FINAL INITIAL STUDY
MITIGATED NEGATIVE DECLARATION

SCH#2013032064

FORTUNA DUMP REMEDIATION PROJECT

Prepared for

CalRecycle

Department of Resources Recycling and Recovery
Waste Permitting Compliance and Mitigation Division
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Acronyms

a.m.	Ante Meridiem (before midday)
AP	Alquist-Priolo
APN	assessor’s parcel number
BACT	Best Available Control Technology
Basin	North Coast Air Basin
BMP	Best Management Practices
CAAQS	California Ambient Air Quality Standards
CalEEMod	California Emissions Estimator Model
CARB	California Air Resources Board
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
CY	cubic yards
District	North Coast Unified Air Quality Management District
EDR	Environmental Data Resources
EIR	Environmental Impact Report

EOP	Emergency Operations Plan
FMMP	Farmland Mapping and Monitoring Program
GHG	greenhouse gas
IS/MND	Initial Study/Mitigated Negative Declaration
LEA	Local Enforcement Agency
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
NPDES	National Pollutant Discharge Elimination System
OES	County of Humboldt's Sheriff's Office of Emergency Services
p.m.	Post Meridiem (after midday)
PM_{10}	particulate matter less than 10 microns in diameter
$PM_{2.5}$	particulate matter less than 2.5 microns in diameter
RS	Residential Suburban
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
U.S.	United States
US EPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

1.1 INTRODUCTION AND PROJECT LOCATION

The California Department of Resources Recycling and Recovery (CalRecycle) proposes the Fortuna Dump Remediation Project (referred to as project and proposed project) to re-grade and cap the former Fortuna Burn Dump with two feet of soil cover. A burn dump was operated on the site as early as the mid-1950s. Currently, it is estimated that approximately 20,000 cubic yards (CY) of waste is located within the project site (CIWMB, 2007). CalRecycle proposes to cap the burn dump area to reduce the potential for environmental and public health and safety risks.

The Fortuna Burn Dump is located at 4498 Mill Street, assessor’s parcel number (APN) 202-321-13, approximately 0.8 mile east of the community of Rohnerville within the city of Fortuna in Humboldt County, California (refer to Figure 1, Regional and Site Vicinity Map). According to Humboldt County’s General Plan land use map, the project site is designated as Agriculture and Suburban and zoned Residential Suburban (RS) with a 2.5-acre minimum parcel size with mobile homes allowed. The project site is approximately nine acres with the inactive burn dump area covering approximately 5.6 acres. According to the U.S. Geological Survey (USGS) *Hydesville, CA* 7.5 Minute Quadrangle Map, the project site is located at Township 2 North, Range 1 East, in the southwest quarter of Section 7.

1.2 PROJECT OBJECTIVES

The principal objective of the project is to reduce the potential for environmental and public health and safety risks, such as personal exposure to damaged and dilapidated large glass and metal objects and unstable slopes, as well as the potential for groundwater contamination. These site risks would be reduced through the re-grading and capping of the former dump area. Unstable slopes and landslide potentials pose potential safety risks. A further objective is to improve the surrounding area above Mill Creek by the capping and redirection of stormwater runoff to reduce soil and waste material erosion and the potential contamination of the creek.

1.3 EXISTING CONDITIONS AND SURROUNDING LAND USES

The project site is located in a rural area consisting of coniferous forest habitat dominated by redwood forest at the perimeter of the property and the area along Mill Creek. The center of the property and the roadsides are dominated by ruderal, disturbed non-native grasslands and non-native shrubs with patches of tree clusters. Along Mill Creek are patches of wetland habitat.

As indicated in the Geologic and Geotechnical Investigation prepared for the project area in January 2012 (see Appendix A), a natural landslide exists along the steep south and southwesterly facing slopes of the project site. This finding is based on the local geologic mapping and review of aerial photographs. The existing slopes on the project site are marginally stable under static conditions; however, under seismic conditions the slope would not be stable (CalRecycle, 2012).

The burn dump area is on a steep south, southwest facing slope that extends downwards towards Mill Creek which runs along the southwestern boundary of the parcel. Mill Creek flows in a northwesterly direction. A single-lane paved road leading northwest from the property is the only access driveway that connects to Mill Street (refer to Figure 2, Project Site). There is one single-lane paved road connecting to the main access driveway which loops around to the east of the property. There are two parallel single-lane dirt haul roads running across the slope through the middle of the project site. Elevations at the site range from approximately 300 feet above sea level at the southwestern edge of the property near Mill Creek to approximately 500 feet above sea level at the northwestern edge of the property, along a ridgeline.

The burn dump area contains scattered pieces of debris and refuse as surficial wastes, primarily non-combustible glass, metal, pottery, and burn ash. There are also scattered household refrigerators, washing machines, tires, and car bodies along the slope. According to a Site Investigation Report prepared in January 2007, the waste volume estimate of the burn dump area is approximately 20,000 CY (CIWMB, 2007).

The project site is currently used to store logging and lumber milling equipment. In addition to waste produced by the operation of the burn dump, the current land owner has also stored personal items. These items include random large and small debris including vehicles (in various degrees of repair), tanks, construction equipment, kitchen sinks, wood, and other items. These are stored along the side of the paved roads on the north and northeast portion of the project site.

Surrounding the project site are residential uses to the north, northwest, and east. To the south and west of the project site is coniferous forest. To the southeast of the project site is the Redwood Empire Country Club. There are sensitive receptors located within 100 feet to the north and east of the project site that includes residential buildings. The nearest school is located approximately 1.5 miles to the west of the project site.

1.4 BACKGROUND

According to Local Enforcement Agency (LEA) records, the project site operated as a burn dump from the late-1950s to 1972. From 1972 to 1987, the project site was used as a solid waste transfer station. IT Corporation reported disposing 50,000 gallons of oil refinery and production processes wastes including tank bottom sediment, oil and water at the project site, from 1950 to 1960 (CIWMB, 2007). From 1959 to 1972, under the name of Eel River Garbage Company, the project site was used as a burn dump for municipal solid waste collection service in the greater Fortuna area. Wastes were deposited near the top of the slope, burned for volume reduction and then pushed down onto the side of the slope towards Mill Creek (CIWMB, 2007).

In 1972, the Eel River Garbage Company ceased operation as a burn dump and the project site became a transfer station for the Table Bluff Sanitary Landfill (County Central Landfill Disposal Site). Trucks brought waste to a concrete pad and dumped it through a chute into 55 CY bins located below. The bins were removed to the landfill daily (CIWMB, 2007). In August 1978, Solid Waste Facility Permit number 12-AA-0007 was issued for the project site. Activity ceased at the project site as of May 1, 1987. At that time, the Eel River Garbage Company was sold and the name was changed to Eel River Disposal. The southern portion of the project site between Mill Creek and the top deck of the landfill was logged in 1995. No Closure Plan was prepared (CIWMB, 2007).

1.5 PROJECT CHARACTERISTICS

The project site is approximately nine acres with the inactive burn dump area covering 5.6 acres. The project proposes re-grading the 5.6-acre burn dump area and relocating some existing burn dump material to outside of the current burn dump footprint to improve the burn dump's underlying slope stability. Re-grading and relocating the burn dump material would increase the size of the burn dump area to a total project impact area of six acres. The project impact area would be capped with up to two-feet of soil (refer to Figure 3, Site Plan). The project would include re-grading of the slope ranging from a mild minimum slope of three percent to slopes as steep as 2:1 to 3:1, throughout the project impact area. The footprint of the cap area is six acres with a depth of up to two feet or approximately 11,000 CY. Soil used for the cap would be free of contamination from petroleum products or organics and construction debris, and not containing solely rock or solely clay material. In addition, debris that is located adjacent to Mill Creek would be redistributed to other areas of the burn dump area to create a 30-foot buffer between the edge of the waste materials and subsequently placed cap and Mill Creek. At steeper sloped areas, near the creek, gabions (wire cages filled with rock or earth material) would be constructed to reduce the potential for soil cap erosion and possible contamination to the creek (refer to Figure 3, Site Plan).

As mentioned above, to increase stability along the southern and southwesterly facing slope of the project site, the area would be re-graded and materials redistributed. A new surface drainage pattern would be created diverting the flow of stormwater to the perimeter of the soil cap. In addition, two soil berms and gabion retaining walls would be constructed to further stabilize the soil cap located nearest to the creek.

The existing water drainage pattern would be altered during re-grading of the waste materials to drain stormwater towards the perimeter of the project impact area. Any stormwater runoff emanating from the capped slopes would be intercepted by one of two re-graded drainage benches located on the bottom one-third and middle one-third of the newly capped slopes (refer to Figure 3, Site Plan). Stormwater flowing down from upper slopes would be intercepted by a slope drainage berm diverting stormwater to one of two filter fabric/rip-rap lined perimeter drainage ditches (one located on both the western and eastern perimeter of the capped area). Stormwater flowing down these perimeter ditches would flow through a series of gabions, and across lower drainage ditches. These facilities would be installed to reduce the surface water flow rate and limit erosion of the newly placed soil cap and the perimeter native soils. Near the bottom of these slopes, the surface water would be directed to flow across a flat rip-rap lined bench prior to draining toward and into Mill Creek (refer to Figure 3, Site Plan).

Upon placement of the soil cap, a vegetative cover would be established to help limit erosion of the new cap. The vegetative cover would include native grasses and small shrubs.

1.5.1 Lot Line Adjustment[1]

The burn dump material is located on a property owned by Mr. Patrick Thomson (APN 202-321-013), a portion of which was acquired in February 2013 via a lot line adjustment with an adjacent property to the southeast formerly owned by Mr. Sean O'Day (APN 202-241-074) (refer to Figure 2). Hence, the burn dump material is located within one parcel as shown in Figure 3.

1.5.2 Construction Details

Construction is anticipated to occur in the summer of 2013. During construction, large waste materials such as vehicles, refrigerators, and washing machines would be collected, removed, and recycled, disposed at an appropriate disposal site, or left in place, crushed and buried. It is anticipated there would be approximately 19,000 cubic yards of material would be excavated and relocated on the site; 11,000 cubic yards of soil would be imported for the proposed cap. The main haul route includes Mill Street as this is the only access road to the project site. It is anticipated that the majority of imported soil would be hauled to the project site from an off-site source.

Since the preparation of the Draft IS/MND, there is a minor revision to the proposed construction action. This revision includes the removal of approximately four pieces of debris observed within Mill Creek. These items are approximately three- by four-feet in size and are characterized as metal tanks and tires. They would be removed by hand or with mechanical equipment with an extended gripping attachment. The machine would be situated outside the creek's ordinary high water mark, which will be clearly marked by a qualified ecologist as part of previously proposed construction-period actions and monitoring measures. These objects would also be collected, removed, and recycled, disposed at an appropriate disposal site, or left within the project site to be crushed and buried.

1.6 REQUIRED APPROVALS

The following approvals would be required for the proposed project:

- **Regional Water Quality Control Board.** As the proposed project would result in demolition and construction activity on over one acre of land it would be subject to the permitting requirements of the *NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities* (Construction General Permit) (Order No. 2009-0009-DWQ, NPDES No. CAS000002). The SWRCB established the Construction General Permit program to regulate stormwater discharges

[1] A lot line adjustment is a minor movement of a property line between adjacent parcels to correct minor trespasses.

from construction sites. The Construction General Permit requires preparation and implementation of a stormwater pollution prevention plan (SWPPP), which would provide Best Management Practices (BMPs) to minimize potential short-term increases in transport of sediment and other pollutants caused by construction.

- **North Coast Unified Air Quality Management District (District).** The District regulates fugitive dust emissions. The provisions that cover these operations are found in District Rule 104 Section 4, Fugitive Dust Emissions, which requires that reasonable precautions be taken to prevent particulate matter from becoming airborne.

Regarding the removal of approximately four pieces of debris within Mill Creek, Mr. Kelley Reid of the U.S. Army Corps of Engineers (Department of the Army), Eureka Field Office, has indicated, that due to the number and location of debris in Mill Creek, the type of debris to be removed, and the proposed removal methods, no Department of the Army permit or other authorization is required relative to their jurisdiction under Section 404 of the Clean Water Act (Reid, 2013).

With regard to California Department of Fish and Wildlife responsibility under the Fish and Game Code (Section 1602), the proposed activity would not substantially divert or obstruct the natural flow of Mill Creek, or substantially change or use any material from the bed, channel or bank. No debris or waste would be deposited. For this reason, notification to this agency is not required regarding these modifications to the proposed project.

The change to the proposed project is minor, and consistent with CEQA Guidelines, Section 15073.5, does not require recirculation of the Draft IS/MND prior to adoption of the Mitigated Negative Declaration because a new, avoidable significant effect was not identified and no new mitigation measures, or other actions, are needed to reduce potential effects.

1.7 CONSISTENCY WITH ZONING, PLANS, AND APPLICABLE LAND USE CONTROLS

As described above, the project site is designated in the Humboldt County General Plan as Agriculture and Suburban and zoned Residential Suburban (RS) with a 2.5-acre minimum parcel size minimum with mobile homes allowed. The project is consistent with the General Plan and zoning requirements because it does not involve either 1) the construction or maintenance of any permanent structures; or 2) any long-term use of the property. There are no land-use controls on the property that would restrict the project activity.

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Figure 1
Regional and Site Vicinity Map

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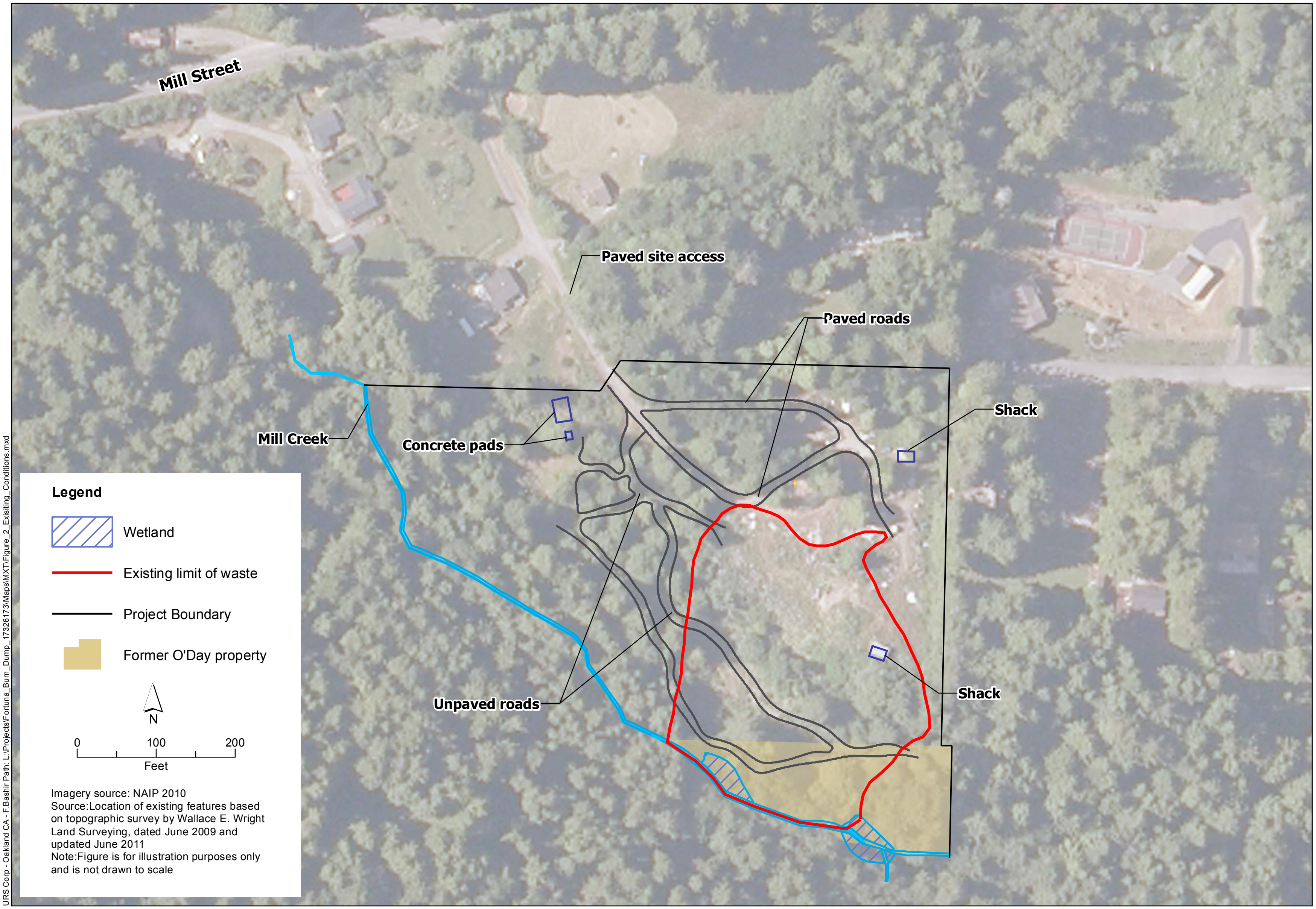

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URS Fortuna Dump Closure Project
Initial Study/Mitigated Negative Declaration

Figure 2
Existing Project Site Conditions

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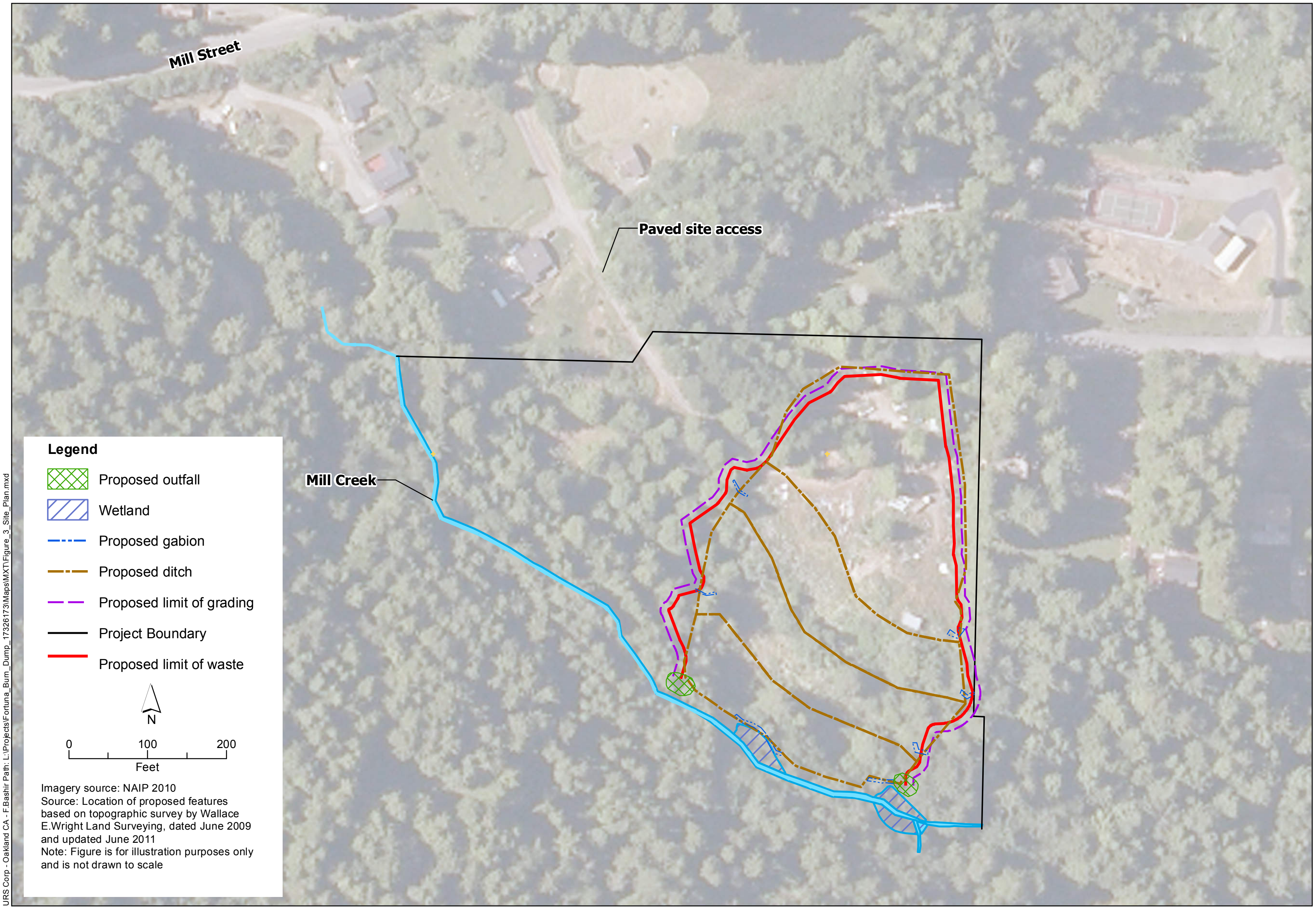

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URS Fortuna Dump Closure Project
Initial Study/Mitigated Negative Declaration

Figure 3
Proposed Site Plan

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2.1 ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The evaluation of potential environmental impacts provided in Section 3 of this Initial Study determined that the proposed project will not result in environmental impacts for the topics that are denoted with a "*". Environmental impacts of the topics that are denoted by a "•" were determined to be less than significant. Environmental impacts of the topics that are denoted with a "✓" can be reduced to less than significant with the implementation of mitigation measures that are identified by this Initial Study. The proposed project will not result in any "Potentially Significant Impacts".

*	Aesthetics	*	Agriculture Resources	•	Air Quality
✓	Biological Resources	✓	Cultural Resources	✓	Geology/Soils
•	Greenhouse Gas Emissions	•	Hazards & Hazardous Materials	•	Hydrology/Water Quality
*	Land Use/Planning	*	Mineral Resources	✓	Noise
*	Population/Housing	*	Public Services	*	Recreation
✓	Transportation/Traffic	*	Utilities/Service Systems	✓	Mandatory Findings

* No impact
• Less-than-significant impact
✓ Less-than-significant impact with mitigation incorporated

Determination

On the basis of this initial evaluation:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☒ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier Environmental Impact Report (EIR) or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Mark De Bie
Deputy Director
CalRecycle

7/22/13
Date

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3.1 EVALUATION OF ENVIRONMENTAL IMPACTS

1) A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).

2) All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.

3) Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.

4) "Negative Declaration: Less Than Significant With Mitigation Incorporated" applies where the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less Than Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from "Earlier Analyses," as described in (5) below, may be cross-referenced).

5) Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. Section 15063(c)(3)(D). In this case, a brief discussion should identify the following:

   a) Earlier Analysis Used. Identify and state where they are available for review.

   b) Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.

   c) Mitigation Measures. For effects that are "Less than Significant with Mitigation Measures Incorporated," describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.

6) Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.

7) Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.

8) This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected.

9) The explanation of each issue should identify:

   a) The significance criteria or threshold, if any, used to evaluate each question; and

   b) The mitigation measure identified, if any, to reduce the impact to less than significance.

3.2 AESTHETICS

Will the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Have a substantial adverse effect on a scenic vista?				✓
b. Substantially damage scenic resources, including but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway?				✓
c. Substantially degrade the existing visual character or quality of the site and its surroundings?				✓
d. Create a new source of substantial light or glare which will adversely affect day or nighttime views in the area?				✓

DISCUSSION:

a-d) **No impact.** The proposed project would not adversely impact scenic vistas or the aesthetic quality of the project area. According to the California Department of Transportation, there are no designated state scenic highways adjacent to the project. The nearest eligible state scenic highways are United States (U.S.) Route 101 and Route 36, located approximately 1.8 miles east and 1.4 miles south of the project site, respectively. There is a golf course located less than one mile to the south of the project site which is not in visual range due to existing terrain. There are residential units located farther to the northwest and northeast of the project site. The site is primarily surrounded by dense growth of redwoods, Douglas firs, grand firs, and California non-native grassland.

The project site is not visible from U.S. Route 101 or Route 36. The existing tree coverage and canopy would remain intact. Upon placement of the soil cap, shrub and vegetation would be planted as part of the proposed project to prevent erosion.

There are no existing sources of nighttime lighting and glare at the project site. Nighttime construction activities are not proposed. Construction would occur during daytime hours and no construction lighting would be used. The proposed project would not require lighting or the use of reflective materials upon completion. Therefore the proposed project would not contribute to night lighting or glare.

3.3 AGRICULTURE AND FORESTRY RESOURCES

In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Will the project:	**Potentially Significant Impact**	**Less Than Significant With Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?				✓
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?				✓

c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?				✓
d) Result in the loss of forest land or conversion of forest land to non-forest use?				✓
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?				✓

DISCUSSION:

a) **No impact.** Based upon a review of maps entitled "Important Farmland in California 2008," prepared by the Farmland Mapping and Monitoring Program (FMMP) of the California Resources Agency and published in December 2010 (FMMP, 2010), farmland in Humboldt County is not mapped by the FMMP as Humboldt County is in the process of having a countywide soil survey produced by the Natural Resources Conservation Service (NRCS). No prime agricultural soils are identified on the project site as determined by the County's online GIS Mapping System. Based on this information, the project site contains no Prime Farmland, Unique Farmland, or Farmland of Statewide Importance. The site has not been used recently or historically for growing crops. Surrounding land uses include rural residences and dense mature trees and vegetation. As such, no impacts to farmland resources are anticipated due to the proposed project.

b) **No impact.** Based on review of Humboldt County's online GIS Mapping System (County, 2012), no Williamson Act contract exists at the site. In addition, the parcel is zoned Residential Suburban with a 2.5 acre parcel size minimum. The proposed project would close the site that has been used as a burn dump in the past. Therefore, the project would not conflict with existing zoning for agriculture use or Williamson Act contract.

c-d) **No impact.** The project site consists of native coniferous forest habitat dominated by redwood forest at the perimeter of the property and the area along Mill Creek. The center of the property and the roadsides are dominated by ruderal, disturbed non-native grasslands and non-native shrubs. Installation of the soil cap and vegetation on the project site would not result in removal of mature trees. There is no timberland found on the project site. Furthermore, the project site is currently zoned "Residential Suburban" by the County of Humboldt Zoning Ordinance, a non-forestland zoning designation. Therefore, no conflict with areas zoned as forest land or timber land, or conversion of such lands to other uses would result from the proposed project.

e) **No impact.** The project site is zoned “Residential Suburban” by the County of Humboldt Zoning Ordinance. The project proposes placement of a two to three foot soil cap over the existing forest floor, revegetation, and rerouting of runoff to preserve the soil cap. No buildings or structures are proposed. Due to the nature of the project, no adverse environmental impacts to agricultural resources would result from the proposed project. Therefore, no loss or conversion of agricultural lands would occur.

3.4 AIR QUALITY

Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Will the project:	**Potentially Significant Impact**	**Less Than Significant With Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a. Conflict with or obstruct implementation of the applicable air quality plan?				✓
b. Violate any air quality standard or contribute substantially to an existing or projected air quality violation?			✓	
c. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?			✓	
d. Expose sensitive receptors to substantial pollutant concentrations?			✓	
e. Create objectionable odors affecting a substantial number of people?			✓	

DISCUSSION:

The proposed project is anticipated to start construction in the summer of 2013. It is anticipated that approximately 75 days would be required to complete construction of the proposed project based on the construction schedule identified in Appendix B, Air Quality Memorandum. Construction would consist of land clearing, placement of the soil cap, enhancing ditches for stream flows, stabilizing the land, and landscaping.

Vehicles and heavy equipment used during the construction would include various pieces of off-road construction equipment such as scrapers, loaders, dozers, backhoes, skid steer loaders, and water trucks. The complete list of construction equipment by phase is shown in Appendix B.

In addition to the off-road construction equipment, there would be on-road motor vehicles from workers commuting to the project site and trucks importing and exporting material to the site. It is estimated that about 2,000 cubic yards of material would be removed during clearing of the project site. During the excavation it is estimated that 19,000 cubic yards of material would be relocated on the site. Although 11,000 CY of soil would be imported, the modeling assumed a worst-case scenario estimating 19,000 CY of imported soil required for the soil cap. Additional material hauling trips were assumed for the import of other project materials such as ditch lining material and gabions. Default trip lengths for Humboldt County were utilized for the project. Refer to Appendix B for more detail regarding the number of trips and trip lengths assumed for the workers and material hauling.

Emissions for project construction were estimated using the California Emission Estimator Model (CalEEMod) version 2011.1.1. CalEEMod is a statewide land use project emissions model designed as a uniform platform to quantify potential criteria pollutant and greenhouse gas (GHG) emissions associated with construction and operation from a variety of land uses, such as residential and commercial facilities. CalEEMod utilizes basic land use information to estimate default construction equipment and mobile source trips and lengths. Refer to Appendix B for more detail regarding the inputs utilized in the model. The estimated emissions from CalEEMod are shown in Table 1, Construction Emissions.

Table 1: Construction Emissions

Tons										Metric Tons
ROG	NO_X	CO	SO_2	Fugitive PM_{10}	Exhaust PM_{10}	PM_{10} Total	Fugitive $PM_{2.5}$	Exhaust $PM_{2.5}$	$PM_{2.5}$ Total	CO_2e
0.33	3.02	1.61	0.00	0.72	0.11	0.83	0.12	0.11	0.23	389.58

Source: Refer to Appendix B for the complete CalEEMod output.

a) **No impact.** The project site is located within the North Coast Air Basin (basin) which is under the jurisdiction of the North Coast Unified Air Quality Management District (District). The basin is comprised of three air districts, the District, the Mendocino County Air Quality Management District, and the Northern Sonoma County Air Pollution Control District. The District includes Del Norte, Humboldt, and Trinity Counties. The basin currently meets all federal air quality standards; however, the entire air basin is currently designated as nonattainment for the state 24-hour and annual average particulate matter smaller than 10 microns in size (PM_{10}) standards. The air basin is designated as unclassified for the state and federal annual $PM_{2.5}$ standard (particulate matter less than 2.5 microns in diameter). Both natural and anthropogenic sources of particulate matter (including vehicle emissions, wind generated dust, construction dust, wildfire and human caused wood smoke, and sea salts) in the basin have led to the PM_{10} nonattainment designation.

To address nonattainment for PM_{10}, the District adopted a Particulate Matter Attainment Plan in 1995. This plan presents available information about the nature and causes of PM_{10} standard exceedance and identifies cost-effective control measures to reduce PM_{10}

emissions to levels necessary to meet California Ambient Air Quality Standards (CAAQS). The Fortuna General Plan calls for the City to coordinate with the District for this project, given the District's primary role in achieving air quality goals.

The District has created Rule 104 Section 4, Fugitive Dust Emissions, which requires that reasonable precautions shall be taken to prevent particulate matter from becoming airborne. Some of the relevant precautions for this project include the following:

- Covering open bodied trucks when used for transporting materials likely to give rise to airborne dust.
- The use of water or chemicals for control of dust in the grading of roads or the clearing of land.
- Application of asphalt, oil, water or suitable chemicals on dirt roads, materials stockpiles, and other surfaces which can give rise to airborne dusts.
- The prompt removal of earth or other track out material from paved streets onto which earth or other material has been transported by trucking or earth moving equipment, erosion by water, or other means.

As shown in Table 1, the project would generate 0.83 tons of PM_{10} and 0.23 tons of $PM_{2.5}$, a minor amount of particulate emissions over the duration of construction in the form of dust and vehicle emissions as a result of earthwork, grading and related construction activities. The project would not cause any long term increase in the emission of particulate matter or other air pollutants. The project would be subject to Rule 104 and thus control fugitive dust emissions associated with construction of the project. While the basin is in nonattainment for PM_{10}, the temporary nature of construction activities combined with compliance with Rule 104 for control of fugitive dust would result in negligible increases in PM_{10} for the local area.

In the long term, the project would not substantially add to the level of PM_{10} or other emissions. There are no operational uses proposed and therefore no operational emissions associated with the project. The project site would be vegetated to minimize fugitive dust emissions. Therefore, the project would not impede implementation of the District's particulate matter attainment plan. The project would also be consistent with applicable City of Fortuna General Plan policies related to air resources. Therefore, no impact is anticipated.

b) **Less-than-significant impact.** Under the federal Clean Air Act of 1977, the United States Environmental Protection Agency (US EPA) is required to identify National Ambient Air Quality Standards (NAAQS) to protect public health and welfare. The US EPA has established NAAQS for six criteria air pollutants. The basin does not meet or exceed any of these NAAQS. Under the California Clean Air Act, California Air Resources Board (CARB) has adopted more stringent standards for the criteria air pollutants. The basin is in nonattainment with the California PM_{10} standards (both 24-hour and annual). The District has adopted a particulate matter attainment plan. Recent air monitoring data, November 2011 to October 2012, did not show any PM_{10} exceedances and had one $PM_{2.5}$ exceedance of the 24-hour NAAQS. The District does not have a mass emissions significance threshold for criteria air pollutants. The District does require Best Available Control Technology (BACT) for stationary sources; however, this project does not propose any operational uses, including stationary sources.

In the basin, most particulate matter is caused by vehicle emissions, wind generated dust, construction dust, wildfire and human caused wood smoke, and sea salts. Health effects from particulate matter include reduced lung function, aggravation of respiratory and cardiovascular diseases, increases in mortality rate, and reduced lung function and growth in children.

Project construction activities would cause the release 0.83 tons of PM_{10} and 0.23 tons of $PM_{2.5}$ (see Table 1), a small amount of PM_{10} and $PM_{2.5}$ emissions related to fugitive dust, exhaust emissions from on-road haul trucks, worker commute vehicles, and off-road construction equipment. However, because of the small footprint and duration of the proposed construction, and with compliance with Rule 104, construction of the proposed project would not cause a violation of air quality standard or contribute substantially to existing or projected air quality violation. The proposed project would re-grade and cap a former burn dump area, thus there would be no operational emissions. The proposed project would only release a negligible amount of air quality pollutants and would not substantially contribute to any air quality standard violation. Therefore, impacts would be less than significant.

c) **Less-than-significant impact.** As described above, the basin is in nonattainment for the criteria air pollutant PM_{10}. Project construction would cause only minor and short-term production of PM_{10} and would not significantly increase background levels. As there are no operational uses proposed, there would be no long term emissions associated with an operational use. Therefore, impacts would be less than significant.

d) **Less-than-significant impact.** Project construction would create temporary emissions of toxic air contaminants, primarily as a component of diesel emissions. Due to the variable nature of construction activity, the generation of toxic air contaminant emissions would be temporary. In addition, current methodologies for conducting health risk assessments are associated with longer-term exposure periods which do not correlate well with the temporary and highly variable nature of construction activities. The project would result in a minor and short-term construction related air emissions. As these emissions are temporary in nature, health risks from project construction are not anticipated. Therefore, impacts would be less than significant.

e) **Less–than-significant impact.** During construction the various diesel-powered vehicles and equipment could create localized odors. Furthermore, since the site is a former burn dump, substrates could be encountered in sub-surface construction that may create objectionable localized odors. These odors would be temporary and not likely to be noticeable for extended periods of time beyond the construction zone due to atmospheric dissipation and natural vegetation screens surrounding the project site. Project operation would not create any objectionable odors as the site would have a vegetative cover placed over the soil cap. Therefore, impacts would be less than significant.

