

Initial Site Assessment

Initial Skills Assessment

Memorandum

*Flex your power!
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To: MATTHEW VOSS,
Associate Environmental Planner
San Joaquin Valley Analysis Branch

Date: July 23, 2009

File: MPA 140
10-0P9200
PM 42.0/42.7

From: GERALD H. WHITE,
Chief
Hazardous Waste and Paleontology Branch

[Handwritten signature]
7/23/09

Subject: Addendum to Initial Site Assessment dated June 2007 and Addendum Memo dated August 2008, for MPA 140, Ferguson Slide Restoration Project.

The Hazardous Waste and Paleontology Branch was requested to provide an addendum to the Initial Site Assessment (ISA) for the Ferguson Slide Restoration project at PM 42.0/42.7.

The Ferguson Slide project is located on State Route (SR) 140 between the towns of Mariposa and El Portal in Mariposa County. The purpose of the project is to provide permanent restoration of the SR-140 roadway to its pre-damaged condition. The alternatives being considered include full restoration of the roadway along the existing alignment as well as new alignments. Originally there were five build alternatives being investigated along with one no build alternative. The original build alternatives are described as follows:

Alternative E: This alternative includes removal of the slide and restoration of SR 140 to its pre-damaged condition. In addition to the slide removal it will most likely include stabilization of the slopes and a subsurface drainage system after slide removal. This alternative was withdrawn by the project development team.

Alternative R: This alternative includes construction of a concrete rock shed through the active slide on the existing SR 140 alignment.

Alternative C: This alternative will realign the highway to the northeast. Open cutting through the mountain. This realignment alternative will include retaining wall construction along existing SR 140 and two bridges across the Merced River that will most likely require bridge bents within the floodplain. (Two bridges would be constructed to cross the river) The highway would be constructed with two 12-foot lanes and 8 foot outside shoulders.

Alternative T: This alternative will realign the highway to the northeast, tunneling through the mountain. This realignment alternative will include retaining wall construction along existing SR 140, two bridges across the Merced River, which will most likely require bridge bents within the

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floodplain, and a two-way tunnel through the mountain. The highway would be constructed with two 12-foot lanes and 8 foot outside shoulders.

Alternative S: Realign the highway to the northeast, spanning the Merced River with two bridges and bypassing the rockslide with a hillside viaduct. The highway would be constructed with two 12-foot lanes and 8 foot outside shoulders.

Three additional build alternatives were being considered in August 2008. These additional alternatives are as follows:

Alternative T-3 (Tunnel Under Slide): This alternative would realign the State Route 140 under the area of the slide. The tunnel would be 2200 ft. long providing two 12 ft. lanes, 8 ft. outside shoulders and 4 ft. emergency walkways. A tunnel operations and maintenance facility located at the Midpines Maintenance Station would be needed along with routine 24-hour supervision of the emergency monitoring and reporting system.

Alternative A (At Grade Realignment): This alternative proposes to realign State Route 140 by constructing two bridges across the Merced River along the existing grade and elevation of Incline Road. The upstream bridge would be 275 ft. long and the downstream bridge would be 300 ft. long. The existing detour alignment along Incline Road would be utilized for the permanent State Route 140 realignment. This section of Incline Road is generally only 18 ft. wide, therefore significant cuts into the east canyon wall would be required to accommodate two 12 ft. lanes, 8 ft. outside shoulders and a 20 ft. at grade debris bench for rock fall. The cut would vary in height up to 125 ft. This alternative was withdrawn by the project development team.

Alternative S-2 (Viaduct Realignment): This alternative is similar to Alternative S in that it proposes to realign State Route 140 by constructing two bridges across the Merced River and a side-hill viaduct/retaining wall on the north side of the river between the two bridges. The roadway would provide two 12 ft. lanes and 8 ft. outside shoulders. This alternative differs from Alternative S bridges by providing longer bridge spans on tangent alignments to accommodate alternative bridge types (through truss or tied arch). A through truss bridge is designed as a cage structure that supports the bridge deck by steel cross members. A tied arch bridge uses an arch structure with cables placed above the bridge deck for support. The downstream bridge would be 700 ft. long and the upstream bridge will be 790 ft. long. The height of these alternative bridge types would be between 110 ft. and 130 ft. above the bridge deck. The viaduct between the two bridges is approximately 510 ft. in length.

No Build Alternative: The No-Build Alternative would leave State Route 140 damaged and blocked by the Ferguson rockslide. As a result of the No-Build Alternative, the temporary detour would become the permanent State Route 140 alignment. The structures for the temporary detour were constructed during a declared emergency and were designed as a temporary solution to the closure of State Route 140. These structures would not meet standard design features nor would the detour meet the purpose and need of the project.

