SURFACE MINING AND RECLAMATION PLAN

SIMPSON – GLENDALE BAR

Randy Sundberg
GR Sundberg Incorporated
5211 Boyd Road
Arcata CA 95521
707 825-6565

SEPTEMBER 2016

TRINITY VALLEY CONSULTING ENGINEERS
67 Walnut Way / Post Office Box 1567
Willow Creek CA 95573
530 629-3000

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I GENERAL INFORMATION

For a detailed discussion of the project, potential impacts, reclamation, performance standards and project monitoring, please see Sections II., III., V., VI., and VII.

1. Project Name:

Simpson - Glendale Bar - Surface Mining and Reclamation Plan.

2. Project Description:

Application for a Conditional Use Permit/Mining Plan/Reclamation Plan for the seasonal extraction in Humboldt County of up to 6,300 cubic yards of sand and gravel per year from river gravel bars.

3. Other Approvals Required:

Division of Mines and Geology Mine I.D., U.S. Army Corps of Engineers Section 404 permit, Lake and Streambed Alteration Agreement with CA Dept. of Fish and Game, Regional Water Quality Control Board Clean Water Act Section 401 Certification.

4. Applicant:

Randy Sundberg
GR Sundberg, Incorporated
5211 Boyd Road
Arcata, CA 95521
(707) 825-6565

5. Operator

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6. Property Owner and Owner of Mineral Rights

Garth and Linda Sundberg 1150 Vista Drive
McKinleyville, CA 95519
(707) 599-0132

7. Agent

Trinity Valley Consulting Engineers
67 Walnut Way
Willow Creek, CA 95573
(530) 629-3000

8. Site Location and Vicinity Maps

Located along the Mad River, River Mile 8, on the Arcata North 7.5' Quadrangle, within portions of Section 13,14, & 23, T6N, R1E, H.B.&M. The site is accessed from the east side of Highway 299, at Glendale and then proceeding west bound on Glendale Drive in Humboldt County (APN 504-131-02& 04, 516-161-04). The portion of gravel bar on this property is approximately 27 acres, as depicted on the site maps. This site is adjacent to an existing construction/storage yard located uphill from the river on the same parcel. See attached Project Vicinity Map (Figure 1), Project location Map (Figure2), Typical Mining Plan/ 2011 Aerial Photograph (Figure 3).

9. Access Route

Access and removal routes are as follows:

From Eureka travel northbound along Highway 101 towards Arcata and exit east on Highway 299. Travel east along Highway 299 and take the Glendale exit at the town of Glendale. Proceed west along Glendale Drive approximately 1320 feet to the entrance located on the left or west side of Glendale Drive.

10. Lead Agency Information

Humboldt County Planning and Building Department
3015 H Street, Eureka, CA 95501
(707) 445-7541

11. Limitations on Operations

The Mining Activities shall be generally take place during daylight hours Monday through Friday (7:00 a.m — 6:00 p.m.). Weekend extraction will occasionally occur contingent upon market demand or a shortened extraction season.

12. Project Commencement Date

This quarry operation is expected to commence immediately following the Lead Agencies approval of the Surface Mining and Reclamation Plan.

13. Project Termination Date

The proposed project termination date is 15 years from the approval of the Conditional Use Permit. Due to the length of time the Lead Agency review requires, the actual date of the public meeting and subsequent approval cannot be determined at a level that would establish actual dates.

14. "Benchmark" Stations

Permanent monitoring "benchmark" locations have been established at the site in accordance with the Lead Agencies Interim Adaptive Management Plan and will

continue to be utilized throughout the duration of the project. The "benchmarks" are annually surveyed by Trinity Valley Consulting Engineers, and have coordinates established utilizing a datum (NGVD 88 & NAD 83) required by the Army Corps of Engineers as well as the Lead Agency. These locations shall be utilized as control points with which to monitor annual extracted volumes of aggregate materials. The monitoring of extracted volumes shall be generated on an annual basis for active mining pursuant to this project.

15. Proposed Subsequent Use

Land use at the site will remain consistent with the current zoning. Due to the inherent nature of the instream setting, the site is annually reclaimed and replenished. The proposed projects lacks any infrastructure that would have to be removed and there are currently no plans on behalf of the land owner to change the land use or zoning from its current state.

The proposed project will consist of upland stockpiles well above the 100 year flood elevation. There are currently no plans to change the landuse or zoning from its current state by the land owner however, the county has several alternatives and the planning commission alternative would change the zoning to Conservation Flood Plain (CF).

16. Future Mining

Mining from within the active channel of a river such as this provides the site with annual reclamation and replenishment of aggregate materials. The proposed project has no impact on the sites ability to provide for future mining activities. At the conclusion of the 15 year CUP at this site, the site will still provide mining opportunities.

II ENVIROMENTAL INFORMATION

1. Environmental Setting

The Simpson Glendale Bar is located approximately 1320 feet west of downtown Glendale in Humboldt County, California (Longitude of approximately-124.02656735304 and latitude 40.899687864769) (Humboldt County 2015). The project consists of annually extracting aggregate from a river bar within the ordinary high water mark of the Mad River and within USACOE jurisdiction (HCPBD 1994).

The upper portion of the lower Mad River basin lies in a mountainous region, mostly forested with redwood and Douglas-fir trees. The forest distribution is described as being 37% fir forest, 24% redwood and 20% oak woodlands with small portions of annual grasses and pines. The river flows through confined topography, aligned along a northwestern trend. The lower and middle sections of the Mad River watershed are located in Humboldt County, almost entirely east of Highway 101, approximately 300 miles northwest of San Francisco, 15 miles north and east of Eureka. The river flows northwesterly, through or alongside the towns of Kneeland, Blue Lake, McKinleyville, and Arcata within the lower watershed. The lower portion of the river enters and flows along a broad alluvial valley beginning in close proximity to the Mad River Fish Hatchery, 1.5 miles upstream of Blue Lake. Topography becomes somewhat confined again as it reached the Annie and Mary Railroad (A&MRR) bridge and the Hwy 299 bridge. Below the 299 bridge, along the Arcata Bottoms, the river crosses a deltaic floodplain to its mouth.

Land use in the surrounding area is a mixture of private and industrial timber lands with the communities of Glendale and Blue Lake close by. Private lands include rural residential development, agriculture, highway commercial, recreational, as well as nearby retail commercial activities along Hwy 299 in Glendale and Blue Lake (HCDCDS 2008).

The climate of the Mad River basin is typical of north coast valleys and is characterized by heavy annual rainfall concentrated in the cool winter months, ranging from 40 inches along the coast to approximately 65 inches near Sweasey Dam, and a relatively dry, moderate summer. The upland slopes are covered by a mixed conifer-hardwood forest matrix, experiencing intensive historical logging activities, while the lower valley area has been largely converted to agricultural use with some urban areas interspersed throughout the valley. The active channel and floodplain are characterized by a variety of annual plants that grow during extended periods of low stream flow (HCDCDS 2008).

The project area utilized for gravel extraction operations at the Simpson-Glendale Bar totals approximately 19 acres. The approximate 19 acre project area for the Simpson Glendale Bar is located on three separate parcels totaling approximately 66 acres with a smaller stockpile area (2 acres) located above the flood plain.

Aggregate extraction techniques to be employed at the site vary due to concerns related to federally listed anadromous fisheries species present within this river reach. As such

NOAA Fisheries has designed descriptions for various techniques to be assessed and utilized when conditions are provided for a preferred alternative. These techniques are provided in further detail below as described within the Biological Opinion prepared for the Mad River (inclusive of this site).

Alternative extraction techniques will be used in place of Standard Method, if the involved agencies determine that such methods could be used to minimize impacts or enhance aquatic or riparian habitat. In the reach upstream of the A & M Railroad Bridge, extraction methods with a habitat improvement component will be given priority, if applicable at the site.

Extraction operations include excavating, grading, loading, and transporting sand and gravel from dry gravel bars to processing plants or existing, adjacent stockpile sites located at or above the 100-year floodplain. Excavation typically consists of removing the top layers of gravel on bars with heavy equipment such as dozers, loaders and dump trucks. A variety of gravel extraction and non-extraction activities are proposed that may be applied on a site-specific basis depending on gravel bar characteristics and proximity to sensitive salmonid habitat. The proposed activities are sorted into four groups according to their objectives:

- standard extraction methods,
- extraction methods with a habitat improvement component,
- committed habitat improvement actions, and
- optional habitat improvement actions.

In general, extraction methods change as the supply of gravel on easily accessible sites is reduced. The numbers of extraction sites following winters with high recruitment levels are typically less than those seasons following low recruitment winters, because fewer sites are needed to obtain planned volumes during high recruitment years than low recruitment years. In the reach upstream of the A&M RR Bridge, extraction methods with a habitat improvement component will be given priority, if applicable at the site.

Standard Extraction Methods

The primary objective of standard extraction methods is to extract commercial quantities of aggregate. Identification of specific extraction methods will occur during the annual pre-extraction planning process and will be proposed as part of the CHERT recommendation to the Corps for permitting by Letter of Modification (LOM) issued annually under the 10-year permit. These methods are generally used when there are sufficient aggregate deposits in easily accessible locations, such as exposed gravel bar surfaces.

Extractions located at or above the 2-year flood level will be limited so that no more than 10 percent of the area above the 2-year flood level is disturbed by mining at any given time. The 10 percent disturbance rate will be calculated on a per-bar basis so that regardless of ownership, no more than 10 percent of the 2-year and above floodplain associated with a given bar is disturbed at any time.

Narrow Skim
Narrow skims are no more than one-third of the bar width, as measured at the widest part of the bar, follow the shape of the bar feature, maintain the point of maximum height of the bar, and trend in the general direction of stream flow. These skims maintain a vertical offset corresponding to the water surface elevation of the 35-percent exceedance flow. Finished skims are free-draining and slope either toward the low-flow channel or in a downstream direction. These skims avoid the head-of-bar buffer, defined as the upstream one-third of the exposed bar surface. As described previously, the head-of-bar buffer may be decreased on a case-by-case basis provided that the extraction area narrows, tapering smoothly to a point, and remains below the upstream cross-over riffle. Narrow skims will retain the maximum lateral bar height.

Horseshoe Skim
Horseshoe skims remove gravel from the downstream two-thirds of gravel bars. A lateral edge-of-water buffer is maintained along the low-flow channel. The finished grade of the extraction area will have a downstream gradient equal to the river and a flat cross slope, and will be no lower than 1-foot above the low-flow water surface elevation as identified during the pre-extraction review. Cut-slopes will be left at a 2:1 (horizontal: vertical) slope except along the upstream side at the head-of-bar buffer where a 6:1 slope will be established. There will be at least a 15-foot offset buffer from the bank. The extraction surface will daylight along the downstream one-third to one-fifth of the bar to facilitate drainage following high runoff events. The horizontal and vertical offsets are intended to remove the excavation area away from the low-flow channel. Due to less frequent flow inundation, horseshoe-shaped skims may take larger flow events to replenish than traditional skim designs, depending on the unaltered bar height between the excavation and the stream.

Traditional Skim
Traditional skims do not exceed one-half of the bar width as measured at the widest point of the bar. This method does not extend beyond the upper one-third head-of-bar buffer and maintains a minimum skim floor at the water surface elevation of the 35-percent exceedance flow. This method will only be used at the Essex Bar and on gravel bars downstream of the A&M RR Bridge.

Secondary Channel Skims
Secondary channel skims are elongated, shallow skims in the area of dry, secondary channels, designed to be free-draining and open at either end so as to not impede fish passage/migration and to prevent any potential fish stranding. The upstream riffle crest, or elevation control of secondary channels, will not be affected by extraction proposals. The minimum skim floor of these excavations will be set at the 35-percent exceedance flow elevation.

Standard Trench
A trench is generally a long, narrow excavation parallel and adjacent to, but outside of, the wetted perimeter of the channel. Trenches will be connected to the wetted channel at the upstream and downstream ends to prevent entrapment of fish. This method will not be used upstream of A&M RR Bridge due to the presence of spawning habitat (CHERT 2008).

Extraction Methods with Habitat Improvement Components

Extraction methods with habitat improvement components are those that allow for harvesting of commercial quantities of aggregate, but also have a primary or secondary objective of providing habitat improvement. These methods include wet and dry floodplain pit excavations, restorative secondary channel skims, oxbow and alcove development, migration channel extractions, and high terrace skims. Other options may be developed by the applicants and NMFS that will allow for both the extraction of commercial quantities of aggregate and aquatic habitat improvement. Identification of specific methods will occur during the pre-extraction planning process and will depend on site conditions at that time.

Wet Floodplain Pits

Wet floodplain pits are irregularly shaped excavations (to avoid excavating riparian vegetation) located on the floodplain surface. Wet pits are typically shallow and allow for gravel extraction away from frequently inundated gravel bar surfaces and most salmonid habitat features. Floodplain pits will be located on surfaces at or above the 2-year flood elevation. Wet pits may have vegetation, either existing or planted, around their perimeter, and may contain some type of cover elements, such as woody debris. These features may also fill in with fine sediment, creating a seedbed in which native riparian vegetation could become established. Lower elevation wet pits should have a connection to the low-flow channel, or other frequently inundated secondary channel, to allow for seasonal salmonid use and reduce salmonid entrapment potential. The pits will be monitored for salmonids stranding after high flows have receded. The pre-extraction plan will include a monitoring plan that assesses the risk of salmonid stranding and includes a fish rescue plan.

Dry Floodplain Pits

Dry floodplain pits are irregularly shaped excavations (to avoid excavating riparian vegetation) located on the three- to five-year return interval floodplain surface and should not have a secondary channel inlet. An outlet connection to a secondary channel will be constructed to reduce entrapment potential and to provide velocity refuge during very high flows. The floor of the pit will not extend into the groundwater table. Dry pits will only fill with sediment during very high-flow events, on the order of every three to five years, and typically over a multi-year period. Dry pits may have vegetation, either existing or planted, around their perimeter. These features may also fill in with fine sediment that creates a seedbed in which native riparian vegetation could become established. The pits will be monitored for salmonid stranding after high flows have receded. The pre-extraction plan will include a monitoring plan that assesses the risk of salmonid stranding and includes a fish rescue plan.

Secondary Channel Skims

Secondary channel skims are described above. With proper design (e.g., variable topography, small side alcoves, introduction of anchored woody debris) these extractions can be used to create or improve high-flow habitat for salmonids. These channels could also be used as upstream adult salmonid migration corridors when water velocities in the main channel are high.

Oxbows
Oxbow extractions are narrow (average low-flow channel or less), linear, off-channel excavations along historical channel locations, typically defined on aerial photographs by curvilinear vegetation colonization, muted secondary channels, or as the toe of a moderate to high terrace or valley margin. Features should be located in the downstream half of the bar to minimize channel capture and could be excavated deeper than the adjacent thalweg. Natural oxbows that intercept hyporheic flow have historically been utilized by juvenile salmonids for rearing with good success. Oxbows could have willow vegetation and large woody debris placed in them to enhance their cover habitat.

Alcoves
Alcove extractions are typically located on the downstream end of gravel bars, where naturally occurring alcoves form and may provide velocity refuge for juvenile salmonids during high flows, and potential thermal refuge for juvenile salmonids during the summer season. Alcove extractions are irregularly shaped to avoid disturbance of riparian vegetation, and are open to the low-flow channel on the downstream end to avoid stranding salmonids. Alcoves are extracted to a depth either above or below the water table.

Migration Channel Excavation
Migration channels may be excavated in those locations where upstream fish passage into tributary channels is impeded by sediment deposits. These channels are constructed to connect main-stem channels to tributaries at lower flows than found in the pre-project condition, thus allowing easier access for upstream migrating adult salmonids, over a wider range of flows.

High Terrace Skim
High terrace skims extract gravel from the 10-year or greater floodplain. This area is excavated to the 35-percent exceedance flow elevation to promote backwatering and fine sediment deposition at higher flows. This extraction is expected to foster riparian vegetation development by creating a suitable seedbed that is at a low enough elevation so seedling roots can gain access to summer groundwater. Riparian vegetation establishment could also be enhanced by direct planting. The extraction may be phased over a number of seasons to cover the planned area. However, once a surface has been extracted, the subsequent riparian vegetation growth will preclude the site's use as an active extraction area well into the future (CHERT 2008).

Reclamation consists of ensuring the bar is left in a configuration so as not to increase the danger of trapping salmonids. Aggregate materials will be loaded on to trucks or off-road haulers, and be transported to the stockpile locations on site and at the existing permitted site in Guintolli or promptly taken to Eureka Ready Mix to be processed. Alternative extraction methods also include designs targeting salmonid habitat restoration (e.g. large woody debris installation).

2. Geology/Topography/Soils

The Mad River basin, with a drainage area of 497 square miles is dominated by confined bed rock walls within its upper and middle reaches, transitioning into the lower 12 mile alluvial reach. The Mad River basin lies entirely within Humboldt County, California and enters the Pacific Ocean just north of the City of Arcata. The project is located within a reach designated as "Lower Mad River" and begins where the river enters a broad alluvial valley (up to 2 mi. wide) at the hatchery, upstream from the City of Blue Lake. The project is located at approximately 50 feet above sea level (Stillwater Science 2010).

Most of the geology underlying the Mad River basin is that of the late Jurassic to late Cretaceous rocks of the Franciscan formation. Due to the steep terrain, locally weak earth materials, frequent seismic activity, and high levels of precipitation, many hill slopes in the Mad River basin are susceptible to mass wasting and surface erosion. The area is one of the most seismically active in the United States and active tectonicism helps contribute to high sedimentation rates observed in the basin through shearing of bed rock and uplift. The basin is one of several in coastal northern California with suspended sediment discharges of 5 to 50 times those of comparable size basins in the United States. Earthflows are recognized as one of the significant sediment sources in the region (Kelsey 1977).

For this reason, the Mad River and its tributaries are subject to high sediment loads. The presence of long-term high sediment loading within the Mad River system is demonstrated by the presence of extensive alluvial deposits throughout the area. In many cases, human activities in the watershed have resulted in significant increases in erosion and subsequent sedimentation (USEPA 2007). The Mad River Total Maximum Daily Loads (TMDLs) for sediment and turbidity are being established in accordance with Section 303(d) of the Clean Water Act, because the State of California has determined that the water quality standards for the Mad River are not met due to excessive sediment and turbidity. In accordance with Section 303(d), the State of California periodically identifies "those waters within its boundaries for which the effluent limitations... are not stringent enough to implement any water quality standard applicable to such waters." In 1992, EPA added the Mad River to California's 303(d) impaired water list due to elevated sedimentation/siltation and turbidity, as part of listing the entire Mad River basin, and consequently a TMDL analysis was completed for the Mad River (USEPA 2007).

The morphology at this site consists of the downstream extent of the broad alluvial reach that terminates near the downstream end of the project where another confined reach begins at the Annie and Mary Railroad (A&MRR) and extends downstream to the Highway 299 Bridge. Common trends in these low gradient alluvial reaches are meandering pool/riffle morphology (Stillwater Science 2010).

The project area has been mapped in Soils of Western Humboldt County (1965). No prime agricultural soils were identified that would be impacted by project activities. Soil-vegetation mapping units of the area rate the surrounding soils as either an industrial area in the case of the stockpile and processing area or highly productive for agricultural

activities to the west where no activities are proposed. No topsoil occurs within the extraction areas (Humboldt County 2014).

Division of Mines and Geology Special Publication 42 does not show any Alquist-Priolo earthquake zones within the project area. Resource mapping indicates that the closest seismic feature is an active fault (Blue Lake Fault) running in a north/south direction and located approximately 0.5 miles east of the project site. Humboldt County in general is at risk for strong ground shaking. In the North Coast Ranges, landslides and soil slips are common due to the combination of sheared rocks, shallow soil profile development, steep slopes, and heavy seasonal precipitation (NR&H Report; pg. 10-9).

3. Hydrology

The Mad River drains 497 mi2 in Humboldt County, California, and enters the Pacific Ocean just north of Arcata, with an average discharge of 15500 cfs (cubic feet/second). The drainage basin is underlain by highly erodible Franciscan Formation, which yields high loads of sand and gravel. The Mad River is confined within bedrock walls for most of its course, but its lower 12 miles are alluvial (Stillwater Science 2010). This reach, designated the "Lower Mad River" begins where the river enters a broad alluvial valley (up to 2 mi. wide) at the hatchery, upstream of Blue Lake. Major land uses in the Mad River that have affected the channel include dams, water development, highways and bridges, river engineering (flood control levees, rip-rapping, etc.), logging, agriculture, gravel extraction, urban development, road building, and recreation(HCDCDS 2008).

The major tributaries of the Mad River include the North Fork Mad River, with a drainage area of approximately 50 mi2, which enters the Mad River on the flood plain approximately 2 miles downstream from the hatchery; Canon Creek, with a drainage area of approximately 16 mi2, which is tributary to the Mad approximately 1.5 miles downstream of the old Sweasey Dam site (river mile 19.6); and Lindsay Creek, which enters the Mad approximately 200 ft. below the Annie and Mary Railroad (A&MRR) bridge, and has a drainage area of approximately 17 mi2. Other smaller tributaries also flow into the Mad River within the project area including Pilot Creek, Hall Creek and Mill Creek (Stillwater Science 2010).

The main-stem Mad River was listed as water quality limited due to sediment and temperature by the State of California. A Total Maximum Daily Load (TMDL) analysis was scheduled for completion in 2001 by the EPA under Section 303(d) of the Clean Water Act (USEPA 2006).

The Mad River's TMDL assessment classifies the Mad River watershed into four hydrogeological subareas; the subarea of interest to gravel extraction is the Lower Mad River subarea, which includes the North Fork of the Mad and its tributaries, Powers Creek, and Lindsay Creek (USEPA 2007a). Land uses that contribute sediment and turbidity in the Lower Mad River subarea are grazing and other agricultural uses, timber harvest, recreation, residential, transportation that includes highway bridges, municipal water supply, and gravel mining.

For the entire Mad River basin, landslides are the dominant natural sediment-producing sources, and roads are the dominant management related sources; road-related landslides and surface erosion contribute 62% of the sediment in the basin as a whole. In the Lower/North Fork subarea, 73% of the suspended sediment is road related, which is consistent with the highest road densities in the Mad River basin being found in the Lower/North Fork subarea (USEPA 2007a). Suspended sediment associated with gravel extraction would be included in "Total management related" sources, but gravel extraction was not considered a source in the modeling assessments that are the bases of the TMDLs.

CHERT recommendations and agency permits specify that skimming be performed at or above the bar elevation that corresponds to the 35% exceedance flow. One reason the 35% exceedance flow elevation was selected is that the river's suspended sediment is very high by the time water begins to flow over the bar surface. CHERT scientists have observed that at that flow, infiltration of precipitation moves fines from the surface to subsurface. By extending the time it takes the river to begin flowing over the extracted bar surface, there is more opportunity for precipitation to wash fines downward into the gravel profile, rather than washing them into the low-flow stream while water is still clear (CHERT 2008). The Glendale-Simpson project area is situated near River Mile (RM) 7, estimated using the map provided by the 2014 Mad River SPEIR. The wetted channel width at high flow varies from approximately 450 feet in the more confined reaches to approximately 1000 feet at the primary extraction area.

The PEIR (1994) stated that "the Mad River and its environments is a dynamic system, constantly changing....Because of the dynamic nature of the river system, it is not possible to forecast with precision how the river environment will change. This precludes the possibility of a fixed formula-based management and monitoring program. An objective of this preferred alternative management plan is to develop over time a dynamic set of adaptive mining and reclamation strategies that will respond to changes in the environment and in our understanding of the environment.....". Since the PEIR (1994), operators, consultants and CHERT have designed extractions within estimates of long-term and annual replenishment to minimize cumulative effects of extraction to Pacific salmonid habitat, and using scientific review of each extraction site to assess site-level replenishment to minimize effects to Pacific salmonids and their habitat on the site-scale. Natural bedload transport processes and rates determine annual extraction amounts, and are assessed annually on a site-specific basis and cumulatively for the Lower Mad River.

The proposed action for the lower Mad River addresses potential effects of instream gravel mining through the use of two components, as previously implemented, that are based on experience gained from the past ten years of scientific review and mitigation of the gravel extraction program on the lower Mad River and include: 1) avoiding or reducing cumulative effects at the reach scale through long-term monitoring and extraction volumes that are constrained within estimates of long-term and annual replenishment; and 2) minimizing localized site-specific effects through annual monitoring, reviews and extraction methods that are designed to minimize effects at each site.

The bedload replenishment rate for the Lower Mad River has been continually refined over time due to concerns regarding potential degradation and its physical and resulting biological impacts to the system. Lehre et al. (1993) estimated long-term bedload sediment yield based on available observations of sediment transport in the river, regional rates of sediment yield, and evidence for changes in bed elevation between 1960 and 1992 — this estimate had been used to constrain extraction volumes since the PEIR (1994). Kondolf (2001) computed an average annual replenishment of 272,000 cy using estimates of sediment storage changes. This estimate is approximately one-third higher than Lehre et al. (1993). The two estimates are for different time periods, during which the channel probably behaved differently (Kondolf 2001).

However, Kondolf's (2001) estimate is based on better and more representative channel survey data including cross sections previously surveyed by the ACOE in 1970. Kondolf (2001) recommended improving and updating the sediment sampling database to improve future estimations. Concern was expressed that potential errors may have been hidden in residual terms used in these calculations, Kondolf s (2001). Therefore, the ACOE utilized further analysis to calculate average annual replenishment for the lower Mad River is (Knutti 2003). However, due to increasing concerns related to anadromous fisheries resources NOAA Fisheries developed additional data related to replenishment that stands as the mode of analysis when annually reviewing extraction quantities from within the system.

The extraction volume based on a fraction of the recruitment and applying the upper and lower limits is termed "sustainable extraction volume" (SEV). The annual recruitment estimate will be based on methods explained in Appendix A to calculate the SEV (NMFS 2010). The SEV will have an extraction limit of 175,000 cubic yards (cy), SEVUL, on high recruitment years and an extraction limit of 62,000 cy, SEVLL, on low recruitment years. If there are more than two years in a row of deficit (Appendix A) where the SEVLL, is higher than the calculated SEV, then extraction volume will be set at the calculated SEV rather than the SEVLL. The SEV value is used to make annual target estimates for the sites above the A&M RR Bridge, the upper reach sites. The extraction volumes of the lower reach sites, below the A&M RR Bridge, are limited only by the site controls and the upper limit of the operation. The target annual extraction volume at each site will be estimated using the relationships in Table I. As our project area is above the A&M RR bridge, we will be using the SEV value to make annual estimates.

For low recruitment years, when the SEV is less than 70,000 cy, an operator may choose to defer the extraction per bar until the following year. Extraction volume following a year of no extraction can be the current year SEV plus the previous year's volume as long as the total extracted volume at the site is less than the maximum amount, and the overall Mad River extraction volume is within the SEVUL of 175,000 cy. Volume will only be deferred for one year. The intent of the banking strategy is to reduce disturbance during low flow years and encourage bar recovery without penalizing the gravel operators.

In general, when either aggradation or degradation of bed deposits, in relation to the annual replenishment rate, occurs within a flood plain there is a potential for significant erosion and sedimentation during flood conditions. A change in a river's channel geometry or meander wavelength may also alter the direction and location of the river's erosive force causing a change in the meander pattern of the river. This change may possibly aggravate stream bank erosion both upstream and downstream of the extraction site. Changes in riverbed morphology are generally attributable to large flood events, rather than gravel extraction (USEPA 2007a). Because of the magnitude of the other forces affecting sediment flow, at the past and projected rate of extraction, the gravel mining operations at the Glendale-Simpson Bar site are not expected to alter these erosion and sedimentation processes. The applicant proposes gravel extraction on the Mad River at the Miller-Almquist Bar (RM 5.3) and the Simpson-Glendale Bar (RM 7.0) in their permit for a maximum combined annual extraction volume of 6,300 cubic yards from both bars. Extraction will be maximized from the lower reach at Miller-Almquist Bar, based on site controls, before extraction at the Simpson-Glendale Bar.

4. Vegetation/Wildlife

A major part of the Mad River basin is covered by conifer forests. Forested areas are predominantly mixed conifer types, such as coast redwood, Douglas-fir, White Fir and Sitka Spruce, which have been extensively developed for marketable timber. The remainder of the basin is covered by woodland (oaks and other hardwoods) and open prairies. The Draft Humboldt County General Plan (HCDCDS 2008) describes the Mad River watershed as being 80% fir, 37% redwood and 20% oak woodlands.

The gravel bars are, for the most part, un-vegetated due to high flows and annual bar scour. There are deciduous riparian trees (alders, willows) along the edge of the channel anchored into fissures in bedrock substrate both within and outside the bankfull channel. Willow scrub is located in isolated patches on both gravel bars (Berg, pg. 122).

Riparian habitat types along the project reach of the Glendale-Simpson project area can be described as upland forest and scrub (Coast redwood, Douglas-fir, alder and big-leaved maple, coyote brush, thimbleberry, Himalaya berry), willow scrub and shrub, and palustrine scrub (coyote brush, pampus grass, poison hemlock) within the assessment area. The proposed extraction areas will typically be desiccated aggregate areas completely devoid of vegetation with the exception of annual forbes. Compliance with state and federal permits require that extraction areas do not contain woody vegetation greater than 2 inches Diameter at Breast Height (dbh) or greater than 1/4 acre in contiguous size. Even with this standard, annual agency review with state federal and local representatives typically avoid all woody vegetation and in fact typically recommend buffers of 25 feet from small willow patches or other woody species. Most gravel bars within these reaches are exposed annually to scouring winter flows, and only small, young patches of willow scrub and shrubs able to take hold in relatively low velocity areas are present or are deposited by annual deposition in areas experiencing in higher velocity flows. In several areas of the extraction reach, the active baseflow channel is directly adjacent to upland vegetation. These descriptions support a plethora of observation based analysis, in which riparian vegetation establishment and inundation frequency obviously play a major role in within the riparian corridor. Thus,

given the extraction standards and areas in which aggregate extraction take place it makes sense that these areas experience greater inundation frequencies throughout out the year and thus have a substantial lack of riparian vegetation.

In general, riparian habitat quantity (area) has not increased since the formation of CHERT, but riparian habitat quality has increased. Although riparian vegetation acreage has not increased significantly since the CHERT program began, a number of extraction practices have increased the quality of riparian habitat. One such extraction practice is the creation of "gravel pit wetlands," which mimic "oxbow lakes common in wide alluvial rivers" (Trush 2008a). The wetland pits are expected to be short-lived because they are typically obliterated by high flows within 2-5 years after their construction, depending on storm intensities. During the time that the wetland pits are present, they "provide abundant, high-quality avian and amphibian habitat" (Trush 2008a). In addition, CHERT recommendations minimize: 1) "any disturbance of existing woody riparian vegetation", and 2) "interference with the gradual colonization of recent depositional surfaces, aggrading floodplains, and re-worked flood terraces" that are created as the channel migrates naturally (Trush 2008a), which together limit gravel extraction's effects on riparian vegetation.

During hydrologic years of normal rainfall, at the Glendale-Simpson site, the bars are scoured by winter and spring waters, resulting in low-water vegetation characterized by annual herbaceous species. Perennial herbaceous species and some woody species have also been able to colonize and persist on the bar, resulting in riparian stands with some wildlife habitat value. These woody species include young sandbar willow and red alder, while the herbaceous vegetation includes sweet white clover, Dalmatian toadflax, rough cocklebur, brooklime, panicled bulrush, pearly everlasting, and grasses.

Other vegetation types found within the project area include Douglas fir, madrone, black and canyon live oaks, big leaf maple, black cottonwood, coyote brush, poison oak, himalaya berry, California blackberry, California wild grape, English ivy, pennyroyal, and various grasses and forbs.