3.5 BIOLOGICAL RESOURCES

Will the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?		✓		
b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?		✓		
c. Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including but not limited to marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?		✓		
d. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?		✓		
e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?				✓
f. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?				✓

DISCUSSION:

a-b) **Less-than-significant with mitigation incorporated.** The project site was surveyed on June 9, 2009, by Senior Ecologist Casey Stewman and a Biological Constraints Analysis and Wetland Delineation Report was prepared. The reconnaissance-level survey covered the entire project study area, using transects and intuitive survey methods. A rare plant survey was also conducted for the special status plant and animal species resulting from the California Natural Diversity Database (CNDDB) and the California Native Plant Society (CNPS) search queries and the Unites States Fish and Wildlife Service (USFWS) Species List. The project site was re-surveyed on December 12, 2012, to document current biological resources potentially affected. Biologist Joe Bandel and Planner Michelle Dunn conducted the site visit. Mr. Bandel prepared an Addendum to the 2009 Biological Constraints Analysis and Wetland Delineation Report in December 2012 (see Appendix C, Biological Addendum). The 2009 special status species list was updated in 2012 via a CNDDB and CNPS database search and current USFWS species list.

Special-Status Plants Species

The project site consisted predominantly of coniferous forest habitats which included redwood forest which dominated the perimeter of the property and the area along Mill Creek. The center of the property and the roadsides were dominated by ruderal, disturbed non-native grasslands, non-native vines and, in places, non-native shrubs. During the 2012 field visit, the vegetation at the site was found to be similar to what was documented in the 2009 survey. However, in general the undergrowth vegetation in the unforested areas was denser, and more overgrown. No special-status plant species with potential to occur based on habitat and local occurrences were discovered in the project site. A complete list of the vascular plants discovered at the project site is provided in Appendix C. The blooming period and time for best identification for most of the plant species with potential habitat in the project area coincided with the 2009 survey. The potential for special-status plants to occur on the site or be impacted by the project is considered low.

Special Status Wildlife Species

Appendix C includes a list of the special-status wildlife species, their status, habitat association(s), and potential for each species to occur within the project area. This list has been updated per the 2012 survey and is provided in Appendix C. Abundant potential nesting habitat and foraging habitat is available in the study area for Cooper’s hawk (*Accipiter cooperii*) and sharp shinned hawk (*Accipiter striatus*). Both are identified as a species of special concern by the California Department of Fish and Wildlife (CDFW) or on CDFW’s Watch List. During the 2009 survey, a large nest likely a raptor nest was observed in one of the Grand fir trees in the northern part of the property and was occupied by a Cooper’s hawk. A sharp shinned hawk was not observed during the survey, however, there is potential for the hawks to use the site for foraging or nesting. During the 2012 survey, no nests were observed; however, there is a medium to high potential for these two hawk species to occur at the project site. **Mitigation Measure BIO-1** would reduce impacts to sensitive birds to a less-than–significant level.

Special status terrestrial animals that have potential to occur on the project site include northern red-legged frog (*Rana aurora aurora*) and foothill yellow-legged frog (*Rana boylii*). Both the species are identified as species of special concern by CDFW or on CDFW's Watch List. One adult northern red-legged frog was observed during the 2009 survey along the stream banks of Mill Creek. No species were observed during the 2012 survey. Potential foraging and dispersal habitat is available for the species near Mill Creek on the project site. Several of the pools along Mill Creek within the project site appear to be of sufficient depth to provide breeding habitat for this species. **Mitigation Measure BIO-2** would reduce impacts to sensitive animals to less-than–significant levels.

Mill Creek at the southwest edge of the project site was inspected for signs of fish and fish habitat. No anadromous fish habitat occurs in the project site because of a passage barrier on Mill Creek at the northwest edge which is the most downstream side of the project site. The barrier is a 10 foot vertical cliff within the creekbed. Nonetheless, storm water from the project site does drain off the property into Mill Creek and downstream into anadromous fish habitat. Downstream of the property Mill Creek is a tributary to Strong Creek which is then tributary to the Eel River which is habitat for anadromous fish. Erosion, sedimentation, leaching of metal compounds and toxic substances from the dump site and destruction of headwater vegetation can all have a deleterious effect on the water quality of Mill Creek, downstream watercourses and the watershed as a whole. Degradation to the water quality can potentially adversely impact steelhead in all life stages in the habitat downstream. However, the proposed project would comply with the National Pollutant Discharge Elimination System (NPDES) requirements for construction site storm water discharges as soil disturbance within the project area is greater than 1 acre in size. A SWPPP is required to be prepared and implemented under these requirements, which includes appropriate erosion-control and water quality-control measures be implemented during site preparation, grading, and construction. The implementation of the SWPPP for the proposed project would minimize short-term erosion impacts and would reduce impacts to fish habitat downstream.

BIO-1: Prior to initiating any construction activity during the nesting period (February 1 to August 31), a pre-construction nesting bird survey for the presence of raptors and Migratory Bird Treaty Act (MBTA) species shall be conducted by a qualified biologist within 30 days prior to construction activities to establish the status of these species on the project site and identify any active nests within 200 feet of the project site. If ground-disturbing activities are delayed or suspended for more than 30 days after the pre-construction survey during the nesting period, the site shall be resurveyed. If occupied raptor nests or other nesting MBTA species are observed within 200 feet of the proposed project site, the USFWS shall be consulted to develop measures, including establishing an appropriate buffer distance to avoid disturbance of nesting species, prior to the initiation of any construction activities. If nesting raptors or MBTA species are discovered within 200 feet of the project site after initiation of ground disturbing activities, then notification shall be provided to the USFWS.

BIO-2: A CDFW-approved biologist shall be present on site during all construction activities within 50 feet of Mill Creek where there is habitat for northern red-legged frog and foothill yellow-legged frog. If either amphibian species is found, all work shall cease until the identified frog leaves the work area.

c) **Less-than-significant with mitigation incorporated.** URS biologist Casey Stewman conducted a jurisdictional delineation of waters of the U.S. in the project site on June 14, 2011. Waters of the U.S. were formally delineated by the survey team in accordance with the routine onsite method described in the *Corps of Engineers Wetlands Delineation Manual*, and under guidance from the *Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region*. The wetland delineation report is included in Appendix C along with the subsequent survey conducted in 2012 by Mr. Bandel to verify current biological resource conditions on the project site.

Jurisdictional waters are potentially present in the project site. The total area of waters of the U.S. (under Section 404 of the Clean Water Act) within the project site is 0.190 acre (8,259 square feet); 0.108 acre (4,697 square feet) function as other waters of the U.S., and 0.082 acre (3,562 square feet) function as wetlands within waters of the U.S. Table 2, Potential Waters of the United States within the Project Site, summarizes the area of each type of potential jurisdictional feature in the project site.

Table 2: Potential Waters of the United States within the Project Site

Feature Type and Label	Length (feet)	Square Feet	Delineated Acres
Other Waters of the United States			
OW-1: Intermittent stream (Mill Creek)	2,071	4,568	0.11
OW-2: Ephemeral stream (Unnamed drainage)	90	129	0.00
Other Waters of the United States Subtotal	2,161	4,697	0.11
Wetlands			

Table 2: Potential Waters of the United States within the Project Site

Feature Type and Label	Length (feet)	Square Feet	Delineated Acres
WL-1: Perennial freshwater wetland (Mill Creek)	191	1,561	0.04
WL-2: Perennial freshwater wetland (Mill Creek)	163	928	0.02
WL-3: Perennial freshwater wetland (Mill Creek)	152	970	0.02
WL-4: Perennial freshwater wetland (Mill Creek)	45	103	0.00
Wetlands Subtotal	551	3,562	0.08
Total Waters of the United States	2712	8,259	0.19

Source: Appendix C, Biological Addendum.

Note: Due to rounding of acreages the sum of wetland acreages does not equal subtotal.

Four areas containing wetlands occur along the lower stream banks of Mill Creek and within the project site. These perennial freshwater wetlands are vegetated with western skunk cabbage (*Lysichiton americanus*), salmonberry (*Rubus spectabilis*), and threeleaf foamflower (*Tiarella trifoliata*) with an overstory cover of big leaf maple, and white alder. The boundaries of the wetlands remain consistent with the 2011 survey. No additional wetlands or other waters of the U.S. were discovered during the 2012 survey. **Mitigation Measure BIO-3** would reduce impacts to less-than–significant levels.

BIO-3: Prior to any construction activity, the wetland areas shall be clearly marked by a qualified biologist using readily visible temporary construction fencing that shall be maintained throughout the construction period. All construction activities and deposition of imported soil material shall avoid any degradation of wetlands functions, including reduced water quality due to erosion or run-off from adjacent construction activities.

d) **Less-than-significant impact with mitigation incorporated.** The project site contains scattered debris and refuse composed of primarily non-combustible glass, metal, pottery, and burn ash. These limited density and extent of existing debris and the proposed actions preclude the possibility of impeding wildlife movement corridors or the use of native wildlife nursery sites. Although no recorded migration corridors or stream channels used by special-status fish or wildlife species occur on the existing project site, Mill Creek could be considered a riparian corridor for the Northern red-legged frog and the foothill yellow-legged frog and construction activities could interfere with the movement of these species. However, incorporation of **Mitigation Measure BIO-2** would mitigate potential impacts to a less-than-significant level. Therefore, with mitigation incorporated it is anticipated that a less-than-significant impact would occur.

e) **No Impact.** No mature trees would be removed as part of this project. No impacts would occur.

f) **No Impact.** The proposed project would not conflict with existing habitat conservation plans or natural community conservation plans in the County of Humboldt. No impact would occur in this regard.

3.6 CULTURAL RESOURCES

Will the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?			✓	
b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section15064.5?			✓	
c. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?		✓		
d. Disturb any human remains, including those interred outside of formal cemeteries?		✓		

DISCUSSION:

a-b) **Less–than-significant impact.** A Cultural Resources Survey and Site Evaluation dated June 2009 was completed for the proposed project. For the Cultural Resources Survey and Site Evaluation, an archaeological site record was completed, including a Primary Record, an Artifact Record, and a Sketch Map. An intuitive pedestrian survey of the project site was performed by URS archaeologist Russell Bevill on June 9, 2009. Findings of the Cultural Resource Survey and Site Evaluation can be found in Appendix D. A records search of all pertinent survey and site data was conducted at the North Coastal Information Center at Klamath, California, on May 28, 2009 [File No. Nilsson 09-01]. The records were identified on the *Fortuna* and *Hydesville*, California, USGS 7.5 Minute Quadrangle, in Humboldt County. The records search included previous archaeological studies conducted within ½ mile of the project site. The Native American Heritage Commission (NAHC) in Sacramento was contacted and a list of appropriate individuals or groups to contact regarding the significance of the proposed project was requested. After the 2009 Cultural Resources Survey and Site Evaluation was written, subsequent responses were received from the NAHC, THPO for the Blue Lake Rancheria Tribes, THPO for the Bear River Band, and the former Tribal Administrator for the Wiyot Tribe. All letter responses indicated that there were no known cultural resources within the project site (see Appendix D).

Based on the physical evidence at the project site, the deposit is limited primarily to metal, glass, ceramic, and calcined bone. Some items of rubber, plastic, and leather have also survived, but are fewer in number. The automobile tires are stacked on the surface and are of a more recent date. The artifacts deposited within the dump have been subject to extensive burning and mixing that precludes the possibility of associating them with a particular person or place. Most artifacts deposited within the dump are younger than 50 years, dating to a period after circa 1955. Overall, the artifacts deposited within the project site may be described as ordinary, domestic refuse mixed with discarded structural materials and automotive parts and do not meet the eligibility criteria for listing on the California Register. In addition, much of the deposited materials lack physical integrity, having been incinerated to reduce volume and subsequently crushed. Therefore, impacts would be less than significant.

c) **Less-than-significant impact with mitigation incorporated.** Paleontological resources are the fossilized evidence of past life found in the geologic record. Despite the prodigious volume of sedimentary rock deposits preserved worldwide, and the enormous number of organisms that have lived through time, preservation of plant or animal remains as fossils is an extremely rare occurrence. Because of the infrequency of fossil preservation, fossils – particularly vertebrate fossils – are considered to be nonrenewable resources. Because of their rarity, and the scientific information they can provide, fossils are highly significant records of ancient life. Paleontologic resource localities are those sites where the fossilized remains of extinct animals and/or plants have been preserved.

The project site has been historically used as a burn dump and scattered with various discarded and disposed materials. The proposed project does not involve excavation of existing soils. However, construction activities may inadvertently unearth a paleontological resource. **Mitigation Measure CR-1** is provided to reduce this potentially significant impact to a less-than–significant level.

CR-1: An inadvertent discovery clause for paleontological resources shall be incorporated into the construction contract for the proposed project. CalRecycle shall notify a qualified paleontologist of unanticipated discoveries, made by construction personnel and subsequently document the discovery as needed. In the event of an unanticipated discovery of a breas, true, and/or trace fossil during construction, excavations within 50 feet of the find shall be temporarily halted or diverted until the discovery is examined by a qualified paleontologist. The paleontologist shall notify the appropriate agencies to determine procedures that shall be followed before construction is allowed to resume at the location of the find.

d) **Less-than-significant impact with mitigation incorporated.** The project site has been used as a burn dump and transfer station in the past. As noted earlier, the NAHC did not respond to previous request or indicate any recorded Native American sites in the project area. The proposed project does not involve excavation of existing soils. However, in the event of an accidental discovery or recognition of any human skeletal remains during project activities, all excavation or disturbance must cease at the site or any nearby area reasonably suspected to overlie adjacent human remains until the District complies with the procedures outlined in CEQA Section 15064.5. **Mitigation Measure CR-2** is provided to reduce this potentially significant impact to a less-than–significant level.

CR-2: If human remains of Native American origin are discovered during project construction, it is necessary to comply with state laws relating to the disposition of Native American burials, which fall within the jurisdiction of the NAHC (Public Resources Code Section 5097). If any human remains are discovered in any location on the project site, there shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until:

- The Humboldt County coroner has been informed and has determined that no investigation of the cause of death is required; and
- If the remains are of Native American origin:
    - The descendants of the deceased Native Americans have made a recommendation regarding the disposition of remains and any associated grave goods, as provided in Public Resources Code Section 5097.98; or
    - The NAHC was unable to identify a descendant or the descendant failed to make a recommendation within 24 hours after being notified.

3.7 GEOLOGY AND SOILS

Will the project:	**Potentially Significant Impact**	**Less Than Significant With Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Pub. 42.				✓

Will the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
ii. Strong seismic ground shaking?			✓	
iii. Seismic-related ground failure, including liquefaction?			✓	
iv. Landslides?		✓		
b. Result in substantial soil erosion or the loss of topsoil?			✓	
c. Be located on a geologic unit or soil that is unstable, or that will become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?		✓		
d. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?				✓
e. Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?				✓

DISCUSSION:

a-i) **No impact.** The State of California has established Earthquake Fault Zones by the Alquist-Priolo (AP) Earthquake Fault Zone Act of 1972. The nearest AP zoned fault is the Little Salmon fault, located approximately 4,900 feet (0.9 mile) northwest of the project site, and an AP zoned branch of the fault is also located approximately 5,600 feet (1.06 miles) southeast of the project site. Other nearby faults identified by the Humboldt County General Plan include the Ferndale (Goose Lake) fault and the Russ fault, located approximately 2.3 and 6.2 miles southwest of the project site, respectively. There are no active or potentially active faults identified on the project site. Therefore, there are no impacts.

a-ii) **Less-than-significant impact.** Humboldt County is located in one of the most seismically active regions of the state and the project site can be expected to experience periodic minor earthquakes and possibly a major earthquake on one of the nearby active faults. The project site would be subject to strong to very strong shaking during a large event on the nearby faults. The project site is located near the Cascadia Subduction Zone (the subducting Gorda and Juan de Fuca Plates form the “Cascadia Subduction Zone” which runs north-south offshore of northern California, Oregon, and Washington. The seaward edge of the Cascadia Subduction Zone is approximately 30 miles west (offshore) of the project site), the nearby AP zoned Little Salmon fault and other nearby active faults as mentioned above. As such, there is a high potential for the project site to experience moderate to strong ground shaking during a major earthquake on one of these faults.

The project proposes capping the project site with two feet of soil, establishing a vegetative cover over the soil cap and designing the site to direct all stormwater runoff to the perimeter of the soil cap to prevent erosion. Construction activities are anticipated to occur only during the summer of 2013. Upon completion of construction activities, the project is complete as there are no operational uses proposed. Although exposure to strong seismic ground shaking is high due to the seismically active region, due to the relatively short construction period and no operational use proposed, a less-than-significant impact would occur.

a-iii) **Less-than-significant impact.** Strong ground shaking caused by large earthquakes can induce ground displacement and/or failure such as liquefaction, compaction settlement, and slope movement. Susceptibility to these hazards relates to the site topography, soil conditions, and/or depth to groundwater. Liquefaction occurs when soils are loose, cohesionless, granular soil below the water table.

The project site is located outside the County of Humboldt liquefaction hazard zone. In addition, according to the Geologic and Geotechnical Investigation prepared in February 2012 (see Appendix A), the project site soils were generally soft to hard clays or clayey gravels. Groundwater was encountered near the elevation of Mill Creek. Based on the clayey nature of the soils and the depth to groundwater, the hazard from ground failure such as liquefaction on the site is low. However, liquefaction is possible within the alluvium found in the channel of Mill Creek. Therefore, potential impacts would be less than significant.

a-iv, c) **Less-than-significant impact with mitigation incorporated.** According to the *Geologic and Geotechnical Study* (see Appendix A), a landslide has been identified along the lower slopes of the project site, extending down to Mill Creek. The landslide most likely is a result of a combination of things including weak soils within the underlying geologic formations, high rainfall and elevated groundwater levels, toe erosion by the adjacent Mill Creek and strong seismic shaking every few hundred years. This feature is an "ancient" landslide, composed of several smaller landslides that resulted in a larger landslide. The landslide is due to a natural process that is not unique to the project site. Future grading or construction within the landslide area could reactivate the landslide due to removal of material at the toe or bottom of the landslide, adding more soil or waste to the head or top of the landslide, changes in the groundwater conditions, or reactivation of the landslide due to strong seismic shaking.

The project proposes to remove waste and landslide debris along the top of the landslide materials to reduce landslide susceptibility and increase slope stability. The debris would be relocated to an area beyond the limits of the landslide area. In addition, soil berms are proposed to increase slope stability and reduce landslide susceptibility. However, during construction activities, potentially triggering a landslide could occur. Implementation and incorporation of **Mitigation Measure GEO-1** would reduce potential impacts to a less-than-significant level. As there are no operational uses proposed, no additional impacts would occur.

GEO-1: All site preparation and earth-work shall be completed under the observation of a qualified Geotechnical Engineer and in accordance with applicable Caltrans Standard Specifications, including Section 19, Earthwork. In addition, the construction contractor shall comply with the California Geological Survey's Guidelines for Evaluating and Mitigating Seismic Hazards in California (Special Publication 117), which specifically address the mitigation of liquefaction and landslide hazards in designated Seismic Hazard Zones. All recommendations of the geotechnical investigation shall be incorporated into project designs.

b) **Less-than-significant impact.** Silty to clayey sand mixed with roots, wood debris, and other organic materials cover the project site in areas not previously disturbed. The project proposes redistributing the existing burn dump material, placing a two-foot soil cap over the existing landfill, grading the site to drain stormwater towards the perimeter of the project impact area, and establishing a vegetative cover to help prevent and minimize erosion. The project would redirect any stormwater to the perimeter of the project impact area and direct the stormwater flow towards and into Mill Creek to prevent erosion. Therefore, as the project is designed to prevent and minimize erosion of soils, a less-than-significant impact would occur.

d, e) **No impact.** Expansive soils are those that possess "shrink-swell" characteristics and are usually fine-grained clay sediments that expand and contract due to moisture and desiccation. Based upon soil data provided in the Geology and Geotechnical Investigation, the project site primarily consists of silty to clayey sand with colluvium consisting of dark brown to yellowish brown silty sand with gravel and firm to soft, gray to yellowish brown clay. These are not considered to be expansive soils. Thus, there would be no impacts associated with expansive soils.

The proposed project would not include the installation of septic tanks. Therefore, the capability of the soils to support the operation of such tanks does not need to be evaluated.

3.8 GREENHOUSE GAS EMISSIONS

Will the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?			✓	
b. Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?			✓	

DISCUSSION:

a) **Less-than-significant impact.** Project construction activities would cause the release of a small amount of GHG emissions related to exhaust emissions from on-road haul trucks, worker commute vehicles, and off-road construction equipment. As shown in the Air Quality section above, Table 1 identifies 389.58 metric tons of carbon dioxide equivalents (CO_2e) would be emitted as a result of the proposed project. However, because of the small footprint and duration of the proposed construction, the proposed project would cause only a negligible release of GHG emissions. Furthermore there would be no operational emissions associated with the proposed project. As such, the proposed project would result in a less-than-significant impact with regards to GHG emissions.

b) **Less-than-significant impact.** The California Global Warming Solutions Act of 2006 (Assembly Bill 32) definitively established the state's climate change policy and set GHG reduction targets. This target is to reduce GHG emissions to 1990 levels by 2020. The CARB has established several regulations aimed at guiding the state to meet this target. These strategies are outlined in CARBs Scoping Plan and include various measures across numerous source categories aimed at reducing GHG emissions. Through this plan and subsequent enactment of regulations, the state is on the path toward meeting the goals of Assembly Bill 32.

The District does not have any rules, regulations, or thresholds of significance for non-stationary or construction related GHG emissions.

The City of Fortuna General Plan does not address GHG emissions and global warming in detail, but does establish related goals and policies that would assist in reducing GHG emissions. This includes encouragement of infill development, promoting energy conservation, energy efficiency and reliance on alternative energy sources in new and existing development.

The construction activities of this project with its negligible amount of GHG emissions generated from non-stationary sources would not conflict with Assembly Bill 32 nor would it conflict with local goals aimed at GHG emission reductions. As such, impact would be less-than-significant.

3.9 HAZARDS AND HAZARDOUS MATERIALS

Will the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?			✓	
b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?			✓	
c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?			✓	
d. Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, will create a significant hazard to the public or the environment.			✓	
e. For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, will the project result in a safety hazard for people residing or working in the project area?			✓	
f. For a project located within the vicinity of a private airstrip, will the project result in a safety hazard for people residing or working in the project area?			✓	
g. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?			✓	
h. Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?			✓	

DISCUSSION:

a-d) **Less-than-significant impact.** The project proposes to cap the former burn dump with two feet of soil. Large bulky items such as cars would be removed and taken to either a landfill, recycled, or left in place. The principal objective of the project is to reduce the potential for environmental and personal health and safety risks, such as personal exposure to damaged and dilapidated large glass and metal objects, as well as unstable slopes and contamination, through the re-grading and capping of the former dump area. The project would remove an existing hazard to the public. Therefore, impacts would be less than significant.

The nearest school is located approximately 1.5 miles to the west of the project site. There would be no impact to schools.

The project site is not located on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 (Envirostar, 2013). As previously mentioned, the project would remove an existing hazard to the public. Therefore, impacts would be less than significant.

e-f) **Less-than-significant impact.** The Rohnerville Airport is located within two miles southwest of the project site. According to the City of Fortuna's General Plan Update 2030, the project site is outside the airport's Land Use Compatibility Zone (City, 2010). Therefore, the proposed project would not result in safety hazards for people residing or working in the project area.

g) **Less-than-significant impact.** The County of Humboldt Sheriff Department's Office of Emergency Services (OES) coordinates countywide response to disasters, is responsible for alerting and notifying appropriate agencies when disaster strikes, coordinates with responding agencies, ensures mobilization of available resources, develops plans and procedures for response and recovery, and provides materials to the public. The OES coordinates evacuation planning in the event of seismic events, tsunamis, slope failure, floods, storms, fires, and hazardous materials spills. The OES has an Emergency Operations Plan (EOP) established in the case of emergency.

The proposed project is located approximately seven miles inland and ranges in elevation from 300 to 500 feet above sea level and is therefore not located within the tsunami inundation zone and therefore would not experience a tsunami in the event of a strong earthquake. The proposed project would not impair the implementation of or physically interfere with emergency evacuation plans or response plans because it would not obstruct emergency routes or cause changes to existing emergency plans. Furthermore, there are no operational uses proposed and would not increase the number of people expose to potential emergencies. It is not anticipate the project would interfere with any emergency response plans or evacuation plans and therefore a less-than-significant impact is anticipated.

h) **Less-than-significant impact.** According to the City of Fortuna General Plan Draft Programmatic EIR dated July 2010, the proposed project is located in the Fire Hazard Severity Zone in State Responsibility Area identified as “high risk”. However, according to the Humboldt County Operational Area Hazard Mitigation Plan, the Humboldt County Fire History map 1908-2004, there has not been a major wildlife in the project area in the last century (County, 2008). The project proposes construction activities to grade the project site and place a two-foot soil cap over the existing burn dump. Upon construction, the proposed soil cap would not involve operational uses that would expose individuals or structures to wildfires. Therefore impacts would be less than significant related to exposure to wildland fire hazards.

3.10 HYDROLOGY AND WATER QUALITY

Will the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Violate any water quality standards or waste discharge requirements?			✓	
b. Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there will be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells will drop to a level which will not support existing land uses or planned uses for which permits have been granted)?				✓
c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which will result in substantial erosion or siltation on or off-site?			✓	
d. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which will result in flooding on or off-site?			✓	
e. Create or contribute runoff water which will exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?			✓	
f. Otherwise substantially degrade water quality?			✓	

Will the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
g. Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?				✓
h. Place within a 100-year flood hazard area structures which will impede or redirect flood flows?				✓
i. Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam?				✓
j. Inundation by seiche, tsunami, or mudflow?				✓

DISCUSSION:

a) **Less-than-significant impact.** The proposed project would not result in an increase in the discharge of wastewater as there are no operational uses proposed. Therefore, the project would not violate any water quality standards or waste discharge requirements. The impact would be less-than-significant.

b) **No impact.** The project would not increase impervious surfaces or interfere with groundwater recharge. The project proposes the placement of a two-foot soil cap with the drainage redirected to the perimeter of the soil cap and down towards Mill Creek to prevent erosion. There would be no impact.

c-f) **Less-than-significant impact.** The proposed project would alter the existing drainage pattern but would not result in substantial erosion or siltation or flooding (refer to Section 1.5, Project Characteristics, and Figure 3). The proposed project is designed to reduce erosion of the soil cap and redirect stormwater flows to the perimeter of the soil cap and down towards Mill Creek. The proposed project also includes installing berms, drainage ditches, filter fabric/rip-rap, and gabions to redirect and slow the flow of stormwater run-off. Thus, a less-than-significant impact would occur.

Construction of the proposed project would result in short-term soil-disturbing activities that could lead to increased erosion during grading and the removal of vegetation. However, the proposed project would comply with the NPDES requirements for construction site storm water discharges as the project is greater than one acre in size. A SWPPP is required to be prepared and implemented under these requirements, which includes appropriate erosion-control and water quality-control measures be implemented during site preparation, grading, and construction. The implementation of the SWPPP for the proposed project would minimize short-term erosion and related impacts on water quality would be less than significant.

The project does not propose operational uses and only consists of construction activities and it is not anticipated that the project would substantially degrade water quality or provide substantial additional sources of polluted runoff. Thus a less-than-significant impact would occur.

g-j) No impact. The project does not propose any operational uses and therefore would not place housing within a 100-year flood hazard area or in an area that would be inundated in the event of a dam failure. The project site is not located immediately downstream of a dam, is not located adjacent or directly downstream from lakes which could cause a seiche, and is located well inland and is not within a County of Humboldt-designated Tsunami Run-Up Zone (City, 2010b). There would be no impacts.

3.11 LAND USE AND PLANNING

Will the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Physically divide an established community?				✓
b. Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect.				✓
c. Conflict with any applicable habitat conservation plan or natural community conservation plan?				✓

DISCUSSION:

a) **No Impact.** The proposed project would place a two-foot soil cap over the entire project site and relocate some of the dump from the historical landslide to stabilize the slope. There are no existing residential uses or communities located on the proposed project site. The proposed project would not divide any community.

b) **No Impact.** According to Humboldt County's general plan land use map, the project site is designated as Agriculture and Suburban (County, 2012b) and zoned Residential Suburban (RS) with a 2.5-acre parcel size minimum with mobile homes allowed. The Humboldt County Zoning Regulations (Section 314-6.1) identifies one-family dwelling as a permitted use and private institutions and private recreation facilities as uses requiring a permit (County, 2012). The proposed project does not propose the development of residential units or uses requiring a permit. No impacts would occur.

c) **No Impact.** The project site is not located within an area covered by a habitat conservation plan or natural community conservation plan. No impacts would occur.

3.12 MINERAL RESOURCES

Will the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Result in the loss of availability of a known mineral resource that will be of value to the region and the residents of the state?				✓
b. Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?				✓

DISCUSSION:

a-b) **No Impact.** Humboldt County's current mineral resource production is primarily limited to sand, gravel, and rock. Mines and quarries in Humboldt County primarily produce shale and quarry stone used for structural applications. There are no mineral resources located in the vicinity of the project site. In addition, the site has been historically used as a burn dump. No impacts would occur.

3.13 NOISE

Will the project result in:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?		✓		
b. Exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels?			✓	
c. A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?				✓

d. A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?		✓		
e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, will the project expose people residing or working in the project area to excessive noise levels?				✓
f. For a project located within the vicinity or a private airstrip, will the project expose people residing or working in the project area to excessive noise levels?				✓

DISCUSSION:

a, d) **Less-than-significant impact with mitigation incorporated.** The project is located within the County of Humboldt and is zoned RS. The County of Humboldt does not have a noise ordinance and specifically does not have an ordinance pertaining to short-term construction noise. The County of Humboldt General Plan Update dated April 2012 does identify the maximum short-term noise standards (Lmax) for a property zoned residential as 65 dBA during daytime hours (6:00 a.m. to 10:00 p.m.) (County, 2012c). The County's General Plan does not specify construction-specific noise standards and the County's General Plan Update EIR dated April 2012 specifies that a Noise Control Ordinance be prepared. The county does not have a Noise Control Ordinance.

General construction activities associated with earth-moving equipment generate maximum noise levels of 85 dB to 90 dB at a distance of 50 feet. Typical hourly average construction-generated noise levels are about 80 dB to 85 dB measured at a distance of 50 feet from the site during busy construction periods. Noise levels drop off at a rate of about 6 dB per doubling of distance between the noise source and receptor. Intervening structures or terrain would result in lower noise levels (County, 2012b).

There are sensitive receptors located within 100 feet to the north and east of the project site, the distance at which construction noise could be potentially significant. These receptors include residential buildings. It is anticipated that construction activities would be short-term and only occur during daytime hours of summer 2013. The majority of construction and earth-moving activities would occur along the southern slope of the property (see Figure 3) which is further away from sensitive receptors and faces away from nearby sensitive receptors.

Implementation of **Mitigation Measure N-1** would control construction noise and ensure that construction-related noise impacts are reduced to less than significant at adjacent sensitive receptors near the project site. **Mitigation Measure N-1** would require the construction contractor to implement additional measures, including the implementation of a noise attenuation plan and provisions for providing notification of allowed construction schedule and procedures for handling noise complaints. It is expected that with the incorporation of the applicable mitigation measure**,** construction-related noise impacts would be reduced to less-than-significant levels.

N-1: The Construction Contractor shall implement, to the satisfaction of the County of Humboldt and to the greatest extent feasible, the following measures to ensure that, during construction, construction noise would be reduced by the greatest extent feasible when within 100 feet of a residential use or sensitive receptor:

- Construction activities shall occur during daytime hours only on Monday through Saturday, except holidays, from 6:00 a.m. through 10:00 p.m.
- Construction contracts shall specify that all construction equipment, fixed or mobile, shall be equipped with properly operating and maintained mufflers and other State required noise attenuation devices.
- All construction equipment shall use the best available noise suppression devices and properly maintained mufflers. All internal combustion engines used in the project area shall be equipped with the type of muffler recommended by the vehicle manufacturer. In addition, all equipment shall be maintained in good mechanical condition to minimize noise created by faulty or poorly maintained engine, drive-train, and other components.
- Construction noise reduction methods (i.e., shutting off idling equipment, installing temporary acoustic barriers around stationary construction noise sources, maximizing the distance between construction equipment staging areas and occupied residential areas, and use of electric air compressors and similar power tools, rather than diesel equipment) shall be employed where feasible. Staging of construction equipment and unnecessary idling of equipment shall be avoided whenever feasible. "Feasible," as used here, means that the implementation of this measure would not have a notable effect on construction operations or schedule.
- Property owners and occupants located within 100 feet of the construction site shall be sent a notice, at least 15 days prior to commencement of construction, regarding the construction schedule of the proposed project. A sign, legible at a distance of 25 feet shall also be posted at the project construction site. All notices and signs shall be reviewed and approved by the City, prior to mailing or posting and shall indicate the dates and duration of construction activities, as well as provide a contact name and a

telephone number where residents can inquire about the construction process and register complaints.

- During construction, stationary construction equipment shall be placed such that emitted noise is directed away from sensitive noise receptors.
- During construction, stockpiling and vehicle staging areas shall be located as far as practical from noise sensitive receptors.
- The contractor shall develop and implement a construction noise attenuation plan to reduce noise-related impacts to nearby sensitive receptors to the degree feasible.
- Signs shall be posted at the construction site that includes permitted construction days and hours and a contact number for noise complaints.

b) **Less-than-significant impact.** Typically, pile driving, blasting, and other special construction techniques typically cause ground vibration and groundborne noise. These construction techniques would not be used during construction activities. Impacts related to ground vibration and groundborne noise during construction would be less than significant.

c) **No impact.** The project does not propose any operational uses. Project-related construction activities would be short-term in nature and would therefore not create a substantial permanent increase in ambient noise levels. Thus, no impact would occur.

e-f) **No impact.** The Rohnerville Airport is located within two miles southwest of the project site. However, the proposed project is not located within the Rohnerville Airport Master Plan land use compatibility zones. Thus, no impact would occur.

3.14 POPULATION AND HOUSING

Will the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?				✓
b. Displace substantial amounts of existing housing, necessitating the construction of replacement housing elsewhere?				✓

Will the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
c. Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?				✓

DISCUSSION:

a-c) **No Impact.** The proposed project would entail the placement of a two-foot soil cap, and vegetation maintenance program. Therefore, the project would not induce population growth. No homes or people would be displaced as a result of the proposed project.

3.15 PUBLIC SERVICES

a) Will the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the following public services:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
i. Fire Protection?				✓
ii. Police Protection?				✓
iii. Schools?				✓
iv. Parks?				✓
v. Other public facilities?				✓

DISCUSSION:

a-e) **No Impact.** The primary purpose of the proposed project is to place a soil cap and revegetate the project site. The project would not create the need for new or altered government facilities associated with fire and police protection, schools, and parks. No impacts would occur.

3.16 RECREATION

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Will the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facilities will occur or be accelerated?				✓
b. Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?				✓

DISCUSSION:

a-b) **No Impact.** The proposed project would not induce population growth or result in any demographic changes in the community. Therefore, it would not increase the use of existing parks or require the construction or expansion of existing recreational facilities. The proposed project does not include the construction of recreational facilities.

3.17 TRANSPORTATION/TRAFFIC

Will the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?		✓		
b. Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?		✓		
c. Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?				✓

Will the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
d. Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?				✓
e. Result in inadequate emergency access?				✓
f. Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?				✓

DISCUSSION:

a, b) **Less-than-significant impact with mitigation incorporated.** The project site would not generate operational vehicle trips traffic and would not impact existing or future levels-of-service at intersections, or conflict with applicable policy or congestion management programs. No operational traffic impacts would occur.