Updates to the descriptions of the alternatives have been made. The following alternatives are being considered:

Alternative S-2: this Alternative is similar to Alternative S and would realign the highway to the northeast, spanning the Merced River with two bridges and bypassing the rockslide with a hillside viaduct and retaining wall. This alternative differs from Alternative S in that it proposes two different bridge type variations along with their own specific roadway alignments. The variations are referred to as S2V1 and S2V2 and are described as:

Alternative S2V1: This variation would construct two tied-arch bridges. A tied-arch bridge uses an arch structure with cables placed above the bridge deck for support. The lengths of the S2V1 tied-arch bridges would be 700 feet and 790 feet. The viaduct between the two bridges would be 510 feet in length. A 10-foot wide rock fall area would be constructed in between the roadway and cut slope. The highway would be constructed with two 12-foot lanes and 8-foot outside shoulders.

Alternative S2V2: This variation would construct two slant-leg bridges. A slant-leg bridge uses "V" shaped columns to support the bridge deck. The slant-leg bridge may also be referred to as a V-Bent bridge. The lengths of the S2V2 slant-leg bridges would be 860 feet and 700 feet. The viaduct between the two bridges would be 65 feet in length. A 10-foot wide rock fall area would be constructed in between the roadway and cut slope. The highway would be constructed with two 12-foot lanes and 8-foot outside shoulders.

No-Build Alternative: this is considered the temporary detour and would become the permanent State Route 140 alignment. The traffic signals controlling the single-lane access through the detour would remain in operation. The temporary detour was constructed during a declared emergency and was designed as a temporary solution to the closure of State Route 140 with an agreement with regulatory agencies that the pavement and structures used for the detour would be removed once a permanent solution could be constructed. Additionally, the No-Build Alternative bridges are temporary with a limited life span, which would require them to be removed from either wear or damage from flooding. When their removal becomes necessary, the highway would become permanently closed.

An ISA was performed by Geocon Consultants Inc. In addition a limited soil investigation was conducted for this project. The ISA indicated that historical land uses did not impact the project area with hazardous substances or waste. The limited soil sampling analytical results identified elevated arsenic levels in three of four soil samples obtained adjacent to the one-way bypass roadway along the former railroad alignment. The source of the arsenic may be associated with the former railroad alignment, historical mining operations, or localized bedrock mineralized zones. Additional sampling and analytical testing would be necessary to characterize arsenic levels in earthwork that enters the waste stream.

The presence of elevated arsenic levels along the one-way bypass is a concern with respect to soil management and disposal where planned highway improvements generate excess soil from this area (alternatives S, S-2, A, C; and T). This would also include the alternatives S2V1 and

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S2V2. It is recommended that Caltrans employees and contractors be notified of the existence of elevated levels of arsenic, a health and safety plan is recommended.

The additional alternatives are low risk for hazardous waste. The original ISA recommendations cover the additional alternatives. No further ISA work is anticipated.

If you have questions regarding this project please contact Susan Greenwood at 559-243-8282.

Memorandum

*Flex your power!
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To: MATTHEW VOSS,
Associate Environmental Planner
San Joaquin Valley Analysis Branch

Date: August 28, 2008

File: MPA 140
10-0P9200
PM 42.3

From: GERALD H. WHITE,
Chief
Hazardous Waste and Paleontology Branch

G. White 8/28/08

Subject: Addendum to Initial Site Assessment dated June 2007, for MPA 140, Ferguson Slide Restoration Project.

The Hazardous Waste and Paleontology Branch was requested to provide an addendum to the Initial Site Assessment (ISA) for the Ferguson Slide Restoration project at PM 42.3.

The Ferguson Slide project is located on State Route (SR) 140 between the towns of Mariposa and El Portal in Mariposa County. The purpose of the project is to provide permanent restoration of the SR-140 roadway to its pre-damaged condition. The alternatives being considered include full restoration of the roadway along the existing alignment as well as new alignments. Originally there were five build alternatives being investigated along with one no build alternative. The original build alternatives are described as follows:

Alternative E: This alternative includes removal of the slide and restoration of SR 140 to its pre-damaged condition. In addition to the slide removal it will most likely include stabilization of the slopes and a subsurface drainage system after slide removal.

Alternative R: This alternative includes construction of a concrete rock shed through the active slide on the existing SR 140 alignment.

Alternative C: This alternative will realign the highway to the northeast. Open cutting through the mountain. This realignment alternative will include retaining wall construction along existing SR 140 and two bridges across the Merced River that will most likely require bridge bents within the floodplain. (Two bridges would be constructed to cross the river) The highway would be constructed with two 12-foot lanes and 8 foot outside shoulders.