Wildlife species in the watershed area represent a high degree of diversity, reflecting the influences of elevation, climate, topography, and vegetation. Characteristic species of forested areas of the Pacific Northwest are relatively abundant. These include black bear, black-tailed deer, northern flickers and other woodpeckers, alligator lizards, and newts. Numerous species with special status inhabit the Mad River watershed as well. The California Department of Fish & Game database for the northern spotted owl provides information on numerous known territories for the species in the watershed (density of one territory per 4,800 surface acres). Historical NSO surveys have confirmed absence surrounding the site. All three North American accipiters (Cooper's hawk, sharp-shinned hawk, northern goshawk) occur in the watershed, however, timber stands within the vicinity lack sufficient habitat for the northern goshawk. Black salamanders and tailed frogs are found in the forested areas. Riparian-associated wildlife species also exhibit a high degree of diversity and density. Bird species richness is high compared to other riparian locations in the west. Species sighted in the watershed during surveys include numerous special status species such as the willow flycatcher, yellow-breasted chat, yellow warbler, and black-capped chickadee. Early

spring migrant willow flycatchers occasionally were detected as migrants one time only and not repeated on return visits except for known summer presence within the vicinity of the fish hatchery. Species was detected more than twice within the months of June and July since 2006. Willow flycatcher is well documented to have juvenile migrants utilizing the corridor and adult occurrence have been documented. Rare raptors are present as well, including bald eagle, peregrine, and merlin. A variety of shorebirds and waterfowl inhabit the basin and include herons, egrets, sandpipers, wood ducks, and mergansers. The composition of riparian bird community is likely to have changed as a result of increases and decreases in acreages of riparian vegetation during large scouring events and subsequent lack thereof.

Riparian mammals occurring along the mainstem Mad River include numerous rodent species, whose distributions are linked to the distribution of riparian vegetation. Larger, semi-aquatic species occur as well, including beavers and river otters. The native herpetofauna includes three species of special concern (western pond turtle, yellow-legged frog and the northern red-legged frog). Introduced bullfrogs have been observed within this reach (Hess 1996), with potentially deleterious effects on native amphibians, fishes, and waterfowl, although the bullfrog has not been observed specifically at this site.

Portions of the project area can be considered to be environmentally sensitive habitat. The sensitive habitat consists of several different kinds and can be classified as follows:

1) The riverine habitat of the river channels and the occasional ponds that form under summer low water conditions provide habitat for invertebrates, fish, amphibians such as frogs and salamanders, invertebrate-eating birds and various mammals including river otters and beavers and other mammals that come to the river to forage (such as bear, deer and raccoon).

2) The exposed cobble in the gravel bars adjacent to the low-flow channels provides roosting habitats for one avian species; killdeer, but otherwise represents one of the sparsest habitats in terms of wildlife diversity and numbers. Of the three habitats listed here this is the general area where extraction activities actually occur.

3) The riparian scrub habitat (Palustrine Scrub-Shrub Wetland; broad-leaved deciduous) occurs on "islands" next to the low flow channels and is the most extensive plant community within the active channel. Portions of this habitat are inundated every winter during high river flows. The Mixed Willow Series dominates the vegetation growing within the riparian scrub habitat. The understory is minimal and is comprised of weedy annual grasses and forbs. Only a sparse covering (40%) of shrubs is found in this community. This primarily includes narrow-leaved willow, shiny willow, red willow with the occurrence of red alder and black cottonwood in varying densities. The riparian scrub habitat supports a variety of wildlife species, including black bear, deer and a number of small mammals such as raccoon, striped skunk, gray fox, rodents and rabbits, and many bird species that use the areas for foraging, nesting and cover.

Two additional types of general habitat can be found near the property beyond that described above. These include the mixed conifer stands surrounding the Mad River

valley and the agricultural-orchard-rural residential areas on surrounding lands within the Glendale area. Mammals typical to these areas include black-tailed deer, raccoon, opossum, fisher, mink, skunk, porcupine, brush rabbit, pocket gophers, wood rats, and deer mice. Representative reptiles and amphibians include the northern red-legged frog yellow-legged frogs, Pacific giant salamanders, rough-skinned newts and garter snakes. Although present in the Mad River Basin, the Bald eagle is more abundant inland particularly around the Ruth Lake Reservoir.

In general the lower Mad River provides summer rearing habitat for juvenile salmonids, late summer/fall holding areas for adults, smolt and pre-smolt outmigration habitat and is a fall/winter migration route for adult salmonids. While redds have been observed near some of the extraction areas the biological opinion generally considers the spawning reach to extend upstream from the Anny Mary Railroad bridge located just below the project site. Designated critical habitat for Southern Oregon/Northern California Coasts (SONCC) Coho salmon encompasses accessible reaches of all rivers (including estuarine areas and tributaries) between the Mattole River in California and the Elk River in Oregon. Designated critical habitat for Coastal California (CC) Chinook salmon includes all river reaches and estuarian areas accessible to listed Chinook salmon from Redwood Creek (Humboldt County, California) to the Russian River (Sonoma County, California). The anadromous species utilizing the Mad River (SONCC Coho salmon, CC Chinook salmon, and Northern California (NC) steelhead) are listed as threatened species under the Endangered Species Act.

The California Department of Fish and Game has operated a fish hatchery on the Mad River since 1971. It was established as an enhancement hatchery to supplement ocean fish stocks to catchable levels and provide for sport fishing opportunities in the Mad River. The hatchery currently releases about150, 000 juvenile steelhead annually in the spring. It is also used as a rearing facility for salmonids that originate from and will be released back into other basins. The hatchery also raises rainbow trout for local put-and-take fisheries. Between 1990 and 2000, the hatchery released between 134,000 and 1,440,460 Age 1+ juvenile steelhead in the Mad River (Zuspan and Sparkman 2002).

In addition to critical habitat designations for listed Pacific salmonids, Essential Fish Habitat (EFH) provisions of the Magnuson-Stevens Act (MSA) require heightened consideration of habitat for commercial species in resource management decisions, including EFH for SONCC oho salmon and CC Chinook salmon, trout and their designated critical habitats are currently listed as 'Threatened' under the Federal Endangered Species Act and in the past have been among the most important species with regard to commercial and sport fisheries(Mad River Pop. 2014).

Further, state listing of Coho salmon requires that operations covered by a 1600 permit be fully mitigated with respect to potential impacts to Coho salmonids, SONCC Coho salmon, Upper Klamath-Trinity Chinook salmon, and KMP steelhead utilizing mainstem habitat at the Glendale Simpson site.

The project area is mainly important for anadromous fisheries as a migration route to and from the upstream spawning grounds; however some spawning has been noted in

this reach of the Mad River as it is located at the furthest downstream extent of what is generally considered the spawning reach. Downstream migration of juvenile salmon and steelhead occurs early spring so as to avoid low flows and high temperatures. Most downstream migration occurs in evening hours. Downstream migration of juvenile salmonids is concentrated prior to or at the beginning of normal extraction periods on the Mad River.

Major problems within the watershed include sedimentation and elevated temperatures lethal to salmonids, TMDLs have been established for these factors. The mainstem Mad River was listed as water quality limited due to sediment by the State of California. A Total Maximum Daily Load (TMDL) analysis was scheduled for completion in 2001 by the EPA under Section 303(d) of the Clean Water Act (Berg, pg. 120).

Reductions in anadromous fish populations have occurred in the Mad River. Some of the major factors commonly cited as possible causes of salmonid reductions include the construction of the Matthews Dam (and subsequent reduced stream flows), sedimentation from the old Sweasey Dam, the 1964 flood, over-harvest of salmon, and intensive logging practices. Fish habitat in the basin is limited by reduced flows and the physical condition of the Mad River and its tributaries. Historical spawning beds composed of clean gravel and cobble have become embedded with filament deposits. The habitat losses resulting from the sedimentation of the river have reduced the reproductive carrying capacity of this portion of the Mad River (NMFS 2010, NOAA 1996).

Southern Oregon, North Coast California Coho CC salmon

Southern Oregon, North Coastal California Coho ESU California coho salmon life history is typified by four life stages (CDFG Undated): Adult upstream migration: "Adult coho salmon enter fresh water from September through January to spawn. Coho salmon move upstream after heavy rains have opened the sand bars that form at the mouths of many California coastal streams, but may enter larger rivers earlier." In the upper reaches of these streams, spawning generally peaks in November and December, but timing varies by stream and/or flow (CDFG Undated).

Spawning and Egg Development: "In California, spawning occurs mainly from November to January, although it can extend into February or March if drought conditions are present... In the Mad River, spawning occurs in November and December. Females usually choose spawning sites near the head of a riffle, just below a pool, where the water changes from laminar to turbulent flow and there is a medium to small gravel substrate. The flow characteristics through the redds [fish eggs' "nests"] usually ensure good aeration of eggs and embryos, and the flushing of waste. Larger Coho salmon produce more eggs and there is a definite tendency for fecundity [reproductive success] to increase. In California, eggs incubate in the gravels from November through April. The incubation period is [shorter if water temperature is higher]... California Coho salmon eggs hatch in about 48 days at 48°F, and 38 days at 51.3°F. After hatching, the alevins (hatchlings) are translucent in color. This is the Coho salmon's most vulnerable life stage, during which they are susceptible to siltation, freezing, gravel scouring and shifting, desiccation, and predation. Alevins remain in the interstices of the gravel for 2 to 10 weeks until their yolk sacs have been absorbed, at

which time their color changes to that more characteristic of fry. The fry are silver to golden with large, vertical, oval, dark parr marks along the lateral line that are narrower than the spaces between them" (CDFG Undated).

Fry and juveniles rearing: "Fry emerge from the gravel between March and July, with peak emergence occurring from March to May... They seek out shallow water, usually moving to the stream margins, where they form schools. As the fish feed heavily and grow, the schools generally break up and individual fish set up territories. At this stage, the fish are termed parr (juveniles). As the parr continue to grow and expand their territories, they move progressively into deeper water until July and August, when they inhabit the deepest pools. This is the period when water temperatures are highest, and growth slows. Rearing areas used by juvenile Coho salmon are low-gradient coastal streams, lakes, sloughs, side channels, estuaries, low-gradient tributaries to large rivers, beaver ponds, and large slackwaters. The most productive juvenile habitats are found in smaller streams with low-gradient alluvial channels containing abundant pools formed by large woody debris. Adequate winter rearing habitat is important to successful completion of coho salmon life history" (CDFG Undated).

Smolt outmigration: "After one year in fresh water, smolts begin migrating downstream to the ocean in late March or early April. In some years, outmigration can begin prior to March and can persist into July. Peak downstream migration in California generally occurs from April to early June. Factors that affect the onset of outmigration include the size of the fish, flow conditions, water temperature, dissolved oxygen (DO) levels, day length, and the availability of food. Low stream productivity, due to low nutrient levels or cold water temperatures, can contribute to slow growth, potentially causing coho salmon to postpone outmigration.

Steelhead

Steelhead are reported to exhibit the most complex and variable life history of the Pacific salmonids. They can be freshwater resident or anadromous; the anadromous steelhead can spend up to 7 years in fresh water before smolting, and then up to 3 years in the ocean before first spawning (NOAA 1996). Further, they are classified into two types, the summer steelhead (that matures in freshwater, requiring several months to mature and spawn), and the winter steelhead (that matures in the ocean, entering fresh water ready to spawn). The Mad River supports both summer and winter steelhead.

Spawning and egg development: Steelhead can spawn more than once before dying, unlike Pacific salmon. Intermittent streams may be used for spawning, and cover is important because steelhead can enter streams weeks before they spawn. Summer steelhead utilize habitat that is not fully utilized by winter steelhead, and often spawn farther upstream than winter steelhead (NMFS 2004a). Steelhead egg incubation time is dependent on water temperature, varying from 1.5 to 4 months, generally between February and June. Fry and juveniles: Fry inhabit shallow water along banks of perennial streams. Summer rearing occurs in "faster parts of pools" (NMFS 2004a). Winter rearing occurs across a wide range of fast and slow velocity habitats, but is characterized primarily by complexity such as large in-stream wood. Larger and older

juveniles will move downstream to rear in larger tributaries and the mainstem. "Rearing is usually 2 years in California ESUs" (NMFS 2004a).

California Coast Chinook Salmon ESU
Chinook salmon runs are designated by adult upstream migration timing. Spring-run Chinook are now only found on the Rogue, Klamath, and Trinity rivers. The Mad River supports "sizeable populations" of fall-run Chinook salmon (NMFS 2004a), however, the species listing status is "threatened" and Critical Habitat has been designated. Adult upstream migration: Timing depends on the size of the river (NMFS 2004a). In the larger river systems (Rogue, Upper Klamath, and Eel), fall-run Chinook return to fresh water in August and September.
In coastal rivers (presumably including the Lower Mad River), the fall-run begins in late October.

Spawning and egg development: On the larger river systems, spawning occurs in late October and early November. In smaller coastal rivers like the Lower Mad River, the peak spawning period is during late November into December, and often extending into January. Eggs resulting from the fall run spawning incubate and emerge from December into mid-April. Although the Chinook salmon ESU covers naturally spawned populations, worthy of mention is the Mad River Hatchery fall-run program. Fry and juveniles: Fry use woody debris and cobble interstitial spaces as cover, but as they grow their habitat preferences change to deeper water with slightly higher velocity. "Data from the Mad River... indicate that emergent Chinook salmon fry develop rapidly following emergence... The months of May and June accounted for 91.5% of the total capture of migrating young-of-the-year Chinook salmon in 2001" (Sparkman 2002, as cited by NMFS 2004a).

Salmon Trends
In the mainstem Lower Mad River, "habitat was quantified for three anadromous salmonid life history stages:

- 2+ juvenile steelhead rearing,
- 1+ juvenile coho salmon, and
- adult salmon and steelhead upstream migration."

Results from Trush (2008b) indicated a dramatic decline in juvenile 1+ coho habitat area from the mid-1940s to the mid-1960s, possibly resulting from large floods of the 1950s and 1960s. Then, after a recovery in habitat through the 1970s and 1980s, juvenile 1+ coho habitat abundance since WY1994 (since the CHERT adaptive management program began) has trended slightly upward.

In general, "there has been modest, overall improvement [in habitat area of the three salmonid life stages] since 1994 and significant improvement compared to habitat abundance in the 1950s through early 1980s" (Trush 2008b). Except for a very recent increase in anadromous salmonid habitat in 2007, habitat area has recovered to pre-1955 and 1964 flood levels and remained fairly constant over the span of CHERT adaptive management. From this we can conclude that major historic floods dominate habitat changes and that any effects of the present extraction program are relatively

small or non-existent. Extraction strategies at this site continue to consider incorporating, where possible, the cooler water seeps and access to bedrock scour pools and overhanging vegetation into the designs that allows healthy cover for rearing salmonids.

Foothill Yellow Legged Frogs

Foothill Yellow-Legged Frogs are fairly common on the rocky perennial river tributaries within the forest and are fairly common along rivers throughout the north coast. While literature lends overall evidence that they prefer higher gradient, shallower streams with more canopy cover and less vegetative streamside cover than do the Northern Red-Legged Frog the overwhelming observations established over the last 15 years depicts this species preferring open canopy cover for thermoregulation.

Breeding sites for these frogs are shallow with slow flowing water with pebble and cobble substrate. The adults and sub-adults preferred river bars along both riffles and pools, with some shade. Occasionally, it was found in other riparian habitats such as backwater, isolated pools, or slow moving water with mud substrate. In the spring, adult frogs congregate along gravel/cobble river bars, where breeding occurs in shallow, slow flowing water. "Previous literature reports breeding to occur from late March through May, with oviposition for any single population being concentrated to a 2-week period... in the Trinity River, breeding activity occurs over a 3-month period from April through late June" (Ashton et al. 1997) with most oviposition occurring in May and early June. Eggs hatch in 27 to 36 days, but incubation is temperature dependent and this time period may be longer due to cold water dam releases (Ashton et al. 1997). Growth to maturity is also temperature dependent; some individuals may reproduce as early as 6 months after metamorphosis (Jennings 1988, as cited by Ashton et al. 1997). CDFW classifies this species as a "Species of Special Concern." The FYLF population is considered stable within the lower Mad River.

Northern Red-Legged Frog

The Northern Red-Legged Frogs require freshwater ponds, pools in slow streams, marshes, or reservoirs with submerged vegetation for egg attachment and emergent vegetation for cover. They are sometimes found in damp woods and meadows away from water bodies, especially during wet weather (Geoffrey 2008). Breeding occurs in late winter and early spring with young being completely transformed into adults by mid-summer. Eggs require 30 to 45 days to hatch, occurring in March or April and metamorphosis occurs 11 to 14 weeks later in June or July. Breeding red-legged frogs have been found in many of the freshwater marshes and ponds in the lower Mad River area. This species is not common within most of the forest and suitable habitat is limited. This species has declined in abundance in portions of its range. Threats to this species include: fragmentation, alteration, or loss of habitat resulting in increased water temperatures, decreased pool depth, or decreased riparian vegetation; and introduction of exotic fishes and/or bullfrogs. The Northern Red-Legged Frog has not been observed within the project reach (HCPBD 2014).

Southern Torrent Salamanders

Southern Torrent Salamanders are mainly aquatic, but capable of terrestrial activity, living primarily in seeps and headwater streams where the water remains cold year

round. Aquatic larvae live in clear shallow water and still murky creeks with accumulated leaves. These salamanders are typically found in disjunct populations on north-facing slopes and relatively high elevations or in mature to old-growth forests. Although placed under the "Least Concern" and "California Species of Special Concern" category this species has a wide distribution and relatively large population. The most prominent concerns for this species include urbanization and temperature rise due to climate change. STS's have never been documented within or adjacent to the project area (AmphiWeb 2008, Stebbins and Lowe).

Northwestern Pond Turtle

The northwestern pond turtle is found "downstream at least to the Blue Lake bridge area" but "its status along the Mad River needs documenting" (MRB 1993). In northern California, it basks intermittently in the morning, and then in late afternoon or early evening they begin foraging. In one population in a northern California stream, a male home range was estimated to be 2.4 acres; the female's range was much smaller (0.6 acres). It can be found in a wide range of wetland habitats including "rivers and streams (both permanent and intermittent), lakes, ponds, reservoirs, permanent and ephemeral shallow wetlands, abandoned gravel pits, stock ponds, and sewage treatment lagoons" (Holland 1994, as cited by Lovich Undated). It is active from February to November, and is often observed basking on surfaces above water. During summer droughts, it can bury itself in soft bottom mud. Breeding occurs between April and August, when females climb onto stream or pond margins, to dig a nest. In northern California and Oregon, hatchlings remain in the nest through the winter (Holland 1994, as cited by Lovich Undated). Federal agencies have designated this species as a sensitive species. Wetland habitat destruction is their single greatest threat; predation by bullfrogs is also noted (Lovich Undated).

Bullfrogs

Information on bullfrogs specific to the Mad River was scarce. The report supporting the 1994 PEIR for gravel extraction simply states "in the study area, the bullfrog's specific status needs to be determined" (MRB1993). It is present throughout much of the United States and is the largest frog in North America. It is highly aquatic and never strays far from permanent water (USFS Undated), preferring water with thick aquatic vegetation.

Breeding is from February through July in permanent water bodies (USFS Undated). Some tadpoles overwinter before transforming into adults. Adults spend winters in the soft muddy bottoms of ponds, lakes, or other water bodies. Fuller (2008) concluded that bullfrog control should be focused on its breeding habitat, which became greater after dam construction and operation.

Bullfrog populations are likely to continue to grow, assuming they continue responding favorably to disturbed aquatic environments and that more aquatic environments are disturbed due to development, change in surface and groundwater regimes, water quality, and climate change. Gravel operations do not purposefully affect bullfrogs beneficially, but beneficial habitat conditions are similar to other amphibians such as red-legged and foothill yellow-legged frogs, and northwestern pond turtles. Fuller (2008) suggests that limiting bullfrog breeding sites would be an effective means of controlling bullfrog populations.

Bullfrog habitat is created by man-made structures and natural river processes. Artificial structures include stock ponds, and wetland pits and alcoves created during extraction. Naturally created bullfrog habitat includes oxbows or alcoves. The original intent of the wetland pit and alcove extractions was to create aquatic habitat, specifically red-legged frog habitat; therefore, limiting wetland pits and alcoves to control bullfrogs would also decrease habitat for red-legged frogs. Suppression of bullfrogs, rather than eradication, is a realistic goal, if red-legged frog habitat is to be simultaneously conserved or recovered. Suppression techniques could include:

Identifying inundation frequencies and elevations, and relating them to the bullfrog's 2-year breeding and rearing requirements. Inundation frequencies and elevations could be identified by mid-winter aerial photography, field observation, or computer modeling.

Reviewing and/or determining life history requirements of bullfrogs and red-legged frogs that could be used to favor red-legged frogs.

This site has and will continue to participate in biological monitoring standards developed initially in conjunction with the Army Corps of Engineers, the California Department of Fish and Game, and the County of Humboldt. Monitoring standards have evolved and incorporated new techniques and guidelines as new information was gathered, through various consultations with NOAA Fisheries, as well as new species being listed. This monitoring strategy is well recognized and has been referred to by several agencies as state of the art, due to its ability to assimilate new information garnered and respond in an adaptive manner.

In addition to the original limitations developed in conjunction with Local, State, and Federal permitting additional limitations on operations have been developed by agency staff in response to biological information garnered over the course of the last 14 years.

Limitations such as more restrictive work seasons, bridge installation requirements, retention of large woody debris (LWD) and extraction design requirements represent specific changes that have occurred over the last 14 years. The ACOE 404 Permit No. 27404N has been provided as attachment 1 and contains a comprehensive list of operational restrictions, while the Biological Opinion (attachment 2) provides a biological rational for these restrictions. These restrictions were developed by numerous biological consultants and agency representatives and are deemed necessary to protect any common or listed wildlife species (AmphiWeb 2008, Fuller 2008).

5. Archeological Resources

The project area contains no known historical, archeological, or paleontological resources, or human remains based on review of County Resource information from the Natural Resources Division of the County Public Works Department (during previous project approval). The extraction area has been utilized for a significant period of time as both a historical extraction and stockpiling site and subsequent storage area and no significant finds of historical archeological, or paleontological resources, or human remains have occurred during this time period. Cumulative impacts to cultural resources

are not cumulatively considerable since no cultural resources are known to exist or have been found on the site (HCDCDS 2008).

In the event that any prehistoric, historic, or paleontological resources are discovered during project operations, all work within fifty feet of the resource shall be halted and the operator shall consult a qualified archaeologist or paleontologist to assess the significance of the find. If any find were determined to be significant by the qualified archaeologist and/or paleontologist, then representatives from GRS Inc. and the qualified archaeologist and/or paleontologist would meet to determine the appropriate course of action. All significant cultural materials recovered shall be subject to scientific analysis, professional museum curation, and a report prepared by the qualified archaeologist and/or paleontologist according to current professional standards.

Should human remains be encountered, the County Coroner shall be contacted immediately. Should the Coroner or archaeologist determine that the remains are likely those of a Native American, the California Native American Heritage Commission shall also be contacted. The Heritage Commission will then consult with the most likely Native American descendants from the area to determine appropriate treatment of the remains.

6. In-Stream Mining

The Mad River drains approximately 497 square miles of the Coast Range Geomorphic Province and empties into the Pacific Ocean north of Humboldt Bay in Humboldt County, California with an average discharge of 15500 cfs (cubic feet/second). The basin is about 100 miles in length and averages six miles wide. Elevations range from sea level at the mouth to 3,000 feet along the western ridge to 6,000 feet in the headwaters. Vegetation in the watershed is composed of early to late seral coniferous forests, hardwoods, and grasslands. Rainfall averages 40 inches along the coast to over 80 inches at the higher elevations (HCDCDS 2008).

Annual discharge for the Mad River and the daily average discharge in the watershed is seasonally dependent, with most large runoff events occurring during the winter. During November–March, the high flow period, the average daily discharge is approximately 2,000–5,000 cfs. Flows can vary greatly during the winter with maximum mean daily discharges exceeding 30,000 cfs during wet years while under 1,000 cfs in dry years (Graham Matthews & Associates 2007). High flows in the watershed tend to be of short duration, returning to winter base flow within a week flowing the peak event (Graham Matthews & Associates 2007). At the USGS Arcata gage, the average annual discharge of the Mad River Basin is approximately 1,000,000 acre-ft. For the record period of 1982 - 2000, the "drier than normal years" average annual discharge was 488,629 acre-feet while the "wetter than normal years" average annual discharge was 1,434,857 acre-feet (HBMWD 2004).

MAR is the average annual supply of bed material load delivered to a river reach by high flows. The bed material load is transported by river flows and includes the coarser sediment sizes (sand and gravel) that are deposited in the form of gravel bars and flood terraces. CHERT scientists believe that we can measure MAR changes only on

decadal, not annual, time scales as the river experiences alternating periods of high and low recruitment due to large catastrophic floods and/or high and low erosion and sediment loading rates, in the contributing watershed upstream. The MAR concept allows us to quantify a sustainable volume of extractable sand and gravel for a reach, termed "sustained yield". In the 1994 PEIR, many geomorphic impacts were listed as being potentially caused by gravel extraction. Geomorphic impacts listed included increases in bed degradation (lowering), bank destabilization, and bank erosion. Many of the biological impacts were closely related to geomorphic ones, and included creation of shallow channels that impede fish migration, and creation of topographic barriers at tributary mouths that would also impede fish migration. The benefits of trenching in aggraded reaches versus its potential detrimental effects in degraded reaches were also discussed in the 1994 PEIR. Since the mid-1990s, downstream bars have generally aggraded (elevation of channel bed has increased), while upstream bars have degraded (channel bed elevation has decreased). Based on longitudinal profiles, at the upstream bars, mean elevations have been generally decreasing spatially and temporally since 1997. At downstream bars, mean elevations have been increasing spatially and temporally since 1993.

Channel confinement is indicated by the differences between the mean and thalweg elevations; the greater the difference, the greater the channel confinement. Since the late 1990s, channel confinement was not consistently increasing or decreasing, as measured by the differences in mean and thalweg elevations (HCPBD 2014).

As metrics for channel stability, active channel widths and active channel surface areas were defined and measured, using the cross sections and aerial photographs provided by the gravel operators, from 1992 to 2007 (Lehre et al. 2005, 2009). The active channel was defined as that portion of the river corridor with frequent sediment deposition or scour; "frequent" means "at least once every several years" (Lehre et al. 2005). Active channel widths and surface areas were also determined to indicate whether the active channel expanded or contracted over time and in response to floods and/or mining. Bank erosion was also estimated using the cross sections and aerial photographs, but for a shorter time period (1998 to 2007) in the recent CHERT analysis (Lehre et al. 2005, 2009) since earlier bank erosion was evaluated in the 1997 post-extraction report.

Channel width, as defined by the distance from one side of a cross section to the other at the reference elevation, is "strongly affected by geomorphic setting" (Lehre et al. 2005). At the upstream bars, cross sections are wide and large width increases are common. At the downstream bars, where the channel is bounded by erosion-resistant banks, channel width remained relatively constant.

Sustained yield extraction, a concept that is accepted by CHERT scientists, appears to be acceptable to NMFS scientists based on issuance of their July 2010 Biological Opinion. The concept requires that one accept that if instream gravel extraction occurs at a rate less than the river's ability to recruit new gravel, and if extraction occurs in ways that consider habitat maintenance and restoration, then effects based on morphological changes will be less than significant. To estimate the extractable volume that maintains a sustained yield extraction rate, CHERT and NMFS have created two

definitions. CHERT defines sustained yield extraction as some percentage of the Mean Annual Recruitment (MAR). NMFS defines sustained yield extraction as Fractional Extraction Volume (FEV), which is estimated using a spreadsheet calculator developed by NMFS. Differences between the sustainable fraction of MAR and FEV may be important to the long term volumes of extractable gravel (HCPBD 2014).

Whether or not gravel extraction affects stream temperature has not been determined for the lower Mad River. If extraction removed riparian vegetation, then air temperature, relative humidity, and percent shade would be affected, depending on the density and acreage of riparian vegetation removed. The location of the vegetation relative to the low flow channel position is also important. Gravel extraction does not determine or affect flow magnitude and timing; the opposite (flow magnitude and timing dictate gravel extraction) is a closer representation of what actually occurs. On the lower Mad River, flow is dependent on natural processes and on the activities of the Humboldt Bay Municipal Water District (HBMWD).

The HBMWD continues to augment flow in the Lower Mad River during the summer months. To provide water to both existing residential users and prospective industrial users, the HBMWD stores water in Ruth Reservoir, located in the upper part of the Mad River watershed. During summer months, water is released from the reservoir for hydropower purposes and to meet low flow requirements below Essex. The HBMWD reports that prior to development of their system, portions of the Lower Mad would "go dry" (HBMWD 2004). The required low flows maintain the lower channel flows at levels greater than under "natural" conditions (HBMWD 2004).

The mainstem Mad River was listed as water quality limited due to sediment by the State of California. A Total Maximum Daily Load (TMDL) analysis was scheduled for completion in 2001 by the EPA under Section 303(d) of the Clean Water Act (USEPA 2007).

The Simpson- Glendale project area is situated near River Mile (RM) 7. The entire gravel bar is inundated at bankfull discharge levels and portions of the property are within the 100-year flood plain. Potential concerns could include upstream/downstream scour, changes in river energy causing erosion of river banks, riparian habitat changes, and sediment input in the river.

In general, when either aggradation or degradation of bed deposits, in relation to the annual replenishment rate, occurs within a flood plain there is a potential for significant erosion and sedimentation during flood conditions. A change in a river's channel geometry or meander wavelength may also alter the direction and location of the river's erosive force causing a change in the meander pattern of the river. This change may possibly aggravate stream bank erosion both upstream and downstream of the extraction site. Changes in riverbed morphology are generally attributable to large flood events, rather than gravel extraction. Because of the magnitude of the other forces affecting sediment flow, at the past and projected rate of extraction, the gravel mining operations at the Glendale-Simpson site are not expected to alter these erosion and sedimentation processes. The maximum permitted volume of extraction at the site is 175,000 cubic yards. On high recruitment years and an extraction limit of 62,000 cy,

SEVLL, on low recruitment years. If there are more than two years in a row of deficit where the SEVLL, is higher than the calculated SEV, then extraction volume will be set at the calculated SEV rather than the SEVLL. The SEV value is used to make annual target estimates for the sites above the A&M RR Bridge, the upper reach sites. The extraction volumes of the lower reach sites, below the A&M RR Bridge, are limited only by the site controls and the upper limit of the operation. The target annual extraction volume at each site will be estimated using the relationships in Table I. As our project area is above the A&M RR Bridge, we will be using the SEV value to make annual estimates (HCPBD 2014).

7. Air Resources

The Glendale-Simpson Bar site is located in a sparsely developed rural setting and operations are limited to extraction activities required to remove a relatively small volume of aggregate material within a short time frame (2-3 weeks).

The project site is located in Humboldt County, which lies within the North Coast Air Basin (NCAB). The NCAB extends for 250 miles from Sonoma County in the south to the Oregon border. The climate of NCAB is influenced by two major topographic units: the Klamath Mountains and the Coast Range provinces. The climate of the Mad River Basin is typical of north coast valleys and is characterized by heavy rainfall concentrated in the cool winter months ranging from 40 inches along the coast to approximately 65 inches near Sweasey Dam, and a relatively dry, moderate summer. Predominate wind direction is typically from the northwest during summer months and from the southwest during storm events occurring during winter months.

Summers are generally warm with infrequent precipitation and early morning fog, and winters are cool and humid. About 80 percent of the annual precipitation, most of which is rainfall, occurred between November and March. Snowfall occurs during winter months at elevations above 2,000 feet and commonly accumulates to significant depths at elevations above 4,000 feet. Annual precipitation varies from less than 40 inches at lower elevations to more than 80 inches at higher elevations. Precipitation for the entire basin averages about 55 inches per year (HCDCDS 2008).