The proposed project would be constructed in the summer of 2013. Implementation of the proposed project would include the import of soil for the soil cap. Approximately 11,000 CY of imported soil would be required for the two-foot soil cap. The source for imported soils has not yet been determined. There would likely be multiple sources for this material. Therefore, it is likely that varying quantities of material would be imported at different times.

The anticipated route to deliver the imported soil material would be U.S. Route 101, exiting Kenmar Road eastbound, turning south onto Ross Hill Road, and continuing on School Street which becomes Mill Street. From Mill Street there is direct access to the project site.

All construction activity would occur within the project site; refer to Figure 3, above. No long-term parking on surface streets is anticipated for soil haul trucks. However, the presence of large and slow moving vehicles and construction equipment in the project vicinity may cause delays and inconvenience for motorists. Therefore, **Mitigation Measure TR-1** is proposed which would be required the implementation of a Construction Traffic Control Plan to minimize impacts on surrounding roadways and nearby parking areas. With implementation of this mitigation measure, potential impacts would be reduced to a less–than-significant impact.

TR-1: Prior to the commencement of construction activities, CalRecycle shall prepare a Construction Traffic Control Plan that would need to be approved by the City of Fortuna Public Works Department and the County of Humboldt Public Works Department. The Construction Traffic Control Plan shall include the following:

- Construction-related truck traffic shall be scheduled to travel during non-peak hours (8:30 a.m. to 4:00 p.m.) on surrounding roadways.
- Proposed routing for all delivery and haul trucks shall be identified. To the extent feasible, truck routing shall avoid or minimize travel through residential areas.
- Notification shall be sent to all neighboring property owners two working days in advance of beginning work. The notice shall describe the anticipated duration of construction, and the name and daytime telephone number of the person performing the work, as well as the CalRecycle project manager.

c) **No Impact.** The Rohnerville Airport is located within two miles southwest of the project site. The project site is not located within the Rohnerville Airport Master Plan Land Use Compatibility zones. Therefore, the project would have no impact on air traffic patterns.

d-f) **No Impact.** The project would reduce the potential environmental and personal health and safety risks, such as exposure to damaged and dilapidated large glass and metal objects, unstable slopes, landslide potentials, and contamination. The purpose of the project would be to reduce and hopefully eliminate the existing environmental hazard to the public. The project would not increase hazards, result in inadequate emergency access, or conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities. Therefore, the proposed project would have no impact.

3.18 UTILITIES AND SERVICE SYSTEMS

Will the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?				✓
b. Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				✓

Will the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
c. Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				✓
d. Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?				✓
e. Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?				✓
f. Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?				✓
g. Comply with federal, state, and local statutes and regulations related to solid waste?				✓

DISCUSSION:

a) **No Impact.** The project site is in the jurisdiction of the North Coast Regional Water Quality Control Board. The proposed project would be in compliance with all applicable water quality standards and waste discharge requirements. The project would require a 401 Certification before work commences. No impacts would occur.

b) **No Impact.** The proposed project would not require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities. No impact would occur.

c) **No Impact.** Although the project does propose the construction of stormwater runoff drainage facilities to redirect water runoff to the perimeter of the soil cap to prevent erosion, the construction of these drainage features would not cause significant environmental effects. Therefore, it is anticipated that the construction of these drainage features would result in no impact.

d-e) **No Impact.** The proposed project would not generate the demand for new water supplies or wastewater treatment. No impacts would occur.

f-g) **No Impact.** No construction debris or other solid waste would be generated as a result of the proposed project. As a result, the project would not conflict with any applicable federal, state, or local statutes and regulations, and no impact would occur.

3.19 MANDATORY FINDINGS OF SIGNIFICANCE

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or wildlife community, reduce the number or restrict the range of an endangered, rare or threatened plant or wildlife, or eliminate important examples of the major periods of California history or prehistory?		✓		
b. Does the project have impacts that are individually limited, but cumulatively considerable? (“Cumulatively considerable” means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?			✓	
c. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?			✓	

DISCUSSION:

a) **Less-than-significant impact with mitigation incorporated.** The proposed project would not degrade the quality of the environment. The proposed project would not substantially reduce habitat of fish or wildlife species or other special-status species as the no operational uses are proposed. Upon construction completion, the project site would have a two-foot soil cap with an established vegetative cover to prevent erosion. There are no sensitive habitats located on the project site. There are wetlands located along Mill Creek as identified in Appendix C and special-status species evaluated in the 2009 biological survey include the northern red-legged frog, foothill yellow-legged frog, the Cooper’s hawk, and the sharp-shinned hawk. All four species have a medium to high potential to occur on the project site and are not federally or state-listed species under the federal Endangered Species Act or the California Endangered Species Act, but rather CDFW species of special concern or on CDFW’s Watch list. The site-specific 2009 and

2012 biological surveys indicated that special-status birds could potentially nest in trees on the project site. As some immature trees may be removed, the proposed project would implement **Mitigation Measures BIO-1 and BIO-2**, which require preconstruction nesting bird surveys and other measures, if construction occurs during the typical avian nesting season or within the frog habitat. Implementation of these measures would reduce the potential impact on special-status species and birds to a less-than–significant level.

The proposed project would not eliminate important examples of the major periods of California history. The project site does not have any structures registered on the California Register of Historical Resources or structures considered “historically significant” under CEQA. Additionally, while it is not anticipated that human remains would be encountered, **Mitigation Measure CR-2** would be implemented to ensure that impacts related to inadvertent discovery of human remains would be reduced to less-than–significant levels.

b) **Less-than-significant impact.** The project proposes short-term construction activities and does not propose an operational use. The short-term nature of the project would not be considered cumulatively considerable.

c) **Less-than-significant impact.** The proposed project does not have environmental effects which would cause substantial indirect or direct adverse effects on humans.

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APPENDICES

Appendix A: Geologic and Geotechnical Investigation

Appendix B: Air Quality Memorandum

Appendix C: Biological Addendum

Appendix D: Cultural Resources Report

Appendix E: Public Notice, Comments Received, and Summary of Changes

Appendix F: Mitigation Monitoring and Reporting Program

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APPENDIX A

GEOLOGIC AND GEOTECHNICAL INVESTIGATION

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GEOLOGIC AND GEOTECHNICAL STUDY
FORTUNA DUMP SITE
Fortuna, California

Prepared for
CalRecycle
1001 I Street, MS #101A-1
Sacramento, California 95812-4025

February 13, 2012

URS Corporation
100 West San Fernando Street, Suite 200
San Jose, California 95113

URS

February 13, 2012
URS Project 28645325

Mr. Mustafe Botan, P.E.
Waste Management Engineer
Solid Waste and Tire Cleanup Programs
CalRecycle
1001 I Street, MS #10A-18
Sacramento, California 95812-4025

Subject: Geologic and Geotechnical Engineering Study
Work Order DRR100007-B4
Fortuna Dump Site
Fortuna, California

Dear Mr. Botan:

URS is pleased to submit this report presenting the results of our geologic and geotechnical engineering study for the Fortuna Burn site at the Mill Street Dump in Fortuna, California. This study was performed to provide support for the capping design of the existing burn dump. This report presents a summary of the findings from our site and subsurface exploration at the site, as well as our opinions and conclusions regarding soil cap placement.

We are pleased to be of service to CalRecycle on this project. Please call us if you have any questions regarding this report.

Sincerely,

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In this report we present the results of our geologic and geotechnical investigations and engineering analyses for the existing Fortuna Mill Street Burn Dump site located at 4498 Mill Street in Fortuna, California. This report includes the results of our geologic data review and site reconnaissance, the logs of seven test pit explorations excavated in June 2011 during our preliminary geologic investigation and the logs of eight geotechnical borings completed in October 2011 during the final investigation to evaluate the depth and subsurface conditions of a landslide complex at the site.

1.1 PROJECT DESCRIPTION

The Fortuna Burn Dump is located approximately 0.8 mile east of the community of Rohnerville, City of Fortuna, Humboldt County, California as shown on the Project Location map, Figure 1. The site is located in Section 7, Township 2 North and Range 1 east of the Hydesville 7½-minute quadrangle with a latitude of N40.566 degrees and a longitude of W124.100 degrees (NAD 83). The site is described by Humboldt County Assessor's Parcel Number (APN) 202-321-13, and is zoned rural residential. The parcel is approximately 9 acres, and the inactive disposal site covers approximately 5.6 acres of a moderate to steep south and southwest facing hill slope, which extends down to the edge of Mill Creek.

The site was operated as a burn dump as early as the mid 1950s until 1972. The waste was deposited and burned at the top of the landfill. Any remaining material after burning was pushed down the hill onto the slope below. The slope currently consists primarily of non-combustible debris, i.e. glass, metal, ceramic, and burn ash. There are also scattered household appliances, tires, and car bodies along the slope.

In 1972 the site ceased operation as a burn dump and became a transfer station. All waste disposal/processing activity ceased at the site as of May 1, 1987. No closure plan was prepared for the site.

CalRecycle is studying the feasibility of placing a 2- to 3-foot-thick soil cap overlying approximately 6 acres of the exposed waste and burn ash material extending down the slopes to the edge of Mill Creek to prevent erosion of the waste into and/or by Mill Creek.

1.2 SCOPE OF WORK

This investigation included the following tasks:

- Review of available geologic maps, reports and historic stereo-paired aerial photographs;
- Preparation of a site-specific health and safety plan;
- Perform a geologic site reconnaissance and prepare a geologic map of the site;
- Excavate seven backhoe test pits during the preliminary investigation to evaluate depth of waste fill and characterize the underlying formational materials;
- Drill eight exploratory borings during the final investigation to investigate a suspected landslide complex at the site and obtain representative soil samples for laboratory testing;
- Complete laboratory testing on selected soil samples from the test pits and borings;
- Prepare four geologic profiles/slope cross-sections based on results of the site investigations;

- Evaluate geologic and seismic hazards impacting the proposed slope after construction of the soil cap;
- Analyze the stability of the existing slope with the proposed 2- to 3-foot-thick cap for pseudo-static conditions, and develop geotechnical recommendations for support of the slope including buttress fill, grading and tiebacks; and
- Prepare a final geotechnical and geologic report.

1.3 PREVIOUS INVESTIGATIONS AND DATA REVIEW

A previous subsurface investigation was completed at the site by Ninyo & Moore, and the results were presented in a report prepared by the California Integrated Waste Management Board dated January, 2007. Ninyo & Moore completed 23 test pit excavations primarily within the limits of the existing burn dump material to evaluate the depth and aerial limits of the waste fill. Samples were also obtained from the waste fill for analytical testing. A site plan was prepared showing the estimated limits of the waste fill along with approximate depths of the fill. Four cross-sections through the fill, A-A', B-B', C-C' and D-D', were also prepared. The locations of the test pits and aerial extent of the waste fill as mapped by Ninyo & Moore are shown on the Site Plan and Geologic Map, Figure 2. Based on the investigation by Ninyo & Moore (2007), hazardous materials primarily in the form of heavy metals are present within the burn dump on the site.

During this study, we reviewed available geologic and seismic hazards maps published by the California Geological Survey (CGS) and the U.S. Geological Survey (USGS). These include regional and local geologic and fault maps as listed in the References Section 10 of this report. The Humboldt County General Plan (2008) was also reviewed to assess slope stability and liquefaction potential hazards of the project area. A review of historic stereo-paired aerial photographs was also completed as discussed in Section 2 of this report.

2.1 SITE HISTORY

According to records obtained from Humboldt County Department of Environmental Health, the site was operated as a burn dump at least as early as the mid 1950s. IT Corporation reported disposing of 50,000 gallons of petroleum waste tank bottom sediment, oil and water at the site from 1955 to 1960. From 1959 to May 1972, Eel River Garbage Company disposed of municipal solid waste at the site. The waste was deposited and burned at the top of the landfill. Any remaining material after burning was pushed down the hill onto the slope below. The slope currently consists primarily of non-combustible debris, i.e. glass, metal, ceramic, and burn ash. There are also scattered household appliances, tires, and car frames and bodies along the slope.

In 1972 the site ceased operation as a burn dump and became a transfer station. All waste disposal/processing activity ceased at the site as of May 1, 1987. No closure plan was prepared for the site.

2.2 AERIAL PHOTOGRAPHY REVIEW

We reviewed historic stereo-paired aerial photographs at the California Geologic Survey field office located on Kampton Road in Eureka, California. Each set of photographs were reviewed with a magnifying stereoscope to document the activities at the site and to evaluate geomorphic features indicative of possible ancient landslides and other geologic features. The features that we studied included drainage patterns, anomalous vegetation, identifying arcuate scarps or other abrupt changes in slope angle, lineations, tonal contrasts, and any signs of excessive groundwater or poor drainage.

The following aerial photographs were reviewed:

Date	Approximate Scale	Flight Line Number	Photograph Number
12-13-40	1:24,000	GRS 7	165 & 166
6-23-48	1:24,000	CDF2-16	85 & 86
8-3-54	1:24,000	CVL-13N	67 & 68
8-15-63	1:12,000	HC-S-2-3	16-55 & 16-56
6-18-88	1:24,000	WAC-88CA	18-92 & 18-93

Both the 1940 and 1948 photographs show no evidence of dump activity. Most of the site has been logged, leaving a strip of trees along the northeast margin of Mill Creek and a larger patch of trees in the southeast corner of the property. A few isolated trees remain in the central portion of the site. Due to the scale of the photographs (1 inch=2,000 feet) it is difficult to make out details of the topography. The 1954 photographs are similar to the 1940 and 1948 photographs with no evidence of dump activity, however small shrubs and trees have reestablished over most of the site. The 1963 photographs have the best scale (1 inch=1,000 feet) and indicate logging activities have been completed since 1954 to include most of the trees along Mill Creek except for a small triangular area in the southeast corner of the site. A few isolated trees also remain in the central portion of the site. Logging of the trees on the adjacent property across Mill Creek southwest of the site has also taken place. Two burn piles are evident near the top of the slope and some car bodies and other debris are scattered across the site. Evidence of an ancient landslide indicated by steep head scarps, hummocky topography and displacement of Mill Creek are evident on this photograph set. The 1988 photographs show no recent evidence of dump activity. Small trees and shrubs are starting to reestablish on the site and the property across Mill Creek has been replanted and has a well-established second growth of redwoods.

3.1 REGIONAL GEOLOGY

The project site is located within the western margins of the Coast Ranges geomorphic province characterized by north to northwest trending mountains and intervening valleys. The project site is mapped along the northern limb of a west striking anticline that roughly follows the axis of the Van Duzen River about 3 miles south of the site (McLaughlin, et al, 2000). A regional geologic map of the project vicinity is presented in Figure 3. Sedimentary deposits mapped in the project area include late Pleistocene to Miocene marine and non-marine siltstone, sandstone, mudstone, conglomerate and volcanic ash of the Wildcat Group overlain by middle to late Pleistocene terrace deposits of the Hookton Formation, consisting of well to poorly sorted, gently folded sand, gravelly silt, clay and conglomerate (Kilbourne, 1985). These deposits are in turn overlain locally by residual soils, colluvium, alluvium and landslide deposits. As shown on Figure 2, the Hookton Formation underlies the project site with alluvium mapped along Mill Creek. A landslide is mapped along the steep south and southwesterly facing slope of the site based on the site geologic mapping and review of aerial photographs and the results of our subsurface investigations. Shallow waste fill also underlies much of the site, overlying the Hookton Formation and landslide deposits. Regional mapping (McLaughlin, et al, 2000 and Kilbourne, 1985) shows that the Hookton Formation dips 5 to 15 degrees to the north and northeast in the project area.

No landslides have been mapped on the site by the CGS (Kilbourne, 1985) or the USGS (McLaughlin, et al, 2000). The Humboldt County General Plan Update (2008) Seismic Safety Map (Figure 4) shows the formations underlying the site as having a "moderate" instability in regards to slope stability.

3.2 REGIONAL SEISMICITY

Humboldt County is located in one of the most seismically active regions of the state and the site can be expected to experience periodic minor earthquakes and possibly a major earthquake (Moment Magnitude, M_w, 7 or greater) on one of the nearby active faults during the life of the proposed project. The site will be subject to strong to very strong shaking during a large event on the nearby faults.

The area near Cape Mendocino is a complex, seismically active region where three crustal plates, the Pacific Plate, the Gorda Plate, and the North American Plate intersect to form the Mendocino Triple Junction. The subducting Gorda and Juan de Fuca Plates form the "Cascadia Subduction Zone" which runs north offshore of northern California, Oregon and Washington. Recent investigations have shown that this system has generated a series of great earthquakes (magnitude 8 to 9) over the past 20,000 years at 300 to 500 year intervals with the most recent event occurring about 300 years ago. The seaward edge of the Cascadia Subduction Zone is mapped about 30 miles west (offshore) of the project site (Jennings, 1994).

No active or potentially active faults have been mapped on the project site (Kilbourne, 1985; Jennings, 1994; McLaughlin, et al). The State of California has established Earthquake Fault Zones by the Alquist-Priolo (AP) Earthquake Fault Zoning Act of 1972 (Hart and Bryant, 1997). The nearest AP zoned fault is the Little Salmon fault, located about 4,900 feet northwest of the site. An AP zoned branch of the fault is also located about 5,600 feet southeast of the site. Other nearby faults included as potential fault rupture hazard zones by the Humboldt County General

Plan, shown on the Seismic Safety Map (Figure 4 of this report) include the Ferndale (Goose Lake) fault and the Russ fault, located about 2.3 and 6.2 miles southwest of the site, respectively.

4.1 SITE RECONNAISSANCE AND GEOLOGIC MAPPING

A geologic site reconnaissance was completed by Mark Schmoll, C.E.G. on June 14 and 15, 2011, before and during the excavation of seven backhoe test pits. A review of the previous investigation by Ninyo & Moore (2007) along with a review of available published geologic reports and maps was made prior to the site reconnaissance. During the geologic mapping, the location of the test pits were staked in the field and natural and man-made exposures of the underlying Hookton Formation terrace deposits were observed. Other features such as the limits of the burn waste, structures and site topography were also observed and the results of the aerial photography review were field checked. The results of the geologic mapping showing the estimated limits of alluvium, landslide deposits and the Hookton Formation are presented on Figure 2. This map is based on the results of the site geologic mapping and the results of the test pit investigations and the borings completed by URS for this study.

4.2 SURFACE CONDITIONS

The site is located on a gently to moderately steep south to southwest sloping hillside that extends to the edge of the northwest flowing Mill Creek. Mill Creek drains into Strongs Creek, and then into the Eel River about 3 miles northwest of the site. Access to the site is off of Mill Street along a paved driveway which passes two residential properties. The topography of the site has been extensively modified due to logging skid roads and dump activities, which has resulted in spreading burn refuse across much of the site and the grading of access roads. Elevations of the site range from about 450 feet near the northeast corner to 290 feet at the northwest corner along Mill Creek.

Remnants of the old burn dump are evident across much of the site as glass, ceramic and metal, as well as scattered car bodies, old water heaters, washing machines and other appliances. Stacks of wood, logging equipment and earth moving equipment are also stored at the site near the top of the slope. Second growth redwood trees, shrubs and ferns cover the lower portion of the site along Mill Creek. A few large trees are also scattered throughout the site as well as a few large diameter stumps from the old growth redwoods previously logged. Mill Creek forms a flat wetland area ranging from 10 to 15 feet wide to over 50 feet in width. Riparian vegetation including skunk cabbage, willows and reeds cover the creek bottom. A small amount of water was flowing in the creek during the site investigations in both June and October.

4.3 SITE EXPLORATION

Our site exploration consisted of excavating seven backhoe test pits and eight exploratory borings . Figure 2 shows the approximate locations of the borings and test pits and the locations of our geologic cross-sections. Cross Sections A-A', B-B', C-C' and D-D' are shown on Figures 5 through 8, and illustrate the idealized stratigraphy beneath the site based on results of the subsurface explorations and geologic mapping.

4.3.1 Test Pits

Seven backhoe test pits, TP-1 through TP-7, were excavated and logged on June 14 and 15, 2011, to depths of 4 to 11 feet below the ground surface (bgs). Figure 2 shows the approximate locations of the exploratory test pits. The test pits were excavated by Pacific States Environmental Contractors of Dublin, California using a track-mounted excavator with a 24-inch bucket. Test pits TP-1 through TP-4 were completed on June 14, 2011 with a Cat 308C excavator. After the completion of TP-4 the track on the excavator slipped off while traversing a steep slope and could not be repaired during the remainder of the day. On June 15, a Takeuchi TB175 excavator was delivered to the site to complete the remaining three test pits, TP-5 through TP-7.

Underground Service Alert (USA) was contacted by Humboldt County Environmental Health Division 48 hours before start of work to mark any underground utilities. No utilities were marked on the site property. Mark Johnson, Humboldt County Environmental Health Division, Environmental Health Specialist, was on site during all test pit excavations and geologic mapping, and opened and closed the gate to the site each day. Procedures for excavating the test pits were performed in accordance with the Site Health and Safety Plan, and a combined oxygen and combustible gas meter was used to monitor air quality during all test pit excavations. No indications of oxygen deficiency or combustible gas were measured. No sampling or handling of the excavated burn dump material was done, and nitrile gloves were used to handle and sample the underlying formational soils. No personnel entered the test pits excavated into the burn dump material, and no test pits outside of the burn dump limits were entered that were greater than 4 feet in depth. At the completion of logging each test pit, the soil was replaced in the same order it was excavated; the materials were not compacted. Each test pit was staked and flagged at completion of backfilling and later surveyed for location and elevation.

Test pit logs are presented in Appendix A.

4.3.2 Borings

Eight exploratory borings were completed to depths of 26 to 42 feet bgs between October 4 and 6, 2011, to characterize subsurface conditions in the lower areas of the landslide. A boring permit was obtained prior to exploration from Humboldt County Department of Environmental Health. The borings were advanced using a track-mounted DB-320 sonic drill rig with a 4-inch bit by Boart Longyear of Upland, California. The boring locations are shown on Figure 2. Borings B-4A and B-5A were drilled adjacent to Borings B-4 and B-5, respectively; these borings were drilled to obtain drive samples and Shelby tube samples at depths determined from review of cores collected in Borings B-4 and B-5. No individual log of Boring B-4A was made as the soils encountered in this boring were similar in classification and depth as those obtained in Boring B-4.

Borings were logged by URS geologist Ben Kozlowicz and reviewed by David Simpson, C.E.G. Drive samples were obtained from Borings B-4A, B-5, and B-5A using a 2-inch diameter (outside diameter) split spoon sampler; 2.5-inch diameter (inside diameter) Shelby tubes were pushed at selected locations to obtain samples of fine-grained soil for strength testing. In accordance with the Site Health and Safety Plan, a combined oxygen and combustible gas meter was used to monitor air quality during drilling of the borings. No indications of oxygen deficiency or combustible gas were measured.

Core samples were selected from the 4-inch sonic core for laboratory testing and the remaining sonic core was laid next to each boring (to the side of the access road) and covered with black plastic. The cores were later moved to the upper flat portion of the site and were covered with plastic sheeting. Other than soil samples collected from the cores, the core samples were left at the site. Improvement to existing roads and new access roads and drill pads for the boring sites were created with a Caterpillar D-6 bulldozer on September 29, 2011. Due to rain and wet conditions between October 4 and 6, the access roads had to be repeatedly cleared of mud with the D-6. Borings were backfilled with bentonite chips at the completion of drilling. Boring logs are presented in Appendix B.

4.4 LABORATORY TESTING

Representative soil samples obtained from the exploratory borings and test pits were tested at URS' San Jose geotechnical laboratory and at Signet Testing Laboratories to evaluate soil engineering properties for use in engineering analyses. Laboratory tests included moisture content, dry density, Plasticity Index (PI), unconfined compressive strength, and consolidated undrained triaxial compression (TXCU).

The results of the laboratory tests are presented on the boring logs at the corresponding sample depths. In addition, laboratory test results are presented graphically in Appendix C.

4.5 SUBSURFACE CONDITIONS

4.5.1 Local Geologic Units

The site geology discussed in the following sections is based upon the site reconnaissance by Mark Schmoll, C.E.G., on a review of the earth materials encountered in our test pit and boring explorations and our review of previous geologic maps and aerial photographs.

The approximate aerial limits of the mapped materials are shown on Figure 2.

4.5.1.1 Waste Fill (wf)

Waste fill consisting of dark brown silty to clayey sand mixed with ash, glass, metal, ceramic, and other non-combustible debris was encountered in Test Pits TP-1, TP-2 and TP-7 to depths of 3 to 7.5 feet. Borings B-2, B-4 and B-4A, and B-5 and B-5A also encountered waste fill to depths of 2 to about 8.5 feet. Waste fill was expected in Test Pits TP-4 and TP-5 where debris such as water heaters and car bodies were observed on the surface and waste fill was previously mapped by Ninyo & Moore (2007), however these locations were underlain by native soils. The limits of the waste fill in these areas shown on Figure 2 have been modified from the original Ninyo & Moore study.

4.5.1.2 Topsoil and Colluvium (not mapped)

Topsoil consisting of silty to clayey sand mixed with abundant roots, wood debris and other organics (duff) overly the site in areas not previously disturbed. Topsoil ranging from 1 to 2 feet in thickness were encountered in Test Pits TP-3 through TP-6 and in Boring B-1. Colluvium consisting of dark brown to yellowish brown silty sand with gravel and firm to soft, gray to yellowish brown clay was encountered in Test Pits TP-2 and TP-7 directly underlying the waste fill and in all of the borings except Borings B-5 and B-5A. The colluvium ranged from 0.5 to 11 feet in thickness. The colluvium may also include some formational materials that were disturbed during grading of the waste fill or fill used to make the drill pad for Boring B-3.

4.5.1.3 Alluvium (Qal)

Alluvium was not encountered in any of the test pits or borings since environmental restrictions prevented entering the wetland area of Mill Creek with equipment. Alluvium is mapped along the creek bottom as shown on Figure 2. This material consists of an estimated 5 to 10 feet of loose, silty sand and soft clay with gravels.

4.5.1.4 Landslide Deposits (Qls)

Based on a review of the stereo-paired aerial photographs and results of the test pit and boring exploration program, we mapped a landslide complex along the lower slopes of the site extending down to Mill Creek as shown on Figure 2. Topographic and surface indications of this landslide include relatively steep head scarp features near the top of the landslides, hummocky topography within the landslide mass and an apparent displacement of Mill Creek. Leaning redwood trees near the top of the steep slope along the eastern property boundary also indicate active slope movement in this area. All of the test pit excavations and borings are within the mapped landslide area. Landslide materials encountered in the borings and test pits consist of dry to wet silty sand, silt and lean to fat clay with occasional gravel, cobbles and boulders. Suspected landslide slip plane surfaces were encountered in all of the borings, consisting of a lean to fat clay layer ranging from about 1 foot thick to greater than 5 feet thick. These clay layers often contained slickensided polished surfaces, indicating landslide movement, and often contained or were underlain by woody debris or charcoal, indicating the landslide over-rode vegetation during movement. The depth of the landslide ranges from as little as 9 feet as encountered in Boring B-1 to as much as 31 to 32.5 feet as encountered in Borings B-2 and B-6, respectively. The geologic profiles shown on Figures 5 and 6 show our interpretation of the landslides depths based on results of the borings and geologic mapping. The depth of the landslide at the toe is controlled in-part by the elevation of Mill Creek.

Due to the extensive modifications to the topography at the site from previous logging activities and operation of the burn dump, the aerial limits of the mapped landslides are only approximate.

4.5.1.5 Hookton Formation (Qh)

The middle to late Pleistocene terrace deposits of the Hookton Formation underlie the project site except where covered by waste fill, alluvium and landslide deposits. The Hookton Formation is described as well to poorly sorted, gently folded unindurated sand, gravel, silt and clay (Kilbourne, 1985). The formation is described as being subject to debris slides, earthflows and rotational slumping. The Hookton Formation at the site is essentially the same as the landslide material encountered in the test pits, from which the landslide is derived. A few limited outcrops of the Hookton Formation observed outside of the landslide area consist of stiff to hard, yellowish brown sandy lean clay and clayey conglomerate. The Hookton Formation materials encountered in the borings consist of dense silty sand and sandy silt with gravel, clayey gravel and poorly graded gravel with sand and silt.

4.5.2 Exploratory Borings

The following is a detailed description of the materials encountered at each boring location.

Boring B-1 encountered approximately 1 foot of topsoil consisting of very dark brown, very loose silty sand with clay and abundant roots and organic debris, underlain by about 5 feet of dark yellowish brown sandy silt with rounded gravel up to 1 inch, interpreted as colluvium/landslide material. From 6 to 8 feet below ground surface (bgs), hard, fat clay was encountered. This zone is interpreted as an old slide plane. From 9 to 35 feet bgs, the terminal depth of this boring, the boring encountered dry sandy silt and silty sand with rounded gravel up to 2 inches, interpreted as in-situ Hookton Formation.

Boring B-2 encountered 2 feet of dry silty sand with gravel fill and burn debris underlain by approximately 22 feet of hard sandy silt to silty sand with traces of small root and burn debris (likely slough), interpreted as colluvium/landslide material. At approximately 24 feet bgs, an approximately 1-foot-thick horizon of stiff, moist, dark gray fat clay was encountered, followed by 3 feet of hard sandy silt. From 28 to 32 feet bgs, slide plane material consisting of hard, very dark gray, fat clay with slickensides was encountered. Below the slide plane to the bottom of the boring at 42 feet was hard silt and silty sand with gravel of the Hookton Formation.

Boring B-3 encountered 11 feet of colluvium/slide material consisting of silty sand with gravel. Slide plane material consisting of clay was encountered from 11 to 20 feet bgs, with a sandy, gravelly zone from 13 to 18 feet. Very soft greenish gray clay was encountered at 11 feet bgs and became olive brown, sandy and gravelly at 13 feet. At 16 feet bgs the material returned to greenish gray with abundant roots and wood up to 2 inches; this material became very dark gray at 19 feet with charcoal/burned wood and small roots. Two slide planes were identified in the clay zones at approximately 12 and 18 feet bgs. From 21 to approximately 23 feet bgs, greenish gray clayey sand and gravel was encountered, becoming yellowish brown sandy gravel at 23 feet and brownish yellow silty sand with gravel from 31 feet to the bottom of boring at 35 feet, interpreted as in-situ Hookton Formation from 23 feet bgs.

Borings B-4 and B-4A encountered approximately 8 feet of fill consisting of glass, rusted metal and ash, and sand and gravel. Beneath this was about 1 foot of colluvium/slide debris consisting of yellowish brown silty sand with gravel. Soft greenish gray clay with abundant wood and bark was encountered from 10.5 to 16 feet bgs, becoming sandy and gravelly at 14 feet. This zone is interpreted as an active slide plane. Shelby tube samples were attempted in Boring B-4A at 11.5 and 14.5 feet; at 11.5 feet the sample tube was plugged by redwood and had no recovery, and at 14.5 feet the sample recovered approximately 24 inches of material. From approximately 16 feet to the bottom of hole at 26.5 feet, dense to very dense clayey gravel with sand interpreted as Hookton Formation was encountered. The SPT sampler driven at a depth of 25 feet in Boring B-4A met refusal criteria in the final 6-inch driving increment.

Boring B-5 encountered similar conditions as B-4/B-4A, with waste fill and clayey sand and gravel from the surface to approximately 8 feet and soft slide plane clay from 13 to 17 feet, becoming sandy and gravelly at 15 feet bgs. The slide plane was encountered at a depth of 9 to10 feet bgs in Boring B-5A, located 5 feet west of Boring B-5, possibly indicating a slope to the east slide plane in this area. Shelby tube samples were attempted at 10 and 12.5 feet in Boring B-5A, with no recovery from the 10 foot sample. In both borings, material encountered below the slide plane was very dense gravel with sand and clay to the bottom of borings at 26.5

feet. SPT samples driven at 25 feet bgs in both borings met refusal for the last interval of driving and recovered rock fragments sheared by the sampler.

Boring B-6 encountered 4.5 feet of gravelly topsoil/colluvium, followed by 5.5 feet of sandy silt. At 8 feet bgs, the sandy silt gradually increased in plasticity to olive and reddish brown stiff lean clay from 10 to 11.5 feet, interpreted as a potential slide plane. From 11.5 feet to 23.5 feet bgs, Hookton Formation landslide debris was encountered consisting of massive silt, sandy silt and silty sand with gravel. At 23.5 feet, the material became stiff to very stiff, strong brown/olive laminated lean clay which abruptly became dark greenish gray and medium stiff at 24.5 feet bgs. This clay became stiff and lean to fat at 28 feet bgs with a 4-inch horizon of burned wood/black organic material at 29 feet. The zone from 24.5 to 31 feet bgs is interpreted as a slide plane. From 31 feet to the bottom of the boring at 42 feet, Hookton Formation, consisting of silt with sand, silty sand and silty sand with gravel, was encountered.

4.6 GROUNDWATER

Groundwater was encountered in Test Pit TP-1 at a depth of 3.2 feet where it flowed into the trench rapidly. This water appears to be perched groundwater from Mill Creek since the nearby Boring B-5 did not encounter groundwater until a depth of 18 feet. All of the other test pits were dry at the time of excavation. Borings B-3 and B-4 also encountered groundwater at depths of 25 feet and 21 feet, respectively, at the time of drilling. These do not represent stabilized groundwater levels since they were measured during the brief drilling operation and before the borings were backfilled. These borings were also drilled at the end of the summer season when groundwater levels are expected to be at their lowest level. Groundwater levels may be higher during and shortly after the rainy season. One groundwater seep was noted in the road cut just north and adjacent to Boring B-5 during the construction of the dozer access roads on September 29, 2011. Mill Creek had a small amount of water flowing in it during both the test pit investigation in June and the boring investigation in October.

5.1 STRONG GROUND SHAKING

Based on the proximity of the site to the Cascadia Subduction Zone, the nearby AP zoned Little Salmon fault and other nearby active faults, there is a high potential for the site to experience moderate to strong ground shaking during a major earthquake on one of these faults. The intensity of earthquake ground motion in the site vicinity will depend on the characteristics of the generating fault, the distance to the earthquake epicenter, the magnitude and duration of the earthquake, and site geologic conditions. We judge the hazard from strong ground shaking to be high at the site.

The CGS Probabilistic Seismic Hazard Assessment web site (accessed on 7-17-2011) provides estimated ground motions (expressed in acceleration due to gravity) within the state based on longitude and latitude. For the project site (longitude W124.10, latitude N40.56) the following parameters are provided:

Ground Motion	Firm Rock	Soft Rock	Alluvium
PGA	0.73	0.73	0.73
Sa 0.2 sec	1.70	1.70	1.70
Sa 1.0 sec	0.62	0.62	0.81

In our opinion, the project site should be considered to be a "soft rock" site, with "alluvium" along the channel bottom of Mill Creek.

5.2 SEISMICALLY-INDUCED GROUND DISPLACEMENT AND LANDSLIDES

Strong ground shaking caused by large earthquakes can induce ground displacement and/or failure such as liquefaction, compaction settlement, and slope movement. A site’s susceptibility to these hazards relates to the site topography, soil conditions, and/or depth to groundwater.

Liquefaction is a phenomenon whereby sediments temporarily lose shear strength and collapse. This condition is caused by cyclic loading during earthquake shaking that generates high pore water pressures within the sediments. The soil most susceptible to liquefaction is loose, cohesionless, granular soil below the water table and within about 50 feet of the ground surface. Liquefaction can result in loss of foundation support and settlement of overlying structures, ground subsidence and translation due to lateral spreading, and differential settlement of affected deposits. Figure 4 shows the project site is located outside of the mapped liquefaction hazard zone. The soils encountered during the site investigation for this study were generally soft to hard clays or clayey gravels. Groundwater was only encountered near the elevation of Mill Creek. Based on the clayey nature of the soils and the depth to groundwater, we conclude that the hazard from liquefaction on this site is low. Liquefaction is possible, however, within the alluvium found in the channel of Mill Creek.