Alternative T: This alternative will realign the highway to the northeast, tunneling through the mountain. This realignment alternative will include retaining wall construction along existing SR 140, two bridges across the Merced River, which will most likely require bridge bents within the floodplain, and a two-way tunnel through the mountain. The highway would be constructed with two 12-foot lanes and 8 foot outside shoulders.

Alternative S: Realign the highway to the northeast, spanning the Merced River with two bridges and bypassing the rockslide with a hillside viaduct. The highway would be constructed with two 12-foot lanes and 8 foot outside shoulders.

Three additional build alternatives are being considered. These additional alternatives are as follows:

Alternative T-3 (Tunnel Under Slide): This alternative would realign the State Route 140 under the area of the slide. The tunnel would be 2200 ft. long providing two 12 ft. lanes, 8 ft. outside shoulders and 4 ft. emergency walkways. A tunnel operations and maintenance facility located reasonably adjacent to the tunnel itself would be needed along with routine 24-hour supervision of the emergency monitoring and reporting system.

Alternative A (At Grade Realignment): This alternative proposes to realign State Route 140 by constructing two bridges across the Merced River along the existing grade and elevation of Incline Road. The upstream bridge would be 275 ft. long and the downstream bridge would be 300 ft. long. The existing detour alignment along Incline Road would be utilized for the permanent State Route 140 realignment. This section of Incline Road is generally only 18 ft. wide, therefore significant cuts into the east canyon wall would be required to accommodate two 12 ft. lanes, 8 ft. outside shoulders and a 20 ft. at grade debris bench for rock fall. The cut would vary in height up to 125 ft.

Alternative S-2 (Viaduct Realignment): This alternative is similar to Alternative S in that it proposes to realign State Route 140 by constructing two bridges across the Merced River and a side-hill viaduct/retaining wall on the north side of the river between the two bridges. The roadway would provide two 12 ft. lanes and 8 ft. outside shoulders. This alternative differs from Alternative S bridges by providing longer bridge spans on tangent alignments to accommodate alternative bridge types (through truss or tied arch). A through truss bridge is designed as a cage structure that supports the bridge deck by steel cross members. A tied arch bridge uses an arch structure with cables placed above the bridge deck for support. The downstream bridge would be 700 ft. long and the upstream bridge will be 790 ft. long. The height of these alternative bridge types would be between 110 ft. and 130 ft. above the bridge deck. The viaduct between the two bridges is approximately 510 ft. in length.

No Build Alternative: The No-Build Alternative would leave State Route 140 damaged and blocked by the Ferguson rockslide. As a result of the No-Build Alternative, the temporary detour would become the permanent State Route 140 alignment. The structures for the temporary detour were constructed during a declared emergency and were designed as a temporary solution to the closure of State Route 140. These structures would not meet standard design features nor would the detour meet the purpose and need of the project.

An ISA was performed by Geocon Consultants Inc. In addition a limited soil investigation was conducted for this project. The ISA indicated that historical land uses did not impact the project

area with hazardous substances or waste. The limited soil sampling analytical results identified elevated arsenic levels in three of four soil samples obtained adjacent to the one-way bypass roadway along the former railroad alignment. The source of the arsenic may be associated with the former railroad alignment, historical mining operations, or localized bedrock mineralized zones. Additional sampling and analytical testing would be necessary to characterize arsenic levels in earthwork that enters the waste stream.

The presence of elevated arsenic levels along the one-way bypass is a concern with respect to soil management and disposal where planned highway improvements generate excess soil from this area (alternatives S, S-2, A, C, and T). It is recommended that Caltrans employees and contractors be notified of the existence of elevated levels of arsenic, a health and safety plan is recommended.

The additional alternatives are low risk for hazardous waste. The original ISA recommendations cover the additional alternatives. No further ISA work is anticipated.

If you have questions regarding this project please contact Susan Greenwood at 559-243-8282.

Project No. S9200-06-06
May 31, 2007

Susan Greenwood, Task Order Manager
Caltrans District 6
2015 E. Shields, Suite 100
Fresno, California 93726

Subject: FERGUSON ROCKSLIDE RESTORATION PROJECT
 STATE HIGHWAY 140, POST MILE 42.0 TO 42.5
 MARIPOSA COUNTY, CALIFORNIA
 CONTRACT NO. 06A1141, TASK ORDER NO. 6
 INITIAL SITE ASSESSMENT AND LIMITED SOIL SAMPLING REPORT

Dear Ms. Greenwood:

In accordance with Caltrans Contract No. 06A1141 and Task Order No. 6, we have performed an Initial Site Assessment (ISA) of State Highway 140 (the Site) in the vicinity of the Ferguson Rockslide in Mariposa County, California.