The only standard currently listed as non-attainment in the North Coast Air Basin is the state standard for particulate PM-10. The NCAB, along with most of the rest of California, does not meet the ambient levels the state sets for PM-10, the federal PM-10 standard is three times the level set by California. While the percentage of days in the year the state standard has been exceeded has been decreasing over the past few years, the standard is still exceeded on several days every year, usually in the winter months when wood stoves are predominantly used for providing heat to residences and outside of the proposed operating season.

Two types of air pollutants could result from this project. One is emissions from licensed extraction equipment and trucks used for transporting the gravel off-site. The other is dust from extraction, and transport activities (CARB 2014, HCDCDS 2008).

The project will result in similar truck traffic levels as has occurred in the past, consisting of approximately 4 trucks per day during the construction season. This could increase to a maximum of 8 trucks per day during heavy activity such as emergency road repairs. Extraction activities at this site are typically completed within a three week time frame and therefore produce little if any traffic throughout the remainder of the year. Vehicles will be maintained to meet emission standards and off-road equipment has undergone review through the Diesel off-road On-line Reporting System (DOORS). Through this system GRS, Inc. will continue to update its fleet through emissions retrofitting and new vehicle acquisition to comply with the Air Resource Board standards. Due to the small scale of the project, emissions from vehicles will be insignificant, especially when compared to the amount of traffic that already occurs on Hwy 299 (HCDCDS 2008).

Extraction and hauling activities can produce high fugitive dust levels during certain times of operation. The major sources of dust at the site would be from extraction on the gravel bar, and truck traffic on the dirt access roads. Most of the dust that could cause a possible nuisance would be most attributable to truck traffic on the dirt access roads, with dust being carried upstream by the prevailing winds that generally travel up the river valley during the day. Dust associated with truck traffic would be trapped by the surrounding dense vegetation and would be less noticeable. Dust would only be created during the time the extraction, and hauling occur, and would be substantially decreased by periodic watering of the extraction areas, and access roads.

USEPA (1995) has determined that at an average wind speed of 10 m.p.h. most dust (30 to 100 p.m in size) generally settles out of the atmosphere within 300 feet of the source, with larger particles traveling less distance and smaller particles traveling a longer distance. Most of the extraction areas, and hauling roads are more than 300 feet from the nearest residences and recreational areas.

The extraction activity will not conflict with or obstruct implementation of the State Air Quality Implementation Plan (SIP) for California. In 1996 the Army Corps of Engineers (ACOE) determined the following in regards to a section 404 permit for the Mad River sites: *"Project activity would have minor, short-term impacts on air quality in the vicinity of the project site. Based on the relatively minor size of the proposed project and limited to an evaluation of the air quality impacts only within Corps of Engineers jurisdictional areas, the Corps has determined that the total direct and non-direct project emissions would not exceed the de minimus threshold levels of 40 CFR 93.153. Therefore, the proposed project would conform to the State Air Quality Implementation Plan (SIP) for California".*

Activity in the project area would continue to require meeting NCUAQMD Air Quality standards, including Regulation 1, which prohibits nuisance dust generation and is enforceable by the District. The North Coast Unified Air Quality Management District currently enforces dust emissions utilizing the CA Health and Safety Code (Section 41701) which limits visible emissions that exceed 40% density to a maximum of 3 minutes for any one hour period (NCUAQMD 2014).

There are currently no air quality problems identified in this region, and as proposed this project will not result in a violation of ambient air quality standards either individually or

cumulatively in the area. The only sensitive receptors are the residences in the vicinity, however, due to the limited extraction activity that will occur, the rapid dissipation of the dust and the low density of residences, impacts will not be significant (CARB 2014, HCDCDS 2008).

8. Noise

Noise generated by the approval of this project would be similar to noise levels from past extraction/processing at the adjacent extraction site that has been in operation approximately 50 years. No new noise sources are proposed. The project is located along Highway 299 approximately 1200 feet west of the town of Glendale. Sources of noise in the project area and surrounding areas are generated by traffic on Highway 299, the Mad River, heavy equipment use during extraction activities at the Glendale-Simpson Bar and adjacent extraction sites, and equipment use during agricultural operations on nearby lands. This operation is the primary noise source as measured adjacent to the extraction area at times of operation. Noise sources that result from this project will include front-end loader, bulldozer, excavator, and dump trucks.

Ambient noise levels in the project area and surrounding areas are relatively elevated due to the close proximity of Highway 299, and the Mad River. To date the adjacent aggregate extraction projects have not had a single complaint of noise generated from the site.

The sensitive receptors in the vicinity of the project site include rural residences, and recreationists using the river. There are residences just within 500 feet of the extraction areas. Noise levels of 60dBA would be reached at approximately 400 feet in distance and approximately 68dBA at 250 feet away. Rural residences that exist within 1,000 feet of the processing site where dba readings would diminish beyond the previous levels substantially.

This project is adjacent to another aggregate extraction site (existing permitted activity) and proposes no perceptible increase in noise generation above current levels. Due to the limited extraction activity that will occur, the rapid removal of material and equipment, the lack of processing facilities, the low density of residences and recreationists, impacts are not significant. This project is completed within a very small time frame when viewed in comparison to other extraction sites located throughout the county. Operating hours during active mining are expected to run Monday through Friday from 7:00 a.m. to 7:00 p.m. and 8:00 a.m. to 5:00 p.m. on Saturdays. Throughout the life of the permit, there will be significant periods of inactivity when no noise will be generated.

9. Land Use

The site is located approximately 1200 feet west of the town of Glendale and consists of a stretch of the Mad River where the broad alluvial reach constricts at the downstream end of the project reach. Associated gravel deposits occur on the western portion of the project site.

Moderately steep forested hill slopes adjoin the western side of the valley, while terraced flat topography adjoins the eastern side. Land use in the surrounding area is a mixture of private and industrials timberlands. Private lands include rural residential development, agriculture, highway commercial, recreational, as well as nearby retail commercial activities along Hwy 299 in Glendale, 1200 feet to the east. Above the valley and terraces, the surrounding land use is predominantly timberland.
The project site parcels 504-131-02, &04, and 516-161-04, owned by Garth and Linda Sundberg is zoned Agricultural General (AG) (Humboldt County 2015).

Adjacent lands are zoned Agricultural Exclusive (20 acre minimum parcel size), Agricultural General (2.5 acre minimum parcel size), and Residential Suburban (1 acre minimum parcel size/allowing mobile homes), and utilized generally for agriculture, residential suburban, rural residential, highway commercial, open space, and wildlife habitat.

The Humboldt County General Plan - Frame Work Plan recognizes the importance of existing gravel extraction sites as follows:

"Sand, gravel and rock, being necessary to construction and development, are an essential component for the continued well-being of the County. They are the basis for much of the construction materials for roads, concrete, stream bank protection, erosion control, septic systems and passive solar projects. Importation of these materials would raise costs and negatively impact the development and maintenance within the County. It is important to protect specific sites and haul routes against land use incompatibilities to assure the continued utilization of this resource."

This project is consistent with the following goals and policies of the Humboldt County General Plan, Framework Plan, applicable to mineral resources:

§2532 GOALS

1. To assure the long-term availability of adequate supplies of mineral resources, to protect mineral resource areas from incompatible land uses and to minimize adverse environmental impacts.

§2533 POLICIES

1. Maintain and update maps of the County's identified mineral deposits.
2. Plan future development such that it will not interfere with the utilization of identified mineral deposits.
3. Ensure adverse environmental effects are prevented or mitigated to the fullest extent feasible and that mined lands are reclaimed to a usable condition which is readily adaptable for alternative land uses under the General Plan.
4. Encourage the production and conservation of minerals, while preserving to the maximum extent feasible the values relating to recreation, watershed, wildlife, range and forage, science, and aesthetic enjoyment.
5. Ensure elimination of residual hazards to the public health and safety.
6. Prevent the disruption of community character in siting and planning mineral resource extraction operations.

7. Require mineral haul routes to avoid incompatible areas such as landslides, highly erodible soils, residential areas, and schools, if feasible.
8. Permit conditions for mineral extraction operations should address allowable dust and noise levels, hours of operation, fencing, traffic, access, setbacks and other means to reduce conflicts with adjacent development.
9. Extraction of instream sand gravel is not to exceed the average annual replenishment level (annual bedload), except when the bedload left from a previous flood is greater than the average annual replenishment or if the projects emphasize fishery enhancement, flood control or bank protection.
10. Bank protection shall be permitted to: (1) Maintain necessary public or private roads, (2) Protect principal structures in danger from erosion, (3) Protect lands designated Agriculture-Exclusive from erosion.
11. Evaluate significant water diversion projects which would reduce the replenishment rate of gravel in streams as to the impact they would have on local mineral supply in Humboldt County.

Section 314-60.1 of the Humboldt County General Plan states:

"Surface removal of minerals and natural materials, including building and construction materials to be used for commercial purposes, shall be allowed in any zone with a Use Permit (HCDCDS 2008)."

10. Aesthetics

The project area is located along the Mad River approximately 1200 feet west of the town of Glendale, consisting of a stretch of the Mad River with bends at the upstream and downstream extents, with the southern boundary being the A & M RR Bridge. Associated gravel deposits occur below ordinary high water (OHW) on the project site.

The project site (APN 504-131-02 & 04 and 516-161-04), according to the County of Humboldt Planning and Development website, is zoned as agricultural with a use code description of commercial/miscellaneous (Humboldt County 2015). Land use in the surrounding area is a mixture of private and industrial timber lands with the communities of Glendale and Blue Lake close by. Private lands include rural residential development, agriculture, highway commercial, recreational, as well as nearby retail commercial activities along Hwy 299 in Glendale and Blue Lake (HCDCDS 2008).

Glendale-Simpson Bar is a privately owned parcel on the Mad River, behind closed gates and with limited access. Although this is a private site, adjacent to other gravel mining operations, there are nearby public lands that citizens use recreationally. However, because the time frame of the gravel mining operation is so small, the proposed gravel mining will have no significant impacts on the aesthetics of the area. Use will be limited to a few weeks of the year and material will be stockpiled offsite or directly taken to a processing plant. No new roads are being constructed, vegetation will remain the same and annual inundation will clear any signs of use. Nevertheless, mitigation measures such as operating hours and timing have been generally defined and the site is rather small which would reduce the duration of operations. We anticipate no significant impacts to the aesthetics of the environment.

11. Roads and Traffic Assessment

Access to the processing site is directly off of Highway 299. Highway 299 is an approximately 40 foot wide striped, semi shouldered Highway in good condition. The last average annual daily traffic volume (AADT) of 2950 back/1900 ahead vehicles on Hwy 299 was taken in 2001 by Caltrans. Hwy 299 provides access to the Six Rivers National Forest Lands, Mad River recreation areas, rural residences, commercial and agricultural operations (HCDCDS 2008).

Access to the extraction area is provided by a private drive behind a locked gate on the Sundberg ownership. This road is utilized by GRS Sundberg Construction during project operations with permission from the property owner. The access road to the extraction areas is a minimum 16 foot wide gravel road in fair condition with turnouts available.

During the construction season, off-site traffic generated by the project consists of approximately 20 truck loads per day during normal operating levels. At times, depending on job specific contract requirements, this amount has increased to a maximum of 60 truck loads per day. During off-season months, no traffic will be created while the extraction area is dormant. Traffic generated by this project during summer months makes up a small portion of the traffic utilizing Highway 299. The design capacity of the roadways is well above current use and this project typically takes 2 to 4 weeks to complete.

12. Water Use

It is expected that water will be used on-site for dust control and to be compliant with all air quality regulations. The mining site and access road will be sprinkled as needed throughout the periods when operations are active. Water will raw and untreated water from the project site or from Humboldt Bay Municipal Water District (HBMWD).

III. MINING PLAN / PLAN of OPERATIONS

1. Project Overview

Application for a Conditional Use Permit/Mining Plan/Reclamation Plan for the seasonal extraction in Humboldt County of up to 6,300 cubic yards of sand and gravel per year from river gravel bars. The existing aggregate extraction site has historically involved aggregate removal from the exposed bar surface within the property. Previously this site received County approval in 1994 for an annual extraction rate of up to 40,000 cubic yards. Secondary activities such as temporary equipment storage during active periods of operation will also occur.

Site conditions and historic monitoring indicates that extraction at average historical levels is appropriate at this site and that such operations will not cause immediate nor cumulative significant adverse environmental impacts. The proposal is apply for a conditional use permit and Surface mining and reclamation plan. This project will remain consistent with the previous terms and conditions found within the previous permits. This project is subject to conditions and oversight found within the County of Humboldt's Interim Adaptive Management plan. as described in Chapter II (3).

The proposal is for the continued extraction of up to 6,300 cubic yards of aggregate (sand and gravel) from adjacent gravel bars on an annual basis. The ongoing operation will continue to extract material as long as material is available on the gravel bar and operations conform to that established within the Interim Adaptive Management Plan. The extraction activity will continue to occur during the summer season between June 1st and October 1st. Aggregate materials will be extracted, loaded onto trucks and transported to an off-site location two miles north west of the project area where processing and storage will occur.

In any given year, project extraction volumes, locations, and methods will be submitted by the applicant for approval by local, state, and federal agencies, including the County of Humboldt, CHERT, Dept. of Fish and Game, and Army Corps of Engineers. This interagency process is more specifically described later in this report.

A. Acreage Permitted

The three parcels consist of approximately 66 acres in total. Generally only limited acres 2-4 acres would be disturbed in any year based on extraction plans estimates utilizing existing monitoring data. The area where surface mining occurs can change after a substantial flood event and change in river configuration. The area subject to this Reclamation Plan will be determined annually based on the review contained herein. (Annual Extraction Review Chapter III (j))

B. Acreage Disturbed

Acreage disturbed in any given year as a result of extraction activities will be dependent on the area permitted for gravel extraction subject to annual review (Annual Extraction Review Chapter III (j))

C. Acreage Reclaimed

Acreage to be left in a reclaimed manner will be dependent on the amount of acreage disturbed as described above. Reclamation is limited to disturbed areas as described in the Reclamation Plan (Chapter IV). All extraction areas are annually mined in a manner representing reclamation at the end of the extraction season.

TABLE 1
DESCRIPTION OF APPROXIMATE PROJECT AREA (ACRES), 2015

	Total Acreage (Approx.)
Parcel Size	66
River Bar	19
Construction Storage Area	2
Outside Project Description	45

D. Site History

The site as it exists today was developed in 1994 by a previous permit and was operated by Zable Trucking to supplement the growing need for aggregate materials to supply ongoing highway projects on Highways 299, and the Humboldt Bay area.

E. Area of Importance

The Simpson-Glendale site has provided aggregate materials that have been continually used by private contractors and public agencies since 1994. Cal Trans has utilized aggregate materials from this site for construction and maintenance along Highways 299. In addition materials from this site help supply local public and private projects.

The market area for the Simpson-Glendale site is generally defined as the area north of Eureka, East to Willow Creek and North to Crescent City to the City of Blue. It is anticipated that as additional funding becomes available for road maintenance, an increased need for aggregate materials will occur.

Since aggregate materials from this site are stored and processed a short distance away, these materials are of paramount importance for local construction and improvement projects. The Humboldt County General Plan — Frame Work Plan recognizes the importance of existing gravel extraction sites as follows:

"Sand, gravel and rock, being necessary to construction and development, are an essential component for the continued well-being of the county. They are the basis for much of the construction materials for roads, concrete, streambank protection, erosion control, septic systems and passive solar projects. Importation of these materials would raise costs and negatively impact the development and maintenance within the County. It is important to protect specific sites and haul routes against land use incompatibilities to assure the continued utilization of this resource."

2. Mining Plan

1) Maps of operations — See Attached Figures
2) Plan of Operation

A. Site Description

Operations at this site will be limited to extraction activities, and stockpiling of materials no processing will occur on site. Excavated materials will be trucked East to Bluelake or West to Arcata to processing sites located adjacent to Highway 299.
Highways 299 provides access between the extraction and processing sites and is well suited of handling the small amount of truck traffic this project proposes, and in a larger context will reduce the amount of truck traffic county wide as raw materials will not have be trucked into and through Humboldt County.

Site access is provided by a privately maintained road from Glendale Road off of Highway 299 down to the river bar. This roadway has been historically part of the permitted extraction operations for the last twenty plus years.

The number of employees on site will range between (3) and (6) depending on the amount of trucks being to transport raw materials. Normal hours of operation are between 7:00 am and 6:00 pm Monday through Friday. Weekend Extraction would occasionally occur contingent upon market demands or a shortened extraction season. This schedule may also change due to an emergency event requiring a greater need of raw materials.

B. Production Schedule

The applicant proposes to remove up to 6,300 cubic yards of aggregate on an annual basis. The applicant will be the only operator/hauler for the extent of operations. Seasonal, intermittent peak activity is anticipated during construction season, but may occur during anytime of the extraction season. The duration and intensity of operation will be dependent on demand, but can be expected to be active on a seasonal basis for the next fifteen plus years.

C. Plan Details

a. Topsoil

There is no native topsoil located within the extraction area. Any existing vegetation on the gravel bar itself is a compilation of river bar and wasteland species which will be relatively unaffected by extraction operations. No topsoil will subsequently be required to be removed or stockpiled. Surrounding land is similarly situated with gravelly (river run) substrate, and when irrigated produces minimal cover with little or no topsoil horizon development.

b. Overburden

No overburden exists at the extraction site.

c. Mine Waste

No waste is produced from this type of project. All materials will be trucked off-site. Due to the nature of the activity and the proposed methods of extraction, no waste will be either retained on-site or disposed of off-site. No discharge from industrial activities into state waters occurs.

d. Extraction Methods

See Chapter II (1) for details on extraction activities.

e. Water requirements

No water use is required for extraction activities. Watering for dust control along the haul road may occur in conjunction with trucking of raw materials.

f. Water Impoundments and Diversions

No water impoundments or diversions are associated with this project.

g. Wastewater Treatment

By the nature of the described extraction activities, no wastewater is produced by this operation. Portable chemical toilets are provided for employees and are maintained by a pumper licensed in Humboldt County.

h. Contaminants

No servicing of equipment (fueling or lubricating) occurs within the extraction area. In the event of an accidental fuel or lubricant leak (i.e. hydraulic lines, etc.), operators have been instructed to move equipment to safer high ground (roadway or upper bench). If gravel is contaminated with a spill, the material will be removed and properly disposed of.

i. Processing

No processing will occur within the project area.

j. In-Stream Mining

No in-stream mining will occur within the scope of this project.

D. Production Schedule

This surface mining project entails the seasonal extraction of up to 6,300 cubic yards of aggregate on an annual basis, the instillation of seasonal crossings over low flow river channels to facilitate gravel transport, and reclamation of extraction areas. This is essentially a continuation of a previous permitted operation. A minimum fifteen year approval is proposed and is supported based on analysis of submitted monitoring information.

E. Extraction Location

The site area along the existing gravel bar is proposed for mining. The primary activity has and will continue to occur adjacent to the low flow river channel. This area is subject to frequent inundation resulting in annual replenishment. The area adjacent to the active channel will continue to be mined using skimming as the primary mode of extraction, additional extraction techniques would include fish enhancement extraction techniques such as the development of alcove's and fish access channels. Other alternatives may be an option but will be subject to annual conditions and specific management purposes.

Reclamation of extraction the extraction area is completed on an annual basis through extraction design and is left in a reclaimed manner at the end of the extraction season. The extraction area will be re-contoured as a function of natural flow events and annual high flow events. Mitigation imposed as part of the project and final extraction slopes allow natural processes to reclaim the site on an annual basis and not significantly impact natural geomorphic processes or channel configuration. Extraction has been designed to complement the natural processes resulting in no significant impacts.

Of the approximate 19 acres located below the Ordinary High Water (OHW) level of the river, it is estimated that approximately 2-4 acres will be utilized for gravel extraction on a annual bases. This area will be available for extraction activity depending on the location of the river and the condition of the gravel bar.

Topography at the end of each extraction season is described in Chapter (4, D) of this Reclamation Plan and is further specified annually by approvals from local, state, and federal agencies such as the County annual extraction approval process, 1603 Agreements with the CA Department of Fish and Wildlife (DFW), and letters of permission (LOP) or individual permits (Section 404) with the Army Corps of Engineers (ACOE).

Annual monitoring and extraction information will be submitted to the appropriate agencies as part of the annual review requirements.

F. Extraction Depth

Extraction through various skimming techniques and designs is the primary mode of extraction. The morphology of this type of site generally consists of gravel bars on a straight or sometimes meandering portion of the river channel. The primary method of extraction will

continue to be bar skimming. Skimming would generally be conducted with a loader or scraper starting generally at a minimum elevation of one foot above the low water channel and proceeding with a longitudinal slope equal to the river and/or a cross bar slope of 0% to 2%. Reclamation for this option consists of ensuring the bar is left in a 'free-draining' configuration so as not to trap fish, and encourage future gravel recruitment.

Other extraction techniques have been utilized to respond to annual conditions of channel morphology. When specifically proposed as part of an annual extraction plan, such plans will be approved by the County (currently through the CHERT process), DFG as part of the 1603 agreement process, and/or the Army Corps of Engineers through their 404 or LOP process. For instance resource agencies may desire wet pit or alcove options to improve fish holding and passage or other needs, as has historically occurred here and is done at other locations on the Mad River. Wet pit mining and/or trenching also occurs typically adjacent to, but outside of the river channel and may at times be utilized to increase channel capacity and/or maintain the adjacent bar morphology to encourage subsequent gravel recruitment. This method is also utilized to reduce bank erosion, create deep water habitat, and to reduce the aerial extent of excavation. Some grading may also occur along off-channel areas, consisting of removing high areas or terrace deposits. This may be proposed to increase overflow channel capacity, riparian vegetation, and habitat values. Such grading will occur will occur in a manner that does not lower the flow regime of the channel, and would not remove established riparian vegetation or cause depressions that would increase the danger of trapping salmonids at high flows. Any such proposal would require County, Department of Fish and Wildlife (DFG), and Army Corps of Engineers (ACOE) approval.

G. Extraction Standards

Since 1992 regulatory extraction standards have been modified on an almost annual basis, as techniques of monitoring and review are field-tested and refined to suit site specific conditions on local rivers. The extraction standards described below may therefore be modified during the annual review process, if the operator, County, Department of Fish and Game, and Army Corps of Engineers agree alternate standards will adequately protect river resource values.

The following standards have been incorporated into this project's Proposed Mitigation Measures.

1. At the time of extraction, a vertical buffer (freeboard) of at least one foot will be maintained between the stream water surface and the extraction area.

2. The residual bar slope will:
   a. Generally follow the slope of the water level in an upstream and downstream direction and maintain a vertical buffer of at least one foot; or
   b. Generally follow the annual pre-extraction downriver bar slope; or
   c. Slope towards the water with a grade of at least 0.5%.

3. Subsurface extraction will generally slope in an upstream and downstream direction.

Changes to the above format may occur only after regulatory agency approval pursuant to County, Army Corps of Engineers annual approval process, and the Department of Fish and Wildlife Stream Alteration Agreement Process.

H. Seasonal Stream Crossing

Much of the extraction area is currently on the northern side if the low flow channel of the Mad River, however a small portion of the bar along the western boundary of the site can be separated from the haul road. To allow access for extraction and hauling equipment, the applicant proposes to install a single seasonal crossing. This crossing would consist of a railroad flatcar placed on gravel abutments with a minimum clearance above the water surface. Approximately 200 cubic yards of gravel would be scraped from adjoining areas to form each of the abutments for the crossing. The crossing will be removed at the end of each extraction season and the abutment material will be regarded to blend in with surrounding topography.

I. Annual Extraction Plan Review

This adaptive management program, with its annual review will regulate and monitor gravel extraction, gravel replenishment, and bed morphology to assure that a degree of dynamic equilibrium is maintained.

Extraction as described herein and proposed in annual submittals has will be designed based on annual conditions and monitoring information. Annual high flow events (particularly such as occurred in January and March of 1995, December of 1996 and January of 1997) may alter specifics for extraction standards on an annual basis. Mining will follow the adaptive management strategies outlined below.

Extraction for a given season will occur after preparation of a specific operating plan for mining and reclamation developed on the basis of annual assessments and monitoring of the proposed project site. Annual assessments and site evaluation will be used to determine when, where and how aggregate can be extracted in a manner providing for reclamation while reducing or preventing potential impacts. The County, Department of Fish and Wildlife, NOAA Fisheries and Army Corps of Engineers have developed a monitoring and adaptive management program that includes annual scientific reviews and recommendations by other agencies. This program which has been subject to annual revision will continue to be followed.

The annual extraction of 6,300 cubic yards of gravel from this private land ownership in Humboldt County, CA is an upper limit. Monitoring and adaptive management strategies will determine the appropriate locations and volumes to be extracted based on current bar configuration. Extraction plans will identify appropriate areas of mining as well as appropriate volumes.

The applicant will continue to develop cross-sectional data and/or other monitoring information based on field surveys in accordance with accepted monitoring standards, such as those presently conducted by the operator in cooperation with Regions 1 and 3

of the Department of Fish and Wildlife, the Army Corps of Engineers, and NOAA Fisheries. As information is analyzed these monitoring standards are subject to revision by resource agencies.

J. Annual Bar Morphology Analysis

These cross-sections would show any sequential changes in bar and river configuration, if that was occurring. When extraction is proposed to occur during the season the appropriate cross-sections will be re-measured and supplemented as necessary with additional cross sections. After the extraction season, cross-sections will be used to monitor conformance to extraction prescriptions, volume extracted, and post-extraction bar configuration. These cross-sections have been, and will continue to be analyzed and utilized in developing annual extraction plans.

K. Management Principles and Practices

Dates of operation, elevation and slope limitations may change annually as approved by the County, Department of Fish and Wildlife, NOAA Fisheries and Army Corps of Engineers through extensions or modifications of operating conditions.

1. Extraction will occur adjacent to but outside of the live stream, or in existing or overflow channels for an alternative source of material, maintaining slopes towards the downriver portions of the bar.

2. Subsurface extraction adjacent to but outside of the live stream will continue as a method to enhance fishery values by creating a deeper and colder environment for holding (thermal refuge) and passage for smolts and adult salmonids. (This will only be proposed if recommended by a qualified fisheries biologist).

3. Extraction of gravel will occur in a manner that represents a final reclamation configuration for the gravel bar for the year.

4. Post-mining topography of gravel bars will be consistent and homogenous with the upstream and downstream topography.

5. Potential tools and methodologies that will be periodically utilized to assist in Managing Aggregate Resources.
   - Annual reports of extraction/ replenishment submitted to government agencies by operators and their consultants.
   - Annual record keeping and reporting of extraction volumes, finished site elevations and project characteristics.
   - Periodic field inspections to identify fish and wildlife species presence/use at this site. - Studies of fisheries resources and salmonid use of area.
   - Aerial photography, on-site photography and videotaping of site conditions.
   - Standardization of cross-section locations and methodologies.

- Continuing compilation and analysis of historical and current data, particularly as a result of monitoring at the project site and in conjunction with information developed by others, including resource agencies.
- Enhancement programs for the development of fishery and wildlife habitat, etc., to be implemented by the operator working in concert with agency personal, river consultants and other professionals.

6. Standards and/or protocols for some of the physical and biological information listed above has been formalized and accepted by both federal and state agencies. These will further define the monitoring/management that will occur at this site. Such standards, since they are subject to annual change, will become part of the project as required by the Army Corps 404 Individual Permit or "Letter of Permission" permit process (for example) rather than incorporating them into the Project Description herein described.

7. The exact method of extraction will be determined based on annual river conditions. The County, Army Corps of Engineers and the California Department of Fish and Game will continue to receive specific annual extraction plans for their review and comment.

IV. RECLAMATION PLAN

1. Proposed Use of Site Afterwards

The existing aggregate extraction site has historically involved aggregate removal from the exposed bar surface within the property. Previously this site received County approval in 1994 for an annual extraction rate of up to 40,000 cubic yards. Secondary activities such as temporary equipment storage during active periods of operation will and has also occur historically.

The Simpson-Glendale site is strategically located in a market area that is important to federal, state, County, and local construction projects in Humboldt County. It is for both local and regional importance that this extraction site continues to operate, since it helps insure a nearby source of aggregate is available to the community.

The Simpson-Glendale ownership is zoned Agricultural (AG); surrounding lands are zoned Residential Suburban Transitional (RST), Community Commercial (C-2), Agriculture Exclusive (AE), and Agricultural General (AG). Much of the immediate area is used for rural residential with pasture for livestock, tree crops, and gardens. A small commercial lot is located directly across the highway from the entrance to the haul road. The parcel slopes sharply into the river basin, and has been historically used as a site for mining. As a result the site quality in relation to timber production is very poor. It is anticipated that the extraction area would be utilized for floodway management, wildlife habitat, and recreation if extraction activities cease.

2. Reclamation Activity

Reestablishment of berms across access roads during winter months and any necessary grading activities for drainage and/or erosion control purposes will continue to occur as annual management activity occurring at the extraction site. Revegetation of the project area is not appropriate. Native grass seed will be planted in select places as needed for drainage and/or erosion control. Naturally occurring species have colonized the gravelly areas in less active portions of the extraction site, and will be left until the area is needed. At present it is not anticipated that any erosion control will be necessary for areas exceeding 1,000 square feet. The extraction area in the active channel will be left in a reclaimed condition at the end of extraction each year, and will be consistent and homogenous with the upstream and downstream topography. Prior to October 15th grading will be completed on the gravel bar, and on November 1st extraction ceases unless extended by the appropriate agencies through their permitting process. In conjunction with the end of the extraction season, the Operator is responsible for removing any and all machinery equipment, waste or other evidence of the operation from the river channel and gravel bar. Subsequent annual high flows recontour the extraction area.

The Operator will be responsible for smoothing out the river bar so that no topographic features remain that degrade the environment (such as ponding, erosion, sedimentation or stream channel alteration). Site specific requirements are also required seasonally by

annual County approval, CA Department of Fish and Wildlife (DFG) for seasonal completion through the Stream Alteration Agreement (1603), and by the Army Corps of Engineers (ACOE) as part of the Individual Permit (Section 404).

If surface mining activity were to cease, no further reclamation of extraction areas would be necessary, other than that preformed on an annual basis. Access roads to the river would remain for property access and management activities, but these would be bermed annually prior to the onset of winter. The river would be utilized for open space/recreational purposes, and private property access.

See the overall Performance Standards Section (V) Reclamation Standards.

3. Schedule of Reclamation Activities

The Gravel bar will be left in a reclaimed condition at the end of each extraction season, as specified during annual review and verified by annual agency site inspections, including the County, the Department of Fish and Wildlife and the Army Corps of Engineers. Berms across the access road are required prior to each winter as part of meeting Regional Water Quality Control Board specifications. These activities will continue to occur each year, meeting reclamation specifications and can be confirmed as part of the County's annual SMARA inspections.

4. Post Mining Topography

The post mining topography of the extraction area will be left in a manner representing reclamation, as described in more detail earlier in this document. Natural bedload transport processes will also continue to annually be a factor at site with the advent of annual high water flowing over the bar, depositing gravel and reshaping the bar. Cross-section will be done to establish the baseline condition for extraction proposals and annual review criteria by resource agencies. Cross-sections will continue to be performed by experienced professionals in a manner that allows cross-sections to be reestablished should flooding substantially change the site. A permanent benchmark has been established on site, and tied to both NGVD & NAVD elevations. Pre and post-mining cross-section information will be submitted to Humboldt County, CA Department of Fish and Wildlife (DFW), and the Army Corps of Engineers (ACOE), on an annual basis as long as information is required by those agencies.

The riverbanks adjacent to the extraction site consist of bedrock, riprapped banks, and or aggregate deposits. Extraction does not occur adjacent to erosional riverbanks; slopes will not be destabilized. Site observations and analysis of aerial photographs and cross-sections have determined the acceptability of currently proposed extraction methods and locations. The river bank on the western side of the river where extraction and hauling will occur is currently heavily vegetated, and will not be degraded by extraction activities. Therefore no planting is currently proposed.

