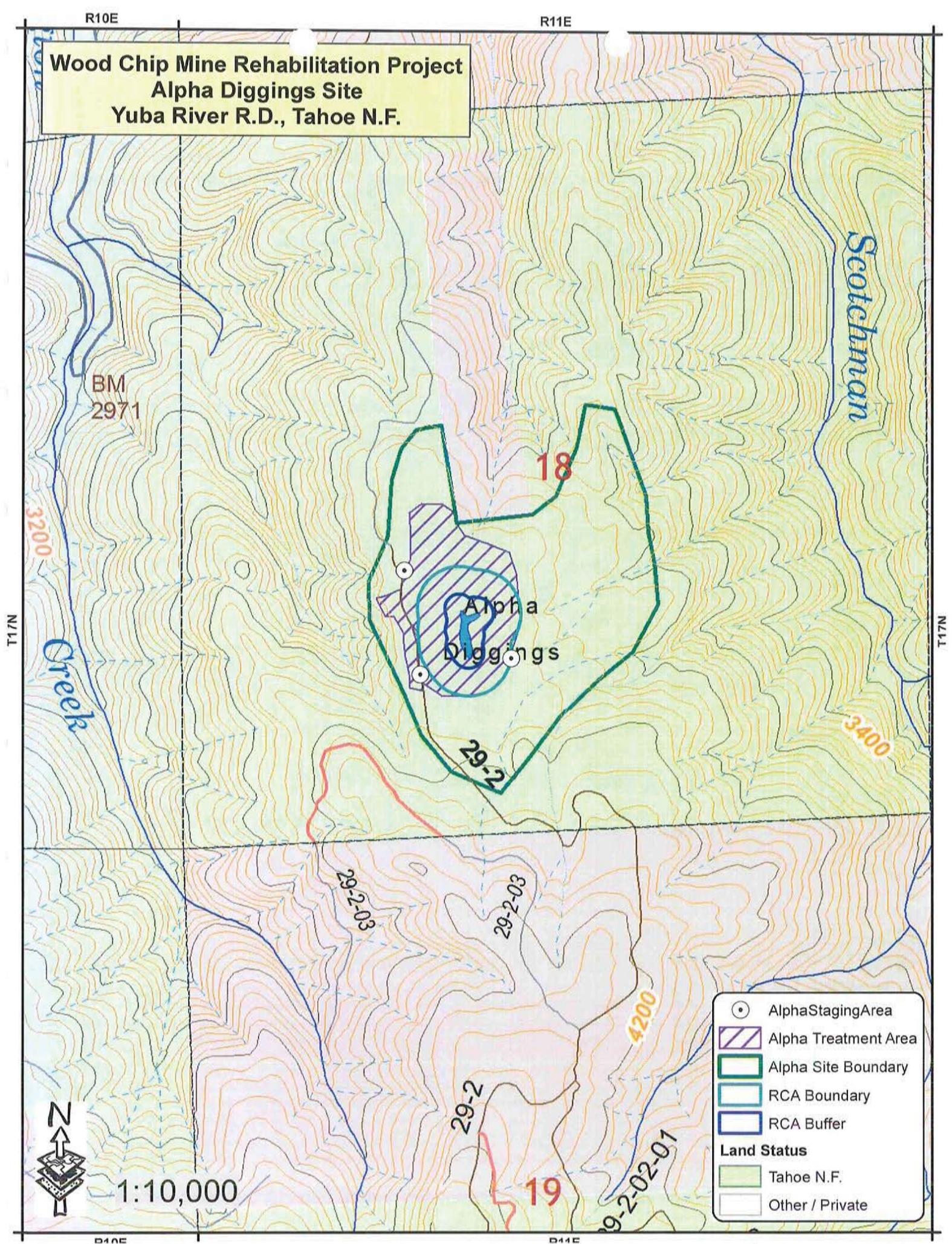
- Wood Chip Mine Rec Project Mine Locations
- Western Nevada County Deer Creek Project

1:85,000

R10E

R11E

**Wood Chip Mine Rehabilitation Project
Alpha Diggings Site
Yuba River R.D., Tahoe N.F.**



BM
2971

3200

18

Alpha
Diggings

29-2

Scotchman

3400

29-2-03

29-2-03

4200

29-2

19

29-2-02-01

T17N

T17N



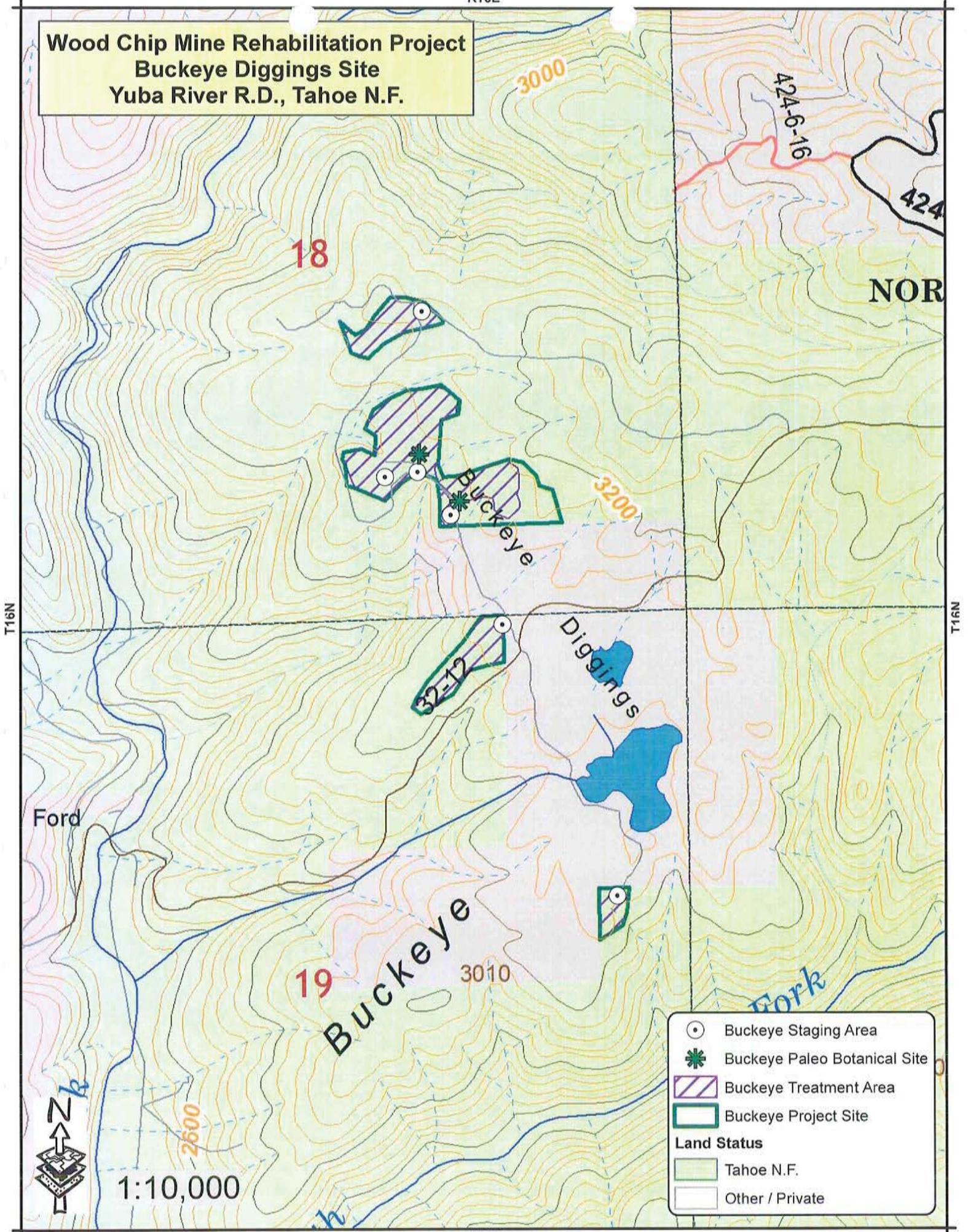
1:10,000

-  Alpha Staging Area
-  Alpha Treatment Area
-  Alpha Site Boundary
-  RCA Boundary
-  RCA Buffer
- Land Status**
-  Tahoe N.F.
-  Other / Private

