January 26, 2015

To: Beth Hendrickson, Manager
John Wesling, Senior Engineering Geologist
Office of Mine and Reclamation
801 K Street, MS 09-08
Sacramento, CA 95814

From: Cathy McKeon
Crawford & Associates, Inc.
100 North Pine Street
Ukiah, CA 95482

Subject: Laytonville Quarry Mine ID 91-23-002 – Response to Comments and Amended Reclamation Plan

Which is/are:

- ☐ For approval
- ☒ For your use
- ☒ Per your request
- ☐ Other – For Return / Exchange

Ms. Hendrickson and Mr. Wesling,

I have included a copy of our response to your comments dated October 16, 2015. This response includes the Amended Reclamation Plan to address your concerns. Only the portion of the Amended Reclamation Plan that was revised is included. A copy of these documents were also sent to John Speka at the County for their review and approval. Let me know if you have any questions or concerns.

Thank you,

Cathy McKeon, PE
Crawford & Associates, Inc.

LAYTONVILLE ROCK QUARRY RENEWAL MINING AND RECLAMATION PLAN 2013

Mendocino County Use Permit Renewal *#UR 15-92/13*
California Mine ID #91-23-0029

Lead Agency

Mendocino County Planning and Building Services
860 North Bush Street
Ukiah, CA 95482

Operator

Shawn and Aurora Studebaker
Laytonville Rock
1136 Laytonville Dos Rios Road
Laytonville, CA 95454

Prepared by

Crawford & Associates, Inc.
Geotechnical Engineering, Design and Construction Services
100 N. Pine Street
Ukiah, CA 95482

Date

August 2014, Amended January 2015

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PROJECT SUMMARY

Project Contact Information

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Permit Approvals Required

Permit	Permitting Authority	Timing
Major Use Permit Renewal UR 15-92/13	Mendocino County Planning Department	In-progress
Reclamation Plan Approval	Mendocino County Planning Department	Concurrent with Use Permit Approval
NPDES - Industrial WDID 1 23I024035	Regional Water Quality Control Board	On-going
Air Quality Permit (1120-5-01-12-32)	Mendocino Co. Air Quality Management District	Renewal Upon Approval

1.0 PURPOSE AND OBJECTIVES

1.1 Site Location, Size, and Access

The project, known as the Laytonville Rock Quarry, is located on property owned by the applicant, Laytonville Rock (Operator/Applicant). The property is located in Section 7, Township 21 North, Range 14 West, Mount Diablo Base and Meridian, Mendocino County, California. A Site Map and Vicinity Map are included in Appendix A.

The Laytonville Rock Quarry was originally permitted by the County of Mendocino in 1983 and was then renewed again in 1992 (U 15-92) for a rock quarry and crushing operations. The 1992 use permit allowed for an average extraction rate between 15,000- 20,000 cubic yards (CY) per year, with a maximum extraction rate of 50,000 CY per year, over a 20-year period, for a total extraction of 325,000 CY over the 20-year permitted period. Aggregate processing was permitted. The existing and proposed quarry access is directly from Laytonville Dos Rios Road east of the town of Laytonville and State Highway 101. The proposed operation is requesting an expansion to allow mining for an additional 30 years. The longer time frames are due to the cost of processing all of the necessary permits.

The expansion would allow for the extraction of 325,000 CY at a reduced average annual production rate of 11,000 CY but a maximum annual peak extraction rate similar to the previous permit, 50,000 CY. Rock extraction/processing will be limited to 20,000 CY. The remaining 30,000 CY would be utilized to sell overburden, should the opportunity arise.

Table 1. Summary of Proposed Mining Operations

Design/Operating Characteristics	Description/Parameters/Assumptions
Operational Activities	
Mining	Excavation using loader and dozer
Processing	Crusher and screen
Reclamation	Extract and place overburden to accomplish slopes in conformance with the grading plan (Sheet 4, Appendix B); place 8" – 24" top soil on reclamation areas. Revegetate with grasses, brush and trees in conformance with Reclamation Plan (Sheet 8, Appendix B)
Mine and Reclamation Data	
Acreage	
Total Parcels	80.51 acres[1]
Mine Boundary	11.5 acres
Acreage to be Disturbed	8.8 (5.2 mining, 3.6 product storage, roads, misc.)
Acreage to be Reclaimed	5.7 acres
Acreage not being Reclaimed	3.10 acres roads, structures[2] and rock slope
Volume	
Average Annual Extraction	11,000 CY
Maximum Annual Extraction	50,000 CY (20,000 Rock; 30,000 overburden)
Maximum Daily Extraction	250 CY
Maximum Daily Processing	850 CY
Maximum Hourly Processing	300 Tons/Hour
Maximum Quarry Extraction	325,000 CY
Planned Depth and Elevation	
Lowest Anticipated Mining Elevation	2070[3]
Maximum Anticipated Mining Depth	100 feet
Operations Schedule Period	
Hours of Operation	6 a.m. – 6 p.m.
Length of Permit	30 years
Reclamation	
End Use	Rangeland
Termination Date	June 1, 2045[4]

LEGAL DESCRIPTION:

All that portion of the East 1/2 of the Northwest 1/4 of Section 7, Township 21 North, Range 14, West M.D.B.M. laying southerly of the following described line:

Beginning at a point which marks the midpoint of the Easterly Boundary of the East 1/2 of the Northwest 1/4 of Section 7, as shown on the map recorded in Map Case 2, Drawer 22, Page 25, Mendocino County Records, proceed Southerly along the North-South section centerline a distance of 115.00 feet to the point of beginning of the line to be described, thence parallel to the line which divides the East 1/2 of the Northwest 1/4 of

[1] Combined acreage of affected parcels (40.37 acres and 40.14 acres)
[2] Roads to be left will serve end use of rangeland.
[3] Floor elevation varies from 2070 to 2080
[4] Actual date may be modified, final termination date is 30 years after final approval of the MRP.

Section 7 into its North 1/2 and South 1/2 (approx. N 84 1/4° 18' W) a distance of 590.00 feet; thence due West to the intersection with the Westerly boundary of the East 1/2 of the Northwest 1/4 of Section 7, a distance of approximately 170 feet and the terminus of said line.

See appendix A for site map. See Appendix B for MRP plans.

1.2 Purpose of Plan

This application for the renewal of the Laytonville Rock Quarry Use Permit and Reclamation Plan provides for:

- Modification of the Laytonville Rock Quarry site plan to accommodate additional mining over a 30-year period and processing on the existing permitted parcel (APN 035-460-06).
- Amendment of the existing Reclamation Plan to correspond with the proposed mine development and end use for rangeland.

For project implementation to proceed, County actions are needed to (a) approve a renewal of the Laytonville Rock Quarry Use Permit (UP 15-92), and (b) approve a revised Reclamation Plan to include the further development of the mine.

The Project Description [5] contained in the initial study describes the current and proposed future operations to be evaluated by the County for environmental impacts under CEQA.

1.3 Reclamation Objectives

The objective of the Reclamation Plan is to continue to implement responsible and environmentally sound aggregate removal; preserve sensitive natural resources; minimize aesthetic impacts through site design; implement reclamation concurrently throughout the life of the mine; and reclaim the project for an end use for rangeland use in conformance with SMARA regulations. The project has been shown to be economically feasible and provide responsible reclamation that will result in a beneficial end use, in accordance with the requirements of SMARA. Implementation and timing of final reclamation activities will be completed by the project owner/operator within five years after the completion of the project.

1.4 Post-mining Land Use and Reclamation Overview

The surrounding site consists of rangeland used for grazing and is covered with grazing grasses and fringed with oak and Douglas fir forest. The end use of the quarry site after reclamation will be for rangeland use (agriculture or grazing). The configuration of the quarry would result in a combination of woodlands and shrublands but may also provide for a seasonal pond on the lower quarry floor which can be used for rangeland purposes. This pond receives only overland surficial flows. A copy of the End Use Notification is included in Appendix H.

[5] (Uma Hinman consulting, 2013)

2.0 SITE DESCRIPTION AND ENVIRONMENTAL SETTING

The project is located north and east of the town of Laytonville. The entrance to the subject property is located near Mile Post 1.0 on the Laytonville Dos Rios Road; approximately 1 mile east of Highway 101 and the town of Laytonville. The project is located on two parcels. The main parcel is a 43-acre parcel that is split by Laytonville Dos Rios Road. The upper portion of the quarry is partially on an adjacent 40. The parcel on the north side of Laytonville Dos Rios Road, with the exception of the existing quarry, is used almost exclusively for quarry activity. The south side of Laytonville Dos Rios Road is used primarily for residential use. Surrounding uses are RMR20 (Upland Residential Use). A copy of the Vicinity Map and Site Map are included in Appendix A.

2.1 Physical Environment

Regional and Site Geology

Soils

MINERAL LAND CLASSIFICATION

The California Mineral Land Classifications System was established by the State to help identify and protect mineral resources in areas subject to urban expansion and other irreversible land uses that would preclude mineral extraction. To date Mendocino County has not been classified. A Geotechnical Report is included in Appendix C, which describes the underlying rock classification and limitations. Based on the geologic maps and the exposed formations at the quarry, the underlying rock consists of Coastal Belt Franciscan rock.

SOIL CLASSIFICATION

The National Resource Conservation Service (NCRM) has performed a soil survey of the area. The survey classifies the on-site soils and provides general limitations. The soils in the area are identified as two different soil types: Hopland-Sanhedrin-Kekawaka complex (15-30 % slopes) and Hopland-Sanhedrin-Kekawaka complex (30-50% slopes). Over 70% of the project site is in the Hopland-Sanhedrin-Kekawaka complex (30-50% slopes) and provides for well-draining soil. A detailed Geotechnical report, which addresses slope stability, is included as Appendix C.

EXISTING DRAINAGE AND GRADING CONDITION

The site drains into a tributary to Ten Mile Creek. The Laytonville Quarry receives a mean annual precipitation of 82". The existing quarry is located between two small watercourses. Both watercourses are class III watercourses. The setback from these watercourses was set at 25'. The runoff from the current quarry highwall and floor is routed through a series of three sediment ponds constructed as part of the original quarry design. They are designed to filter sediment before reaching any offsite watercourses. The series of three ponds were developed as a part of original reclamation plan and have been used and maintained throughout the history of the quarry. The Existing Conditions Map is included in the MRP as Sheet 2 of Appendix B. The existing slopes above the quarry range in steepness from almost vertical to 3:1 or flatter. The oversteepened areas in the northwest portion of the quarry will be the initial areas to be reshaped to be compliant with this MRP. The existing quarry configuration accepts diffuse surface runoff from a limited drainage

above the quarry highwall. The existing quarry contains runoff in the three sediment ponds on the existing floor of the quarry. The existing conditions are shown on Sheet 2, of the Mining and Reclamation Plan (MRP). The drainage documentation, included in Appendix D.1, was included in the original use permit submittal. The documentation notes that without infiltration the sediment ponds need to have a surface area of 3740 sf combined, with a minimum depth of 6 feet to adequately filter the sediment. This combined area of the two ponds on the upper quarry floor more than meet this area and depth. From these ponds the stormwater is directed through a culvert to the lower pond before leaving the site. The lower pond is a polishing pond.

The historic extraction rates vary from 7,000 CY to 48,000 CY with the average being approximately 14,794 CY/YR over the previous 10 year period (2003-2012) based on aerial topography comparison between. The maximum reported extraction over this period is 48,297 in 2004.

The sediment cleanout schedule is included as Appendix D.1 as well. Computations submitted with the original permit are included in same Appendix.

Water Demand, Water Supply and Groundwater

Water Demand:

The existing operation has two significant water demands: dust suppression during rock processing and dust suppression for the roads/quarry floor. No increase in water demand is expected as a result of the proposed project. The existing and projected demand is shown in Table 1.

Water Supply:

The applicant utilizes two separate water sources for the project. A small spring located southeast of the quarry will be used for domestic and utilitarian uses around the shop. This spring currently does not freely run to any watercourse, but seeps into the ground before running offsite. The water from the spring is transported to a 10,000 gallon water tank near the southeast corner of the shop via a 3/4" waterline. The capacity of the spring is 10 gallons/hour during the spring and fall. The second water source are the two ponds on the floor of the quarry. These ponds are established in bedrock and retain water from diffuse surface runoff during early spring and late fall. Processing is performed during these periods to utilize available onsite water. The combined capacity of the two ponds is 212,000 gallons, which is more than adequate for the water demand shown in Table 1. Pond #3 is also available for supplemental water supply should it be necessary or desired.

Table 1. Laytonville Quarry Water Demand

		Existing					Proposed				
Water Use	**Period**	**Max Daily Demand (gpd)**	**Max Weekly Demand (gpd)**	**Max Processing Rate (Tons/Hr)**	**Days of Operation**	**Total Water Demand (gal)**	**Max Daily Demand (gpd)**	**Max Weekly Demand (gpd)**	**Max Processing Rate (Tons/Hr)**	**Days of Operation**	**Total Water Demand (gal)**
Processing				6 hours/day					8 hours/day		
	Peak Season @ 6 days/wk	3,750	22,500	400	20	75,000	5,000	30,000	300	15	75,000
	Off Season @ 5 days/wk	500	2,500	400	5	2,500	500	2,500	300	5	2,500
	Total Process Water Demand				25	77,500				20	77,500
Washing	Peak Season	-	-		-	-	0	0		0	0
	Off Season	-	-		-	-	0	0		0	0
	Total Wash Water Demand									0	0
Dust Suppression	Peak Season (Driest Days)	750	4,500		30	22,500	750	4,500		30	22,500
	Peak Season (Remainder)	500	3,000		90	45,000	500	3,000		90	45,000
	Off Season	0	0		30	0	0	0		30	0
	Total Dust Sup Water Demand				150	67,500				150	67,500
Total Water Demand						**145,000**					**145,000**

Notes:
Peak Season: June - October
Off Season: November - May
Processing does not occur every day.
Dust suppression assumed 6 days/week during peak season, 4 months
Dust suppression assumed 3 days/week during off season for only 1 months out of season, with no dust suppression for remainder (November only)
70 processing days based on 20,000 CY Peak production, assuming 85% processed.
Will use more dustoff to suppress dust for roads/

Groundwater:

The project is located in the mountainous area just east of Long Valley and the town of Laytonville. This area is located within the Franciscan Bedrock complex which in general is not considered water bearing[6]. Based on recent subsurface exploration and existing surficial conditions, two groundwater zones are apparent at the project area. Shallow groundwater which is percolating along the rock/overburden boundary and deeper groundwater percolating through fractures in the rock. The proposed lower quarry floor will be roughly 40' below the existing quarry and during the Fall of 2013, several borings in the existing quarry face recorded hydraulic head more than 10 feet above the existing quarry floor. Borings installed within the overburden recorded perched groundwater at a depth of less than 20 feet during the Fall of 2013. Water which seeps from the walls and is captured on the quarry floor will be pumped to the ponds on the upper quarry floor as necessary to allow for rock extraction. The floor will be graded to concentrate any captured water and keep sediment out of the concentrated water storage areas.

Water Quality

The existing quarry configuration accepts diffuse surface runoff from a limited drainage area consisting of 6.1 acres above the quarry highwall. A series of three rock lined brow ditches will be constructed on the south side of the quarry highwall to redirect non-industrial upslope runoff to the channel south of the quarry. The north side of the quarry receives limited runoff upslope of the quarry highwall due to the topography of the quarry/slope and does not require brow ditches. These ditches are shown on the grading plan, Sheet 4 of the MRP. All surface runoff associated with the quarry rock extraction is directed to the lower quarry floor where it is retained. All quarry operations are performed in conformance with the NPDES Industrial Permit for the quarry. A copy

[6] (California Department of Water Resources, 2004)

of the current Industrial SWPPP[7] is included in Appendix F. The primary sediment control BMPs will continue to be the existing sediment ponds and the redirection of offsite water away from the quarry highwall. As the lower quarry floor is developed, Pond #2 will be relocated to the lower quarry floor.

All toxics are stored in closed containers and are not subject to stormwater runoff. The fueling area, just to the west of the shop, is consists of two - 1,000 gallon diesel fuel tanks in a concrete containment. The volume of the containment system is 7,180 gallons. A complete list of stored materials is included in the SWPPP.

Climate

The inland Mendocino county climate is moderate. Summers are hot and winters are cold and wet. Average annual precipitation is 82 inches[8] with the majority falling between November and April. Average daily temperatures range from 45 degrees in January to 67 degrees in August, with average daily high temperatures ranging from 53 degrees to 83 degrees, although lows can reach into the upper 20s, and highs can reach above 100 degrees. Humidity ranges from 70-90% in the morning and from 25-75% in afternoon, summer and winter respectively. [9]

2.2 Vegetation and Wildlife

Vegetation

The Botanical Report (Hulse-Stephens, 2014)[10] was prepared for the project and is included as Appendix E. No listed plant species were found within the study area.

The existing disturbed portion of the quarry does not include much vegetation. Upland of the quarry is a Ponderosa pine/Douglas fir and oak forest. Non-native grasslands and shrubs extend north from the southern watercourse, above and north of the highwall to the northerly watercourse. The majority of the quarry floor is devoid of grasses and consists of exposed bedrock. Along the westerly perimeter of the quarry floor there is tall brush consisting of common manzanita, toyon and coyote brush. A few seeps are evident on the southeast slopes above the quarry. These seeps are not being disturbed. A small stand of fir forest exists between the shop and Laytonville Dos Rios Road. These trees will not be removed as they are the visual buffer between the quarry and the road. There is a stand of grasslands dominated by Harding grass and scattered with coyote brush between the highwall and the shrubland described above.

Three sediment ponds were established under previous use permits to address water quality. Although there is evidence of riparian plants in these ponds, they were established and continue to be used for industrial use and are maintained annually by the operator.

[7] (Rau and Associates, Inc., 2013)
[8] (USGS)
[9] (City-Data.com)
[10] (Hulse-Stephens, 2014)

Wildlife

A Biological Assessment was prepared by NCRM[11] for the project and is included in Appendix E. The database queries show the potential for 21 listed special species to be present. None of these species were found at the project site. A full listing of the species can be found in the Biological Report.

2.3 Land Use

Surface Mining Permit

The existing rock quarry has been operating for over 30 years under County Use Permits. The operator is now applying for a Use Permit renewal to continue operating the quarry for another 30 years. An initial application submittal was made in January of 2013, prior to permit expiration. However, OMR requested additional geotechnical review, which required additional borings and analysis. Additionally, the botanical survey for the spring needed to be completed to verify that no special species plants were present. The final permit submittal was resubmitted in August 2014. Mendocino County policy is to allow operators to continue to operate if a good faith effort is made towards obtaining the use permit renewal.

Existing and Allowed Uses

The project is located within a 43-acre parcel, APN 035-460-06. There is an easement over portions of the parcel to the north, APN 035-460-02, owned by Ms. Nordeman. Both parcels are in RMR - Remote Residential (RMR20) zoning. Mining and processing is allowed with a Major Use Permit. Surrounding parcels are also RMR20, with the exception of a few to the east that are zoned with RL, rangeland zoning. The nearest offsite residential structure is approximately 670 feet southwest from the west edge of the quarry. The nearest residential structure owned by the operator is a residence approximately 250 feet to the south. Laytonville Dos Rios Road is approximately 50 feet south of the shop at its closest point. The location of the project site with respect to the nearest structures and Comptche Ukiah Road are shown on of the vicinity map included in Appendix A.

Visual Setting

The existing operation occupies the entire flat area of the parcel and is fairly void of vegetation except for the two ponds on the quarry floor.

The undisturbed portion of the project area, above the quarry highwall, is characterized by Ponderosa Pine/Douglas fir and oak forests with small open meadows primarily used for rangeland use (agriculture/livestock) prior to the Quarry use. The existing quarry is visible from Laytonville Dos Rios Road for only very limited times. Brief views of the Quarry are visible from Laytonville Dos Rios Road at the main entrance as you head eastbound and again at the smaller utility entrance to the north as you head westbound. The majority of the site is obscured from view by the 50 foot tree buffer between the road and the quarry. This visual buffer will remain.

[11] (North Coast Resource Management , 2014)

The quarry has very limited visible from Highway 101, where only the very top of the quarry can been seen, due to the topography downslope of the quarry. The highwall is visible from a few residents in the valley and from the high school, but the view is remote and the proposed quarry expansion will not be noticed. There are a few homes on the north ridge. The view from these residences are obscured by trees. Photos and a brief visual analysis are included in Appendix L[12] .

3.0 PROPOSED MINING OPERATION

3.1 Phasing, Mining, Engineering, and Drainage

The Operator proposes to extract an average of 11,000 CY of combined pit rock and overburden throughout the 30 year permit period, for a maximum combined extraction of 50,000 CY in any given year with an overall extraction of 325,000 CY. This is consistent with the previous use permit. The operator does not anticipate rock extraction to exceed 20,000 CY in any given year, but would like to retain the ability to extract 50,000 CY should the opportunity become available to sell overburden.

Multiple borings have been performed to determine the depth to bedrock and water. Three Geophysical borings have been completed and were used to assess stability. The boring locations and underlying rock mapping is shown on the Geophysical Plan, Sheet 3 of the MRP. A more detailed discussion of the findings and recommendations are included in the Geology section of this plan and in the Geotechnical Report included in Attachment C.

The method of extraction will be by bulldozer or front end loader. Some of the harder rock areas will require blasting prior to removal with construction equipment. Blasting would occur two to three times per year. Rock which will not require further processing will be loaded on trucks and hauled away.

The existing site and detailed topography of the project area is included as Sheet 2 in the MRP (Appendix B). Sheet 4 of the MRP illustrates the location of the topsoil salvaging and topsoil storage areas and required signage. The Grading Plan, Sheet 4 of the MRP, shows proposed finish grade contours for the rock extraction at the full limits of rock extraction. The potential grading limits for overburden storage (both temporary and permanent) are shown on Reclamation Plan, Sheet 8. The Reclamation Plan, Sheet 8, shows the reclamation areas and Sheet 9 shows the reclamation planting details.

Grading Criteria

Based on the existing exposures at the quarry and the additional Geophysical boring logs the configuration of the slope of the quarry walls will be determined using the following criteria in accordance with the Geotechnical Report included in Appendix C:

[12] Photos from the quarry highwall and houses were provided by the operator. Visual analysis from Laytonville Dos Rios Road and Highway 101 or elsewhere was performed using Google Earth imagery, 2013.

- Cuts:
  - Melange soils: 2:1
  - Fine Grained Material (soil): 1.5:1
  - Granular material/Moderately to intensely weathered bedrock: 1:1
  - Fresh to slightly weathered bedrock; 0.75:1 (Intermediate)
- Fills:
  - Overburden; 2:1 overall (Final)

A registered professional engineer or geologist shall review the slopes every 40,000 CY or when the grading is within 100' of the final slope configuration, whichever is sooner, to confirm the slope criteria is met and stable.

Proposed Grading and Drainage Condition

GRADING

The grading for the rock and overburden extraction is shown on the Grading Plan, Sheet 4 of the MRP. The cross sections are shown on Sheets 5-7. Benches shall be constructed at a maximum 50' vertical distance and be a minimum 15' in width. Where mélange soil is exposed intermediate 10' benches will need to be incorporated between the contact with rock. The overall slope of quarry is designed at 1:1 for the hard rock areas and 1.8:1 in the overburden or soil areas, including benches, in accordance with the grading criteria. The upper slope of the highwall, in overburden, will be graded to 1.5:1 slope. These slopes allow for a static Factor of Safety (F_S) greater than 1.9 and a psuedostatic F_S greater than 1.2. The Geotechnical report notes that these slopes are acceptably stable for the end use of rangeland and are considered to be adequately stable for industrial standards and the end use.

The floor of the existing quarry will be excavated approximately 40 feet below the existing floor elevation. This area will be used to store excess overburden and NOA material from the upper portion of the highwall and surrounding areas, as necessary. This overburden will be relocated to the northwest portion of the lower quarry floor, compacted and covered with topsoil to provide an overall 2:1 or flatter slope, unless sold as product. The overburden fill will be protected at the base by a gravel/rock lining up to 5' in depth. The grading complies with the slope criteria noted above. The lower quarry floor may contain up to 106,300 CY of overburden to an elevation of 2120, which is the upper quarry floor elevation. Overburden material not sold as product will be compacted to no less than 90%, except for the final top 18" which shall be 85% to encourage vegetative growth.