The accompanying report presents the details of the ISA and limited soil sampling and analytical testing conducted at the request of Caltrans. The report summarizes the findings relative to the potential for the existing presence, as of the date of the site visit (March 22, 2007), of hazardous substances/petroleum hydrocarbon impacts at the Site at levels likely to warrant mitigation action pursuant to current regulatory guidelines.

Please contact us should you have any questions concerning the contents of this Report or if we may be of further service.

Sincerely,

GEOCON CONSULTANTS, INC.

John E. Juhrend, PE, CEG
Project Manager

JEJ:jaj

(5 + 2CD) Addressee

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INITIAL SITE ASSESSMENT AND LIMITED SOIL SAMPLING REPORT

1.0 INTRODUCTION

This report presents the results of an Initial Site Assessment (ISA) of State Highway 140 (Hwy 140) in the vicinity of the Ferguson Rockslide in Mariposa County, California performed by Geocon Consultants, Inc. under Caltrans Contract No. 06A1141 and Task Order (TO) No. 6. The approximate site boundaries are depicted on the Vicinity Map, Figure 1.

Caltrans is currently evaluating alternatives to repair or realign Hwy 140 (the Site) in the vicinity of the Ferguson Rockslide. The massive slide occurred in April and May 2006 and ultimately caused closure of the highway alignment. A temporary bypass consisting of two bridges across the Merced River and use of a former railroad alignment as a single-lane roadway was completed in August 2006. Caltrans requested the performance of an ISA and limited soil sampling under TO No. 6 to determine if hazardous substances/petroleum hydrocarbons are present within the project boundaries to assist with evaluating alternative landslide mitigation measures and Hwy 140 route designs and to address potential impacts for construction purposes.

1.1 Purpose and Scope of Services

The purpose of the ISA was to identify potential “recognized environmental conditions” as defined by the American Society for Testing and Materials (ASTM) Designation E 1527-05 *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process*. Section 1.1.1 of the ASTM Standard E 1527-05 defines the term “recognized environmental conditions” as *“the presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, ground water, or surface water of the property.”* The term as further defined by ASTM *“is not intended to include de minimis conditions that generally do not present a material risk of harm to public health or the environment.”* “Historical recognized environmental conditions” are defined as an *“environmental condition which in the past would have been considered a recognized environmental condition, but which may or may not be considered a recognized environmental condition currently.”*

The main components of this report, as specified by the ASTM Standards, include the following:

- **Physical Setting:** Physical setting references were reviewed and the Site was observed to obtain information concerning the topographic, geologic, and hydrogeologic characteristics of the Site and vicinity. Such information may be indicative of the direction and/or extent that a contaminant could migrate in the event of a spill or release.
- **Records Review:** The objective of the records review is to obtain and review records that will help identify recognized environmental conditions at or potentially affecting the Site. We reviewed

publicly available federal, state, and local regulatory agency records for the Site and properties located within 1/8 mile of the Site.

- **Site History:** The purpose of consulting historical references is to develop a history of the previous uses of the Site and surrounding area in order to identify if past uses have led to recognized environmental conditions in connection with the Site. Historical sources reviewed included aerial photographs, topographic maps, a cultural resources report prepared for the Site and interviews with Caltrans personnel.
- **Site Reconnaissance:** The objective of the site reconnaissance is to observe site conditions and activities for indications of evidence of recognized environmental conditions. The site reconnaissance was performed by viewing the Site and adjacent properties from Hwy 140 and the bypass.

1.2 Report Limitations

This ISA and Limited Soil Sampling Report has been prepared exclusively for Caltrans. The information obtained is only relevant for the dates of the records reviewed or as of the date of the latest site visit. Therefore, the information contained herein is only valid as of the date of the report and will require an update to reflect recent records/site visits.

Caltrans should recognize that this report is not a comprehensive site characterization and should not be construed as such. The findings and conclusions presented in this report are predicated on the site reconnaissance, a review of the specified regulatory records and historical usage of the Site, and limited soil sampling and analytical testing as presented in this report. Caltrans should also understand that wetlands, asbestos, lead-based paint, lead in drinking water, radon and methane gas, wetland and mold surveys, and surveys for naturally occurring asbestos surveys were not included in the scope of services for this report.

Therefore, the report should only be deemed conclusive with respect to the information obtained. No guarantee or warranty of the results of the ISA is implied within the intent of this report or any subsequent reports, correspondence or consultation, either express or implied. We strived to conduct the services summarized herein in accordance with the local standard of care in the geographic region at the time the services were rendered.

2.0 PHYSICAL SETTING

This section provides a brief description of the physical setting of the Site and surrounding vicinity including topography, geologic and hydrogeologic conditions. Observations of onsite conditions are described in Section 3.0.