As shown on Figure 2 in plan view and on Figures 5 and 6 in cross-section, a landslide complex is mapped along the lower slopes of the site, extending down to the edge of Mill Creek. Due to the extensive grading that has taken place at the site over the past 70 to 80 years from logging activities and the operation of the burn dump, the existing topography makes the actual aerial limits of the landslides difficult to interpret. However, based on the relatively steep head scarp area and apparent lateral displacement of Mill Creek, the weak and clayey characteristics of the onsite Hookton Formation soils, and the results of the test pits and borings completed at the site, a landslide has been confirmed to exist at the site.

The landslide at the site is an "ancient" landslide or a complex of several smaller landslides that are a result of mass wasting. The landslide most likely is a result of a combination of things including weak soils within the Hookton Formation terrace deposits, high rainfall and elevated groundwater levels, toe erosion by the adjacent Mill Creek and strong seismic shaking every few hundred years. The "gouge" is a result of remolding of the fat to lean clay interbeds within the Hookton Formation which create weak zones. This landsliding is a natural process that is not unique to the site; it is likely that similar landslides are present both upstream and downstream of the site.

Any future site grading or construction within the landslide area needs to consider the possible impact that the landslide could be reactivated due to removal of material at the toe of the landslide, loading at the head of the landslide due to placement of fill, changes in the groundwater conditions due to modifications in site drainage, or reactivation of the landslide due to strong seismic shaking.

5.3 FAULT RUPTURE

Following California's Alquist-Priolo Special Studies Zone Act of 1972, construction of structures for human occupancy in designated Earthquake Fault Zones is not permitted until a site-specific evaluation of surface fault rupture and fault creep has been performed. These zones are established by the CGS along faults or segments of faults that are judged to be sufficiently active and well defined as to constitute a potential hazard to structures from surface faulting or fault creep.

The nearest AP zoned fault is the Little Salmon fault, located about 4,900 feet northwest of the site. No other mapped faults cross the project site or are in close proximity. We judge the potential for fault rupture at the site to be low.

5.4 OTHER GEOLOGIC HAZARDS

A tsunami is a large, transient long-period sea wave caused by submarine landslides, earthquakes, or volcanic eruptions. Based on the site distance from the ocean and the site elevation, tsunami hazards at the site are judged to be negligible.

The nearest active volcano is more than 100 miles from the site (Jennings, 1994) and therefore the volcanic hazard is negligible.

Review of regional geologic information indicates that no Franciscan Complex rocks, and specifically serpentinite, are present at the site. Franciscan Complex rocks are mapped south and east of the site. We interpret the hazard associated with asbestos to be low at the site.

The landslide complex mapped during our site reconnaissance and encountered during our field investigation poses challenges to the construction of the planned 2- to 3-foot-thick soil cap. As to be discussed in Section 7 of this report, the existing slope in its current configuration is judged to be marginally stable under static conditions and not stable (factor of safety of less than 1.0) under seismic conditions, with and without the proposed soil cap.

Based on the results of our geologic evaluation and geotechnical exploration we have qualitatively and quantitatively assessed four options for consideration during the planning process for placement of the 2- to 3-foot-thick cap. Each is discussed briefly below along with an order of magnitude construction cost estimate. Recommendations for site earthwork associated with these options are presented in Section 8 of this report.

6.1 OPTION 1 - CAP WASTE ONLY

The portions of the site covered with waste fill are to be capped with 2 to 3 feet of soil. The soil cap should be keyed and benched into the existing slope to prevent the soil cap from creeping downhill over the surface of the waste fill. In addition, capping of the waste fill should incorporate drainage internal and external to the cap itself. Since placement of the soil cap alone does not repair or improve the landslide, there could still be slope instability requiring occasional maintenance. Keeping water away from the slope (erosion control) and the use of lightweight soil to cap the waste fill could reduce the impact of the new construction on the current slope stability. Horizontal drains might be installed through the slide material to reduce the potential for build up of hydrostatic pressures due to seasonal groundwater. We estimate that the cost of capping the site with no landslide mitigation or improvement could be on the order of $500,000 to $700,000.

6.2 OPTION 2 – REMOVE WASTE FILL AND DEBRIS FROM TOP AREA OF SLOPE; CAP WASTE

This option would consist of removing waste fill and landslide debris along the top of the slope area to reduce driving forces, and, therefore improve slope stability. We understand that any waste fill that is removed from the slope would be spread across the flatter uphill portion of the landfill site, within the mapped limits of waste fill but well beyond the limits of the slide area. Because this option does not repair the landslide, occasional instability could occur requiring occasional maintenance. Keying, benching, drainage and erosion control for the soil cap would be needed as discussed above. We estimate the cost of this option to be on the order of $900,000 to $1 million.

6.3 OPTION 3 – BUTTRESS FILL WITH EARTH TOE BERM; CAP WASTE

The waste fill and landslide material would be removed from the toe of the slope and would be replaced with engineered fill. Prior to placement of this buttress fill, subdrains and a blanket drain would be installed in the buttress keyway excavation to reduce the potential build up of groundwater. Following buttress fill construction, an earth berm fill would be placed along the toe of the slope to provide additional resistance to sliding. Construction of the buttress fill could be difficult given that the toe of the landslide would have to be cut in order to install drainage features and place the buttress material. Although such cut would only be temporary, it could lead to slope instability during construction. Some long-term maintenance could be required with this option since the existing landslide would not be completely removed or mitigated, and keying, benching, drainage and erosion control for the soil cap would be necessary. It is likely that some of the materials removed in the excavation, other than waste fill, may be suitable for use in the construction of the buttress. We estimate that the cost of this option could be on the order of $1.1 to $1.3 million.

6.4 OPTION 4 – INSTALL TIEBACKS AND TOE BERM; CAP WASTE

This option would consist of installing several rows of tiebacks near the toe of the slope to increase the slope stability to an acceptable level during seismic loading. Tiebacks would be anchored to a structural wall facing constructed at the toe of the slope (shotcrete, concrete tiebeam, etc), extending through the waste fill and landslide material, and derive support/resistance in the underlying intact formational material. Installation of tiebacks would likely require a temporary cut with benches at the toe of the slope which could lead to potential slope instability during construction. A small berm/buttress would likely be constructed at the toe of the slope following tieback installation to further improve slope stability. This option offers the least potential for long-term maintenance due to occasional instability. Keying, benching, drainage and erosion control for the soil cap would be required for this option as well. We estimate that the cost of tieback installation and structural wall to be on the order of $2.3 to $2.8 million.

7.1 BACKGROUND

We evaluated the stability of the existing slope and analyzed each of the options discussed in the preceding section using the computer program SLOPE/W (Version 4). The purpose of our analysis was to provide a relative comparison between the four capping options for a minimum factor of safety against slope instability.

We selected two of the slope cross-sections, B-B’ and C-C’, presented in Appendix D, which we judged to be most relevant for our analyses. The soil profiles used for our analyses were based on our recent borings and test pits. Section B-B’ is drawn perpendicular to the slope contours across a large section of the waste fill and mapped landslide. This cross-section extends from approximately Elevation 420 feet at the top of the hill to Elevation 320 at Mill Creek, with Borings B-3 and B-5 and Test Pit T-21 projected through it. Section C-C’ also extends through a large section of waste fill and mapped landslide from about Elevation 430 ft to Elevation 335 feet. Test Pits T-2, T-4, T-14 and T-19 (Ninyo & Moore, 2007) and TP-7 (URS, 2011) are projected onto this cross-section.

Results from laboratory unconfined compression tests and consolidated undrained triaxial compression tests performed during this investigation were used to develop strength parameters for the fine-grained slide plane materials. Correlation of friction angle to standard penetration driving resistance obtained during sampling was used to develop strength parameters for the underlying Hookton Formation. The parameters that we judged appropriate for our analysis are summarized below.

Summary of Estimated Shear Strength Parameters

Location / Material Type	Unit Weight (pcf)	Shear Strength			
		Drained		Undrained	
		C' (psf)	ϕ' (degrees)	C (psf)*	ϕ (degrees)
Burnt Ash Waste	100	0	28	--	--
Slide Mass (Lean Clay)	120	0	26	1,500	0
Slide Plane Material (Fat Clay)	115	0	26	1,500	0
Hookton Formation (Sandy Lean Clay to Clayey Gravel)	128	0	38	--	--

*Cohesion parameters assumed for sensitivity of 1.0.

Free groundwater was encountered near the base of the inferred slide plane in Borings B-3, B-4 and B-5, and likely represents a perched condition. We assume that internal and external drainage will be incorporated into the final slope design such that the waste fill, landslide mass and slide plane materials will not become saturated; therefore, we did not include a groundwater table in our analyses.

Our analyses represent a best estimate of the factor of safety associated with failure along the inferred slide plane and do not include a search for the critical slip surface having the minimum factor of safety; therefore, there could be other critical slip surfaces where the factor of safety is less than that computed for the inferred existing slide plane.

7.2 RESULTS

Consistent with the U.S. Army Corps of Engineers (COE) Manual for Engineering and Design, Slope Stability (EM 1110-2-1902), and CCR Section 21750 requirements, we used a horizontal acceleration of 0.35 g, equal to one-half of the estimated PGA, for our analyses, and considered a minimum factor of safety of 1.5 to be appropriate for evaluation of each capping option for pseudo-static loading conditions. These requirements are summarized in the following table:

Case Number	Design Loading Condition	Minimum Factor of Safety Required	
		Corps of Engineers	CCR Section 21750
1	End of Construction	1.3	Not applicable
2	Long Term Effective Strength	1.5	Not applicable
3	Earthquake (Pseudo-Static)	Not applicable	1.5

7.2.1 Existing Conditions with No Soil Cap

Using a slide plane inferred from recent borings at the site as shown on cross-sections B-B' and C-C', we computed the static and pseudo-static factors of safety of the existing slopes without the soil cap. The computed factors of safety for the existing slopes under short-term, long-term and pseudo-static loading conditions without the soil cap are summarized in the following table:

Summary of Computed Factors of Safety for Existing Slope

Loading Condition	Factor of Safety (FS)	
	Cross Section B-B'	Cross Section C-C'
Short-term undrained	3.2	2.7
Long-term drained	1.3	1.5
Earthquake, k_h = 0.35g*	1.2	1.0

*Pseudo-static acceleration based on one-half of the estimated PGA of 0.7g

As shown above, the computed factors of safety for the slope along the inferred slide plane and in its existing condition are 1.3 for long-term drained conditions through Section B-B' and 1.0 for pseudo-static loading through Section C-C'. It is likely that localized, steeper areas of the site could have lower computed factors of safety.

7.2.2 Conditions with Soil Cap for All Options

Using a slide plane inferred from recent borings at the site as shown on cross-sections B-B' and C-C', we analyzed the existing slopes for the cap only option (Option 1) and modeled soil capping Options 2, 3, and 4 to achieve a computed factor of safety of 1.5 for pseudo-static loading conditions. Our analyses indicate that placement of the proposed soil cap without additional grading or slope improvement reduces the computed pseudo-static factor of safety from 1.0 to 0.9 as shown on Figure D-1 in Appendix D.

The stability of the capped slope can be improved as reflected by a pseudo-static factor of safety of 1.5, by either unloading the waste fill and landslide material at the top of the slope (Option 2) or by removing slide plane materials at the toe and replacing the removed materials with engineered fill and an additional toe berm (Option 3). Placement of the cap alone (Option 1) or Option 2 or Option 3 would likely be subject to occasional instability, requiring some long-term maintenance since the landslide materials would not be completely removed or reinforced. Option 4, which includes installation of tiebacks, would provide improved slope stability and would be least likely to require slope maintenance. The slope configurations for Options 2, 3, and 4 which have computed factors of safety of 1.5 under pseudo-static loading conditions are presented as Figures D-2, D-3, and D-4 in Appendix D.

Recommendations for site earthwork associated with each of the above options are presented in the following Section 8. The cross-sections presented for Options 1 through 4 in Appendix D should be considered conceptual and should not be used for construction. Likewise, the tieback lengths and elevations shown in Appendix D for Option 4 should be considered approximate as selection of tieback bonded lengths, unbonded lengths, inclinations and would be the responsibility of the tieback design engineer.

As discussed in the preceding section, the existing slopes at the site are marginally stable under static conditions and have computed factors of safety of less than the required 1.5 under pseudo-static loading due to the underlying landslide materials. Placement of the required 2- to 3-foot-thick soil cap over the waste fill without some type of landslide mitigation/repair would further decrease the stability of the existing slopes (computed factor of safety of less than 1.0).

In order to attain the desired factor of safety of 1.5 against slope failure during an earthquake and provide the required 2- to 3-foot-thick cap over the waste fill, some mitigation of the landslide would be required, presented as Options 2, 3 and 4.

Following are general recommendations for site earthwork including excavation, keying and benching, compaction, material for fill, and surface and subsurface drainage which would be applicable to construction of final graded slopes for Options 1, 2, 3 and 4. Option 4, tieback installation, would be developed through a design-build process; therefore, we have provided recommended soil parameters that we judge appropriate for the on-site soils to be used for tieback design, but have not included any recommendations for tieback lengths, elevations, quantities or installation procedures in this report.

8.1 SITE PREPARATION AND EARTHWORK

All site preparation and earthwork should be completed under the observation of the Geotechnical Engineer, and in accordance with the applicable sections of the Caltrans Standard Specifications and as described herein.

8.1.1 Clearing and Stripping

Areas of the site to be capped with soil should be cleared of old refrigerators, car bodies, surface vegetation, trees and root systems prior to the start of grading. Specific measures should be adopted in the construction of the cap that would enable salvaging of mature trees. Materials resulting from clearing operations should not be used as compacted fill or blended with other materials, and should be removed from the site to a location designated by the Owner.

8.1.2 Excavations

Excavation should include removal of surficial deposits along the length of the slope for keying and benching of the soil cap, and could include, depending on the repair option selected, excavation of waste fill and landslide debris at the toe of the slope for construction of tiebacks or buttress, or at the top of the slope to flatten the inclination and improve stability.

Excavation at the toe of the slope for tieback installation or buttress keyway construction should be limited to no more than 20 lineal feet at any given time. The temporary cut slopes should be monitored during construction for signs of instability. If slope instability is observed, excavation lengths might need to be reduced as determined by the Geotechnical Engineer and/or Engineering Geologist. If unsuitable materials are encountered at the base of the proposed excavations, they should be removed in their entirety and be replaced with engineered fill. All excavation should be performed under the observation of the Geotechnical Engineer and/or Engineering Geologist.

8.1.3 Fill Materials

Soils, whether from sources on or off site, should be approved by the Geotechnical Engineer and Owner for the intended use and specifically for a required location or purpose, prior to placement.

General fill material to be used for construction of the buttress and/or toe berm should meet the material requirements of Caltrans for structure backfill. Fill material should not contain rocks or lumps over 3 inches in greatest dimension and not more than 15 percent larger than 1½ inches. In addition, general fill material should have a plasticity index not greater than 15 and a pH between 6 and 8. Excavated native soils that meet the above requirements for general fill may be reused for buttress or toe berm construction. Waste fill should not be used as general fill for buttress or toe berm construction.

We recommend that the soil cap consist of a low plasticity, predominantly clayey material which will be less susceptible to erosion and allow less water to infiltrate the debris fill than a granular soil. If drainrock is used as part of the buttress fill, either filter fabric or filter material should surround the drainrock to prevent soil migration into the drainrock.

8.1.4 Fill Placement and Compaction

All new fills should be placed and compacted to the requirements outlined in Caltrans Standard Specifications, Chapter 19, and on a dry weight basis.

8.1.5 Keying and Benching For Soil Cap Placement

To minimize the potential for surficial instability or creep of the proposed soil cap, keying and benching into the existing slopes will be required where the surface gradient is steeper than 6:1 (horizontal:vertical). The keyway and benches should be constructed in accordance with Caltrans Standard Specifications, Chapter 19-6.01.

Waste fill excavated from the benches should not be used as engineered fill and should be disposed of at a location designated by the Owner.

8.1.6 Buttress Keyway Excavation and Drainage

The buttress fill depicted as Option 3 should be excavated at the toe of the existing slope in lengths not to exceed 25 lineal feet. The keyway for the buttress should be at least 40 feet wide at the base with a maximum cut slope inclination of 1.5:1 (horizontal:vertical) at the back of the excavation and 1:1 (horizontal:vertical) at the front of the excavation along Mill Creek. The keyway excavation should extend at least 5 feet below the interpreted slide plane materials into competent formation material. The final width and depth of the buttress excavation as well as the temporary cut slope inclinations should be evaluated and modified as necessary at the time of construction by the Geotechnical Engineer and/or Engineering Geologist.

A drainage blanket should be placed on benches cut into the back of the buttress keyway excavation and along the bottom of the keyway excavation to intercept seepage from the underlying soil and provide drainage of water that infiltrates from the surface. The drainage blanket should be at least 18 inches thick and consist of a layer of permeable material that is placed over the prepared subgrade before fill is placed. In addition, the bottom of the keyway should be graded inboard to a subsurface drainage system that connects to the drainage blanket. The drainage system should consist of a 6-inch diameter perforated or slotted pipe and Class 2 permeable material that is at least 18 inches wide and 4 feet thick. Alternatively, the perforated pipe can be wrapped in drain rock wrapped with geotextile fabric. The pipe should connect to a solid pipe that is sloped to drain to an approved discharge point.

8.2 CONSTRUCTION CONSIDERATIONS

8.2.1 Temporary Slopes and Construction Excavations

Safety standards set by OSHA limit the height of unshored vertical excavations to 5 feet if construction personnel will be working in the excavations. The set of guidelines published by OSHA classifies soils in detail as Type A, B or C. In general, Type A soils are stronger, Type B soils are intermediate, and Type C soils are weaker. Based on the soil type, depth, duration the excavation is open, and sequence of soils exposed in excavations, OSHA recommends maximum allowable slopes. For example, excavations in homogeneous soils 20 feet or less in depth, they state that maximum allowable slopes (horizontal:vertical) should be ¾ to 1, 1 to 1, and 1½ to 1 for Types A, B and C soils, respectively. Based on the strength and consistency of soils that would likely be encountered for construction of buttress fills, we recommend maximum temporary slope heights of 1½ to 1, consistent with OSHA Type C soils.

Equipment and stockpiles should not be stored within 10 feet from the hinge point of the excavation slopes. Some localized sloughing or raveling of temporary slopes should be expected.

8.2.2 Erosion Control

Construction activities including grading and excavation can remove vegetation and expose areas of loose soil that, if not properly protected, can be subject to soil loss and erosion by wind and stormwater runoff. Newly constructed engineered slopes can undergo substantial erosion through dispersed sheet flow runoff, and more concentrated runoff can result in the formation of erosional channels and larger gullies, compromising the integrity of the slope and resulting in significant soil loss. At a minimum, seeding of the slopes should be performed following completion of grading and erosion control should be provided along the face of the new slopes to promote growth of vegetation, including placement of netting and straw waddles following seeding. In addition, concrete lined terrace drains (v-ditches) could be constructed at 20- to 30-foot intervals to reduce the distance of sheet flow down the slope face. An erosion control program should be developed for the project by a registered civil engineer, landscape architect, or other qualified professional.

8.2.3 Horizontal Drains

We recommend that horizontal drains be installed into the hillside at several locations to intercept perched groundwater which could be a contributing factor to the observed slope instability. The installation typically consists of drilling a nearly horizontal boring (2 to 10 degrees from horizontal) and concurrently placing a steel casing into the hillside. A slotted or screened plastic pipe is then placed inside the casing, which is then withdrawn leaving the plastic pipe in-place. The plastic pipe is then attached to a tightline pipe which conveys the water to a suitable location which at this site would most likely be the adjacent Mill Creek. Horizontal drains will likely need periodic flushing/maintenance to remove fines that clog the slotted pipes.

8.2.4 Permanent Slopes

Permanent cut and fill slopes underlain by waste fill or landslide debris should have a maximum inclination of 3:1 (horizontal:vertical). Slopes associated with the engineered fill toe berm or tieback installation should have a maximum inclination of 2:1 (horizontal:vertical).

Our services have been performed in accordance with generally accepted principles and practices of the geological and geotechnical engineering profession. This warranty is in lieu of all other warranties, either expressed or implied. The conclusions presented in this report are professional opinions based on the indicated project criteria and data available at the time this report was prepared. Finally, the conclusions and recommendations presented in this report are intended only for planning purposes for the project described and at the site indicated.

The estimated costs for capping and the three improvement options discussed are based on assumed material costs, material volumes, and earthwork considerations, and therefore so not represent actual costs.

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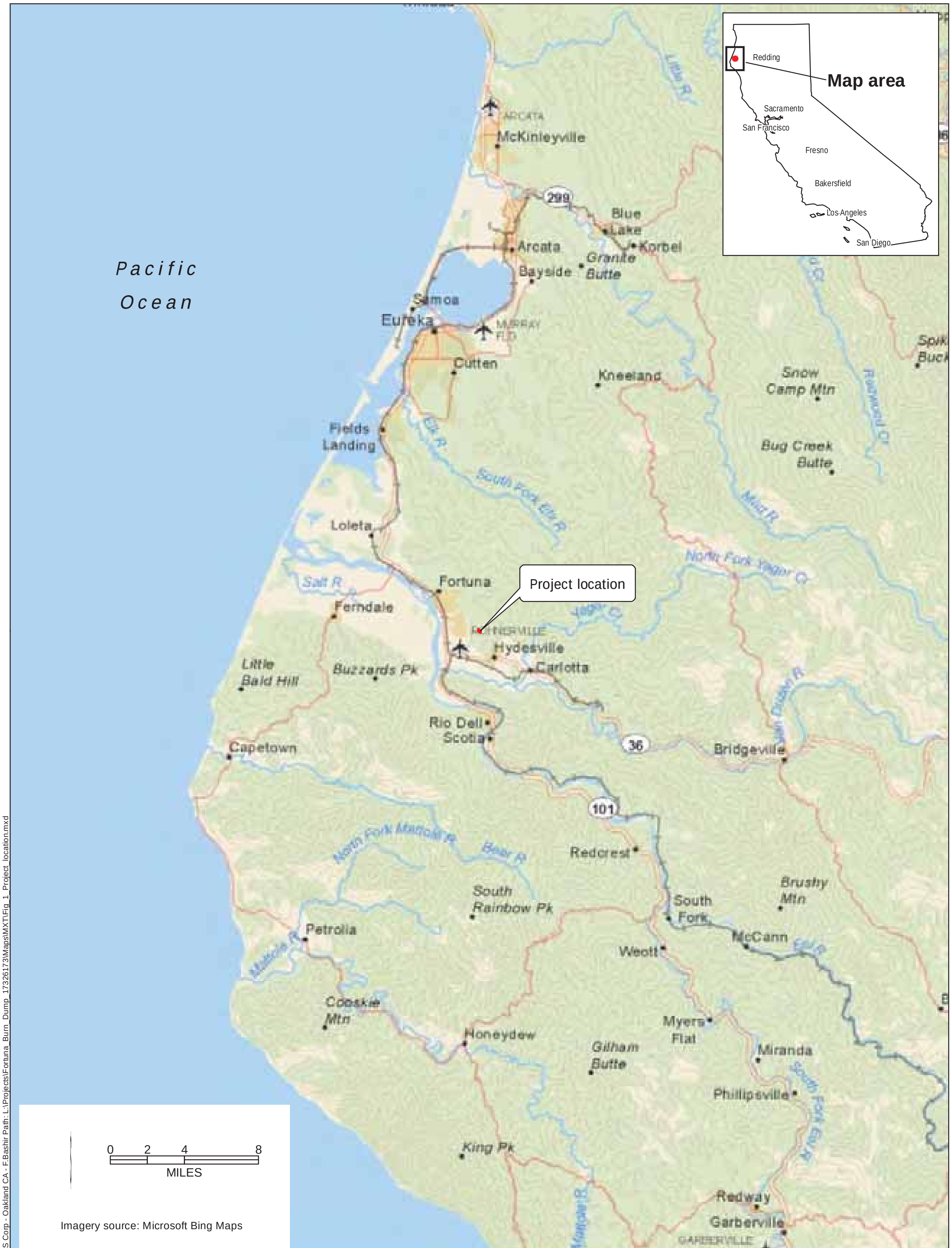
Aerial Photography (black and white, stereo pair from California Geological Survey collection)

Date	Approximate Scale	Flight Line Number	Photograph Number
12-13-40	1:24,000	GRS 7	165 & 166
6-23-48	1:24,000	CDF2-16	85 & 86
8-3-54	1:24,000	CVL-13N	67 & 68
8-15-63	1:12,000	HC-S-2-3	16-55 & 16-56
6-18-88	1:24,000	WAC-88CA	18-92 & 18-93

Figures

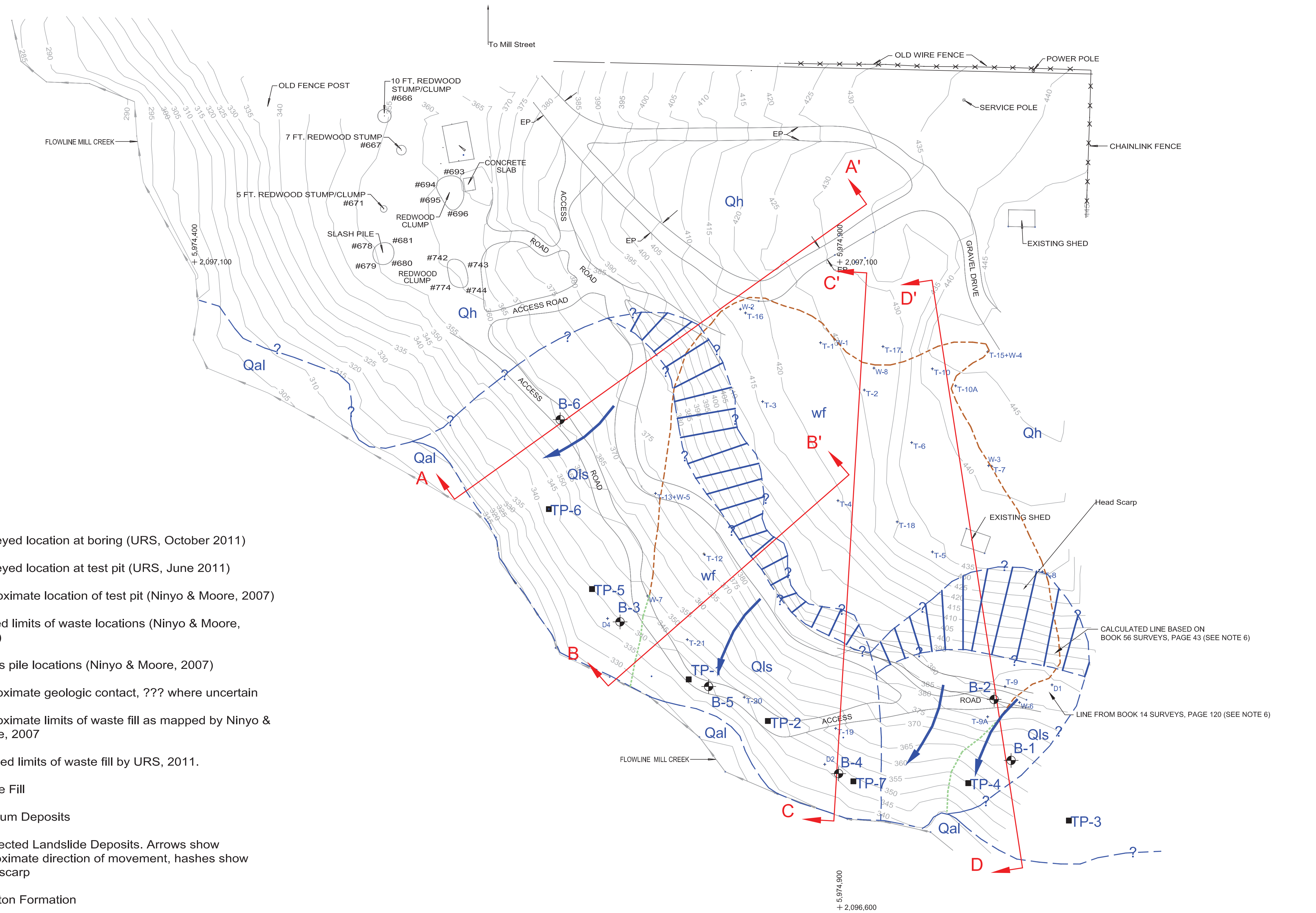


URS Corp - Oakland CA - F.Bashir Path: L:\Projects\Fortuna_Burn_Dump_17326173\Maps\MXT\Fig_1_Project_location.mxd

URS

FORTUNA DUMP SITE
Geologic Evaluation

Figure 1
Project Location Map



LEGEND

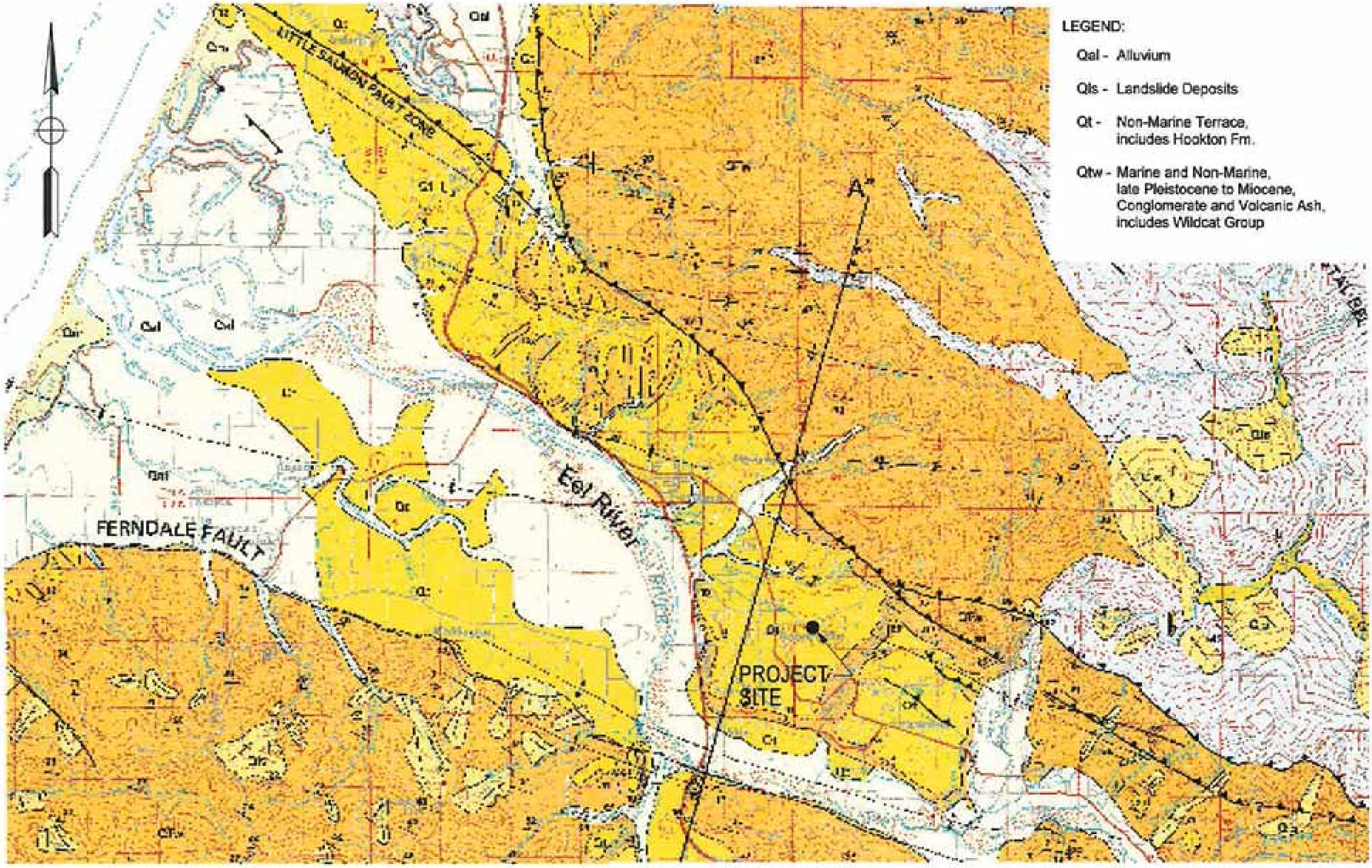
	B-3	Surveyed location at boring (URS, October 2011)
	TP-3	Surveyed location at test pit (URS, June 2011)
	T-3	Approximate location of test pit (Ninyo & Moore, 2007)
	W1 - W8	Staked limits of waste locations (Ninyo & Moore, 2007)
	D1 - D4	Debris pile locations (Ninyo & Moore, 2007)
?		Approximate geologic contact, ??? where uncertain
		Approximate limits of waste fill as mapped by Ninyo & Moore, 2007
		Revised limits of waste fill by URS, 2011.
	wf	Waste Fill
	Qal	Alluvium Deposits
	Qls	Suspected Landslide Deposits. Arrows show approximate direction of movement, hashes show back scarp
	Qh	Hookton Formation
A A'		Location of Geologic Cross-Section

0 40 80 160 240

SCALE IN FEET

Map based on topographic survey by Wallace E. Wright Land Surveying, dated June 2009 and updated June 2011 to show 2011 test pit (TP) locations.