DRAINAGE

The Drainage Design Documentation for the future conditions, included in Appendix D.2, concludes that the quarry floor will be adequate to contain 3 consecutive 100-year storm events without infiltration (conservative), with all overburden placed in the quarry floor.

As the lower quarry floor is developed pond #1 will be relocated to the lower quarry floor and will develop into a seasonal pond that will be used for rangeland use. A minimum pond volume equivalent to a single 25-year storm event (212,535 CF) should be provided at all times while the

quarry is in operation. The minimum retention without infiltration will ensure that the water quality of the surrounding channels will continue to be unaffected by the operation.

As the quarry floor is lowered, the 6.1 acres of diffuse surface runoff will be captured and infiltrated into the floor of the quarry and only sediment from the upper quarry traffic and storage areas will be diverted into the existing sediment pond (#2) on the upper quarry floor and from there diverted to the lower pond (#3) below, west of the quarry floor. Cleanout of ponds #2 and #3 will continued to be cleaned annually, in accordance with the existing cleanout schedule. Pond #1, in the lower quarry floor, would be cleaned out as desired by the operator. In the event that water ponds to the rim of the lower quarry floor, overflow water will be directed to pond (#2) on the upper quarry floor via an overflow pipe, as shown on sheet 8 and 9 of the MRP.

The proposed quarry design will separate industrial and non-industrial runoff. All industrial runoff from the quarry operation will be directed to the quarry floor and retained. Non-industrially related runoff will be directed to the surrounding natural channels south of the quarry via three rock lined interceptor ditches. These ditches are shown on Sheet 4 of the MRP. The roads to and in the quarry will be watered during the dry weather periods or treated with dust prevention coating (Dustoff).

If seeps are exposed on the quarry wall, this water would drain to the quarry floor where it will be retained or infiltrated. As noted in the geotechnical report, any seeps that may develop as a result of the mining operation would be from percolating groundwater.[13]

3.2 Mining Equipment, Supplies and Stored Material

The project will require the use of the following equipment:

- 1 – Crusher (rented)
- 1 – Screen (not rented)
- 2 – Loader (966D, 966C)
- 1 – Dozer (D9H)
- 1 – Water Truck (4,000 gallon)

Two 1,000 gallon diesel fuel tanks are stored onsite just east of the shop. These tanks are stored in a concrete containment facility. To prevent rainwater from filling up the containment they will be covered.

All equipment, materials and supplies shall be stored near shop area as shown on plan sheet 4 of the MRP.

3.3 Processing Operations

This project will also involve the use of crushing and screening equipment onsite. It is estimated that 85% of the rock will be processed. As noted previously, it is anticipated that the maximum annual rock extraction (excluding overburden) would be 20,000 CY with a maximum processing rate of 850 CY/day, or 300 tons/hour. Rock to be processed onsite will be loaded by front end loader into a portable screening and crushing plant. It is anticipated that the portable screening and crushing

[13] All water is expected to seep and flow overland to the floor of the quarry.

operation will be moved as the extraction of the quarry proceeds. It is estimated that the processing will occur 20 days out of the year maximum, with 3/4 of those days occurring during the dry season, as shown on Table 1. At the requested maximum rock extraction rate of 20,000 CY per year, the resulting operation would process approximately 17,000 CY of rock per year.

The water for dust control will be loaded into a water truck, which will be off-loaded into a storage tank. From there the water is piped to the screener/crusher. The screener/crusher system will be moved into and out of the flat area on the quarry floor as it is used. The amount of water needed for crushing/screening varies with the seasons. Overall water use is noted in Table 1.

3.4 Visual

The upper reclamation of the quarry highwall will eventually obscure the upper wall from the view in Long Valley. As noted in previous sections, the views are remote and the additional exposure during operations and in the interim will be insignificant.

3.5 Traffic

Maximum hauling could be up to 1,000 CY/day. Traffic generated during this peak hauling period is expected to be a maximum of 12 trip ends in a peak hour and 128 trip ends during a maximum day. Most jurisdictions do not require a traffic study unless there are more than 50 Peak hourly trips being generated by a project. This project falls well below that threshold and is consistent with the current use.

The Laytonville Dos Rios Bridge (Burger Creek Bridge), located approximately 5 miles east of the project site has an AADT of 137[14] in 2011. It is expected that the project site on Laytonville Dos Rios Road would have 2 times that amount to account for the residential uses closer to Laytonville. This would compute to be an AADT of 275 vehicles per day. The initial Environmental Assessment prepared for the 1992 Use permit noted that the section of Laytonville Dos Rios Road adjacent to the project site had an AADT of 200. Mendocino County growth rate is 1.83%[15]. Based on this growth rate the current AADT would be 293 vehicles/day. The project would not significantly impact the County road.

Since inception of the project the National Traffic Safety Data Base noted there have been no known accidents with the project area. Since the extraction rate will remain the same, and since the AADT is so small, the continued use will pose no significant impact. The National Highway Traffic Safety Administration website indicates that no traffic accidents have occurred in this area between 2008 and 2012 (latest available data)[16]. No further traffic analysis is warranted.

Traffic in this area generally travels at 25 miles an hour or less due to the tight curves to the east (R=150') and west (R=100') of the main approach. These curve radii can support a design speed of 25 mph. Assuming that drivers are traveling 5 MPH faster than the design speed, a minimum 30 mph should be used which would require a minimum of 215 feet of minimum sight distance. Sight distance to the east of the main access is approximately 425 feet. The sight distance to the west is

[14] (BridgeHunter.com)
[15] (2013 World Media Group, LLC, 2013)
[16] (National Highway Traffic Safeety Adminstration, 2008-2012)

obscured by a shrub and tree. This vegetation will be removed to provide a minimum of 215 feet or more if available, as noted on sheet 4 of the MRP.

The existing approach was improved in accordance with an encroachment permit as required by the use permit conditions of approval for the existing operation.

3.6 Project Reserves, Production, and Operating Life

Use Permit U 15-92 provided for an average annual extraction of 20,000 CY, with a maximum annual extraction of 50,000 CY, for 20 years. The permit renewal requests an extension of the permit with reduced average extraction rates for an additional 30 years/ based on borings at the site, it is unlikely that additional deposits are available beyond the limits of this project.

3.7 Operating Schedule and Work Force

Project operations will occur between the hours of 6:00 a.m. and 6:00 p.m. No nighttime operations will occur; therefore, there will be no night lighting. The operator and up to two employees comprise the workforce for this operation, aside from the occasional subcontractor who is used for blasting.

3.8 Utilities and Water Supply

Typical operations during the summer months will require dust suppression on the quarry floor and for processing. Projected daily dust suppression will require one water truck load per day during the dry summer months, which equates to approximately 4,000-5,000 gallons per day. Historical water use for the crushing process is approximately 3,000- 4,000 gallons per day and the remainder is used for dust suppression of the quarry floor. This operation is consistent with the existing Mendocino Air Quality Management District Permit requirements included in Appendix G.

The water supply for the quarry operations will continue to be the existing sediment ponds shown on Sheet 2 and 4 of Appendix B. The two ponds on the upper quarry floor have a capacity of 212,000 gallons. The water is drafted from the ponds into a water truck and used for either the processing and onsite dust suppression. The use of "Dust-off" product may also be used reduce the use of water. The existing and proposed water demand is shown on Table 1.

The lower floor of the quarry, once fully established, can also retain water for use in dust suppression.

The existing shop has electrical, propane and telephone utilities. Propane is served via a tank. The project is served with a portable toilet that is serviced every other week.

3.9 Mine Waste Management

Naturally Occurring Asbestos (NOA)

The Geotechnical Report has identified an area on the southeast side of the quarry, within the proposed mining limits, that has Naturally Occurring Asbestos (NOA). There are two distinct area of NOA as shown on Sheet 2 of the MRP. One area is on the southwest corner and the other is a strip

that runs north/south. It is estimated that up to 20,000 CY of NOA may be embedded within these specific areas. In one small area NOA may be embedded within the rock limits (Section 5), all other NOA areas are estimated to take place in overburden. As recommended in the Geotechnical report, the operator will overexcavate and remove this NOA prior to commencing with mining the remaining rock to be incorporated into product.

Prior to excavating in this area, the operator will flag the limits of the exposed NOA, and over-excavate the NOA material in advance of rock removal, and relocate the NOA to the quarry floor and cover with a minimum of 6" of clean overburden. During this operation, the material/face of the NOA rock will be wetted to prevent airborne transmission. During removal a geologist should be present to review and confirm the limits of removal. Additional mitigation includes periodic sampling of the exposed slopes to verify that NOA does not exceed the 0.25% limit. This sampling shall take place every 40,000 CY. A more detailed discussion of NOA is included in the Geotechnical Report included in Appendix C.

Overburden

Estimated overburden depths are shown on the sections and make up approximately 77,000 CY of the overall extraction. This volume includes the estimated volume of NOA discussed above. The majority of the overburden may be sold or stored onsite as appropriate. The overburden will be stored in the lower quarry floor. Fill slopes shall be no steeper than 2:1, seeded and mulched after disturbance prior to the wet weather each spring. The potential configuration of the stored overburden is shown on Sheet 8 and in the Sections on Sheets 5-7 of the MRP. A minimum amount of overburden (approximately 1,500 CY) will be retained to allow for minimum 6” NOA cover in the lower quarry floor during the operations and during final reclamation.

3.10 Public Health and Safety

Public exposure to the site will be minimal as the project is located behind locked gates and is difficult to access given the mountainous terrain. Since there is no exposure to the public, fencing is not required.

There will be no public exposure of the onsite NOA with the mitigation proposed in the above grading section.

3.11 Closure of Surface Openings

There will be no surface openings that need to be closed.

4.0 RECLAMATION PRACTICES AND ACTIONS

The reclamation of the quarry will be done to establish an end use for rangeland. A total of 5.7 acres will be reclaimed including the mining area, the product storage area and the topsoil storage area. The mine boundary extends approximately 50’ beyond the active working areas. The perimeters of the site and the upper wall areas are designed to provide an adequate factor of safety for the end use of Rangeland. The reclaimed areas, as shown on Sheet 8 of Appendix B, will be

covered with topsoil, seeded and mulched in accordance with the specifications. The lowest portion of the floor, below elevation 2120, is expected to retain diffuse surface water in the early parts of the summer. Stored water will be used for rangeland purposes if available.

4.1 Responsible Parties

The sole responsible party for reclamation of the quarry, from topsoil stockpiling to monitoring, will be Laytonville Rock. A signed acknowledgment of this responsibility is included in the Reclamation Plan Certifications, Appendix K.

4.2 Subsequent Use and Impact on Future Mining

The end use of the project site will be for rangeland. The seed mix identified in Table 3 will allow for rangeland use in the future. It is unlikely that any further rock extraction would be feasible beyond that which is shown, given the limited rock resource and configuration of the terrain.

4.3 Reclamation Standards and Goals

The primary goal of this reclamation plan is to meet an end use for rangeland use. The practice of terraced quarry exploitation provides locations for the redistribution of topsoil to create planting benches. It is important to understand that while the principles of ecological restoration will be employed in this reclamation effort, the return of the quarry to its pre-existing landform is not possible. The endpoint of the reclamation is to stabilize the site, rehabilitate some of the prior ecosystem functions, establish a portion of the representative habitat, primarily the oak habitat where feasible, provide for visual mitigation and provide for rangeland use. This reclamation and visual mitigation plan proposes a moderate, but achievable, set of soil stabilization, ecosystem rehabilitation and revegetation goals. Site stability and drainage issues are address separately in the grading and drainage plans.

The secondary goal of the plan is to mitigate for the loss of oaks and to provide for visual mitigation. To achieve this goal, the upper 1.5:1 slopes will be replanted with oaks and shrubs. The perimeter of the floor of the upper quarry will be planted with native oaks and herbaceous vegetation to mitigate for oak loss. The interior of the floor will be reclaimed to allow for rangeland use by incorporating an open grassland area and a low area to catch diffuse surface water for seasonal water use.

The botanical report notes that the mining area has 5 different communities of vegetation: Ponderosa pine - Douglas Fir forest with a large component of native oak trees are established at the very upper (east) end of the mining area; Manzanita shrubland just below the forest and south of the quarry; Harding Grass Swards just above the quarry highwall and two communities of riparian plants associated with the sediment ponds and seasonally saturated soils on the slopes and flats.

The Oak Woodlands Conservation Act requires that intact oak trees that are impacted by the project subject to CEQA be mitigated. The location of the existing oaks are shown on Sheet 2 of the MRP. The oaks that could potentially be impacted are listed in the botanical report and are estimated to be as many as 65 oaks. The Reclamation Plan established the oaks based on this estimate, using a 3:1 replacement ratio and assumes a 50% die off rate, which resulted in planting of 390 oaks.

However, this number is conservative, given that the location of the oaks were taken with GPS and the number included trees within 40 feet of the mining boundary. The actual number of oaks could be far less. To prevent over planting of oaks, a final oak count will be performed prior to reclamation to establish the actual number of oaks impacted. Any oaks within 10' of the quarry highwall are considered terminally impacted. Any additional oaks within 20' of the highwall will be monitored and, if they show distress, will be replaced. Ultimately a 3:1 ratio of surviving oaks will be required for all impacted (removed, terminally impacted and distressed) oaks. The areas of restoration to mitigate for the oaks are shown on Sheet 8 of the MRP. The computations for the oaks are included in Appendix M.

The remaining areas will be restored to provide an end use of rangeland, including open grasslands, shrub/woodland benches and an open area for seasonal water storage. These areas are also shown on Sheet 8 of the MRP.

4.4 Reclamation Schedule and Phasing

Mining will begin by bringing the northeast corner of the quarry into compliance, then subexcavating the quarry floor. This area will be used for storage of material containing NOA and unsold overburden from the upper face of the quarry. The operator then may proceed with further subfloor excavation or mine the face of the quarry as long as adequate overburden/NOA storage is available.

4.5 Demobilization and Overview of Reclamation Topography

4.5.1. Removal of Buildings, Structures and Equipment

The equipment is minimal (shaker and screen) and can be easily disassembled with a loader, mechanic and lowboy. All portions of the equipment will be transported offsite with a lowboy and sold as salvage (salvage value not considered in financial assurances). The buildings on the site (scale shack and office) will remain as outbuildings for general rangeland maintenance use. The storage containers and fuel tanks shall be removed. The scale will be removed and replaced with fill to allow access to continue to the east side of the quarry. The concrete bin blocks used for product storage and the underlying footing shall be removed, unless used for rangeland use (feed storage).

4.5.2. Roads

The existing road through the site (currently across the scale) and to the first bench will be left intact for rangeland purposes as shown on Sheet 8 of the MRP. There is no hard surfacing present. Where aggregate baserock road surfacing is present outside of the roadway to remain, it shall be removed and either reclaimed for product or hauled off.

4.5.3. Highwall Topography

The intermediate slope grading is shown on Sheet 4 of Appendix B. Sections through the quarry are included on Sheet 5-7 of Appendix B. See detailed discussion in Section 3 regarding the grading and slopes.

The final reclaimed slopes are shown on Sheet 8 of Appendix B. The placement of overburden in the lower quarry floor is optional, except for covering of NOA.

4.5.4. Cut Slope Stability

Because of the relative remote area, the setbacks to property lines and the proposed end use, the proposed Quarry configuration is considered to be adequately stable, as noted in the Geotechnical Report in Appendix C. Geotechnical review of the final cut faces is required to make sure that the slopes are graded to meet the criteria set forth in this MRP.

4.5.5. Drainage Diversion, Structures and Equipment

Interceptor ditches will be constructed above the south highwall to direct non-industrial water away from the quarry face during the operation. These channels will remain. All benches will be outsloped to allow drainage towards the quarry floor.

As noted previously the quarry does not intercept the natural channels and will only intercept diffuse surface runoff. A more thorough discussion was included in Section 3.

The existing ponds at the end of the quarry grading operation shall remain in place, as will the pipes to allow wildlife and general rangeland use (watering). Pond #2 will function as a safe overflow in the event that the lower floor of the quarry fills up to the upper quarry floor elevation. At the discretion of the operator, the connecting pipes between the lower floor and Pond #2 and from Pond #2 to Pond #3 may be removed and replaced with open swales. Review of the swale size should be performed by a civil engineer to confirm adequate sizing. All channels, if used, would need to be rock lined.

4.6 Surface Preparation and Resoiling

4.6.1. Backfilling or Other Subsurface Preparation

Prior to reclamation the floor of the quarry shall be ripped to a depth of 4" prior to receiving topsoil. Hard rock surfaces may be overblasted in lieu of ripping. During the operation the overburden and the NOA will be transferred from the active mining area to the opposite side of the quarry, compacted and shaped to accommodate an overall 2:1 slope. Material containing NOA will be covered with a minimum 6" layer of non-NOA overburden. All overburden will be compacted to 90%.

4.6.2. Topsoil Stockpiling and Salvaging

Topsoil will be salvaged from the mining areas and relocated to the temporary stockpile areas. The salvage and storage areas are shown on Sheet 4 of Appendix B. It is estimated that approximately 12,000 CY of topsoil is needed for restoration. The temporary topsoil stockpile will be limited to a 6’ depth, shaped with maximum slopes of 3:1, compacted and seeded prior to October 15. All stored topsoil will be compacted to 85% and track-walked perpendicular to the slope prior to seeding/planting. Temporary topsoil areas shall have signage indicating that the stockpile is topsoil and not to be disturbed.

Overburden may be used in the haul road base, as fill for access roads or may be processed into quarry rock products. Sediment may be processed or blended into quarry rock product/s or used as an additive to the topsoil; depending on gradation. Overburden and other rock products not to be incorporated into the topsoil shall be kept separate from topsoil and other growth mediums.

4.6.3. Final Topsoil Placement

At final reclamation, the planting areas will be covered with topsoil to the depth shown on the plans, ranging from 8" to 24". Areas to be reclaimed shall be done in accordance with Sheet 8 of the MRP. These areas are described below in more detail. Placement of topsoil shall be completed, compacted to 85% and track-walked perpendicular to the slope prior to seeding.

In the NOA areas a 6" depth of NOA-free material shall remain over the NOA, reshaped and reseeded being careful not to mix the cover material into the underlying material containing NOA.

4.7 Reclamation Strategy

4.7.1. Upper Quarry Floor

The goal of the reclamation in this area is to restore a mosaic of self sustaining native oak woodland for oak mitigation or grassland habitat. This would allow rangeland uses on the upper quarry floor. Reclamation of these areas will be accomplished by planting oak tree species, hydroseeding of herbaceous species and control of invasive exotic plant species. The selection of the oak species to be installed at this site was guided by the dominant native species to be impacted by the project, the physical conditions of the site, and the composition of the existing plant communities. This area will be reclaimed as Oak Woodlands (100%; 1.61 Acres). The Upper Quarry Floor oak woodland planting area is shown on Sheet 8 of the MRP. The area south of the scale (0.40 acres) will remain in its current condition for rangeland maintenance and storage use. All buildings will remain for same use. Storage units will be removed.

If the number of oaks that are impacted by the project are less than anticipated, the area of oak woodland may be reduced accordingly to provide for the 3:1 replacement after the anticipated 50% die off. The remaining area would then be reclaimed as grasslands if the area of woodlands were reduced. The reclamation plan assumes full woodland planting on the floor. The financial Assurances is based, however, on the current excavation and the anticipated disturbance in the upcoming year.

4.7.2. Lower Quarry Floor & Upper Topsoil Storage Area

The goal for this area is to provide an area that can be used for general rangeland use and continue to be stable. For the lower quarry floor this area must also withstand periodic inundation. This area will be reclaimed as grassland (100% 2.07 Acres). It is expected that the floor of the lower quarry will be inundated periodically. Because of this planting of oaks are not considered feasible.

4.7.3. 1.5:1 slopes

The goal of this area is to provide visual relief and for vegetation that would provide wildlife foraging and promote stability. These areas will be reclaimed with a mix of Oak Woodland (50% - 0.67 acres), Shrubland (25% - 0.34 acres) and Grassland (25% - 0.33 acres).

4.7.4. Benches

The reclamation goal of these areas is to provide for visual relief and stability. These areas will be reclaimed with woodland (50%-0.34 acre) and Shrubland (50%-0.34 acre).

4.7.5. Pilot Planting Areas

The northeast portion of the quarry will be graded to final limits and used as a Pilot Planting area, totaling 0.24 acres. The Pilot Planting area is shown on Sheet 8 of the MRP. This area incorporates all vegetative series and will resemble some of the most difficult areas to reestablish (benches and upper 1.5:1 slopes). The area shown is incorporated into the various areas noted above.

Pilot planting will be performed within 10 years of final reclamation to allow for planting, monitoring and adjustments in the plan and procurement of plants, should they be different from that specified. Monitoring and recording shall be performed in accordance with the monitoring sections of this plan. The success or failures noted for the Pilot Planting areas will be used to further refine and guide the Reclamation Plan. Any adjustments to the plan shall be submitted as a recommendation to the Planning Department. Prior to implementation of any modifications, these modifications shall be recommended and approved in writing by the County.

4.8 Revegetation

The reclamation will consist of three different planting series; Mixed Oak Woodland; Shrubland Series and Grasslands Series. The various plants are listed in Table 3 and 4. The computations for the planting/seeding quantities are included in Appendix M. A more detailed discussion of each planting series is included below.

4.8.1. Erosion Control

All disturbed non- rock surface areas shall be seeded in accordance with the Grassland Series, including non-planted areas within the Shrubland and Oak woodland series. Such seeding and fertilizing shall be performed between August 15 and October 15 of any year to provide the best conditions for germination. In each area, where noted, the additional woody plant series shall be incorporated.

4.8.2. Grasslands Series

For the grasslands portion of the project, the method of plantings will be to hydroseed with grass, forb and shrub species seen or known to occur in the project vicinity. The ecological reference site for the grasslands habitat is located in the grassland to the east, just above the quarry. The grassland is composed of non-native grasses/forbs. Native grass components of the hydroseeding

mix represent remnant native species observed within the project area. Prior to hydroseeding, an ecologist shall confirm that the seeds collected for planting is weed free or be certified weed free.

The grassland habitat will become established in 1-3 years.

Seed Mix

Grass and forb species observed in the quarry during the biological reconnaissance are shown in Appendix E of this report. Numerous native grasses were identified. Among these are perennial grasses that include Wild rye (Elymus glaucus), California oatgrass (Danthonia californica) and slender hairgrass (Deschampsia elongata) and annual grass, Nuttal's fescue or three-weeks fescue (Festuca microstachys, formally known as Vulpia microstachys). In addition to these grasses, two other perennial grasses have been selected that are common in interior Mendocino County and adapted to exposed slopes. These grasses are California brome (Bromus carinatus) and purple needle grass (Stipa pulchra formally known as Nasella pulcra). Four native annual forbs observed on the site and recommended for including in the hydroseeding are; Spanish Clover (Acmispon americanus formally known as Lotus purshianus), California poppy (Eschscholzia californica), miniature lupine (Lupinus bicolor) and wildcat clover (Trifolium wildenovii).

Table 3 presents the seed mix and application rates of pure live seed. The percent of total cover for each species is targeted at 25 percent. However, the success criteria for grasslands will allow for reduction in coverage (only 70% cover required for success) and requires that a minimum of 3 of the grasses or forbs be present at final reclamation monitoring. This would allow for natural re-seeding and recruitment in the event that one species is more or less tolerant of the site.

Planting Locations

Grassland habitat will be established on the lower quarry floor, the upper topsoil area and on the 1.5:1 slopes at varying degrees of cover. Grasslands will be established for the full area of the lower quarry floor and upper topsoil area. For the remainder of the areas, the grasslands habitat will be the initial habitat for erosion control and dominated by the overstory habitat (Mixed Oak Woodlands and Shrubland) as they develop over the years.

Planting Procurement

Aerial Seed Procurement

The seeds listed in Table 3 are currently available through S&S Seeds and its Bay Area affiliate Pacific Coast Seeds. The sales manager, David Gilpin, may be contacted at (925) 373-4417. All seed shall be procured from lots derived from North San Francisco Bay Area ecotypes.