D10E

D11E

**Wood Chip Mine Rehabilitation Project
Buckeye Diggings Site
Yuba River R.D., Tahoe N.F.**



NOR

424-6-16

424

18

Buckeye

3200

Diggings

32-12

Ford

19

Buckeye

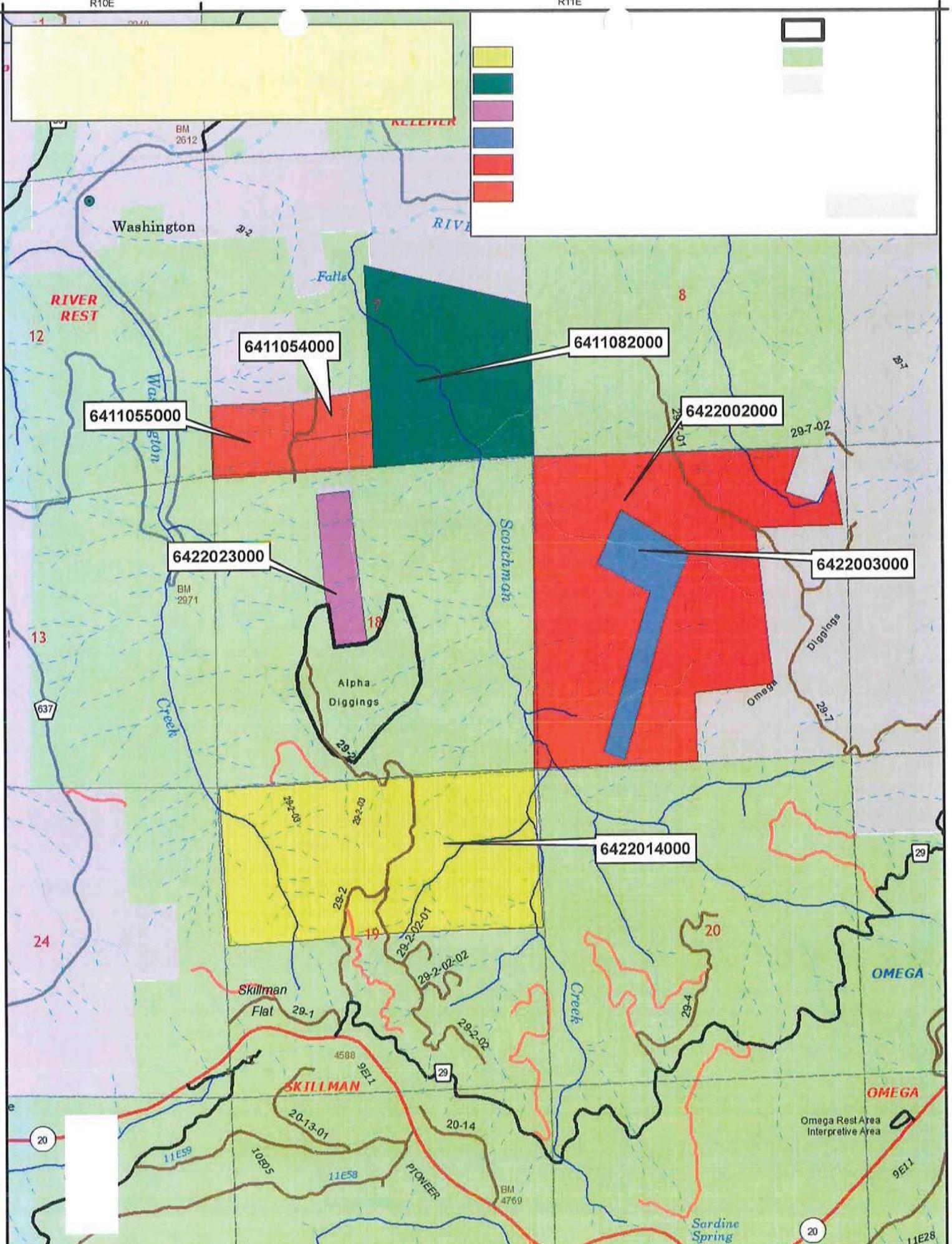
3010

Fork

1:10,000



- Buckeye Staging Area
 - Buckeye Paleo Botanical Site
 - Buckeye Treatment Area
 - Buckeye Project Site
- Land Status**
- Tahoe N.F.
 - Other / Private



R09E

R10E

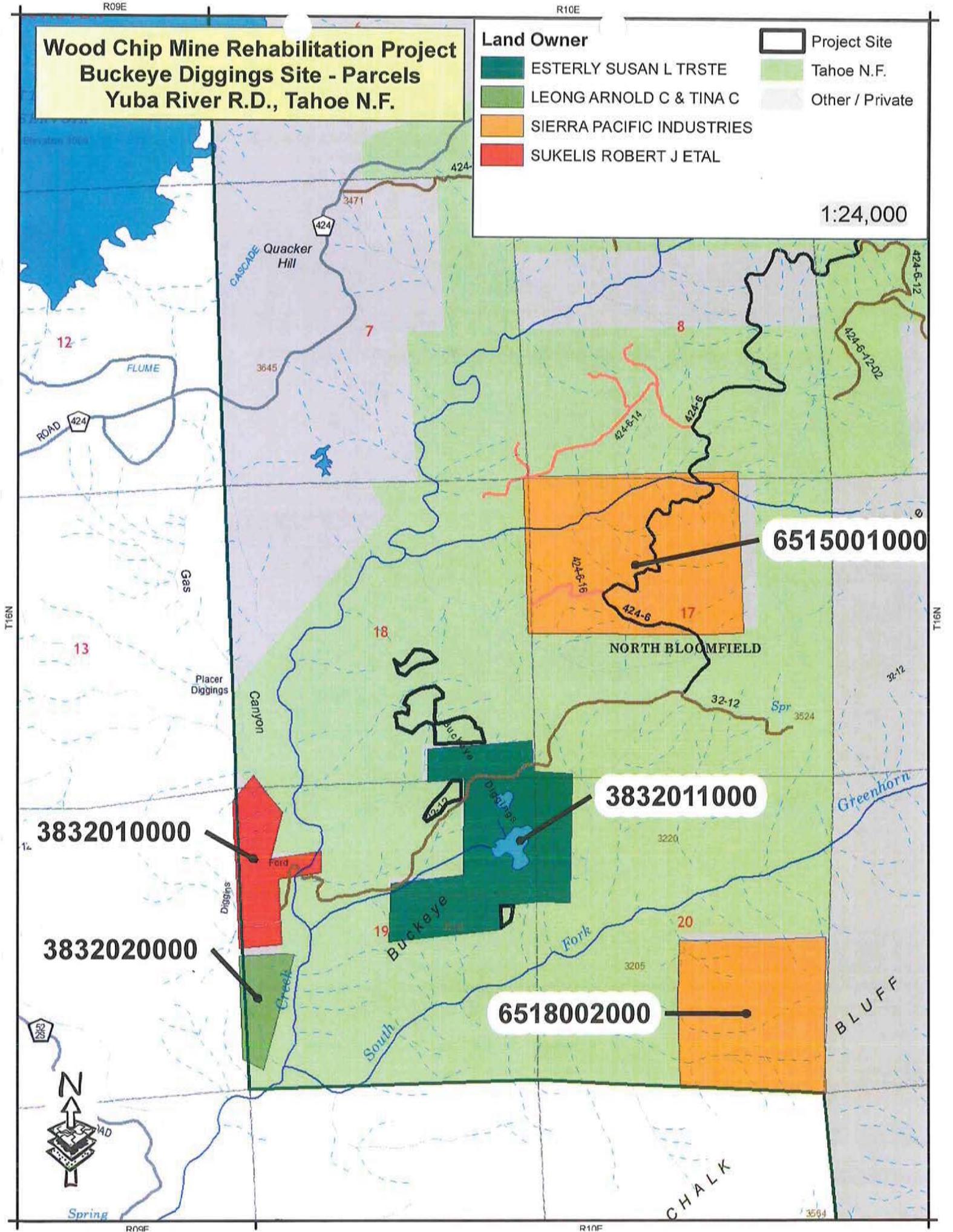
**Wood Chip Mine Rehabilitation Project
Buckeye Diggings Site - Parcels
Yuba River R.D., Tahoe N.F.**

Land Owner

- ESTERLY SUSAN L TRSTE
- LEONG ARNOLD C & TINA C
- SIERRA PACIFIC INDUSTRIES
- SUKELIS ROBERT J ETAL

- Project Site
- Tahoe N.F.
- Other / Private

1:24,000



T16N

T16N

12

R09E

R10E

3594

R11E

**Wood Chip Mine Rehabilitation Project
Alpha Diggings Site
Yuba River R.D., Tahoe N.F.**

18

Alpha
Diggings

29-2-03

29-2-03

29-2-03



1:7,000

Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics,
CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP,
swisstopo, and the GIS User Community

R11F

T17N

T17N

Wood Chip Mine Rehabilitation Project
Buckeye Diggings Site
Yuba River R.D., Tahoe N.F.