Project No. 28645325	FORTUNA DUMP SITE GEOLOGIC EVALUATION Fortuna, California	SITE PLAN AND GEOLOGIC MAP	Figure 2
February 2012	URS		



LEGEND:

Qal - Alluvium

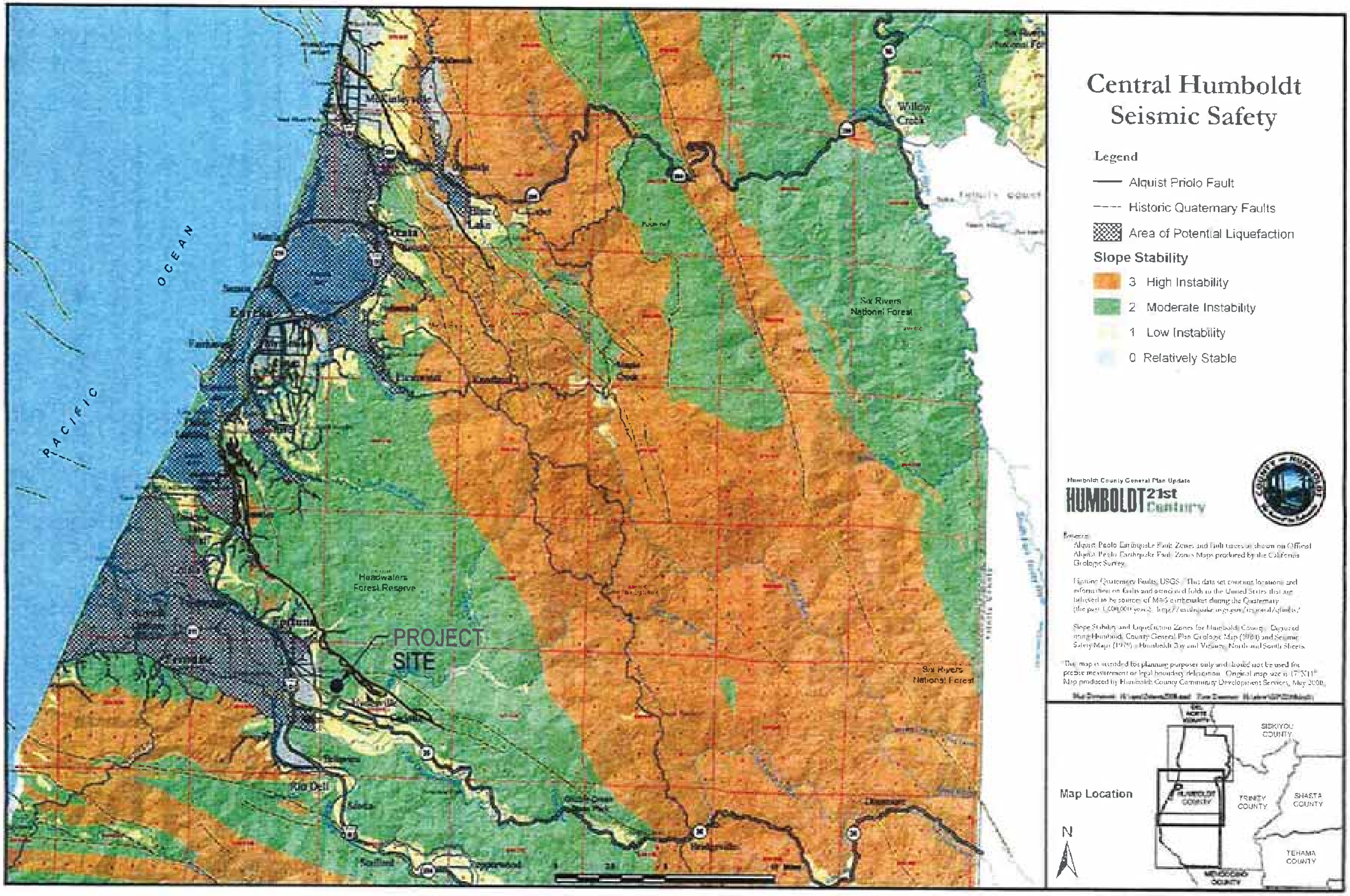
Qls - Landslide Deposits

Qt - Non-Marine Terrace, includes Hookton Fm.

Qtw - Marine and Non-Marine, late Pleistocene to Miocene, Conglomerate and Volcanic Ash, includes Wildcat Group

Source: Geology of the Cape Mendocino, Eureka, Garberville, and Southwestern Part of the Hayfork 30x60 Minute Quadrangles and Adjacent Offshore Area, Northern California. McLaughlin, et al, 2000, USGS MF-2336, a digital database.

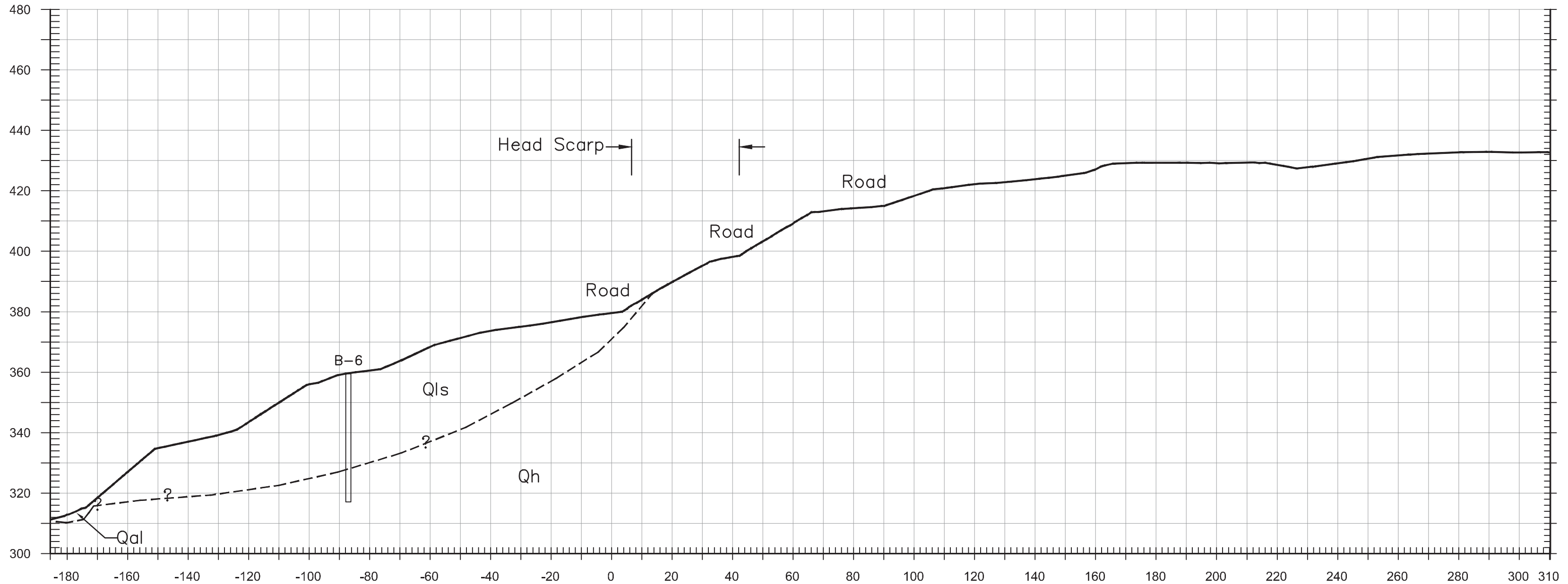
URS	FORTUNA DUMP SITE GEOLOGIC EVALUATION	REGIONAL GEOLOGIC MAP	Figure 3 JANUARY 2012



Source: Humboldt County General Plan
Updated, 2008

URS	FORTUNA DUMP SITE GEOLOGIC EVALUATION	SEISMIC HAZARD MAP	Figure 4 AUGUST 2011

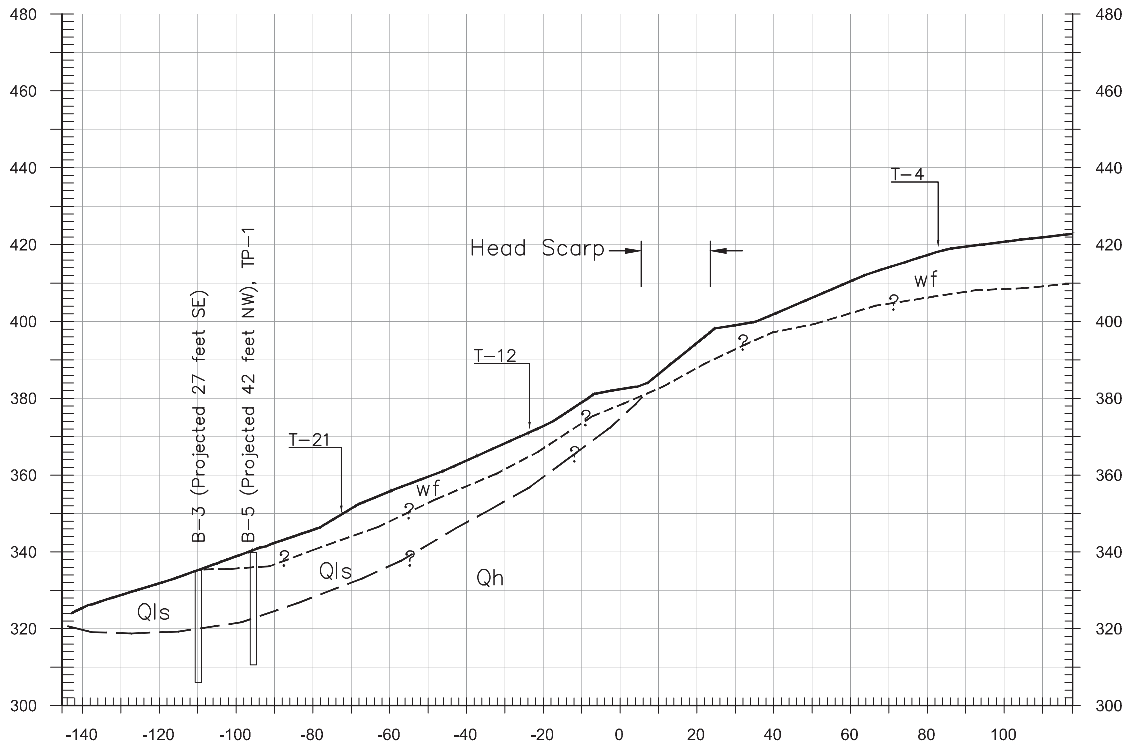
Figure4.dgn 8/22/2011 1:19:34 PM



SECTION A-A'

See Legend on Figure 2 for description of geologic unit.

Project No. 28645325	FORTUNA DUMP GEOLOGIC EVALUATION Fortuna, California	GEOLOGIC CROSS-SECTION A-A'	Figure 5
February 2012			
URS			

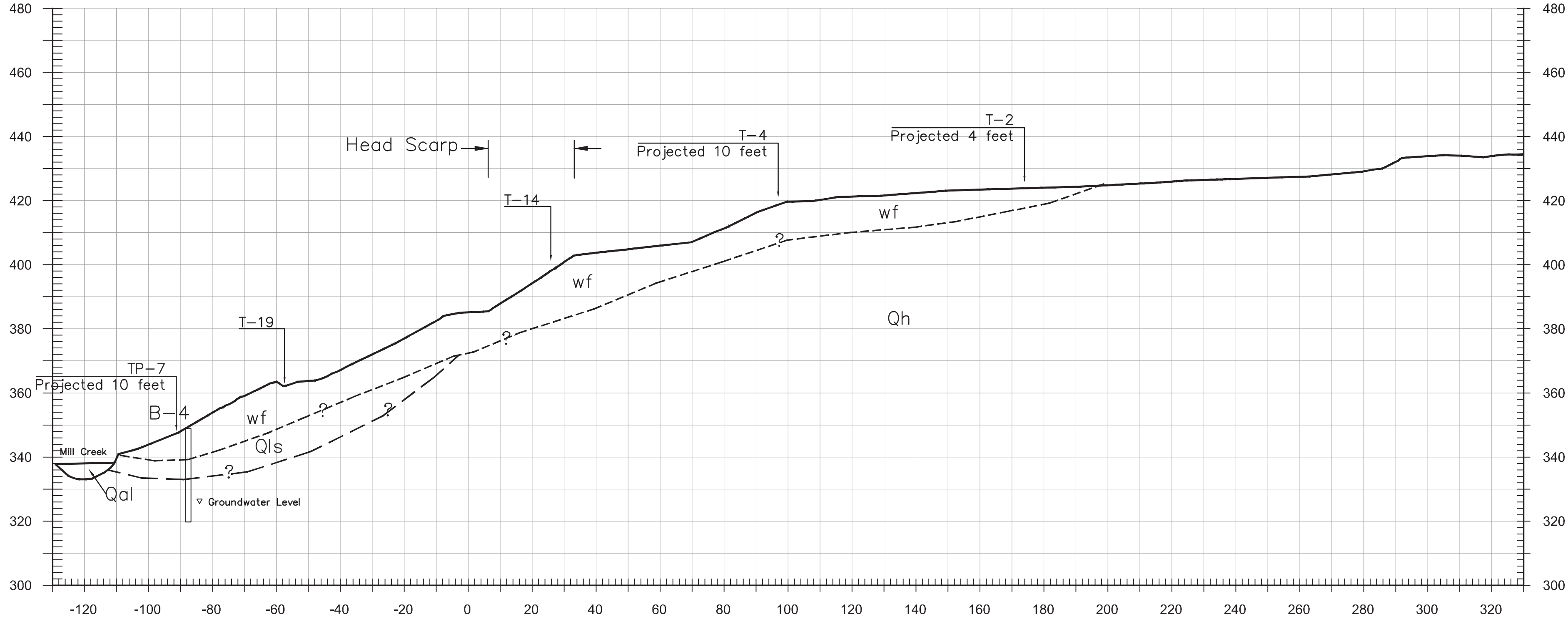


SECTION B-B'

See Legend on Figure 2 for description of geologic unit.

Project No. 28645325	FORTUNA DUMP GEOLOGIC EVALUATION Fortuna, California	GEOLOGIC CROSS-SECTION B-B'	Figure 6
February 2012			

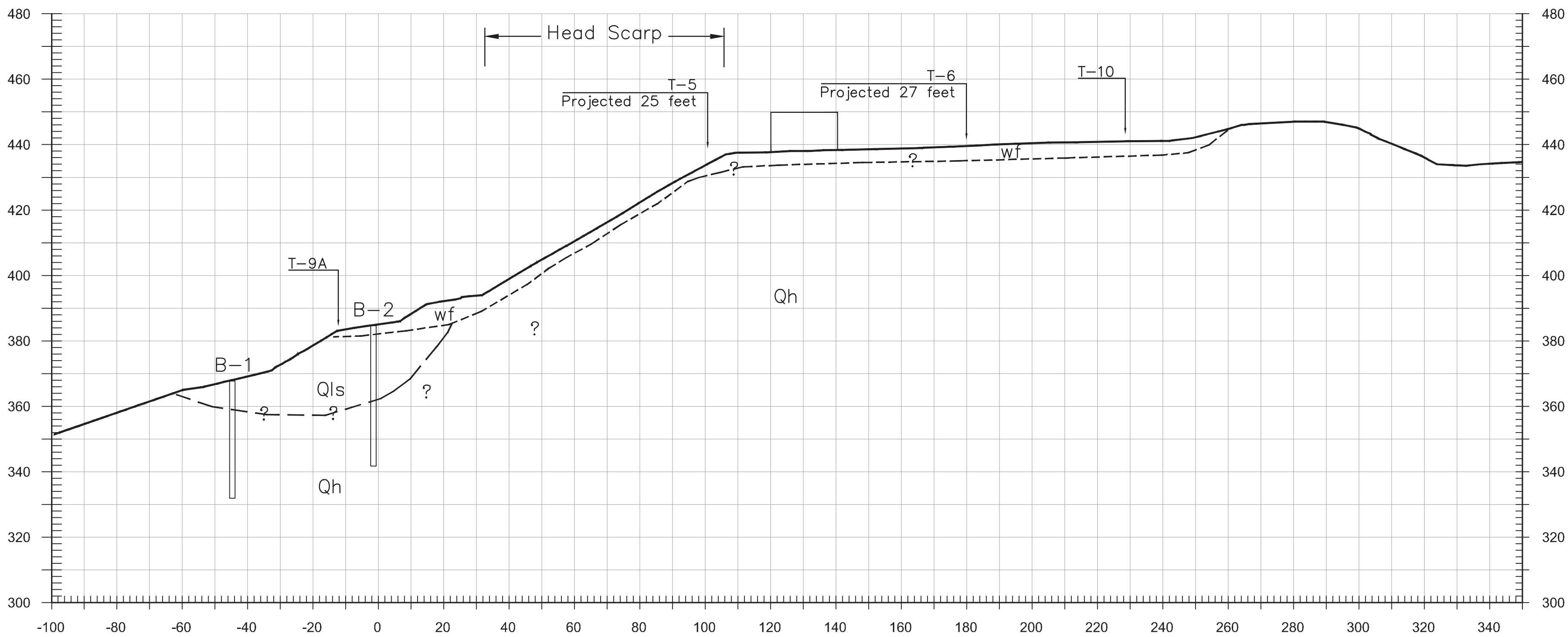
URS



SECTION C-C'

See Legend on Figure 2 for description of geologic unit.

Project No. 28645325	FORTUNA DUMP GEOLOGIC EVALUATION Fortuna, California	GEOLOGIC CROSS-SECTION C-C'	Figure 7
February 2012	URS		



SECTION D-D'

See Legend on Figure 2 for description of geologic unit.

Project No. 28645325	FORTUNA DUMP GEOLOGIC EVALUATION Fortuna, California	GEOLOGIC CROSS-SECTION D-D'	Figure 8
February 2012			
URS			

Appendix A

Test Pit Logs (URS, 2011)

TP-1

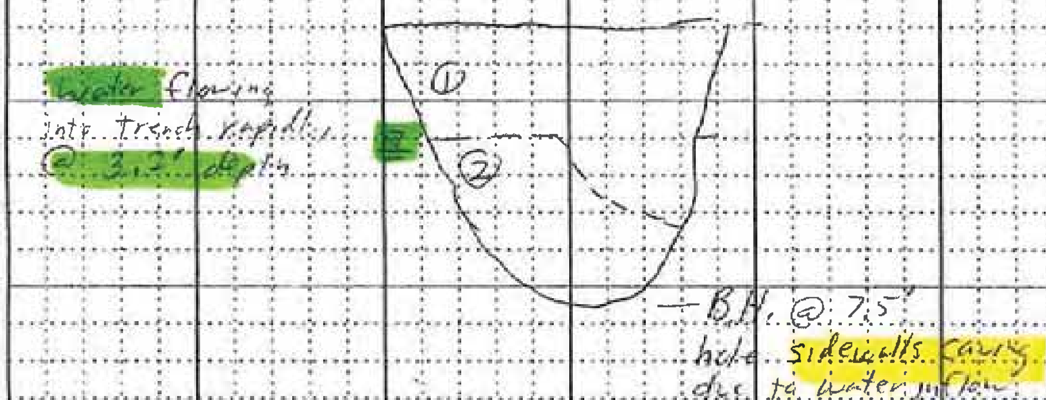
Excavated by: Pacific Envir.	Geologist/Engineer: Schmell	URS TEST PIT LOG	Project: Fortuna Dump Site	
Equipment Used: Cat 308c	Date: 6-14-11		Project No.: 28645280 [illegible]	Pit Location: See Plan

DESCRIPTION	PHYSICAL CONDITION	ATTITUDES	SAMPLES
24" bucket			
① 1. Fill - Moist, dk. brown, silty sand (SM) mixed with ~50% burn-fill with glass + metal (mostly bottles). Some rubbr.			TP- Grab/Drive
② 2. Landslide ? - wet, lt. yellowish brn. clay with sand + gravel (CH), med. plasticity, gravels sub-rounded to ~2" dia., some			TP- Grab/Drive
③ weathered sandstone fragments, no obvious bedding or structure.			TP- Grab/Drive
④ [Landslide Debris from Hookton Fm.]			TP- Grab/Drive
⑤			TP- Grab/Drive

Scale: 1" = 5' Horizontal 1" = 5'

GRAPHIC REPRESENTATION

Elevation: ______ • Pit Trend: N40W



Trench Outline

Contact

Gradational

Erosional

Free Water

Test Pit No.

TP- 1

Figure

TP-2

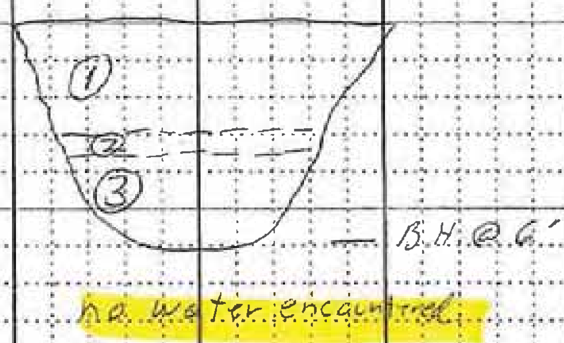
Excavated by: Pacific Envir.	Geologist/Engineer: Schnell	URS TEST PIT LOG	Project: Fortuna Dump Site	
Equipment Used: Cat 308 C	Date: 6-14-11		Project No.: 28645280	Pit Location: See Plan

24" bucket DESCRIPTION	PHYSICAL CONDITION	ATTITUDES	SAMPLES
① Moist, dk. brn. silty sand (SM) with ~50-60% glass, ceramics, some metal! Landfill Debris			TP- Grab/Drive
② Moist, lt. yellowish brn. clay (CH) with sand and gravel, gravel to ~2" dia., subrounded (Colluvium)			TP- Grab/Drive
③ Moist, olive to yellowish brn. mottled, clay (CL), firm (Poc Pen ~2.0 t/ft²) with occasional rounded cobbles to 12" dia., no structure			TP- Grab/Drive
④ observable, [Landslide Debris from Hookton Fm.]			TP- Grab/Drive
⑤			TP- Grab/Drive

Scale: 1" = 5' Horizontal 1" = 5'

GRAPHIC REPRESENTATION

Elevation: ______ Pit Trend: N35W



Trench Outline

Contact

Gradational

Erosional

Free Water

Test Pit No.

TP- 2

Figure

TP-3

Excavated by: Pacific Envir.	Geologist/Engineer: Schmell	URS TEST PIT LOG	Project: Fortuna Dump Site
Equipment Used: Cat 308 C	Date: 6-14-11		Project No.: 28645280 / Pit Location: See Plan

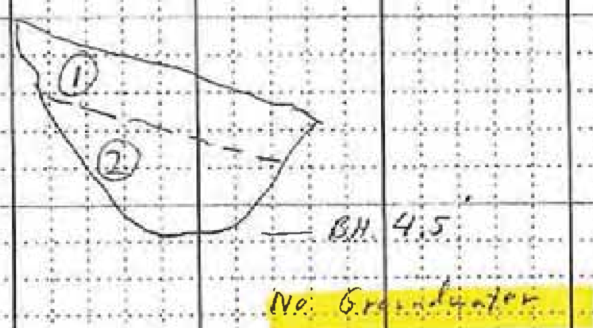
DESCRIPTION	PHYSICAL CONDITION	ATTITUDES	SAMPLES
① Moist, dk. brn., silty to clayey sand with abundant roots, weed debris + organics topsoil/duff			TP- Grab/Drive
② Moist, yellowish brn., lean clay (CL) w silt, hard (PP>4.5 T/ft²) with few sub-rounded gravels to 1" dia, trace sand Hookton Fm/Landslide			TP- Grab/Drive
③			TP- Grab/Drive
④			TP- Grab/Drive
⑤			TP- Grab/Drive

Scale: 1" = 5 Horizontal 1" = 5

GRAPHIC REPRESENTATION

Elevation: ______

Pit Trend: NSW



Trench Outline

Contact

Gradational

Erosional

Free Water

Test Pit No.

TP- 3

Figure

TP-4

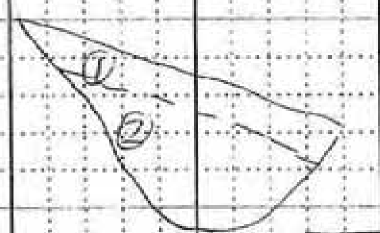
Excavated by: Pacific Envir.	Geologist/Engineer: Schmell	**URS** TEST PIT LOG	Project: Fortuna Dump Site	
Equipment Used: Cat 308C	Date: 6-14-11		Project No.: 28645280	Pit Location: See Plan

DESCRIPTION	PHYSICAL CONDITION	ATTITUDES	SAMPLES
(1) Moist, dk. brn., silty to clayey sand (SM-SC) w/ abundant roots + organic debris. Topsoil/duff			TP- Grab/Drive
(2) Moist, yellowish brn. w/ reddish brn. mottling, lean clay (CL), hard, [illegible] [illegible] subrounded gravel			TP- Grab/Drive
(3) + cobbles to 14" diam. Hookton Fm./Landslide			TP- Grab/Drive
(4)			TP- Grab/Drive
(5)			TP- Grab/Drive

Scale: 1" = 5' Horizontal 1" = 5'

GRAPHIC REPRESENTATION

Elevation: ______ Pit Trend: N10E



B.H. @ 4'

No groundwater

Trench Outline

Contact

Gradational

Erosional

Free Water

Test Pit No. ______

TP- 4

Figure

TP-5

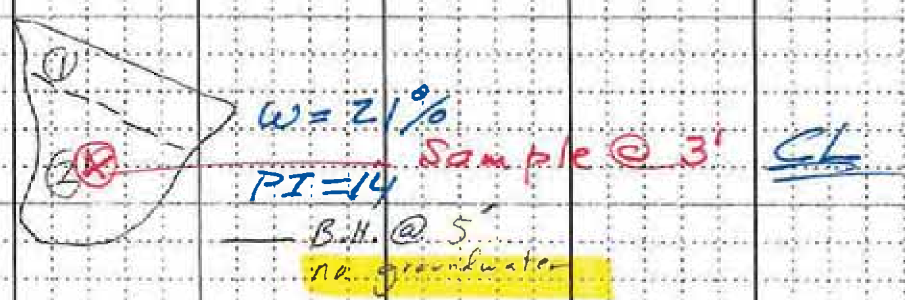
Excavated by: Pacific Envir.	Geologist/Engineer: Schmell	URS TEST PIT LOG	Project: Fortuna Dump Site	
Equipment Used: Takeuchi TB175	Date: 6-15-11		Project No.: 28645280	Pit Location: See Plan

DESCRIPTION (24" bucket)	PHYSICAL CONDITION	ATTITUDES	SAMPLES
(1) Moist, dk. brown, clayey sand (SC), with abundant roots, wood debris & organics, topsoil/fill			TP- Grab/Drive
(2) Moist, yellowish brown, lean clay (CL) with [illegible] firm, a few gravel [illegible] 2'			TP- Grab/Drive
(3) disturbed appearance Landslide – Hookton Fm.			TP- Grab/Drive
(4)			TP- Grab/Drive
(5)			TP- Grab/Drive

Scale: 1" = 5' Horizontal 1" = 5'

GRAPHIC REPRESENTATION

Elevation: ______ Pit Trend: N15E



Trench Outline

Contact

Gradational

Erosional

Free Water

Test Pit No. ______

TP- 5

Figure

TP-6

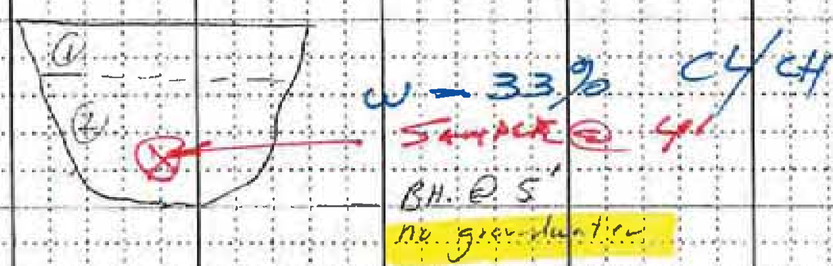
Excavated by: Pacific Envir.	Geologist/Engineer: Schmell	URS TEST PIT LOG	Project: Fortuna Dump Site	
Equipment Used: Takeuchi 7B175	Date: 6-15-11		Project No.: 28645280	Pit Location: See Plan

	DESCRIPTION	PHYSICAL CONDITION	ATTITUDES	SAMPLES
1	Moist, dk. brn. silty to clayey sand (SM-SC) with abundant roots + organics. topsoil/duff			TP- Grab/Drive
2	Moist, yellowish brn to lt. reddish brn mottled, lean clay (CL), med. plasticity, soft, a few subround gravels			TP- Grab/Drive
3	+ cobbles to 12" dia. roots to ~4', disturbed structure Landslide / Hookton Fm	[illegible]		TP- Grab/Drive
4				TP- Grab/Drive
5				TP- Grab/Drive

Scale: 1" = 5 Horizontal 1" = 5'

GRAPHIC REPRESENTATION

Elevation: ______ Pit Trend: N 25W



Trench Outline

Contact

Gradational

Erosional

Free Water

Test Pit No.

TP- 6

Figure

TP-7

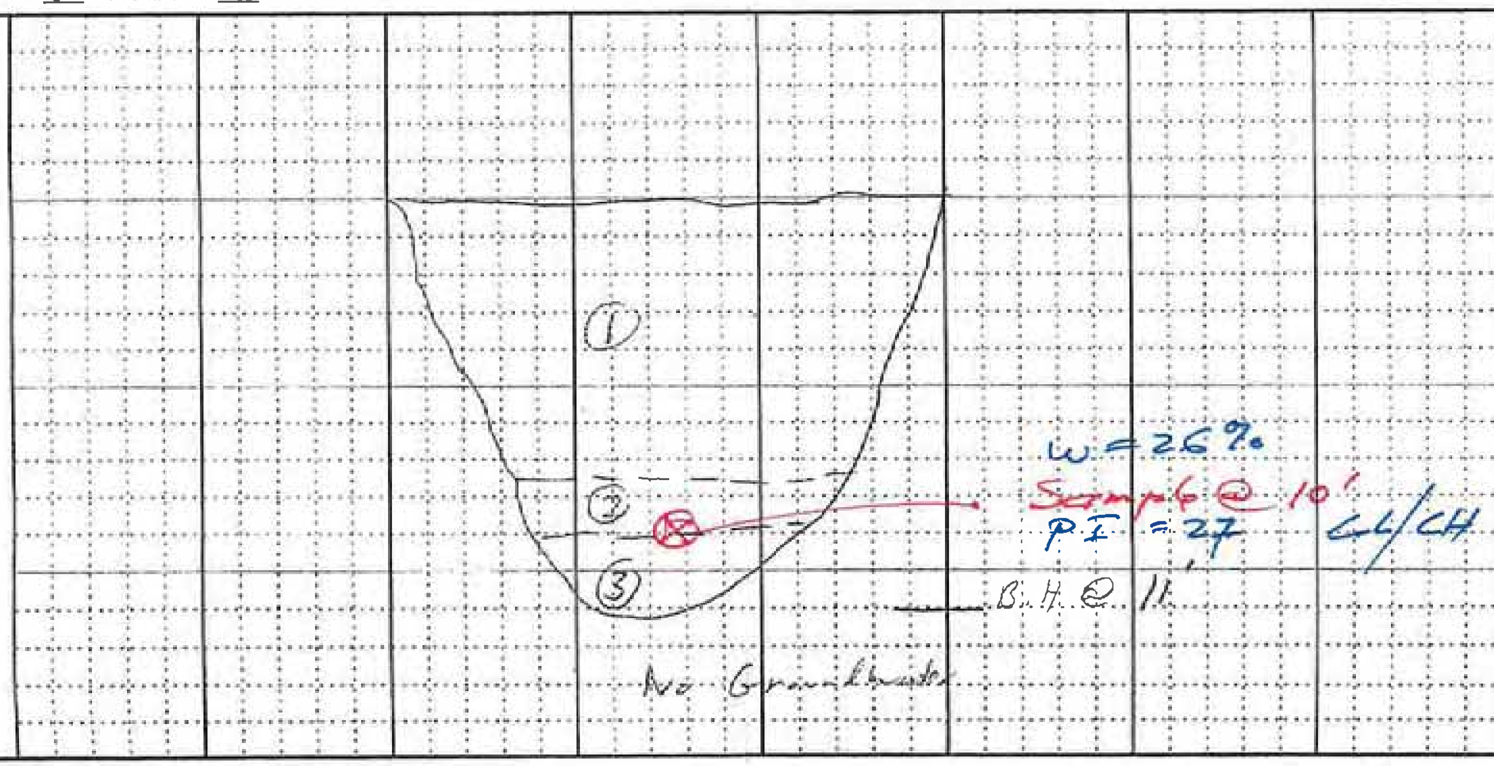
Excavated by: Pacific Envir.	Geologist/Engineer:	**URS** TEST PIT LOG	Project: Fortuna Dump Site
Equipment Used: Takeuchi TB175	Date: 6-15-11		Project No.: 28645280 / Pit Location: See Plan

DESCRIPTION	PHYSICAL CONDITION	ATTITUDES	SAMPLES
① Burn dump debris - Glass, wire, water tanks, washing machines & other metal debris mixed with dk. brn. silty sand			TP- Grab/Drive
② Moist, gray, sandy clay (CL), soft PP ~ 1 T/ft² (colluvium ?)			TP- Grab/Drive
③ Moist, yellowish brn to gray, fat clay (CH) med-high plasticity soft, pp ~ 1.5 T/ft², with a layer of gray, v. soft (PP < 1.0)			TP- Grab/Drive
④ Remolded, fat clay, high plasticity, ~~possible~~ slip plane Landslide / Hookton Fm	Bag sample TP-7-1 @ 10.5' of slip plane ?		TP- Grab/Drive
⑤			TP- Grab/Drive

Scale: 1" = 5' Horizontal 1" = 5'

GRAPHIC REPRESENTATION

Elevation: ______ Pit Trend: N70W



Trench Outline

Contact

Gradational

Erosional

Free Water

Test Pit No.

TP- 7

Figure

Appendix B

Boring Logs (URS, 2011)

Fortuna Dump Site; Fortuna, California

BORING LOCATION:			GROUND SURFACE ELEVATION (ft): 367.4 TOP OF WELL CASING ELEVATION (ft): N/A
DRILLING AGENCY	Boart Longyear	DRILLER	DATE STARTED: 10/4/11 DATE FINISHED: 10/4/11
DRILLING EQUIPMENT	DB-320 Track	STATION	COMPLETION DEPTHS: BORING: 35.0 (ft) WELL: N/A (ft)
DRILLING METHOD	Sonic Core	DRILL BIT 4-inch	SAMPLING METHOD: Sonic Core
SIZE AND TYPE OF CASING	set 6" casing to 25'		NUMBER OF SAMPLES: DIST: 3 UNDIST:
TYPE OF PERFORATION	N/A	FROM N/A TO N/A	WATER DEPTH (ft): FIRST: N/A COMPL.: N/A 24 hr.: N/A
SIZE AND TYPE OF PACK	N/A	FROM N/A TO N/A	LOGGED BY: B.Kozlowicz CHECKED BY: D.Simpson

TYPE OF SEAL	TYPE	FR	TO	TYPE	FR	TO
	No. 1: Bentonite Chips	0	35'	No. 3: N/A	N/A	N/A
	No. 2: N/A	N/A	N/A	No. 4: N/A	N/A	N/A

LOG OF BORING B-1

(Sheet 1 of 2)

DEPTH (feet)	MATERIAL DESCRIPTION	ELEVATION (feet)	DEPTH (feet)	SAMPLES: NUMBER	TIME SAMPLED	INDEX PROPERTIES: MOISTURE CONTENT (%)	DRY DENSITY (pcf)	UNCONFINED COMPRESSIVE STRENGTH (psf)	NOTES
0	**Silty SAND (SM) - TOPSOIL** Loose, moist, very dark brown, (10YR 2/2); abundant roots and organic debris, with clay				0809				
	Silty SAND (SM) COLLUVIUM Dry, dark yellowish brown, (10YR 4/6): trace rounded gravel up to 1 inch, roots	365							
5	Becomes hard and laminated (1 - 5 mm), Sandy Silt (ML)		5		0813 0818				
	Becomes clayey								
	Fat CLAY (CH) SLIDE PLANE Hard, strong brown, (7.5YR 4/6); and greenish gray, (5GY 6/1): mottled	360		1		25	95	8854	PP>4.5 tsf LL=60 PI=35
	Becomes light olive brown, (2.5Y 5/3) Becomes Silty Clay								
	Sandy SILT (ML) HOOKTON FORMATION Dry, brown, (10Y 4/3)								
10			10		0821 0831				
	As above except dark yellowish brown to strong brown			2					
		355							
	Silty SAND (SM) HOOKTON FORMATION Dry, pale brown, (10YR 6/3); to strong brown, (7.5YR 4/6); 40% fine sand, 40% rounded gravel to 2 inches, 20% non plastic fines								
15			15		0832 0837				
		350							
20			20		0839 0843				

Other columns (blank on this sheet): SOIL GRAPHIC, WELL GRAPHIC, PID Reading (soil),ppm, PID Reading (airspace),ppm, WATER LEVEL, TYPE, RECOVERY (%).