2.1 Location and Existing Rockslide Bypass Improvements

The Site consists of Hwy 140 to either side of the Ferguson Rockslide between approximate Post Mile 42.0 and 42.5 in Mariposa County, California (see Project Location Maps, Figures 2A and 2B). The Site is located within the Merced River Canyon approximately 10 miles west of Yosemite National Park between the communities of Briceburg and El Portal. The project area is located with the Stanislaus National Forest on the north side of the river and the Sierra National Forest on the south side of the river.

Within the site boundaries, Hwy 140 is a two-lane highway that follows the banks of the Merced River through a deeply incised canyon. Movement of the Ferguson Rockslide was initiated in April and May 2006 during heavy rainfall events. Caltrans attempted to protect Hwy 140 from the rockslide using concrete barriers and fencing. A massive slope failure occurred on May 29th that covered approximately 600 feet of Hwy 140 necessitating traffic closure. The volume of the rockslide mass is estimated at 0.7 million cubic yards. Aerial and oblique photographs of the Ferguson Rockslide are presented on Figures 3 and 4.

An emergency Hwy 140 detour project was completed in August 2006 to allow for limited one-way traffic around the rockslide area. This project included the placement of two modular bridges across the Merced River and construction of a single-lane bypass road (Incline Road) over an abandoned railroad alignment (former Yosemite Valley Railroad) located across the river from the rockslide. The bypass was later equipped with automatic traffic signals to allow for controlled one-way traffic.

Additional details regarding the temporary bypass roadway improvements are presented in the California Environmental Quality Act (CEQA) Categorical Exemption Determination Form presented in Appendix A. According to this document, "The project has no potential for exposure to hazardous materials."

2.2 Proposed Rockslide and Highway Mitigation Alternatives

Caltrans is currently evaluating the following alternatives to mitigate the impact of the Ferguson Rockslide on the current Hwy 140 roadway alignment:

No Build Alternative – Due to the severe impact of the Ferguson Rockslide on transportation and associated economic effects, this alternative has been determined not to be a viable solution.

Alternative E, Restore Existing Roadway – This alternative would restore the existing Hwy 140 roadway by removing the rockslide material and regrading the mountainside slopes.

Alternative R, Rock Shed – This alternative would restore the existing Hwy 140 roadway by excavating a portion of the rockslide mass and constructing an enclosed concrete rock shed.

Alternative C, Hill-side Viaduct/Excavated Cuts – This alternative would realign Hwy 140 along the ridge across the river from the Ferguson Rockslide using two bridges and a hillside excavated cut section, embankment fills and retaining walls.

Alternative T, Hill-side Viaduct/Tunnel – This alternative would realign Hwy 140 along the same route as Alternative C but use a tunnel section instead of a hillside excavated cut section.

Alternative S, Hill-side Viaduct – This alternative would realign Hwy 140 along the ridge across the river from the Ferguson Rockslide using two bridges and a hillside viaduct. Alternative S would be closer to the river than Alternatives C and T.

The construction of a permanent alignment of Hwy 140 through or around the Ferguson Rockslide will require excavation, fill placement and/or offsite disposal. The magnitude of required excavation cuts and fills will depend on the selection of the final build alternative. The approximate mitigation alternatives are depicted on Figures 2A and 2B.

Caltrans further proposes several temporary construction easements (TCEs) located within the vicinity of the project for use as construction staging areas. Due to lack of specific details, environmental assessment of future TCEs will be addressed under separate studies.

2.3 Review of USGS Topographic Maps

Review of the United States Geologic Survey (USGS) maps for the El Portal and Kinsley, California, quadrangles dated between 1947 and 2001 indicate that the Site is located at an elevation of approximately 1,380 feet above mean sea level (MSL) within the Merced River Canyon. The confluence of the Southfork Merced River and main Merced River branch is located approximately ¼ mile upstream of the project boundaries. The Site is bounded by steep slopes extending to Ferguson Ridge southerly of the Site at elevations between 3,000 and 3,830 feet MSL and to an unnamed ridge to the north at elevations above 3,000 feet MSL.

2.4 Soil and Geologic Conditions

Information concerning the general soil and geologic conditions in proximity to the Site was obtained from a review of the *Ferguson Rock Slide Geology Report* prepared by the United States Forest Service dated June 20, 2006, and other geologic reports prepared for Caltrans. Bedrock within the vicinity of the Site consists of dark gray metamorphic rock comprised of phyllite, slate and chert of the early Triassic Hite Cove Formation. This metasedimentary unit is characterized by sequences of rhythmically banded chert in a matrix of phyllite. Historical mining operations in the vicinity of the

Site include gold, silver, copper, and lead ore and limestone (Portland cement) quarries. Historical mining operations have not been identified within the project boundaries.