18

424.6

Diggings

19

Buckeye

3010

Fork

3205



1:10,000

T16N

T16N



United States
Department of
Agriculture

Forest
Service

Pacific
Southwest
Region

Regional Office, R5
1323 Club Drive
Vallejo, CA 94592
(707) 562-8737 Voice
(707) 562-9130 Text (TDD)

File Code: 2160

Date: May 23, 2007

Route To:

Subject: Approval of the CERCLA Removal Action Memorandum for the Alpha Diggings Hydraulic Mine

To: Forest Supervisor, Tahoe National Forest

Enclosed you will find the signed Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Action Memorandum for the non time critical removal action at the Alpha Diggings Hydraulic Mine site on the Tahoe National Forest. The Action Memorandum describes the site investigation work conducted to date and identifies response action to be undertaken to address contamination concerns in accordance with the National Contingency Plan.

Upon completion of the removal action, Rick Weaver, the site On-Scene Coordinator, will need to provide the Regional Environmental Engineer with a copy of the removal action completion report and the CERCLA administrative record for the project.

If you have any questions regarding this matter, please contact Dennis Geiser, Regional Environmental Engineer, at 707-562-8729.

/s/ Eugene Kim (for)

NELSON HERNANDEZ

Director, Engineering (Acting)

cc: Rick Weaver
Belinda R Walker
Dennis J Geiser



**REMOVAL ACTION MEMORANDUM
NON-TIME CRITICAL REMOVAL ACTION
ALPHA DIGGINGS HYDRAULIC MINE SITE**

I. PURPOSE

The name of this abandoned gold ore mill Site is the Alpha Diggings Hydraulic Mine, (Site). The Site is located in Placer County, California on National Forest System lands under the jurisdiction, custody and control of the United States Department of Agriculture, Forest Service (Forest Service), Pacific Southwest Region within the Tahoe National Forest. The purpose of this memorandum is to select the non-time critical removal action to address mercury releases in storm water runn-off from Alpha Diggings Hydraulic Mine, because the situation at the Site meets the criteria for a removal action under Section 300.415 of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP).

This decision document, called a Removal Action Memorandum (RAM), presents the Forest Service's selected removal response action for the Site, chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA), 42 U.S.C. 9601 *et seq.*, and, to the extent practicable, the NCP. The RAM is based upon the administrative record for the Site.

II. SITE CONDITIONS AND BACKGROUND

A. Site Description

1. Removal Site Evaluation

Hydraulic mining occurred at Alpha Diggings from the early 1850s to the late 1860s. Liquid mercury was used during hydraulic mining to facilitate gold recovery. The site has numerous physical features associated with hydraulic mining that include remnant ground sluices, at least one drain tunnel, numerous potential drain tunnel inlets, depressions that fill with rain water to form pit lakes, and large piles of cobbles and boulders ringing sluices and pit lakes. Precipitation that falls on Alpha Diggings flows from the site though the sluice network designed to drain the site (and recover gold) during hydraulic mining. Surface runoff from the site drains into three defined drainages including Scotchman Creek, an unnamed central drainage in an incised ravine, and Washington Creek. All three water sources drain into the South Yuba River, which is used for recreation, freshwater habitat (including spawning and migration), and municipal and domestic water supply (California Regional Water Quality Control Board, Central Valley Region 2004).

The primary concern at the site is that mercury concentrations in water and sediment at Alpha Diggings pose a threat to human health and ecological receptors. Highly mobile sediment in the hydraulic mine pit and ground sluice network is released from the site through storm water runoff and deposited in Scotchman Creek, Washington Creek, and the South Yuba River. Two special status animal species (mountain and foothill yellow-legged frogs) have been documented in creeks less than 0.5 mile downstream from the mine; the foothill yellow-legged frog was reportedly observed on site during the preliminary assessment/site inspection. Scotchman Creek downstream from the debris dam, approximately 1 mile downstream from Alpha Diggings, has been identified as a rainbow trout fishery. In addition, the South Yuba River, located less than 1.5 miles downstream from Alpha Diggings along the central incised ravine, has been identified as a fishery.

2. Physical Location

Alpha Diggings is an inactive hydraulic gold mine located on land administered by the Forest Service in Nevada County, approximately 1.4 miles southeast of Washington, California (Figure 1-1). This 79.6-acre site is found in the south 1/2 of Section 18, Township 17 North, Range 11 East of the Mount Diablo Base and Meridian (Washington 7.5-minute topographic quadrangle). The unpatented land has been given the address of 11968 Alpha Road, Nevada County, California, with an Assessor's Parcel Number (APN) of 64-220-01 (Nevada County Assessor's Office, 1997). The site is located at an elevation of approximately 4,000 feet above mean sea level, within the South Yuba River watershed.

3. Site Characteristics and History

The area disturbed by hydraulic mine operations at the Site is about 90 acres. The primary features on the site are numerous large piles of cobble and boulders straddling numerous sluice cuts. Exhumed bedrock is exposed throughout the site and several pit lake depressions store water in the winter and spring, with the lakes shrinking up to form several wetlands by late summer. Mine operators used mercury at the Site to recover gold and the resulting slurry was directed through sluice cuts and drain tunnels, where gold particles combined with liquid mercury to form gold-mercury amalgam. Mercury was lost from the wooden sluices boxes within the pit, within the tunnel, and within sediments washed into the sluice cut and the stream channels into which the pit drained. Information on the operational history at Alpha Diggings was obtained from the potentially responsible party investigation completed by Tetra Tech (2002).

Alpha Diggings began operations in the early 1850s. Miners made the first discoveries near the town of Alpha in 1850. Later that year, other miners panned their way up Scotchman Creek toward what became the Alpha Diggings and the town of Alpha was established near the Alpha Diggings; however, the exact location of the town is unknown. Charles Phelps filed the first claim for mining in the Alpha Diggings area and for water rights in Scotchman Creek in 1853. The town was apparently moved several times so that the underlying terrain could be worked. Alpha Diggings was at its height of prosperity in 1854 and 1855. By 1867, only one hydraulic claim was still in operation in the Alpha Diggings area, and only eight people were listed as occupying the town of Alpha.

The Alpha Hydraulic Gravel Mining Company was active in the area in the late 1870s and 1880s. The Sawyer Decision of 1884 prohibited hydraulic mining operations, but Chinese miners were rumored to have mined the site as late as 1887. Limited mining activity occurred at Alpha Diggings during the Great Depression (Slyter 1980). Alpha Diggings was reportedly one of the richest placer mines in Nevada County; gold production from the mine was estimated to exceed \$2 million (Slyter 1980). An estimated 5 million cubic yards (cy) of auriferous gravel was processed at Alpha Diggings (Lindgren 1911), and an estimated 6,660 to 19,980 pounds of mercury were lost during processing activities over the operational life of Alpha Diggings (SAIC 2004). No former town structures remain on the property.