Fortuna Dump Site; Fortuna, California

LOG OF BORING B-1

Continued- Sheet 2 of 2

DEPTH (feet)	SOIL GRAPHIC	MATERIAL DESCRIPTION	ELEVATION (feet)	WELL GRAPHIC	PID Reading (soil),ppm	PID Reading (airspace),ppm	WATER LEVEL	DEPTH (feet)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES TIME SAMPLED	SAMPLES RECOVERY (%)	INDEX PROPERTIES MOISTURE CONTENT (%)	INDEX PROPERTIES DRY DENSITY (pcf)	INDEX PROPERTIES UNCONFINED COMPRESSIVE STRENGTH (psf)	NOTES
			345								0933					
									3		0936					
25								25			0845					
											0930					
			340													
30								30			0939					
											1001					
		As above except strong brown, 15% gravel, 65% fine to medium sand, 20% low plasticity fines	335													
35								35			1003					
		BOTTOM OF BORING AT 35 FEET Boring dry ATD														
			330													
40								40								
			325													
45								45								
			320													
50								50								

Fortuna Dump Site; Fortuna, California

BORING LOCATION:		GROUND SURFACE ELEVATION (ft): 384.1 TOP OF WELL CASING ELEVATION (ft): N/A	
DRILLING AGENCY: Boart Longyear	DRILLER	DATE STARTED: 10/4/11 DATE FINISHED: 10/4/11	
DRILLING EQUIPMENT: DB-320 Track	STATION	COMPLETION DEPTHS	BORING: 42.5 (ft) WELL: N/A (ft)
DRILLING METHOD: Sonic Core	DRILL BIT 4-inch	SAMPLING METHOD: Sonic Core	
SIZE AND TYPE OF CASING: N/A		NUMBER OF SAMPLES	DIST: 3 UNDIST:
TYPE OF PERFORATION: N/A	FROM N/A TO N/A	WATER DEPTH (ft)	FIRST: N/A COMPL.: N/A 24 hr.: N/A
SIZE AND TYPE OF PACK: N/A	FROM N/A TO N/A	LOGGED BY: B.Kozlowicz	CHECKED BY: D.Simpson

TYPE OF SEAL	TYPE	FR	TO	TYPE	FR	TO
	No. 1: Bentonite Chips	0	42.5'	No. 3: N/A	N/A	N/A
	No. 2: N/A	N/A	N/A	No. 4: N/A	N/A	N/A

LOG OF BORING B-2

(Sheet 1 of 2)

DEPTH (feet)	SOIL GRAPHIC	MATERIAL DESCRIPTION	ELEVATION (feet)	WELL GRAPHIC	PID Reading (soil),ppm	PID Reading (airspace),ppm	WATER LEVEL	DEPTH (feet)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: TIME SAMPLED	SAMPLES: RECOVERY (%)	INDEX PROPERTIES: MOISTURE CONTENT (%)	INDEX PROPERTIES: DRY DENSITY (pcf)	INDEX PROPERTIES: UNCONFINED COMPRESSIVE STRENGTH (psf)	NOTES
0		**Silty SAND (SM) with gravel - FILL** Dry, dark grayish brown to yellowish red, burn debris									1147					
		Sandy SILT (ML) with gravel - COLLUVIUM) Dry, pale brown to yellowish brown, trace burn debris, small roots														PP=3.25 tsf
			380													
5								5								
			375													
10		**Sandy SILT (ML) - COLLUVIUM/SLIDE DEBRIS** Hard, dry, yellowish brown with greenish gray mottling, trace small roots and organics, medium plasticity fines Becomes strong brown, Silty Sand (SM)						10			1149 1155					
			370													
15								15			1157 1204					
			365													
20								20			1207 1212					

Fortuna Dump Site; Fortuna, California

LOG OF BORING B-2

Continued- Sheet 2 of 2

DEPTH (feet)	MATERIAL DESCRIPTION	ELEVATION (feet)	SAMPLES NUMBER	TIME SAMPLED	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	UNCONFINED COMPRESSIVE STRENGTH (psf)	NOTES
	Lean CLAY (CL) SLIDE PLANE(?) Stiff, moist, dark gray	360	1		26	98	3133	PP=1.5 tsf LL=34 PI=13
25	**Sandy SILT (ML)** Hard, dry, strong brown			1214 1219				
	Becomes yellowish brown Silty Sand (SM)							
	Fat CLAY (CH) SLIDE PLANE Hard, moist, very dark gray, trace black organics and very dark brown silt chips, with slickensides	355	2					PP>4.5 tsf
30				1221 1228				
	As above with 10% fine sand							
	SILT (ML) HOOKTON FORMATION Hard, dry, dark yellowish brown, (10YR 3/6); non plastic, laminated bed (<1mm)	350						
35				1236 1253				
	Becomes strong brown Sandy Silt							
	Silty SAND (SM) with gravel HOOKTON FORMATION Dry, pale brown to yellowish brown, 50% fine sand, 30% small rounded gravel up to 1.5 inches, 20% non plastic fines	345		1258				
40			3	1302				
	BOTTOM OF BORING AT 42-1/2 FEET Boring dry ATD	340						
45								
		335						
50								

Fortuna Dump Site; Fortuna, California

BORING LOCATION:		GROUND SURFACE ELEVATION (ft): 337.9 TOP OF WELL CASING ELEVATION (ft): N/A	
DRILLING AGENCY: Boart Longyear	DRILLER	DATE STARTED: 10/4/11 DATE FINISHED: 10/4/11	
DRILLING EQUIPMENT: DB-320 Track	STATION	COMPLETION DEPTHS: BORING: 35.0 (ft) WELL: N/A (ft)	
DRILLING METHOD: Sonic Core	DRILL BIT: 4-inch	SAMPLING METHOD: Sonic Core	
SIZE AND TYPE OF CASING: N/A		NUMBER OF SAMPLES: DIST: 3 UNDIST:	
TYPE OF PERFORATION: N/A	FROM N/A TO N/A	WATER DEPTH (ft): FIRST: 25 COMPL.: N/A 24 hr.: N/A	
SIZE AND TYPE OF PACK: N/A	FROM N/A TO N/A	LOGGED BY: B.Kozlowicz	CHECKED BY: D.Simpson

TYPE OF SEAL	TYPE	FR	TO	TYPE	FR	TO
	No. 1: Bentonite Chips	0	35'	No. 3: N/A	N/A	N/A
	No. 2: N/A	N/A	N/A	No. 4: N/A	N/A	N/A

LOG OF BORING B-3

(Sheet 1 of 2)

DEPTH (feet)	MATERIAL DESCRIPTION	ELEVATION (feet)	SAMPLE NUMBER	TIME SAMPLED	MOISTURE CONTENT (%)	NOTES
0	**Silty SAND (SM) with gravel - COLLUVIUM** Loose, dry, dark yellowish brown, rounded gravel up to 2 inches, roots to 1 inch			1512		
		335				
5						
		330				
	Becomes dense, no roots					
10				1515		
				1525		
	Fat CLAY (CH) with sand - SLIDE PLANE Very soft, moist, dark greenish gray, trace small rounded gravel					PP< 0.25 tsf
	Becomes olive brown Sandy fat Clay with gravel	325				
15						
	Becomes dark greenish gray with gravel up to 3 inches, and abundant roots up to 2 inches - SLIDE PLANE	320				
	Becomes very dark gray with charred/burned wood up to 1 inch and small roots and gravel		1		29	LL=35 PI=12
20				1530		
				1537		
	Clayey SAND (SC) with gravel - HOOKTON FORMATION (?) Moist, dark greenish gray, up to 2 inch					PP< 0.2 tsf

URS

Fortuna Dump Site; Fortuna, California

LOG OF BORING B-3

Continued- Sheet 2 of 2

DEPTH (feet)	MATERIAL DESCRIPTION	ELEVATION (feet)	WATER LEVEL	SAMPLES NUMBER	TIME SAMPLED	NOTES
	rounded gravel					
	Clayey GRAVEL (GC) with sand HOOKTON FORMATION Moist, yellowish brown to strong brown	315				
25			▽	2		
	Becomes dense, strong brown with greenish gray mottling, with small rounded gravel to 3/4 inch				1540	
					1545	
	Becomes strong brown without mottling, Silty Gravel (GM) with sand, rounded gravel up to 2 inches	310				
30						
	Brownish yellow Silly Sand (SM) with gravel, moist, subrounded gravel up to 1 inch				1548	
	Becomes dark yellowish brown					
		305				
				3	1554	
35	BOTTOM OF BORING AT 35 FEET					
		300				
40						
		295				
45						
		290				
50						

Column headings also printed: SOIL GRAPHIC; WELL GRAPHIC; PID Reading (soil),ppm; PID Reading (airspace),ppm; DEPTH (feet); TYPE; RECOVERY (%); INDEX PROPERTIES: MOISTURE CONTENT (%), DRY DENSITY (pcf), UNCONFINED COMPRESSIVE STRENGTH (psf)

Fortuna Dump Site; Fortuna, California

BORING LOCATION:			GROUND SURFACE ELEVATION (ft): 345.9 TOP OF WELL CASING ELEVATION (ft): N/A	
DRILLING AGENCY	Boart Longyear	DRILLER	DATE STARTED: 10/5/11 DATE FINISHED: 10/5/11	
DRILLING EQUIPMENT	DB-320 Track	STATION	COMPLETION DEPTHS	BORING: 26.5 (ft) WELL: N/A (ft)
DRILLING METHOD	Sonic Core	DRILL BIT 4-inch	SAMPLING METHOD	Sonic Core, SPT, Shelby
SIZE AND TYPE OF CASING	N/A		NUMBER OF SAMPLES	DIST: 5 UNDIST: 1
TYPE OF PERFORATION	N/A	FROM N/A TO N/A	WATER DEPTH (ft)	FIRST: 21 COMPL.: N/A 24 hr.: N/A
SIZE AND TYPE OF PACK	N/A	FROM N/A TO N/A	LOGGED BY B.Kozlowicz	CHECKED BY D.Simpson

TYPE OF SEAL	TYPE	FR	TO	TYPE	FR	TO
	No. 1: Bentonite Chips	0	26.5'	No. 3: N/A	N/A	N/A
	No. 2: N/A	N/A	N/A	No. 4: N/A	N/A	N/A

LOG OF BORING B-4/B-4A

(Sheet 1 of 2)

DEPTH (feet)	MATERIAL DESCRIPTION	ELEVATION (feet)	WATER LEVEL	SAMPLE NUMBER	TIME SAMPLED	RECOVERY (%)	MOISTURE CONTENT (%)	NOTES
0	**FILL** glass, rusted metal, ash, burn debris, sand and gravel	345			0949			
5		340						
8.5	**Silty SAND (SM) with gravel** Moist, yellowish brown, rounded gravel up to 3 inches			2				
10	**Fat CLAY (CH) SLIDE PLANE** Medium to stiff, moist, light olive brown, (2.5Y 5/4); 10% fine sand Becomes soft, greenish gray and dark gray with olive brown, abundant wood pieces and bark up to 1 inch	335		0a	0949 1003	0		PP 0.8 - 1.25 tsf PP 0.25 - 0.5 tsf Sample No 0a collected from Boring B4A (4 feet west)
14	**Clayey GRAVEL (GC) with sand HOOKTON FORMATION(?)** Wet, very dark greenish gray, rounded gravel up to 1-1/2 inches			3			19	LL=41 PI=19
15		330		1a	1003 1008	80	31	Sample No 1a collected from Boring B4A (4 feet west) LL=45 PI=16
17.5	Becomes dark olive gray with less plastic fines and rounded gravel and rock fragments up to 3 inches - HOOKTON FORMATION							
20		325	▽ (21)		1008 1009			

URS

Fortuna Dump Site; Fortuna, California

LOG OF BORING B-4/B-4A

Continued- Sheet 2 of 2

DEPTH (feet)	SOIL GRAPHIC	MATERIAL DESCRIPTION	ELEVATION (feet)	WELL GRAPHIC	PID Reading (soil),ppm	PID Reading (airspace),ppm	WATER LEVEL	DEPTH (feet)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES TIME SAMPLED	SAMPLES RECOVERY (%)	INDEX PROPERTIES MOISTURE CONTENT (%)	INDEX PROPERTIES DRY DENSITY (pcf)	INDEX PROPERTIES UNCONFINED COMPRESSIVE STRENGTH (psf)	NOTES
25		**Poorly graded GRAVEL (GP-GC) with sand and clay HOOKTON FORMATION** Very dense, moist, yellowish brown to strong brown, gravel to 2 inches	320					25	4 2a 1		1012 1015	1: 71 2a: 97				SPT blow counts for Sample1 are 19/38/50 for 5" SPT blow counts for Sample 2a are 20/46/50 for 5.5" Sample No 2a collected from Boring B4A (4 feet west)
		BOTTOM OF BORING AT 26-1/2 FEET														
30			315					30								
35			310					35								
40			305					40								
45			300					45								
50								50								

Fortuna Dump Site; Fortuna, California

BORING LOCATION:			GROUND SURFACE ELEVATION (ft): 339.2 TOP OF WELL CASING ELEVATION (ft): N/A
DRILLING AGENCY	Boart Longyear	DRILLER	DATE STARTED: 10/5/11 DATE FINISHED: 10/5/11
DRILLING EQUIPMENT	DB-320 Track	STATION	COMPLETION DEPTHS BORING: 26.5 (ft) WELL: N/A (ft)
DRILLING METHOD	Sonic Core	DRILL BIT 4-inch	SAMPLING METHOD Sonic Core, SPT
SIZE AND TYPE OF CASING	N/A		NUMBER OF SAMPLES DIST: 4 UNDIST:
TYPE OF PERFORATION	N/A	FROM N/A TO N/A	WATER DEPTH (ft) FIRST: 18 COMPL.: N/A 24 hr.: N/A
SIZE AND TYPE OF PACK	N/A	FROM N/A TO N/A	LOGGED BY B.Kozlowicz CHECKED BY D.Simpson

TYPE OF SEAL	TYPE	FR	TO	TYPE	FR	TO
	No. 1: Bentonite Chips	0	26.5'	No. 3: N/A	N/A	N/A
	No. 2: N/A	N/A	N/A	No. 4: N/A	N/A	N/A

LOG OF BORING B-5
(Sheet 1 of 2)

DEPTH (feet)	MATERIAL DESCRIPTION	ELEVATION (feet)	WATER LEVEL	SAMPLE NUMBER	TIME SAMPLED	MOISTURE CONTENT (%)	NOTES
0	**Clayey SAND (SC) with gravel COLLUVIUM/FILL** Moist, dark yellowish brown, (10YR 4/6); angular to rounded gravel up to 2 inches, with some burn debris, depth of debris uncertain				1227		Run 1 only recovered 1.5/8.5'
5		335					3 inch burn debris in shoe at 8-1/2 feet (BOH after run 1) - slough(?) - expected no debris in boring as base of fill in road cut approximately 2 feet above boring elevation. Debris not visible in sidewall of boring. Slower drilling from 10 to 12'
					1228 1231		
		330		2			
10					1231 1237		
	Fat CLAY (CH) with sand Very soft, moist, light olive brown to dark yellowish brown, with gravel						
	Fat CLAY (CH) SLIDE PLANE Soft, dark greenish gray, with slickensides, abundant wood to 1 inch and organics, a 5 inch piece of sharp, twisted metal			3		28	
		325					
15	Becomes very dark gray Sandy fat Clay (CH) with gravel, with abundant wood and organics up to 2 inches; rounded gravel up to 2 inches						LL=41 PI=17
			▽				
	Gravelly fat CLAY (CH) HOOKTON FORMATION(?) Stiff, moist, olive brown to yellowish brown, rounded gravel up to 2 inches	320					PP = 1.75 tsf
20	**Poorly graded GRAVEL (GP-GC) with clay and sand HOOKTON FORMATION** Very dense, moist, olive brown to dark yellowish brown.				1239 1247		

URS

Fortuna Dump Site; Fortuna, California

LOG OF BORING B-5

Continued- Sheet 2 of 2

DEPTH (feet)	SOIL GRAPHIC	MATERIAL DESCRIPTION	ELEVATION (feet)	WELL GRAPHIC	PID Reading (soil),ppm	PID Reading (airspace),ppm	WATER LEVEL	DEPTH (feet)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES TIME SAMPLED	SAMPLES RECOVERY (%)	INDEX PROPERTIES MOISTURE CONTENT (%)	INDEX PROPERTIES DRY DENSITY (pcf)	INDEX PROPERTIES UNCONFINED COMPRESSIVE STRENGTH (psf)	NOTES
		gravel and rock fragments to 4 inches														
		Fines become less plastic (GP-GM)	315						4							Hard drilling, chatter
25								25	1			63				blow counts: 47, 32, 50/4"; gravel and sheared rock fragments in sampler
		BOTTOM OF BORING AT 26-1/2 FEET														
30			310					30								
35			305					35								
40			300					40								
45			295					45								
50			290					50								

Fortuna Dump Site; Fortuna, California

BORING LOCATION:			GROUND SURFACE ELEVATION (ft): 339 TOP OF WELL CASING ELEVATION (ft): N/A
DRILLING AGENCY	Boart Longyear	DRILLER	DATE STARTED: 10/5/11 DATE FINISHED: 10/5/11
DRILLING EQUIPMENT	DB-320 Track	STATION	COMPLETION DEPTHS BORING: 23.8 (ft) WELL: N/A (ft)
DRILLING METHOD	Sonic Core	DRILL BIT 4-inch	SAMPLING METHOD SPT, Shelby
SIZE AND TYPE OF CASING	N/A		NUMBER OF SAMPLES DIST: 1 UNDIST: 1
TYPE OF PERFORATION	N/A	FROM N/A TO N/A	WATER DEPTH (ft) FIRST: 18 COMPL.: N/A 24 hr.: N/A
SIZE AND TYPE OF PACK	N/A	FROM N/A TO N/A	LOGGED BY B.Kozlowicz CHECKED BY D.Simpson

TYPE OF SEAL	TYPE	FR	TO	TYPE	FR	TO
	No. 1: Bentonite Chips	0	26.5'	No. 3: N/A	N/A	N/A
	No. 2: N/A	N/A	N/A	No. 4: N/A	N/A	N/A

LOG OF BORING B-5A

(Sheet 1 of 2)

DEPTH (feet)	SOIL GRAPHIC	MATERIAL DESCRIPTION	ELEVATION (feet)	WELL GRAPHIC	PID Reading (soil),ppm	PID Reading (airspace),ppm	WATER LEVEL	DEPTH (feet)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES TIME SAMPLED	SAMPLES RECOVERY (%)	INDEX PROPERTIES MOISTURE CONTENT (%)	INDEX PROPERTIES DRY DENSITY (pcf)	INDEX PROPERTIES UNCONFINED COMPRESSIVE STRENGTH (psf)	NOTES
0		**Clayey SAND (SC) with gravel COLLUVIUM/FILL** Moist, dark yellowish brown, (10YR 4/6); angular to rounded gravel up to 2 inches, with some burn debris	335													
5								5								
		Sandy lean CLAY (CL) SLIDE PLANE Soft to medium, moist, dark greenish gray, trace rounded gravel and organics and dark gray to olive brown sandy clasts	330													
10								10	0			13				Sample 0: 8" debris slough, 4" soft greenish gray clay, not saved. TX CU
			325						1			63	26			LL=34 PI=13
15								15								
							▽ (18)									
			320													
20		**Poorly graded GRAVEL (GP-GC) with sand and clay - HOOKTON FORMATION**						20								

URS

Fortuna Dump Site; Fortuna, California

LOG OF BORING B-5A

DEPTH (feet)	SOIL GRAPHIC	MATERIAL DESCRIPTION	ELEVATION (feet)	WELL GRAPHIC	PID Reading (soil),ppm	PID Reading (airspace),ppm	WATER LEVEL	DEPTH (feet)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES TIME SAMPLED	SAMPLES RECOVERY (%)	INDEX PROPERTIES MOISTURE CONTENT (%)	INDEX PROPERTIES DRY DENSITY (pcf)	INDEX PROPERTIES UNCONFINED COMPRESSIVE STRENGTH (psf)	NOTES
		Very dense, olive brown to dark yellowish brown, rounded gravel and angular rock fragments to 1-1/2 inches, trace organics and small wood pieces/roots							2			80				Broke autohammer 2nd interval. Rocks sheared by sampler Blows: 55, 38/4"
		BOTTOM OF BORING AT 24 FEET														

URS

Fortuna Dump Site; Fortuna, California

BORING LOCATION:		GROUND SURFACE ELEVATION (ft): 359.4 TOP OF WELL CASING ELEVATION (ft): N/A	
DRILLING AGENCY: Boart Longyear	DRILLER	DATE STARTED: 10/6/11 DATE FINISHED: 10/6/11	
DRILLING EQUIPMENT: DB-320 Track	STATION	COMPLETION DEPTHS	BORING: 42.0 (ft) WELL: N/A (ft)
DRILLING METHOD: Sonic Core	DRILL BIT 4-inch	SAMPLING METHOD: Sonic Core	
SIZE AND TYPE OF CASING: N/A		NUMBER OF SAMPLES	DIST: UNDIST:
TYPE OF PERFORATION: N/A	FROM N/A TO N/A	WATER DEPTH (ft)	FIRST: N/A COMPL.: N/A 24 hr.: N/A
SIZE AND TYPE OF PACK: N/A	FROM N/A TO N/A	LOGGED BY: B.Kozlowicz	CHECKED BY: D.Simpson

TYPE OF SEAL	TYPE	FR	TO	TYPE	FR	TO
	No. 1: Bentonite Chips	0	42'	No. 3: N/A	N/A	N/A
	No. 2: N/A	N/A	N/A	No. 4: N/A	N/A	N/A

LOG OF BORING B-6

(Sheet 1 of 2)

DEPTH (feet)	MATERIAL DESCRIPTION	ELEVATION (feet)	SAMPLE NUMBER	TIME SAMPLED	NOTES
0	**Gravelly fat CLAY (CH) with sand** Moist, dark brown, rounded gravel to 2 inches, roots and organics			0821	
	Silty SAND (SM) with gravel COLLUVIUM Dry, brownish yellow to yellowish brown, subangular to rounded gravel to 2 inches, trace small roots			0824 0826	
5	**Sandy SILT (ML)** Moist, strong brown and greenish gray mottled/laminated, small roots	355			
	Fines increase in plasticity to medium		1		
10	**Lean CLAY (CL)** Stiff to very stiff, moist, olive, ((5Y 4/3); red brown mottled, with abundant small to fine roots	350	2	0829 0835	PP= 2.0 to 2.5 tsf
	SILT (ML) Moist, strong brown to olive, massive with trace fine roots				
15	As above except Sandy Silt with no roots	345			
	Silty SAND (SM) HOOKTON FORMATION SLIDE DEBRIS Dry, strong brown, massive Becomes dark yellowish brown to olive with approximately 30% small rounded gravel to 1 inch			0836 0840	
20		340	3	0844 0848	

Column headings also printed: SOIL GRAPHIC; WELL GRAPHIC; PID Reading (soil),ppm; PID Reading (airspace),ppm; WATER LEVEL; SAMPLES: TYPE, RECOVERY (%); INDEX PROPERTIES: MOISTURE CONTENT (%), DRY DENSITY (pcf), UNCONFINED COMPRESSIVE STRENGTH (psf)

Fortuna Dump Site; Fortuna, California

LOG OF BORING B-6

Continued- Sheet 2 of 2

DEPTH (feet)	MATERIAL DESCRIPTION	ELEVATION (feet)	DEPTH (feet)	SAMPLES NUMBER	TIME SAMPLED	MOISTURE CONTENT (%)	NOTES
	Lean CLAY (CL) Stiff to very stiff, strong brown and olive laminations	335					
25	**Fat CLAY (CH) with sand - SLIDE PLANE** Medium to stiff, moist, dark greenish gray, trace black organics		25		0851 0856		
	As above except trace sand, stiff to very stiff, lean to fat clay			4		32	LL=62 PI=33
	4 inch horizon of burned wood/organics laminated in clay	330					
30			30		0856 0903		
	SILT (ML) with sand HOOKTON FORMATION Hard, olive and strong brown mottled/laminated. 1 inch greenish gray horizon at 32 feet	325					
35	As above except with increasing sand		35		0907 0915		
	Becomes Sandy Silt						
	Silty SAND (SM) with gravel HOOKTON FORMATION Dry, light olive brown, 15% small rounded gravel and rock fragments to 1/2 inch	320			0918 0926		
40	Becomes pale yellow with 30% rounded gravel to 2 inches		40	5	0930		
	BOTTOM OF BORING AT 42 FEET Boring dry ATD	315					
45			45				
50		310	50				

Other column headings: SOIL GRAPHIC; WELL GRAPHIC; PID Reading (soil),ppm; PID Reading (airspace),ppm; WATER LEVEL; SAMPLES TYPE; RECOVERY (%); INDEX PROPERTIES: DRY DENSITY (pcf); UNCONFINED COMPRESSIVE STRENGTH (psf)

Appendix C

Laboratory Test Results (URS, 2011)

LABORATORY TESTING PROGRAM

Laboratory tests were performed on selected samples as an aid in classifying the soils and to evaluate the physical properties of the soils. Detailed descriptions of the laboratory tests are presented below under the appropriate test headings. Test results are presented in the figures in this appendix, and on most boring logs.

Moisture Content and Dry Density

Moisture content and dry density determinations were made on selected samples. The samples were first trimmed to obtain volume and wet weight, and then were dried in accordance with ASTM D2216 and D2937. After drying, the weight of each sample was measured, and moisture content and dry density were calculated. The results of the individual tests are presented on the boring logs.

Unconfined Compressive Strength

The unconfined compressive strength was estimated for selected samples. These tests were performed in accordance with ASTM D2166. The axial load applied was measured with a load cell at an axial strain rate of 1.0 percent per minute. Loading was continued until the axial load reached a peak value. The results of these tests are presented at the corresponding sampling intervals on the individual boring logs.

Plasticity Index

The plasticity characteristics of the native soil were determined for selected samples by performing Liquid Limit and Plastic Limit tests generally in accordance with ASTM D4318.

Consolidated Undrained Triaxial Compression Strength

The shear strength characteristics were determined for two samples in accordance with ASTM D4767. In this test method, the shear characteristics are measured under undrained conditions. This test is applicable to field conditions where soils that have been fully consolidated under one set of stresses are subjected to a change in stress without time for further consolidation to take place (undrained condition), and the anticipated field stress conditions are similar to those in the test method.

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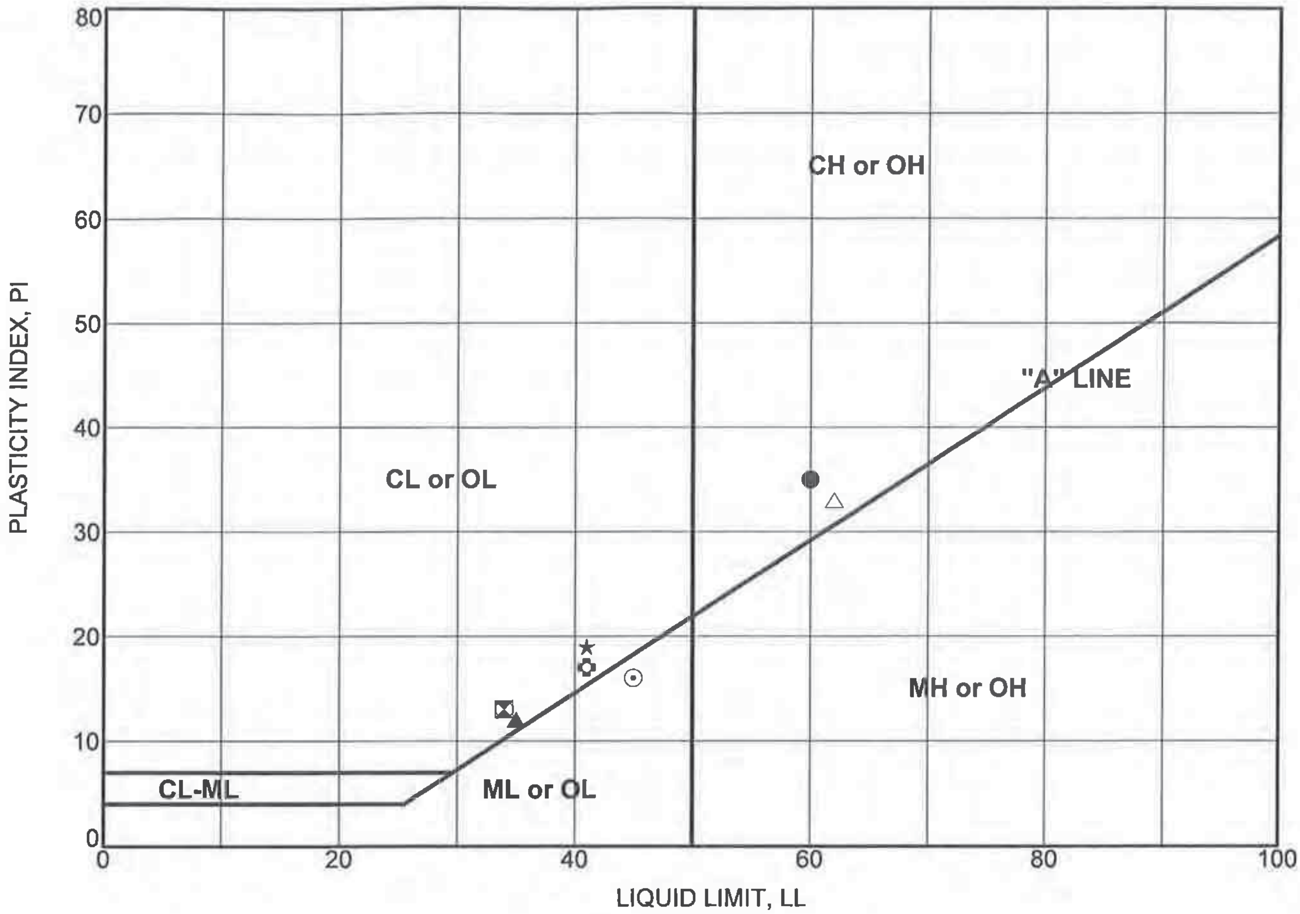
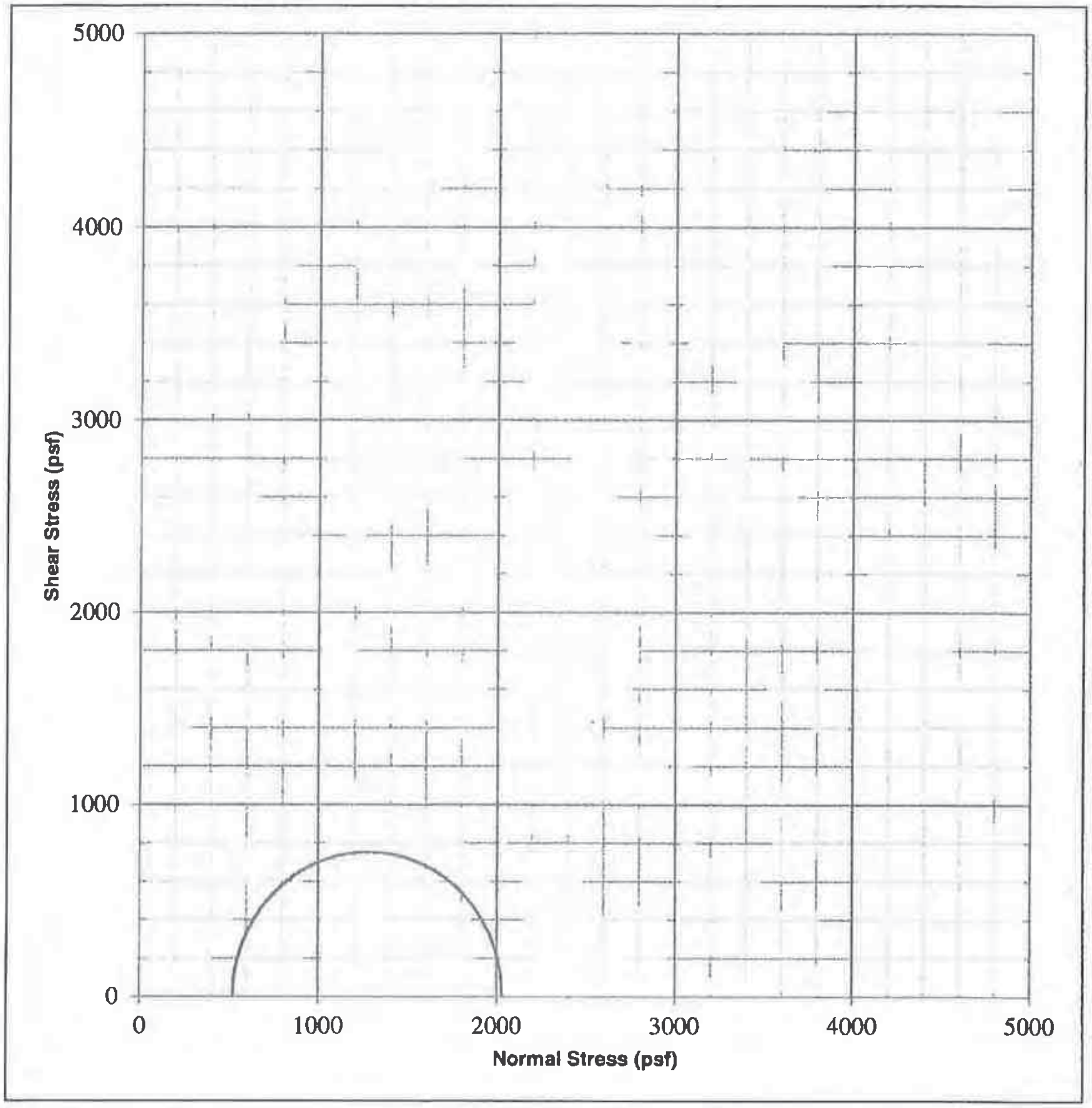


Boring Number	Sample Number	Depth (feet)	Test Symbol	Moisture Content (%)	LL	PL	PI	Description
B-1	S01	7	●	25	60	25	35	
B-2	S01	24	⊠	26	34	21	13	
B-3	S01	19	▲	29	35	23	12	
B-4	S03	14	★	19	41	22	19	
B-4	S01A	16	⊙	31	45	29	16	
B-5	S03	14	✪	28	41	24	17	
B-5A	S01	14	○	26	34	21	13	
B-6	S04	29	△	32	62	29	33	