5. Reclamation on Future Mining

Annual extraction at the Applicants ownership will not affect the opportunity to continue to mine at this location or adjacent lands.

6. Public Health and Safety

Public health and safety concerns include both on-site and off-site impacts. The project will not have a significant increase of risk to people on-site due to the following: it is an isolated location; access is controlled by a locked gate; material to be extracted is structurally stable and; no attractive nuisance to encourage trespass exists.

Equipment requiring fuel will be filled off-site; subsequently no fuel storage will occur on site. No 'abandoned' equipment, structures, refuse, etc. associated with extraction activity will remain within extraction areas after extraction has been discontinued.

7. Control of Contaminants

The potential for contaminants is limited to operation related activities such as equipment leaks or spills. Such contaminants from equipment shall continue to be controlled through proper equipment maintenance and operation; all equipment maintenance work will be conducted off of extraction areas. Any materials contaminated from equipment leaks or spills will be properly disposed of, as required by state and federal laws.

In the event of an accidental fuel or lubricant leak (i.e. hydraulic lines, etc.), operators have been instructed to move equipment to safer high ground (roadway or upper bench). If gravel is contaminated with a spill, the material will be removed and properly disposed of.

8. Revegetation

The extraction area is located outside of established riparian areas. The flood washed portion of the gravel bar contains primarily annual vegetation. Natural processes of removal by flood and replacement by deposition annually renews vegetation to these areas. Site reviews and annual aerial photographs show that existing riparian vegetation is not affected by extraction activities. The gravel bar on the Applicants ownership is similarly vegetated as adjacent un-mined gravel bars. No established vegetation is proposed to be removed from the stream channel and as a result, other than natural reoccurrence no revegetation is proposed. These management decisions will be based on a specific year's extraction proposal and management considerations and reviewed by agencies as part of the annual review process.

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VI. FINANCIAL ASSURANCE

Financial Assurance Guidelines

I. PRIMARY RECLAMATION ACTIVITIES Page__1__ of ___6_

Description of Task:

Establish finial grades on gravel bar and reestablishment of berms and cross drains on all access roads

Methods to be Used:

Tractor

Miscellaneous Information (no automatic calculations occur in this area):

Overburden (c.y.):		0.00	Topsoil (c.y.)		0.00	Acres:		0.00
Production Rate (c.y./hr):	1.			2.			3.		4.	
Haul Distance (feet):	1.			2.			3.		4.	
Factor for Haul Distance	1.			2.			3.		4.	

A. Equipment - List equipment required to complete identified task. For large reclamation jobs separate mine areas for ease of accounting

Equipment	$/Hour	# of Hours	Cost ($)
Tractor D-6D	$75.30	3.0	$226
	$0.00	0.0	$0
	$0.00	0.0	$0
	$0.00	0.0	$0

Total Equipment Cost for this Task = $226

B. Labor - List all labor categories to complete identified task

Labor Category	$/Hour	of ManHours	Cost ($)
Supervision	$66.70	3.0	$200
Grader Op	$61.25	3.0	$184
	$0.00	0.0	$0
	$0.00	0.0	$0

Total Labor Cost for this Task = $384

C. Materials - List all materials required to complete identified task (include disposal costs).

Item	Quantity	$/Unit	Cost ($)
	0.00	$0.00	$0
	0.00	$0.00	$0
	0.00	$0.00	$0

Total Materials Cost for this Task = $0

D. Direct Cost for this Task

Equipment Cost + Labor Cost + Materials Cost = **$610**

Financial Assurance Cost Estimate

Financial Assurance Guidelines

II. REVEGETATION Page__2__ of __6__

Description of Task:

Revegetation of native seed mix for needed erosion control on access road cross drains

Methods to be Used:

Revegetation will consists of manually broadcasting seed mix.

A. Equipment - List equipment required to complete identified task.

Equipment	$/Hour	# of Hours	Cost ($)
	$0.00	0.0	$0
	$0.00	0.0	$0
	$0.00	0.0	$0

Total Labor Cost for this Task = $0

B. Labor - List all labor categories to complete identified task.

Labor Category	$/Hour	# of ManHours	Cost ($)
Supervisor	$47.37	0.5	$23.7
Laborer	$47.27	0.5	$23.6
	$0.00	0.0	$0.0

Total Equipment Cost for this Task = $47

C. Materials - List all material required to complete identified task.

Item / Plant Species	Unit of Measure	# of Units	$/Unit	Cost ($)
Native Grass Seed Mix	Lbs	1.0	$16.50	$17
		0.0	$0.00	$0
		0.0	$0.00	$0
		0.0	$0.00	$0
		0.0	$0.00	$0
		0.0	$0.00	$0
		0.0	$0.00	$0

Total Materials Cost for this Task = $17

D. Direct Cost for this Task

Equipment Cost + Labor Cost + Materials Cost = **$64**

Financial Assurance Cost Estimate

Financial Assurance Guidelines

III. PLANT STRUCTURES AND EQUIPMENT REMOVAL Page__3__ of__6__

Description of Task:

There are no building or structure to be removed from the site. All equipment is removed from the site following annual extraction activities and is stored in a area just off site of the area the reclamation activities will occure.

Methods to be Used:

A. Equipment - List equipment required to complete identified task.

Equipment	$/Hour	# of Equip Hours	Cost ($)
	$0.00	0.0	$0
	$0.00	0.0	$0
	$0.00	0.0	$0
	$0.00	0.0	$0

Total Labor Cost for this Task $0

B. Labor - List all labor categories to complete identified task.

Labor Category	$/Hour	# of ManHours	Cost ($)
	$0.00	0.0	$0
	$0.00	0.0	$0
	$0.00	0.0	$0
	$0.00	0.0	$0

Total Equipment Cost for this Task $0

C. Demolition - List all structures and equipment to be dismantled or demolished.

Structure / Equipment	Type of Material	Volume (cubic feet)	Unit Cost Basis	Disposal Cost	Cost ($)
		$0.00	0.00	$0.00	$0
		$0.00	0.00	$0.00	$0
		$0.00	0.00	$0.00	$0
		$0.00	0.00	$0.00	$0

Total Materials Cost for this Task $0

D. Direct Cost for this Task

Equipment Cost + Labor Cost + Demolition Cost = **$0**

Financial Assurance Cost Estimate

Financial Assurance Guidelines

(Sections "C"and "D" have been automated)

E. Surplus / Salvage Value

1. **Total cost to remove plant structures and equip for which salvage value is being claimed. (This is obtained from values already entered in A, B, & C above. No entry needed if salvage value is not being claimed)	$0.00
2. Net salvage value of the plant structures and equipment.* (no entry if salvage value is not being claimed)	$0
3. Subtract Line 2 from Line 1. (allowable credit for salvage value)	$0
4. Total plant structure and misc structure demo costs	$0

*NOTE This is the value of plant structures, buildings and equipment on a salvage basis – e.g. after the structures and equipment have been removed for sale or use off-site. In order to include net salvage value in the financial assuranace calculation, the operator must provide a letter of agreement, signed contract, bid, or quote from an independent company which provides industrial dismantling or equipment salvage services, or is in the business of buying and selling scrap metals or similar products.

**Note This value must be obtained by manually adding items previously entered in sections A, B, & C that are related to removal of items for which salvage value is being claimed. This manual step is necessary in order to apply salvage value only towards costs of removing equipment for which salvage is being claimed, not towards other demolition costs.

Financial Assurance Cost Estimate

Financial Assurance Guidelines

IV. MISCELLANEOUS COSTS

Examples of this type of cost could include temporary storage of equipment and materials off site, special one-time permits (i.e. transportation permits for extra wide overweight loads, etc.), decommissioning a process mill (i.e. decontamination of equipment), or disposal of warehouse inventories.

Item / Task	Quantity	$/Unit	Cost ($)
	0.0	$0.00	$0
	0.0	$0.00	$0
	0.0	$0.00	$0
	0.0	$0.00	$0
	0.0	$0.00	$0
	0.0	$0.00	$0
	0.0	$0.00	$0
	0.0	$0.00	$0
	0.0	$0.00	$0
	0.0	$0.00	$0

Total Miscellaneous Costs **$0.00**

V. MONITORING

Monitoring Task	$/Visit	# Visits/Year	# of Monitoring Years	Cost ($)
Stormwater	$50.00	3.0	3.0	$450
	$0.00	0.0	0.0	$0
	$0.00	0.0	0.0	$0
	$0.00	0.0	0.0	$0
	$0.00	0.0	0.0	$0

Total Monitoring Costs **$450**

Financial Assurance Cost Estimate

Financial Assurance Guidelines

VII. SUMMARY OF COSTS

Page__6__ of___6_

Total of all Primary Activities Costs	$610
Total of all Revegetation Costs	$64
Total of all Plant Structures & Equipment Removal Costs (corrected for salvage)	$0
Total of all Miscellaneous Costs	$0
Total of all Monitoring Costs	$450
Total of Direct Costs	$1,124
Supervision (7%) (based on graph no. 1)	$79
Profit/Overhead (14%) (based on graph no. 2)	$157
Contingencies (10%) (based on "C" in section VI.)	$112
Mobilization (1%) (1% to 5%)	11.24
Total of Indirect Costs	$360
Total of Direct and Indirect Costs	$1,483
Lead Agency Administrative Cost*	$500
*$500 for in stream/ $1,000 for upland sites	
Total Estimated Cost of Reclamation	**$1,983**

Financial Assurance Cost Estimate

VII. STATEMENT OF RESPONSIBILITY

STATEMENT OF RESPONSIBILITY

Substantial deviations from the approved reclamation plan shall not be undertaken until an amendment has been filed with, and approved by, Humboldt County Planning Department. Any successor or assignees in interest of this surface mining operation are required to assume responsibility for meeting the terms of the approved reclamation plan.

I, the undersigned, hereby agree to accept full responsibility for reclaiming all mined lands as described and submitted herein with any modifications requested by the Humboldt County Planning Department as Conditions of Approval.

Sign _____ Date 3/15/17

Randy Sundberg
GR Sundberg, Incorporated
5211 Boyd Road
Arcata, CA 95521
(707) 825-6565

FIGURES

MAPS

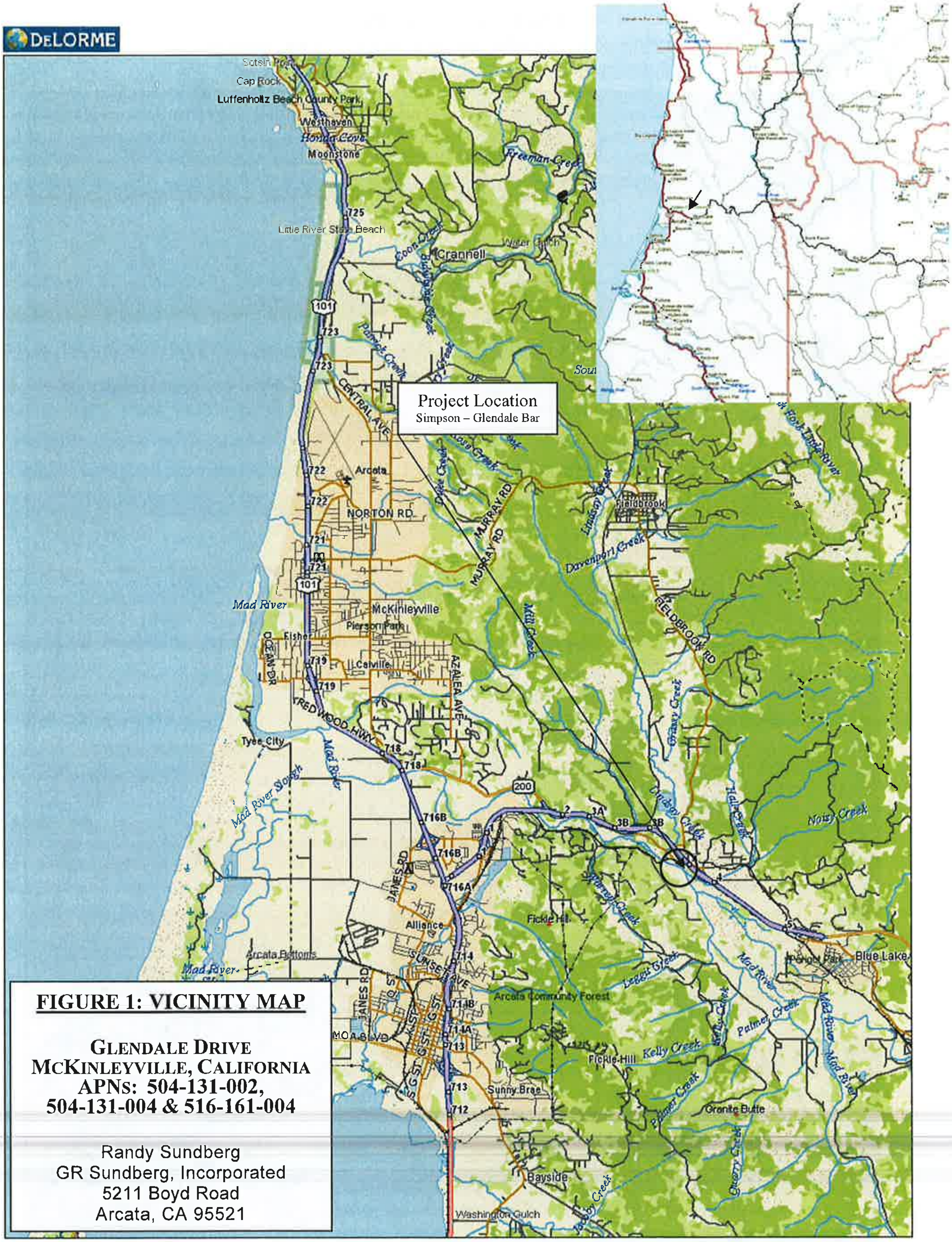

FIGURE 1: VICINITY MAP

GLENDALE DRIVE
MCKINLEYVILLE, CALIFORNIA
APNS: 504-131-002,
504-131-004 & 516-161-004

Randy Sundberg
GR Sundberg, Incorporated
5211 Boyd Road
Arcata, CA 95521

MN (15.2° E)

0 ½ 1 1½ 2 2½ mi
Data Zoom 11-0

SUNDBERG PROPERTY
LOCATED IN PORTIONS OF SECTIONS 13, 14 AND 23
TOWNSHIP 6 NORTH, RANGE 1 EAST, H.B&M

PARCELS OWNED BY SUNDBERG
DEED 2006-26453-3

FIGURE 2 - LOCATION MAP

N
W
E
S

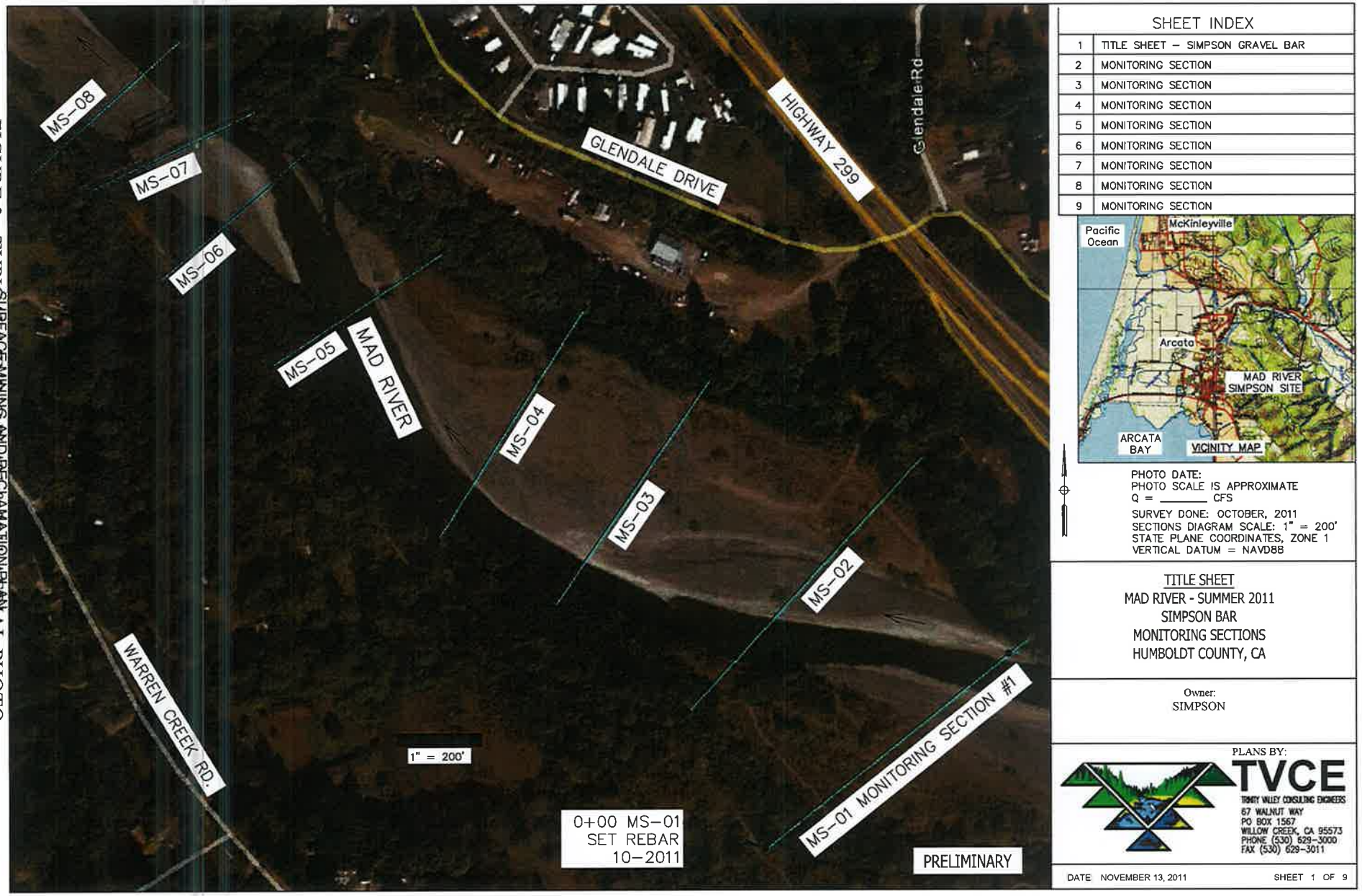

FIGURE 3 - TYPICAL MONITORING CROSS SECTION ON AERIAL PHOTO

SHEET INDEX	
1	TITLE SHEET – SIMPSON GRAVEL BAR
2	MONITORING SECTION
3	MONITORING SECTION
4	MONITORING SECTION
5	MONITORING SECTION
6	MONITORING SECTION
7	MONITORING SECTION
8	MONITORING SECTION
9	MONITORING SECTION

PHOTO DATE:
PHOTO SCALE IS APPROXIMATE
Q = _____ CFS
SURVEY DONE: OCTOBER, 2011
SECTIONS DIAGRAM SCALE: 1" = 200'
STATE PLANE COORDINATES, ZONE 1
VERTICAL DATUM = NAVD88

TITLE SHEET
MAD RIVER - SUMMER 2011
SIMPSON BAR
MONITORING SECTIONS
HUMBOLDT COUNTY, CA

Owner:
SIMPSON

PLANS BY:
TVCE
TRINITY VALLEY CONSULTING ENGINEERS
67 WALNUT WAY
PO BOX 1567
WILLOW CREEK, CA 95573
PHONE (530) 629-3000
FAX (530) 629-3011

DATE NOVEMBER 13, 2011 SHEET 1 OF 9

ATTACHMENT A

BIOLOGICAL REPORT

BIOLOGICAL REPORT

SIMPSON – GLENDALE BAR

GR Sundberg, Corporation
9-1-2016

Table of Contents

Biological Report
Simpson-Glendale Bar – Surface Mining and Reclamation Plan

SECTION 1 SUMMARY OF FINDINGS AND CONCLUSIONS

Project Description

The application is for a conditional Use Permit/Mining Plan/Reclamation Plan for the seasonal extraction in Humboldt County of up to 6,300 cubic yards of sand and gravel per year from river gravel bars. This is for applicant, Randy Sundberg, GR Sundberg, Incorporated, Arcata, CA (530) 629-300. Located along the Mad River, River Mile 8, on the Arcata North 7.5' Quadrangle, within portions of Section 13,14, & 23, T6N, R1E, H.B.&M. The site is accessed from the east side of Highway 299, at Glendale and then proceeding west bound on Glendale Drive in Humboldt County (APN 504-131-02& 04, 516-161-04). The portion of gravel bar on this property is approximately 27 acres, as depicted on the site maps. This site is adjacent to an existing construction/storage yard located uphill from the river on the same parcels historically utilized for stockpiling and processing aggregate products.

The Simpson Glendale Bar is located approximately 1320 feet west of downtown Glendale in Humboldt County, California. The project consists of the annual extraction of aggregate from a river bar within the ordinary high water mark of the Mad River. LBJ Enterprises has surveyed gravel operations along the Mad River since 1997. This year in 2015 a new gravel bar was proposed for operations. The standard bird monitoring program was established for the Sundberg Bar. This will benefit significantly from the 20 years of biological monitoring on all the Lower Mad River gravel operations in the wider watershed/study area. Aquatic salmonids are present in the adjacent mainstem of the Mad River. Operations as planned will be reviewed by the County of Humboldt Extraction Review Team (CHERT) to ensure the most appropriate mining practices for salmonid species. Those species with suitable habitat potentially impacted by the proposed activities will not be affected by the proposed gravel mining operations. An Osprey was detected flying over the bar on 7/24/15, no nests are known from this portion of the Mad River. Two California Species of Concern (CSC): Yellow Warbler and Yellow-breasted Chat may however nest or attempt to nest in the suitable alder/willow riparian habitat adjacent to the project area along both banks of the Mad River. They might be impacted by disturbance during the breeding season that is usually finished in July. No riparian habitat will be removed and the mining activities will not significantly add to the current level of disturbance and impacts to species potentially present. Significant impacts to any sensitive species are not expected as a result of the proposed activities.

SECTION 2 INTRODUCTION, BACKGROUND, AND PROJECT UNDERSTANDING

Introduction

The project area utilized for gravel extraction operations at the Simpson-Glendale Bar totals approximately 27 acres. The acre project area for the Simpson Glendale Bar is located on three separate parcels totaling approximately 66 acres with a smaller stockpile area (2 acres) located above the flood plain. Standard aggregate extraction techniques (see previous proposed extraction) will be employed at the site and vary due to concerns related to federally listed anadromous fisheries species present within this river reach. As such NOAA Fisheries has designed descriptions for various techniques to be assessed and utilized when conditions are provided for a preferred alternative. These techniques are described

within the biological rpinion prepared for the Mad River (inclusive of this site). Alternative extraction techniques will be used in place of Standard Methods (See Section 1.5), if the involved agencies determine that such methods could be used to minimize impacts or enhance aquatic or riparian habitat.

Background

Gravel mining has occurred historically along the Mad River. Currently an established biological and hydrological monitoring program has been established for all operators on the Mad River. This has been under the broad review of the CHERT committee on behalf of ACOE and the County for the past 20 years. Extraction operations include excavating, grading, loading, and transporting sand and gravel from dry gravel bars to processing plants or existing, adjacent stockpile sites located at or above the 100-year floodplain. Excavation typically consists of removing the top layers of gravel on bars with heavy equipment such as bulldozers, loaders and dump trucks. A variety of gravel extraction and non-extraction activities are proposed that may be applied on a site-specific basis depending on gravel bar characteristics and proximity to sensitive salmonid habitat. Extraction methods with a habitat improvement component will be given priority, if applicable at the site.

Project Understanding

The Simpson – Glendale Bar joined the group of up to six other gravel bars on the Mad River. Biological surveys were initiated in May 2015. Going through a permitting process with Army Corps of Engineers (ACOE), and the County of Humboldt will require a Reclamation Plan that incorporates thorough review of all concerns, including biological issues. The goal in part is to reduce the potential overall environmental impact of gravel mining activities on the surrounding area. As stated before the application is for a Conditional Use Permit/Mining Plan/Reclamation Plan for the seasonal extraction in Humboldt County of up to 6,300 cubic yards of sand and gravel per year from river Simpson – Glendale gravel bar. Full details of the extraction proposed are detailed elsewhere in this report.

SECTION 3 METHODS

3.1 Field Observation and Studies

To conduct field studies, a list of potential concerns or species was generated. Based on the geographic location of the project within Humboldt County any sensitive species, within range, that might theoretically occur was initially considered. Presented in Section IV-B (4.2.1) are the Protected Endangered, Threatened and Sensitive (PETS) species considered potentially present in the wider project area. Initial screening considered all possible PETS species within their respective range for Humboldt County, however; lack of suitable habitat in many cases eliminated them from further concern.

Survey Methods

During the 2015 breeding season surveys, and in the fall of 2015, wildlife biologist Robert Hewitt assessed the potential habitat and impacts from proposed activity on biological resources of concern. Point Counts, Area Searches and Willow Flycatcher surveys were completed. Bird species of the area were recorded (Section V (5.0) B.). Any suitable habitat was assessed, this included both banks of the river. Full protocol biological surveys of the project area have been conducted for the Willow Flycatcher for 2016. Surveys followed the standard practices established for other active gravel bars along the Mad River. The coordinated surveys began in the wider study area in 1997. In the broader context, habitat in the coastal Humboldt County area has been incidentally studied for its bird species by many local ornithologists, and its birdlife is very well known.

3.2 Trustee and Other Agency Consultation

Consultation History

ACOE permit requirements for proposed gravel mining activities in the vicinity of the Mad River has resulted in a broad cooperative review process outlined in the ACOE Letter of Permission (LOP). Established 20 years ago the LOP has directed gravel operation under the review of the CHERT and has led to a thorough understanding of gravel issues and ability to meet permitting requirements. Under the LOP a biological review to address potential impacts and any mitigation measures for the wildlife habitat within the project area is needed. The legal location of the project area is T 6N, R 1E, HBM, Sections13, 14 & 23. The parcel number is APN: 504-131- 02& 04. The review is conducted to evaluate the proposed gravel mining activities for the Conditional Use Permit/Mining Plan/Reclamation Plan for the seasonal extraction in Humboldt of up to 6,300 cubic yards of gravel. No previous formal consultations are known for this site, however, it will be incorporated into the LOP review and mining design process with the other Humboldt County gravel operators. There are no known additional formal consultations at this time.

3.3 Document and Report Review

The following documents and reports were reviewed: Humboldt County Zoning Regulations, 2009 Mad River cumulative report 1997-2009, title 3 guidelines for ordinance, CDF&W CNDDB. ACEO, their LOP, and many other references used to originally design the LOP. CHERT recommendations and on-going Mad River reports submitted to CDF&W and ACOE provided a historical documentation of annual results..

3.4 Cumulative Biological and Watershed Effects

The cumulative biological and watershed effects were considered primarily using knowledge of the biological and watershed effects gathered over the past 20 years of observation. There have been repeated visits annually to all extraction sites on the Mad River up to the CDF&W Blue Lake Fish Hatchery to understand the ecology and help with the Cumulative Biological and Watershed Effects determination. A very thorough coverage of the riparian habitats and open gravel bars has been obtained, and many of the details are provided in the 2009 Cumulative Mad River Report 1997-2009. Familiarity with similar species, habitats and circumstances throughout Humboldt County further assists in any wider impact determination.

SECTION 4 RESULTS AND DISSCUSSION

4.1 (A) Existing Site Conditions

The upper portion of the lower Mad River basin lies in a mountainous region, mostly forested with redwood and Douglas-fir trees. The forest distribution is described as being 37% fir forest, 24% redwood and 20% oak woodlands with small portions of annual grasses and pines. The river flows through confined topography, aligned along a northwestern trend. The lower and middle sections of the Mad River watershed are located in Humboldt County, almost entirely east of Highway 101, approximately 300 miles northwest of San Francisco, 15 miles north and east of Eureka. The river flows northwesterly, through or alongside the towns of Kneeland, Blue Lake, McKinleyville, and Arcata within the lower watershed. The lower portion of the river enters and flows along a broad alluvial valley beginning in close proximity to the Mad River Fish Hatchery, 1.5 miles upstream of Blue Lake. Topography becomes

somewhat confined again as it reached the Annie and Mary Railroad (A&MRR) bridge and the Hwy 299 bridge. Below the Hwy. 299 bridge, along the Arcata Bottoms, the river crosses a deltaic floodplain to its mouth. The site is located approximately 1300 feet west of the town of Glendale and consists of a stretch of the Mad River where the broad alluvial reach constricts at the downstream end of the project reach. Associated gravel deposits occur on the western portion of the project site. Moderately steep forested hill slopes adjoin the western side of the valley, while terraced flat topography adjoins the eastern side. A dense canopy of cottonwood/willow riparian habitat occupies the broad floodplain on the south bank. Land use in the surrounding area is a mixture of private and industrials timberlands. Private lands include rural residential development, agriculture, highway commercial, recreational, as well as nearby retail commercial activities along Hwy. 299 in Glendale, 1300 feet to the east. Above the valley and terraces, the surrounding land use is predominantly zoned for timber production (TPZ). Adjacent lands are zoned Agricultural Exclusive (20 acre minimum parcel size), Agricultural General (2.5 acre minimum parcel size), and Residential Suburban (1 acre minimum parcel size/allowing mobile homes), and utilized generally for agriculture, residential suburban, rural residential, highway commercial, open space, and wildlife habitat. The climate of the Mad River basin is typical of north coast valleys and is characterized by heavy annual rainfall concentrated in the cool winter months, ranging from 40 inches along the coast to approximately 65 inches near Sweasey Dam, and a relatively dry, moderate summer. The upland slopes are covered by a mixed conifer-hardwood forest matrix, that has experienced historical logging activities, while the lower valley area has been largely converted to agricultural use with some urban areas interspersed throughout the valley. The active channel and floodplain are characterized by a variety of annual plants that grow during extended periods of low stream flow (HCDCDS 2008).

The wildlife habitat at the site for operations is primarily within the riparian habitat on the upper banks of the river. Habitat will not be disturbed (see CHERT dbh requirements) other than out on the gravel bar during operations. Annual species and sparse open vegetation describes the habitat here and will be impacted by the operations footprint. Such habitat is normally substantially removed during regular river flows. A species list was generated for the Simpson – Glendale Gravel Bar. Habitat provided a good canopy cover of willow/alder riparian habitat along the edges of the river bar, with open vegetation closer to the Mad River, a river bank is to the south and narrow open band of gravel on the north side (stockyard). A narrow strip of willow/alder riparian habitat is on the north bank.

4.1.1 Terrestrial

Environmental Baseline

The surrounding landscape is primarily mid-seral upland forest and alder/willow/cottonwood dominated riparian habitat along the creek. The lower Mad River watershed below the Blue Lake Fish hatchery provided the boundaries for the Biological Assessment Area (BAA). A small watercourse is present that runs down the eastern boundary of the property. The vegetation is dominated by red alder (*Alnus rubra*) with a few willow (*Salix* spp.) and black cottonwood (*Poplus spp.*) with an understory of thimbleberry (*Rubrus parviflorus*), elderberry (*Sambucus* spp.), Himalaya berry (*Rubrus armeniacus*), smaller shrubby willows and other typical riparian plants. Within the rural/residential matrix of low density housing and forest habitat the BAA provides habitat value suitable for a variety of deciduous forest dwelling and conifer species. A major part of the Mad River basin is covered by conifer forests. Forested areas are predominantly mixed conifer types, such as coast redwood, Douglas-fir, White Fir and Sitka Spruce, which have been extensively developed for marketable timber. The remainder of the basin is covered by woodland (oaks and other hardwoods) and open prairies. The Draft Humboldt County General Plan (HCDCDS 2008) describes the Mad River watershed as being 80% fir, 37% redwood and 20% oak woodlands. The wider area is known to support Bald Eagle, Osprey, Peregrine Falcon, Yellow Warbler and other songbirds.