4. Release or Threatened Release into the Environment of a Hazardous Substance, or Pollutant or Contaminant:

The primary metal detected in surface water and sediment at the Alpha Diggings Hydraulic Mine Site at levels in excess of background concentrations and human health risk based exposure criteria is lead which is a designated hazardous substances under section 101(14) of CERCLA. Concentrations of mercury at Alpha Diggings were found to exceed the human health screening benchmark in one surface water sample and the ecological screening benchmark in two solid matrix samples. The water quality benchmark exceedance was in a water sample collected by the USGS at a location identified as a "Mine Pit". The concentration of mercury in the "Mine Pit" sample was 0.055 µg/L; the drinking water standard is 0.05 µg/L. The ecological soil benchmark exceedances were in sediment samples collected by Tetra Tech and the USGS from the floor of the drain tunnel. Concentrations of mercury in the drain tunnel sediment samples were 1.13 mg/kg and 6.64 mg/kg. These concentrations exceed the ecological screening criteria for a robin (1 mg/kg) and a mallard (4 mg/kg) by less than an order of magnitude, and are considered to represent a moderate risk to the ecological receptors (Ford 1996).

None of the samples collected from locations where water flowed off site contained mercury concentrations that exceeded the screening criteria. Field observations and analytical data collected during the disturbed sampling event showed that non-vegetated areas at Alpha Diggings are subject to erosion during storm events. Mercury in sediment mobilized by surface runoff is released from the site and contributes to the mercury and sediment load in receiving waters, particularly Scotchman Creek.

5. NPL status

The Site is not listed on the National Priorities List

6. Maps, pictures and other graphic representations

- Refer to Alpha Diggings EE/CA, Prepared for USFS by Tetra Tech , June, 2006

B. Other Actions to Date

Site investigation and sampling activities have been conducted at Alpha Diggings by the USGS, SAIC, and Tetra Tech from 1999 to 2006. The investigations are summarized below and are discussed in greater detail in the tech memo (Tetra Tech, 2006a) and the final EE/CA (Tetra Tech, 2006b).

Investigations were conducted to evaluate the presence and extent of mercury at the site. Mercury was used at the site to facilitate gold recovery during hydraulic mining, and has been identified in surface water and sediment at Alpha Diggings. Mercury is also believed to remain at the bases of the ground sluices and pit lakes. Biota sampling revealed a "moderate" bioaccumulation of mercury relative to 44 Section 1 Introduction other mine and stream sites throughout the South Yuba River, Bear River, and Greenhorn Creek watersheds. Significant sediment transport from Alpha Diggings has occurred during storm events due to the poor vegetative cover, susceptibility of on-site geologic materials to erosion, and the sluice system enhancing surface water drainage. There are currently no engineering controls on-site to prevent erosion and migration of mercury-containing sediment during storm events, which may negatively impact downstream water quality.

In 2005 and 2006, Tetra Tech prepared an EE/CA for a non-time critical removal action to address mercury-affected sediment in ground sluices, pit lakes, and drain tunnels at the site. The EE/CA summarized site conditions, previous investigations, risk screening results, applicable or relevant and appropriate requirements (ARARs), preliminary removal action objectives, and preliminary removal action goals. Also, the EE/CA identified, screened, and analyzed response actions, technologies, and process technologies for effectiveness, implementability, and cost. Four removal action options were developed and evaluated. These included 1) No Action, 2) Land Use Controls and Access Restrictions, 3) Selective Engineering Controls, and 4) Selective Engineering Controls, Land Use Controls, and Access Restrictions.

The fourth alternative (Selective Engineering Controls, Land Use Controls, and Access Restrictions) was recommended for implementation because it provides the highest degree of protection for human and ecological receptors, will comply with ARARs, provides long-term effectiveness and permanence, and greatly reduces the mobility and off-site migration of sediment and particulate-bound mercury. The non time critical removal action presented in this CMP is being conducted following this removal action alternative in the EE/CA.

C. State and Local Authorities Role

This RAM will be provided as formal notification to State and Local authorities that otherwise do not, at this time, have an active role in the response actions for the Site. The State of California was requested and provided Applicable or Relevant and Appropriate Requirements (ARARs) that have been incorporated as appropriate into the RAM.

The Forest Service is conducting response actions at the Site pursuant to its lead agency authority under CERCLA and Executive Order 12580. Pursuant to 42 U.S.C. Section 9621(e); and 40 C.F.R. Section 300.400(e), no Federal, State or local permits are required for the on-site activities of this removal action.

III. THREATS TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT, AND STATUTORY AND REGULATORY AUTHORITIES

The potential risks to humans and ecological receptors described above document attainment of the following NCP removal action factors found at 40 Code of Federal Regulations (CFR) Section 300.415(b)(2):

- Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances or pollutants or contaminants.
- Actual or potential contamination of drinking water supplies or sensitive ecosystems.

- Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released.

Based on these three NCP factors, a removal action is warranted at Alpha Diggings to minimize human and ecological exposure to mercury, to minimize migration of sediment and mercury through storm water runoff, and to minimize accumulation of mercury in the food chain. Field observations and analytical data collected during the disturbed sampling event showed that non-vegetated areas at Alpha Diggings are subject to erosion during storm events. Sediment mobilized by surface runoff is released from the site and contributes to the sediment load in receiving waters, particularly Scotchman Creek.

i. Actual or potential exposure to hazardous substances or pollutants or contaminants by nearby populations or the food chain;

Mercury concentrations in sediment samples from the drain tunnel outlet exceeded screening criteria and represent a moderate risk to ecological receptors (Ford 1996). Ecological receptors may be exposed to moderate levels of mercury when they disturb drain tunnel sediment.

ii. Actual or potential contamination of drinking water supplies or sensitive ecosystems;

Water from the eastern off-site drainages and the drain tunnel outlet discharges to Scotchman Creek. Water from the western off-site drainage discharges to Washington Creek. Scotchman and Washington Creeks ultimately discharge into the South Yuba River. Special status animals were identified in all three of these water bodies downstream from Alpha Diggings (CDFG 2006) (see Figure 3). Additionally, the foothill yellow-legged frog (a State of California species of concern) was reportedly identified at Alpha Diggings during the PA/SI (SAIC 2004). The Water Board identified numerous beneficial uses for the Yuba River, including drinking water, irrigation and stock watering, recreation, fresh water habitat, and fish migration and spawning (Water Board 2004). The mercury concentration in one water sample from within the mine pit exceeded drinking water standards. Water samples collected from ground sluices and the drain tunnel, which are more representative of potentially contaminated water leaving the site, had mercury concentrations that were below drinking water screening criteria.

v. Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released;

Much of the ground surface at Alpha Diggings is loose, non-vegetated soil and weathered bedrock that is highly susceptible to erosion during storm events. Sediment transport was found to increase significantly in storm water runoff. Storm events may cause off-site migration of sediment and mercury. Field observations did not show increased flow from the drain tunnel following a significant rain event, which indicates the drain tunnel is not in direct hydraulic connection with on-site ground sluices and pit ponds. Flow during both sampling events was similar and occurred near the height of the wet season and the driest portion of the dry season. Tetra Tech assumes that seasonal fluctuations in flow from the drain tunnel are not substantial based on these field observations.

vii. The availability of other appropriate federal or state response mechanisms to respond to the release;

As stated above, the Site is located on National Forest system lands under the jurisdiction, custody and control of the Forest Service, within the Tahoe National Forest. No other federal, state or local response mechanisms are available to respond to the release.

IV. ENDANGERMENT DETERMINATION

Actual or threatened releases of hazardous substances, pollutants and contaminants from the Site, if not addressed by implementing the response actions selected in this RAM, may continue to present an imminent and substantial endangerment to public health, or welfare, or the environment.

V. PROPOSED ACTIONS AND ESTIMATED COST

A. Alternative Actions Evaluated

Specific alternatives that were considered for the CERCLA response action at the Former Truckee Dump Site were:

Alternative 1: No Action

Under the No Action alternative, no treatment or removal action would occur at Alpha Diggings. Consequently, potential human health, ecological, and water quality impacts associated with sediment mobility and mercury exposure are assumed to remain unchanged. The No Action alternative is used as a baseline against which other removal action alternatives are compared. The No Action alternative is applicable to all media at Alpha Diggings. The No Action alternative will be retained through the detailed analysis of alternatives.