The original alignment of Hwy 140 within the vicinity of the Ferguson Rockslide is located along a filled bench adjacent to the Merced River. The base of the rockslide is approximately 300 feet above the river. Rockfalls extend from the base of the slide over approximately 600 feet of Hwy 140 and into the Merced River (see Figure 4).

Groundwater occurs within the project boundaries as isolated seeps within bedrock fractures. Few low flow seeps were reported to have occurred within the rockslide mass.

3.0 SITE RECONNAISSANCE AND LIMITED SOIL SAMPLING

Mr. John Juhrend, PE, CEG, with Geocon and Ms. Susan Greenwood with Caltrans performed a site reconnaissance on March 22, 2007. The purpose of the reconnaissance was to survey the existing Site and adjacent property conditions from Hwy 140 and the temporary bypass to attempt to identify visual indicators of potential hazardous substances/petroleum hydrocarbon impacts to the Site. Information included hereinafter is based on observations noted during the site reconnaissance and the results of limited soil sampling and analytical testing. Photographs taken during the site reconnaissance are attached.

3.1 Site Reconnaissance

Hwy 140 within the project boundaries is a two-lane paved roadway located on a fill bench at the base of the canyon slopes adjacent to the Merced River. The Merced River Canyon in this area consists of steep canyon slopes with vegetation generally comprised of live oak, digger pine, toyon and redbud.

The rockslide occurred at a 90 degree bend in the river and completely covered an approximate 600-foot-long segment of Hwy 140 (Photos 1 and 2). Pacific Gas and Electric (PG&E) transmission towers are located on either side of the rockslide approximately 300 feet above the river (Photo 1). A temporary bypass consisting of two bridges and a paved one-way roadway on the opposite side of the river (Photos 3 through 6) was constructed by Caltrans to allow traffic flow around the rockslide until a permanent roadway is built. The temporary one-way roadway was constructed over a former railroad alignment. A radar monitoring station installed to evaluate rockslide movement was noted on the nose of the ridge above the one-way bypass. Additional improvements other than Hwy 140 and the former railroad alignment were not noted within or immediately beyond the project boundaries (Photos 7 and 8).

Evidence of potential recognized environmental conditions including former or existing buildings, chemical storage/use/disposal areas, mining facilities, stained soil, distressed vegetation or other indicators of potential hazardous substance/petroleum hydrocarbon impacts were not noted within the site boundaries.

3.2 Soil Sampling and Analytical Testing

We obtained four surface soil samples (MP1 through MP4) adjacent to the upslope side of Hwy 140 and four surface soil samples (MP5 through MP8) from the upslope side of the temporary one-way roadway within the site boundaries. The approximate soil sample locations are depicted on Figure 5. The samples were placed in labeled Ziploc resealable bags and submitted to Creek Environmental Laboratories, Inc. under chain-of-custody documentation for the following analyses:

- Title 22 metals following Environmental Protection Agency (EPA) Test Methods 6020 and 7471 (mercury).
- Samples with total metal concentrations greater than ten times the Soluble Threshold Limit Concentration (STLC) were further analyzed for soluble metals following the Waste Extraction Test and EPA Test Method 6020.
- Soil pH following EPA Test Method 9045.

With the exception of chromium (sample MP2) and arsenic and barium (sample MP6), the reported metal concentrations did not exceed ten times the STLC and appear to be within the range of naturally occurring background levels. None of the reported total metal concentrations exceed California Total Threshold Limit Concentration (TTLC) hazardous waste criteria. Soluble chromium, arsenic and barium of 0.14, 0.77 and 24 milligrams per liter, respectively, are below California STLC hazardous waste criteria.

With the exception of arsenic, the reported metal concentrations do not exceed California Human Health Screening Levels (CHHSLs) for commercial/industrial soil. Reported arsenic concentrations of between 7.2 and 56 milligrams per kilogram (mg/kg) exceed the arsenic CHHSL of 0.24 mg/kg. The highest reported arsenic concentrations of between 24 and 56 mg/kg were associated with soil samples MP6 through MP8 obtained along the one-lane bypass roadway. These elevated arsenic concentrations may be associated with the former railroad alignment (slag ballast or arsenical pesticides), historical mining operations, or associated with localized bedrock mineralized zones.

The reported pH values of between 5.3 and 8.2 are generally within the neutral range.

Where sufficient satellite coverage allowed, the soil sample locations were recorded using a global positioning system (GPS). A summary of the soil sample GPS coordinates and laboratory results are presented on Table 1. The laboratory reports and chain-of-custody documentation are presented in Appendix B.

4.0 SITE HISTORY

This section provides a brief description of the history of the Site and surrounding vicinity based on review of website research, historical aerial photographs and topographic maps.