Riparian habitat types along the project reach of the Glendale-Simpson project area can be described as: upland forest and scrub (Coast redwood, Douglas-fir, alder and big-leaved maple, coyote brush, thimbleberry, Himalayaberry), willow scrub and shrub, and palustrine scrub (coyote brush, pampas grass, poison hemlock) all within the assessment area. The proposed extraction areas will typically be desiccated aggregate areas completely devoid of vegetation with the exception of annual forbes. Compliance with state and federal permits require that extraction areas do not contain woody vegetation greater than 2 inches Diameter-at-Breast-Height (dbh) or greater than 1/4 acre in contiguous size. Even with this standard, annual agency review with state federal and local representatives typically avoid all woody vegetation and in fact typically recommend buffers of 25 feet from small willow patches or other woody species. Most gravel bars within these reaches are exposed annually to scouring winter flows, and only small, young patches of willow scrub and shrubs able to take hold in relatively low velocity areas are present or are deposited by annual deposition in areas experiencing in higher velocity flows. In several areas of the extraction reach, the active base flow channel is directly adjacent to upland vegetation. These descriptions support an observation based analysis, in which riparian vegetation establishment and inundation frequency obviously play a major role in within the riparian corridor. Thus, given the extraction standards and areas in which aggregate extraction take place it makes sense that these areas experience greater inundation frequencies throughout out the year and thus have a substantial lack of riparian vegetation. In general, riparian habitat quantity (area) has not increased since the formation of CHERT, but riparian habitat quality has increased. Although riparian vegetation acreage has not increased significantly since the CHERT program began, a number of extraction practices have increased the quality of riparian habitat. One such extraction practice is the creation of "gravel pit wetlands," which mimic "oxbow lakes common in wide alluvial rivers" (Trush 2008a). The wetland pits are expected to be short-lived because they are typically obliterated by high flows within 2-5 years after their construction, depending on storm intensities. During the time that the wetland pits are present, they "provide abundant, high-quality avian and amphibian habitat" (Trush 2008a). In addition, CHERT recommendations minimize: 1) "any disturbance of existing woody riparian vegetation", and 2) "interference with the gradual colonization of recent depositional surfaces, aggrading floodplains, and re-worked flood terraces" that are created as the channel migrates naturally (Trush 2008a), which together limit gravel extraction's effects on riparian vegetation. During hydrologic years of normal rainfall, at the Glendale - Simpson site, the bars are scoured by winter and spring waters, resulting in low-water vegetation characterized by annual herbaceous species. Perennial herbaceous species and some woody species have also been able to colonize and persist on the bar, resulting in small riparian stands with some wildlife habitat value. These woody species include young sandbar willow and red alder, while the herbaceous vegetation includes sweet white clover, Dalmatian toadflax, rough cocklebur, brooklime, panicled bulrush, pearly everlasting, and grasses. Other vegetation types found within the project area include Douglas-fir, madrone, black and canyon live oaks, big leaf maple, black cottonwood, coyote brush, poison oak, himalaya berry, California blackberry, California wild grape, English ivy, pennyroyal, and various grasses and forbs. Wildlife species in the watershed area represent a high degree of diversity, reflecting the influences of elevation, climate, topography, and vegetation. Characteristic species of forested areas of the Pacific Northwest are relatively abundant. These include black bear, black-tailed deer, northern flickers and other woodpeckers, songbirds, western fence lizards, and salamanders.

Numerous species with special status inhabit the Mad River watershed as well. The CDF&W database for the Northern Spotted Owl (NSO) provides information on several known territories for the species in the watershed.. Historical NSO surveys have confirmed their absence surrounding the site. All three North American accipiter species (Cooper's Hawk, Sharp-shinned Hawk and Northern Goshawk) occur in the watershed. Timber stands within the vicinity lack sufficient habitat for the Northern Goshawk. Pacific giant salamanders and tailed frogs are found in the forested areas. Riparian-associated wildlife species also exhibit a high degree of diversity and density. Bird species richness is high compared to other riparian locations in the west. Species sighted in the watershed during surveys include several special status species such as the Willow Flycatcher, Yellow-breasted Chat and Yellow Warbler. Early spring

migrant Willow Flycatchers were occasionally detected as migrants on point counts and area searches. They were present once in a seasonand not seen a second time on return visits. There is one known WIFL summer presence within the BAA. It is ocated at the CCDF&W Blue Lake Fish Hatchery in the vicinity of the Guynup gravel bar, upstream from the mad River bridge. WIFLs have been detected more than twice within the months of June and July from 2006-present. WIFL is well documented to have juvenile migrants utilizing the river corridor as well as occasional adult occurrences that have been recorded in the riparian habitat during the fall. Rare raptors are present as well, including Bald Eagle, Peregrine Falcon, and Merlin. A variety of shorebirds and waterfowl inhabit the basin and inclue herons, egrets, sandpipers, Wood Ducks, and mergansers. The composition of riparian bird community has generally remained unchanged over the past 20 years. Most of the common breeding species are found on most bars, in most years. Small changes in availability of habitat may result in increases and decreases in acreages of riparian vegetation during large river scouring events and subsequent lack thereof. This would cause subtle shifts in the bird community, but not cause any significant impacts.

Mammals

Portions of the project area can be considered to be environmentally sensitive habitat. The sensitive habitat consists of several different kinds and can be classified as follows:

1) The riverine habitat of the river channels and the occasional ponds that form under summer low water conditions provide habitat for invertebrates, fish, amphibians such as frogs and salamanders, invertebrate-eating birds and various mammals including river otters and beavers and other mammals that come to the river to forage (such as bear, deer and raccoon).

2) The exposed cobble in the gravel bars adjacent to the low-flow channels provides roosting habitats for some avian species: Killdeer (*Charadrius vociferous*) and Spotted Sanpiper (*Calidris aethene*), but otherwise represents one of the sparsest habitats in terms of wildlife diversity and numbers. Of the three habitats listed here this is the general area where extraction activities physically occur. Adult foothill yellow-legged frogs bask on the cobble river edges and immediately disperse into the river when disturbed.

3) The riparian scrub habitat (Palustrine Scrub-Shrub Wetland; broad-leaved deciduous) occurs on "islands" next to the low flow channels and is the most extensive plant community within the active channel. Portions of this habitat are inundated every winter during high river flows. The Mixed Willow Series dominates the vegetation growing within the riparian scrub habitat. The understory is minimal and is comprised of weedy annual grasses and forbs. Only a sparse covering (40%) of shrubs is found in this community. This primarily includes narrow-leaved willow, shiny willow, red willow with the occurrence of red alder and black cottonwood in varying densities. The riparian scrub habitat supports a variety of wildlife species, including black bear, deer and a number of small mammals such as raccoon, striped skunk, gray fox, rodents and rabbits, and many bird species that use the areas for foraging, nesting and cover.

Two additional types of general habitat can be found near the property beyond that described above. These include the mixed conifer stands surrounding the Mad River valley and the agricultural-orchard-rural residential areas on surrounding lands within the Glendale area. Mammals typical to these areas include black-tailed deer, raccoon, opossum, fisher, mink, skunk, porcupine, brush rabbit, pocket gophers, wood rats, and deer mice. Representative reptiles and amphibians include the northern red-legged frog yellow-legged frogs, Pacific giant salamanders, rough-skinned newts and garter snakes.

4.1.2 Hydrologic and Aquatic

The Mad River drains 497 mi^2 in Humboldt County, California, and enters the Pacific Ocean just north of Arcata, with an average discharge of 15500 cubic feet/second (cfs). The drainage basin is underlain by the highly erodible Franciscan Formation, which yields high loads of sand and gravel. The gravel bars are, for the most part, un-vegetated due to high flows and annual bar scour. There are deciduous riparian trees (alder, willow and cottonwood) along the edge of the channel anchored into fissures in bedrock substrate both within and outside the bank-full channel. Willow scrub is located in isolated patches on both shorelines.

4.1.3 Sensitive Species or Habitats

The project site is new to the survey program to truly support any significant wildlife "on-site." In 2015 there was a single record of an Osprey, there were no other sensitive species detected. Thus the majority of PETS species were considered within this report for offsite, indirect impacts to individuals or habitat. Below are the PETS species considered potentially present in the wider project area. Initial screening considered all possible species within their respective range for Humboldt County, however, lack of suitable habitat in many cases eliminated further concern. These species are: **Golden Eagle** *Aquila chrysaetos,* **Marbled Murrelet** *Brachyramphus marmoratus,* **Northern Goshawk** *Accipiter gentilis,* **Pacific Fisher** (*Martes pennanti*) and **Humboldt Marten** (*Martes americana humboltensis*).

The PETS below are listed in order of priority for protection, Federally protected species listed first. The immediate location on the Mad River shoreline and finite area of potential riparian habitat allows a further screening of species with definitively no habitat present (see above) and reduces concerns for those species still potentially within the Biological Assessment Area (BAA) (see below).

Federally Protected Species

Bald Eagle *Haliaeetus leucocephalus*
Bald Eagles are a federally protected eagle species under the Bald and Golden Eagle act of 1940 (USFWS). They are a rare to uncommon resident and a locally rare breeder in Humboldt County (Harris 2005). When present, they are often located near open water and undisturbed shorelines (Hunter et al. 2005). Tall perches with long sight lines that are secluded from disturbances are favored for nesting sites. Fish bearing waters are available and Bald Eagles may be expected to forage occasionally or potentially nest. Currently Bald Eagle numbers seem to be increasing in Humboldt County. Large platform trees used to support possible nest structures were present on the hillslopes. No large nest structures were observed in the vicinity. This species is not known to nest within the immediate area, but does nest within the greater Mad River watershed. This species will not be affected by mining activities.
Spotted Owl *Strix occidentalis*
The Northern Spotted Owl is a species listed as "threatened" under the Federal Endangered Species Act (USFWS 1990). However, Humboldt County supports a substantial number of breeding pairs of Northern Spotted Owls (Hunter et al. 2005) and they are considered an uncommon resident and breeder (Harris 2005). They are often associated with old growth forests but are also known to inhabit second growth stands that provide sufficient prey, cover, and nesting sites (Hunter et al. 2005). This species is known to occur within the wider area on commercial timberlands. None are known from within 0.7 miles of the project site. Given the nearby human activity Spotted Owls are unlikely to be in the area, although there is a chance they would forage in the adjacent mid-seral conifer habitat present. Any suitable foraging habitat will not be removed and there will be no impacts to this species as a result of mining activities.

California Protected Species

White-tailed Kite *Elanus leucurus*
While still a fully-protected species in California (Shuford and Gardali 2008), White-tailed Kites are a common breeding resident of coastal plains of Humboldt County. Sites preferred by White-tailed Kites support vole prey populations and are characterized by grasses 1 to 4 feet in height with a layer of decadent thatch beneath. Furthermore, typical sites that support kites tend to be close in proximity or interconnected to other suitable grassland parcels (Hunter et al. 2005). Nesting sites have been reported in the sub-canopies of deciduous or conifer trees (Harris 2005). The location and habitat of the project area are not favorable for supporting White-tailed Kites. They are however occasionally detected on the gravel bars and may well nest in the more open areas of the BAA. These birds may occasionally fly over the project site and even though they are common resident breeders in the wider Humboldt coastal area they would not nest here or be impacted by project activities.

Peregrine Falcon *Falco peregrines anatum*
Peregrine Falcons are a fully-protected species and a common migrant and wintering bird of Humboldt County (Harris 2005). They are quite rare breeders in the county, limited to nesting in coastal and inland cliffs often near bodies of water (Grinnell 1944). Impacts would not occur as foraging or nesting habitat for this species is not present. Peregrine Falcons will only incidentally fly over the BAA due to their proximity and large home range. Peregrine Falcons will not be impacted by the proposed activities.

Willow Flycatcher *Empidonax traillii brewsteri*
The Little Willow Flycatcher (WIFL) is a species listed as "endangered" by the State of California (Hunter et al. 2005). Detections of WIFL in Humboldt County can be relatively common, but consist almost entirely of spring and fall migrants. Only three pairs have been confirmed breeding in Humboldt County since 1930 (Hunter et al. 2005, Hewitt 2009). One in the Klamath River area and one each on the lower Eel and lower Mad Rivers in the vicinity of Fortuna and Blue Lake respectively. Other possible or probable breeding observations of Willow Flycatchers have been located just inland along the North Coast. Although very rare in Northern California, WIFL regularly breed in re-generating clearcuts in the Coast Ranges of Oregon and Washington. These habitats are typically 1000-3000 feet in elevation and contain young conifers along with willow and alder. In contrast to this, the known Humboldt nests have been located in large stands of dense willow/cottonwood riparian habitat along the lower Eel and Mad Rivers. Willow Flycatchers have not been reported as breeding in the riparian vegetation of any other rivers in Humbodlt County. WIFL however do occur during migration and occasionally remain over the summer breeding period in such areas and thus other rivers provide potential habitat for this species elsewhere in Humboldt County. WIFL may have yet to be found in other watersheds due to lack or difficulty of survey and identification. The habitat on-site might possibly support any nesting birds as it is a narrow and small clump of willows. This is in contrast to wider lower floodplain areas of the Mad and Eel with large patches of cottonwood/willow riparian habitat. However, as mentioned before, fall migrant individuals, often juveniles, may represent the possibility of their occurrence. These birds are non-breeding and remain only for a few days during their southbound migration. Given the residential juxtaposition of this location, the rarity of nesting birds and the degree of human disturbance, this species will not be impacted by the mining activities. Annual protocol surveys for the presence or absence of WIFL will be conducted, and the results provided to CDF&W.

Bank Swallow *Riparia riparia*
The Bank Swallow is a state threatened species that has only recently recolonized Humboldt County. Bank Swallows are restricted to portions of California where sandy, vertical bluffs or riverbanks are available for the birds to dig their burrows and nest in colonies. Today, there remain only a few coastal nesting areas in Northwest California: Smith River, Mad River Bluffs and Fernbridge. The Mad River Bluffs location at the opposite, south, end of Clam Beach is the closest known colony. There is presumably habitat for this species nearby on potential sandy river banks. The colonies are closely followed and locations well known. No suitable nesting banks were seen in the immediate area and it

would not be expected. It will not be impacted by proposed mining activities. They may possibly fly over during migration, or foraging with other swallow species.

California Species of Special Concern

Northern Harrier *Circus cyaneus*
Northern Harriers are a California Bird Species of Special Concern (Priority 3) (Shuford and Gardali 2008) and are an uncommon breeder in Humboldt County (Harris 2005). Breeding harriers occur most frequently in coastal lowland open areas composed of contiguous marsh, tall grasslands, beach dune brushfields, and overgrown pastures. Nests are placed on the ground under tall grass or brush land cover (Harris 2005). This species would unlikely be seen foraging over the project site and has not been recorded. Open areas on site are not large enough to support nesting Northern Harriers, and they will not be affected by the proposed operations.

Vaux's Swift *Chaetura vauxi*
Vaux's Swifts are a California Bird Species of Special Concern (Priority 2) (Shuford and Gardali 2008) and are a common summer resident and breeder in Humboldt County (Harris 2005). They are found mostly in the redwood zone of Humboldt County due to the presence of large nesting cavities of remnant old growth redwood stands. The Mad River BAA offers possible habitat as in several cases Vaux's Swift are known to use chimneys as roosting or nesting habitat. Vaux's Swifts do occur on site, foraging for insect prey. On site nesting/roosting habitat is not present and impacts to this high-flying species are not expected.

Olive-sided Flycatcher *Contopus cooperi*
Olive-sided Flycatchers are a California Bird Species of Special Concern (Priority 2) (Shuford and Gardali 2008) and are a common summer resident and breeder in Humboldt County (Harris 2005). These flycatchers are found throughout the county and are typically associated with conifer forests that have ample openings between stands. They are mostly vacant in the more oak-dominated landscapes of interior sites of Humboldt County (Hunter et al. 2005). Olive-sided Flycatchers could be recorded in this conifer coastal location, however it is an abundant species in our area and significant impacts are not expected.

Purple Martin *Pogne subis*
Purple Martins are a California Bird Species of Special Concern (Priority 2) (Shuford and Gardali 2008) and are an uncommon summer resident and breeder (Harris 2005). Most documented breeding Martins have been found within the redwood zone of Humboldt, likely due to the presence of remnant snags used for nesting on private timberland (Hunter et al. 2005). Purple Martins may forage over the site, especially during migratory periods. Currently a pair is known to nest in the CDF&W Blue Lake Fish Hatchery infrastructure. A high up exposed pipe presents an ideal substitute nest cavity. At the Simpson – Glendale site large conifer snags for nesting are absent and this species will not be impacted by proposed operations.

Yellow Warbler *Dendroica petechia*
Yellow Warblers are a California Bird Species of Special Concern (Priority 2) (Shuford and Gardali 2008) and are a locally common summer resident and breeder (Harris 2005). Locations of these locally numerous breeding warblers are typically riparian areas with stands of black cottonwood, willow, and alder (Hunter et al. 2005). Yellow Warblers could occur in the riparian habitat in the BAA. This habitat is limited and there were five detections of this species in 2015. It regularly occurs in the BAA riparian habitat. It will occur during migratory periods as even minimal habitat is utilized this close to the ocean. Riparian habitat throughout Humboldt County supports good numbers of breeding Yellow Warblers in comparison to the rest of the state where riparian habitat has been severely impacted. Here in Northwestern California their numbers are not as suppressed, and riparian habitat supports healthy numbers of this species. The isolated habitat patch on the stockyard side with human disturbance may reduce the likelihood of nesting, but they would be regularly occurring neotropical migrants. Any impacts to this species in this mixed residential/rural landscape are not expected.

Yellow-breasted Chat *Icteria virens*
Yellow-breasted Chats are a California Bird Species of Special Concern (Priority 3) (Shuford and Gardali 2008) and are a locally uncommon summer resident and breeder (Harris 2005). They are variable in their nesting habitat preferences, but in general can be found near rivers where abundant thickets provide cover (Hunter et al. 2005). Riparian habitat throughout Humboldt County supports good numbers of this species. Yellow-breasted Chats may well occur in the more shrubby riparian habitat associated with this area. Chats are a riparian associated species, and are likely to occur in the BAA as the gravel bar habitat is open and brushy enough. A single bird was detected on the property across the river (south bank) in 2015. Again, likely impacts to this species in this rural/residential setting are not expected.

California Taxa to Watch

Osprey *Pandion haliaetus*
Ospreys are a common resident and breeder in Humboldt County. Breeding ospreys primarily occupy habitat within a few miles of fish-bearing water bodies (Harris 2005). They almost always nest in the flat or broken tops of native conifer trees or snags (Hunter et al. 2005) Nesting locations vary from near water's edge to well upslope of water's edge. This species regularly nests along the Mad River. The immediate vicinity of the BAA does not have any particularly suitable nesting sites and may have more human activity than would be tolerated by this species. No nests are known within 0.25 miles, Ospreys will not be impacted by the proposed mining activity.
Sharp-shinned Hawk *Accipiter striatus*
Sharp-shinned Hawks are common migrants and winter visitors but uncommon summer breeders in Humboldt County (Harris 2005). They can be found county-wide during the breeding season, most often in areas of contiguous forest cover (Hunter et al. 2005). Suitable forested nesting habitat is present for this species and they would be expected to occasionally hunt in the area. They are a known breeding species in the area, but prefer dense conifer habitat which is abundant within the greater vicinity. No impacts are expected, to this small forest raptor.
Cooper's Hawk *Accipiter cooperii*
Similar to Sharp-shinned Hawk distributions, Cooper's Hawks are common migrants and winter visitors but uncommon summer breeders in Humboldt County (Harris 2005). However, they are much less dependent on contiguous tracts of forest and actually prefer areas with broken forest cover (Hunter et al. 2005) Preferred nesting habitats include riparian and lowland woodland settings. Cooper's Hawks have developed a tolerance for human disturbances which has allowed for their increase in some residential areas. This species would be expected to use the BAA for hunting, and possible nesting. Impacts to this species are not expected.
Grasshopper Sparrow *Ammodramus savannarum*
Grasshopper Sparrows are a California Bird Species of Special Concern (Priority 2) (Shuford and Gardali 2008) and are a locally uncommon summer resident and breeder (Harris 2005). These birds are closely associated with grassland habitats that receive little disturbance from humans (Hunter et al. 2005, Irvin et al. 2013). These habitats exist both coastally and well inland in Humboldt County. The openings on site are not mature grassland meadows desired by this species. They may also be too small and the landscape juxtaposition is inappropriate for this species. This species is not expected to occur in the project area, it has however breed along the Mad River within the study area on the Guynup gravel bar (north bank fields). Lack of habitat removes the chance of any impacts to this sparrow.

MAMMALS

No sensitive mammal species have been detected in the survey area, and would not be expected to occur. Riparian mammals occurring along the mainstem Mad River include numerous rodent species, whose distributions are linked to the distribution of riparian vegetation. Evidence and occasional sightings of larger, semi-aquatic species, such as beavers and river otters, is often seen.

Red tree vole or Sonoma tree vole (*Arborimus pomo*) The Red tree vole (Sonoma tree vole) is found in the north coast fog belt typically in Douglas-fir. This vole inhabits northwestern California, from Freestone, Sonoma County, north through Mendocino, Humboldt, and western Trinity Counties to the South Fork of the Smith River, Del Norte County. There is some disagreement over the specific identity (*pomo* versus *longicaudus*) of tree voles at the northern extent of the range in northern California (Blois 2015). It builds its nests within the canopies of trees and feeds almost exclusively on Douglas-fir needles. There are Douglas-fir trees within the BAA, and this species might be present. No nest structures have been observed, and no tree voles have been detected. There is ample habitat for this species in the surrounding forestland, and none of this will be removed. No impacts to this species are expected.

4.1.2 Hydrologic and Aquatic

AMPHIBIANS AND REPTILES

Sensitive amphibian species include the tailed frog (*Ascaphus truei*) and the southern seep salamander, aka. Southern torrent salamander (*Rhycotriton varigatus*). Based upon their habitat requirement for, fast moving forest streams and seeps, it is assumed that the tailed frog and southern torrent salamander could not occur within the project area. Marginal habitat for this species could be present, but none was seen during the field inspection when the gravel bar and riparian habitat was traversed. Mining activities and careful design of extraction may well improve the water use conditions and no impacts to these amphibian species are expected. The native herpetofauna includes three species of special concern (western pond turtle, yellow-legged frog and the northern red-legged frog). Introduced bullfrogs have been observed within this reach (Hess 1996), with potentially deleterious effects on native amphibians, fishes, and waterfowl, although the bullfrog has not been observed specifically at this site.

Foothill Yellow-legged Frogs
Foothill yellow-legged frogs (FYLF) are fairly common on the rocky perennial river tributaries within the forest and are fairly common along rivers throughout the north coast. The have been detected regularly along the Mad River including along the margins adjacent to the river at the Simpson – Glendale bar. While literature lends overall evidence that they prefer higher gradient, shallower streams with more canopy cover and less vegetative streamside cover than do the Northern Red-Legged Frog the overwhelming observations established over the last 20 years depicts this species preferring open canopy cover or the gravel bar for thermoregulation. Breeding sites for these frogs are shallow with slow flowing water and a pebble and cobble substrate. The adults and sub-adults prefer river bars along both riffles and pools, with some shade. Occasionally, FYLF are found in other riparian habitats such as backwater, isolated pools, or slow moving water with mud substrate. In the spring, adult frogs congregate along gravel/cobble river bars, where breeding occurs in shallow, slow flowing water. Previous literature reports breeding to occur from late March through May, with oviposition for any single population being concentrated to a 2-week period. In the Trinity River, breeding activity occurs over a 3-month period from April through late June" (Ashton et al. 1997) with most oviposition occurring in May and early June. Eggs hatch in 27 to 36 days, but incubation is temperature dependent and this time period may be longer due to cold water dam releases (Ashton et al. 1997). Growth to maturity is also temperature dependent; some individuals may reproduce as early as 6 months after metamorphosis (Jennings 1988, as cited by Ashton et al. 1997). CDF&W classifies this species as a "Species of Special Concern." The FYLF population is considered stable within the lower Mad River. No significant impacts are expected to FYLF as a result of the proposed gravel mining activities

Northern Red-legged Frog (*Rana aurora aurora*)
The Northern Red-legged Frogs require freshwater ponds, pools in slow streams, marshes, or reservoirs with submerged vegetation for egg attachment and emergent vegetation for cover. They are sometimes found in damp woods and meadows away from water bodies, especially during wet weather (Geoffrey 2008). Breeding occurs in late winter and early spring with young being completely transformed into adults by mid-summer. Eggs require 30 to 45 days to hatch, occurring in March or April and metamorphosis occurs 11 to 14 weeks later in June or July. Breeding red-legged frogs have been found in many of the freshwater marshes and ponds in the lower Mad River area. This species is not common within most of the forest and suitable habitat is limited. This species has declined in abundance in portions of its range. Threats to this species include: fragmentation, alteration, or loss of habitat resulting in increased water temperatures, decreased pool depth, or decreased riparian vegetation; and introduction of exotic fishes and/or bullfrogs. The Northern Red-legged Frog has not been observed within the project reach (HCPBD 2014). Northern Red Legged Frog is a potentially occurring species that uses ponds, marshes and the moist forest floor debris as habitat. Red-legged Frog habitat is present in the BAA and they may well be present. However, this locally common species will remain in the forested areas away from the mining activities. No impacts to any amphibian species are expected as a result of the proposed operations.

Southern Torrent Salamanders
Southern Torrent Salamanders (STS) are mainly aquatic, but capable of terrestrial activity, living primarily in seeps and headwater streams where the water remains cold year round. Aquatic larvae live in clear shallow water and still murky creeks with accumulated leaves. These salamanders are typically found in disjointed populations on north-facing slopes and relatively high elevations or in mature to old-growth forests. Although placed under the "California Species of Special Concern" category this species has a wide distribution and relatively large population. The most prominent concerns for this species include urbanization and temperature rise due to climate change. STS's have never been documented within or adjacent to the project area (AmphiWeb 2008, Stebbins and Lowe).

Northwestern Pond Turtle The northwestern pond turtle is found downstream at least to the Blue Lake/Mad River Bridge. In northern California, it basks intermittently in the morning, and then in late afternoon or early evening they begin foraging. In one population in a northern California stream, a male home range was estimated to be 2.4 acres; the female's range was much smaller (0.6 acres). It can be found in a wide variety of wetland habitats including rivers and streams (both permanent and intermittent), lakes, ponds, reservoirs, permanent and ephemeral shallow wetlands, abandoned gravel pits, stock ponds, and sewage treatment lagoons (Holland 1994, as cited by Lovich Undated). It is active from February to November, and is often observed basking on surfaces above water. During summer droughts, it can bury itself in soft bottom mud. Breeding occurs between April and August, when females climb onto stream or pond margins, to dig a nest. In northern California and Oregon, hatchlings remain in the nest through the winter (Holland 1994, as cited by Lovich Undated). Federal agencies have designated this species as a sensitive species. Wetland habitat destruction is their single greatest threat; predation by bullfrogs is also noted (Lovich Undated). This species was not detected at the project site and will not be significantly impacted by gravel mining operations.

Bullfrogs (*Rana buulei*)
Information on bullfrogs specific to the Mad River was scarce. It is present throughout much of the United States and is the largest frog in North America. It is highly aquatic and never strays far from permanent water (USFS Undated), preferring water with thick aquatic vegetation. Breeding is from February through July in permanent water bodies (USFS Undated). Some tadpoles overwinter before transforming into adults. Adults spend winters in the soft muddy bottoms of ponds, lakes, or other water bodies. Fuller (2008) concluded that bullfrog control should be focused on its breeding habitat which is increasing.. Bullfrog populations are likely to continue to grow, assuming they continue responding favorably to disturbed aquatic environments and that more aquatic environments are disturbed due to development, change in surface and groundwater regimes, water quality, and climate change. Gravel operations do not benefit bullfrogs specifically, but beneficial habitat conditions are similar to other

amphibians such as red-legged and foothill yellow-legged frogs, and northwestern pond turtles. Fuller (2008) suggests that limiting bullfrog breeding sites would be an effective means of controlling bullfrog populations. Bullfrog habitat is created by man-made structures and natural river processes. Artificial structures include stock ponds, and wetland pits and alcoves created during extraction. Naturally created bullfrog habitat includes oxbows or alcoves. The original intent of the wetland pit and alcove extractions was to create aquatic habitat, specifically red-legged frog habitat; therefore, limiting wetland pits and alcoves to control bullfrogs would also decrease habitat for red-legged frogs. Suppression of bullfrogs, rather than eradication, is a realistic goal, if amphibian habitat is to be simultaneously conserved or recovered. Suppression techniques could include:

Identifying inundation frequencies and elevations, and relating them to the bullfrog's 2-year breeding and rearing requirements. Inundation frequencies and elevations could be identified by mid-winter aerial photography, field observation, or computer modeling.

Reviewing and/or determining life history requirements of bullfrogs and red-legged frogs that could be used to favor red-legged frogs.

FISHERIES

The following Federally listed species (herein referred to as Pacific salmonids), and their designated critical habitat were considered for this assessment: Southern Oregon/Northern California Coasts (SONCC) **coho salmon** *(Oncorhynchus kisutch);* listed as threatened. California Coastal (CC) **chinook salmon** *(O. tshawytscha);* listed as threatened. Northern California (NC) **steelhead** *(0. mykiss);* listed as threatened.

In general the lower Mad River provides summer rearing habitat for juvenile salmonids, late summer/fall holding areas for adults, smolt and pre-smolt outmigration habitat and is a fall/winter migration route for adult salmonids. While redds have been observed near some of the extraction areas the biological opinion generally considers the spawning reach to extend upstream from the AMRR bridge located just below the project site. Designated critical habitat SONCC coho salmon encompasses accessible reaches of all rivers (including estuarine areas and tributaries) between the Mattole River in California and the Elk River in Oregon. Designated critical habitat for CC chinook salmon includes all river reaches and estuarine areas accessible to listed Chinook salmon from Redwood Creek (Humboldt County, California) to the Russian River (Sonoma County, California). The anadromous species utilizing the Mad River (SONCC Coho salmon, CC Chinook salmon, and NC steelhead) are listed as threatened species under the Endangered Species Act. The CDF&W has operated the Blue Lake Fish Hatchery on the Mad River since 1971. It was established as an enhancement hatchery to supplement ocean fish stocks to catchable levels and provide for sport fishing opportunities in the Mad River. The hatchery currently releases about150,000 juvenile steelhead annually in the spring. It is also used as a rearing facility for salmonids that originate from and will be released back into other basins. Additionally the hatchery raises rainbow trout for local put-and-take fisheries. Between 1990 and 2000, the hatchery released between 134,000 and 1,440,460 Age 1+ juvenile steelhead in the Mad River (Zuspan and Sparkman 2002). In addition to critical habitat designations for listed Pacific salmonids, Essential Fish Habitat (EFH) provisions of the Magnuson-Stevens Act (MSA) require this heightened consideration of habitat for commercial species in resource management decisions, including EFH for SONCC coho salmon and CC chinook salmon, trout and their designated critical habitats are currently listed as Threatened under the Federal Endangered Species Act and in the past have been among the most important species with regard to commercial and sport fisheries (Mad River Pop. 2014). Further, state listing of coho salmon requires that operations covered by a 1600 permit be fully mitigated with respect to potential impacts to Coho salmonids, SONCC Coho salmon, Upper Klamath-Trinity chinook salmon, and KMP steelhead utilizing mainstem habitat at the Glendale

Simpson site. The project area is mainly important for anadromous fisheries as a migration route to and from the upstream spawning grounds. Some spawning has been noted in this reach of the Mad River as it is at the furthest downstream extent of what is generally considered the spawning reach. Downstream migration of juvenile salmon and steelhead occurs early spring so as to avoid low flows and high temperatures. Most downstream migration occurs in evening hours. Downstream migration of juvenile salmonids is concentrated prior to or at the beginning of normal extraction periods on the Mad River. Major problems within the watershed include sedimentation and elevated temperatures lethal to salmonids, The Total Maximum Daily Load (TMDL) have been established for these factors. The mainstem Mad River was listed as water quality limited due to sediment by the State of California. A TMDL analysis was scheduled for completion in by the EPA under Section 303(d) of the Clean Water Act . Reductions in anadromous fish populations have occurred in the Mad River. Some of the major factors commonly cited as possible causes of salmonid reductions include the construction of the Matthews Dam (and subsequent reduced stream flows), sedimentation from the old Sweasey Dam, the 1964 flood, over-harvest of salmon, and logging activity. Fish habitat in the basin is limited by reduced flows and the physical condition of the Mad River and its tributaries. Historical spawning beds composed of clean gravel and cobble have become embedded with filament deposits. The habitat losses resulting from the sedimentation of the river have reduced the reproductive carrying capacity of this portion of the Mad River (NMFS 2010, NOAA 1996).