Alternative 2: Land use Controls and Access Restrictions

This alternative would implement administrative and institutional land use controls to reduce erosion caused by certain site uses (including OHV traffic), encourage the growth of soil-stabilizing vegetation, and reduce direct human contact with contaminants. Land use controls are appropriate in remote areas where direct human contact is not a primary concern (human receptors are not living or working directly on or near the site). Land use controls are considered a feasible alternative for reducing site traffic.

Alternative 3: Selective Engineering Controls

This alternative would divide the project into five watersheds and use selective engineering controls that will primarily consist of Best management practices to control nonpoint source water pollution. The BMPs would be used primarily to reduce contaminant mobility and direct contact by humans and wildlife.

Alternative 4: Selective Engineering Controls Land Use Controls and Access Restrictions

Alternative 4 is a combination of selective engineering controls, land use controls, and access restrictions. As described previously, selective engineering controls will primarily consist of BMPs such as surface controls and revegetation. The site was divided into five watersheds based on topography. The watershed boundaries depict the assumed on-site sediment migration pattern and are not intended to illustrate off-site watershed patterns that do not affect the migration of potentially contaminated site sediment.

B. Selected Response Action

The response action selected for addressing the human health and ecological threat posed mercury in sediment is Alternative Number 4 Selective Engineering Controls Land use Controls and Access Restrictions. This action alternative best meets the response action goals which are to: 1. Reduce the amount of storm water that drains onto the site and reduce the runoff from the site to reduce migration of suspended sediment and mercury to Scotchman and Washington Creeks, and the South Yuba river. 2. Minimize the potential for exposure and release of mercury that may be present in ground sluices and pit lakes. 3. Improve public awareness of on-site objective dangers due to previous mining activities. The fourth alternative (Selective Engineering Controls, Land Use Controls, and Access Restrictions) was recommended for implementation because it provides the highest degree of protection for human and ecological receptors, will comply with ARARs, provides long-term effectiveness and permanence, and greatly reduces the mobility and off-site migration of sediment and particulate-bound mercury.

The response action consists of the following key activities:

- Preparation of Removal Action Work plan
- Premobilization Site Reconnaissance
- Mobilization and Work Zone delineation
- Implementation of BMPs including

- Grading
 - Soil Berm Construction
 - Detention Basin construction
 - Diversion Channel Construction
 - Energy dissipaters Construction
 - Rock Armoring
 - Road obliteration
 - Revegetation
 - Posting of Signage
 - Demobilization
- Preparation of After Action Report
 - Post Removal Monitoring and Maintenance
 - Monitoring and Maintenance will be performed to maintain the remedy and assess its effectiveness in reducing mercury discharges from the site.

C. Contribution to long-term performance

Due to the small total volume and levels of contamination found in the mill tailings, excavation and off-site disposal of the mill tailings assures that releases of mill tailings from the Site will be permanently terminated. No further response actions will be necessary to address mill tailings at the Site.

D. EE/CA

In 2005 and 2006, Tetra Tech prepared an EE/CA for a non-time critical removal action to address mercury-affected sediment in ground sluices, pit lakes, and drain tunnels at the site. The EE/CA summarized site conditions, previous investigations, risk screening results, applicable or relevant and appropriate requirements (ARARs), preliminary removal action objectives, and preliminary removal action goals. Also, the EE/CA identified, screened, and analyzed response actions, technologies, and process technologies for effectiveness, implementability, and cost. Four removal action options were developed and evaluated. These included 1) No Action, 2) Land Use Controls and Access Restrictions, 3) Selective Engineering Controls, and 4) Selective Engineering Controls, Land Use Controls, and Access Restrictions.

E. Applicable or Relevant and Appropriate Requirements (ARARs)

EPA has developed three categories of ARARs to assist in the identification of ARARs. The three categories are (1) chemical-specific, (2) location-specific, (3) and action-specific ARARs. EPA guidance recognizes that some requirements do not fall neatly into this classification. These categories are described as follows:

Chemical-Specific ARARs: These ARARs are usually health- or risk-based numerical values or methodologies which, when applied to site-specific conditions, result in the establishment of numeric values. These values establish the acceptable amount or concentration of a chemical that may be found in, or discharged to the ambient environment.

Location-Specific ARARs: Location-specific ARARs are restrictions placed on the concentration of hazardous substances or the conduct of activities solely because they occur in special locations. Location-specific ARARs relate to the geographical or physical position of the site (e.g., presence of wetlands, endangered species, flood plains, etc.).

Action-Specific ARARs: Action-specific ARARs are usually technology- or activity- based requirements or limitations on actions taken with respect to hazardous substances.

The proposed actions shall attain ARARs under federal or state environmental or facility siting laws. Other federal and state advisories, criteria or guidance may, as appropriate, be considered in formulating the removal

action. The Removal Action will comply with the ARARs listed below to the extent practicable considering the exigencies of the situation.

1. Chemical Specific

California Health & Safety Code Division 20, Chapter 6.5, Section 25157.8: Directs that wastes containing total lead in excess of 350 parts per million, copper in excess of 2500 parts per million, or nickel in excess of 2000 parts per million to land at other than a class I hazardous waste disposal facility. Applicable to remediation wastes and materials generated during the response action that are disposed of in the State of California.

California Environmental Protection Agency, California Human Health Screening Levels (CHHSLs): The California Human Health Screening Levels (CHHSLs) were developed as a tool to assist in the evaluation of contaminated sites for potential adverse threats to human health. While the current intended future use of the Site is industrial, residential standards shall be utilized as to not limit future redevelopment potential. The California Department of Toxic Substances Control has also identified the California LeadSpread 7 model to determine soil clean-up levels for lead. In 2004, the LeadSpread model was utilized to determine the soil cleanup levels for lead at the Truckee Townhomes Site Removal Action. The Truckee Townhomes Site is located within the western boundary of the Former Truckee Dump Site across Donner Pass Road on private lands. The DTSC lead cleanup level for the proposed 30 multi-family condominium development was 220 mg/kg, which is higher than the California Human Health Screening Levels of 150 mg/kg. The CHHSLs will be utilized for this removal action.

U.S. Environmental Protection Agency, Region 9, Preliminary Remediation Goals. Establishes risk based human health standards for the evaluation and cleanup of contaminated sites. While the current intended future use of the Site is industrial, residential standards shall be utilized to not limit redevelopment potential. Where the State has developed more stringent standards, the more protective concentration will be applied.

2. Location Specific

Archeological and Historic Preservation Act, 16 U.S.C. Section 469 (36 CFR Part 65) Establishes procedures to preserve historical and archeological data which might be destroyed through alteration of terrain as a result of a Federal construction project or federally licensed activity or program. Archaeological surveys and historical analysis have been previously conducted of the Site.

National Historic Preservation Act, 16 U.S.C. Section 470 (36 CFR Part 800) Requires Federal agencies to take into account the effect of a Federally assisted undertaking or licensing on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register of Historic Places. Archaeological surveys and historical analysis have been conducted of the property and the Site has been deemed as not eligible for inclusion.

Endangered Species Act, 16 U.S.C. Section 1531 et. seq Defines and provides a means for conserving various species of fish, wildlife, and plants what may be threatened with extinction, and provides for the designation of critical habitats essential to the conservation of a threatened or endangered species. Requires Federal agencies ensure that actions they authorize, fund or carry out are not likely to jeopardize the continued existence of threatened or endangered species or adversely modify or destroy their critical habitat. No T&E species have been identified as being present on-site and within the proposed removal action area and the Site is not critical habitat.

Northern Sierra Air Quality Management District: Substantive requirements of the following rules are applicable to the excavation and handling of contaminated soil:

- NSAQMD Rule 202 - Visible Emissions
- NSAQMD Rule 205 - Nuisance
- NSAQMD Rule 226 - Dust Control

Porter Cologne Water Quality Act, Water Code 13000 et. seq. The RWQCB is required to develop Basin Management Plans to set enforceable water quality standards for the protection of the beneficial uses of State waters. The provisions of the California Porter Cologne Act prohibiting and regulating the release of pollutants into waters of the State is applicable to the response action.