Project: Fortuna Dump Site;
Project Number: 28645325

PLASTICITY CHART



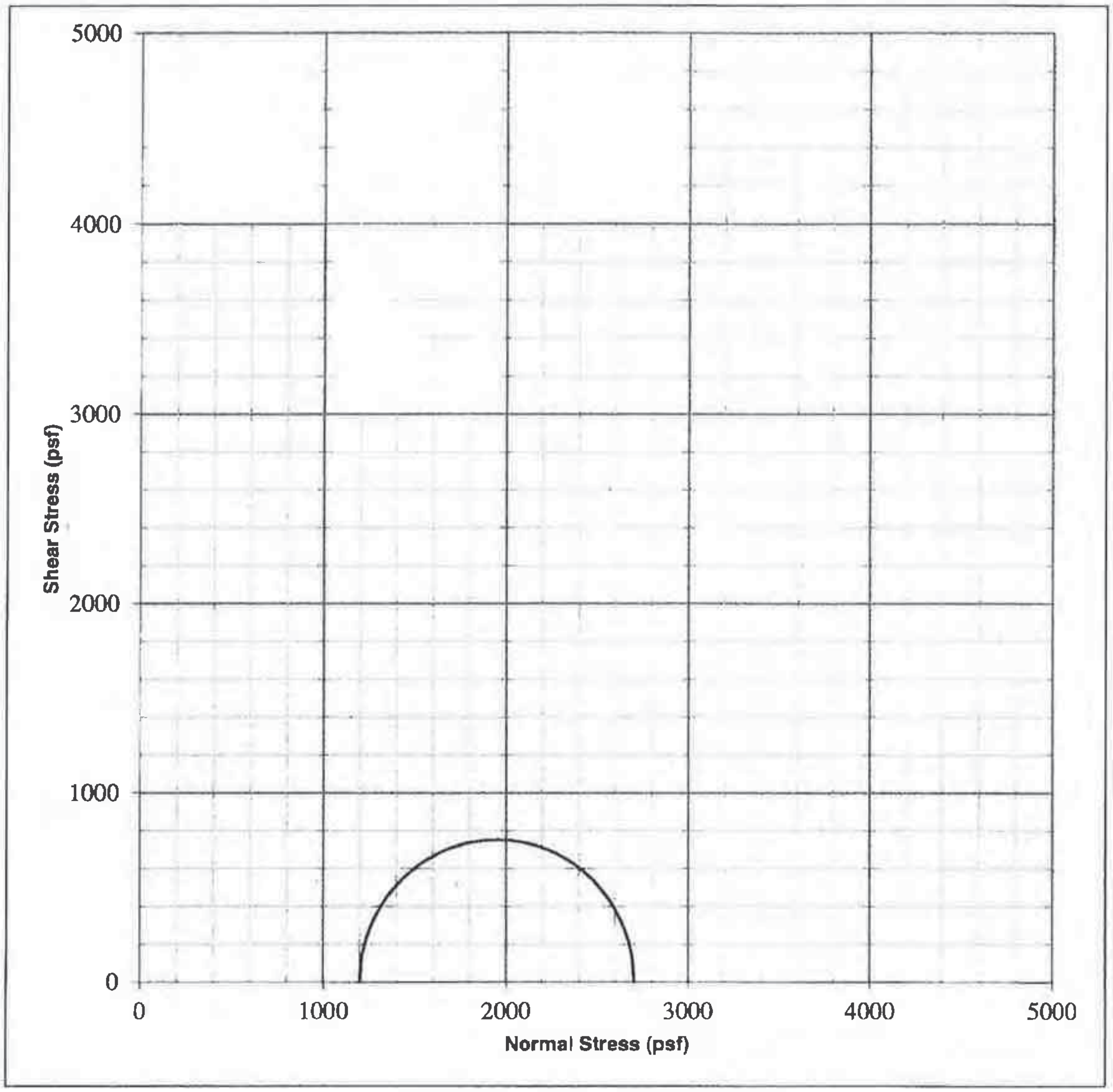
EFFECTIVE STRESS MOHR CIRCLE

Failure Criteria Maximum Effective σ1 / σ3 ratio

Line Type	Minor Principal Stress at failure (psf) σ_3	Maximum Deviator Stress at failure (psf)	Axial Strain at Failure (%)	Initial Height (in.)	Initial Diam. (in.)	Initial Moisture Content (%)	Initial Wet Density (pcf)	Initial Dry Density (pcf)	Initial Void Ratio	Initial Satura-tion (%)	Specific Gravity (assumed)	Rate of Strain (%/min)	Liquid Limit	Plastic Limit	Height to Diameter Ratio
solid	1200	1504	4.69	5.74	2.86	26.20	118.7	94.1	0.792	89.3	2.70	0.02	34	21	2.0

Client:	**URS**	Boring #: **B-5A**	Sample #: **S01**
Project:	**Fortuna Dump**	Depth (ft): **12.5-15**	
Project #:	**28645325.000**	Soil: **Dark grayish brown sandy lean clay with organics**	

ASTM D-4767	**TRIAXIAL COMPRESSION CONSOLIDATED-UNDRAINED**	**TXCU**



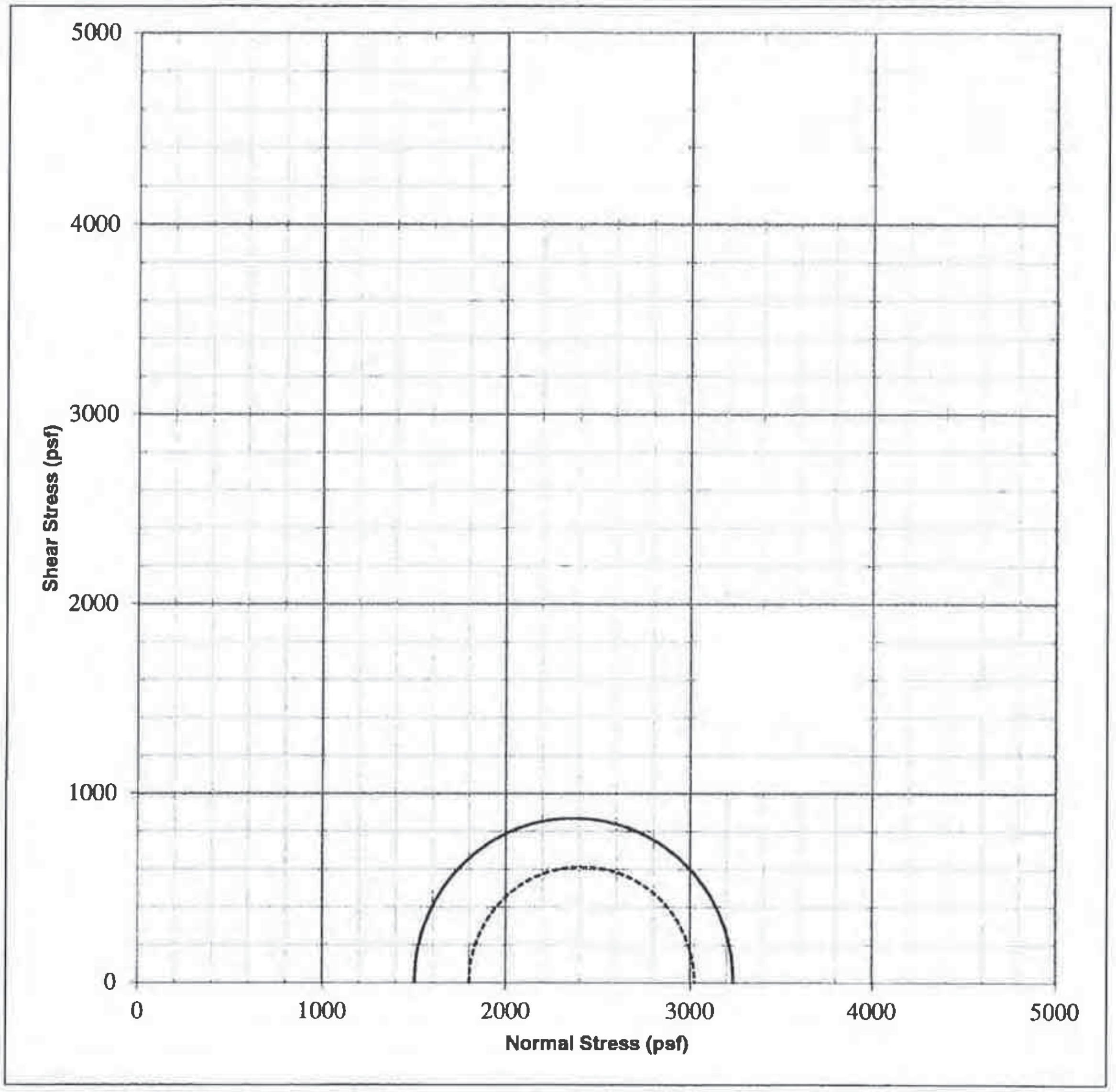
TOTAL STRESS MOHR CIRCLE

Failure Criteria Maximum Effective σ1 / σ3 ratio

Line Type	Minor Principal Stress at failure (psf) σ_3	Maximum Deviator Stress at failure (psf)	Axial Strain at Failure (%)	Initial Height (in.)	Initial Diam. (in.)	Initial Moisture Content (%)	Initial Wet Density (pcf)	Initial Dry Density (pcf)	Initial Void Ratio	Initial Saturation (%)	Specific Gravity (assumed)	Rate of Strain (%/min)	Liquid Limit	Plastic Limit	Height to Diameter Ratio
solid	1200	1504	4.69	5.74	2.86	26.20	118.7	94.1	0.792	89.3	2.70	0.02	34	21	2.0

Client: **URS**	Boring #: **B-5A** Sample #: **S01**
Project: **Fortuna Dump**	Depth (ft): **12.5-15**
Project #: **28645325.000**	Soil: **Dark grayish brown sandy lean clay with organics**

ASTM D-4767	**TRIAXIAL COMPRESSION CONSOLIDATED-UNDRAINED**	**TXCU**



TOTAL STRESS MOHR CIRCLES

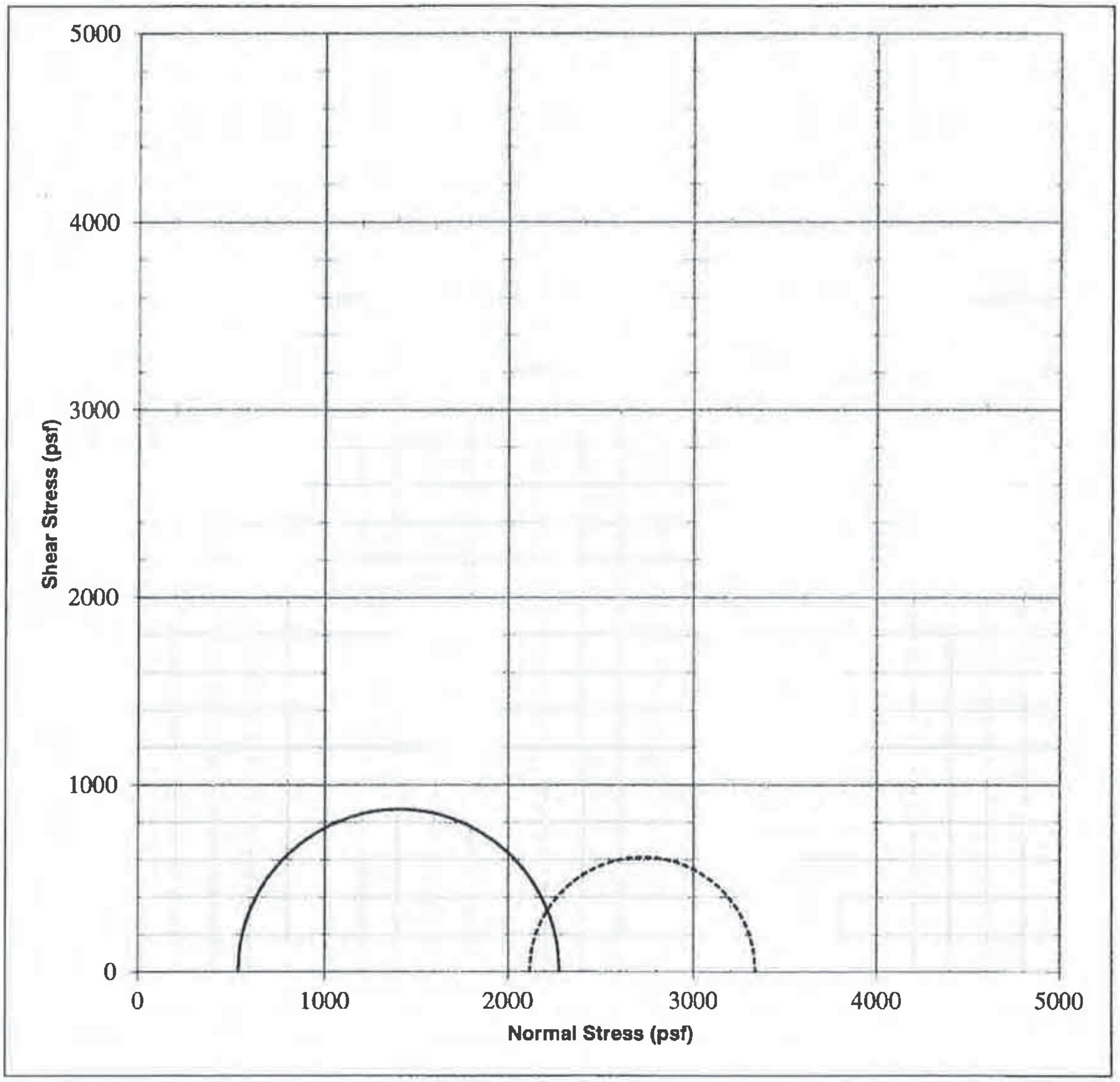
Failure Criteria Maximum Effective σ1 / σ3 ratio

Line Type	Minor Principal Stress at failure (psf) σ_3	Maximum Deviator Stress at failure (psf)	Axial Strain at Failure (%)	Initial Height (in.)	Initial Diam. (in.)	Initial Moisture Content (%)	Initial Wet Density (pcf)	Initial Dry Density (pcf)	Initial Void Ratio	Initial Saturation (%)	Specific Gravity (assumed)	Rate of Strain (%/min)	Liquid Limit	Plastic Limit	Height to Diameter Ratio
solid	1500	1738	7.16	5.96	2.87	31.23	114.5	87.3	0.932	90.5	2.70	0.02	45	29	2.1
dot	1800	1224	19.89	5.75	2.86	25.45	124.0	98.9	0.705	97.5	2.70	0.02			2.0

Client: **URS**	Boring #: **B-4A** Sample #: **S01**
Project: **Fortuna Dump**	Depth (ft): **14.5-17**
Project #: **28645325.000**	Soil: **Dark grayish brown silt with organics**

ASTM D-4767	**TRIAXIAL COMPRESSION CONSOLIDATED-UNDRAINED**	**TXCU**

SIGNET TESTING LABS **PLATE NUMBER**________



EFFECTIVE STRESS MOHR CIRCLES

Failure Criteria Maximum Effective σ1 / σ3 ratio

Line Type	Minor Principal Stress at failure (psf) σ_3	Maximum Deviator Stress at failure (psf)	Axial Strain at Failure (%)	Initial Height (in.)	Initial Diam. (in.)	Initial Moisture Content (%)	Initial Wet Density (pcf)	Initial Dry Density (pcf)	Initial Void Ratio	Initial Saturation (%)	Specific Gravity (assumed)	Rate of Strain (%/min)	Liquid Limit	Plastic Limit	Height to Diameter Ratio
solid	1500	1738	7.16	5.96	2.87	31.23	114.5	87.3	0.932	90.5	2.70	0.02	45	29	2.1
dot	1800	1224	19.89	5.75	2.86	25.45	124.0	98.9	0.705	97.5	2.70	0.02			2.0

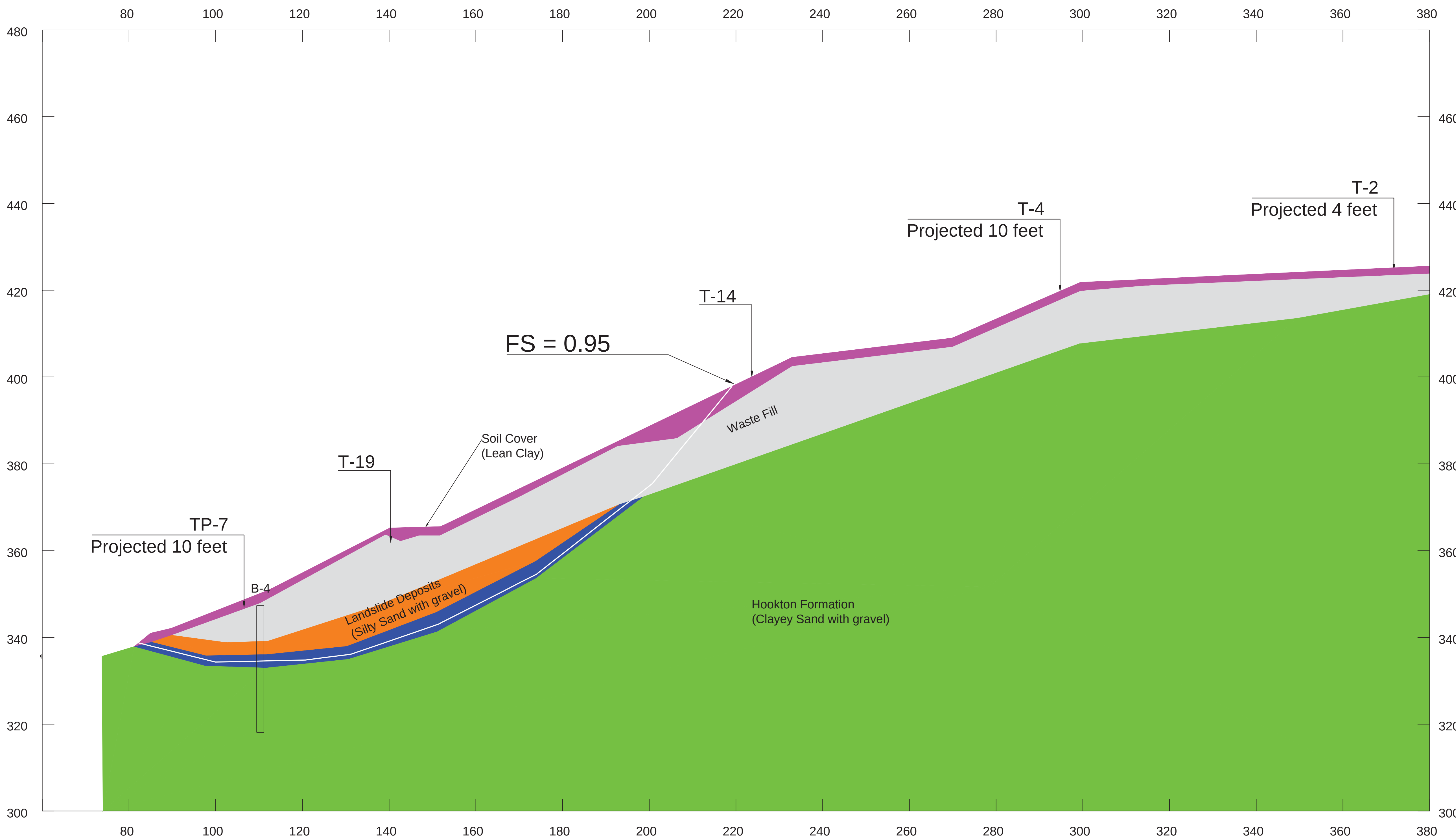
Client: **URS**	Boring #: **B-4A** Sample #: **S01**
Project: **Fortuna Dump**	Depth (ft): **14.5-17**
Project #: **28645325.000**	Soil: **Dark grayish brown silt with organics**

ASTM D-4767	**TRIAXIAL COMPRESSION CONSOLIDATED-UNDRAINED**	**TXCU**

SIGNET TESTING LABS **PLATE NUMBER**________

Appendix D

Slope Stability Analyses



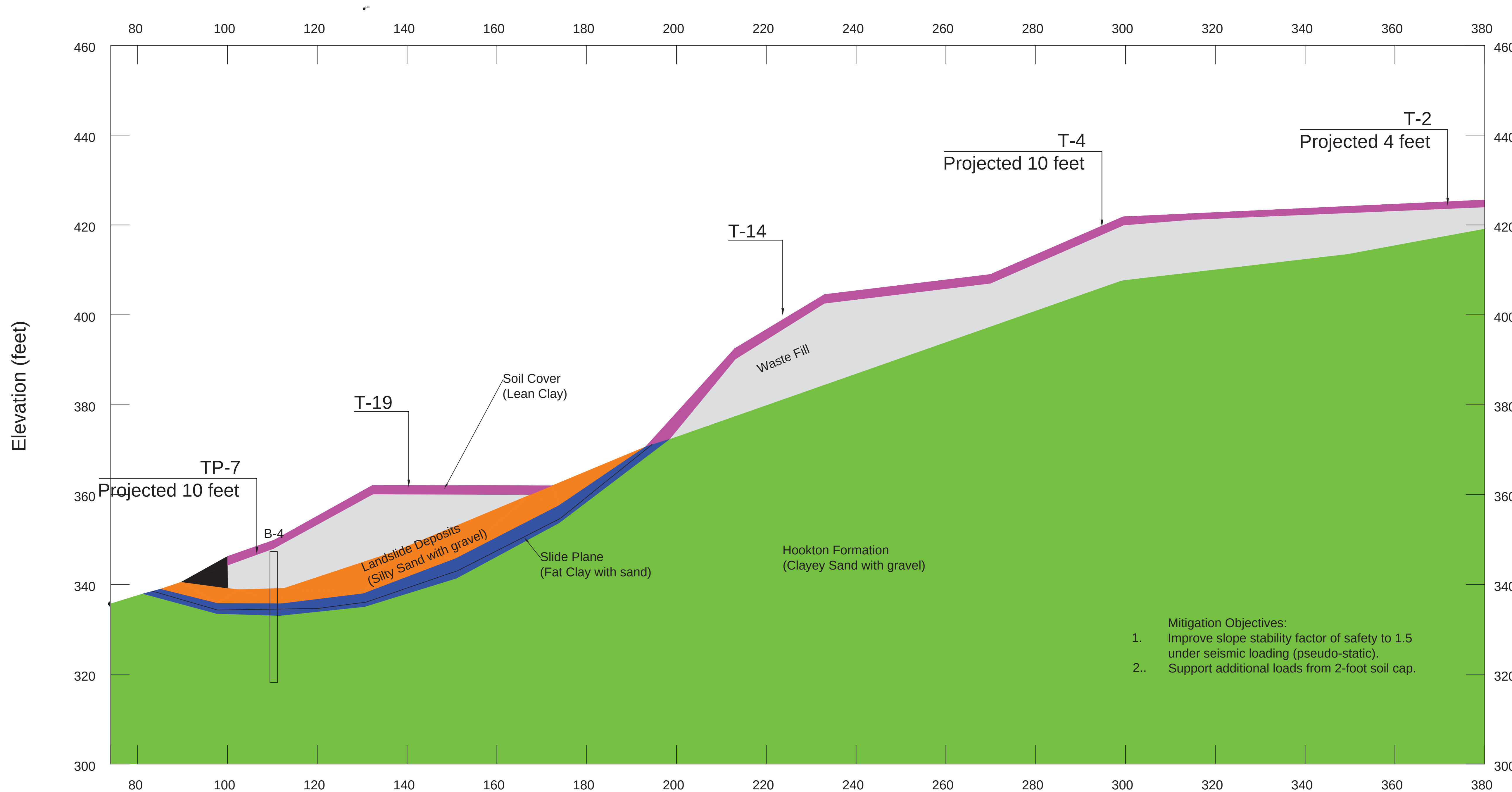
LEGEND

B-4	Approximate location fo borings
T-3	Approximate location of test pit (Ninyo & Moore)
TP-3	Surveyed location at test pit (URS, 2011)

Survey Reference:

1. Topographic survey map by Wallace E. Wright Land Surveying, Fortuna, California
2. Map revised: June 14, 2011 Section 7 T2N, R1E, H.M.
3. Date of survey: June 2009
4. Datum: assumed.

Project No. 28645325	FORTUNA DUMP SITE GEOLOGIC EVALUATION Fortuna, California	SOIL CAP ONLY SLOPE MITIGATION OPTION 1 CROSS SECTION C-C'	Figure D-1
12/19/2011	URS		



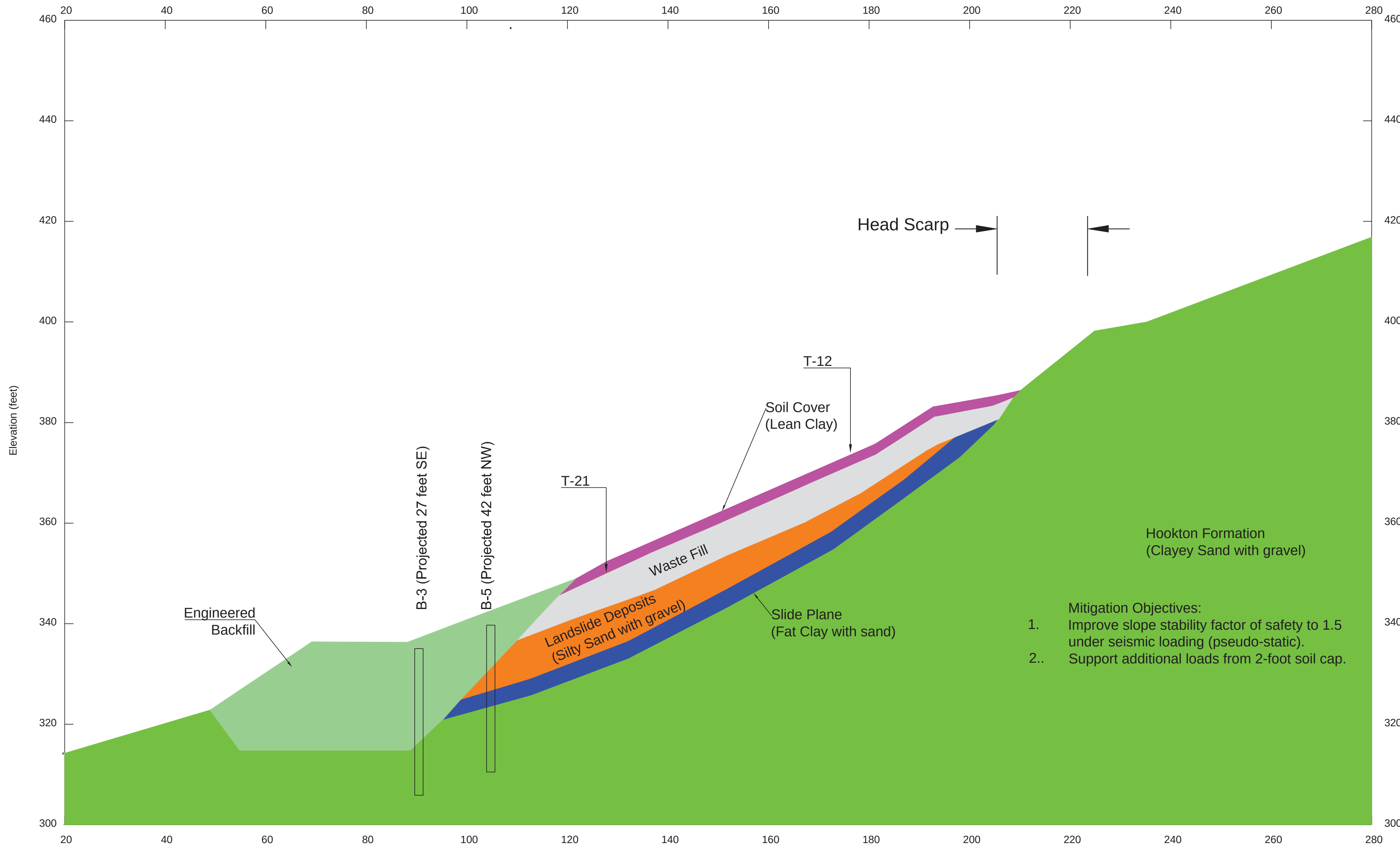
LEGEND

B-4	Approximate location fo borings
T-3	Approximate location of test pit (Ninyo & Moore)
TP-3	Surveyed location at test pit (URS, 2011)

Survey Reference:

1. Topographic survey map by Wallace E. Wright Land Surveying, Fortuna, California
2. Map revised: June 14, 2011
   Section 7 T2N, R1E, H.M.
3. Date of survey: June 2009
4. Datum: assumed.

Project No. 28645325	FORTUNA DUMP SITE GEOLOGIC EVALUATION Fortuna, California	REGRADING WITH CAP SLOPE MITIGATION OPTION 2 CROSS SECTION C-C'	Figure D-2
12/19/2011	URS		



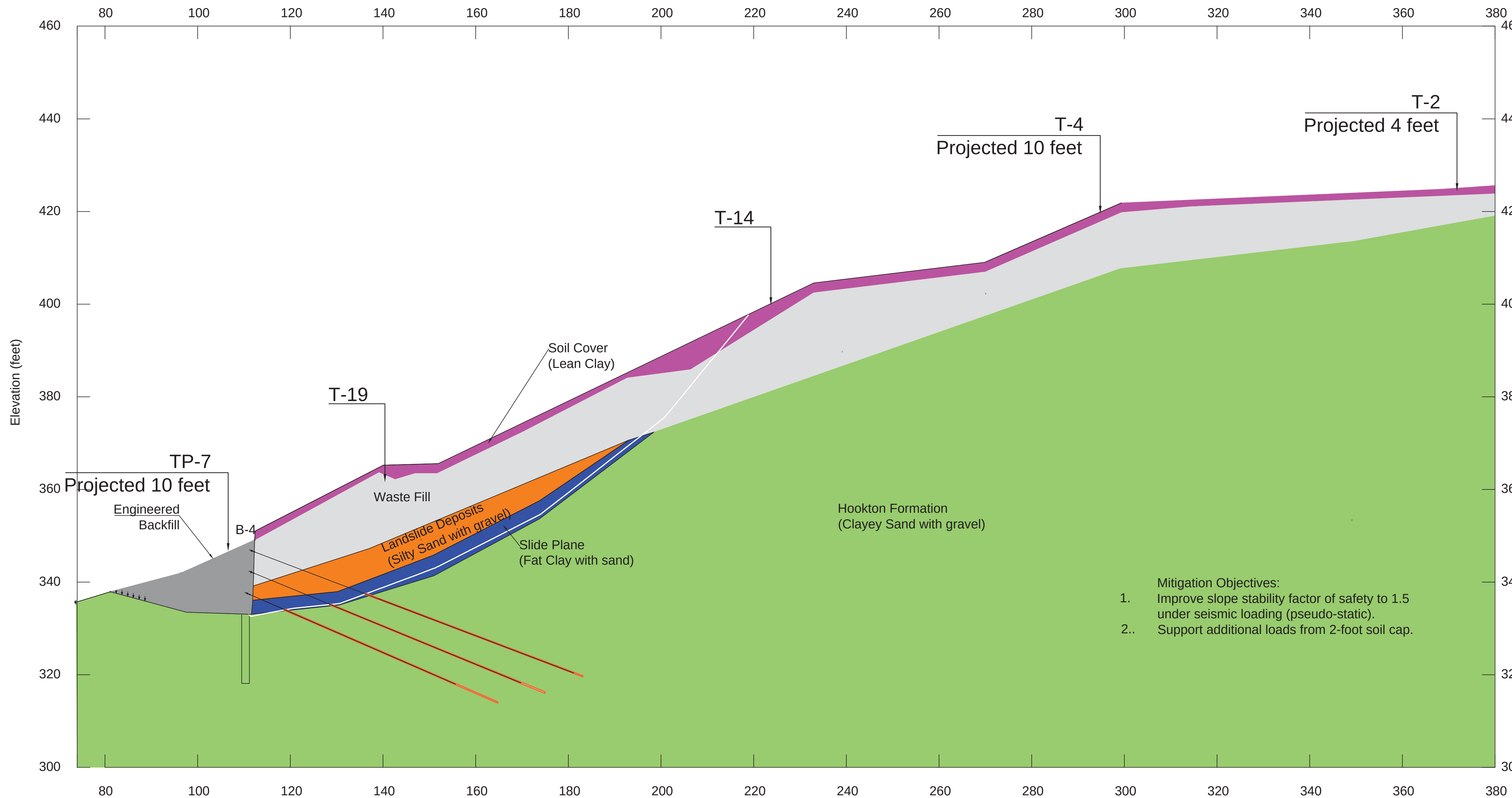
LEGEND

B-3 Approximate location fo borings

T-21 Approximate location of test pit (Ninyo & Moore)

Survey Reference:
1. Topographic survey map by Wallace E. Wright Land Surveying, Fortuna, California
2. Map revised: June 14, 2011
Section 7 T2N, R1E, H.M.
3. Date of survey: June 2009
4. Datum: assumed.

Project No. 28645325	FORTUNA DUMP SITE GEOLOGIC EVALUATION Fortuna, California	STABILIZATION BERM WITH CAP SLOPE MITIGATION OPTION 3 CROSS SECTION B-B'	Figure D-3
12/19/2011	URS		



LEGEND

B-4	Approximate location fo borings
T-3	Approximate location of test pit (Ninyo & Moore)
TP-3	Surveyed location at test pit (URS, 2011)

Survey Reference:
1. Topographic survey map by Wallace E. Wright Land Surveying, Fortuna, California
2. Map revised: June 14, 2011
   Section 7 T2N, R1E, H.M.
3. Date of survey: June 2009
4. Datum: assumed.

Project No. 28645325	FORTUNA DUMP SITE GEOLOGIC EVALUATION Fortuna, California	TIE BACK WALL SLOPE MITIGATION OPTION 4 CROSS SECTION C-C'	Figure D-4
12/19/2011	URS		

Appendix E

Test Pit Logs (Ninyo & Moore, 2007)

Kleinfelder / Inyo & Moore

TEST PIT LOG

FORTUNA DUMP
ROHNERVILLE, CALIFORNIA

PROJECT NO.	DATE
104690020	1/07

DATE EXCAVATED '01/06 TEST PIT NO. T-1

GROUND ELEVATION 423.8'± (MSL) LOGGED BY BAB

METHOD OF EXCAVATION Excavator

LOCATION Main level area

DESCRIPTION

UNITS

Ⓐ COVER/FILL:
Brown yellowish red, damp, sandy clayey SILT with cobbles.

Ⓑ BURNED MATERIALS AND FILL:
Mottled brown black burned materials and minor fill. Distinct layer. Burned materials comprise approximately 90-95% and consist primarily of broken glass, metal, debris, and bottles.

Ⓒ COLLUVIUM (?)/HOOKTON FORMATION (?):
Light brownish yellowish red, moist to very moist, clayey SILT.