Seed Treatment

No treatment is recommended for the Shrubland seed or the other seeds in the mix prior to being mixed with the hydroseed slurry.

Site Preparation

If the final floor surface consists of unfractured bedrock, all compacted surfaces will be scarified or overblasted to a minimum depth of 4” below finished grade prior to placement of topsoil/overburden.

lant Installation

Hydroseed Application Procedure

The entire quarry floor site and upper quarry slopes will be hydroseeded. The benches will be broadcast seeded (see following section) for erosion control. Seed will be thoroughly mixed to ensure that they are applied at the pure live seed rates shown in Table 3. Erosion control materials will be applied in a one-step application with the hydroseeding equipment. The one-step application will consist of the following:

- Seed mix + Wood fiber (800 lbs/acre) + Biosol (800 lbs/acre) + Potassium sulfate (215 lbs/acre) + Sulfur coated urea (344 lbs/acre) + Magnesium sulfate (215 lbs/acre) + Soil sulfur (215 lbs/acre)+ Non-asphaltic tackifier

The quarry floors, processing site, and upper slope areas will be hydroseeded between October 15 and October 30, unless restricted by wind or inclement weather. It is strongly preferred that hydroseed be applied prior to the onset of winter rains.

Broadcast Seed Application Procedure

The benches will be broadcast seeded. The plant species in the broadcast seed mix shall be identical to those in the hydroseed mix described in Table 3, which is the Native Erosion Control Seed Mix by provided by PCS. However, wood fiber, amendments, and tackifier will not be included in the broadcast seed mix.

The seed mix will be applied at the pound per acre rate described in Table 3. Seed will be uniformly broadcast using a hand held rotary seed dispenser or “belly-grinder” type dispenser. The seed will then be raked into the soil surface to a depth of 1/4 inch. A one-inch layer of straw mulch may be applied on top of the seedbed at the Operator’s discretion.

Vegetation Removal

Maintenance of the hydroseeded or broadcast seeded areas will include removal/control of CDFA listed noxious weeds during early monitoring years (1-5) at the time of regular maintenance activities for the woody plant areas to allow for establishment of desired species. Six species of CDFA listed weeds have been observed in the project area. These noxious weeds are Italian thistle (Carduus pycnocephalus), yellow star thistle (Centaurea solstatialis), Bull thistle (Cirsium vulgare), medusahead grass (Elymus caputmedusae), St. Johnswort (Jypericum perforatum) and French broom (Genista monspessulana). These species have potential to diminish available water and light resources from desired establishing plants. Grassland maintenance will consist primarily of monitoring and control of exotic weed species that invade the areas.

4.8.3. Oak Woodland Series

The oak woodlands will be planted on the upper quarry floor, the benches and on the 1.5:1 slopes. On the slopes and benches, the oaks will be planted in bunches to provide the 50% cover and make the upper slopes look more natural. Reclamation of these areas will be accomplished via active revegetation with woody plant species, hydroseeding of herbaceous species and control of invasive exotic plant species. The selection of the plant species to be installed at this site was guided by the dominant native species to be impacted by the project, the physical conditions of the site, and the composition of the existing plant communities.

Moderate oak woodland habitat is expected to develop at the site within approximately 30 years of plant installation. However, the long-term habitat goal to provide a vertical structure comparable to adjacent woodland is not expected to be achieved for 50 or more years, due to the slow growth rate of the trees to be planted.

Open grasslands will meet the criteria noted above in "grasslands". The oak woodlands portion of the project shall meet the criteria noted below.

Planting Locations and density

Tree density of 20-foot on-center triangular spacing (126 trees per acre) are typical for many revegetation projects. An averaged spacing of 14-foot on-center triangular spacing for trees is employed for this Reclamation Plan (180 trees/acre). The estimated trees are shown in Appendix M. This list indicates that the oak trees will exceed the 3:1 ratio of replacement after reclamation and after the allowed 50% die-off. The recommended planting represents overplanting of five tree species. As tree species take significantly longer to establish and produce seed than do shrub species, overplanting of tree species is desired. Moreover, tree species are deep-rooted and can accommodate modest overplanting without significantly increasing competition for nutrients.

Woody plants will be installed according to the planting zones previously described in the reclamation strategy and as shown on Sheet 8 of the MRP. Individual planting locations will be flagged following the completion of grading and topsoil spreading activities. It is recommended that colored flagging or another method of marking individual planting locations be employed.

TABLE 3. GRASSLANDS: SEED MIX FOR HYDROSEED AND BROADCAST SEED AREAS

Common Name	Scientific Name	Type	Approx. Number of Live Seeds per Pure Live Seed Pound	Minimum % Germination	Pounds of Pure Live Seed/Acre	Live Seed per sq. ft.
California brome	*Bromus carinatus*	perennial grass	76,000	80	22.0	20.93
blue wild rye	*Elymus glaucus*	perennial grass	100,000	80	8.0	22.96
three weeks fescue	*Festuca microstachys (Vulpia microstachys)*	annual grass	300,000	70	4.5	41.32
tomcat clover or clammy clover	*Trifolium willdenovii or T. obtusiflorum*	annual legume	270,000	53	3.5	15.49
		TOTAL			**38**	

Planting Procurement

Reclamation will be accomplished through the planting of native tree and shrub species whose propagules (seed, cuttings, etc.) are collected from on-site oak woodland and shrubland habitats prior to their removal, as well as undisturbed habitats adjacent to the quarry. If a sufficient supply of propagules are not available adjacent to the sites, or the time gap between plant removal and reclamation is too long, the collection zone will be expanded to similar vegetative habitats in the Ten-Mile Creek watershed and further expanded to North Central Mendocino County ecotypes, as needed. The container sizes utilized for planting will include treepots, deepots and/or super cells specifically designed for habitat restoration purposes. Trees of the *Quercus* genus will include both container stock and/or acorns as appropriate. Container plants shall be hardened off (located) at the site for a minimum of one week prior to planting. Native plant nurseries are generally capable of conducting contract seed collection and contract growing services for the required plant material. Please note that qualified nurseries should be contacted two years prior to the anticipated planting date.

Container Plants

The container plants to be installed will be contract grown or available plantings acclimated onsite. Seeds and other propagules will be collected approximately one to two years prior to installation to allow sufficient time for the plants to grow before they are planted. Seeds for the target species are generally collected between late summer and fall. Plants shall be grown in super cells, treepot, or deepot containers, as indicated in Table 4, to encourage rooting deeper in the soil profile below grass roots.

A restoration ecologist should inspect the container plants upon delivery and prior to planting to ensure that they are healthy and vigorous. Container plants deemed unsuitable should be returned to the nursery for replacement. It is preferred that container plants be installed on or as near to the day they are delivered as possible. Tree health and vigor should be maintained if trees are stored between time of delivery and planting.

Direct Seed

Interior live oak, Oregon white oak, and black oak acorns, may be planted directly at the reclamation sites as an alternative to contract growing for these species. Tanoak is not a true oak and does not germinate well from direct seed. Direct seeding of acorns is particularly effective for replacement plantings for dead plants. If this planting method is chosen, it is preferable that acorns and seed material be collected and planted in the same season.

Collection Method

The following oak regeneration guidelines adapted from *Collection and Care of Acorns-A Practical Guide for Seed Collectors and Nursery Managers*[17] should be followed:
Acorn Harvest: 1.-Collection of mature acorns directly from limbs produces the highest quality seeds though most acorns are collected from the ground after they have fallen. 2.-Collection should begin when acorns start to fall. 3-Of the acorns that fall 5 to 10% are usually insect-infested or diseased and they should be discarded. 4-In species where the cup encases more than half the acorn (black oaks) cup scars on bottom of the acorns should be checked. If the cup scar is dark discard. Viable acorn scars will be yellow, or lighter than the acorn color. 5- Acorn age can be determined by holding the acorn to the ear and shaking. Acorns that rattle are very dry, in danger of losing viability and should be discarded. The rattle is caused by shrinkage of the cotyledons away from the interior of the pericarp. 6- Seed shall be kept in a cool, shaded place until planted. As little as 5% moisture loss will decrease acorn quality. If oak acorns are not direct-seeded within four weeks following collection, then they may require stratification and pre-germination. If the Operator is not the acorn collecting agent, seed delivery should be requested just before installation, and only in amounts that can be planted the same day to prevent heating and desiccation which reduces germination.

Soil Amendments

Successful reclamation at mine sites throughout California often includes the addition of nitrogen stabilized organic amendment, inorganic fertilizer, and the judicious use of mycorrhizal innoculants. Surface soil on the upper slope will be amended utilizing stockpiled topsoil, as well as fertilizer and inoculated seeds applied via hydroseeding. Backfill placed in individual planting holes will also be amended. Soil amendments recommended per the Soils and Plant Laboratory for general container planting are summarized below. Surface soil amendment recommendations are discussed under hydroseeding.

Approximately 0.5 cubic foot of mycorrhizal inoculum (inoculum) will be harvested from the interface between the duff and topsoil within the adjacent oak woodland and Shrubland-Oak inoculum will be used on species of the oak vegetation series and Shrubland inoculum will be used for plants of that series. Inoculum and inorganic amendments will be uniformly mixed at the rates shown in Table 6. Two cups (16 ounces) of the tanoak series or Shrubland series inoculum/amendment mix will then be uniformly hand blended with soil removed from the planting holes and backfilled into the holes at the time of planting.

[17] (Bonner, 2003)

Site Preparation

Planting Terrace and Hole.

Prior to planting, a rectangular area measuring two-foot wide by three-foot long around each planting site will be scalped of herbaceous vegetation to reduce weed competition. A small back-sloped terrace will be cut into the slope with a pick-mattock and the excavated material will form a berm at the front of the terrace. A planting hole, 8-inches in width and 16-inches in depth, will be dug in the center of the terrace. This represents minor over-excavation for the purpose of creating a column of decompacted soil that is well mixed between the topsoil and subsoil – any rocks greater than 3-inches in diameter will be removed.

Soil amendments will either be placed in the bottom of the planting hole or blended with native soil removed from the planting hole in the amounts described per the soil amendment sub-section above. The amended soil backfill will be lightly compacted to remove air spaces between roots and soil.

Plant Installation

Woody plants will be installed in the planting areas after the onset of winter rains when the soil is moist to a depth of at least six inches. This typically occurs by December but may occur as early as November.

A survival-enhancing revegetation planting method commonly referred to as "collar and screen" planting will be employed. This method was developed at the University of California, Davis, and proven in the field by Circuit Rider Productions at multiple mine and quarry sites in northern California. This method yields high survival rates on most sites with little or no irrigation (*Acorn to Oak*, R. Thompson and L. Bush, 1979).

Container Plant Installation

A "collar" (i.e., one quart plastic dairy container with bottom cut off) will be placed into the planting hole. The over-excavated planting hole will be partially filled to the approximate depth of the nursery container. The plants will be gently removed from containers in such a manner that the root ball remains intact and is not bent or broken. Plants will be installed immediately after removal from the container. Matted roots on the sides shall be "fluffed" by hand or longitudinally sliced to ¼ inch deep. Matted roots on the bottom of the rootball shall be fluffed only. Trees exhibiting "J-roots" should be discarded. Plants will be watered in their nursery containers the morning of the day they are planted.

Seedlings will be placed in the collar so that their root crowns are at or slightly above (up to 0.5 inch) the grade outside the collar. The collar will be backfilled with in-situ soil and amendment and the tree adjusted so that the root crown remains at grade following soil settlement that occurs after initial irrigation. The area outside the collar will be partially backfilled and hand compacted.

TABLE 4. RECOMMENDED PLANT INSTALLATION SPECIFICATION FOR UPPER QUARRY SLOPE AND UPPER QUARRY FLOOR

Layer	Common Name	Scientific Name	% Canopy Cover Goal for Series	On-Center Spacing (ft.)	Planting Position	Propague or Container Size	Number of Plants
Oak Woodland Vegetation Series							
Over-story	Tanoak	*Notholithocarpus densiflorus*	5	14	northeastern portion of slope near drip lines of existing trees in groups of 3-5	Super Cell/ Tree Pots	24
	Oregon White Oak	*Quercas garryana*	40	14	same as above, groups of 3-5	Super Cell/ Tree Pots	188
	Madrone	*Arbutus menziesii*	5	14	same as above, groups of 2-3	Super Cell/ Tree Pots	23
	Canyon Live Oak	*Quercus chrysolepsis*	20	14	same as above, groups of 2-3	Super Cell/ Tree Pots	94
Midstory	Interior live oak	*Quercus wislizenii*	15	14	northeastern portion of slope further away from existing trees in groups of 3-5	Super Cell/ Tree Pots	70
	Black oak	*Quercus kellogii*	5	14	same as above	Super Cell/ Tree Pots	24
Shrub Layer	Toyon	*Heteromeles arbutifolia*	10	8-14	Throughout northeastern portion of slope between tree in clusters of 5-10	Super cell/ D-pot	23
Shrubland Vegetation Series							
Tall	Manzanita	*Arctostaphylos manzanita*	60	8-14	throughout southeastern portion of the slope in clusters of 10-15	Super cell/ D-pot	283
	Mountain mahagony	*Cercocarpus betuloides*	5	8-14	same as above	Super cell/ D-pot	24
	Coyote Brush	*Baccharis pilularis*	15	8-14	same as above	Super cell /D-pot	70
	Deer brush	*Ceanothus integerrimus*	10	8-14	same as above	Super cell /D-pot	47
Short	Buck brush	*Ceanothus cuneatus*	10	8-14	same as above	Super cell /D-pot	47
Grasslands - Cover Goal for Planting Area: **See Table 3 for planting specifications**							

The protective screen will be wrapped around the outside of the collar two to three inches below grade forming a cylinder around the collar. A wire will be wrapped around the screen and twisted to hold the screen in place. The remaining backfill will be placed outside the collar and tamped firmly. The lip of the collar should be one-inch above grade and the soil depth inside the collar should match the soil grade outside of the collar.

The top of the screen will be folded over approximately one-inch, essentially enclosing the plant. Manzanita, buck brush, and buckwheat will be planted with a collar without a screen due to their low spreading growth form.

Plant Installation

Woody plants will be installed in the planting areas after the onset of winter rains when the soil is moist to a depth of at least six inches. This typically occurs by December but may occur as early as November.

A survival-enhancing revegetation planting method commonly referred to as "collar and screen" planting will be employed. This method was developed at the University of California, Davis, and proven in the field by Circuit Rider Productions at multiple mine and quarry sites in northern California. This method yields high survival rates on most sites with little or no irrigation (*Acorn to Oak*, R. Thompson and L. Bush, 1979).

Container Plant Installation

A "collar" (i.e., one quart plastic dairy container with bottom cut off) will be placed into the planting hole. The over-excavated planting hole will be partially filled to the approximate depth of the nursery container. The plants will be gently removed from containers in such a manner that the root ball remains intact and is not bent or broken. Plants will be installed immediately after removal from the container. Matted roots on the sides shall be "fluffed" by hand or longitudinally sliced to ¼ inch deep. Matted roots on the bottom of the rootball shall be fluffed only. Trees exhibiting "J-roots" should be discarded. Plants will be watered in their nursery containers the morning of the day they are planted.

Seedlings will be placed in the collar so that their root crowns are at or slightly above (up to 0.5 inch) the grade outside the collar. The collar will be backfilled with in-situ soil and amendment and the tree adjusted so that the root crown remains at grade following soil settlement that occurs after initial irrigation. The area outside the collar will be partially backfilled and hand compacted.

The protective screen will be wrapped around the outside of the collar two to three inches below grade forming a cylinder around the collar. A wire will be wrapped around the screen and twisted to hold the screen in place. The remaining backfill will be placed outside the collar and tamped firmly. The lip of the collar should be one-inch above grade and the soil depth inside the collar should match the soil grade outside of the collar.

The top of the screen will be folded over approximately one-inch, essentially enclosing the plant. Manzanita, buck brush, and buckwheat will be planted with a collar without a screen due to their low spreading growth form.

Direct Seeded Plants

Acorns may be installed prior to the onset of winter rains but will generally germinate at higher rates if planted between November and January. Begin planting after fall rains have moistened the soil to a depth of 8 to 10 inches. Cover acorns with 1/2 to 1 inch deep soil or deeper if depredation from rodents is visible. If acorn begins to germinate care should be taken to protect the tender root. The acorn should be planted with the root pointing down. Use a small diameter stick or screwdriver to make a hole for the root[18]. Stratified and pre-germinated acorns may be planted up to March 15. Acorn planting holes shall be prepared as previously described for container plants. Acorns will be installed one to two inches below ground and parallel to the soil surface. The narrow ends of the acorn shall be oriented toward the center of the hole. Three acorns will be installed in a four-inch equilateral triangle, centered in each planting collar.

4.8.4. Shrubland Series

The Shrubland series will be planted on the 1.5:1 slopes and benches. Reclamation of these areas will be accomplished via active revegetation with woody plant species, hydroseeding of herbaceous species and control of invasive exotic plant species. The selection of the plant species to be installed at this site was guided by the dominant native species to be impacted by the project, the physical conditions of the site, and the composition of the existing plant communities.

The Shrubland vegetation series will take approximately 5 to 10 years to become fully established.

Planting Locations & Density

The planting shall be in accordance with Table 4 specifications and as shown on Sheet 8 of the MRP. The averaged spacing of 11-foot on center triangular spacing for shrubs, is employed for this Reclamation Plan (527 plants/acre). The recommended planting represents underplanting of five shrub species. Shrub species are expected to increase by natural recruitment at a much greater rate than are tree species such that the balance between tree and shrub densities will equalize over time.

The underplanting of shrub species is mitigated in the following ways:

- spacing between shrub clusters will be a minimum of 30-feet apart, permitting the distance between plants in the same cluster to be reduced significantly;
- shrub species are expected to increase by natural recruitment at a much greater rate than are tree species such that the balance between tree and shrub densities will equalize over time.

Per the monitoring standards, a 50 percent die-off for woody plantings is acceptable. For this series cover is not a good indication of success. Planting density and a minimum die off rate will be used to establish cover. This allowance would result in an overall average survival density of around 393 shrubs per acre. The specified acreage for planting of each vegetative species is noted in Table 4. Initially, the entire reclamation area will consist of grassland habitat, which is expected to reduce to the noted cover goal acreage of grassland habitat (as noted in the Table 4) in the long term as increasing woody plant canopies shade out understory grasses.

[18] (California Departmetn of Fish and Game, 2010)

Planting Procurement, Site preparation and Plant Installation

Plant procurement, Site Preparation and Plant installation shall be done in accordance with Section 4.8.

4.9 Maintenance Plan

Maintenance of all reclamation areas during the three-year plant establishment period will be the sole responsibility of the quarry owner/Operator. Basic maintenance will consist of all work and materials necessary to maintain the reclamation plantings, the water source, and general stability of the site during the three-year plant establishment period and subsequent five-year monitoring period accorded to each of the three stages, including the pilot planting phase.

Included in maintenance will be documentation of all maintenance work in a log, including repair of water sources, repair and maintenance of planting terraces, plants and plant protection hardware, reapplication of wood mulch, culling of extra seedlings, erosion control, and all other miscellaneous tasks necessary to maintain the reclamation areas. Plants will need to be self-sustaining without irrigation for two years prior to release of financial assurances.

4.9.1. Irrigation

The Operator, under the direction of a qualified restoration ecologist, will monitor the plants to determine the amount and frequency of irrigation and based on experience with the pilot planting phase. Typically, in Year 1, the plants will be irrigated with enough regularity (approximately 2-3 times per month), from March through October, to keep the soils within the root zone moist. The irrigation schedule in Year 2 will be based on the water requirements of the plants and is anticipated to be somewhat less (approximately 1-2 times per month). In Year 3, little irrigation (0-1 times per month) will be required. Actual irrigation of the site may vary depending upon the conditions of the plants. Precise irrigation requirements will be determined through site observations using an adaptive management approach toward irrigation

Each tree and shrub plant will receive approximately 0.5 gallon (4 dippers) of water during each irrigation. Water must be gently poured into each planting collar where it will be directed to the roots. This may require two passes due to the limited capacity of the collars.

4.9.2. Weed Control

Weeds within the reclamation areas will be controlled inside and around each plant collar, as well as within the backsloped planting terrace. Weeds will be hand pulled without disturbing seed, seedlings, plants, or their roots – preferably before seed heads have set. Weed-eating, post-emergent herbicide, hand pulling, or any combination thereof shall control weeds outside of backsloped planting terraces if needed. Care will be taken to avoid impacting any native woody species that offshoot from plantings or colonize the gaps between plantings during weeding. Weeding should take place during regularly scheduled irrigation visits since weeds are more easily removed after irrigation has softened the soil. During weeding activities, the level of mulch required to maintain a weed free environment within the basins should be assessed. Additional mulch may be prescribed at this time.

Invasion of the revegetation site by invasive, non-native species, particularly starthistle in the grasslands, is a concern and shall be monitored during the three-year plant establishment period. Invasive weed species could significantly impede the development of the plantings and may reduce the diversity of

plants and the aesthetic of the site. Hence, invasive, non-native species should be controlled as part of maintenance activities if deemed necessary by the monitoring biologist or restoration ecologist.

Should yellow starthistle be observed in some abundance during the first three years of monitoring, use of a selective broadleaf chemical control agent should be employed. Agents such as Garlon or Transline shall be applied early in the season (February to mid-March) when the starthistle seedling rosettes are less than 1.5" in diameter. No chemical spraying should take place during windy conditions. As an alternative, selective grazing may also be utilized in the open grassland portions of the reclamation area. Grazing should be kept to areas where starthistle is most dense to prevent significant reduction of other planted species and those locations noted on the Reclamation Plan.

4.9.3. Plant Protection

Screens wired onto collars installed around plants shall be maintained in good working order during Year 1 and 2 of the plant establishment period. Once seeds have germinated and stem growth has reached the height of screen, the screen will be opened at the top to allow the tree leader to grow. If browse becomes heavy on the planting benches, either apply screens to those collars or fence out deer at either end of the quarry bench. At Year 3, the conditions of protective hardware and plants overall health will be evaluated and the protective hardware shall be removed if appropriate. All protective hardware will be removed upon successful revegetation.

4.9.4. Plant Replacement

Dead plants will be replaced using the same species and methods as described in this Reclamation Plan or per recommendations of a qualified restoration ecologist. It is assumed that replacement plantings will rely heavily on direct seeded acorns and buckeyes in existing planting spots. This way monitoring activities will not be discontinuous due to the time lag to nursery grow and outplant replacement plants.

4.9.5. Natural Recruitment

Due to the shrubland and oak scrub woodland vegetation preserved adjacent to the mitigation site, as well as seed cascading down the slopes from earlier phases of reclamation, natural recruitment of native trees and shrubs from adjoining areas is expected to occur. Care must be exercised to minimize damage to naturally recruited plants during site maintenance. Native plants which enter the mitigation planting areas as volunteer seedlings, offshoots, or by spillover from adjacent natural areas shall be protected and their expansion encouraged. Poison oak shall be allowed to spread into the project to the extent that worker safety can be maintained. Maintenance personnel must be trained to differentiate between native and non-native species.

4.9.6. Schedule

The first year of maintenance for any of the three stages of reclamation will begin on the first day following acceptance of the installation phase by the project owners or their representative. The minimum frequency for Operator's site visits during the maintenance phase shall be the following:

<u>March 1 through September 30</u>

Year 1 – once every 10 days
Year 2 – once every three weeks
Year 3 – once every month

October 1 through February 28

Year 1 – once every month
Year 2 – once every six weeks or after large multi-day storms
Year 3 – once every other month or after large multi-day storms

Frequency of visits may need to be increased to address irrigation needs based on the adaptive management approach described above. The plant establishment period and associated site maintenance will be extended if human intervention is required to sustain the success rates noted. If the success rates are achieved after year 2 without human intervention, even if shorter than the time frames noted, monitoring may be terminated.

4.10 Monitoring

The purpose of the monitoring plan is to track vegetation establishment, assess the degree of revegetation success, and provide a basis for adaptive management recommendations. This will be achieved through both quantitative and qualitative monitoring activities. The goal for success is to have all areas self sustaining for two years without human intervention.