Southern Oregon, North Coast California Coho CC salmon

Southern Oregon, North Coastal California Coho ESU California coho salmon life history is typified by four life stages (CDF&W Undated): Adult upstream migration: "Adult coho salmon enter fresh water from September through January to spawn. Coho salmon move upstream after heavy rains have opened the sand bars that form at the mouths of many California coastal streams, but may enter larger rivers earlier." In the upper reaches of these streams, spawning generally peaks in November and December, but timing varies by stream and/or flow (CDF&W Undated).

Spawning and Egg Development: "In California, spawning occurs mainly from November to January, although it can extend into February or March if drought conditions are present... In the Mad River, spawning occurs in November and December. Females usually choose spawning sites near the head of a riffle, just below a pool, where the water changes from laminar to turbulent flow and there is a medium to small gravel substrate. The flow characteristics through the redds [fish eggs' "nests"] usually ensure good aeration of eggs and embryos, and the flushing of waste. Larger Coho salmon produce more eggs and there is a definite tendency for fecundity [reproductive success] to increase. In California, eggs incubate in the gravels from November through April. The incubation period is [shorter if water temperature is higher]... California Coho salmon eggs hatch in about 48 days at 48°F, and 38 days at 51.3°F. After hatching, the alevins (hatchlings) are translucent in color. This is the Coho salmon's most vulnerable life stage, during which they are susceptible to siltation, freezing, gravel scouring and shifting, desiccation, and predation. Alevins remain in the interstices of the gravel for 2 to 10 weeks until their yolk sacs have been absorbed, at which time their color changes to that more characteristic of fry. The fry are silver to golden with large, vertical, oval, dark parr marks along the lateral line that are narrower than the spaces between them" (CDF&W Undated).

Fry and juveniles rearing: "Fry emerge from the gravel between March and July, with peak emergence occurring from March to May... They seek out shallow water, usually moving to the stream margins, where they form schools. As the fish feed heavily and grow, the schools generally break up and individual fish set up territories. At this stage, the fish are termed parr (juveniles). As the parr continue to grow and expand their territories, they move progressively into deeper water until July and August, when they inhabit the deepest pools. This is the period when water temperatures are highest, and growth slows. Rearing areas used by juvenile Coho salmon are low-gradient coastal streams, lakes, sloughs, side channels, estuaries, low-gradient tributaries to large rivers, beaver ponds, and large slack water portions of the river. The most productive juvenile habitats are found in smaller streams with low-gradient alluvial

channels containing abundant pools formed by large woody debris. Adequate winter rearing habitat is important to successful completion of coho salmon life history" (CDF&W Undated).

Smolt outmigration: "After one year in fresh water, smolts begin migrating downstream to the ocean in late March or early April. In some years, outmigration can begin prior to March and can persist into July. Peak downstream migration in California generally occurs from April to early June. Factors that affect the onset of outmigration include the size of the fish, flow conditions, water temperature, dissolved oxygen (DO) levels, day length, and the availability of food. Low stream productivity, due to low nutrient levels or cold water temperatures, can contribute to slow growth, potentially causing coho salmon to postpone outmigration.

Steelhead

Steelhead are reported to exhibit the most complex and variable life history of the Pacific salmonids. They can be freshwater resident or anadromous; the anadromous steelhead can spend up to 7 years in fresh water before smolting, and then up to 3 years in the ocean before first spawning (NOAA 1996). Further, they are classified into two types, the summer steelhead (that matures in freshwater, requiring several months to mature and spawn), and the winter steelhead (that matures in the ocean, entering fresh water ready to spawn). The Mad River supports both summer and winter steelhead.

Spawning and egg development: Steelhead can spawn more than once before dying, unlike Pacific salmon. Intermittent streams may be used for spawning, and cover is important because steelhead can enter streams weeks before they spawn. Summer steelhead utilize habitat that is not fully utilized by winter steelhead, and often spawn farther upstream than winter steelhead (NMFS 2004a). Steelhead egg incubation time is dependent on water temperature, varying from 1.5 to 4 months, generally between February and June. Fry and juveniles: Fry inhabit shallow water along banks of perennial streams. Summer rearing occurs in "faster parts of pools" (NMFS 2004a). Winter rearing occurs across a wide range of fast and slow velocity habitats, but is characterized primarily by complexity such as large in-stream wood. Larger and older juveniles will move downstream to rear in larger tributaries and the mainstem. "Rearing is usually 2 years in California ESUs" (NMFS 2004a).

California Coast Chinook Salmon ESU

Chinook salmon runs are designated by adult upstream migration timing. Spring-run Chinook are now only found on the Rogue, Klamath, and Trinity rivers. The Mad River supports "sizeable populations" of fall-run Chinook salmon (NMFS 2004a), however, the species listing status is "threatened" and Critical Habitat has been designated. Adult upstream migration: Timing depends on the size of the river (NMFS 2004a). In the larger river systems (Rogue, Upper Klamath, and Eel), fall-run Chinook return to fresh water in August and September. In coastal rivers (presumably including the Lower Mad River), the fall-run begins in late October.

Spawning and egg development: On the larger river systems, spawning occurs in late October and early November. In smaller coastal rivers like the Lower Mad River, the peak spawning period is during late November into December, and often extending into January. Eggs resulting from the fall run spawning incubate and emerge from December into mid-April. Although the Chinook salmon ESU covers naturally spawned populations, worthy of mention is the Mad River Hatchery fall-run program. Fry and juveniles: Fry use woody debris and cobble interstitial spaces as cover, but as they grow their habitat preferences change to deeper water with slightly higher velocity. "Data from the Mad River… indicate that emergent Chinook salmon fry develop rapidly following emergence… The months of May and June accounted for 91.5% of the total capture of migrating young-of-the-year Chinook salmon in 2001" (Sparkman 2002, as cited by NMFS 2004a).

Salmon Trends

In the mainstem Lower Mad River, "habitat was quantified for three anadromous salmonid life history stages:

• 2+ juvenile steelhead rearing,
• 1+ juvenile coho salmon, and
• adult salmon and steelhead upstream migration."

Results from Trush (2008b) indicated a dramatic decline in juvenile 1+ coho habitat area from the mid-1940s to the mid-1960s, possibly resulting from large floods of the 1950s and 1960s. Then, after a recovery in habitat through the 1970s and 1980s, juvenile 1+ coho habitat abundance since WY1994 (since the CHERT adaptive management program began) has trended slightly upward. In general, "there has been modest, overall improvement [in habitat area of the three salmonid life stages] since 1994 and significant improvement compared to habitat abundance in the 1950s through early 1980s" (Trush 2008b). Except for a very recent increase in anadromous salmonid habitat in 2007, habitat area has recovered to pre-1955 and 1964 flood levels and remained fairly constant over the span of CHERT adaptive management. From this we can conclude that major historic floods dominate habitat changes and that any effects of the present extraction program are relatively small or non-existent. Extraction strategies at this site continue to consider incorporating, where possible, the cooler water seeps and access to bedrock scour pools and overhanging vegetation into the designs that allows healthy cover for rearing salmonids. The appropriate mitigation designed with the CHERT and agency review will ensure there are no significant impacts to protected salmonid anadromous fish.

4.2 Offsite Conditions

4.2.1 Terrestrial

The cumulative effects assessment summarizes the information gathered over 20 years of bird monitoring along the Mad River, Humboldt County, CA. Surveys have been completed as recommended by the CHERT Interim Monitoring Program. The 2015 season completes the twentieth year of point count and area search surveys for most the gravel extraction locations. The determination of any trends in bird species presence requires data collected over several years. Continued monitoring within the BAA will demonstrate if any apparent trend truly represents long-term changes in bird populations of the Mad River. Many of the species present have demonstrated reproductive success and a consistent presence on the gravel bars; no bird species have shown a significant decline. Gravel operations continue to avoid any direct impacts to the established riparian habitat utilized by most of the breeding birds present. Changes in the abundance or frequency of detection of bird species could indicate that indirect effects were occurring. Trend data was analyzed and no dramatic changes were detected throughout the wider study area from the Blue Lake Fish Hatchery to the Hwy. 299 bridge. We recommend further analysis with a more focused study that addresses individual species reproduction and survivorship given their survey presence. We can however, look at the more subtle, annual variation in the riparian community, and if current conditions continue, significant impacts to avian species are not expected. Avian monitoring was conducted from 1997-2015. The results and analyses of this report are sufficient to allow gravel operation permitting and activities at the project site. LBJ will continue to log and analyze data with the intention of detecting any trends in species abundance which at this stage appears to remain essentially consistent and not significant.

4.2.2 Offsite Aquatic

See fisheries previously (Section 4.1.2). The on-site hydrologic conditions are intimately connected to the greater watershed. The entire system needs to be considered in depth for each species at an individual level.

4.2.3 Sensitive Species or Habitats

The LOP monitoring for the gravel operators within the BAA was established in 1997. The following off-site species accounts are based on the cumulative data gathered to meet the LOP requirements over the past 20 years. The following gravel bars are surveyed within the lower Mad River BAA: O'Neill, Simpson – Glendale, Christie, Johnson, Blue Lake, Emerson and Guynup gravel bars. The size of the area monitored (BAA) and the number of operators involved provided a thorough basis to assess off-site cumulative effects.

Threatened and Endangered Species

In contrast to the quantitative information on abundant species gathered by point counts and area search surveys, information on rare or threatened species is qualitative and often incidental in nature. The following special animal sections discuss the status of species of concern in the study area and vicinity. Other information sources are referenced and potential threats discussed. Further information on specific records is provided in the main species accounts section.

A species of concern is defined as any species that has protected status under either federal or state legislation. Threatened and Endangered species, CDF&W "Sensitive" and "Species of Special Concern" are included. A list was developed from the "special animals" list supplied by CDF&W (March 1998) of all species in the region that received such protection. The first step in assessing cumulative conflicts between proposed management and biological resources of concern involved the examination of all available data that included range maps, databases and a literature review. The specific natural history requirements of species thought to be associated with the riparian habitat, or considered sensitive to gravel operations, were addressed and presented in the discussion of population resources of concern. A species was dropped from further consideration if the project area was found to occur outside its distribution, or the project area did not contain its vital habitat requirements.

4.2.3.1 Bald Eagle (*Haliaeetus leucocephalus)*

The Bald Eagle is currently listed as Threatened by the U.S. Fish and Wildlife Service (USFWS). We recorded this species in 1997, 2001, 2002, 2003 and 2008. Most detections have occurred in summer, but this may be a result of increased survey effort at that time. In general, Bald Eagles are more widespread in Humboldt County during the winter months, and wintering birds do inhabit the Mad River system. A few nesting locations are known from the Klamath, Trinity, and Mad River Systems; nests have been seen near Jacoby Creek and south of Korbel. Most likely, all of the summer sightings over the course of a season pertain to a single pair. Nest sites generally are located in tall trees, so the breeding eagles probably fly from their nest site to the Mad River to forage during the summer. As this species continues its recovery, it can be expected to recolonize its former range along the Mad River.

4.2.3.2 Peregrine Falcon (*Falco peregrinus*)

This species was removed from the Federal Endangered species list in 1999. It remains protected under California state law. Humboldt County supports relatively high densities of wintering Peregrine Falcons but only a few scattered breeding pairs. We recorded Peregrines five times during summer, and always near Blue Lake. The closest known nesting sites are on the coastal lowlands in Jacoby Creek four miles to the south, suggesting that the summer records may have represented non-breeding young birds or failed breeding adults. Individual Peregrine Falcons may range over a wide area while foraging, so it is possible these birds originated from nests elsewhere in the region. Four records during fall and winter monitoring were more expected. The gravel bars support migrant shorebirds, particularly during peak movements in April and August. This provides a potential food base for local falcons.

4.2.3.3 Western Snowy Plover (*Chardrius alexandrinus nivosus*)

Western Snowy Plover is currently listed as Threatened by the USFWS. No Snowy Plovers were detected in the study area. Although this species occurs more typically on coastal beaches and dunes, it also utilizes several large gravel bars along the Eel River. No Snowy Plovers have ever been recorded on the Mad River gravel bars.

4.2.3.4 Willow Flycatcher *(Empidonax traillii brewsteri)*

The Little Willow Flycatcher is listed as a Threatened species by the CDF&W. We recorded very small numbers in the study area in summer and fall. A few migrants are found in coastal riparian habitat of Humboldt County each year, but its status as a breeding species is only beginning to unfold. Three egg sets attributed to this species were found along the Eel River near Miranda in the 1930s (Harris 2005), but the species was not confirmed breeding in lowland riparian habitat of Humboldt County for the remainder of the century. LBJ established the summer presence of very small number of WIFL on the lower Eel River every year from 1997-2008. It was unclear whether these were unmated males or if, perhaps, females went undetected. Breeding was confirmed by a pair at the lower Van Duzen River bird banding study site in the summer of 2002 which remained until 2005. This finding emphasized the need for a more comprehensive approach to determining the status of this species elsewhere. Little Willow Flycatcher surveys were integrated into the standardized monitoring programs on the Eel and Mad Rivers. The WIFL protocol survey guidelines were followed and the gravel bars surveyed in June and July. Two breeding-season sightings were recorded on Blue Lake in July 2002. Such sightings may involve a very small, previously undetected breeding population, early attempts at colonization or recolonization, or non-breeding birds prospecting marginal habitat. Continued Little Willow Flycatcher surveys are needed to answer these questions. Gravel operations are not permitted to remove established riparian vegetation, and extraction activities occur outside the species' nesting season, so impacts to this species are unlikely except those caused naturally by large floods. We found fall migrant Little Willow Flycatchers in the study area on four occasions.

4.2.3.5 Bank Swallow (*Riparia riparia*)

The Bank Swallow is currently listed as threatened by CDF&W. This species breeds in lowland areas along coasts, rivers and streams. Vertical banks, cliffs and bluffs in alluvial, friable soils characterize nesting colony sites (Garrison 1999). This species is a rare migrant and locally rare breeder in Northwest California (Harris 2005). During the five-year breeding bird atlas (BBA) project, no nest locations of this species were found in Humboldt County. A colony on the bluffs at the mouth of Mad River is the nearest known colony in Humboldt County and was recently established. Based on its continued rarity significant impacts would not currently be expected. We did not detect any Bank Swallows along the Mad River during the study.

Species of Special Concern

Several species of concern and neotropical migrants were also recorded during the monitoring period:

4.2.3.6 Double-crested Cormorant (*Phalacrocorax auritus*)

The Double-crested Cormorant (DCCO) was listed as a Species of Special Concern by the CDF&W (breeding). We found this species on all bars during the summer and on Christie, Johnson, and O'Neill in fall. Most records involved birds flying up and down the river. Townsend (1887) found large numbers roosting farther downstream along the Mad as early as 1885. Our records from the breeding season probably involved both non-breeding individuals and birds commuting from nesting colonies in the Humboldt Bay or along the coast. Of the 39 records O'Neil had 18 (46%) certainly because it was closer to the ocean than the other bars. This species nests on secure sea stacks. Unlike other, strictly coastal, cormorant species, DCCO

commonly range inland along river corridors. Nesting and colonizing attempts of this species are very conspicuous. We have not detected any evidence of such activity, nor would any be likely, on or near the bars during our surveys.

4.2.3.7 Great Blue Heron (*Ardea herodias*)

The Great Blue Heron (GBHE) was listed as a "special animal" by the CDF&W (breeding). Individuals were recorded on 72 occasions on all bars during both the summer and fall seasons, normally foraging along the river's edge. This species most often nests in colonies, but small groups and single nesting pairs are not unusual in trees that can support their bulky nests. Nest sites vary, but in northwestern California, they typically are located in tall trees (Harris 2005). Nesting locations normally are quite conspicuous. During our surveys, we carefully observed and noted any arboreal ardeid heron behavior for nesting activity; none was detected. Herons observed on the bars were presumed to be non-breeders or foraging individuals ranging out from known rookeries in the greater Mad River watershed. Butler (1992) reported that the mean distance traveled by adults from nesting to foraging areas was 2.3 – 6.5 km. This species is widely distributed throughout Humboldt County and the United States.

4.2.3.8 Great Egret (*Ardea alba*)

The Great Egret (GREG) was listed as a "special animal" by the CDF&W at its nesting locations. Forty-one individuals were recorded on all bars during the summer and fall. Great Egrets are a recent addition to Humboldt County avifauna; the primary colony on Indian Island in Humboldt Bay was established only 50 years ago (Harris 2005). This species is more strongly colonial than the Great Blue Heron when nesting. We did not record any potential nesting activity in the study area. Summer records from the study area probably involve birds commuting from colonies or non-breeders. Significant impacts to this species from gravel operations are unlikely.

4.2.3.9 Snowy Egret (*Egretta thula*)

Snowy Egret (SNEG) was listed as a "special animal" by the CDF&W. We recorded only one was recorded in the Mad River BAA, a bird at the Blue Lake Bar, 22 June 2002. This species was first recorded in Humboldt County in the 1950s, becoming regular in the 1960s and apparently undergoing a rapid increase here around 1980. Several breeding colonies occupy islands in the neck of Humboldt Bay. The Blue Lake bird probably originated in one of those colonies, either as a commuting adult or post-breeding dispersant. Less ubiquitous than the larger GREG, SNEG are also restricted to these relatively recent colony sites. Occasional foraging birds should be expected on the river. Significant impacts to non-breeding individuals from gravel operations are unlikely.

4.2.3.10 Black-crowned Night Heron (*Nycticorax nycticorax*)

The Black-crowned Night Heron (BCNH) is currently listed as a "special animal" by the CDF&W. Most of o records involved birds flying over during point counts. Non-breeding birds, 1 to 2-years-old, are often found away from known nesting areas in the summer and probably account for most or all summer records from the study area. The species was present on five bars; however, they were not recorded on the Blue Lake bar. Roost sites usually are located in dense trees or shrubs, often overhanging water. One was seen carrying nesting material at Guynup, 5 Jun 1999, but we did not determine where this bird took the material, nor have we found any other evidence of breeding in the study area. This is the only other visually recorded bird as on Emmerson 27 May 1999 (SAM/PAH), which is adjacent to Guynup and is the same year. This species nests colonially. Harris (2005) stated that local colonies often relocate, so the status of the species on the gravel bars should continue to be monitored closely for any other evidence of breeding. The nearest known nesting birds are two small urban rookeries located in the town of Blue Lake. Non-native "exotic "trees are used, Preservation of existing riparian

vegetation will provide opportunities for roosting and potential establishment of a breeding colony.

4.2.3.11 Osprey (*Pandion haliaetus*)

The Osprey (OSPR) is currently listed as a Species of Special Concern by the CDF&W. Ospreys were recorded with some regularity at all bars. There were 55 observations with the point count database and more than 100 detections overall. This species breeds at scattered locations along the Mad River. Normally it uses highly conspicuous nesting sites atop tall trees or poles. Foraging individuals fish along substantial stretches of the river. A probable nest site was located on Johnson, 18 Jul 1997. However, it clearly didn't meet OSPR specifications as it hasn't been used since the first year of our study. Most records in the study area probably involved repeated sightings of 1-2 pairs each year. OSPR that forage along the river are unlikely to be disturbed by gravel operations, and there are no nest sites that would be impacted.

4.2.3.13 Sharp-shinned Hawk (*Accipiter striatus*)

The Sharp-shinned Hawk (SSHA) was listed as a Species of Special Concern by the CDF&W. We recorded only two in the study area. One at Blue Lake, 26 Jun 1997, was within the species' breeding season, while another at O'Neill, 20 Sep 1998, was during the typical migration period. An unidentified *Accipiter* was also seen at Blue Lake on 10 Jul 1997. Mature cottonwood forest at Blue Lake may provide suitable nesting habitat for this species, but the summer sighting may also have involved a non-breeding bird or a failed breeding individual. *Accipiters* in their first summer of life are sometimes seen away from nesting areas. This small woodland hawk is a sparsely distributed breeding species in Humboldt County. Its nesting habitat is variable. Grinnell and Miller (1944) described it as "either deciduous or coniferous woodland, not dense forest but at edges or where broken." It is more widespread in winter and particularly during migration, when individuals can be found hunting in a variety of lowland habitats. There will be no habitat removed and no significant impacts to this species

4.2.3.14 Cooper's Hawk (*Accipiter cooperi*)

The Cooper's Hawk (COHA) is currently listed as a Species of Special Concern by the CDF&W. Scattered summer records indicated possible breeding in or near the study area. An adult and a juvenile were recorded flying over Johnson together on 27 Jun 1999. This species was recorded breeding in the Blue Lake area in 1995 (Harris 2005). Large cottonwoods may provide suitable nest sites on the bars, although it is unlikely that more than one or two pairs are present in the area in any year, given the general scarcity of this species. Cooper's Hawks are more widespread during migration and winter. There are three records during fall surveys: one at Blue Lake in 1997 and one each from Guynup and Emmerson in 2002. Raptors typically nest early in the season and can be expected to fledge young before extraction-related disturbance could occur. Considering current seasonal restrictions on operations it is unlikely nesting COHA would be disturbed. As no raptors of concern have been confirmed breeding, and habitat use appears to be limited, significant impacts as a result of gravel mining activities are not expected.

4.2.3.15 Vaux's Swift (*Chaetura vauxi*)

The Vaux's Swift (VASW) is currently listed as a Species of Special Concern by the CDF&W. It was recorded on all bars during summer monitoring, almost invariably as birds flying overhead or foraging over the river. We only found the species thrice in the fall: once at Blue Lake and twice at Guynup. We had 122 detections recorded on point counts, 41 of which (36%) came from Blue Lake Bar. Apart from that they appeared regularly to be at any point count station near water, and the high pitched twitter heard overhead. Vaux's Swifts typically breed in coniferous forest, requiring large, hollow trees for nesting and roosting (Hunter and Majurek 2003). Chimneys occasionally are used as nest sites in residential areas. Such sites also are used by roosting flocks

in migration and summer, and rarely, in winter (Bull and Collins 1993). Breeding sites are likely located in coniferous forest in the surrounding hills. Because the species' activities in the BAA appear to be restricted to aerial foraging, drinking, and transit, gravel operations are unlikely to pose a significant threat.

4.2.3.16 Purple Martin (*Progne subis*)

The Purple Martin (PUMA) is currently listed as a Species of Special Concern by the CDF&W. Small numbers of Purple Martins breed in coniferous forest near the coast in Humboldt County. They were in cavities in snags often located in prominent positions. Our late records were from late Jul-early Sep, typical timing for martins to appear in open lowland habitats. Such records may represent birds staging after the breeding season, early migrants, or foraging individuals still breeding in the surrounding coniferous forest. We did not locate any nest sites in the study area, and the paucity of sightings of this conspicuous species suggests that no breeding sites were located in the immediate vicinity. On 19 May 2004, some northbound PUMA came and once again they exclusively used the Guynup site. Recently monitoring has begun to detect this species more often. The Guynup bar is the typical location for birds heard foraging overhead. Nesting occurs on the east bank of the Guynup bar in isolated decadent cottonwood snags

4.2.3.17 Black-capped Chickadee (*Poecile atricapillus*)

The Black-capped Chickadee (BCCH) was listed as a Species of Special Concern by the CDF&W. This species has made a recent southward expansion in coastal northwestern California. BCCH began to appear at the Mad River estuary in the late 1980s. Small numbers were already present on all bars when we began monitoring in 1997, ranging from two detections on O'Neill point counts that year to eleven on Emmerson. By 2002, point count detections ranged from to 5 at Johnson to 39 at Blue Lake. This species appears to be restricted to lowland riparian and cultivated suburban habitat in Humboldt County, while the Chestnut-backed Chickadee occupies a variety of upland and coniferous forest, in addition to sharing the BCCH newly-claimed lowland habitat. We often found the two species in mixed flocks in the study area. A high count of 19 Black-capped Chickadees was obtained at Emmerson, 17 Sep 2001 and the latest sighting was at Guynup on 11 September 2008.

4.2.3.18 Yellow Warbler (*Dendroica petechia*)

The Yellow Warbler (YEWA) is currently listed as a Species of Special Concern by the CDF&W. This was one of the five most frequently detected species during summer point counts and represents 1% of the total bird count. Key habitat for Yellow Warblers included riparian deciduous habitat and montane shrubbery in open conifer forests (CDF&W 1990). Historically it "breeds where ever willows are found… confined to the Upper Sonoran faunal zone and to the vicinity of water, whether running or stagnant" (Dawson 1923). Development impacts on riparian habitats across California, particularly in the south, have caused dramatic declines in breeding pair numbers (Remsen 1978). Yellow Warblers use the remnant mature patches of riparian habitat. Impacts to this habitat, such as fragmentation and the expansion of Brown-headed Cowbird (*Molothrus ater*) parasitism may affect this species. Monitoring along the Mad River should be continued to assess the health and trends of an important population of this species. An adult seen carrying food for young at Blue Lake, 11 Jul 1998, confirmed breeding there. Fall migrants were noted in small numbers in riparian and weedy areas, often in mixed insectivore flocks. Migrants seen in September appeared to often represent the pale northern races, such as *D. p. rubiginosa*.

4.2.3.19 Yellow-breasted Chat (*Icteria virens*)

The Yellow-breasted Chat (YBCH) is currently listed as a Species of Special Concern by the CDF&W. This species was common in the study area with enough detection to represent 1% of

the total bird population on the Mad River. Yellow-breasted Chats require dense, brushy thickets and tangles near water, and thick understory in riparian habitat (CDF&W 1990). This species is a locally uncommon to common summer resident in northwest California (Harris 2005). They were particularly prevalent along the Mad River in areas with mixed willows, dense blackberry thickets, and medium-sized shrubs, such as coyote brush. We found moderate numbers on all bars except O'Neill, which had only a single record on 26 May 2000. This skulking species was almost invariably detected by its distinctive song. Fall migrants, who rarely vocalize, are extremely difficult to detect. The fall surveys produced only singles on Blue Lake and Guynup, 6 Sep 2000, and an exceptionally late bird at Christie, 5 Nov 2000. Compared with the remainder of California, Yellow-breasted Chat and Yellow Warbler populations in Humboldt County appear to be relatively robust. However, continued monitoring is necessary to determine if this population is stable. The Yellow-breasted Chat was one of the top 20 most abundant species in each year of survey. Like the Yellow Warbler, this species utilizes the available riparian habitat associated with the gravel bars. These migrant species are probably limited by the size of remnant habitat patches available. Any further reduction of habitat would be detrimental.

FISHERIES

The following Federally listed species (referred to as Pacific salmonids), and their designated critical habitat were considered for this assessment: Southern Oregon/Northern California Coasts (SONCC) **coho salmon** *(Oncorhynchus kisutch);* listed as threatened. California Coastal (CC) **chinook salmon** *(O. tshawytscha);* listed as threatened. Northern California (NC) **steelhead** *(0. mykiss);* listed as threatened. These species were discussed in section 4.2.3 (Sensitive species and habitats).

4.3 Development Effects

4.3.1 Direct

Direct biological impacts are not expected to be significant, based on the limited area of activity. Careful consideration by CHERT of the monitoring data gathered for 20 years is possible. Some minor brushy vegetation removal may occur, but there will be no direct removal of trees. Direct impacts to the creek will occur but BMPs will be used during the brief period of operations and review of plans by CHERT will ensure no significant impacts. With fisheries enhancement plans, there may be an overall reduction in any potential long term direct impacts.

4.3.2 Indirect

Indirect impacts are generally considered to be caused by impacts to habitat that can then affect an individual species. At this site the required habitat for most species is not present. For those that might have suitable habitat the impact on the habitat (due to CHERT guidelines) will not be significant. Indirect concerns and habitat use are more thoroughly addressed for individual species in Section IV B species accounts.

4.3.3 Cummulative

The combined actions under the Army Corps Engineers Letter of Permission (LOP) has provided a broad consideration of mining activities along much of the Lower Mad River. Monitoring streambed topography, fisheries and wildlife for 20 years has provided the CHERT with excellent data as the basis of their determinations. No significant cumulative effects have been experienced under the LOP process which continues to benefit from annual feedback.

4.4 Recommended Mitigation and Monitoring Measures

Direct removal of any wildlife habitat will not occur. Standard County guidelines will be followed to meet all requirements. The recommendations of the CHERT committee will be followed after extraction plans are reviewed.

SECTION 5 CONCLUSION

The CHERT review team and multidisciplinary monitoring program has established a broad biological and hydrologic knowledge across the entire Lower Mad River where gravel mining occurs. (see map). The Humboldt County General Plan - Frame Work Plan recognizes the importance of existing gravel extraction sites as follows:

> *"Sand, gravel and rock, being necessary to construction and development, are an essential component for the continued well-being of the County. They are the basis for much of the construction materials for roads, concrete, stream bank protection, erosion control, septic systems and passive solar projects. Importation of these materials would raise costs and negatively impact the development and maintenance within the County. It is important to protect specific sites and haul routes against land use incompatibilities to assure the continued utilization of this resource."*

The CHERT review team assess' all aspects of the potential impacts and use of BMP on an annual basis for all gravel bars. This approach has allowed a continued production of gravel for Humboldt County, while protecting the environment using an adaptive management approach.

This project is consistent with the following goals and policies of the Humboldt County General Plan, Framework Plan, applicable to mineral resources. The plan will assure the long-term availability of adequate supplies of mineral resources, to protect mineral resource areas from incompatible land uses and to minimize adverse environmental impacts. Maintain and update maps of the County's identified mineral deposits. Allow future development such that it will not interfere with the utilization of identified mineral deposits. Ensure adverse environmental effects are prevented or mitigated to the fullest extent feasible and that mined lands are reclaimed to a usable condition which is readily adaptable for alternative land uses under the General Plan. Gravel mining will provide for the production and conservation of minerals, while preserving to the maximum extent feasible the values relating to recreation, watershed, wildlife, range and forage, science, and aesthetic enjoyment. River bar maintenance provided the elimination of residual hazards to the public health and safety and prevents the disruption of community character in siting and planning mineral resource extraction operations. Mineral haul routes are to avoid incompatible areas such as landslides, highly erodible soils, residential areas, and schools, if feasible. Permit conditions for mineral extraction operations should address allowable dust and noise levels, hours of operation, fencing, traffic, access, setbacks and other means to reduce conflicts with adjacent development. Extraction of instream sand gravel is not to exceed the average annual replenishment level (annual bedload), except when the bedload left from a previous flood is greater than the average annual replenishment or if the projects emphasize fishery enhancement, flood control or bank protection. Bank protection shall be permitted to: Maintain necessary public or private roads, protect principal structures in danger from erosion. The plan protects lands designated Agriculture-Exclusive from erosion. It Evaluates significant water diversion projects which would reduce the replenishment rate of gravel in streams. as to the impact they would have on local mineral supply in Humboldt County. This site has and will continue to participate in biological monitoring standards developed initially in conjunction with the ACOE, the County of Humboldt and CDF&W. Monitoring standards have evolved and incorporated new techniques and guidelines as new information was gathered, through various consultations with NOAA Fisheries, as

well as for any new species being listed. This monitoring strategy is well recognized and has been considered by several agencies as state of the art. Specifically due to its ability to assimilate new information garnered and respond in an adaptive manner. In addition to the original limitations developed in conjunction with Local, State, and Federal permitting additional limitations on operations have been developed by agency staff in response to biological information garnered over the course of the last 20 years. Limitations such as more restrictive work seasons, bridge installation requirements, retention of large woody debris (LWD) and extraction design requirements represent specific changes that have occurred over the last 20 years. The ACOE 404 Permit contains a comprehensive list of operational restrictions, and the Biological provides a biological rational for these restrictions. These recommendations and guidelines were developed by numerous biological consultants and agency representatives and are deemed necessary to protect any common or listed wildlife species (AmphiWeb 2008, Fuller 2008 Hewitt 2009).