4.1 Yosemite Valley Railroad

Information obtained from www.yosemitevalleyrailroad.com indicates that the Yosemite Valley Railroad was constructed in the early 1900s between Merced and Yosemite National Park for transportation of passengers and freight, and to service lumber and mining facilities. The railroad operations continued into the early 1940s but was forced to close due to increased use of Hwy 140 completed in 1925, closed logging and mining facilities and increased maintenance costs due to flooding.

Historical railroad facilities other than mainline tracks do not appear to have been constructed within the site boundaries other than reference to “Bloss Station” on a route map. This station would have been located at the approximate mid-point of the one-way bypass roadway.

4.2 Aerial Photographs

Historical aerial photographs for the years 1977, 1987, 1993 and 1998 (scale 1”=666”) were obtained from Environmental Data Resources (EDR). Observations noted during the review are discussed hereinafter. Copies of the EDR aerial photographs are presented in Appendix C.

Each of the photographs depicts the pre-rockslide site conditions including Hwy 140 and the former railroad alignment (Incline Road). The PG&E transmission line alignment is visible upslope of Hwy 140 in each of the photographs. The rockslide area is further identified by scarps and ancient slide morphology. No structures or other features/improvements potentially associated with hazardous materials/petroleum hydrocarbons were noted during review of the aerial photographs.

4.3 Review of USGS Topographic Map

We reviewed USGS topographic maps dated 1947, 1981, 1992 and 2001 for the El Portal and Kinsley, California, quadrangles obtained from EDR. The review was performed to obtain information relative to the previous development and uses of the Site and properties located in the site vicinity. A review of the USGS topographic maps is presented hereinafter. Copies of the EDR topographic maps are presented in Appendix D.

The 1947 map depicts Hwy 140 and the former railroad alignment (Incline Road) to either side of the Merced River. A benchmark elevation of 1,377 MSL is depicted on the former railroad alignment within the site boundaries. The electrical transmission line is depicted upslope from Hwy 140. No other

features are depicted within the site boundaries. Features depicted in the site vicinity include a “Geologic Exhibit” approximately ½ mile downstream of the Site along Hwy 140, a “cement plant” approximately 2 miles downstream of the Site, the community of “South Fork” approximately ½ mile upstream of the Site, and “Ferguson Ridge” and “Ferguson Dump” approximately ¾ mile south of the Site.

No significant changes appear on the 1981, 1992 and 2001 maps. The 1992 map depicts the Merced River Canyon including the project boundaries as “Merced Wild and Scenic River.”

4.4 Review of Right-of-way Maps and As-built Plans

We were not provided with copies of right-of-way maps or as-built plans for review. Information provided by Caltrans indicates that 1951 as-built plans contain typical cross-sections and construction details but no roadway layout.

4.5 Review of Historic Cultural Resources Information

Review of the previously referenced CEQA form indicates that the Yosemite Valley Railroad alignment was the only identified cultural resource within the site boundaries. The railroad alignment was determined to be ineligible for the National Register of Historic Places due to the dismantling of the railroad infrastructure, natural deterioration and modern road improvements (Incline Road) along portions of the alignment.

4.6 Interviews

Interviews were conducted with Caltrans personnel including Mr. Louis Donada and Ms. Kathy Ikeda regarding conditions encountered during construction of the temporary Hwy 140 bypass around the rockslide. They both indicated that they are not aware of any discovery of hazardous substances/petroleum hydrocarbons during the bypass construction activities nor was evidence of historical mining activities encountered. Soil materials generated during excavation activities were reportedly used onsite as fill.

5.0 REGULATORY AGENCY RECORDS

EDR performed a search of federal, state, and local databases for the Site and surrounding areas. No properties were identified within the specified search distances on the EDR report. A copy of *The EDR Radius Map* dated March 28, 2007 is presented in Appendix E.

6.0 SUMMARY OF FINDINGS

The Site consists of Hwy 140 to either side of the Ferguson Rockslide between approximate Post Mile 42.0 and 42.5 in Mariposa County, California. Within the site boundaries, Hwy 140 is a two-lane highway that follows the banks of the Merced River through a deeply incised canyon. Movement of the

Ferguson Rockslide was initiated in April and May 2006 during heavy rainfall events that covered approximately 600 feet of the highway necessitating traffic closure. An emergency Hwy 140 detour project was completed in August 2006 to allow for limited one-way traffic around the rockslide area including two modular bridges across the Merced River and construction of a single-lane bypass road over an abandoned railroad alignment. Caltrans is currently evaluating alternatives (i.e. slide removal, rock shed, viaduct, tunnel) to mitigate the impact of the Ferguson Rockslide on the current Hwy 140 roadway alignment.