Quantitative monitoring will occur once annually during the mid-growing season (June) following plant installation in order to measure the success of revegetation against the performance criteria and final success criteria established in this Reclamation Plan. Quantitative measurements of percent survival, percent vegetative cover, and plant health and vigor will be collected, analyzed, and reported to OMR.

Moreover, one additional annual site visit will be conducted near the end of growing season (October) in Year 1 and 2 to qualitatively assess vegetation establishment and to monitor vegetation maintenance. The purpose of qualitative monitoring is to assess the overall performance of the vegetation and to ensure the adequacy of the maintenance plan. Results of qualitative monitoring will be internal and inform adaptive management recommendations.

Qualitative assessment of the following factors will be made during site visits:

- Vegetation establishment with special attention paid to areas lacking vegetation
- Mortality of planted shrubs and trees
- Plant species composition
- Slope stability and erosion
- Formation of seeps
- Irrigation and maintenance of planted trees and shrubs
- Invasion of revegetation site by non-native, invasive weeds
- Other pertinent site conditions that may influence plant establishment

A qualified biologist or restoration ecologist will perform the site monitoring.

4.10.1. Performance and Success Criteria

The success of reclamation will be evaluated based on the quantitative performance and success criteria summarized below. However, performance criteria for years 1-4 are minimum interim performance standards only. Final success for the project is achieved only after the final Performance Standards are met following two years without human intervention regardless of the timeframes it takes to achieve that success. The percent of cover for grasses/forbs is best suited as a measure of density for grasses, as it can be almost impossible to measure density of grasses[19].

i. Tree and Shrub Plantings

Years 1–2 Minimum Performance Standard: At the end of the Year 1, 80 percent overall combined tree and shrub survival with a minimum of 4 oak tree (woodland) or 3 shrub (shrubland) species surviving with a health and vigor rating of 2, averaged across all species. If criteria not met see remedial measures in section 4.11.

Years 3–4 Minimum Performance Standard: At the end of the Year 3, 65 percent overall combined tree and shrub survival with a minimum of 4 oak tree (woodland) or 3 shrub (shrubland) plant species surviving and a health and vigor rating of 2.5, averaged across all species .If criteria not met see remedial measures in section 4.11.

Final Success Standard: 50 percent overall combined tree and shrub survival with a minimum of 3 oak tree (woodland) or 3 shrub (shrubland) plant species surviving. Final success standard is met following two years without human intervention at which time further monitoring is not required. If criteria is not met see remedial measures in section 4.11. Using the above noted criterias a summary of the Final Success Standards for trees and shrubs for each planting area is given in Table 5.

TABLE 5. FINAL COMBINED SUCCESS STANDARDS – TREE AND SHRUB PLANTINGS[20]	
Overall Cover	10% cover shrubs and trees combined per 175 ft x 12 ft transect
Density = Upper Slope Area	40 trees/acres; 80 shrubs/acre
Density = Benches	40 trees/acres; 145 shrubs/acre
Density = Upper Quarry Floor[21]	8.5 trees/acres; 2.5 shrubs/acre[22]
Species Richness	3 species trees and 3 shrubs per 175 ft x 12 ft transect for upper slope and bench areas. Minimum of 2 species of shrubs and 2 trees in overall Upper floor area.
Percent Survival – All Trees	50% overall survival of planted trees and shrubs
Percent Survival – Oaks Only	3:1 Replacement of actual oak trees dead, removed or determined to be mortally wounded. Example: For 65 Oaks, success would be a total of 195 oaks.

[19] (California Conservation, Office of Mine Reclamation, 2003), Page 92
[20] See computations on Appendix M.
[21] Density shown is based on minimum oak replacement. Density on lower quarry floor may increase depending on mortality of oaks at final reclamation.
[22] Density computations shall include entire upper quarry floor area, including grassland areas.

ii. Hydroseeded Grasslands

Year 1 Minimum Performance Standard: At the end of Year 1 there shall be 50 percent vegetation cover of reclaimed grassland, either by the grass, forb, and shrub species in the hydroseed mix or by naturally recruited native or naturalized grasses and forbs occurring in the reference grassland site. A minimum of 3 grass/forb species shall be present. If criteria not met see remedial measures in section 4.11.

Final Success Standard: Final success is 70 percent vegetative cover in the grassland habitat with the plant types described above. A minimum of 3 grass/forb species shall be present. Final success standard is met following two year without human intervention at which time further monitoring is not required. If criteria not met see remedial measures in section 4.11.

There are no performance and success criteria for broadcast seeded areas because herbaceous cover is intended for topsoil stability and grassland habitats are not the intended climax community. A summary of the Final Success Standards for grasslands is included in Table 6.

TABLE 6. FINAL SUCCESS STANDARDS - GRASSLANDS	
Cover[23]	70% cover grasslands per 175 ft x 12 ft transect
Species Richness	3 species of grass/forbs from seed mix per 175 ft x 12 ft transect

4.10.2. Monitoring Methods

Semi-permanent transects will be established at random locations throughout the three vegetation series, i.e., mixed-oak woodland, shrubland, and grasslands. Two metal t-posts will be pounded into the ground at either end of the transect line. Percent woody plant survival (aggregate and individual species), as well as percent herbaceous vegetative cover (all herbaceous species combined) will be measured using the line intercept method (Bonham 1989). The total number of transects will be determined by evaluating the average survivorship and cover values obtained over increasing numbers of quadrates and transects. The number of transects used will be the point where additional samples do not substantially change the average plant survival or cover value obtained (Kershaw 1973). The sample area may be slightly increased or decreased after initial data are collected and analyzed and the requisite sample surface area is re-assessed. Computations to meet the above noted success criteria are based on transects that represent each of the reclamation areas (Upper Slope, Bench, Upper Quarry Floor and Lower Quarry Floor).

i. Tree and Shrub Plantings

The **percent survival** for aggregate woody plant species across the woody plant associations will be estimated by simple count of all living tree seedlings and shrubs divided by the total number of marked planting locations by transect and for all transects. For benches trees and shrubs within 6 feet either side of the transect center line will be counted. The 12-foot maximum transect width will be equally applied to the upper slopes and upper quarry floor.

- **Average health and vigor** will be determined by species for trees and shrubs in Years 1, and 3 to

[23] Grassland areas include all exposed areas within all planting series excluding areas with overstory from trees or shrubs.

determine which species are best adapted to site conditions. Species counted along the transects will be rated for health and vigor. Those species with the highest health and vigor rating will be used for dead plant replacement. Final success (estimated at year 5) will be determined based on the ability to survive without human intervention.

- The average health and vigor by shrub and tree species will be determined based on the following scale:

Ratings	**=**	**Health and Vigor**
0	=	Dead
1	=	Very Low Vigor
2	=	Low Vigor
3	=	Moderate Vigor
4	=	High Vigor
5	=	Very High Vigor

ii. Hydroseeded Grasslands

Vegetation cover is a good measure of the grassland establishment and correlates with relative density and species richness. Therefore, the percent vegetative cover will be quantitatively monitored in Years 1 and 2 to evaluate the development of herbaceous vegetation. Herbaceous growth will be measured using photo monitoring in accordance with UC Monitoring method[24]. Monitoring will occur twice during the first year (once just after establishment) and thereafter during peak herbaceous growth periods around June and July. Monitoring will occur for two years or until success criteria are met.

4.11 Remedial Measures

4.11.1. Tree and Shrub Planting Remedial Measures

If the percent survival falls below 80 percent in Year 1 and below 65 percent in Year 3, then all dead trees and shrubs will be replaced via container planting or direct seeding of acorns. The most robust plant species exhibiting high survivorship would be utilized to replace the dead individuals; however, the minimum species richness noted above shall be considered when choosing replacement species. Adaptive management measures to increase survival could include additional plant protection hardware, deeper irrigation basins, more frequent irrigation, an increase in weeding, mulch or soil amendment, etc. If woody plant survival is just slightly under the success standard, then naturally recruited woody plants would be protected and counted.

If success criteria are not met in five years, then the reclamation methods will be re-evaluated and more intensive approaches will be developed and implemented with the prior approval of the lead agency and the State Department of Conservation.

[24] (University of California, Division of Agricultural and Natural Resources, 2003)

4.11.2. Hydroseeding (Grasslands) and Broadcast Seeding Remedial Measures

If the percent coverage is less than 50 percent coverage in Year 1, then additional soil preparation and resowing of seed in bare areas by the hand and rake method will be employed. If the cover is still less than 70 percent in Year 2, then adaptive management measures, including additional soil placement, "rain for rent" irrigation, direct transplant of grass plugs, and substitute species will be considered. If the richness of species is deficient, the botanist may suggest replacement species to supplement the variety and to use for reseeding.

4.12 Reporting

All monitoring results shall be noted on monitoring data sheets that will be developed for the project, similar to the attached Sample Data Monitoring Forms (Appendix I). Any recommended changes in the Reclamation Plan shall be discussed with the Mendocino County Planning Department prior to implementation. Monitoring findings shall be correlated with identified transects in the field, such that the findings can be replicated if necessary. Transect t-posts will also serve as photo-documentation points. A minimum of three photographs will be taken per reclamation area (12 total) during transect monitoring. Select photographs will be included in annual reports to further document monitoring findings.

Annual vegetation monitoring reports will be prepared in November of Years 1, 2, 3, and 5, or until final success is achieved, in each of the three stages of reclamation documenting the progress of vegetation establishment and Reclamation Plan performance for each phase. Milestones reached and problems encountered, including the adaptive management prescriptions being considered and/or implemented will be briefly discussed in each annual report.

4.13 Financial Assurances

4.13.1. Detailed Cost Estimate

Financial Assurance estimates shall be submitted within 30 days of approval of all conditional approvals from the County for review and approval by Mendocino County. The estimate will include the required 10 percent administrative costs for Mendocino County to provide annual inspections. Updated financial assurances will be prepared annually to address changes in the operation that affect the cost of reclamation and to update unit costs in accordance with SMARA requirements.

4.13.2. Payees

In the event of default by the Operator, the financial assurances will be set up in the name of the County of Mendocino and the OMR. The financial assurances document (bond or CD) will be submitted to Mendocino County within 30 days of approval of the Financial Assurance estimates.

In event of default by the operator, the financial assurances currently are and will continue to be set up in the name of the County of Mendocino and the Office of Mines and Reclamation.

4.13.3. Schedule of Releases

The time frames associated with the reclamation of each phase is dependent on the actual demand experienced and will be subject to change. The estimated completion phases are noted in the written Reclamation Plan contained herein. It is anticipated that financial releases will be associated with each of the following milestones:

4.13.4. Milestones

- End of Pilot Reclamation Planting
- Removal of Equipment/Structures
- End of Final Reclamation Planting
- End of Final Reclamation Monitoring

The initial cost to reclaim the quarry has been calculated based on the estimated area of disturbance over the upcoming year and the reclamation that would be required at the end of that year based on this MRP. The initial bonding cost will include the removal of all equipment. The costs to reclaim benches would be based on comparative percentage of lineal foot of benches. For each subsequent year the cost to reclaim the quarry will be based on the existing disturbance area and the additional disturbance that is anticipated in the upcoming year less any reclamation areas that have met the success criteria.

The number of oaks that need to be planted in the reclamation areas are in direct proportion to the number of overall oaks anticipated to be mortally wounded, dead or removed (6:1). The financial assurances will estimate the oak loss based on the disturbance area in the upcoming year and base the number of oaks that need to be planted accordingly, to accommodate the 6:1 planting mitigation ratio, but no less than 150 trees will be included per the original reclamation plan. Appendix M should be modified annually to reflect the appropriate oak/shrub planting. If woodlands are reduced, the remainder of the upper quarry floor will remain as grasslands. The cost for grasslands reclamation will remain the same regardless of the oak planting, as all areas are initially seeded as grasslands for erosion control. Each year the disturbed oaks will need to be reassessed and oak planting areas increased to accommodate the mitigation ratio.

Once the reclamation planting is completed in any given area, in the first two years 25% of the reclamation costs will be included in the Financial Assurances to provide for remediation, if necessary, in addition to the monitoring cost itself. For the following two years 10% will be retained. Once the success criteria is met, regardless of the year, all Reclamation costs will be removed from the Financial Assurances for the area that is deemed successful. This progressive method of Financial Assurances estimation will be employed for the pilot planting areas and any areas reclaimed prior to the Final Reclamation. Monitoring costs will continue to be included in the financial assurances until the entire site is reclaimed successfully.

4.13.5. Initial Detailed Cost Estimate

In order to meet the Surface Mining and Reclamation Act (SMARA), we are including the following schedule of reclamation and the initial recommended bond amount to ensure that reclamation takes place. A detailed Financial Assurances Estimate is Included in Appendix J.

A. Backfilling, regrading, slope stability and recontouring.

The pit will be reclaimed as shown in the MRP. The cost for the financial assurance is based on the existing conditions and the anticipated disturbance in the upcoming year, this work will also include reshaping of the upper slopes to conform to the reclamation plan grading criteria and to cover and restore the NOA areas.

The estimated cost is as follows:

Move and Recontour: $ 10,450

B. Revegetation

When grading disturbs soil (as opposed to the pit/rock surface), grass seed shall be planted each fall between August 15 and October 31 of each year. However, the maximum revegetation would occur at the end of Phase II.

Estimated Revegation Cost: $ 32,986

C. Drainage, diversion structures, waterways and erosion control.

The haul road will likely be graded each year prior to beginning the haul of material from the pit. It would also be likely that at the end of the season the roads will be graded for the winter. Culverts and ditches will divert the water into discharge points which will prevent erosion from occurring on the road. This is inlcuded under the work described in item “A” above, but it is rewritten here to acknowledge and identify the specific standard. There is no additional cost associated with complying with this standard.

Estimated Drainage/erosion control Cost: $ 6,374

D. Stream Protection.

As Noted above, no streams will be affected by the project. There are no additional costs with this item because it will be accomplished by recontouring under Item “A” and as drainage development in Item "C" above.

E. Building, Structure and Equipment Removal.

There will be no buildings or other structures associated with the pit rock extraction process. Equipment to push the pit rock into piles and load it onsite are existing at the Laytonville Rock property. No additional costs are anticipated to get this equipment to the site. The cost to move in and move out a portable crusher is the only cost.

Estimated Equipment Removal Cost: $ 5,635

In summary, the maximum cost of performing items in any given year are estimated to be around $55,446. This amount includes markups for mobilization, supervision, contingencies and county administration. Thus it is recommended that the initial amount of financial assurances required by Section 2773 of SMARA be set at $55,446.

4.13.6. Payees

In the event of default by the operator, the financial assurances will be set up in the name of the County of Mendocino and the Office of Mines and Reclamation.

4.13.7. Schedule of Releases

Releases shall be based on withholding 25% of the costs of drainage and revegetation in year 1 & 2 of monitoring and 10% in year 3 & 4 of monitoring.

Completion Phase	Year	Monetary Release	Bond Amount
During Mining	Year 1 – Year 25	$0	$55,446
Pilot & Reshape face	Year 25 – Year 30	$16,473	$38,973
Completion Revegation +1 Yr Mon.	Year 31	$27,237	$11,736
Completion 1 Yr. Mon.	Year 32	$1,110	$10,626
Completion 1 Yr Mon, release 15%	Year 33	$5,204	$ 5,422
Completion 1 Yr. Mon.	Year 34	$1110	$ 4,312
Completion 1 Yr Mon, release 10%	Year 35	$4,312	$ 0

4.13.8. Basis for Costs to Complete Reclamation Actions

The costs for the reclamation were based on requirements set forth in the Surface and Mining and Reclamation Financial Assurances Guidelines[25]. The estimate included man and equipment hours and material necessary to complete each phase of the work. The hourly wages and equipment rates were based on the following sources:

1. California Department of Transportation Division of Construction, *"Labor Surcharge and Equipment Rental Rates,"* Effective April 1, 2012 through March 31, 2013.
2. General Prevailing Wage Determination Made by Director of Industrial Relations Pursuant to California labor Code Part 7, Chapter 1, Article 2, Section 1770, 1773 and 1773.1 for Commercial Building, Highway, Heavy Construction and Dredging Projects: Crafts, Operating Engineer (Heavy and Highway Work). August 22, 2011; Labor and Related Classifications, August 22, 2011, and; Teamsters, August 22, 2011.
3. Mendocino County Farm Supply
4. Pacific Coast Seed Supply
5. Center for Social and Environmental Stewardship

[25] (California State Mining and Geology Board, July 23, 2004)

The current financial mechanism will be updated upon approval of this Reclamation Plan. Future Financial Assurances estimates are approximate only and should reflect the actual work necessary to reclaim the quarry in any given year and use the appropriate updated references.

5.0 PREPARER'S SIGNATURE

Prepared by:
Crawford and Associates, Inc.

1-20-15

Cathy A. McKeon — Date
Registered Civil Engineer — 51026

A Reclamation Plan Amendment shall be required prior to any substantial revision of this Mining and Reclamation Plan as required by SMARA.

6.0 REFERENCES

2013 World Media Group, LLC. (2013, December). *USA.com*. Retrieved December 2013, from www.usa.com/mendocino-county-ca.html

Bonner, F. (2003). *Collection and Care of Acorns - A Practical Guide for Seed Collectors and Nursery Managers.* . Retrieved August 2014, from http://www.nsl.fs.fed.us/collection%20and%20care%20of%20acorns.pdf

BridgeHunter.com. (n.d.). *BridgeHunter.com*. Retrieved December 6, 2013, from Laytonville-Dos Rios Bridge, Mendocino County California: http://bridgehunter.com/ca/mendocino/bh43905/

California Conservation, Office of Mine Reclamation. (2003). *Special Publication 123: Rehabilityation of disturbed lands in California: A Manual for Decision Making.* Sacramento: State of California.

California Department of Water Resources. (2004). *California Groundwater Bulletin 118, North Coast Hydrologic Region, Laytonville Valley Groundwater Basin.*

California Departmetn of Fish and Game. (2010). *California Salmonid Stream Habitat Restoration Manual, 4th Edition*. Retrieved August 2014, from https://www.dfg.ca.gov/fish/resources/habitatmanual.asp

California State Mining and Geology Board. (July 23, 2004). *Surface Mining and Reclamation, Financial Assurances Guidelines.* State of California.

City-Data.com. (n.d.). *City-Data.com*. Retrieved December 05, 2013, from http://www.city-data.com/city/Laytonville-California.html

Hulse-Stephens, G. (2014). *Botanical Survey of the Laytonville Quarry.* Ukiah.

John Harper, U. C. (2012, June 20). Livestock and Natural Resources Advisor. (R. A. Cathy McKeon, Interviewer)

Mendocino County. (2009). *Mendocino County General Plan, Resource Element.* Ukiah: Mendocino County.

Monares, L. (2013, December 05). US Army Corp of Engineers, San Fransisco North Branch Chief. (C. McKeon, Interviewer)

National Highway Traffic Safety Adminstration. (2008-2012). Retrieved December 06, 2013, from NCSA Data Resource Website: http://www-fars.nhtsa.dot.gov/QueryTool

North Coast Resource Management . (2014). *Biological Assessmenet for the Laytonville Rock Mining and Reclamation Plan.* Redwood Valley.

Rau and Associates, Inc. (2013). *Laytonville Quarry Industrial SWPPP.* Laytonville.

Transportation Research Board. (2010). *Highway Capacity Manual .* Transportation Research Board.

U.S. Census Beareau. (1990). *U.S. Census Beareau*. Retrieved June 13, 2012, from http://quickfacts.census.gov/states/06/06045.html

University of California, Division of Agricultural and Natural Resources. (2003). *Photo-Monitoring for Better Land Use Planning and Assessment, Publication 8067.* University of California .

USGS. (n.d.). *USGS California Streamstats*. Retrieved December 05, 2013, from USGS Streamstats: http://streamstatsags.cr.usgs.gov/ca_ss/default.aspx?

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M. 2014 Financial Assurances Planting Computation
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APPENDIX B:

MINING AND RECLAMATION PLANS

Plan Sheet 4 Amended 01-20-2015

GRADING NOTES:

1. MAXIMUM ANTICIPATED FINISHED GRADING FOR EXCESS OVERBURDEN IS SHOWN ON SHEET 9.
2. LOCATE ALL NOA CONTAMINATED MATERIAL TO LOWER FLOOR OF QUARRY AND COVER WITH A MINIMUM 6" OF NOA-FREE MATERIAL PRIOR TO MINING AREA IN ACCORDANCE WITH THE GEOTECHNICAL RECOMMENDATIONS.
3. ALL DISTURBED SOIL LOCATIONS THAT AREA EXPOSED SHALL BE SEEDED ANNUALLY PRIOR TO OCTOBER 15TH.
5. OVERBURDEN MAY ALSO BE STORED IN TOPSOIL AREAS BUT MUST BE KEPT SEPARATE.
6. INSTALL SIGNAGE AT TOPSOIL STORAGE AREAS "TOPSOIL - DO NOT DISTURB".
7. MAXIMUM DEPTH OF TOPSOIL IS 6.0'.
8. REMOVE SMALL TREES/SHRUBS WEST OF ENTRANCE TO PROVIDE MINIMUM OF 215' OF SITE DISTANCE TO WEST FROM 15' NORTH OF EDGE OF DOS RIOS ROAD.
9. EQUIPMENT, SUPPLIES AND MATERIALS SHALL BE STORED IN SHOP AREA AS SHOWN. HAZARDOUS WASTE SHALL BE STORED IN SHOP/CONTAINERS OR TANKS.

APN 035-460-05
SMITH

APN 035-460-02
NORDEMAN

APN 035-460-06
STUDEBAKER

APN 035-460-06
STUDEBAKER

SALVAGE AND RELOCATE ALL STOCKPILED TOPSOIL TO SOIL STORAGE AREAS SHOWN.

MINE BOUNDARY

TOPSOIL SALVAGE AREA ABOVE EL=2240 WITHIN QUARRY MINE DISTURBANCE AREA. RELOCATE TO SOIL STORAGE AREAS SHOWN.

LIMITS OF MODIFIED QUARRY.

APPROX SOIL/ROCK BOUNDARY

LOWER TOPSOIL STORAGE AREA

POND #1 RELOCATE WITH LOWER FLOOR

UPPER PROCESSING FLOOR

PORTABLE SCREEN - RELOCATE AS NECESSARY

PORTABLE RADIAL STACKER AND CRUSHER TO REMAIN

EXIST. CATCH BASIN AND POND TO REMAIN. INSTALL OVERFLOW PIPE CONCURRENT WITH LOWER FLOOR CONSTRUCTION SEE DETAIL SHEET 9

POND #3

POND #2

LOWER QUARRY FLOOR ELEV.=2083 TO 2089

EX. CATCH BASIN - TO REMAIN

EX. SCALE SHACK TO BE REMOVED

NEW SCALE SHACK

TRUCK SCALE

SHOP

ACCESS RD TO REMAIN

ENTRANCE

DOS RIOS ROAD

EQUIPMENT, MATERIAL AND SUPPLY STORAGE AREA SEE NOTE 9

SEE NOTE 8

UPPER TOPSOIL STORAGE AREA

ROCK LINE DITCHES TO BE CONSTRUCTED UNDER THIS MRP

(E) ACCESS RD TO REMAIN

ROCK LINED CUTOFF DITCHES TO SOUTHERLY CHANNEL (TYP)

SEEP DO NOT DISTURB

COVER NOA

ACCESS RD TO REMAIN

SECTION 1

SECTION 2

SECTION 3

SECTION 4

SECTION 5

SECTION 6

SECTION 7

SCALE: 1"=40'

0 40 80
SCALE IN FEET

Estimated

Earthwork Volumes	Rock	Overburden
Nordman Parcel	4,845 cu.yds.	43,960 cu.yds.
Studebaker Parcel	242,262 cu.yds.	33,705 cu.yds.
Total	247,107 cu.yds.	77,665 cu.yds.