Water Quality Control Plan for the Lahontan Region (North and South Basins): Establishes water quality objectives, describes waste discharge prohibitions, and designates the beneficial uses for waters in this watershed basin. The substantive requirements are applicable to the response action.

State Water Resources Control Board Resolution No. 92-49 ("Anti-Degradation Policy"). Requires that quality surface and groundwater be maintained to the maximum extent possible. Also outlines policy on cleanup and abatement. The substantive requirements are applicable to the response action.

3. Action Specific

Federal Noxious Weed Act, 7 U.S.C. 2801 et seq. Requires efforts to avoid the introduction and spread of identified noxious weeds. Applicable to the implementation of the response action.

Clean Water Act of 1972, as amended. It addresses both point and nonpoint sources of pollution and establishes or requires programs for the control of both sources of pollution. Through the execution of a formal Management Agency Agreement (MAA) with the Forest Service in 1981, the SWRCB designated the Forest Service (USFS) as the WQMA for NFS lands in California. The Forest Service has prepared a document entitled "Water Quality Management for National Forest System Lands in California", which describes current Forest Service Best Management Practices (BMPs) and procedures for protection of water quality.

National Pollution Discharge Elimination System (40 CFR Parts 122, 123, 124), implemented by State Water Resources Control Board Order No. 92-08 DWQ: Regulates pollutants in discharges of storm water associated with construction activity (clearing, grading, or excavation) involving the disturbance of 5 acres or more. Requirements to ensure storm water discharges do not contribute to a violation of surface water quality standards. Applies to construction areas over 5 acres in size. Includes measures to minimize and/or eliminate pollutants in storm water discharges and monitoring to demonstrate compliance.

California Health and Safety Code, Division 20, Chapter 6.5, Section 25100 et seq Statutes governing hazardous waste control, management and control of hazardous waste facilities, transportation, laboratories, classification of extremely hazardous, hazardous and non-hazardous waste.

California Code of Regulations, Title 22, Division 4.5, Chapter 11, et seq Criteria to determine if a material is a hazardous waste. Regulations include soluble threshold limit concentration and total threshold limit concentration analytical procedures. The substantive provisions are applicable for all remediation wastes and materials generated during the response action.

F. Project Schedule

1. Schedule

Construction activities are expected to span 32 working days starting on May 1, 2007 and finishing site restoration by June 12, 2007. The three years of operation and maintenance will begin following the completion of site restoration.

2. Estimated Costs

<u>Task</u>	<u>Cost</u>
Removal Action Construction Contract	\$358,109
Administration and agency oversight	\$5,000
Post Removal Operations and Maintenance	\$50,000
Total Cost	\$413,109

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

Should action be delayed or not taken, the Site will continue to discharge mercury in stormwater into the south Yuba River watershed. The public and the environment will continue to be threatened as described above. The concentrations and magnitudes of mercury being released with stormwater discharge from the Site will continue to be affected by the magnitude and frequency of storm events, snowmelt run off, and human disturbance.

VII. OUTSTANDING POLICY ISSUES

None have been identified at this time.

VIII. ENFORCEMENT

The Forest Service's PRP search and follow-up research by the Office of General Counsel (OGC) resulted in the determination that no viable PRPs were locatable.

IX. DECISION

The Forest Service has CERCLA authority and is the "lead agency" for National Forest System (NFS) land at non-National Priorities List Sites. No other appropriate response mechanisms or authorities are currently available to address this Site.

In compliance with the Forest Service's role in protecting the public health and welfare and the environment, and because the release or threatened releases are on NFS lands under the administration of the Tahoe National Forest, and pursuant to the authority found at 42 U.S.C. 5604 (a), Executive Order 12580, and 7 CFR 2.60, the Forest Service undertakes this response action. The response action will not be inconsistent with the NCP.

Approval is hereby given by the Forest Service to conduct a time critical removal action to address mercury discharge in storm water runoff from Alpha Diggings Hydraulic Mine Site on the Tahoe National Forest. The removal action for the Site was developed in accordance with CERCLA, as amended, and is not inconsistent with the NCP. This decision is based upon information contained within the Site's administrative record.

Signature: /s/ Eugene Kim (for)
Nelson Hernandez
Acting Director of Engineering
Pacific Southwest Region

Date: May 23, 2007

DECISION MEMO
for
The Buckeye Diggins Mine Restoration Project

USDA, Forest Service
Tahoe National Forest
Nevada City Ranger District
Nevada County, California

PROPOSED ACTION:

It is my decision to proceed with the Buckeye Diggins Mine Restoration project as outlined in the scoping letter dated August 20, 1999. The project location is in the Greenhorn creek watershed with a legal location of Township 16 north, Range 10 east, sections 17, 18, 19 and 20.

The areas covered under this proposal consist of old hydraulic mining sites in the area known as Buckeye Diggins. Most of Buckeye Diggins is private land but there are 4 areas totaling about 55 acres which are on National Forest land. This site was considered by a number of sources to be the original hydraulic mining site. It was originally worked in 1852. The area has had some non-hydraulic mining activity since then but this has been only in a few isolated areas primarily in the northwest part of the project area. These areas presently are dominated by whiteleaf manzanita with scattered ponderosa pine and sugar pine, most of which are in generally poor health. Based on sample plots, most of the area has about 10 to 20 trees per acre which are in at least reasonably good health and vigor which should respond to release and fertilization from increases in soil productivity. There is a good representation of black oak on the site in the fringe areas although the interior areas have very low numbers of this species.

The soils on the site are generally of low productivity and a sandy loam texture. There is a large amount of surface cobble generally less than 2" in size. This seems to exist largely due to past erosion causing formation of this "erosion pavement". Soil analysis was performed by a soil testing lab and all samples showed low levels of available nitrogen, as well as most other micro-nutrients. Soil analysis showed slightly higher results for potassium and magnesium. Available water holding capacity is relatively high although water retention ability is fairly low at this time.

The desired future condition for the project areas is for a mixed conifer forest with large diameter classes from which large down logs and snags may be derived. The forest would contain a full range of native species with ponderosa pine and sugar pine more prevalent on south and west slopes and Douglas fir dominating on north and east slopes. Black oak would be present to provide for mast production. Understory vegetation would be fairly sparse, primarily consisting of a mix of the shrub species presently found on the site along with various native forbes and grasses. Fuel loadings would be light, generally less than 5 tons to the acre. Soil productivity would be increased and soil porosity would be maintained to allow for normal hydrologic processes to continue over at least 90 percent of the soil surface area.

The silvicultural treatment in this restoration project involves masticating the shrubs and low vigor, diseased or damaged trees using an excavator with a mulching head and a ground pressure of less than 6 pounds per square inch. Mulched material will be left scattered on the ground with depths generally not exceeding 2 inches. The site would then be planted in the spring with a mix of ponderosa pine, sugar pine, Douglas fir and incense cedar (other native species would be planted if available from nurseries). A packet of time release fertilizer specifically formulated for use on low productivity sites such as these would be placed in the planting hole with each tree. Different fertilizer nutrient mixes would be used and results would be monitored. A handful of soil taken from a near by early seral site would be placed in the planting hole with each tree to help reintroduce soil microbiota to the site. In the late spring parts of the site would be treated with biosolids from local wastewater treatment plants. Application of biosolids would be accomplished with the use of a smaller sized tractor (track laying) and a common manure

spreader of similar piece of equipment. Sites which would be treated would have slopes less than 15 percent and would not be within 25 feet of ephemeral stream channels (there are no intermittent or perennial streams in or adjacent to the project area). The areas to be treated with biosolids would be "alternating strip treated". This means that the application process would attempt to treat a strip of ground the width of the spreader and then skip treatment on the adjacent area of similar area. The amount of biosolids applied would be determined following soil analysis done approximately 2 to 4 weeks following planting and using nitrogen loading calculations would be of a low enough quantity to assure nitrogen loading does not significantly exceed uptake quantities. Biosolids used in this project would meet or exceed standards for "class B" biosolids as defined in the U. S. Environmental Protection Agency regulations for land application of biosolids (40 C.F.R. Part 503). These same regulations would be used to govern the application process at the site. The regulations also set forth guidelines for monitoring of the biosolids application. Soil testing will be done at least on a yearly basis for at least the next 5 years. Following soil analysis and with consultation of biosolids experts, determination if and when future biosolids applications would be needed in the next 5 years would be made. It is likely that at least one more treatment would be needed within the next 5 years.