The historical survey coverage and multiple visits by biologists annually, for multiple years strongly establishes that the determination of no significant effect. Section 314-60.1 of the Humboldt County General Plan states: "Surface removal of minerals and natural materials, including building and construction materials to be used for commercial purposes, shall be allowed in any zone with a Use Permit (HCDCDS 2008)." There are no significant biological concerns at this point. As this is the first year of monitoring it is beneficial that monitoring will be ongoing following the CHERT recommended biological monitoring plan for the duration of future mining activities.

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ATTACHMENT B

CULTURAL RESOURCES STUDY REPORT

A Cultural Resources Survey Report for The Simpson-Glendale Bar Surface Mining and Reclamation Plan Glendale, Humboldt County, California

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USGS 7.5' Topographic Quadrangle Maps: Arcata North, CA
Survey Area: approximately 30 acres

August 2016

CONFIDENTIAL INFORMATION

Archaeological and other heritage resources can be damaged or destroyed through uncontrolled public disclosure. Archaeological site locations and culturally sensitive information is considered confidential and public access to such information is restricted by state and federal law.

Information regarding the location, character or ownership of a historic resource is exempt from the Freedom of Information Act pursuant to 16 U.S.C. 470w-3; Section 304 of the National Historic Preservation Act, 36 CFR 800(6)(a)(5) and 36 CFR 800.11(c); Section 9(a) of the Archaeological Resources Protection Act; Executive Order 13007; Section 6254.10 of the California State Government Code: and the 2005 California Senate Bill 922.

SUMMARY OF INVESTIGATION

William Rich and Associates (WRA) completed a cultural resources investigation for gravel extraction at Assessor's Parcel Number (APN) 504-131-02, 504-131-04 and 516-161-04, in the community of Glendale, Humboldt County, California. GR Sundberg, Inc. is applying to the Humboldt County Planning and Building Department (County) for a Conditional Use Permit /Mining Plan/Reclamation Plan for sand and gravel extraction along the Mad River.

The purpose of this investigation and report is to document whether historical resources are present within the proposed use area pursuant to Section 15064.5 of the California Environmental Quality Act (CEQA). The methods detailed in the investigation included a review of the files at the Northwest Information Center (NWIC); a review of archaeological and historical literature pertinent to the project area and general region; and correspondence with Native Americans and other knowledgeable individuals regarding the history of the area.

The NWIC record search indicates that two previous surveys have occurred in the project area (Eidsness 1987 (S#9576); Roscoe and Van Kirk 1993 (S#15201)), and a portion of the historical Arcata-Mad River Railroad, recorded as P-12-000815 (CA-HUM-872H) once bisected the location. Additionally, Native American archaeological site P-12-001140 (CA-HUM-930) is situated adjacent, but elevated on a terrace above the project area. Three other resources and several previous surveys are recorded with the NWIC within a one-half mile radius.

Background historical research indicates the project is within the traditional territory of the Patawat division of the Wiyot Tribe. This group controlled the lands from Little River to south of Mad River and east to Blue Lake. Early ethnographic work with the Wiyot Tribe by Loud (1918) and Curtis (1927) documented several village locations that may correspond to recorded archaeological sites and other place names in the project vicinity.

The three Wiyot area Tribes were contacted for this investigation. This was initiated with a letter to the Native American Heritage Commission (NAHC) who were asked to provide a list of Native American individuals and tribes with ancestral interest in this portion of Humboldt County. Correspondence was ultimately conducted with representatives of the Blue Lake Rancheria, Bear River Band of Rohnerville Rancheria, and the Wiyot Tribe.

The archaeological field investigation was conducted on May 2, 2016 and June 29, 2016 and covered the entire project area of approximately 20 acres, with some additional survey occurring to the east at the location of archaeological site P-12-001140 (CA-HUM-930). The proposed gravel extraction potion of the project area contains a relatively disturbed and young landform void of cultural resources. This location is composed of coarse cobble, pebbles, and sand. The upland location, proposed for staging is currently a graded terrace surface with gravel and asphalt.

During the investigation no cultural resources were identified in the project area. The route of the Arcata-Mad River Railroad, P-12-000815 (CA-HUM-872H), that once bisected the survey area, has been removed and is no longer present. The archaeological site P-12-001140 (CA-HUM-930) was visited and confirmed to be outside of the project area, however brief recommendations are included in this report to ensure complete avoidance of this area.

No historical resources, as defined in CEQA § 15064.5 (a), were identified within the direct project area as a result of this investigation. This supports a finding that the proposed conditional use permit for gravel extraction along the Mad River will not cause a substantial adverse change in the significance of an historical resource (Public Resource Code (PRC) § 21084.1). Recommendations to avoid the area of archaeological site P-12-001140 (CA-HUM-930) are proposed. This includes limiting extraction to alluvial gravel deposits and avoiding the bedrock terrace supporting the archaeological site, and installing a barrier to exclude equipment from inadvertently entering the area. If plans change to include areas not previously surveyed, additional investigations would be required.

Due to the substantial ground disturbances that have taken place on the property, it would be unlikely that intact buried archaeological deposits exist. If, however archaeological materials are encountered for any reason at this location, all work shall stop in the immediate vicinity of the occurrence(s) until a professional archaeologist, who meets the Secretary of the Interior's Standards and Guidelines, has evaluated the materials and offered recommendations for further action (CEQA § 15064.5 e-f).

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1.0 Introduction and Project Description

During the summer of 2016, William Rich conducted a cultural resources investigation for the Simpson - Glendale Bar - Surface Mining and Reclamation Plan located at 1689 Glendale Drive, in the unincorporated community of Glendale, California. Specifically this area covers portions of APNs 504-131-02, 504-131-04 and 516-161-04 in Township 6 North, Range 1 East; Sections 13, 14 and 23 (Humboldt Base Meridian) (Figure 1). The investigation was requested by Trinity Valley Consulting Engineers, LLC who provided the project description summarized below.

1.1 Project Description

The project area utilized for gravel extraction operations at the Simpson-Glendale Bar totals approximately 19 acres and encompasses portions of three separate parcels. A smaller stockpile area of 2 acres is located above the flood plain at the GR Sundberg, Inc. construction yard.

Land use at the site will remain consistent with the current zoning. Due to the inherent nature of the instream setting, the site is annually reclaimed and replenished. The proposed projects lacks any infrastructure that would have to be removed and there are currently no plans on behalf of the landowner to change the land use or zoning from its current state. The proposed project termination date is 15 years from the approval of the Conditional Use Permit.

Extraction operations include excavating, grading, loading, and transporting sand and gravel from dry gravel bars to processing plants or existing, adjacent stockpile sites located at or above the 100-year floodplain. Excavation typically consists of removing the top layers of gravel on bars with heavy equipment such as dozers, loaders and dump trucks. A variety of gravel extraction and non-extraction activities are proposed that may be applied on a site-specific basis depending on gravel bar characteristics and proximity to sensitive salmonid habitat. The proposed activities are sorted into four groups according to their objectives:

- standard extraction methods,
- extraction methods with a habitat improvement component,
- committed habitat improvement actions, and
- optional habitat improvement actions.

In general, extraction methods change as the supply of gravel on easily accessible sites is reduced. The numbers of extraction sites following winters with high recruitment levels are typically less than those seasons following low recruitment winters, because fewer sites are needed to obtain planned volumes during high recruitment years than low recruitment years. In the reach upstream of the Arcata-Mad River Railroad Bridge, extraction methods with a habitat improvement component will be given priority, if applicable at the site.

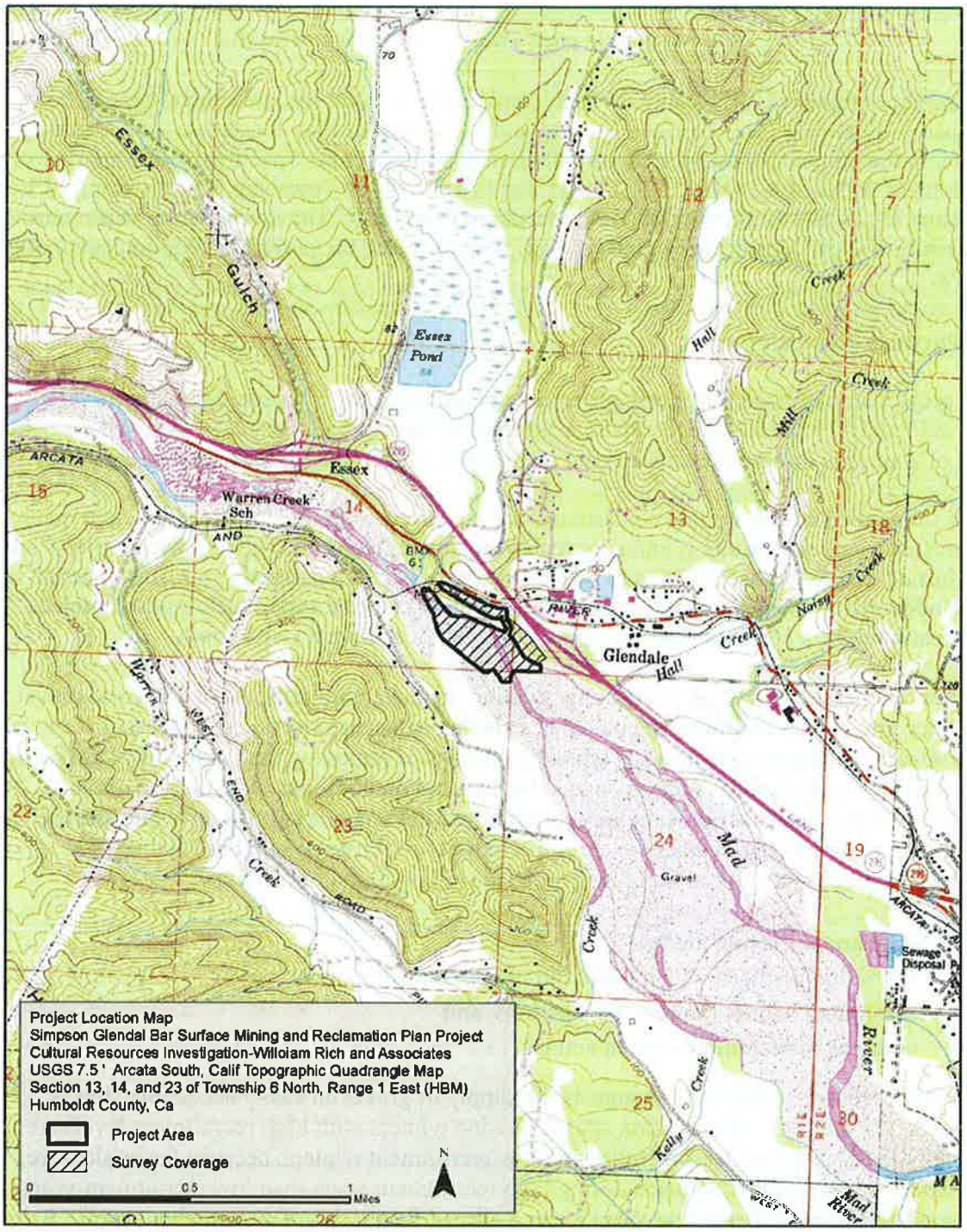

Figure 1. Project Location Map

Standard Extraction Methods

The primary objective of standard extraction methods is to extract commercial quantities of aggregate. Identification of specific extraction methods will occur during the annual pre-extraction planning process and will be proposed as part of the County of Humboldt Extraction Review Team (CHERT) recommendation to the Corps for permitting by Letter of Modification (LOM) issued annually under the 10-year permit. These methods are generally used when there are sufficient aggregate deposits in easily accessible locations, such as exposed gravel bar surfaces.

Extractions located at or above the 2-year flood level will be limited so that no more than 10 percent of the area above the 2-year flood level is disturbed by mining at any given time. The 10 percent disturbance rate will be calculated on a per-bar basis so that regardless of ownership, no more than 10 percent of the 2-year and above floodplain associated with a given bar is disturbed at any time.

Narrow Skim

Narrow skims are no more than one-third of the bar width, as measured at the widest part of the bar, follow the shape of the bar feature, maintain the point of maximum height of the bar, and trend in the general direction of stream flow. These skims maintain a vertical offset corresponding to the water surface elevation of the 35-percent exceedance flow. Finished skims are free-draining and slope either toward the low-flow channel or in a downstream direction. These skims avoid the head-of-bar buffer, defined as the upstream one-third of the exposed bar surface. As described previously, the head-of-bar buffer may be decreased on a case-by-case basis provided that the extraction area narrows, tapering smoothly to a point, and remains below the upstream cross-over riffle. Narrow skims will retain the maximum lateral bar height.

Horseshoe Skim

Horseshoe skims remove gravel from the downstream two-thirds of gravel bars. A lateral edge-of-water buffer is maintained along the low-flow channel. The finished grade of the extraction area will have a downstream gradient equal to the river and a flat cross slope, and will be no lower than 1-foot above the low-flow water surface elevation as identified during the pre-extraction review. Cut-slopes will be left at a 2:1 (horizontal: vertical) slope except along the upstream side at the head-of-bar buffer where a 6:1 slope will be established. There will be at least a 15-foot offset buffer from the bank. The extraction surface will daylight along the downstream one-third to one-fifth of the bar to facilitate drainage following high runoff events. The horizontal and vertical offsets are intended to remove the excavation area away from the low-flow channel. Due to less frequent flow inundation, horseshoe-shaped skims may take larger flow events to replenish than traditional skim designs, depending on the unaltered bar height between the excavation and the stream.

Traditional Skim

Traditional skims do not exceed one-half of the bar width as measured at the widest point of the bar. This method does not extend beyond the upper one-third head-of-bar buffer and maintains a

minimum skim floor at the water surface elevation of the 35-percent exceedance flow. This method will only be used at the Essex Bar and on gravel bars downstream of the A&M RR Bridge.

Secondary Channel Skims
Secondary channel skims are elongated, shallow skims in the area of dry, secondary channels, designed to be free-draining and open at either end so as to not impede fish passage/migration and to prevent any potential fish stranding. The upstream riffle crest, or elevation control of secondary channels, will not be affected by extraction proposals. The minimum skim floor of these excavations will be set at the 35-percent exceedance flow elevation.

Standard Trench
A trench is generally a long, narrow excavation parallel and adjacent to, but outside of, the wetted perimeter of the channel. Trenches will be connected to the wetted channel at the upstream and downstream ends to prevent entrapment of fish. This method cannot be used upstream of A&M RR Bridge due to the presence of spawning habitat (CHERT 2008).

Extraction Methods with Habitat Improvement Components
Extraction methods with habitat improvement components are those that allow for harvesting of commercial quantities of aggregate, but also have a primary or secondary objective of providing habitat improvement. These methods include wet and dry floodplain pit excavations, restorative secondary channel skims, oxbow and alcove development, migration channel extractions, and high terrace skims. Other options may be developed by the applicants and NMFS that will allow for both the extraction of commercial quantities of aggregate and aquatic habitat improvement. Identification of specific methods will occur during the pre-extraction planning process and will depend on site conditions at that time.

Wet Floodplain Pits
Wet floodplain pits are irregularly shaped excavations (to avoid excavating riparian vegetation) located on the floodplain surface. Wet pits are typically shallow and allow for gravel extraction away from frequently inundated gravel bar surfaces and most salmonid habitat features. Floodplain pits will be located on surfaces at or above the 2-year flood elevation. Wet pits may have vegetation, either existing or planted, around their perimeter, and may contain some type of cover elements, such as woody debris. These features may also fill in with fine sediment, creating a seedbed in which native riparian vegetation could become established. Lower elevation wet pits should have a connection to the low-flow channel, or other frequently inundated secondary channel, to allow for seasonal salmonid use and reduce salmonid entrapment potential. The pits will be monitored for salmonids stranding after high flows have receded. The pre-extraction plan will include a monitoring plan that assesses the risk of salmonid stranding and includes a fish rescue plan.

Dry Floodplain Pits
Dry floodplain pits are irregularly shaped excavations (to avoid excavating riparian vegetation) located on the three- to five-year return interval floodplain surface and should not have a secondary channel inlet. An outlet connection to a secondary channel will be constructed to reduce entrapment potential and to provide velocity refuge during very high flows. The floor of the pit will not extend into the groundwater table. Dry pits will only fill with sediment during very high-flow events, on the order of every three to five years, and typically over a multi-year period. Dry pits may have vegetation, either existing or planted, around their perimeter. These features may also fill in with fine sediment that creates a seedbed in which native riparian vegetation could become established. The pits will be monitored for salmonid stranding after high flows have receded. The pre-extraction plan will include a monitoring plan that assesses the risk of salmonid stranding and includes a fish rescue plan.

Secondary Channel Skims
Secondary channel skims are described above. With proper design (e.g., variable topography, small side alcoves, introduction of anchored woody debris) these extractions can be used to create or improve high-flow habitat for salmonids. These channels could also be used as upstream adult salmonid migration corridors when water velocities in the main channel are high.

Oxbows
Oxbow extractions are narrow (average low-flow channel or less), linear, off-channel excavations along historical channel locations, typically defined on aerial photographs by curvilinear vegetation colonization, muted secondary channels, or as the toe of a moderate to high terrace or valley margin. Features should be located in the downstream half of the bar to minimize channel capture and could be excavated deeper than the adjacent thalweg. Natural oxbows that intercept hyporheic flow have historically been utilized by juvenile salmonids for rearing with good success. Oxbows could have willow vegetation and large woody debris placed in them to enhance their cover habitat.

Alcoves
Alcove extractions are typically located on the downstream end of gravel bars, where naturally occurring alcoves form and may provide velocity refuge for juvenile salmonids during high flows, and potential thermal refuge for juvenile salmonids during the summer season. Alcove extractions are irregularly shaped to avoid disturbance of riparian vegetation, and are open to the low-flow channel on the downstream end to avoid stranding salmonids. Alcoves are extracted to a depth either above or below the water table.

Migration Channel Excavation
Migration channels may be excavated in those locations where upstream fish passage into tributary channels is impeded by sediment deposits. These channels are constructed to connect main-stem channels to tributaries at lower flows than found in the pre-project condition, thus allowing easier access for upstream migrating adult salmonids, over a wider range of flows.

High Terrace Skim
High terrace skims extract gravel from the 10-year or greater floodplain. This area is excavated to the 35-percent exceedance flow elevation to promote backwatering and fine sediment deposition at higher flows. This extraction is expected to foster riparian vegetation development by creating a suitable seedbed that is at a low enough elevation so seedling roots can gain access to summer groundwater. Riparian vegetation establishment could also be enhanced by direct planting. The extraction may be phased over a number of seasons to cover the planned area. However, once a surface has been extracted, the subsequent riparian vegetation growth will preclude the site's use as an active extraction area well into the future (CHERT 2008).

Reclamation consists of ensuring the bar is left in a configuration so as not to increase the danger of trapping salmonids. Aggregate materials will be loaded on to trucks or off-road haulers, and be transported to the stockpile locations on site and at the existing permitted site in Guintolli or promptly taken to Eureka Ready Mix to be processed. Alternative extraction methods also include designs targeting salmonid habitat restoration (e.g. large woody debris installation).

2.0 Environmental and Cultural Setting

2.1 Natural Setting

The project area is situated on a Late Pleistocene/Holocene fluvial terrace of the lower Mad River just as it leaves the Blue Lake fan and cuts through the north end of Fickle Hill on its way to the Arcata Bottom, approximately six miles from the Pacific Ocean. These and other terraces in nearby coastal river valleys have formed by fluvial response to sea level change, regional uplift, and active faulting. This is an active and relatively young geological setting. Rapid tectonic uplift in this region, coupled with a high annual rainfall produces some of the highest erosion rated in the nation (Alt and Hyndman 2000). Sediment load deposited in the local stream and rivers is therefore very high and has the potential to developed significant terrace deposits.

The Franciscan complex is a mix of blocks consisting of Middle Jurassic, Cretaceous, and Paleogene greywacke, metagreywacke, blueschist, greenstone, chert, serpentinite, and minor amounts of limestone and argillite (Jennings 1977). This bedrock unit is commonly described as a mélange due to its highly mixed nature that forms a rolling and unstable terrain which often results in earth flow land movements where the rock units protrude from un-forested grasslands. Exposures of chert suitable for flakestone tool production occur in many places in the general region.

The Mad River basin is one of several in coastal Northern California with suspended sediment discharges of 5 to 50 times those of comparable size basins in the United States. Earthflows are recognized as one of the significant sediment sources in the region (Kelsey 1977). For this reason, the Mad River and its tributaries are subject to high sediment loads. The presence of long-term high sediment loading within the Mad River system is demonstrated by the presence of extensive alluvial deposits throughout the area. Specifically, the morphology at this location consists of the downstream extent of the broad alluvial reach that terminates near the downstream end of the project where another confined reach begins at the Arcata-Mad River Railroad and extends downstream to the Highway 299 Bridge. Common trends in these low gradient alluvial reaches are meandering pool/riffle morphology (Stillwater Science 2010).

The project area has been mapped in Soils of Western Humboldt County (1965). No prime agricultural soils were identified that would be impacted by project activities. Soil-vegetation mapping units of the area rate the surrounding soils as either an industrial area in the case of the stockpile and processing area or highly productive for agricultural activities to the west where no activities are proposed. No topsoil occurs within the extraction areas (Humboldt County 2014).

Because of the alluvial, river bar setting of this project area, it is probable that no in situ archaeological deposits exist. There also seems to be a low likelihood of encountering subsurface archaeological deposits at the upland staging and processing location at the construction yard, because project actions are limited to the existing ground surface.

This location would have supported a diverse range of plants and animals important to the people who lived here in the prehistoric and historic past. Except for the grizzly bear and condor, generally, all the historic animals are still present.

2.2 PREHISTORY

The prehistory of the Northwest California region has a deep prehistoric record reaching to the early Holocene Period over 7,000 years ago. Archaeological research in this general region has hypothesized a continuous prehistoric cultural chronology for the last 7,800 years before present. Oldest is the Borax Lake Pattern ***(8,000 to 3,000 B.P.)*** attributed to the earliest known prehistoric occupation for this portion of northwest California. These remains are thought to represent the activities of small, highly mobile family groups who ranged over wide areas (Fitzgerald and Hildebrandt 2001). The Middle Period ***(5,000 to 2,500 B.P.)*** is represented by the Mendocino Pattern, an adaptive orientation toward the use of low elevations, located along salmon bearing streams near acorn crops and which could be occupied by larger concentrations of people during the winter months (Hildebrandt and Hayes 1983, 1984, Bickel 1979). The late period Tuluwat (formerly Gunther) Pattern is generally dated after 1,100 years ago and presumed to represent a continuation of the Middle Archaic Period with a particular focus on coastal resources. Sites dating to this time are found throughout the western North Coast Ranges in moderate density. The environments along the lower Mad River between the former "Big Bend" and Blue Lake are marked by ethnographically described sites of this period which may have earlier settlement (Roscoe et al. 2016)

2.3 ETHNOGEOGRAPHY

The standard published sources are in disagreement regarding the ethnogeography of lands in the vicinity of modern-day Blue Lake, including the project area. Elsasser, writing about the Wiyot tribe (an Algonquian speaking tribe) in the Smithsonian Handbook, maps the tribe's territory as including all of the lower Mad River up to a boundary about three miles south of Blue Lake, including all of the North Fork Mad River drainage (Elsasser 1978:155). Wallace, writing in the same publication about the neighboring Whilkut tribe, shows what he calls the "North Fork Whilkut" controlling the entire North Fork drainage while his "Mad River Whilkut" occupy the main Mad south from the forks at Blue Lake to a line many miles upriver (Wallace 1978:164). Heizer, the volume's editor, did not attempt to reconcile or explain the discrepancy. Other ethnographers have probed more deeply, however, and from their work the following perspective emerges.

By the time of sustained Euroamerican settlement in 1850, the Blue Lake area had become a borderland zone between the territories of the Wiyot and their Athabascan speaking neighbors (Loud 1918:264). Loud identifies the latter group as Chilulas rather than Whilkuts, but according to Merriam this incorrectly transposes units of the Whilkut tribe. Merriam determined that the Whilkut (or Hwil-kut) tribe contained four subunits. The Hoch-tin-net (or Ho-tin-net) were "the Blue Lake or North Fork Mad River Indians inhabiting the valley of North Fork Mad River from

its head to Korbel and Blue Lake" (Merriam 1998:reel 9). Loud's so-called Chilulas were actually the northernmost subunit of Whilkuts, and were more properly called the Hoich-let-kah (or Hoech-kut-ka) (Merriam 1998:reel 9). The Wiyots of Mad River were actually a subunit of the larger Wiyot tribe, and were known as Pat-a-wats, after the Wiyot name for Mad River. Merriam indicates that the Pat-a-wats were a "tribe on lower Mad River from Blue Lake near the junction of north Fork down to coast, and thence south to southern shore of Humboldt Bay" (Merriam 1976:68).

Loud describes the encroachment on the Blue Lake area by the Whilkuts:

> The Wiyot at Blue Lake were nearly exterminated by an attack only a year or two previous to the settlement of the whites, who reported seeing thirty or forty graves here as a result. After this attack some of the surviving women lived near Blue Lake with Chilula [Whilkut] husbands. Whether or not these women were married before the fight is not known. Jim Brock, one of our informants, had a Chilula father from Redwood creek, while his half brother, Kneeland Jack, is a full blooded Wiyot. At the time of the massacre, Blue Lake Bob was a baby or a child and wanted to cry while in hiding, but his mother held her hand over his mouth and so escaped detection. Bob was a boy in 1850; so the massacre could only have been a few years previous. Jim Brock volunteered the information that there was a time when the Chilula killed the Wiyot on opportunity. (Loud 1918:252)

According to Loud:

> ...it appears that the vicinity of Blue Lake was a populous center a few years before the arrival of the whites and before the murderous raid of the Chilulas [Whilkuts] ....Before the massacre the territory [around Blue Lake] was unquestionably Wiyot, but after that time, and especially after the whites came and did away with tribal feuds, the Indian population became somewhat mixed by intermarriage, there being a considerable number of Chilula. It is reported that in 1850 there were twenty houses built of slabs and poles within a radius of two miles from the present village of Blue Lake. (Loud 1918:264)

2.4 Native American Placenames in Project Vicinity

A review of the ethnographical literature for the Wiyot Tribe produced during the early twentieth-century, reveals that this stretch of lower Mad River had a relatively utilized landscape with population bases nearby. Several named villages are reported by Loud (1918) and Curtis (1970) in the vicinity. Loud's map of Wiyot territory shows "Site S, Q, T and U" in the project vicinity. Loud (1918) acknowledged that several habitation sites were stretched along the river

between the big bend and Blue Lake where "...about every mile there was an Indian house of two" (Loud 1918:263).

The unconfirmed location of Loud's Site S is thought to lie somewhere approximately 100 meters north of the project area. Loud describes this site as *djemashun-dasun-dun* – "fern place" (Loud 1918:290). Sites Q, T and U described below were located on the south side of the Mad River approximately 300 meters southwest from the project area. Their descriptions are below.

Site Q: *tsa-tikai-tin* – rock place; name refers to white rock, now buried in sand, which was visible for a long distance (Loud 1918: 290).

Site T: *kochweke-ten* - *Kochweke* is an onomatopoetic name of a bird, possibly a quail (Loud 1918:290).

Site U: *khokwo-siltin-tin* - redwood place; a flat prairie with one big redwood log to which name refers.

Archaeological site P-12-001140 (CA-HUM-930) is situated along the north edge of the Mad River, approximately 100 meters east from the southern end of the project area (Roscoe and Van Kirk 1993). This site is described as a habitation village with house pit features, anthropogenic midden soil, and many artifact types. It is possible that Loud's "Site S" coincides with this location.

2.5 HISTORIC PERIOD

In general, areas in California north of San Francisco were not populated by Euro-American settlers as early nor as quickly as southern California. Early settlement was hindered by densely timbered tracts of land that extended from the coast to the interior (Coy 1929). While the North Coast of California had been scouted by European ships beginning in the sixteenth century, the year 1806 marks the first record of Humboldt Bay's discovery by the *O'Cain*, an American ship chartered by a Russian-American Company in Alaska. Sustained Euro-American settlement of the area did not take place until 1850; a year after the bay was "rediscovered" by the overland expedition led by Josiah Gregg (Coy 1929, Loud 1918). At that time, Humboldt and Trinidad bays became jumping off places for miners heading to the interior gold mines. Settlements rapidly developed around the bays to provide services and supplies for the Argonauts (Shoup 1983). The dense redwood forests of northern California provided the timber needed to build these settlements. Initially the only way of transporting lumber was by custom-built schooners adept at carrying lumber through the steep and rocky coastal terrain of California's west coast.

Fort Humboldt was established in 1853 on a high bluff behind Bucksport, a community located in southern Humboldt Bay, to meet the need for military protection of the new American settlements (Coy 1929). Senators from northern California decried the need for military protection from hostile Indians, claiming that in the past "few months" 130 settlers had been

killed and $240,000 worth of property destroyed by Indians. Coincidently, U.S. Indian Agent Redick McKee wrote the Governor, blaming the Euro-Americans of this region for their unjustifiable hostility towards the Indians and citing as an example the murder of 15 or 20 Indians on Humboldt Bay near the mouth of Elk River in February 1853. There was strong sentiment in California among Euro-Americans that the Indians should be exterminated. Despite the hostilities, there was a substantial increase in the amount of lands enclosed and cultivated between 1860 and 1865, due in large measure to passage of the Homestead Act of 1862 (Coy 1929). Most of the Indian attacks on Euro-Americans were confined almost exclusively to depredations on stock or the robbing of isolated ranch houses (Coy 1929).

In the 1850s, timber resources were recognized as being more valuable than gold. The first lumber mill was set up at Eureka by 1852, and Humboldt Bay became an important seaport as seagoing vessels were the only way to move the forest products to market. As logging progressed, those in the timber industry and their employees had to move further back from the bay to reach new untouched areas. As the problem of transportation became less difficult with the organization of the San Francisco and North Pacific Railroad Company in 1869; the railroad became the fastest way to transport lumber to mills and timber harvesting rapidly became the largest industry in this region. Explosives were employed in the construction of railroads and highways in order to clear land through redwood forests, it was considered an efficient means of clearing stumps and assisting in grading as well as excavating through rock masses. By the mid 1890's the northwest lumber industry had been infused with new industrial machinery that exponentially increased production and drove down market prices. The capitalization of the lumber industry caused smaller, local mills to be consumed by larger corporations by 1910. Completion of the railroad between Eureka and San Francisco in 1914 opened up the north coast to new commercial opportunities and markets.

The huge demand for lumber all across North America was leading to the rapid depletion of this resource and preservation of the dwindling redwood forests became a prime concern of local citizens. With the onset of WWII and the subsequent economic boom of the 1950's logging peaked so that by the 1960's nearly 90 percent of all original redwoods had been harvested. In 1968 Redwood National Park was established to secure some of the very few abiding groves of ancient North Coast redwoods.