REGISTERED PROFESSIONAL ENGINEER
CATHY A. MCKEON
NO. 51026
EXP. 9-30-15
CIVIL
STATE OF CALIFORNIA

DATE:	REVISION:	BY:
01-19-15	ADDED MATERIAL STORAGE AREA & BLA	CAM

COMPUTER NO. Z:\R12023\
PATH: Drawings\Civil-2012\
FILE:
PSVIEW:
MSVP:
MSVIEW:

OWNER: LAYTONVILLE ROCK

LOCATION: 1136 LAYTONVILLE DOS RIOS ROAD
LAYTONVILLE, CALIFORNIA

RAU AND ASSOCIATES INC.
CIVIL ENGINEERS · LAND SURVEYORS
100 NORTH PINE STREET · (707) 462-6536 · UKIAH, CA 95482

DRAWING: GRADING PLAN

PROJECT: MINING AND RECLAMATION PLAN

Date:	AUGUST 2014
Scale:	AS SHOWN
Drawn:	MAW
Checked:	CAM
Reviewed:	GCR
JOB NO.	R12023

SHEET 4 of 9 SHEETS

Xrefs: 120404-ortho.dwg; R12023 XC TOPO.dwg; R12023 XC TITLE 2.dwg
Path: C:\Users\Cathy\Box Sync\Projects\14-190.1 Laytonville Rock Quarry\R12023 RAU Archive\Drawings\Civil - 2012\R12023 XC GRADING.dwg Plot Date: Jan 20, 2015 at 8:46am

APPENDIX M:

2014 FINANCIAL ASSURANCES PLANTING COMPUTATIONS

APPENDIX M - 2014 FINANCIAL ASSURANCES PLANTING COMPUTATION

Planting Estimate & Oak Replacement Ratio

Laytonville Quarry Reclamation Plan

Area	2014 Acres	% Series	% Oak	% Other Tree	% Shrub	% Grassland (1)	% Overall	Acres in series (1) 2014 (ac)	Tree/ Acre (ea) (2)	Shrub/ Acre (ea) (2)	Seed Acre (lb)	Oaks (ea)	Other Tree (ea)	Shrubs (ea)	Shrub Seed (lbs)	Grass Seed (lbs) (1)
1.5:1 Upper Slope																
Pilot	0.24															
Shrub Series (ea)		25	0	0	100	100	25.0	0.06	180	527	38	0	0	32	0.12	2
Oak Series (ea)		50	85	5	10	100	50.0	0.12	180	527	38	18	1	6		5
Grassland Series (lb)		25	0	0	0	100	25.0	0.06	180	527	38	0	0	0		2
							100%	0.24								
Final	0.84															
Shrub (ea)		25	0	0	100	0	25.0	0.21	180	527	38	0	0	111	0.42	8
Oak (ea)		50	85	5	10	0	50.0	0.42	180	527	38	64	4	22		16
Grassland (lb)		25	0	0	0	100	25.0	0.21	180	527	38	0	0	0		8
Sub Total	1.08						100%	0.84								
Benches	0.55															
Shrub (ea)		50	0	0	100	0	50.0	0.275	180	527	38	0	0	145	0.28	10
Oak (ea)		50	85	5	10	0	50.0	0.275	180	527	38	42	2	14		10
Grassland (lb)		0	0	0	0	100	0.0	0	180	527	38	0	0	0		0
							100%	0.55								
Lower Quarry Floor	1.37															
Shrub (ea)		0	0	0	100	0	0.0	0	180	527	38	0	0	0	0.69	0
Oak (ea)		0	85	5	10	0	0.0	0	180	527	38	0	0	0		0
Grassland (lb)		100	0	0	0	100	100.0	1.37	180	527	38	0	0	0		52
							100%	1.37								
Upper Quarry Floor	1.58															
Shrub (ea)		0	0	0	100	0	0.0	0	180	527	38	0	0	0	0.79	0
Oak (ea)(4)		10	85	5	10	0	10.0	0.158	180	527	38	24	1	8		6
Grassland (lb)		90	0	0	0	100	90.0	1.422	180	527	38	0	0	0		54
							100%	1.58								
Upper Topsoil Storage	0.42															
Shrub (ea)		0	0	0	100	0	0.0	0	180	527	38	0	0	0	0.21	0
Oak (ea)		0	85	5	10	0	0.0	0	180	527	38	0	0	0		0
Grassland (lb)		100	0	0	0	100	100.0	0.42	180	527	38	0	0	0		16
							100%	0.42								
Total Acres Reclaim (ac)	5															
Total Oaks (ea)												148				
Total Other Trees (ea)													8			
Total Shrubs (ea)														338		
Total Shrub Seed (lbs)															2.50	
Total Grassland Seed (lbs)																132
Total EC Seed (lbs)																57
50% Oak Survive (ea)												74				
Potential Oaks Removed												16				
Oak Replacement Ratio												**4.6**				

(1) Grassland seeding will be used to cover entire planting area (100%) initially and is reflected in Pounds/seed per acre in this table. Percentage shown for grasslands should be used for success criteria only.
(2) Tree planting spacing = 14', shrub spacing 11' apart
(3) % oak woodland has been reduced to address the minimum 150 trees planting. Only 16 trees removed. The 150 trees will mitigate the oak tree loss adequately.

FINAL DENSITY SUCCESS CRITERIA FOR TREES AND SHRUBS							
RECLAMATION AREA (Plan sheet 8, MRP)	TOTAL AREA	PLANT		SURVIVE		DENSITY	
		TREES	SHRUBS	TREES	SHRUBS	TREES	SHRUBS
	(ACRES)	(EA)	(EA)	(EA)	(EA)	(#/ACRE)	(#/ACRE)
Upper Slope Area	1.08	87	171	44	86	40	80
Benches	0.55	44	159	22	80	40	145
Upper Quarry Floor	1.58	25	8	13	4	8.5	2.5

Laytonville Rock Quarry Renewal Mining and Reclamation Plan 2013

Mendocino County Use Permit Renewal #*UR 15-92/13*
California Mine ID #91-23-0029

Lead Agency

Mendocino County Planning and Building Services
860 North Bush Street
Ukiah, CA 95482

Operator

Shawn and Aurora Studebaker
Laytonville Rock
1136 Laytonville Dos Rios Road
Laytonville, CA 95454

Prepared by

RAU AND ASSOCIATES INC.
Civil Engineers • Land Surveyors
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Date

August 2014

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PROJECT SUMMARY

Project Contact Information

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860 North Bush Street
Ukiah, CA 95482
(707) 463-4281

Permit Approvals Required

Permit	Permitting Authority	Timing
Major Use Permit Renewal UR 15-92/13	Mendocino County Planning Department	In-progress
Reclamation Plan Approval	Mendocino County Planning Department	Concurrent with Use Permit Approval
NPDES - Industrial WDID 1 23I024035	Regional Water Quality Control Board	On-going
Air Quality Permit (1120-5-01-12-32)	Mendocino Co. Air Quality Management District	Renewal Upon Approval

1.0 PURPOSE AND OBJECTIVES

1.1 Site Location, Size, and Access

The project, known as the Laytonville Rock Quarry, is located on property owned by the applicant, Laytonville Rock (Operator/Applicant). The property is located in Section 7, Township 21 North, Range 14 West, Mount Diablo Base and Meridian, Mendocino County, California. A Site Map and Vicinity Map are included in Appendix A.

The Laytonville Rock Quarry was originally permitted by the County of Mendocino in 1983 and was then renewed again in 1992 (U 15-92) for a rock quarry and crushing operations. The 1992 use permit allowed for an average extraction rate between 15,000- 20,000 cubic yards (CY) per year, with a maximum extraction rate of 50,000 CY per year, over a 20-year period, for a total extraction of 325,000 CY over the 20-year permitted period. Aggregate processing was permitted. The existing and proposed quarry access is directly from Laytonville Dos Rios Road east of the town of Laytonville and State Highway 101. The proposed operation is requesting an expansion to allow mining for an additional 30 years. The longer time frames are due to the cost of processing all of the necessary permits.

The expansion would allow for the extraction of 325,000 CY at a reduced average annual production rate of 11,000 CY but a maximum annual peak extraction rate similar to the previous permit, 50,000 CY. Rock extraction/processing will be limited to 20,000 CY. The remaining 30,000 CY would be utilized to sell overburden, should the opportunity arise.

Table 1. Summary of Proposed Mining Operations

Design/Operating Characteristics	Description/Parameters/Assumptions
Operational Activities	
Mining	Excavation using loader and dozer
Processing	Crusher and screen
Reclamation	Extract and place overburden to accomplish slopes in conformance with the grading plan (Sheet 4, Appendix B); place 8" – 24" top soil on reclamation areas. Revegetate with grasses, brush and trees in conformance with Reclamation Plan (Sheet 8, Appendix B)
Mine and Reclamation Data	
Acreage	
Total Parcels	80.51 acres
Mine Boundary	11.5 acres
Acreage to be Disturbed	8.8 (5.2 mining, 3.6 product storage, roads, misc.)
Acreage to be Reclaimed	5.7 acres
Acreage not being Reclaimed	3.10 acres roads, structures[1] and rock slope
Volume	
Average Annual Extraction	11,000 CY
Maximum Annual Extraction	50,000 CY (20,000 Rock; 30,000 overburden)
Maximum Daily Extraction	250 CY
Maximum Daily Processing	850 CY
Maximum Hourly Processing	300 Tons/Hour
Maximum Quarry Extraction	325,000 CY
Planned Depth and Elevation	
Lowest Anticipated Mining Elevation	2070[2]
Maximum Anticipated Mining Depth	100 feet
Operations Schedule Period	
Hours of Operation	6 a.m. – 6 p.m.
Length of Permit	30 years
Reclamation	
End Use	Rangeland
Termination Date	30 years after Approval Date of MRP

LEGAL DESCRIPTION:

All that portion of the East 1/2 of the Northwest 1/4 of Section 7, Township 21 North, Range 14, West M.D.B.M. laying southerly of the following described line:

Beginning at a point which marks the midpoint of the Easterly Boundary of the East 1/2 of the Northwest 1/4 of Section 7, as shown on the map recorded in Map Case 2, Drawer 22, Page 25, Mendocino County Records, proceed Southerly along the North-South section centerline a distance of 115.00 feet to the point of beginning of the line to be described, thence parallel to the line which divides the East 1/2 of the Northwest 1/4 of Section 7 into its North 1/2 and South 1/2 (approx. N 84 1/4° 18' W) a distance of 590.00 feet; thence due West to the intersection with the Westerly boundary

[1] Roads to be left will serve end use of rangeland.
[2] Floor elevation varies from 2070 to 2080

of the East 1/2 of the Northwest 1/4 of Section 7, a distance of approximately 170 feet and the terminus of said line.

See appendix A for site map. See Appendix B for MRP plans.

1.2 Purpose of Plan

This application for the renewal of the Laytonville Rock Quarry Use Permit and Reclamation Plan provides for:

- Modification of the Laytonville Rock Quarry site plan to accommodate additional mining over a 30-year period and processing on the existing permitted parcel (APN 035-460-06).
- Amendment of the existing Reclamation Plan to correspond with the proposed mine development and end use for rangeland.

For project implementation to proceed, County actions are needed to (a) approve a renewal of the Laytonville Rock Quarry Use Permit (UP 15-92), and (b) approve a revised Reclamation Plan to include the further development of the mine.

The Project Description [3] contained in the initial study describes the current and proposed future operations to be evaluated by the County for environmental impacts under CEQA.

1.3 Reclamation Objectives

The objective of the Reclamation Plan is to continue to implement responsible and environmentally sound aggregate removal; preserve sensitive natural resources; minimize aesthetic impacts through site design; implement reclamation concurrently throughout the life of the mine; and reclaim the project for an end use for rangeland use in conformance with SMARA regulations. The project has been shown to be economically feasible and provide responsible reclamation that will result in a beneficial end use, in accordance with the requirements of SMARA. Implementation and timing of final reclamation activities will be completed by the project owner/operator within five years after the completion of the project.

1.4 Post-mining Land Use and Reclamation Overview

The surrounding site consists of rangeland used for grazing and is covered with grazing grasses and fringed with oak and Douglas fir forest. The end use of the quarry site after reclamation will be for rangeland use (agriculture or grazing). The configuration of the quarry would result in a combination of woodlands and shrublands but may also provide for a seasonal pond on the lower quarry floor which can be used for rangeland purposes. This pond receives only overland surficial flows. A copy of the End Use Notification is included in Appendix H.

[3] (Uma Hinman consulting, 2013)

2.0 SITE DESCRIPTION AND ENVIRONMENTAL SETTING

The project is located north and east of the town of Laytonville. The entrance to the subject property is located near Mile Post 1.0 on the Laytonville Dos Rios Road; approximately 1 mile east of Highway 101 and the town of Laytonville. The property is a 43-acre parcel that is split by Laytonville Dos Rios Road. The parcel on the north side of Laytonville Dos Rios Road, with the exception of the existing quarry, is used almost exclusively for quarry activity. The south side of Laytonville Dos Rios Road is used primarily for residential use. Surrounding uses are RMR20 (Upland Residential Use). A copy of the Vicinity Map and Site Map are included in Appendix A.

2.1 Physical Environment

Regional and Site Geology

Soils

Mineral Land Classification

The California Mineral Land Classifications System was established by the State to help identify and protect mineral resources in areas subject to urban expansion and other irreversible land uses that would preclude mineral extraction. To date Mendocino County has not been classified. A Geotechnical Report is included in Appendix C, which describes the underlying rock classification and limitations. Based on the geologic maps and the exposed formations at the quarry, the underlying rock consists of Coastal Belt Franciscan rock.

Soil Classification

The National Resource Conservation Service (NCRM) has performed a soil survey of the area. The survey classifies the on-site soils and provides general limitations. The soils in the area are identified as two different soil types: Hopland-Sanhedrin-Kekawaka complex (15-30 % slopes) and Hopland-Sanhedrin-Kekawaka complex (30-50% slopes). Over 70% of the project site is in the Hopland-Sanhedrin-Kekawaka complex (30-50% slopes) and provides for well-draining soil. A detailed Geotechnical report, which addresses slope stability, is included as Appendix C.

Existing Drainage and Grading Condition

The site drains into a tributary to Ten Mile Creek. The Laytonville Quarry receives a mean annual precipitation of 82". The existing quarry is located between two small watercourses. Both watercourses are class III watercourses. The setback from these watercourses was set at 25'. The runoff from the current quarry highwall and floor is routed through a series of three sediment ponds constructed as part of the original quarry design. They are designed to filter sediment before reaching any offsite watercourses. The series of three ponds were developed as a part of original reclamation plan and have been used and maintained

throughout the history of the quarry. The Existing Conditions Map is included in the MRP as Sheet 2 of Appendix B. The existing slopes above the quarry range in steepness from almost vertical to 3:1 or flatter. The oversteepened areas in the northwest portion of the quarry will be the initial areas to be reshaped to be compliant with this MRP. The existing quarry configuration accepts diffuse surface runoff from a limited drainage above the quarry highwall. The existing quarry contains runoff in the three sediment ponds on the existing floor of the quarry. The existing conditions are shown on Sheet 2, of the Mining and Reclamation Plan (MRP). The drainage documentation, included in Appendix D.1, was included in the original use permit submittal. The documentation notes that without infiltration the sediment ponds need to have a surface area of 3740 sf combined, with a minimum depth of 6 feet to adequately filter the sediment. This combined area of the two ponds on the upper quarry floor more than meet this area and depth. From these ponds the stormwater is directed through a culvert to the lower pond before leaving the site. The lower pond is a polishing pond.

The historic extraction rates vary from 7,000 CY to 48,000 CY with the average being approximately 14,794 CY/YR over the previous 10 year period (2003-2012) based on aerial topography comparison between. The maximum reported extraction over this period is 48,297 in 2004.

The sediment cleanout schedule is included as Appendix D.1 as well. Computations submitted with the original permit are included in same Appendix.

Water Demand, Water Supply and Groundwater

Water Demand:

The existing operation has two significant water demands: dust suppression during rock processing and dust suppression for the roads/quarry floor. No increase in water demand is expected as a result of the proposed project. The existing and projected demand is shown in Table 1.

Water Supply:

The applicant utilizes two separate water sources for the project. A small spring located southeast of the quarry will be used for domestic and utilitarian uses around the shop. This spring currently does not freely run to any watercourse, but seeps into the ground before running offsite. The water from the spring is transported to a 10,000 gallon water tank near the southeast corner of the shop via a 3/4" waterline. The capacity of the spring is 10 gallons/hour during the spring and fall. The second water source are the two ponds on the floor of the quarry. These ponds are established in bedrock and retain water from diffuse surface runoff during early spring and late fall. Processing is performed during these periods to utilize available onsite water. The combined capacity of the two ponds is 212,000 gallons, which is more than adequate for the water demand shown in Table 1. Pond #3 is also available for supplemental water supply should it be necessary or desired.

Table 1. Laytonville Quarry Water Demand

		Existing					Proposed				
Water Use	**Period**	**Max Daily Demand (gpd)**	**Max Weekly Demand (gpd)**	**Max Processing Rate (Tons/Hr)**	**Days of Operation**	**Total Water Demand (gal)**	**Max Daily Demand (gpd)**	**Max Weekly Demand (gpd)**	**Max Processing Rate (Tons/Hr)**	**Days of Operation**	**Total Water Demand (gal)**
Processing				6 hours/day					8 hours/day		
	Peak Season @ 6 days/wk	3,750	22,500	400	20	75,000	5,000	30,000	300	15	75,000
	Off Season @ 5 days/wk	500	2,500	400	5	2,500	500	2,500	300	5	2,500
	Total Process Water Demand				25	77,500				20	77,500
Washing	Peak Season	-	-		-	-	0	0		0	0
	Off Season	-	-		-	-	0	0		0	0
	Total Wash Water Demand									0	0
Dust Suppression	Peak Season (Driest Days)	750	4,500		30	22,500	750	4,500		30	22,500
	Peak Season (Remainder)	500	3,000		90	45,000	500	3,000		90	45,000
	Off Season	0	0		30	0	0	0		30	0
	Total Dust Sup Water Demand				150	67,500				150	67,500
Total Water Demand						**145,000**					**145,000**

Notes:
Peak Season: June - October
Off Season: November - May
Processing does not occur every day.
Dust suppression assumed 6 days/week during peak season, 4 months
Dust suppression assumed 3 days/week during off season for only 1 months out of season, with no dust suppression for remainder (November only)
70 processing days based on 20,000 CY Peak production, assuming 85% processed.
Will use more dustoff to suppress dust for roads/

Groundwater:

The project is located in the mountainous area just east of Long Valley and the town of Laytonville. This area is located within the Franciscan Bedrock complex which in general is not considered water bearing[4]. Based on recent subsurface exploration and existing surficial conditions, two groundwater zones are apparent at the project area. Shallow groundwater which is percolating along the rock/overburden boundary and deeper groundwater percolating through fractures in the rock. The proposed lower quarry floor will be roughly 40' below the existing quarry and during the Fall of 2013, several borings in the existing quarry face recorded hydraulic head more than 10 feet above the existing quarry floor. Borings installed within the overburden recorded perched groundwater at a depth of less than 20 feet during the Fall of 2013. Water which seeps from the walls and is captured on the quarry floor will be pumped to the ponds on the upper quarry floor as necessary to allow for rock extraction. The floor will be graded to concentrate any captured water and keep sediment out of the concentrated water storage areas.

Water Quality

The existing quarry configuration accepts diffuse surface runoff from a limited drainage area consisting of 6.1 acres above the quarry highwall. A series of three rock lined brow ditches will be constructed on the south side of the quarry highwall to redirect non-industrial upslope runoff to the channel south of the quarry. The north side of the quarry receives limited runoff upslope of the quarry highwall due to the topography of the quarry/slope and does not require brow ditches. These ditches are shown on the grading plan, Sheet 4 of the MRP. All surface runoff associated with the quarry rock extraction is directed to the lower quarry

[4] (California Department of Water Resources, 2004)

floor where it is retained. All quarry operations are performed in conformance with the NPDES Industrial Permit for the quarry. A copy of the current Industrial SWPPP[5] is included in Appendix F. The primary sediment control BMPs will continue to be the existing sediment ponds and the redirection of offsite water away from the quarry highwall. As the lower quarry floor is developed, Pond #2 will be relocated to the lower quarry floor.

All toxics are stored in closed containers and are not subject to stormwater runoff. The fueling area, just to the west of the shop, is consists of two - 1,000 gallon diesel fuel tanks in a concrete containment. The volume of the containment system is 7,180 gallons. A complete list of stored materials is included in the SWPPP.

Climate

The inland Mendocino county climate is moderate. Summers are hot and winters are cold and wet. Average annual precipitation is 82 inches[6] with the majority falling between November and April. Average daily temperatures range from 45 degrees in January to 67 degrees in August, with average daily high temperatures ranging from 53 degrees to 83 degrees, although lows can reach into the upper 20s, and highs can reach above 100 degrees. Humidity ranges from 70-90% in the morning and from 25-75% in afternoon, summer and winter respectively. [7]

2.2 Vegetation and Wildlife

Vegetation

The Botanical Report (Hulse-Stephens, 2014)[8] was prepared for the project and is included as Appendix E. No listed plant species were found within the study area.

The existing disturbed portion of the quarry does not include much vegetation. Upland of the quarry is a Ponderosa pine/Douglas fir and oak forest. Non-native grasslands and shrubs extend north from the southern watercourse, above and north of the highwall to the northerly watercourse. The majority of the quarry floor is devoid of grasses and consists of exposed bedrock. Along the westerly perimeter of the quarry floor there is tall brush consisting of common manzanita, toyon and coyote brush. A few seeps are evident on the southeast slopes above the quarry. These seeps are not being disturbed. A small stand of fir forest exists between the shop and Laytonville Dos Rios Road. These trees will not be removed as they are the visual buffer between the quarry and the road. There is a stand of grasslands dominated by Harding grass and scattered with coyote brush between the highwall and the shrubland described above.

[5] (Rau and Associates, Inc., 2013)
[6] (USGS)
[7] (City-Data.com)
[8] (Hulse-Stephens, 2014)

Three sediment ponds were established under previous use permits to address water quality. Although there is evidence of riparian plants in these ponds, they were established and continue to be used for industrial use and are maintained annually by the operator.

Wildlife

A Biological Assessment was prepared by NCRM[9] for the project and is included in Appendix E. The database queries show the potential for 21 listed special species to be present. None of these species were found at the project site. A full listing of the species can be found in the Biological Report.

2.3 Land Use

Surface Mining Permit

The existing rock quarry has been operating for over 30 years under County Use Permits. The operator is now applying for a Use Permit renewal to continue operating the quarry for another 30 years. An initial application submittal was made in January of 2013, prior to permit expiration. However, OMR requested additional geotechnical review, which required additional borings and analysis. Additionally, the botanical survey for the spring needed to be completed to verify that no special species plants were present. The final permit submittal was resubmitted in August 2014. Mendocino County policy is to allow operators to continue to operate if a good faith effort is made towards obtaining the use permit renewal.

Existing and Allowed Uses

The project is located within a 43-acre parcel, APN 035-460-06. There is an easement over portions of the parcel to the north, APN 035-460-02, owned by Ms. Nordeman. Both parcels are in RMR - Remote Residential (RMR20) zoning. Mining and processing is allowed with a Major Use Permit. Surrounding parcels are also RMR20, with the exception of a few to the east that are zoned with RL, rangeland zoning. The nearest offsite residential structure is approximately 670 feet southwest from the west edge of the quarry. The nearest residential structure owned by the operator is a residence approximately 250 feet to the south. Laytonville Dos Rios Road is approximately 50 feet south of the shop at its closest point. The location of the project site with respect to the nearest structures and Comptche Ukiah Road are shown on of the vicinity map included in Appendix A.

Visual Setting

The existing operation occupies the entire flat area of the parcel and is fairly void of vegetation except for the two ponds on the quarry floor.

The undisturbed portion of the project area, above the quarry highwall, is characterized by Ponderosa Pine/Douglas fir and oak forests with small open meadows primarily used for rangeland use (agriculture/livestock) prior to the Quarry use. The existing quarry is visible

[9] (North Coast Resource Management , 2014)

from Laytonville Dos Rios Road for only very limited times. Brief views of the Quarry are visible from Laytonville Dos Rios Road at the main entrance as you head eastbound and again at the smaller utility entrance to the north as you head westbound. The majority of the site is obscured from view by the 50 foot tree buffer between the road and the quarry. This visual buffer will remain.