Seedlings would be monitored for growth, health, disease and competition. If needed, release of seedlings would be accomplished by manual methods involving either grubbing or cutting using hazel hoes, shears or similar tools and would involve radius treatments of areas within 6' radius of planted and naturally occurring trees.

The following measures for protecting the environment and assuring that non-significant impacts are mitigated will be observed in the implementation of the action:

1. Machinery used for site preparation activities will not adversely compact soils per standard and guide item 55. (input from hydrologist and soil scientist)
2. At least 35 percent effective ground cover will be left on the site after site preparation. Slash will not be piled and burned. This will result in reduced soil movement, aid in soil moisture retention and to a lesser extent aid in nutrient cycling. (input from hydrologist)
3. Machinery (excavators) will not operate on slopes exceeding 35 percent. This will reduce excessive displacement of soils. Tractors will be limited to lower percentage slopes. (input from soil scientist)
4. Machinery tracks will not operate within 50 feet of ephemeral stream areas except where they may benefit riparian dependent resources. (input from hydrologist)
There are no intermittent or perennial in or adjacent to any of the work areas.
5. Black oaks will be released from competition from neighboring conifers to increase species diversity and maintain future mast producing oaks in the stand. (per conversation with wildlife biologist)
6. Biosolids will be tested and must meet at a minimum class B standards for land application of biosolids as defined in U.S. E.P.A. regulations governing land application of biosolids (Title 40, part 503 of the Code of Federal Regulations). Testing will be done at an independent lab and will be done prior to transport from a wastewater treatment plant.
7. Biosolids will not be applied within 25 feet of ephemeral stream channels or on slopes greater than 15 percent. (input from hydrologist and consultation with biosolids experts)

SCOPING AND PUBLIC INVOLVEMENT:

Internal scoping was done involving archeologists, botanists, hydrologists, wildlife biologists, fisheries biologists, soil scientists, and silviculturists.

A scoping letter dated August 20, 1999 was mailed to a total of 32 individuals and organizations. In addition, an article appeared on the front page of the "Union" newspaper on September 7, 1999 and a radio interview with the project leader was done on September 13, 1999 on KVMR radio. A total of 23 phone responses were logged and 2 letters were received. All responses to scoping were positive although residents in the Buckeye road area requested that their road not be used for large vehicle (truck) traffic. The Buckeye road crossing of Greenhorn creek does not have a bridge (the road runs through the stream channel) so there will be no truck traffic using the resident portion of the Buckeye road. Questions were asked about the specifics of E.P.A. testing requirements for biosolids.

Several Nevada County wastewater treatment plant operators and managers were consulted about the project before and during the scoping period.

No issues were identified.

REASONS FOR CATEGORICALLY EXCLUDING THE PROPOSED ACTION:

An environmental analysis was conducted for this proposed action. As a result of the analysis, a determination has been made that the action is in a category of actions that are excluded from documentation in an Environmental Assessment or an Environmental Impact Statement. That category of exclusion was established by the Chief, Forest Service, and is listed as:
FSH 1909.15, Chapter 31.2, category 5 and is as follows:

Regeneration of an area to native tree species, including site preparation which does not involve the use of herbicides or result in vegetation type conversion.

It is also determined through the environmental analysis that there were no extraordinary circumstances or related to this proposal that might cause the action to have significant effects. Specifically, this determination is based upon the absence, among others, of effects on the following:

1. Steep slopes or highly erosive soils.
2. Threatened or endangered species or their critical habitat. Biological evaluation were completed for sensitive plant and animal species. No habitat occurs for Threatened, Endangered or Sensitive species in the project area.
3. Flood plains, wetlands, or municipal watersheds.
4. Congressionally designated areas, such as wilderness, wilderness study areas, or National Recreation Areas.
5. Inventoried roadless areas.
6. Research Natural Areas.
7. Native American religious or cultural sites, archaeological sites, or historic properties or areas. Archaeology surveys are complete. Nothing was found.

FINDINGS REQUIRED BY OTHER LAWS:

All management practices and activities of the proposed action are consistent with the management direction , including standards and guidelines, in the final Land and Resource Management Plan for the Tahoe National Forest (June 14, 1990), as amended, and its provisions, which were developed in accordance with the National Forest Management Act of 1976. 16 USC 1604(j) and 36 CFR 219.10(e)

IMPLEMENTATION DATE:

This action may be implemented after December 22, 1999.

ADMINISTRATIVE REVIEW OR APPEAL OPPORTUNITY:

This project is not subject to appeal pursuant to the Forest Service regulations at 36 CFR 215.8(4) and may be implemented immediately.

CONTACT PERSON:

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November 8, 2002

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U.S. Environmental Protection Agency, Region 9
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TDD #: 09-02-02-0009
Project #: 0213.01RS

Subject: Buckeye Flat Mine Site, Nevada County, California
Latitude 39° 12'45" North, Longitude 120° 50'08" West

In February 2002 the U.S. Forest Service (USFS) requested assistance from the U.S. Environmental Protection Agency (EPA) Region 9 Emergency Response Section (ERS) to investigate elevated elemental mercury levels at the Buckeye Flat mine site near Nevada City, California. The EPA ERS tasked the Ecology and Environment, Inc. Superfund Technical Assessment and Response Team (START) to conduct a removal assessment to locate potential mercury source areas at the Buckeye Flat mine site. The contaminants of concern were elemental mercury and methyl mercury.

Site Description and Background

The site is a historic hydraulic gold mine dating from approximately 1852 and is privately owned by Richard Esterley. The mine is situated within the Greenhorn Creek drainage at approximately 3,000 feet above mean sea level in the Tahoe National Forest, approximately eight miles southeast of Nevada City, California (Figure 1). The site consists of a large hydraulic mine pit, surrounded by heavily forested slopes on approximately 200 acres. Several drainage tunnels exist at the site; some of the tunnels are plugged and some have water flowing from them. Two lakes exist year round at the site, these lakes nearly fill the mine pit after the winter precipitation. Several minor streams drain the site into Greenhorn Creek.

The Buckeye Flat mine site investigation is part of a larger mercury contamination study in the Sierra Nevada Foothills in which the USFS and the U.S. Geological Survey (USGS) are involved. Mercury contamination in the foothills of the Sierra Nevada Mountains is a legacy of gold mining activities following the 1848-49 California gold rush. Mercury was widely used in mines throughout the foothills, an area of extensive hydraulic mining, during the 1850s and 1880s. Mercury was used to enhance the recovery of gold because of its chemical reactivity with the precious metal. In typical hydraulic mining techniques, gravel deposits were washed

through mercury-laden sluices to separate the gold from the gravel. Thousands of pounds of mercury were washed out of the sluices and lost during this process. The lost mercury migrated from the mine sites into surrounding drainages that conveyed it downstream.

Previous Sampling

In 1999, the USGS collected surface water samples downgradient of the Buckeye Flat Mine site. Samples were collected June 18 and December 2, 1999, downgradient from the area referred to in Figure 2 as Buckeye North and August 26, 1999, downgradient from the Buckeye South area. Table 1 summarizes preliminary USGS data for these samples.

According to a USGS website that posts historical streamflow data (*Surface Water Data for California, Monthly Streamflow Statistics, Bear River*), surface water runoff was likely occurring during the June sampling event and samples were likely collected from flowing water. However, the August and December samples were most likely collected from standing water as, according to the USGS website, there was a low probability of surface water runoff in the site vicinity during these time periods. A USGS representative confirmed that samples collected in August were collected from warm, standing water.