Based on a review of the previously referenced documents, the Site is underlain by dark gray metamorphic rock comprised of phyllite, slate and chert of the early Triassic Hite Cove Formation. Historical mining operations occur in the vicinity of the Site but have not been identified within the project boundaries. The Hwy 140 alignment within the vicinity of the Ferguson Rockslide is located along a filled bench adjacent to the Merced River. The base of the rockslide is approximately 300 feet above the river. Rockfalls extend from the base of the slide over approximately 600 feet of Hwy 140 and into the Merced River. Groundwater occurs within the project boundaries as isolated seeps within bedrock fractures. Few low flow seeps were reported to have occurred within the rockslide mass.

The results of the onsite reconnaissance performed on March 22, 2007, indicate that Hwy 140 within the project boundaries is a two-lane paved roadway located at the base of the canyon slopes adjacent to the Merced River. The Merced River Canyon in this area consists of steep canyon slopes with vegetation generally comprised of live oak, digger pine, toyon and redbud. The rockslide occurred at a 90 degree bend in the river and completely covered an approximate 600-foot-long segment of Hwy 140. PG&E transmission towers are located on either side of the rockslide approximately 300 feet above the river. The temporary one-way roadway was constructed over a former railroad alignment. A radar monitoring station installed to evaluate rockslide movement and to provide real time roadside advisories was noted on the nose of the ridge above the one-way bypass. Additional improvements other than Hwy 140 and the former railroad alignment were not noted within or immediately beyond the project boundaries. Evidence of potential recognized environmental conditions including former or existing buildings, chemical storage/use/disposal areas, mining facilities, stained soil, distressed vegetation or other indicators of potential hazardous substance/petroleum hydrocarbon impacts were not noted within the site boundaries.

The results of the limited soil sampling and analytical testing indicate that with the exception of arsenic, the reported metal concentrations appear to be within the range of naturally occurring background levels. The highest reported arsenic concentrations of between 24 and 56 mg/kg were associated with three of four soil samples obtained along the one-lane bypass roadway. Each of the reported arsenic levels exceed the commercial/industrial CHHSL of 0.24 mg/kg. None of the reported metals concentrations exceed California hazardous waste criteria. The reported soil pH values of between 5.3 and 8.2 are within the neutral range.

A review of historical information indicates that the Yosemite Valley Railroad formerly operated along the alignment of the current one-way bypass (Incline Road). The railroad was constructed in the early 1900s between Merced and Yosemite National Park for transportation of passengers and freight, and to service lumber and mining facilities. The railroad operations continued into the early 1940s but was forced to close due to increased use of Hwy 140 completed in 1925, closed logging and mining facilities, and increased maintenance costs due to flooding. Historical railroad facilities other than mainline tracks do not appear to have been constructed within the site boundaries other than reference to "Bloss Station" on a route map. This station would have been located at the approximate mid-point of the current one-way bypass. Information obtained from Caltrans personnel indicates that hazardous material impacts were not identified during construction of the temporary bypass.

A review of information obtained from governmental agencies indicates that hazardous material/waste facilities or incidents are not reported within the project boundaries nor within the vicinity of the Site.

7.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the results of the site reconnaissance and historical and regulatory agency records review, recognized environmental conditions were not identified within the project boundaries.

The results of the limited soil sampling and analytical testing identified elevated arsenic levels (24 to 56 mg/kg) in three of four surface soil samples obtained adjacent to the one-way bypass roadway along the former railroad alignment. The remaining soil samples obtained from the bypass and along Hwy 140 contained arsenic levels of from 7.2 to 19 mg/kg, within the expected range of naturally occurring background. The source(s) of the elevated arsenic levels may be associated with the former railroad alignment (slag ballast or arsenical pesticides), historical mining operations, or associated with localized bedrock mineralized zones. Additional sampling and analytical testing would be necessary to confirm the source(s) of the elevated arsenic levels.

The presence of elevated arsenic levels along the one-way bypass (former railroad alignment) is a project constraint with respect to soil management and disposal where planned highway improvements generate excess soil from this area. Prior to offsite disposal of any excess soil generated from excavations within the vicinity of the one-way bypass, soil sampling and testing, and notification of arsenic levels should be provided to the offsite disposal facility for proper disclosure and material acceptance.

Elevated arsenic levels further pose an exposure risk to temporary construction workers or future site occupants where pedestrian and/or recreational uses may be proposed for the one-way bypass roadway. We recommend that Caltrans maintenance personnel and contractors be properly notified and informed of potential risks associated with elevated arsenic levels in soil and that engineering controls (i.e. dust control, proper hygiene) be utilized during construction. Any planned pedestrian and/or recreational uses of the one-way bypass should maintain current improvements (i.e. clean fill cap, pavement, etc.) and other risk management controls to minimize exposure potential.