The quarry has very limited visible from Highway 101, where only the very top of the quarry can been seen, due to the topography downslope of the quarry. The highwall is visible from a few residents in the valley and from the high school, but the view is remote and the proposed quarry expansion will not be noticed. There are a few homes on the north ridge. The view from these residences are obscured by trees. Photos and a brief visual analysis are included in Appendix L[10] .

3.0 PROPOSED MINING OPERATION

3.1 Phasing, Mining, Engineering, and Drainage

The Operator proposes to extract an average of 11,000 CY of combined pit rock and overburden throughout the 30 year permit period, for a maximum combined extraction of 50,000 CY in any given year with an overall extraction of 325,000 CY. This is consistent with the previous use permit. The operator does not anticipate rock extraction to exceed 20,000 CY in any given year, but would like to retain the ability to extract 50,000 CY should the opportunity become available to sell overburden.

Multiple borings have been performed to determine the depth to bedrock and water. Three Geophysical borings have been completed and were used to assess stability. The boring locations and underlying rock mapping is shown on the Geophysical Plan, Sheet 3 of the MRP. A more detailed discussion of the findings and recommendations are included in the Geology section of this plan and in the Geotechnical Report included in Attachment C.

The method of extraction will be by bulldozer or front end loader. Some of the harder rock areas will require blasting prior to removal with construction equipment. Blasting would occur two to three times per year. Rock which will not require further processing will be loaded on trucks and hauled away.

The existing site and detailed topography of the project area is included as Sheet 2 in the MRP (Appendix B). Sheet 4 of the MRP illustrates the location of the topsoil salvaging and topsoil storage areas and required signage. The Grading Plan, Sheet 4 of the MRP, shows proposed finish grade contours for the rock extraction at the full limits of rock extraction. The potential grading limits for overburden storage (both temporary and permanent) are shown on Reclamation Plan, Sheet 8. The Reclamation Plan, Sheet 8, shows the reclamation areas and Sheet 9 shows the reclamation planting details.

[10] Photos from the quarry highwall and houses were provided by the operator. Visual analysis from Laytonville Dos Rios Road and Highway 101 or elsewhere was performed using Google Earth imagery, 2013.

Grading Criteria

Based on the existing exposures at the quarry and the additional Geophysical boring logs the configuration of the slope of the quarry walls will be determined using the following criteria in accordance with the Geotechnical Report included in Appendix C:

- Cuts:
  - Melange soils: 2:1
  - Fine Grained Material (soil): 1.5:1
  - Granular material/Moderately to intensely weathered bedrock: 1:1
  - Fresh to slightly weathered bedrock; 0.75:1 (Intermediate)
- Fills:
  - Overburden; 2:1 overall (Final)

A registered professional engineer or geologist shall review the slopes every 40,000 CY or when the grading is within 100’ of the final slope configuration, whichever is sooner, to confirm the slope criteria is met and stable.

Proposed Grading and Drainage Condition

Grading

The grading for the rock and overburden extraction is shown on the Grading Plan, Sheet 4 of the MRP. The cross sections are shown on Sheets 5-7. Benches shall be constructed at a maximum 50’ vertical distance and be a minimum 15’ in width. Where mélange soil is exposed intermediate 10' benches will need to be incorporated between the contact with rock. The overall slope of quarry is designed at 1:1 for the hard rock areas and 1.8:1 in the overburden or soil areas, including benches, in accordance with the grading criteria. The upper slope of the highwall, in overburden, will be graded to 1.5:1 slope. These slopes allow for a static Factor of Safety (F_S) greater than 1.9 and a psuedostatic F_S greater than 1.2. The Geotechnical report notes that these slopes are acceptably stable for the end use of rangeland and are considered to be adequately stable for industrial standards and the end use.

The floor of the existing quarry will be excavated approximately 40 feet below the existing floor elevation. This area will be used to store excess overburden and NOA material from the upper portion of the highwall and surrounding areas, as necessary. This overburden will be relocated to the northwest portion of the lower quarry floor, compacted and covered with topsoil to provide an overall 2:1 or flatter slope, unless sold as product. The overburden fill will be protected at the base by a gravel/rock lining up to 5' in depth. The grading complies with the slope criteria noted above. The lower quarry floor may contain up to 106,300 CY of overburden to an elevation of 2120, which is the upper quarry floor elevation. Overburden material not sold as product will be compacted to no less than 90%, except for the final top 18" which shall be 85% to encourage vegetative growth.

Drainage

The Drainage Design Documentation for the future conditions, included in Appendix D.2, concludes that the quarry floor will be adequate to contain 3 consecutive 100-year storm events without infiltration (conservative), with all overburden placed in the quarry floor.

As the lower quarry floor is developed pond #1 will be relocated to the lower quarry floor and will develop into a seasonal pond that will be used for rangeland use. A minimum pond volume equivalent to a single 25-year storm event (212,535 CF) should be provided at all times while the quarry is in operation. The minimum retention without infiltration will ensure that the water quality of the surrounding channels will continue to be unaffected by the operation.

As the quarry floor is lowered, the 6.1 acres of diffuse surface runoff will be captured and infiltrated into the floor of the quarry and only sediment from the upper quarry traffic and storage areas will be diverted into the existing sediment pond (#2) on the upper quarry floor and from there diverted to the lower pond (#3) below, west of the quarry floor. Cleanout of ponds #2 and #3 will continued to be cleaned annually, in accordance with the existing cleanout schedule. Pond #1, in the lower quarry floor, would be cleaned out as desired by the operator. In the event that water ponds to the rim of the lower quarry floor, overflow water will be directed to pond (#2) on the upper quarry floor via an overflow pipe, as shown on sheet 8 and 9 of the MRP.

The proposed quarry design will separate industrial and non-industrial runoff. All industrial runoff from the quarry operation will be directed to the quarry floor and retained. Non-industrially related runoff will be directed to the surrounding natural channels south of the quarry via three rock lined interceptor ditches. These ditches are shown on Sheet 4 of the MRP. The roads to and in the quarry will be watered during the dry weather periods or treated with dust prevention coating (Dustoff).

If seeps are exposed on the quarry wall, this water would drain to the quarry floor where it will be retained or infiltrated. As noted in the geotechnical report, any seeps that may develop as a result of the mining operation would be from percolating groundwater.[11]

3.2 Mining Equipment

The project will require the use of the following equipment:

- 1 – Crusher (rented)
- 1 – Screen (not rented)
- 2 – Loader (966D, 966C)
- 1 – Dozer (D9H)
- 1 – Water Truck (4,000 gallon)

[11] All water is expected to seep and flow overland to the floor of the quarry.

Two 1,000 gallon diesel fuel tanks are stored onsite just east of the shop. These tanks are stored in a concrete containment facility. To prevent rainwater from filling up the containment they will be covered.

3.3 Processing Operations

This project will also involve the use of crushing and screening equipment onsite. It is estimated that 85% of the rock will be processed. As noted previously, it is anticipated that the maximum annual rock extraction (excluding overburden) would be 20,000 CY with a maximum processing rate of 850 CY/day, or 300 tons/hour. Rock to be processed onsite will be loaded by front end loader into a portable screening and crushing plant. It is anticipated that the portable screening and crushing operation will be moved as the extraction of the quarry proceeds. It is estimated that the processing will occur 20 days out of the year maximum, with 3/4 of those days occurring during the dry season, as shown on Table 1. At the requested maximum rock extraction rate of 20,000 CY per year, the resulting operation would process approximately 17,000 CY of rock per year.

The water for dust control will be loaded into a water truck, which will be off-loaded into a storage tank. From there the water is piped to the screener/crusher. The screener/crusher system will be moved into and out of the flat area on the quarry floor as it is used. The amount of water needed for crushing/screening varies with the seasons. Overall water use is noted in Table 1.

3.4 Visual

The upper reclamation of the quarry highwall will eventually obscure the upper wall from the view in Long Valley. As noted in previous sections, the views are remote and the additional exposure during operations and in the interim will be insignificant.

3.5 Traffic

Maximum hauling could be up to 1,000 CY/day. Traffic generated during this peak hauling period is expected to be a maximum of 12 trip ends in a peak hour and 128 trip ends during a maximum day. Most jurisdictions do not require a traffic study unless there are more than 50 Peak hourly trips being generated by a project. This project falls well below that threshold and is consistent with the current use.

The Laytonville Dos Rios Bridge (Burger Creek Bridge), located approximately 5 miles east of the project site has an AADT of 137[12] in 2011. It is expected that the project site on Laytonville Dos Rios Road would have 2 times that amount to account for the residential uses closer to Laytonville. This would compute to be an AADT of 275 vehicles per day. The initial Environmental Assessment prepared for the 1992 Use permit noted that the section of Laytonville Dos Rios Road adjacent to the project site had an AADT of 200.

[12] (BridgeHunter.com)

Mendocino County growth rate is 1.83%[13]. Based on this growth rate the current AADT would be 293 vehicles/day. The project would not significantly impact the County road.

Since inception of the project the National Traffic Safety Data Base noted there have been no known accidents with the project area. Since the extraction rate will remain the same, and since the AADT is so small, the continued use will pose no significant impact. The National Highway Traffic Safety Administration website indicates that no traffic accidents have occurred in this area between 2008 and 2012 (latest available data)[14]. No further traffic analysis is warranted.

Traffic in this area generally travels at 25 miles an hour or less due to the tight curves to the east (R=150') and west (R=100') of the main approach. These curve radii can support a design speed of 25 mph. Assuming that drivers are traveling 5 MPH faster than the design speed, a minimum 30 mph should be used which would require a minimum of 215 feet of minimum sight distance. Sight distance to the east of the main access is approximately 425 feet. The sight distance to the west is obscured by a shrub and tree. This vegetation will be removed to provide a minimum of 215 feet or more if available, as noted on sheet 4 of the MRP.

The existing approach was improved in accordance with an encroachment permit as required by the use permit conditions of approval for the existing operation.

3.6 Project Reserves, Production, and Operating Life

Use Permit U 15-92 provided for an average annual extraction of 20,000 CY, with a maximum annual extraction of 50,000 CY, for 20 years. The permit renewal requests an extension of the permit with reduced average extraction rates for an additional 30 years/ based on borings at the site, it is unlikely that additional deposits are available beyond the limits of this project.

3.7 Operating Schedule and Work Force

Project operations will occur between the hours of 6:00 a.m. and 6:00 p.m. No nighttime operations will occur; therefore, there will be no night lighting. The operator and up to two employees comprise the workforce for this operation, aside from the occasional subcontractor who is used for blasting.

3.8 Utilities and Water Supply

Typical operations during the summer months will require dust suppression on the quarry floor and for processing. Projected daily dust suppression will require one water truck load per day during the dry summer months, which equates to approximately 4,000-5,000 gallons per day. Historical water use for the crushing process is approximately 3,000- 4,000 gallons per day and the remainder is used for dust suppression of the quarry floor. This operation is

[13] (2013 World Media Group, LLC, 2013)
[14] (National Highway Traffic Safeety Adminstration, 2008-2012)

consistent with the existing Mendocino Air Quality Management District Permit requirements included in Appendix G.

The water supply for the quarry operations will continue to be the existing sediment ponds shown on Sheet 2 and 4 of Appendix B. The two ponds on the upper quarry floor have a capacity of 212,000 gallons. The water is drafted from the ponds into a water truck and used for either the processing and onsite dust suppression. The use of "Dust-off" product may also be used reduce the use of water. The existing and proposed water demand is shown on Table 1.

The lower floor of the quarry, once fully established, can also retain water for use in dust suppression.

The existing shop has electrical, propane and telephone utilities. Propane is served via a tank. The project is served with a portable toilet that is serviced every other week.

3.9 Mine Waste Management

Naturally Occurring Asbestos (NOA)

The Geotechnical Report has identified an area on the southeast side of the quarry, within the proposed mining limits, that has Naturally Occurring Asbestos (NOA). There are two distinct area of NOA as shown on Sheet 2 of the MRP. One area is on the southwest corner and the other is a strip that runs north/south. It is estimated that up to 20,000 CY of NOA may be embedded within these specific areas. In one small area NOA may be embedded within the rock limits (Section 5), all other NOA areas are estimated to take place in overburden. As recommended in the Geotechnical report, the operator will overexcavate and remove this NOA prior to commencing with mining the remaining rock to be incorporated into product.

Prior to excavating in this area, the operator will flag the limits of the exposed NOA, and over-excavate the NOA material in advance of rock removal, and relocate the NOA to the quarry floor and cover with a minimum of 6" of clean overburden. During this operation, the material/face of the NOA rock will be wetted to prevent airborne transmission. During removal a geologist should be present to review and confirm the limits of removal. Additional mitigation includes periodic sampling of the exposed slopes to verify that NOA does not exceed the 0.25% limit. This sampling shall take place every 40,000 CY. A more detailed discussion of NOA is included in the Geotechnical Report included in Appendix C.

Overburden

Estimated overburden depths are shown on the sections and make up approximately 77,000 CY of the overall extraction. This volume includes the estimated volume of NOA discussed above. The majority of the overburden may be sold or stored onsite as appropriate. The overburden will be stored in the lower quarry floor. Fill slopes shall be no steeper than 2:1, seeded and mulched after disturbance prior to the wet weather each spring. The potential configuration of the stored overburden is shown on Sheet 8 and in the Sections on Sheets

5-7 of the MRP. A minimum amount of overburden (approximately 1,500 CY) will be retained to allow for minimum 6” NOA cover in the lower quarry floor during the operations and during final reclamation.

3.10 Public Health and Safety

Public exposure to the site will be minimal as the project is located behind locked gates and is difficult to access given the mountainous terrain. Since there is no exposure to the public, fencing is not required.

There will be no public exposure of the onsite NOA with the mitigation proposed in the above grading section.

3.11 Closure of Surface Openings

There will be no surface openings that need to be closed.

4.0 RECLAMATION PRACTICES AND ACTIONS

The reclamation of the quarry will be done to establish an end use for rangeland. A total of 5.7 acres will be reclaimed including the mining area, the product storage area and the topsoil storage area. The mine boundary extends approximately 50’ beyond the active working areas. The perimeters of the site and the upper wall areas are designed to provide an adequate factor of safety for the end use of Rangeland. The reclaimed areas, as shown on Sheet 8 of Appendix B, will be covered with topsoil, seeded and mulched in accordance with the specifications. The lowest portion of the floor, below elevation 2120, is expected to retain diffuse surface water in the early parts of the summer. Stored water will be used for rangeland purposes if available.

4.1 Responsible Parties

The sole responsible party for reclamation of the quarry, from topsoil stockpiling to monitoring, will be Laytonville Rock. A signed acknowledgment of this responsibility is included in the Reclamation Plan Certifications, Appendix K.

4.2 Subsequent Use and Impact on Future Mining

The end use of the project site will be for rangeland. The seed mix identified in Table 3 will allow for rangeland use in the future. It is unlikely that any further rock extraction would be feasible beyond that which is shown, given the limited rock resource and configuration of the terrain.

4.3 Reclamation Standards and Goals

The primary goal of this reclamation plan is to meet an end use for rangeland use. The practice of terraced quarry exploitation provides locations for the redistribution of topsoil to create planting benches. It is important to understand that while the principles of ecological restoration will be employed in this reclamation effort, the return of the quarry to its pre-existing landform is not possible. The endpoint of the reclamation is to stabilize the site, rehabilitate some of the prior ecosystem functions, establish a portion of the representative habitat, primarily the oak habitat where feasible, provide for visual mitigation and provide for rangeland use. This reclamation and visual mitigation plan proposes a moderate, but achievable, set of soil stabilization, ecosystem rehabilitation and revegetation goals. Site stability and drainage issues are address separately in the grading and drainage plans.

The secondary goal of the plan is to mitigate for the loss of oaks and to provide for visual mitigation. To achieve this goal, the upper 1.5:1 slopes will be replanted with oaks and shrubs. The perimeter of the floor of the upper quarry will be planted with native oaks and herbaceous vegetation to mitigate for oak loss. The interior of the floor will be reclaimed to allow for rangeland use by incorporating an open grassland area and a low area to catch diffuse surface water for seasonal water use.

The botanical report notes that the mining area has 5 different communities of vegetation: Ponderosa pine - Douglas Fir forest with a large component of native oak trees are established at the very upper (east) end of the mining area; Manzanita shrubland just below the forest and south of the quarry; Harding Grass Swards just above the quarry highwall and two communities of riparian plants associated with the sediment ponds and seasonally saturated soils on the slopes and flats.

The Oak Woodlands Conservation Act requires that intact oak trees that are impacted by the project subject to CEQA be mitigated. The location of the existing oaks are shown on Sheet 2 of the MRP. The oaks that could potentially be impacted are listed in the botanical report and are estimated to be as many as 65 oaks. The Reclamation Plan established the oaks based on this estimate, using a 3:1 replacement ratio and assumes a 50% die off rate, which resulted in planting of 390 oaks. However, this number is conservative, given that the location of the oaks were taken with GPS and the number included trees within 40 feet of the mining boundary. The actual number of oaks could be far less. To prevent over planting of oaks, a final oak count will be performed prior to reclamation to establish the actual number of oaks impacted. Any oaks within 10' of the quarry highwall are considered terminally impacted. Any additional oaks within 20' of the highwall will be monitored and, if they show distress, will be replaced. Ultimately a 3:1 ratio of surviving oaks will be required for all impacted (removed, terminally impacted and distressed) oaks. The areas of restoration to mitigate for the oaks are shown on Sheet 8 of the MRP. The computations for the oaks are included in Appendix M.

The remaining areas will be restored to provide an end use of rangeland, including open grasslands, shrub/woodland benches and an open area for seasonal water storage. These areas are also shown on Sheet 8 of the MRP.

4.4 Reclamation Schedule and Phasing

Mining will begin by bringing the northeast corner of the quarry into compliance, then subexcavating the quarry floor. This area will be used for storage of material containing NOA and unsold overburden from the upper face of the quarry. The operator then may proceed with further subfloor excavation or mine the face of the quarry as long as adequate overburden/NOA storage is available.

4.5 Demobilization and Overview of Reclamation Topography

4.5.1. Removal of Buildings, Structures and Equipment

The equipment is minimal (shaker and screen) and can be easily disassembled with a loader, mechanic and lowboy. All portions of the equipment will be transported offsite with a lowboy and sold as salvage (salvage value not considered in financial assurances). The buildings on the site (scale shack and office) will remain as outbuildings for general rangeland maintenance use. The storage containers and fuel tanks shall be removed. The scale will be removed and replaced with fill to allow access to continue to the east side of the quarry. The concrete bin blocks used for product storage and the underlying footing shall be removed, unless used for rangeland use (feed storage).

4.5.2. Roads

The existing road through the site (currently across the scale) and to the first bench will be left intact for rangeland purposes as shown on Sheet 8 of the MRP. There is no hard surfacing present. Where aggregate baserock road surfacing is present outside of the roadway to remain, it shall be removed and either reclaimed for product or hauled off.

4.5.3. Highwall Topography

The intermediate slope grading is shown on Sheet 4 of Appendix B. Sections through the quarry are included on Sheet 5-7 of Appendix B. See detailed discussion in Section 3 regarding the grading and slopes.

The final reclaimed slopes are shown on Sheet 8 of Appendix B. The placement of overburden in the lower quarry floor is optional, except for covering of NOA.

4.5.4. Cut Slope Stability

Because of the relative remote area, the setbacks to property lines and the proposed end use, the proposed Quarry configuration is considered to be adequately stable, as noted in the Geotechnical Report in Appendix C. Geotechnical review of the final cut faces is required to make sure that the slopes are graded to meet the criteria set forth in this MRP.

4.5.5. Drainage Diversion, Structures and Equipment

Interceptor ditches will be constructed above the south highwall to direct non-industrial water away from the quarry face during the operation. These channels will remain. All benches will be outsloped to allow drainage towards the quarry floor.

As noted previously the quarry does not intercept the natural channels and will only intercept diffuse surface runoff. A more thorough discussion was included in Section 3.

The existing ponds at the end of the quarry grading operation shall remain in place, as will the pipes to allow wildlife and general rangeland use (watering). Pond #2 will function as a safe overflow in the event that the lower floor of the quarry fills up to the upper quarry floor elevation. At the discretion of the operator, the connecting pipes between the lower floor and Pond #2 and from Pond #2 to Pond #3 may be removed and replaced with open swales. Review of the swale size should be performed by a civil engineer to confirm adequate sizing. All channels, if used, would need to be rock lined.

4.6 Surface Preparation and Resoiling

4.6.1. Backfilling or Other Subsurface Preparation

Prior to reclamation the floor of the quarry shall be ripped to a depth of 4" prior to receiving topsoil. Hard rock surfaces may be overblasted in lieu of ripping. During the operation the overburden and the NOA will be transferred from the active mining area to the opposite side of the quarry, compacted and shaped to accommodate an overall 2:1 slope. Material containing NOA will be covered with a minimum 6" layer of non-NOA overburden. All overburden will be compacted to 90%.

4.6.2. Topsoil Stockpiling and Salvaging

Topsoil will be salvaged from the mining areas and relocated to the temporary stockpile areas. The salvage and storage areas are shown on Sheet 4 of Appendix B. It is estimated that approximately 12,000 CY of topsoil is needed for restoration. The temporary topsoil stockpile will be limited to a 6’ depth, shaped with maximum slopes of 3:1, compacted and seeded prior to October 15. All stored topsoil will be compacted to 85% and track-walked perpendicular to the slope prior to seeding/planting. Temporary topsoil areas shall have signage indicating that the stockpile is topsoil and not to be disturbed.

Overburden may be used in the haul road base, as fill for access roads or may be processed into quarry rock products. Sediment may be processed or blended into quarry rock product/s or used as an additive to the topsoil; depending on gradation. Overburden and other rock products not to be incorporated into the topsoil shall be kept separate from topsoil and other growth mediums.

4.6.3. Final Topsoil Placement

At final reclamation, the planting areas will be covered with topsoil to the depth shown on the plans, ranging from 8" to 24". Areas to be reclaimed shall be done in accordance with

Sheet 8 of the MRP. These areas are described below in more detail. Placement of topsoil shall be completed, compacted to 85% and track-walked perpendicular to the slope prior to seeding.

In the NOA areas a 6" depth of NOA-free material shall remain over the NOA, reshaped and reseeded being careful not to mix the cover material into the underlying material containing NOA.

4.7 Reclamation Strategy

4.7.1. Upper Quarry Floor

The goal of the reclamation in this area is to restore a mosaic of self sustaining native oak woodland for oak mitigation or grassland habitat. This would allow rangeland uses on the upper quarry floor. Reclamation of these areas will be accomplished by planting oak tree species, hydroseeding of herbaceous species and control of invasive exotic plant species. The selection of the oak species to be installed at this site was guided by the dominant native species to be impacted by the project, the physical conditions of the site, and the composition of the existing plant communities. This area will be reclaimed as Oak Woodlands (100%; 1.61 Acres). The Upper Quarry Floor oak woodland planting area is shown on Sheet 8 of the MRP. The area south of the scale (0.40 acres) will remain in its current condition for rangeland maintenance and storage use. All buildings will remain for same use. Storage units will be removed.

If the number of oaks that are impacted by the project are less than anticipated, the area of oak woodland may be reduced accordingly to provide for the 3:1 replacement after the anticipated 50% die off. The remaining area would then be reclaimed as grasslands if the area of woodlands were reduced. The reclamation plan assumes full woodland planting on the floor. The financial Assurances is based, however, on the current excavation and the anticipated disturbance in the upcoming year.

4.7.2. Lower Quarry Floor & Upper Topsoil Storage Area

The goal for this area is to provide an area that can be used for general rangeland use and continue to be stable. For the lower quarry floor this area must also withstand periodic inundation. This area will be reclaimed as grassland (100% 2.07 Acres). It is expected that the floor of the lower quarry will be inundated periodically. Because of this planting of oaks are not considered feasible.

4.7.3. 1.5:1 slopes

The goal of this area is to provide visual relief and for vegetation that would provide wildlife foraging and promote stability. These areas will be reclaimed with a mix of Oak Woodland (50% - 0.67 acres), Shrubland (25% - 0.34 acres) and Grassland (25% - 0.33 acres).