Table 1
Mercury Results for USGS 1999 Sampling Events
Buckeye Flat Mine Drainage
All units are nanograms per liter (ng/L)

Sample Location	Sample Date	Total Mercury (Unfiltered)	Methyl Mercury (Unfiltered)
Buckeye - North Tunnel 1/2	6/18/99	3.9	2.2
Buckeye - North Tunnel 2/2	6/18/99	4.2	2.7
Buckeye Flat - South Tunnel 1/2	8/26/99	188,000	6,000
Buckeye Flat - South Tunnel 2/2	8/26/99	183,000	6,400
Buckeye - North Tunnel 1/2	12/2/99	30,380	1,220
Buckeye - North Tunnel 2/2	12/2/99	31,644	1,330

The Buckeye Flat mine site is privately owned and the USGS was unable to obtain access to the property for their sampling events. Since the USGS sampling documented potentially significant mercury levels downgradient of the site, the USFS determined that streams and other drainage on the Buckeye Flat site needed to be investigated. Assuming that the EPA could obtain access to the site from the property owner, the USFS requested EPA assistance with the investigation.

Site Activities

On March 22, 2002, the START, EPA, USFS and USGS and conducted a site walk to determine whether sampling at the Buckeye Flat mine site was warranted and to discuss potential sampling locations. The USGS guided the group to the areas where they had previously collected samples.

Subsequent to the site walk, the EPA decided to proceed with sampling and directed START to produce an emergency response sampling plan. The project objective was to generate data to be used in conjunction with the USGS data to identify and isolate potential contributing source areas of mercury at the site. The EPA and START determined that sampling during a period of surface water runoff would allow calculation of mercury mass transport in the drainage areas and provide a more accurate representation of site conditions than sampling conducted in low or no runoff flow periods. Small beads of elemental mercury can produce high levels of total mercury in pools of shallow standing water but contribute scarcely detectable levels of mercury in samples collected during periods of surface water runoff.

On April 15, 2002 the START collected 18 surface water samples, including two duplicate samples, and one field blank sample. All sampling activities were conducted in accordance with the *ERS and START Emergency Quality Assurance Sampling Plan for Water*, dated April 1, 2002, with the following exceptions:

- Only two tributaries to the pit lakes were located by the field team, therefore only two samples were collected upgradient of the pit lakes rather than the four samples listed in the sampling plan.
- An additional sample was collected in Buckeye South (BF-S-4).
- Methyl mercury analysis was done on sample BF-N-2 rather than BF-N-1 as called for in the sampling plan.
- Methyl mercury analysis was done on sample BF-Lake INF-1 instead of on sample BF-S-9.
- No field blank samples were required in the sampling plan, however the field team did collect a field blank that was submitted for both total and methyl mercury analysis.

Surface water was flowing at all but four of the sample locations and surface water flow rates were collected by the USGS, when possible, at each sample location. Global positioning system (GPS) coordinates were collected at each sample location by the START.

Data Discussion

The START submitted 19 samples to Frontier Geosciences in Seattle, Washington for analysis of total mercury by method FGS-069 (EPA method 1631 modified), four of the 19 samples were also submitted for analysis of methyl mercury by method FGS 070.2 (EPA method 1630 modified). All laboratory data were validated by a START chemist in accordance with *EPA Quality Assurance/Quality Control Guidance for Removal Activities*, OSWER Directive 9360.4-

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01, April 1990. All data were found to meet definitive data category requirements and all data were found acceptable to meet project data use objectives with qualification. The detection limits for methyl mercury in samples BF-N-2 and BF-S-1 and total mercury in samples BF-N-5 and BF-S-5 were adjusted and the results for these samples qualified because concentrations of methyl mercury and total mercury in the field blank were greater than the detection levels. The Analytical Data Review Summary is included as an attachment to this report.

Data for this sampling event is presented in Table 2. The START calculated the mercury mass transport at each sample location and analyzed the mass transport data to determine potential mercury sources in the study area. The Buckeye North area consists of a northern drainage (A) and a southern drainage (B) both of which contribute to the mercury concentrations documented at downgradient points (Table 2 and Figure 3). However, mass transport calculations document that Drainage B is the larger mercury source in the Buckeye North area, contributing approximately 50 times the mercury that Drainage A does to downgradient points. Analysis of Buckeye South was complicated by the fact that four of the ten points sampled did not have flowing water and therefore mass transport calculation for the entire area was not possible. The Buckeye South area was divided into three drainages (Table 2 and Figure 4); only the upper area of Drainage C and Drainage D contained flowing water. Samples collected upgradient of the site (BF-Lake INF-1 and BF-Lake INF-2) document that a mercury source exists upgradient of the Buckeye Flat study area. It also appears that, based on the lower mass transport of mercury at sample point BF-S-9 below the pit lakes, that mercury is being diluted by water in the pit lakes. Mass transport calculations document that Drainage D is the largest contributor in the Buckeye South area to mercury measured at the downgradient point BF-S-1.

Concentrations of mercury in the Buckeye North downgradient sample locations (BF-N-1 and BF-N-2) are comparable to that documented in USGS samples collected in June 1999. If runoff flow conditions were similar in June 1999 to those during this sampling event, mercury mass transport should be comparable for these two events. No data comparison is possible between this data and USGS data collected in August and December 1999 because runoff was not occurring at those times.

Summary

On April 15, 2002, the START collected surface water samples from surface water runoff at the Buckeye Flat mine site. Sample results documented several source areas at the site contributing mercury to points downgradient of the site, the highest of those was located in the southern drainage of the Buckeye North area, upstream of sample location BF-N-7.

Table 2
Mercury Results for Surface Water Sample, April 15, 2002
Buckeye Flat Mine Site
All results units are nanograms per liter (ng/L)

Stream Area	Sample	Total Mercury Result	Total Methyl Mercury Result	Stream Flow Rate ¹	Daily Mass Transport of Total Mercury ²
Buckeye North:					
Drainage A (BF-N-6 to BF-N-5)	BF-N-6	2.79	N/A ³	1	8,584
	BF-N-5	<1.4	N/A	1	7,630
Drainage B (BF-N-7 to BF-N-3)	BF-N-7	4.25	N/A	20	416,955
	BF-N-3	3.16	N/A	20	344,465
	BF-N-4 (dup of N-3)	3.98	N/A	20	433,851
Confluence of Drainage A and B	BF-N-2	3.55	<0.15	24	463,374
Buckeye North Downgradient	BF-N-1	3.27	N/A	24	427,747
Buckeye South:					
Drainage C Upper (INF-1 & -2 to BF-S-9)	BF-Lake INF-1	6.41	0.631	1	34,937
	BF-Lake INF-2	20.7	N/A	1	112,823
	BF-S-9	2.09	N/A	0.9	10,562
Drainage C Lower (BF-S-8 to BF-S-4)	BF-S-8	7.14	N/A	No data ⁴	N.C. ⁵
	BF-S-6	2.79	N/A	0 ⁶	0
	BF-S-7 (dup of S-6)	2.8	N/A	0 ⁶	0
	BF-S-5	<1.4	N/A	0 ⁶	0
	BF-S-4	4.27	N/A	0 ⁶	0
Drainage D (BF-S-3)	BF-S-3	1.79	N/A	10	97,562
Drainage E (BF-S-2)	BF-S-2	12.8	N/A	0 ⁶	0
Downgradient of Drainage C, D and E	BF-S-1	2.43	<0.15	12	157,464
Field Blank	BF-Trip Blank	0.28	0.03	N.A. ⁷	N.A. ⁷

¹ Units are gallons per minute
² Mass transport in nanograms of mercury per day = mercury concentration x 3.785 liters per gallon x flow rate x 1440 minutes per day.
³ Not analyzed for in this sample.
⁴ No stream flow data collected at this point; observed flow was less than 1 gallon per minute.
⁵ Not calculated.
⁶ Standing water.
⁷ Not applicable.

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This report concludes START activities under this Technical Directive Document. If you have any questions regarding this report, please do not hesitate to contact this office.

Respectfully,

John Walter
START Member

Attachments:

Attachment 1 Site Maps (Figures 1-4)

Attachment 2 Photographic Documentation

Attachment 3 Analytical Data Review Summary