Arcata-Mad River Railroad

In January 1884 the Arcata-Mad River Railroad completed its line extension from Warren Creek to the mill town of North Fork, later called Korbel (Fountain 2001:(97)289). The grade crosses the Mad River just south of the project area before turning east and continuing through the project area and along the base of Liscomb Hill before reaching Blue Lake. The entire alignment of the Arcata-Mad River Railroad beginning at the wharf at Arcata Bay and extending to Korbel on the North Fork of the Mad River was designated a California Historical Landmark in 1970 (#842). A segment of the railroad within the project area has been recorded as CA-HUM-872H (Eidsness 1987). The rail line was used into the 1970s and was not active after 1983.

In the 1960s, with the construction of State Route 299, the main travel route to Glendale and Blue Lake was updated, leaving Glendale Blvd. orphaned to those with local destinations. Until this time, Glendale Blvd. served as the main roadway along the north side of the river, providing access to the east and west and to the north into Fieldbrook Valley.

3.0 METHODS

3.1 BACKGROUND RESEARCH AND CONSULTATION

3.1.1 Northwest Information Center Records Search

A records search at the Northwest Information Center was conducted by staff of the Northwest Information Center on June 20, 2016. The search included the entire project area (Appendix A).

3.1.2 Background Literature Research

Background literature research was aimed at obtaining information pertinent to the prehistoric and historical uses of the survey area. It was also hoped that this would generate specific geographic information about archaeological and historical sites in the survey area and its vicinity. Background research also provided an understanding of the types of cultural resources that were likely to be encountered in the project area. This included an examination of the historical maps, records and published documents available at the Humboldt State University-Humboldt Room and the author's personal collections.

3.1.3 Consultation with Native Americans

William Rich contacted the Native American Heritage Commission (NAHC) on June 26, 2016 requesting a search of the Sacred Lands Inventory File. The NAHC has not responded as of July 24, 2016, despite two more attempts on July 5 and 15, 2016 to request information. Based on past experience in the general vicinity, WRA contacted members of the Blue Lake Rancheria, Wiyot Tribe and Bear River Band of Rohnerville Rancheria via written letter/email on June 20, 2016 (Appendix B). Tribal Historic Preservation Officer (THPO), Janet Eidsness responded on June 27, 2016 and asked to visit the project area. William Rich accompanied Ms. Eidsness to the project location and vicinity on June 29, 2016. We also visited archaeological site P-12-001140 (CA-HUM-930) to confirm its location outside of the proposed project area. Mrs. Eidsness indicated that the site was recommended as a sacred land in 2007 to the NAHC (see Section 4.0). We were both pleased to see that the site remained in good condition with no recent looting or disturbances.

3.2 SURVEY METHODS

3.2.1 Survey Expectations

Archaeological sites associated with Wiyot occupation are known in the general vicinity along the banks of the Mad River. Loud (1918: plate 1) maps Site S, Q, T and U just to the north and southwest, at what would be at least 300 meters, given the scale of the map. Recorded archaeological site P-12-001140 (CA-HUM-930) is also documented to the south at approximately 100 meters.

Archaeological sites typical for this general setting would include stone tools of chert and obsidian, ground stone implements, locally darkened midden soils, shell, bone, and features. Expected historic period cultural resource indicators include standing or ruined buildings;

ceramic, glass, or metal artifacts; structures; trails; tailings and pits. Artifacts associated with the Arcata-Mad River Railroad or historic ranching could also be present in the vicinity.

3.2.2 Field Investigation

The field survey of the project area was conducted on May 2, 2016 and June 29, 2016 by William Rich. This included walking over the entire project area of approximately 20 acres (Figures 2-5). The field survey was conducted in a reconnaissance manner. This included walking intuitive zig-zag transects in a systematic grid over the entire location proposed for gravel extraction and the upland processing/storage footprint at the Sundberg construction yard. The survey also included the project access road that will be used to haul gravel to the storage location.

Mineral sediments were observed over much of project area at the gravel bar. The upland staging location is mostly covered in gravel and asphalt and offered limited access of mineral sediments. These were sought along the cut bank on the north side of the yard and the fill slopes to the south. The access road leading to the gravel bar offered the best access to mineral sediment and opportunity to inspect for buried cultural resources. Cut banks and small terraces along this hill were investigated. The terrace appears to have been cut and leveled, removing the historical surface. Given the relatively minor vertical limits of the proposed actions, an exhaustive subsurface survey to assess the potential for buried archaeological sites was not performed.

Figure 2. View to the west of gravel bar proposed for extraction.

Figure 3. View to the east of gravel mining bar with location of archaeological site P-12-001140 on terrace.

Figure 4. View to the north of proposed access road.

Figure 5. View to the west of Sundberg work yard and location of Arcata-Mad River Railroad.

4.0 FINDINGS

4.1 BACKGROUND SEARCH RESULTS

4.1.1 Previously Recorded Cultural Resources

According to the NWIC and ethnographic literature sources pertaining to the Wiyot area, no known archaeological sites or other places of importance to Native Americans are known to occur in the direct project area (Appendix A). Adjacent to the southeast portion of the extraction area, and located on the high river terrace, is the archaeological site known as P-12-001140 (CA-HUM-930). This site is a former Wiyot village, with a dark anthropogenic midden deposit covering a two acre area. A series of pits resulting from former plank houses, and an assortment of tool stone debitage and tools were previously identified here.

Intensive surface survey, ground penetrating radar studies, & micro mapping with collection of formed tools and obsidian, along with tribal consultation with Blue Lake, Bear River and Wiyot tribes, was undertaken by Blue Lake, THPO Janet Eidsness, as a consultant to Garth Sundberg in 2007, in response to ground disturbance related to logging and looting by a small group of homeless campers on the property. No report has yet been completed. New site boundaries were assigned and were provided by Ms. Eidsness for the purposes of this investigation.

The site is assumed to be significant, containing request integrity to be eligible for listing to the National Register of Historic Places (Personal Communication, Janet Eidsness 2016). The site was visited during this investigation with the help of Ms. Eidsness and found to be in relatively good condition. Although timber harvesting and road development in the site area occurring about 2007 appears to have had the potential to impact the integrity of the deposit, the site appears stable with no major erosion occurring. Several house pits are evident, midden deposit appears to persist, and artifacts were observed on the ground surface during the 2016 site visit.

The former Arcata-Mad River Railroad grade traverses through the project area. This linear site, noted as CA-HUM-827H (Eidsness 1987) is the area's first railroad and was one of California's longest lasting. Although much of the track has been removed, Eidsness (1987) notes several contributing elements of the grade between Arcata and Korbel. These include the steel truss bridge over the Mad River, and several extant wooden trestles along Warren Creek Road, and the wooden trestle at Hall Creek. This site is recognized as California Historic Landmark #842 and is considered a historical resource pursuant to CEQA.

The portion of the grade at this project location, however, has been removed. Missing are the rails, ties, ballast and grade. No recognizable evidence can be found. This segment would not contribute to the significance of the resource.

Three other archaeological sites are recorded outside of the current project area, but within one half mile radius. These are P-12-001141 (CA-HUM-931), an archaeological site located on the left bank terrace above the Mad River at the south side of the Arcata-Mad River Railroad

crossing. This site has been recently tested and evaluated as a potentially eligible resources for its information potential associated with Wiyot settlement and technology over the past 2,000 years (Fitzgerald et al. 1993, Roscoe et al. 2016).

Another archaeological site associated with Native American occupation along this reach of Mad River is P-12-001854 (CA-HUM-1106). This location contains a moderate density lithic scatter distributed over a hill top setting adjacent to Mad River just south of the mouth of Lindsay Creek. This site was recommended eligible for its potential to address research questions associated with prehistory (Burns et al. 2007).

A third archaeological sites is also known to exist along the Mad River, south of Lindsay Creek. This site, P-12-003043 (CA-HUM-1469), was documented by Browning (2013) as a historic period and prehistoric artifact scatter.

The pillar ruins of an historical bridge, crossing Lindsay Creek, were also identified in 2012 by Salisbury and Grunder within a one half mile radius of the current project location.

These sites have been visited by this author in the past, but because of their location, well outside of the project area, were not assessed at this time.

4.1.2 Previous Archaeological Surveys

According to the NWIC files the proposed gravel extraction area and the upland spoils and processing location had been previously surveyed for cultural resources (Appendix A). In 1987, Eidsness conducted an archaeological survey on the south side of the Mad River for a sewer line installation project. She documented the Arcata-Mad River Railroad and assigned several contributing elements of significance. These include the major intact structures at crossings, like the steel bridge over the Mad River, and wooden trestles at Hall Creek and Warren Creek. The grade also traversed the northern side of the current project area with a small spur grade entering now what is the Sundberg construction yard.

In 1993, Roscoe and Van Kirk covered much of the current gravel extraction area previously for a proposed similar action reaching throughout the lower Mad River (S#15201). Prepared on behalf of Humboldt County Planning Department for a Programmatic Environmental Impact Report for gravel extraction at ten locations, Roscoe and Van Kirk reported the identification of two archaeological sites mentioned above (P-12-001140 and P-12-001141) along the river in this vicinity. Although these sites are located well above the flood plain of the Mad River, Wiyot tribal member Jerry James specifically expressed concern, at that time, for elevated gravel mining which could lead to increased erosion and loss of the archaeological deposit at P-12-001140.

4.2 Field Survey Results

The cultural resources field survey was conducted during two visits. The survey coverage included an approximate area of 30 acres (Figure 6) and covered the entire gravel bar proposed for mining, the access road and the proposed staging and processing location. Conditions during the field survey were considered good to fair.

The Arcata-Mad River Railroad grade route and a small siding were identified from historical air photos, but after a field review, are determined completely destroyed and paved over in this project area (Figure 7). No physical evidence of the grade is currently present at this project location.

The GR Sundberg Inc. office and shop buildings at the survey area are all less than 50 years of age and therefore would not be considered historical resources, per CEQA § 15064.5 (a).

Figure 6. Survey Coverage and Site Location Map

Figure 7. View to the west in 1954, showing Arcata-Mad River Railroad grade and spur that once traversed the Sundberg work yard (Humboldt Room Shuster Collection # 2001.01.1841).

5.0 CONCLUSIONS

No historical resources, as defined in CEQA § 15064.5 (a), were identified within the direct project area as a result of this investigation. This supports a finding that gravel extraction along this section of the Mad River will not cause a substantial adverse change in the significance of an historical resource (Public Resource Code (PRC) § 21084.1).

The applicant shall take into account indirect impacts to the river terrace which hosts archaeological site P-12-001140 (CA-HUM-930). This site lies more than 100 feet from the extraction area, but this site shall not be entered, nor shall the supporting terrace be undermined. Surface mining in this area shall be limited to alluvial gravel deposits on the river bar and the applicant shall avoid any quarrying to bedrock or colluvium. No project related actions shall occur within 100 feet of the CA-HUM-930 archaeological site boundary. Furthermore, the ingress and egress routes to reach the gravel bar and the work yard shall be used only as proposed. The dirt road leading to the southeast from the main access road shall be avoided. This road leads to the archaeological site and is off-limits to project actions. A gate, chain or other such barrier shall be placed on the beginning of this road during operations to ensure that all equipment are excluded from inadvertently entering the site.

No further archaeological studies are recommended at this time. It is the opinion of this author that the investigation constitutes a good faith effort to identify cultural resources at the project location. Due to the substantial ground disturbances that have taken place on the property, it would be unlikely that intact buried archaeological deposits exist. If, however any archaeological materials are uncovered during project activities, the following pages offer recommendations for ensuring that potential project impacts to significant cultural resources are eliminated or reduced to less than significant levels. If project plans change to include areas not previously surveyed, additional investigations would be required.

5.1 PROTOCOLS FOR INADVERTENT DISCOVERIES

Inadvertent Discovery of Cultural Resources
Although relatively unlikely, due the significant historic ground disturbances that occurred at this location, there is always the possibility that intact archaeological deposits remain concealed below the present ground surface.

If cultural resources, such as chipped or ground stone, historic debris, building foundations, or bone are discovered, work shall be stopped, per the requirements of CEQA (15064.5 (f)). Work near the archaeological finds shall not resume until a professional archaeologist, who meets the Secretary of the Interior's Standards and Guidelines, has evaluated the materials and offered recommendations for further action.

If human remains are discovered during project construction, work will stop at the discovery location, within 20 meters (66 feet), and any nearby area reasonably suspected to overlie adjacent

to human remains (Health and Safety Code, Section 7050.5). The Humboldt County coroner must be immediately contacted at the Coroner's office, David Parris 3012 I Street, Eureka, CA 95501; Phone: 707-445-7242.

6.0 PROFESSIONAL QUALIFICATIONS

William Rich is a Registered Professional Archaeologist (RPA), holding a M.A. in Archaeology and Heritage Preservation, with over fifteen years of archaeology experience working in Northern California. He has recently completed several similar investigations in the Glendale and Blue Lake areas. Mr. Rich meets the Secretary of Interior's Professional Qualifications Standards for conducting this survey (Title 36 Code of Federal Regulations Part 61, and 48 Federal Regulation 44716).

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Appendix A
Record Search Results

CALIFORNIA HISTORICAL RESOURCES INFORMATION SYSTEM

ALAMEDA, COLUSA, CONTRA COSTA, DEL NORTE, HUMBOLDT, LAKE, MARIN, MENDOCINO, MONTEREY, NAPA, SAN BENITO, SAN FRANCISCO, SAN MATEO, SANTA CLATA, SANTA CRUZ, SOLANO, SONOMA, YOLO

Northwest Information Center
Sonoma State University
150 Professional Center Drive, Suite E
Rohnert Park, California 94928-3609
Tel: 707.588.8455
nwic@sonoma.edu
http://www.sonoma.edu/nwic

6/20/2016 NWIC File No.: 15-1759

William C. Rich
William C. Rich and Associates
P.O. Box 184
Bayside, CA 95524

re: Sundberg Gravel Extraction Project

The Northwest Information Center received your record search request for the project area referenced above, located on the Arcata North USGS 7.5' quad. The following reflects the results of the records search for the project area and a 0.5 mile radius:

Resources within project area:	P-12-815.
Resources within 0.5 mile radius:	P-12-1140, 1141, 1854, 2480, & 3043.
Reports within project area:	S-15201 & 9576 (copied S-9576).
Reports within 0.5 mile radius:	S-41335, 19597, 41724, 41903, 18914, 43017, 9574, 45494, 41904, 43975, 42412, 896, 40425, 41779, & 41655.
Other Reports within records search radius:	S-848, 2458, 8226, 15529, & 20395. These reports are classified as Other Reports; reports with little or no field work or missing maps. The electronic maps do not depict study areas for these reports, however a list of these reports has been provided. In addition, you have not been charged any fees associated with these studies.

Resource Database Printout (list):	☒ enclosed	☐ not requested	☐ nothing listed
Resource Database Printout (details):	☐ enclosed	☒ not requested	☐ nothing listed
Resource Digital Database Records:	☐ enclosed	☒ not requested	☐ nothing listed
Report Database Printout (list):	☒ enclosed	☐ not requested	☐ nothing listed
Report Database Printout (details):	☒ enclosed	☐ not requested	☐ nothing listed
Report Digital Database Records:	☐ enclosed	☒ not requested	☐ nothing listed
Resource Record Copies:	☒ enclosed	☐ not requested	☐ nothing listed
Report Copies:	☒ enclosed	☐ not requested	☐ nothing listed

OHP Historic Properties Directory:	☒ enclosed	☐ not requested	☐ nothing listed
Archaeological Determinations of Eligibility:	☐ enclosed	☐ not requested	☒ nothing listed
CA Inventory of Historic Resources (1976):	☒ enclosed	☐ not requested	☐ nothing listed
Caltrans Bridge Survey:	☐ enclosed	☒ not requested	☐ nothing listed
Ethnographic Information:	☐ enclosed	☒ not requested	☐ nothing listed
Historical Literature:	☐ enclosed	☒ not requested	☐ nothing listed
Historical Maps:	☐ enclosed	☒ not requested	☐ nothing listed
Local Inventories:	☐ enclosed	☒ not requested	☐ nothing listed
GLO and/or Rancho Plat Maps:	☐ enclosed	☒ not requested	☐ nothing listed
Shipwreck Inventory:	☐ enclosed	☒ not requested	☐ nothing listed

*Notes:

- There were no properties in Glendale in the historic inventories. Copied the indices for Blue Lake & the Arcata vicinity.

Please forward a copy of any resulting reports from this project to the office as soon as possible. Due to the sensitive nature of archaeological site location data, we ask that you do not include resource location maps and resource location descriptions in your report if the report is for public distribution. If you have any questions regarding the results presented herein, please contact the office at the phone number listed above.

The provision of CHRIS Data via this records search response does not in any way constitute public disclosure of records otherwise exempt from disclosure under the California Public Records Act or any other law, including, but not limited to, records related to archeological site information maintained by or on behalf of, or in the possession of, the State of California, Department of Parks and Recreation, State Historic Preservation Officer, Office of Historic Preservation, or the State Historical Resources Commission.

Due to processing delays and other factors, not all of the historical resource reports and resource records that have been submitted to the Office of Historic Preservation are available via this records search. Additional information may be available through the federal, state, and local agencies that produced or paid for historical resource management work in the search area. Additionally, Native American tribes have historical resource information not in the CHRIS Inventory, and you should contact the California Native American Heritage Commission for information on local/regional tribal contacts.

Should you require any additional information for the above referenced project, reference the record search number listed above when making inquiries. Requests made after initial invoicing will result in the preparation of a separate invoice.

Thank you for using the California Historical Resources Information System (CHRIS).

Sincerely,

Lisa C. Hagel
Researcher

Appendix B
Native American Correspondence

FAX COVER SHEET

DATE: June 26, 2016 (Resent 7/5/2016)

TO: Katy Sanchez
Native American Heritage Commission

FAX: 916-373-5471

FROM: William Rich, M.A., RPA

SUBJECT: Native American Contact List and Sacred Lands Database Search:
Sundberg Gravel Project, Humboldt County, CA

PAGES: 2 (cover and 1 map)

Dear Katy,

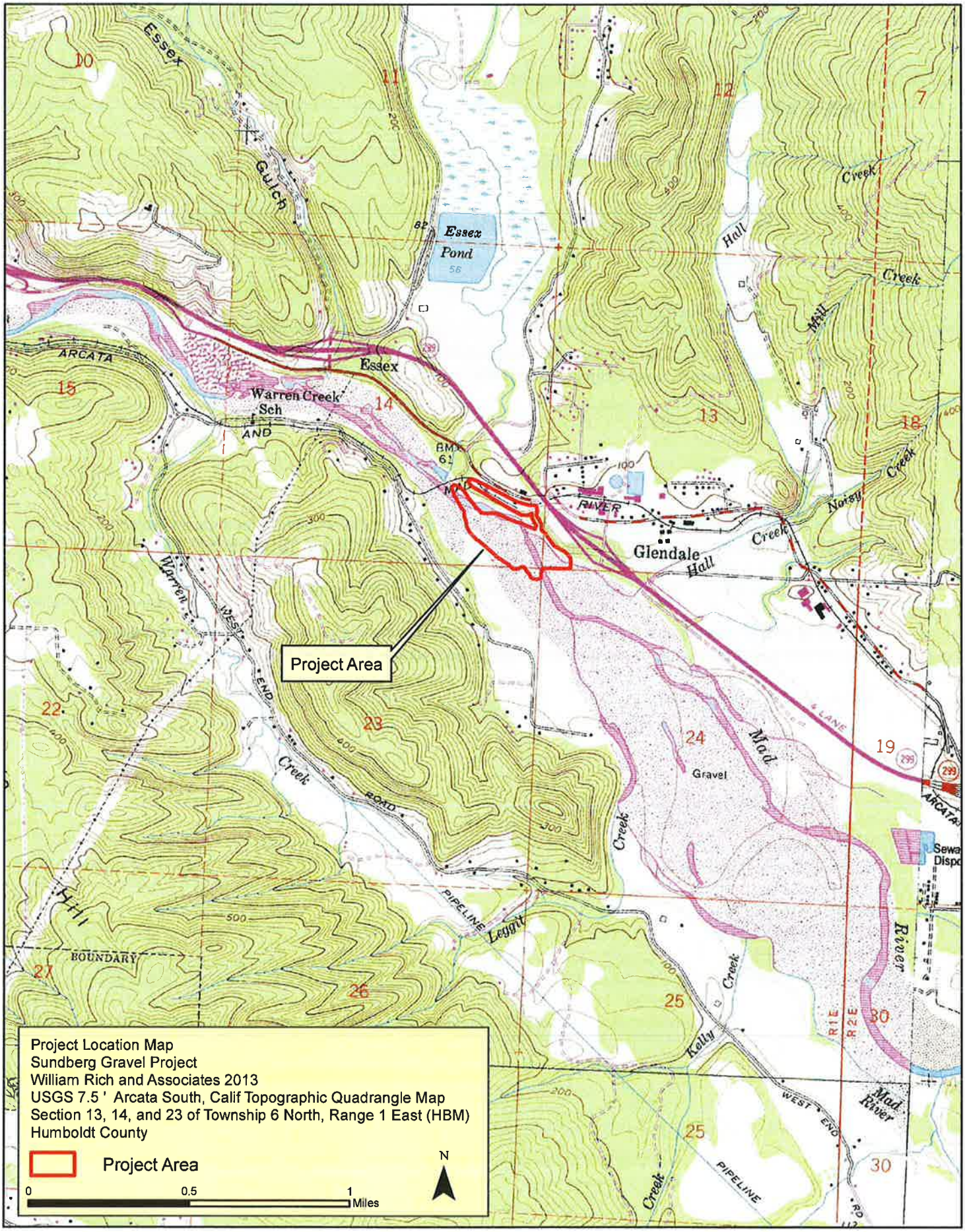
William Rich and Associates will be conducting a cultural resources investigation for a gravel project in Blue Lake, Humboldt County, California. Specifically, the project area is in Township 6 North, Range 1 East, Sections 13,14 and 23 (HB&M) and is shown on the 7.5 USGS Topographic Quadrangle Map, Arcata North, California. The project area is indicated on the accompanying map.

We would greatly appreciate a list of Native American contacts and a search of the sacred lands database for previously identified sites of concern within the project area or a one-half mile radius.

Thank you for your assistance.

Sincerely,

William Rich, M.A.,RPA
William Rich and Associates
P.O. Box 184
Bayside, CA 95524
Voice (707) 834-5347
Fax (707) 826-4336
wcr@2xtreme.net


Project Area
Project Location Map
Sundberg Gravel Project
William Rich and Associates 2013
USGS 7.5 ' Arcata South, Calif Topographic Quadrangle Map
Section 13, 14, and 23 of Township 6 North, Range 1 East (HBM)
Humboldt County
Project Area
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0.5
1
Miles
N
Essex
Pond
Glendale
Gravel
Warren Creek Sch
Mad River
Hall Creek
Noisy Creek
Leggit Creek
Kelly Creek
PIPELINE
WEST END ROAD
BOUNDARY
ARCATA
4 LANE

June 20, 2017

Distribution List
1. Blue Lake Rancheria – Arla Ramsey, Tribal Administrator; Claudia Brundin, Chairperson; Janet Eidsness, THPO; Diane Holliday
2. Wiyot Tribe – Brian Mead, Tribal Administrator; Ted Hernandez, Chairperson; Tom Torma, THPO; Stephen Kullman, Environmental Coordinator
3. Bear River Band of Rohnerville Rancheria – William Sand, Chairperson; Edwin Smith, Environmental Coordinator/Cultural; Erika Cooper, THPO

Dear Tribal Representative,

William Rich and Associates is conducting a cultural resources investigation for a proposed gravel extraction project near Blue Lake, Humboldt County, California. The project is occurring on a river bar of the Mad River between the confluences of Hall and Lindsay Creeks, at an upland storage location on a graded terrace. These locations are connected by an improved dirt road. Specifically, these locations are in Township 6 North, Range 1 East, Sections 13,14 and 23 (HB&M) and is shown on the 7.5 USGS Topographic Quadrangle Map, Arcata North, California. The project area is indicated on the accompanying map.

The investigation will include a pedestrian survey utilizing close spaced transects over the entire project area. Background research, including a NWIC records search will be conducted. It is known that Native American archaeological sites are recorded in the general vicinity, but not expected to coincide with the project area.

The aim of this investigation is to identify significant cultural resources that have the potential to be impacted as a result of the proposed action to quarry and process alluvial gravel, and provide recommendations to avoid, reduce, or minimize any adverse changes. This notification letter is provided to seek information that the Tribe may wish to disclose for this project location. Any culturally sensitive information that you share with WRA will be held under strict confidentiality and will not be made available to the public.

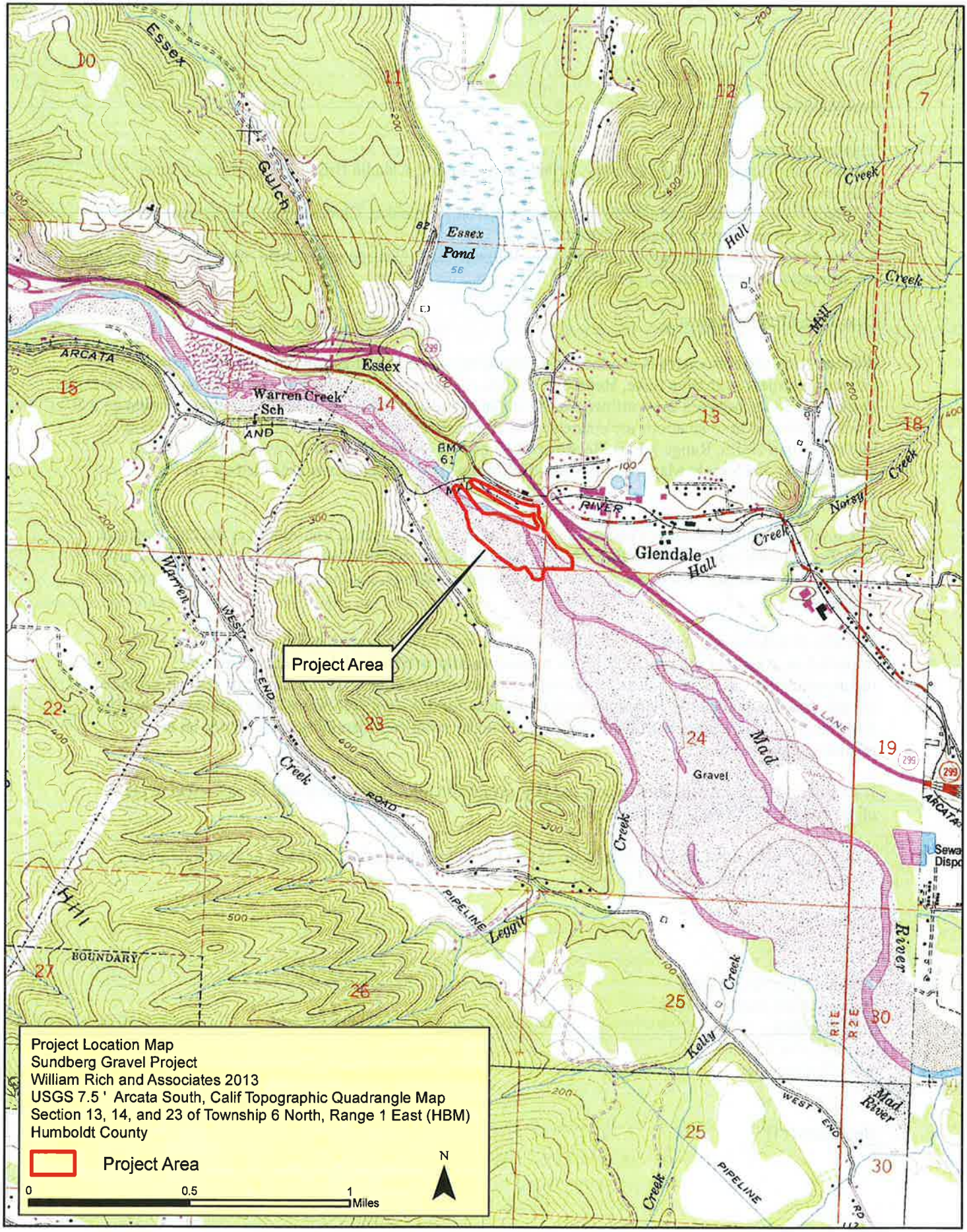
A copy of the final investigation report and any completed resources records will be submitted to my client and the Northwest Information Center.

Thank you in advance for your assistance. If you have any information, concerns or questions please contact William Rich at 834-5347 (cell).

Sincerely,

William Rich, M.A., RPA
William Rich and Associates
P.O. Box 184
Bayside, CA 95524
wcr@2xtreme.net

Enclosures (1)


Project Area
Project Location Map
Sundberg Gravel Project
William Rich and Associates 2013
USGS 7.5 ' Arcata South, Calif Topographic Quadrangle Map
Section 13, 14, and 23 of Township 6 North, Range 1 East (HBM)
Humboldt County
Project Area
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Miles
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Essex
Pond
Glendale
Gravel
Warren Creek Sch
Mad River
Hall Creek
Noisy Creek
Kelly Creek
Leggit Creek
Warren Creek
Essex Gulch
PIPELINE
BOUNDARY
ARCATA
4 LANE

From: Janet Eidsness [mailto:JEidsness@bluelakerancheria-nsn.gov]
Sent: Monday, June 27, 2016 2:13 PM
To: Bill Rich (wcr@2xtreme.net)
Cc: erikacooper@brb-nsn.gov; Tom Torma (tom@wiyot.us)
Subject: Blue Lake THPO response to Sundberg Gravel Extraction project near Glendale - HUM-930

Hello Bill,

Thanks for your letter dated 6/20/16 describing the proposed archaeological study for the subject project. As you know, it is located adjacent to, and may overlap, a portion of CA-HUM-930. Intensive surface survey, ground penetrating radar studies, & micro mapping with collection of formed tools & obsidian, along with tribal consultation with Blue Lake, Bear River and Wiyot tribes, were undertaken by me as a consultant to Garth Sundberg in 2007, in response to ground disturbance related to logging on the property. I have a substantial amount of formally unrecorded data and artifact collection from this site. Also in files is note that Nick Angleloff was asked by Garth to evaluate site significance in ca. 2012; don't know if that happened.

You are welcome to arrange meeting to review the site data and mapping, as an aid to your study. Please contact me in advance so we can set up a time/place.

Blue Lake Rancheria is very concerned about protecting this highly significant Wiyot cultural resource.

Regards,

Janet P. Eidsness, M.A.
Tribal Heritage Preservation Officer (THPO)
Blue Lake Rancheria
P.O. Box 428 (428 Chartin Road)
Blue Lake, CA 95525
Office (707) 668-5101 ext. 1037
Fax (707) 668-4272
jeidsness@bluelakerancheria-nsn.gov
cell (530) 623-0663 jpeidsness@yahoo.com

From: Erika Cooper [mailto:erikacooper@brb-nsn.gov]
Sent: Friday, July 01, 2016 11:51 AM
To: Janet Eidsness
Cc: Bill Rich (wcr@2xtreme.net); Tom Torma (tom@wiyot.us)
Subject: Re: Blue Lake THPO response to Sundberg Gravel Extraction project near Glendale - HUM-930

Hello all,

I went through my files and seem to have only info up through 2007, nothing from 2012. From the 2007 site map it looks like the current project area slightly overlaps the SW edge of HUM-930. Please keep me in the loop on this project.

Thanks.

From: Tom [mailto:tom@wiyot.us]
Sent: Wednesday, June 29, 2016 11:38 AM
To: 'Janet Eidsness' <JEidsness@bluelakerancheria-nsn.gov>; 'Bill Rich' <wcr@2xtreme.net>
Cc: erikacooper@brb-nsn.gov
Subject: RE: Blue Lake THPO response to Sundberg Gravel Extraction project near Glendale - HUM-930

Hi Bill,

I don't believe that I have seen a notification of this project. Given Janet's experience, and the project location, I would defer to her on this project. However, for the sake of my records, could you please send me a copy of the project notification.

Thank you,
Tom

Mr. Torma was re-sent the letter and map on June 30, 2016. WCR