4.7.4. Benches

The reclamation goal of these areas is to provide for visual relief and stability. These areas will be reclaimed with woodland (50%-0.34 acre) and Shrubland (50%-0.34 acre).

4.7.5. Pilot Planting Areas

The northeast portion of the quarry will be graded to final limits and used as a Pilot Planting area, totaling 0.24 acres. The Pilot Planting area is shown on Sheet 8 of the MRP. This area incorporates all vegetative series and will resemble some of the most difficult areas to reestablish (benches and upper 1.5:1 slopes). The area shown is incorporated into the various areas noted above.

Pilot planting will be performed within 10 years of final reclamation to allow for planting, monitoring and adjustments in the plan and procurement of plants, should they be different from that specified. Monitoring and recording shall be performed in accordance with the monitoring sections of this plan. The success or failures noted for the Pilot Planting areas will be used to further refine and guide the Reclamation Plan. Any adjustments to the plan shall be submitted as a recommendation to the Planning Department. Prior to implementation of any modifications, these modifications shall be recommended and approved in writing by the County.

4.8 Revegetation

The reclamation will consist of three different planting series; Mixed Oak Woodland; Shrubland Series and Grasslands Series. The various plants are listed in Table 3 and 4. The computations for the planting/seeding quantities are included in Appendix M. A more detailed discussion of each planting series is included below.

4.8.1. Erosion Control

All disturbed non- rock surface areas shall be seeded in accordance with the Grassland Series, including non-planted areas within the Shrubland and Oak woodland series. Such seeding and fertilizing shall be performed between August 15 and October 15 of any year to provide the best conditions for germination. In each area, where noted, the additional woody plant series shall be incorporated.

4.8.2. Grasslands Series

For the grasslands portion of the project, the method of plantings will be to hydroseed with grass, forb and shrub species seen or known to occur in the project vicinity. The ecological reference site for the grasslands habitat is located in the grassland to the east, just above the quarry. The grassland is composed of non-native grasses/forbs. Native grass components of the hydroseeding mix represent remnant native species observed within the project area. Prior to hydroseeding, an ecologist shall confirm that the seeds collected for planting is weed free or be certified weed free.

The grassland habitat will become established in 1-3 years.

Seed Mix

Grass and forb species observed in the quarry during the biological reconnaissance are shown in Appendix E of this report. Numerous native grasses were identified. Among these are perennial grasses that include Wild rye (Elymus glaucus), California oatgrass (Danthonia californica) and slender hairgrass (Deschampsia elongata) and annual grass, Nuttal's fescue or three-weeks fescue (Festuca microstachys, formally known as Vulpia microstachys). In addition to these grasses, two other perennial grasses have been selected that are common in interior Mendocino County and adapted to exposed slopes. These grasses are California brome (Bromus carinatus) and purple needle grass (Stipa pulchra formally known as Nasella pulcra). Four native annual forbs observed on the site and recommended for including in the hydroseeding are; Spanish Clover (Acmispon americanus formally known as Lotus purshianus), California poppy (Eschscholzia californica), miniature lupine (Lupinus bicolor) and wildcat clover (Trifolium wildenovii).

Table 3 presents the seed mix and application rates of pure live seed. The percent of total cover for each species is targeted at 25 percent. However, the success criteria for grasslands will allow for reduction in coverage (only 70% cover required for success) and requires that a minimum of 3 of the grasses or forbs be present at final reclamation monitoring. This would allow for natural re-seeding and recruitment in the event that one species is more or less tolerant of the site.

Planting Locations

Grassland habitat will be established on the lower quarry floor, the upper topsoil area and on the 1.5:1 slopes at varying degrees of cover. Grasslands will be established for the full area of the lower quarry floor and upper topsoil area. For the remainder of the areas, the grasslands habitat will be the initial habitat for erosion control and dominated by the overstory habitat (Mixed Oak Woodlands and Shrubland) as they develop over the years.

Planting Procurement

Aerial Seed Procurement

The seeds listed in Table 3 are currently available through S&S Seeds and its Bay Area affiliate Pacific Coast Seeds. The sales manager, David Gilpin, may be contacted at (925) 373-4417. All seed shall be procured from lots derived from North San Francisco Bay Area ecotypes.

Seed Treatment

No treatment is recommended for the Shrubland seed or the other seeds in the mix prior to being mixed with the hydroseed slurry.

Site Preparation

If the final floor surface consists of unfractured bedrock, all compacted surfaces will be scarified or overblasted to a minimum depth of 4” below finished grade prior to placement of topsoil/overburden.

Plant Installation

Hydroseed Application Procedure

The entire quarry floor site and upper quarry slopes will be hydroseeded. The benches will be broadcast seeded (see following section) for erosion control. Seed will be thoroughly mixed to ensure that they are applied at the pure live seed rates shown in Table 3. Erosion control materials will be applied in a one-step application with the hydroseeding equipment. The one-step application will consist of the following:

- Seed mix + Wood fiber (800 lbs/acre) + Biosol (800 lbs/acre) + Potassium sulfate (215 lbs/acre) + Sulfur coated urea (344 lbs/acre) + Magnesium sulfate (215 lbs/acre) + Soil sulfur (215 lbs/acre)+ Non-asphaltic tackifier

The quarry floors, processing site, and upper slope areas will be hydroseeded between October 15 and October 30, unless restricted by wind or inclement weather. It is strongly preferred that hydroseed be applied prior to the onset of winter rains.

Broadcast Seed Application Procedure

The benches will be broadcast seeded. The plant species in the broadcast seed mix shall be identical to those in the hydroseed mix described in Table 3, which is the Native Erosion Control Seed Mix by provided by PCS. However, wood fiber, amendments, and tackifier will not be included in the broadcast seed mix.

The seed mix will be applied at the pound per acre rate described in Table 3. Seed will be uniformly broadcast using a hand held rotary seed dispenser or “belly-grinder” type dispenser. The seed will then be raked into the soil surface to a depth of 1/4 inch. A one-inch layer of straw mulch may be applied on top of the seedbed at the Operator’s discretion.

Vegetation Removal

Maintenance of the hydroseeded or broadcast seeded areas will include removal/control of CDFA listed noxious weeds during early monitoring years (1-5) at the time of regular maintenance activities for the woody plant areas to allow for establishment of desired species. Six species of CDFA listed weeds have been observed in the project area. These noxious weeds are Italian thistle (Carduus pycnocephalus), yellow star thistle (Centaurea solstatialis), Bull thistle (Cirsium vulgare), medusahead grass (Elymus caputmedusae), St. Johnswort (Jypericum perforatum) and French broom (Genista monspessulana). These species have potential to diminish available water and light resources from desired establishing plants. Grassland maintenance will consist primarily of monitoring and control of exotic weed species that invade the areas.

4.8.3. Oak Woodland Series

The oak woodlands will be planted on the upper quarry floor, the benches and on the 1.5:1 slopes. On the slopes and benches, the oaks will be planted in bunches to provide the 50% cover and make the upper slopes look more natural. Reclamation of these areas will be accomplished via active revegetation with woody plant species, hydroseeding of herbaceous species and control of invasive exotic plant species. The selection of the plant species to be installed at this site was guided by the dominant native species to be impacted by the project, the physical conditions of the site, and the composition of the existing plant communities.

Moderate oak woodland habitat is expected to develop at the site within approximately 30 years of plant installation. However, the long-term habitat goal to provide a vertical structure comparable to adjacent woodland is not expected to be achieved for 50 or more years, due to the slow growth rate of the trees to be planted.

Open grasslands will meet the criteria noted above in "grasslands". The oak woodlands portion of the project shall meet the criteria noted below.

Planting Locations and density

Tree density of 20-foot on-center triangular spacing (126 trees per acre) are typical for many revegetation projects. An averaged spacing of 14-foot on-center triangular spacing for trees is employed for this Reclamation Plan (180 trees/acre). The estimated trees are shown in Appendix M. This list indicates that the oak trees will exceed the 3:1 ratio of replacement after reclamation and after the allowed 50% die-off. The recommended planting represents overplanting of five tree species. As tree species take significantly longer to establish and produce seed than do shrub species, overplanting of tree species is desired. Moreover, tree species are deep-rooted and can accommodate modest overplanting without significantly increasing competition for nutrients.

Woody plants will be installed according to the planting zones previously described in the reclamation strategy and as shown on Sheet 8 of the MRP. Individual planting locations will be flagged following the completion of grading and topsoil spreading activities. It is recommended that colored flagging or another method of marking individual planting locations be employed.

Table 3. Grasslands: Seed Mix for Hydroseed and Broadcast Seed Areas

Common Name	Scientific Name	Type	Approx. Number of Live Seeds per Pure Live Seed Pound	Minimum % Germination	Pounds of Pure Live Seed/Acre	Live Seed per sq. ft.
California brome	*Bromus carinatus*	perennial grass	76,000	80	22.0	20.93
blue wild rye	*Elymus glaucus*	perennial grass	100,000	80	8.0	22.96
three weeks fescue	*Festuca microstachys (Vulpia microstachys)*	annual grass	300,000	70	4.5	41.32
tomcat clover or clammy clover	*Trifolium willdenovii or T. obtusiflorum*	annual legume	270,000	53	3.5	15.49
		TOTAL			**38**	

Planting Procurement

Reclamation will be accomplished through the planting of native tree and shrub species whose propagules (seed, cuttings, etc.) are collected from on-site oak woodland and shrubland habitats prior to their removal, as well as undisturbed habitats adjacent to the quarry. If a sufficient supply of propagules are not available adjacent to the sites, or the time gap between plant removal and reclamation is too long, the collection zone will be expanded to similar vegetative habitats in the Ten-Mile Creek watershed and further expanded to North Central Mendocino County ecotypes, as needed. The container sizes utilized for planting will include treepots, deepots and/or super cells specifically designed for habitat restoration purposes. Trees of the *Quercus* genus will include both container stock and/or acorns as appropriate. Container plants shall be hardened off (located) at the site for a minimum of one week prior to planting. Native plant nurseries are generally capable of conducting contract seed collection and contract growing services for the required plant material. Please note that qualified nurseries should be contacted two years prior to the anticipated planting date.

Container Plants

The container plants to be installed will be contract grown or available plantings acclimated onsite. Seeds and other propagules will be collected approximately one to two years prior to installation to allow sufficient time for the plants to grow before they are planted. Seeds for the target species are generally collected between late summer and fall. Plants shall be grown in super cells, treepot, or deepot containers, as indicated in Table 4, to encourage rooting deeper in the soil profile below grass roots.

A restoration ecologist should inspect the container plants upon delivery and prior to planting to ensure that they are healthy and vigorous. Container plants deemed unsuitable should be returned to the nursery for replacement. It is preferred that container plants be installed on or as near to the day they are delivered as possible. Tree health and vigor should be maintained if trees are stored between time of delivery and planting.

Direct Seed

Interior live oak, Oregon white oak, and black oak acorns, may be planted directly at the reclamation sites as an alternative to contract growing for these species. Tanoak is not a true oak and does not germinate well from direct seed. Direct seeding of acorns is particularly effective for replacement plantings for dead plants. If this planting method is chosen, it is preferable that acorns and seed material be collected and planted in the same season.

Collection Method

The following oak regeneration guidelines adapted from *Collection and Care of Acorns-A Practical Guide for Seed Collectors and Nursery Managers*[15] should be followed:
Acorn Harvest: 1.-Collection of mature acorns directly from limbs produces the highest quality seeds though most acorns are collected from the ground after they have fallen. 2.-Collection should begin when acorns start to fall. 3-Of the acorns that fall 5 to 10% are usually insect-infested or diseased and they should be discarded. 4-In species where the cup encases more than half the acorn (black oaks) cup scars on bottom of the acorns should be checked. If the cup scar is dark discard. Viable acorn scars will be yellow, or lighter than the acorn color. 5-Acorn age can be determined by holding the acorn to the ear and shaking. Acorns that rattle are very dry, in danger of losing viability and should be discarded. The rattle is caused by shrinkage of the cotyledons away from the interior of the pericarp. 6- Seed shall be kept in a cool, shaded place until planted. As little as 5% moisture loss will decrease acorn quality.
If oak acorns are not direct-seeded within four weeks following collection, then they may require stratification and pre-germination. If the Operator is not the acorn collecting agent, seed delivery should be requested just before installation, and only in amounts that can be planted the same day to prevent heating and desiccation which reduces germination.

Soil Amendments

Successful reclamation at mine sites throughout California often includes the addition of nitrogen stabilized organic amendment, inorganic fertilizer, and the judicious use of mycorrhizal innoculants. Surface soil on the upper slope will be amended utilizing stockpiled topsoil, as well as fertilizer and inoculated seeds applied via hydroseeding. Backfill placed in individual planting holes will also be amended. Soil amendments recommended per the Soils and Plant Laboratory for general container planting are summarized below. Surface soil amendment recommendations are discussed under hydroseeding.

Approximately 0.5 cubic foot of mycorrhizal inoculum (inoculum) will be harvested from the interface between the duff and topsoil within the adjacent oak woodland and Shrubland-Oak inoculum will be used on species of the oak vegetation series and Shrubland inoculum will be used for plants of that series. Inoculum and inorganic amendments will be uniformly mixed at the rates shown in Table 6. Two cups (16 ounces) of the tanoak series or Shrubland series inoculum/amendment mix will then be uniformly hand blended with soil removed from the planting holes and backfilled into the holes at the time of planting.

[15] (Bonner, 2003)

Site Preparation

Planting Terrace and Hole.

Prior to planting, a rectangular area measuring two-foot wide by three-foot long around each planting site will be scalped of herbaceous vegetation to reduce weed competition. A small back-sloped terrace will be cut into the slope with a pick-mattock and the excavated material will form a berm at the front of the terrace. A planting hole, 8-inches in width and 16-inches in depth, will be dug in the center of the terrace. This represents minor over-excavation for the purpose of creating a column of decompacted soil that is well mixed between the topsoil and subsoil – any rocks greater than 3-inches in diameter will be removed.

Soil amendments will either be placed in the bottom of the planting hole or blended with native soil removed from the planting hole in the amounts described per the soil amendment sub-section above. The amended soil backfill will be lightly compacted to remove air spaces between roots and soil.

Plant Installation

Woody plants will be installed in the planting areas after the onset of winter rains when the soil is moist to a depth of at least six inches. This typically occurs by December but may occur as early as November.

A survival-enhancing revegetation planting method commonly referred to as “collar and screen” planting will be employed. This method was developed at the University of California, Davis, and proven in the field by Circuit Rider Productions at multiple mine and quarry sites in northern California. This method yields high survival rates on most sites with little or no irrigation (*Acorn to Oak*, R. Thompson and L. Bush, 1979).

Container Plant Installation

A “collar” (i.e., one quart plastic dairy container with bottom cut off) will be placed into the planting hole. The over-excavated planting hole will be partially filled to the approximate depth of the nursery container. The plants will be gently removed from containers in such a manner that the root ball remains intact and is not bent or broken. Plants will be installed immediately after removal from the container. Matted roots on the sides shall be “fluffed” by hand or longitudinally sliced to ¼ inch deep. Matted roots on the bottom of the rootball shall be fluffed only. Trees exhibiting “J-roots” should be discarded. Plants will be watered in their nursery containers the morning of the day they are planted.

Seedlings will be placed in the collar so that their root crowns are at or slightly above (up to 0.5 inch) the grade outside the collar. The collar will be backfilled with in-situ soil and amendment and the tree adjusted so that the root crown remains at grade following soil settlement that occurs after initial irrigation. The area outside the collar will be partially backfilled and hand compacted.

Table 4. Recommended Plant Installation Specification for Upper Quarry Slope and Upper Quarry Floor

Layer	Common Name	Scientific Name	% Canopy Cover Goal for Series	On-Center Spacing (ft.)	Planting Position	Propague or Container Size	Number of Plants
Oak Woodland Vegetation Series							
Over-story	Tanoak	*Notholithocarpus densiflorus*	5	14	northeastern portion of slope near drip lines of existing trees in groups of 3-5	Super Cell/ Tree Pots	24
	Oregon White Oak	*Quercas garryana*	40	14	same as above, groups of 3-5	Super Cell/ Tree Pots	188
	Madrone	*Arbutus menziesii*	5	14	same as above, groups of 2-3	Super Cell/ Tree Pots	23
	Canyon Live Oak	*Quercus chrysolepsis*	20	14	same as above, groups of 2-3	Super Cell/ Tree Pots	94
Midstory	Interior live oak	*Quercus wislizenii*	15	14	northeastern portion of slope further away from existing trees in groups of 3-5	Super Cell/ Tree Pots	70
	Black oak	*Quercus kellogii*	5	14	same as above	Super Cell/ Tree Pots	24
Shrub Layer	Toyon	*Heteromeles arbutifolia*	10	8-14	Throughout northeastern portion of slope between tree in clusters of 5-10	Super cell/ D-pot	23
Shrubland Vegetation Series							
Tall	Manzanita	*Arctostaphylos manzanita*	60	8-14	throughout southeastern portion of the slope in clusters of 10-15	Super cell/ D-pot	283
	Mountain mahagony	*Cercocarpus betuloides*	5	8-14	same as above	Super cell/ D-pot	24
	Coyote Brush	*Baccharis pilularis*	15	8-14	same as above	Super cell /D-pot	70
	Deer brush	*Ceanothus integerrimus*	10	8-14	same as above	Super cell /D-pot	47
Short	Buck brush	*Ceanothus cuneatus*	10	8-14	same as above	Super cell /D-pot	47
Grasslands - Cover Goal for Planting Area: **See Table 3 for planting specifications**							

The protective screen will be wrapped around the outside of the collar two to three inches below grade forming a cylinder around the collar. A wire will be wrapped around the screen and twisted to hold the screen in place. The remaining backfill will be placed outside the collar and tamped firmly. The lip of the collar should be one-inch above grade and the soil depth inside the collar should match the soil grade outside of the collar.

The top of the screen will be folded over approximately one-inch, essentially enclosing the plant. Manzanita, buck brush, and buckwheat will be planted with a collar without a screen due to their low spreading growth form.

Plant Installation

Woody plants will be installed in the planting areas after the onset of winter rains when the soil is moist to a depth of at least six inches. This typically occurs by December but may occur as early as November.

A survival-enhancing revegetation planting method commonly referred to as “collar and screen” planting will be employed. This method was developed at the University of California, Davis, and proven in the field by Circuit Rider Productions at multiple mine and quarry sites in northern California. This method yields high survival rates on most sites with little or no irrigation (*Acorn to Oak*, R. Thompson and L. Bush, 1979).

Container Plant Installation

A “collar” (i.e., one quart plastic dairy container with bottom cut off) will be placed into the planting hole. The over-excavated planting hole will be partially filled to the approximate depth of the nursery container. The plants will be gently removed from containers in such a manner that the root ball remains intact and is not bent or broken. Plants will be installed immediately after removal from the container. Matted roots on the sides shall be “fluffed” by hand or longitudinally sliced to ¼ inch deep. Matted roots on the bottom of the rootball shall be fluffed only. Trees exhibiting “J-roots” should be discarded. Plants will be watered in their nursery containers the morning of the day they are planted.

Seedlings will be placed in the collar so that their root crowns are at or slightly above (up to 0.5 inch) the grade outside the collar. The collar will be backfilled with in-situ soil and amendment and the tree adjusted so that the root crown remains at grade following soil settlement that occurs after initial irrigation. The area outside the collar will be partially backfilled and hand compacted.

The protective screen will be wrapped around the outside of the collar two to three inches below grade forming a cylinder around the collar. A wire will be wrapped around the screen and twisted to hold the screen in place. The remaining backfill will be placed outside the collar and tamped firmly. The lip of the collar should be one-inch above grade and the soil depth inside the collar should match the soil grade outside of the collar.

The top of the screen will be folded over approximately one-inch, essentially enclosing the plant. Manzanita, buck brush, and buckwheat will be planted with a collar without a screen due to their low spreading growth form.

Direct Seeded Plants

Acorns may be installed prior to the onset of winter rains but will generally germinate at higher rates if planted between November and January. Begin planting after fall rains have moistened the soil to a depth of 8 to 10 inches. Cover acorns with 1/2 to 1 inch deep soil or deeper if depredation from rodents is visible. If acorn begins to germinate care should be taken to protect the tender root. The acorn should be planted with the root pointing down. Use a small diameter stick or screwdriver to make a hole for the root[16]. Stratified and pre-germinated acorns may be planted up to March 15. Acorn planting holes shall be prepared as previously described for container plants. Acorns will be installed one to two inches below ground and parallel to the soil surface. The narrow ends of the acorn shall be oriented toward the center of the hole. Three acorns will be installed in a four-inch equilateral triangle, centered in each planting collar.

4.8.4. Shrubland Series

The Shrubland series will be planted on the 1.5:1 slopes and benches. Reclamation of these areas will be accomplished via active revegetation with woody plant species, hydroseeding of herbaceous species and control of invasive exotic plant species. The selection of the plant species to be installed at this site was guided by the dominant native species to be impacted by the project, the physical conditions of the site, and the composition of the existing plant communities.

The Shrubland vegetation series will take approximately 5 to 10 years to become fully established.

Planting Locations & Density

The planting shall be in accordance with Table 4 specifications and as shown on Sheet 8 of the MRP. The averaged spacing of 11-foot on center triangular spacing for shrubs, is employed for this Reclamation Plan (527 plants/acre). The recommended planting represents underplanting of five shrub species. Shrub species are expected to increase by natural recruitment at a much greater rate than are tree species such that the balance between tree and shrub densities will equalize over time.

The underplanting of shrub species is mitigated in the following ways:

- spacing between shrub clusters will be a minimum of 30-feet apart, permitting the distance between plants in the same cluster to be reduced significantly;
- shrub species are expected to increase by natural recruitment at a much greater rate than are tree species such that the balance between tree and shrub densities will equalize over time.

Per the monitoring standards, a 50 percent die-off for woody plantings is acceptable. For this series cover is not a good indication of success. Planting density and a minimum die off rate will be used to establish cover. This allowance would result in an overall average survival density of around 393 shrubs per acre. The specified acreage for planting of each vegetative species is noted in Table 4. Initially, the entire reclamation area will consist of grassland habitat,

[16] (California Departmetn of Fish and Game, 2010)

which is expected to reduce to the noted cover goal acreage of grassland habitat (as noted in the Table 4) in the long term as increasing woody plant canopies shade out understory grasses.

Planting Procurement, Site preparation and Plant Installation

Plant procurement, Site Preparation and Plant installation shall be done in accordance with Section 4.8.

4.9 Maintenance Plan

Maintenance of all reclamation areas during the three-year plant establishment period will be the sole responsibility of the quarry owner/Operator. Basic maintenance will consist of all work and materials necessary to maintain the reclamation plantings, the water source, and general stability of the site during the three-year plant establishment period and subsequent five-year monitoring period accorded to each of the three stages, including the pilot planting phase.

Included in maintenance will be documentation of all maintenance work in a log, including repair of water sources, repair and maintenance of planting terraces, plants and plant protection hardware, reapplication of wood mulch, culling of extra seedlings, erosion control, and all other miscellaneous tasks necessary to maintain the reclamation areas. Plants will need to be self-sustaining without irrigation for two years prior to release of financial assurances.

4.9.1. Irrigation

The Operator, under the direction of a qualified restoration ecologist, will monitor the plants to determine the amount and frequency of irrigation and based on experience with the pilot planting phase. Typically, in Year 1, the plants will be irrigated with enough regularity (approximately 2-3 times per month), from March through October, to keep the soils within the root zone moist. The irrigation schedule in Year 2 will be based on the water requirements of the plants and is anticipated to be somewhat less (approximately 1-2 times per month). In Year 3, little irrigation (0-1 times per month) will be required. Actual irrigation of the site may vary depending upon the conditions of the plants. Precise irrigation requirements will be determined through site observations using an adaptive management approach toward irrigation

Each tree and shrub plant will receive approximately 0.5 gallon (4 dippers) of water during each irrigation. Water must be gently poured into each planting collar where it will be directed to the roots. This may require two passes due to the limited capacity of the collars.

4.9.2. Weed Control

Weeds within the reclamation areas will be controlled inside and around each plant collar, as well as within the backsloped planting terrace. Weeds will be hand pulled without disturbing seed, seedlings, plants, or their roots – preferably before seed heads have set. Weed-eating, post-emergent herbicide, hand pulling, or any combination thereof shall control weeds outside of backsloped planting terraces if needed. Care will be taken to avoid impacting any native woody species that offshoot from plantings or colonize the gaps between plantings during weeding. Weeding should take place during regularly scheduled irrigation visits since weeds are more easily removed after irrigation has softened the soil. During weeding activities, the level of

mulch required to maintain a weed free environment within the basins should be assessed. Additional mulch may be prescribed at this time.

Invasion of the revegetation site by invasive, non-native species, particularly starthistle in the grasslands, is a concern and shall be monitored during the three-year plant establishment period. Invasive weed species could significantly impede the development of the plantings and may reduce the diversity of plants and the aesthetic of the site. Hence, invasive, non-native species should be controlled as part of maintenance activities if deemed necessary by the monitoring biologist or restoration ecologist.

Should yellow starthistle be observed in some abundance during the first three years of monitoring, use of a selective broadleaf chemical control agent should be employed. Agents such as Garlon or Transline shall be applied early in the season (February to mid-March) when the starthistle seedling rosettes are less than 1.5” in diameter. No chemical spraying should take place during windy conditions. As an alternative, selective grazing may also be utilized in the open grassland portions of the reclamation area. Grazing should be kept to areas where starthistle is most dense to prevent significant reduction of other planted species and those locations noted on the Reclamation Plan.

4.9.3. Plant Protection

Screens wired onto collars installed around plants shall be maintained in good working order during Year 1 and 2 of the plant establishment period. Once seeds have germinated and stem growth has reached the height of screen, the screen will be opened at the top to allow the tree leader to grow. If browse becomes heavy on the planting benches, either apply screens to those collars or fence out deer at either end of the quarry bench. At Year 3, the conditions of protective hardware and plants overall health will be evaluated and the protective hardware shall be removed if appropriate. All protective hardware will be removed upon successful revegetation.

4.9.4. Plant Replacement

Dead plants will be replaced using the same species and methods as described in this Reclamation Plan or per recommendations of a qualified restoration ecologist. It is assumed that replacement plantings will rely heavily on direct seeded acorns and buckeyes in existing planting spots. This way monitoring activities will not be discontinuous due to the time lag to nursery grow and outplant replacement plants.

4.9.5. Natural Recruitment

Due to the shrubland and oak scrub woodland vegetation preserved adjacent to the mitigation site, as well as seed cascading down the slopes from earlier phases of reclamation, natural recruitment of native trees and shrubs from adjoining areas is expected to occur. Care must be exercised to minimize damage to naturally recruited plants during site maintenance. Native plants which enter the mitigation planting areas as volunteer seedlings, offshoots, or by spillover from adjacent natural areas shall be protected and their expansion encouraged. Poison oak shall be allowed to spread into the project to the extent that worker safety can be maintained. Maintenance personnel must be trained to differentiate between native and non-native species.

4.9.6. Schedule

The first year of maintenance for any of the three stages of reclamation will begin on the first day following acceptance of the installation phase by the project owners or their representative. The minimum frequency for Operator's site visits during the maintenance phase shall be the following:

March 1 through September 30

Year 1 – once every 10 days
Year 2 – once every three weeks
Year 3 – once every month

October 1 through February 28

Year 1 – once every month
Year 2 – once every six weeks or after large multi-day storms
Year 3 – once every other month or after large multi-day storms

Frequency of visits may need to be increased to address irrigation needs based on the adaptive management approach described above. The plant establishment period and associated site maintenance will be extended if human intervention is required to sustain the success rates noted. If the success rates are achieved after year 2 without human intervention, monitoring may be terminated.

4.10 Monitoring

The purpose of the monitoring plan is to track vegetation establishment, assess the degree of revegetation success, and provide a basis for adaptive management recommendations. This will be achieved through both quantitative and qualitative monitoring activities. The goal for success is to have all areas self sustaining for two years without human intervention.

Quantitative monitoring will occur once annually during the mid-growing season (June) following plant installation in order to measure the success of revegetation against the performance criteria and final success criteria established in this Reclamation Plan. Quantitative measurements of percent survival, percent vegetative cover, and plant health and vigor will be collected, analyzed, and reported to OMR.

Moreover, one additional annual site visit will be conducted near the end of growing season (October) in Year 1 and 2 to qualitatively assess vegetation establishment and to monitor vegetation maintenance. The purpose of qualitative monitoring is to assess the overall performance of the vegetation and to ensure the adequacy of the maintenance plan. Results of qualitative monitoring will be internal and inform adaptive management recommendations.

Qualitative assessment of the following factors will be made during site visits:

- Vegetation establishment with special attention paid to areas lacking vegetation
- Mortality of planted shrubs and trees
- Plant species composition

- Slope stability and erosion
- Formation of seeps
- Irrigation and maintenance of planted trees and shrubs
- Invasion of revegetation site by non-native, invasive weeds
- Other pertinent site conditions that may influence plant establishment

A qualified biologist or restoration ecologist will perform the site monitoring.

4.10.1. Performance and Success Criteria

The success of reclamation will be evaluated based on the quantitative performance and success criteria summarized below. Performance criteria are interim standards or project milestones that should be achieved for the project to meet the final success criteria that it must achieve. The survival percentage for trees and shrubs is best suited as a measure of density and cover. The percent of cover for grasses/forbs is best suited as a measure of density for grasses, as it can be almost impossible to measure density of grasses[17].

i. Tree and Shrub Plantings

Years 1–2 Performance Standard: At the end of the Year 1, 80 percent overall combined tree and shrub survival with a minimum of 4 oak tree (woodland) or 3 shrub (shrubland) species surviving with a health and vigor rating of 2, averaged across all species. If criteria not met see remedial measures in section 4.11.

Years 3–4 Performance Standard: At the end of the Year 3, 65 percent overall combined tree and shrub survival with a minimum of 4 oak tree (woodland) or 3 shrub (shrubland) plant species surviving and a health and vigor rating of 2.5, averaged across all species .If criteria not met see remedial measures in section 4.11.

Year 5 Success Standard: At the end of the Year 5, 50 percent overall combined tree and shrub survival with a minimum of 3 oak tree (woodland) or 3 shrub (shrubland) plant species surviving and a health and vigor rating of 3, averaged across all species. When this success standard is met following two years without human intervention, further monitoring is not required. If criteria not met see remedial measures in section 4.11.

ii. Hydroseeded Grasslands

Year 1 Performance Standard: In Year 1 there will be 50 percent vegetation cover of reclaimed grassland, either by the grass, forb, and shrub species in the hydroseed mix or by naturally recruited native or naturalized grasses and forbs occurring in the reference grassland site. A minimum of 3 grass/forb species shall be present. If criteria not met see remedial measures in section 4.11.

Year 2 Success Standard: In Year 2 there will be 70 percent vegetative cover in the grassland habitat with the plant types described above. A minimum of 3 grass/forb species shall be

[17] (California Conservation, Office of Mine Reclamation, 2003), Page 92

present. When this success standard is met following two year without human intervention, further monitoring is not required. If criteria not met see remedial measures in section 4.11.

There are no performance and success criteria for broadcast seeded areas because herbaceous cover is intended for topsoil stability and grassland habitats are not the intended climax community.

4.10.2. Monitoring Methods

Semi-permanent transects will be established at random locations throughout the three vegetation series, i.e., mixed-oak woodland, shrubland, and grasslands. Two metal t-posts will be pounded into the ground at either end of the transect line. Percent woody plant survival (aggregate and individual species), as well as percent herbaceous vegetative cover (all herbaceous species combined) will be measured using the line intercept method (Bonham 1989). The total number of transects will be determined by evaluating the average survivorship and cover values obtained over increasing numbers of quadrates and transects. The number of transects used will be the point where additional samples do not substantially change the average plant survival or cover value obtained (Kershaw 1973). The sample area may be slightly increased or decreased after initial data are collected and analyzed and the requisite sample surface area is re-assessed.

i. Tree and Shrub Plantings

The **percent survival** for aggregate woody plant species across the woody plant associations will be estimated by simple count of all living tree seedlings and shrubs divided by the total number of marked planting locations by transect and for all transects. For benches trees and shrubs within 6 feet either side of the transect center line will be counted. The 12-foot maximum transect width will be equally applied to the upper slopes and upper quarry floor.

- **Average health and vigor** will be determined by species for trees and shrubs in Years 1, 3, and 5 to determine which species are best adapted to site conditions. Species counted along the transects will be rated for health and vigor. Those species with the highest health and vigor rating will be used for dead plant replacement. The average health and vigor by shrub and tree species will be determined based on the following scale:

Ratings	**=**	**Health and Vigor**
0	=	Dead
1	=	Very Low Vigor
2	=	Low Vigor
3	=	Moderate Vigor
4	=	High Vigor
5	=	Very High Vigor

ii. Hydroseeded Grasslands

Vegetation cover is a good measure of the grassland establishment and correlates with relative density and species richness. Therefore, the percent vegetative cover will be quantitatively monitored in Years 1 and 2 to evaluate the development of herbaceous vegetation. Herbaceous growth will be measured using photo monitoring in accordance with UC Monitoring method[18]. Monitoring will occur twice during the first year (once just after establishment) and thereafter during peak herbaceous growth periods around June and July. Monitoring will occur for two years or until success criteria are met.

4.11 Remedial Measures

4.11.1. Tree and Shrub Planting Remedial Measures

If the percent survival falls below 80 percent in Year 1 and below 65 percent in Year 3, then all dead trees and shrubs will be replaced via container planting or direct seeding of acorns. The most robust plant species exhibiting high survivorship would be utilized to replace the dead individuals; however, the minimum species richness noted above shall be considered when choosing replacement species. Adaptive management measures to increase survival could include additional plant protection hardware, deeper irrigation basins, more frequent irrigation, an increase in weeding, mulch or soil amendment, etc. If woody plant survival is just slightly under the success standard, then naturally recruited woody plants would be protected and counted.

If success criteria are not met in five years, then the reclamation methods will be re-evaluated and more intensive approaches will be developed and implemented with the prior approval of the lead agency and the State Department of Conservation.

4.11.2. Hydroseeding (Grasslands) and Broadcast Seeding Remedial Measures

If the percent coverage is less than 50 percent coverage in Year 1, then additional soil preparation and resowing of seed in bare areas by the hand and rake method will be employed. If the cover is still less than 70 percent in Year 2, then adaptive management measures, including additional soil placement, “rain for rent“ irrigation, direct transplant of grass plugs, and substitute species will be considered. If the richness of species is deficient, the botanist may suggest replacement species to supplement the variety and to use for reseeding.

4.12 Reporting

All monitoring results shall be noted on monitoring data sheets that will be developed for the project, similar to the attached Sample Data Monitoring Forms (Appendix I). Any recommended changes in the Reclamation Plan shall be discussed with the Mendocino County Planning Department prior to implementation. Monitoring findings shall be correlated with identified transects in the field, such that the findings can be replicated if necessary. Transect t-posts will also serve as photo-documentation points. A minimum of three photographs will be taken per

[18] (University of California, Division of Agricultural and Natural Resources, 2003)

reclamation area (12 total) during transect monitoring. Select photographs will be included in annual reports to further document monitoring findings.

Annual vegetation monitoring reports will be prepared in November of Years 1, 2, 3, and 5, or until final success is achieved, in each of the three stages of reclamation documenting the progress of vegetation establishment and Reclamation Plan performance for each phase. Milestones reached and problems encountered, including the adaptive management prescriptions being considered and/or implemented will be briefly discussed in each annual report.

4.13 Financial Assurances

4.13.1. Detailed Cost Estimate

Financial Assurance estimates shall be submitted within 30 days of approval of all conditional approvals from the County for review and approval by Mendocino County. The estimate will include the required 10 percent administrative costs for Mendocino County to provide annual inspections. Updated financial assurances will be prepared annually to address changes in the operation that affect the cost of reclamation and to update unit costs in accordance with SMARA requirements.

4.13.2. Payees

In the event of default by the Operator, the financial assurances will be set up in the name of the County of Mendocino and the OMR. The financial assurances document (bond or CD) will be submitted to Mendocino County within 30 days of approval of the Financial Assurance estimates.

In event of default by the operator, the financial assurances currently are and will continue to be set up in the name of the County of Mendocino and the Office of Mines and Reclamation.

4.13.3. Schedule of Releases

The time frames associated with the reclamation of each phase is dependent on the actual demand experienced and will be subject to change. The estimated completion phases are noted in the written Reclamation Plan contained herein. It is anticipated that financial releases will be associated with each of the following milestones:

4.13.4. Milestones

- End of Pilot Reclamation Planting
- Removal of Equipment/Structures
- End of Final Reclamation Planting
- End of Final Reclamation Monitoring

The initial cost to reclaim the quarry has been calculated based on the estimated area of disturbance over the upcoming year and the reclamation that would be required at the end of that year based on this MRP. The initial bonding cost will include the removal of all equipment. The costs to reclaim benches would be based on comparative percentage of lineal foot of benches. For each subsequent year the cost to reclaim the quarry will be based on the existing

disturbance area and the additional disturbance that is anticipated in the upcoming year less any reclamation areas that have met the success criteria.

The number of oaks that need to be planted in the reclamation areas are in direct proportion to the number of overall oaks anticipated to be mortally wounded, dead or removed (6:1). The financial assurances will estimate the oak loss based on the disturbance area in the upcoming year and base the number of oaks that need to be planted accordingly, to accommodate the 6:1 planting mitigation ratio, but no less than 150 trees will be included per the original reclamation plan. Appendix M should be modified annually to reflect the appropriate oak/shrub planting. If woodlands are reduced, the remainder of the upper quarry floor will remain as grasslands. The cost for grasslands reclamation will remain the same regardless of the oak planting, as all areas are initially seeded as grasslands for erosion control. Each year the disturbed oaks will need to be reassessed and oak planting areas increased to accommodate the mitigation ratio.

Once the reclamation planting is completed in any given area, in the first two years 25% of the reclamation costs will be included in the Financial Assurances to provide for remediation, if necessary, in addition to the monitoring cost itself. For the following two years 10% will be retained. Once the success criteria is met, regardless of the year, all Reclamation costs will be removed from the Financial Assurances for the area that is deemed successful. This progressive method of Financial Assurances estimation will be employed for the pilot planting areas and any areas reclaimed prior to the Final Reclamation. Monitoring costs will continue to be included in the financial assurances until the entire site is reclaimed successfully.

4.13.5. Initial Detailed Cost Estimate

In order to meet the Surface Mining and Reclamation Act (SMARA), we are including the following schedule of reclamation and the initial recommended bond amount to ensure that reclamation takes place. A detailed Financial Assurances Estimate is Included in Appendix J.

A. <u>Backfilling, regrading, slope stability and recontouring.</u>

The pit will be reclaimed as shown in the MRP. The cost for the financial assurance is based on the existing conditions and the anticipated disturbance in the upcoming year, this work will also include reshaping of the upper slopes to conform to the reclamation plan grading criteria and to cover and restore the NOA areas.

The estimated cost is as follows:

Move and Recontour:	$ 10,450

B. <u>Revegetation</u>

When grading disturbs soil (as opposed to the pit/rock surface), grass seed shall be planted each fall between August 15 and October 31 of each year. However, the maximum revegetation would occur at the end of Phase II.

Estimated Revegation Cost:	$ 32,986

C. Drainage, diversion structures, waterways and erosion control.

The haul road will likely be graded each year prior to beginning the haul of material from the pit. It would also be likely that at the end of the season the roads will be graded for the winter. Culverts and ditches will divert the water into discharge points which will prevent erosion from occurring on the road. This is inlcuded under the work described in item “A” above, but it is rewritten here to acknowledge and identify the specific standard. There is no additional cost associated with complying with this standard.

Estimated Drainage/erosion control Cost: $ 6,374

D. Stream Protection.

As Noted above, no streams will be affected by the project. There are no additional costs with this item because it will be accomplished by recontouring under Item “A” and as drainage development in Item "C" above.

E. Building, Structure and Equipment Removal.

There will be no buildings or other structures associated with the pit rock extraction process. Equipment to push the pit rock into piles and load it onsite are existing at the Laytonville Rock property. No additional costs are anticipated to get this equipment to the site. The cost to move in and move out a portable crusher is the only cost.

Estimated Equipment Removal Cost: $ 5,635

In summary, the maximum cost of performing items in any given year are estimated to be around $55,446. This amount includes markups for mobilization, supervision, contingencies and county administration. Thus it is recommended that the initial amount of financial assurances required by Section 2773 of SMARA be set at $55,446.

Payees

In the event of default by the operator, the financial assurances will be set up in the name of the County of Mendocino and the Office of Mines and Reclamation.

4.13.6. Schedule of Releases

Releases shall be based on withholding 25% of the costs of drainage and revegetation in year 1 & 2 of monitoring and 10% in year 3 & 4 of monitoring.

Completion Phase	Year	Monetary Release	Bond Amount
During Mining	Year 1 – Year 25	$0	$55,446
Pilot & Reshape face	Year 25 – Year 30	$16,473	$38,973
Completion Revegation +1 Yr Mon.	Year 31	$27,237	$11,736
Completion 1 Yr. Mon.	Year 32	$1,110	$10,626
Completion 1 Yr Mon, release 15%	Year 33	$5,204	$ 5,422
Completion 1 Yr. Mon.	Year 34	$1110	$ 4,312
Completion 1 Yr Mon, release 10%	Year 35	$4,312	$ 0

4.13.7. Basis for Costs to Complete Reclamation Actions

The costs for the reclamation were based on requirements set forth in the Surface and Mining and Reclamation Financial Assurances Guidelines[19]. The estimate included man and equipment hours and material necessary to complete each phase of the work. The hourly wages and equipment rates were based on the following sources:

1. California Department of Transportation Division of Construction, *"Labor Surcharge and Equipment Rental Rates,"* Effective April 1, 2012 through March 31, 2013.
2. General Prevailing Wage Determination Made by Director of Industrial Relations Pursuant to California labor Code Part 7, Chapter 1, Article 2, Section 1770, 1773 and 1773.1 for Commercial Building, Highway, Heavy Construction and Dredging Projects: Crafts, Operating Engineer (Heavy and Highway Work). August 22, 2011; Labor and Related Classifications, August 22, 2011, and; Teamsters, August 22, 2011.
3. Mendocino County Farm Supply
4. Pacific Coast Seed Supply
5. Center for Social and Environmental Stewardship

The current financial mechanism will be updated upon approval of this Reclamation Plan. Future Financial Assurances estimates are approximate only and should reflect the actual work necessary to reclaim the quarry in any given year and use the appropriate updated references.

[19] (California State Mining and Geology Board, July 23, 2004)

5.0 PREPARER'S SIGNATURE

Prepared by:
Rau and Associates, Inc.

8.29.14

Cathy A. McKeon — Date
Registered Civil Engineer — 51026

Reviewed by:
Rau and Associates, Inc.

8.29.2014

George C. Rau — Date
Registered Civil Engineer — 21908
Registered Geotechnical Engineer — 00710

A Reclamation Plan Amendment shall be required prior to any substantial revision of this Mining and Reclamation Plan as required by SMARA.

6.0 REFERENCES

2013 World Media Group, LLC. (2013, December). *USA.com*. Retrieved December 2013, from www.usa.com/mendocino-county-ca.html

Bonner, F. (2003). *Collection and Care of Acorns - A Practical Guide for Seed Collectors and Nursery Managers.* . Retrieved August 2014, from http://www.nsl.fs.fed.us/collection%20and%20care%20of%20acorns.pdf

BridgeHunter.com. (n.d.). *BridgeHunter.com*. Retrieved December 6, 2013, from Laytonville-Dos Rios Bridge, Mendocino County California: http://bridgehunter.com/ca/mendocino/bh43905/

California Conservation, Office of Mine Reclamation. (2003). *Special Publication 123: Rehabilityation of disturbed lands in California: A Manual for Decision Making.* Sacramento: State of California.

California Department of Water Resources. (2004). *California Groundwater Bulletin 118, North Coast Hydrologic Region, Laytonville Valley Groundwater Basin.*

California Departmetn of Fish and Game. (2010). *California Salmonid Stream Habitat Restoration Manual, 4th Edition*. Retrieved August 2014, from https://www.dfg.ca.gov/fish/resources/habitatmanual.asp

California State Mining and Geology Board. (July 23, 2004). *Surface Mining and Reclamation, Financial Assurances Guidelines.* State of California.

City-Data.com. (n.d.). *City-Data.com*. Retrieved December 05, 2013, from http://www.city-data.com/city/Laytonville-California.html

Hulse-Stephens, G. (2014). *Botanical Survey of the Laytonville Quarry.* Ukiah.

John Harper, U. C. (2012, June 20). Livestock and Natural Resources Advisor. (R. A. Cathy McKeon, Interviewer)

Mendocino County. (2009). *Mendocino County General Plan, Resource Element.* Ukiah: Mendocino County.

Monares, L. (2013, December 05). US Army Corp of Engineers, San Fransisco North Branch Chief. (C. McKeon, Interviewer)

National Highway Traffic Safety Adminstration. (2008-2012). Retrieved December 06, 2013, from NCSA Data Resource Website: http://www-fars.nhtsa.dot.gov/QueryTool

North Coast Resource Management . (2014). *Biological Assessmenet for the Laytonville Rock Mining and Reclamation Plan.* Redwood Valley.

Rau and Associates, Inc. (2013). *Laytonville Quarry Industrial SWPPP.* Laytonville.

Transportation Research Board. (2010). *Highway Capacity Manual .* Transportation Research Board.

U.S. Census Beareau. (1990). *U.S. Census Beareau*. Retrieved June 13, 2012, from http://quickfacts.census.gov/states/06/06045.html

University of California, Division of Agricultural and Natural Resources. (2003). *Photo-Monitoring for Better Land Use Planning and Assessment, Publication 8067.* University of California .

USGS. (n.d.). *USGS California Streamstats*. Retrieved December 05, 2013, from USGS Streamstats: http://streamstatsags.cr.usgs.gov/ca_ss/default.aspx?

APPENDICES

A. Maps
B. Mining and Reclamation Plans
C. Geotechnical Report
D. Drainage Design Documentation
E. Botanical and Biological Report
F. Industrial SWPPP
G. Permits (NOI, MCQAMD)
H. End Use Notification
I. Monitoring Information
J. Financial Assurances Estimate
K. Reclamation Plan Certifications
L. Visual Assessment
M. 2014 Financial Assurances Planting Computation
N. Initial Study

RECLAMATION PLAN CERTIFICATIONS

MONITORING

Pursuant to CCR Section 2273 (a), the success of reclamation will be monitored for three years, or until performance standards are met, provided that, during the last two years, there has been no human intervention, including, for example, irrigation, fertilization, or weeding. Remedial measures will be implemented as necessary to achieve the performance standards.

LEAD AGENCY CERTIFICATION

I, the undersigned, hereby certify that this reclamation plan complies with the applicable requirements of Articles 1 and 9 (commencing with Sections 3500 et seq. And 3700 et seq., respectively) of Chapter 8 of the Division 2 of Title 14 of the California Code of Regulations, and with the requirements of the Surface Mining and Reclamation Act, Sections 2710 et seq.

Signed this _____day of _____, 20__

Planning Director

STATEMENT OF RESPONSIBILITIES

I, the undersigned, hereby agree to accept full responsibility for reclamation of all mined lands as described and submitted herein and in conformance with the applicable requirements of Articles 1 and 9 (commencing with Sections 3500 et seq. and 3700 et seq., respectively) of Chapter 8 of the Division 2 of Title 14 of the California Code of Regulations, the Surface Mining and Reclamation Act, Sections 2710 et seq. and with modifications requested by the administering agency as conditions of approval.

Signed this _____day of _____, 20___

Mine Operator or Operator's Agent

APPENDIX A:

MAPS

APPENDIX B:

MINING AND RECLAMATION PLANS

APPENDIX C:

GEOTECHNICAL REPORT

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