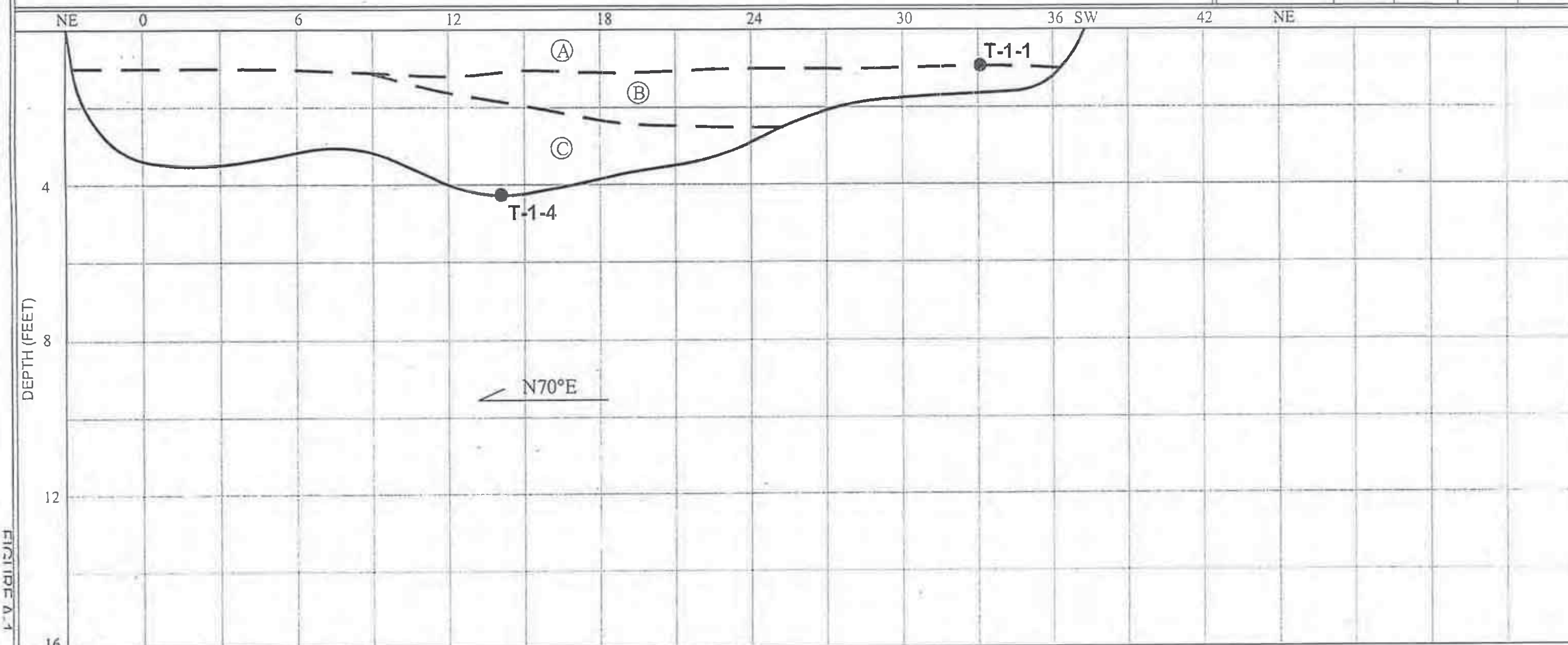
NOTES

Burned materials pinch out approximately 9 feet from the northeast end of the trench

Total Depth = 4 feet.
Groundwater not encountered during trench excavating.

Depths of subsurface materials encountered vary and are estimates only due to trench length, sloping ground surfaces, and accessibility.

SAMPLE ID	LEAD TTLC (mg/kg)	LEAD STLC (mg/L)	LEAD TCLP (mg/L)	LEAD DIWET (mg/L)
T-1-1	2800	200	3.3	ND
T-1-4	5.3	NA	NA	NA



SCALE = Vert: 1 in./4 ft., Horiz: 1 in./6 ft.

FIGURE A-1

Ninyo & Moore

TEST PIT LOG

FORTUNA DUMP
ROHNERVILLE, CALIFORNIA

PROJECT NO.	DATE
104690020	1/07

DATE EXCAVATED /01/06 TEST PIT NO. T-2

GROUND ELEVATION 425.3' ± (MSL) LOGGED BY BAB

METHOD OF EXCAVATION Excavator

LOCATION Main level area

DESCRIPTION

UNITS

Ⓐ COVER/FILL:
Brown yellowish red, dry, fine slightly sandy clayey SILT and silty CLAY.

Ⓑ BURNED MATERIALS AND MINOR FILL:
Mottled black brownish yellowish red, slightly moist, burned materials and minor fill. Burned materials comprise approximately 95-100 % and consist primarily of abundant broken fused and melted glass, broken bottles, and chunks of fused metal and glass.

Ⓒ COLLUVIUM (?)/HOOKTON FORMATION (?):
Brown (4'-5') and brownish yellowish red (5'-6'), moist to very moist, slightly fine sandy silty CLAY.

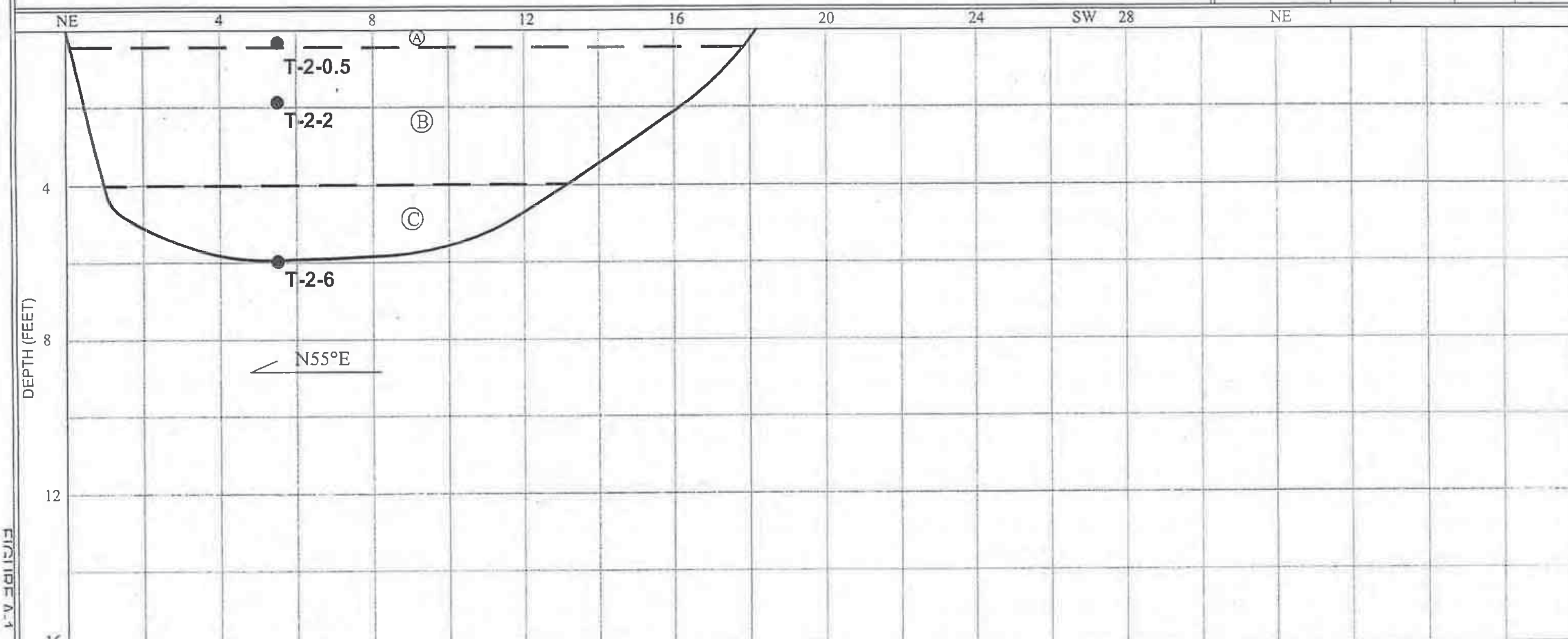
NOTES

Burned wastes comprised of very dense fused metal and glass.

Total Depth = 6 feet.
Groundwater not encountered during trench excavating.

Depths of subsurface materials encountered vary and are estimates only due to trench length, sloping ground surfaces, and accessibility.

SAMPLE ID	LEAD TTLC (mg/kg)	LEAD STLC (mg/L)	LEAD TCLP (mg/L)	LEAD DIWET (mg/L)
T-2-0.5	72	2.3	NA	NA
T-2-2	3600	710	2.5	ND
T-2-6	7	NA	NA	NA



SCALE = Vert: 1 in./4 ft.

FIGURE A-1

Ninyo & Moore

TEST PIT LOG

FORTUNA DUMP
ROHNERVILLE, CALIFORNIA

PROJECT NO.	DATE
104690020	1/07

DATE EXCAVATED '01/06 TEST PIT NO. T-3

GROUND ELEVATION 416.0'± (MSL) LOGGED BY BAB

METHOD OF EXCAVATION Excavator

LOCATION Main level area

DESCRIPTION

UNITS

Ⓐ COVER/FILL:
Light brownish yellowish red, damp, very loose, sandy clayey SILT.

Ⓑ BURNED MATERIALS, MINOR MUNICIPAL WASTES, AND FILL:
Highly mixed and mottled, brown black, moist, burned materials, minor municipal solid wastes, and minor sandy clayey SILT. Burned materials comprise approximately 90 %+ and consist primarily of abundant glass, some melted glass, bricks, porcelain, glass bottles, much lesser municipal solid wastes approximately 5-10 % consisting primarily of plastics, cobbles, bricks, asphalt debris, wire and other metal debris.

Ⓒ COLLUVIUM (?)/HOOKTON FORMATION (?):
Gray, hard, wet, clayey SILTSTONE/silty CLAY.

NOTES

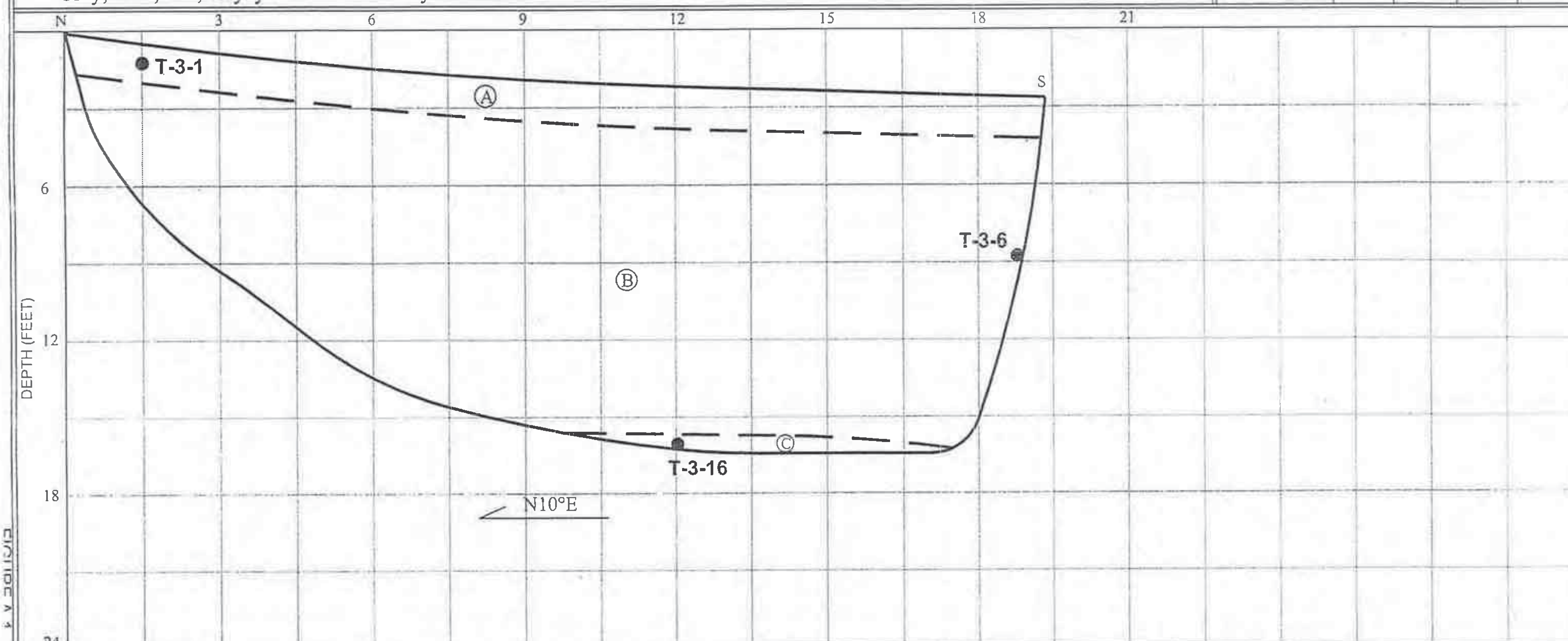
Wastes are very mixed; consisting of burned materials and lesser municipal solid wastes that appear to have been moved around and mixed to create level area.

Wastes to ~ 15.5 feet bgs at center.

Total Depth = 17 feet.
Groundwater not encountered during trench excavating.

Depths of subsurface materials encountered vary and are estimates only due to trench length, sloping ground surfaces, and accessibility.

SAMPLE ID	LEAD TTLC (mg/kg)	LEAD STLC (mg/L)	LEAD TCLP (mg/L)	LEAD DIWET (mg/L)
T-3-1	320	12	NA	NA
T-3-6	27000	1200	0.65	0.11
T-3-16	12	NA	NA	NA



SCALE = Vert: 1 in./6 ft.

FIGURE A-1

Ninyo & Moore

TEST PIT LOG

FORTUNA DUMP
ROHNERVILLE, CALIFORNIA

PROJECT NO.	DATE
104690020	1/07

DATE EXCAVATED _ .01/06 TEST PIT NO. T-4

GROUND ELEVATION 419.3'± (MSL) LOGGED BY BAB

METHOD OF EXCAVATION Excavator

LOCATION Main level area

DESCRIPTION

UNITS

Ⓐ SLOPE WASH/BURNED MATERIALS:
Brown, damp, fine sandy silty CLAY with burned wastes consisting primarily of bottles, broken glass and debris.

Ⓑ FILL:
Brown yellowish red, fine sandy silty CLAY.

Ⓒ BURNED MATERIALS/MUNICIPAL SOLID WASTES:
Highly mixed and mottled brownish black, burned materials and municipal solid wastes comprising approximately 80-90% and consist primarily of broken glass, partially melted glass, flip top aluminum cans, metal, metal debris, burned wastes, with some very distinct oxidized zones (red-brown), stove parts, wood, batteries, and metal containers.

Ⓓ COLLUVIUM (?)/HOOKTON FORMATION (?):
Brownish yellowish red, moist, fine sandy silty CLAY.

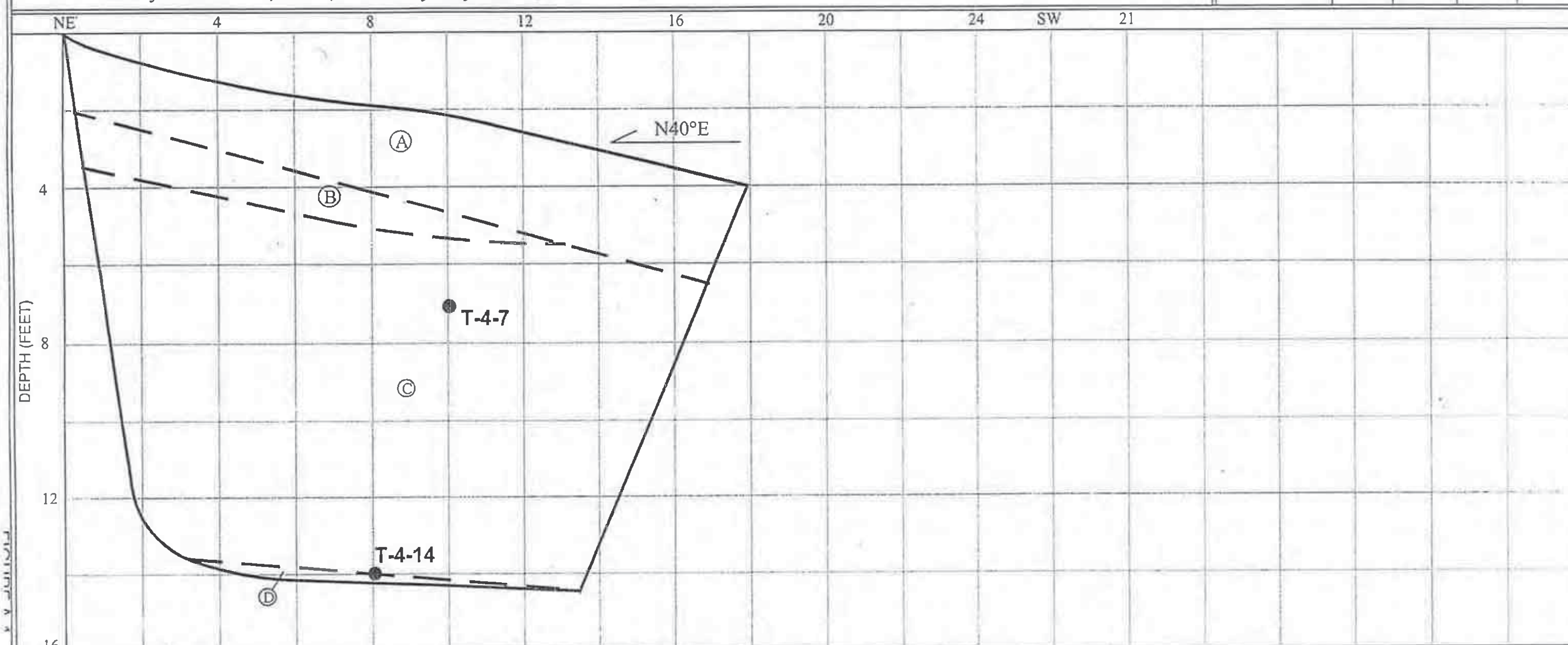
NOTES

Cover/fill appears absent.

Total Depth = 16 feet.
Groundwater not encountered during trench excavating.

Depths of subsurface materials encountered vary and are estimates only due to trench length, sloping ground surfaces, and accessibility.

SAMPLE ID	LEAD TTLC (mg/kg)	LEAD STLC (mg/L)	LEAD TCLP (mg/L)	LEAD DIWET (mg/L)
T-4-7	2500	22	0.11	ND
T-4-14	6.8	NA	NA	NA



SCALE = Vert: 1 in./4 ft.

Kleinfelder?

Ninyo & Moore

TEST PIT LOG

FORTUNA DUMP
ROHNERVILLE, CALIFORNIA

PROJECT NO.	DATE
104690020	1/07

DATE EXCAVATED]2/06 TEST PIT NO. T-5

GROUND ELEVATION 433.5'± (MSL) LOGGED BY BAB

METHOD OF EXCAVATION Excavator

LOCATION West of new shed, sloped area

SAMPLE ID	LEAD TTLC (mg/kg)	LEAD STLC (mg/L)	LEAD TCLP (mg/L)	LEAD DIWET (mg/L)

DESCRIPTION

UNITS

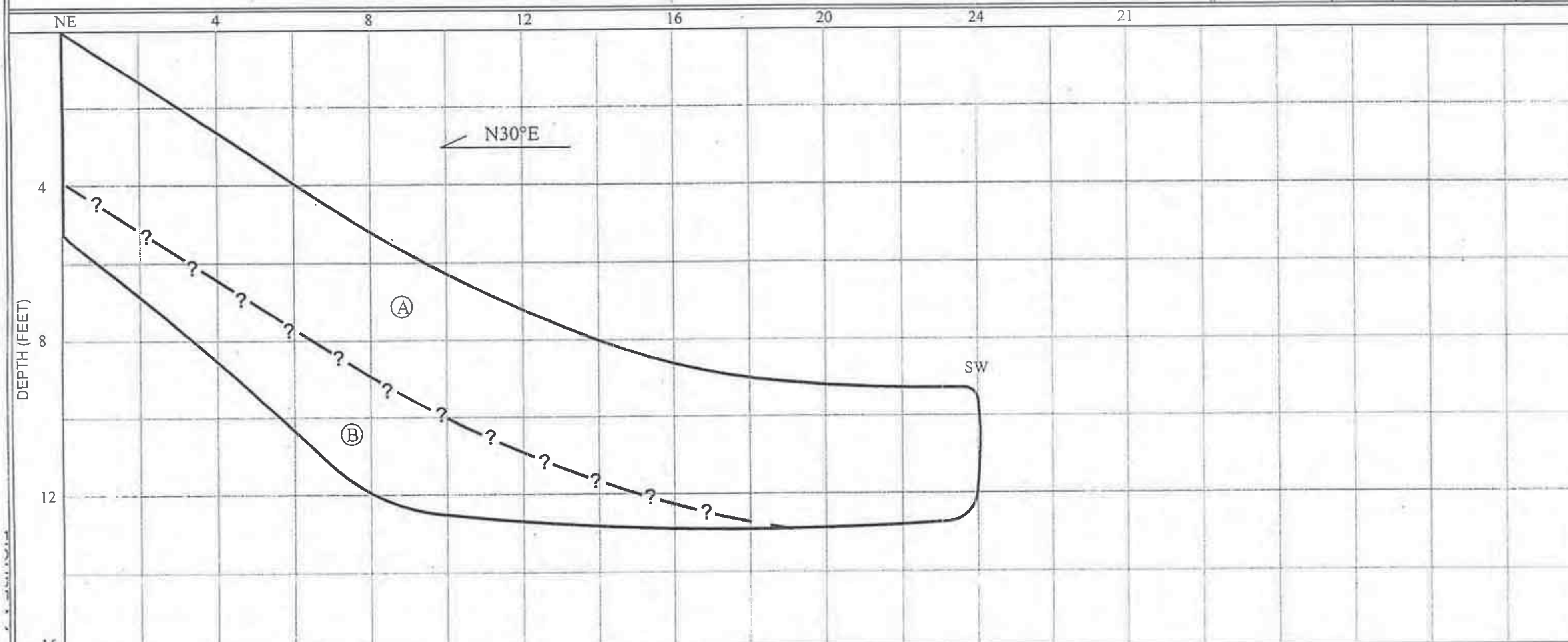
Ⓐ SLOPE WASH/DEBRIS:
Brown, dry to damp, hard, slightly sandy silty CLAY with debris comprising approximately 50-60% and consisting primarily of wood, milled wood, metal sign, roofing materials, and metal debris.

Ⓑ COLLUVIUM (?)/HOOKTON FORMATION (?):
Brownish yellowish red, damp, slightly sandy silty CLAY.

NOTES

Wastes appear to be mostly relatively large debris pushed over the slope as opposed to buried burned materials. Very difficult to access this trench due to steep slope, loose fill/caving, and poison oak.

Total Depth = 12 feet.
Groundwater not encountered during trench excavating.
Depths of subsurface materials encountered vary and are estimates only due to trench length, sloping ground surfaces, and accessibility.



SCALE = Vert: 1 in./8 ft., Horiz: 1 in./4 ft.

Ninyo & Moore

TEST PIT LOG

FORTUNA DUMP
ROHNERVILLE, CALIFORNIA

PROJECT NO.	DATE
104690020	1/07

DATE EXCAVATED)1/06 TEST PIT NO. T-6

GROUND ELEVATION 436.9'± (MSL) LOGGED BY BAB

METHOD OF EXCAVATION Excavator

LOCATION Upper level area/sloped area

DESCRIPTION

UNITS

Ⓐ BURNED MATERIALS AND FILL:
Highly mottled black brownish yellowish red, burned materials and fill. Burned materials comprise approximately 80-85 % and consist primarily of glass, glass bottles, and jars, broken glass, and metal debris.

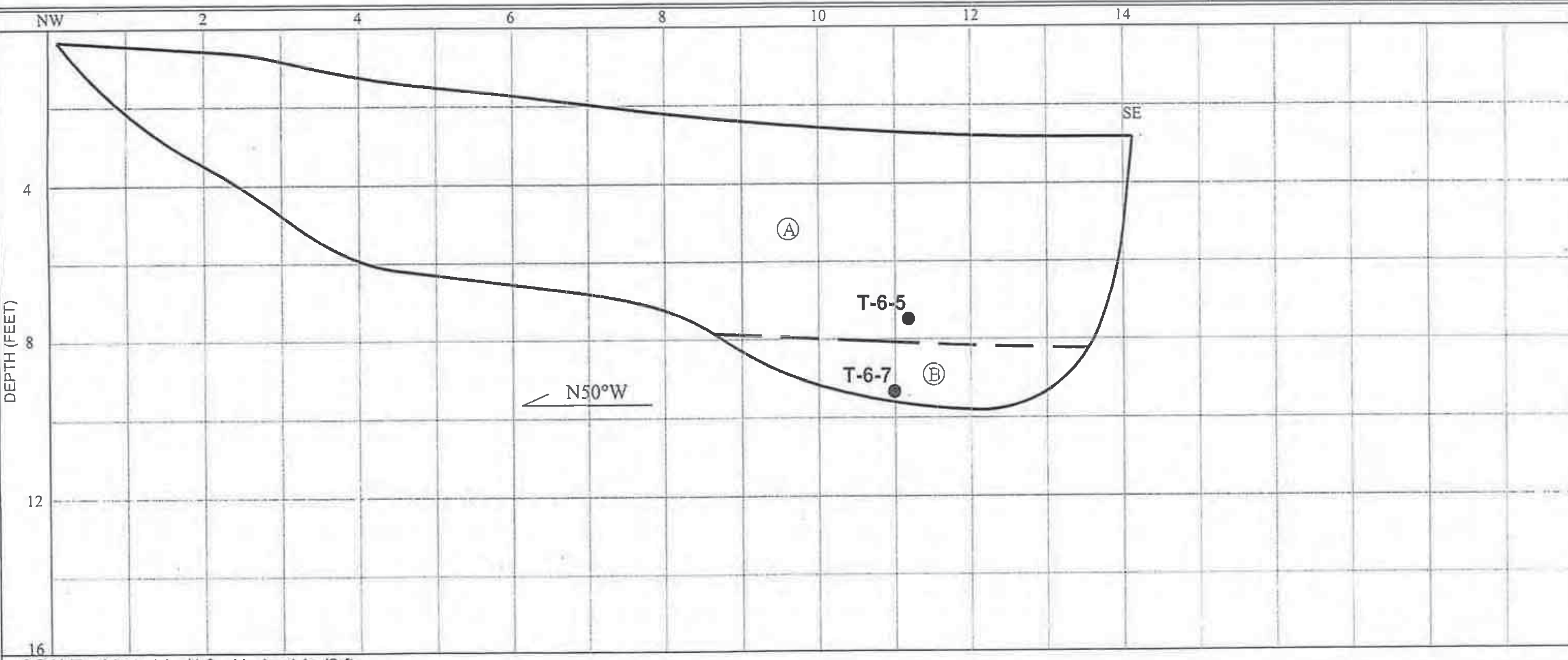
Ⓑ COLLUVIUM (?)/HOOKTON FORMATION (?):
Brownish yellowish red, moist, silty CLAY.

NOTES

Total Depth = 10 feet.
Groundwater not encountered during trench excavating.

Depths of subsurface materials encountered vary and are estimates only due to trench length, sloping ground surfaces, and accessibility.

SAMPLE ID	LEAD TTLC (mg/kg)	LEAD STLC (mg/L)	LEAD TCLP (mg/L)	LEAD DIWET (mg/L)
T-6-5	620	18	NA	NA
T-6-7	6.2	NA	NA	NA



SCALE = Vert: 1 in./4 ft., Horiz: 1 in./2 ft.

Ninyo & Moore

TEST PIT LOG

FORTUNA DUMP
ROHNERVILLE, CALIFORNIA

PROJECT NO.	DATE
104690020	1/07

DATE EXCAVATED 01/06 TEST PIT NO. T-6A

GROUND ELEVATION 439.9' ± (MSL) LOGGED BY BAB

METHOD OF EXCAVATION Excavator

LOCATION East of T-6

DESCRIPTION

SAMPLE ID	LEAD TTLC (mg/kg)	LEAD STLC (mg/L)	LEAD TCLP (mg/L)	LEAD DIWET (mg/L)

UNITS

Ⓐ COVER/FILL:
Brownish gray, dry to damp, clayey SILT with cobbles.

Ⓑ BURNED MATERIALS, FILL, AND MINOR MUNICIPAL SOLID WASTES:
Highly mixed and mottled black brownish yellowish red burned, material, fill, and minor municipal solid waste. Burned materials comprise approximately 85-90% and consist primarily of glass, glass bottles, broken glass, metal debris, fused metal, glass wood and very minor plastic.

Ⓒ COLLUVIUM (?)/HOOKTON FORMATION (?):
Brownish yellowish red, moist, silty CLAY.

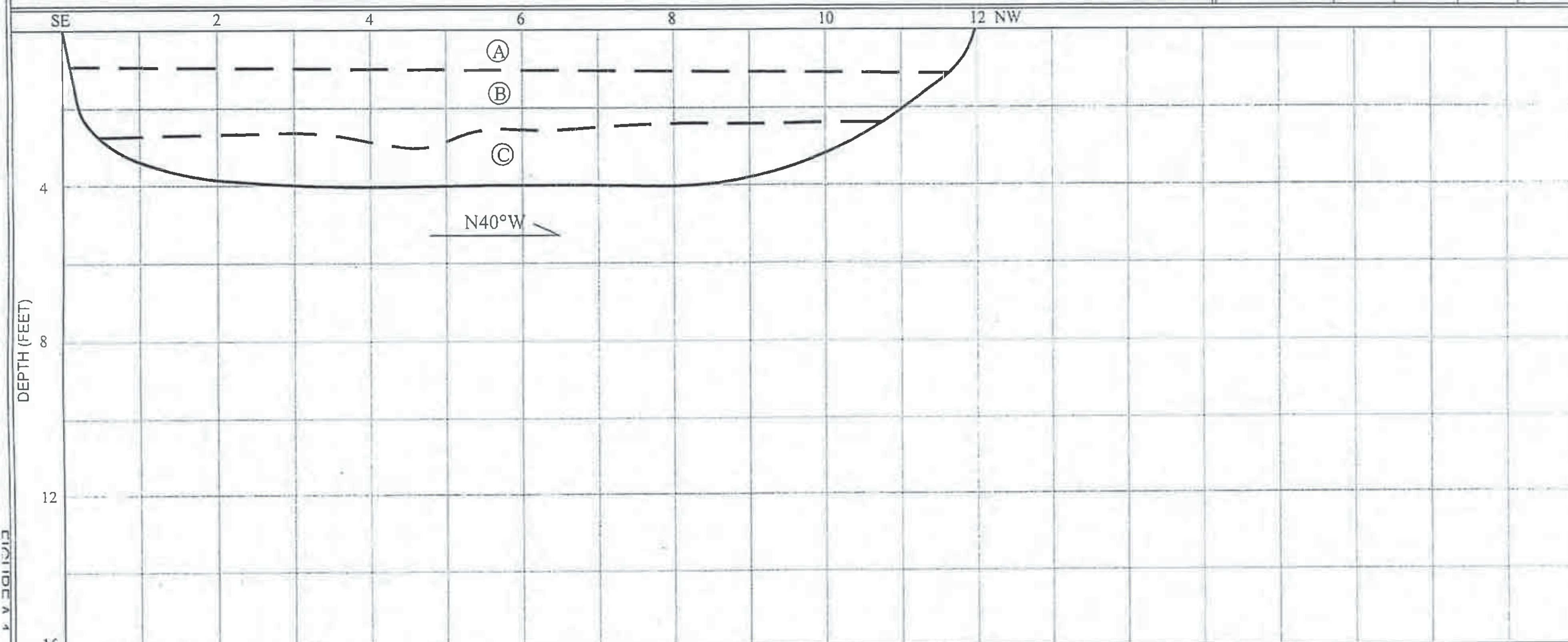
NOTES

Wastes appear pushed around since occasional plastic mixed with burned materials.

Wastes appear more concentrated at shallower depths.

Total Depth = 4 feet.
Groundwater not encountered during trench excavating.

Depths of subsurface materials encountered vary and are estimates only due to trench length, sloping ground surfaces, and accessibility.



SCALE = Vert: 1 in./4 ft., Horiz: 1 in./2 ft.

Kleinfelder/Ninyo & Moore

TEST PIT LOG

FORTUNA DUMP
ROHNERVILLE, CALIFORNIA

PROJECT NO.	DATE
104690020	1/07

DATE EXCAVATED 01/06 TEST PIT NO. T-7

GROUND ELEVATION 441.2'± (MSL) LOGGED BY BAB

METHOD OF EXCAVATION Excavator

LOCATION Upper level area, near milled wood pile.

DESCRIPTION

UNITS

Ⓐ COVER/FILL:
Brownish yellowish red, dry, very fine sandy silty CLAY.

Ⓑ BURNED MATERIALS AND FILL:
Mottled black brownish yellowish red, burned materials and fill. Burned materials comprise approximately 80-85 % and consist primarily of glass, metal debris, and some cobbles.

Ⓒ COLLUVIUM (?)/HOOKTON FORMATION (?):
Brownish yellowish red, damp to moist, silty fine sandy silty CLAY.

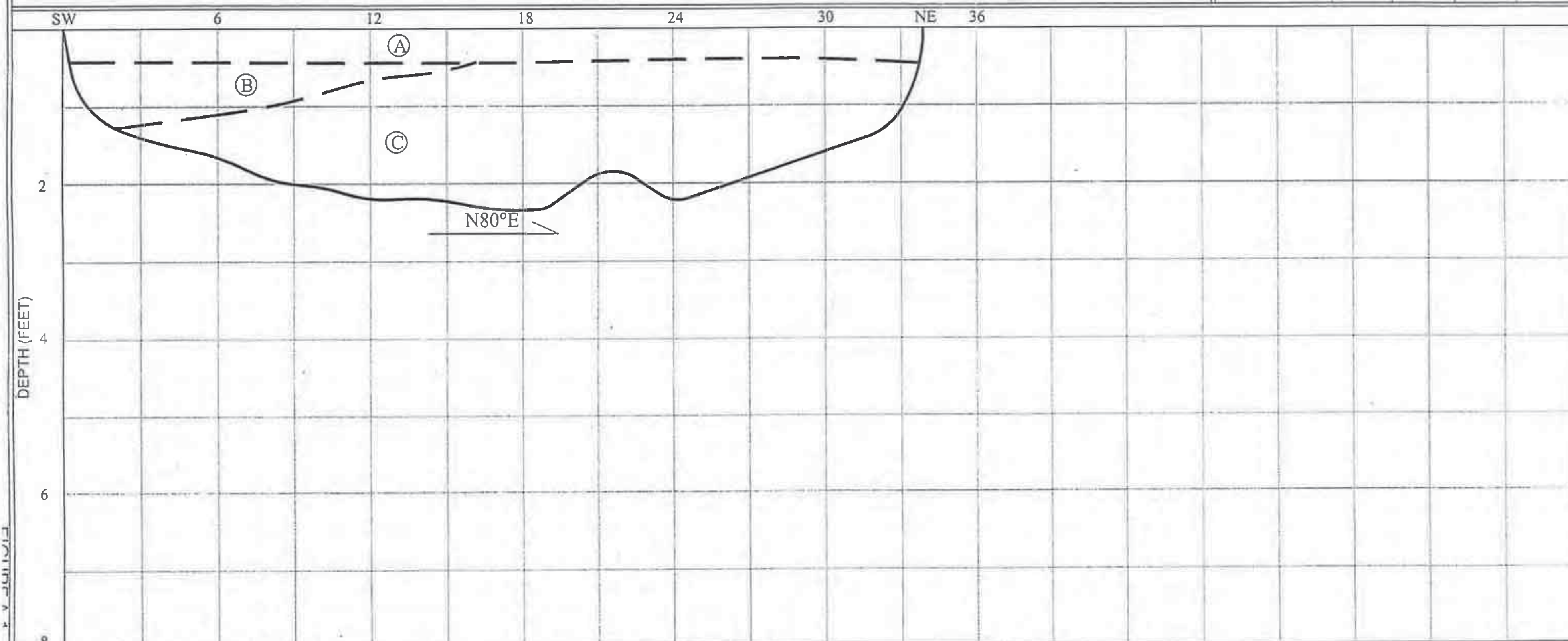
NOTES

Burned materials thin and pinch out approximately 16 feet northeast of southwest end of trench.

Total Depth = 4 feet.
Groundwater not encountered during trench excavating.

Depths of subsurface materials encountered vary and are estimates only due to trench length, sloping ground surfaces, and accessibility.

SAMPLE ID	LEAD TTLC (mg/kg)	LEAD STLC (mg/L)	LEAD TCLP (mg/L)	LEAD DIWET (mg/L)



SCALE = Vert: 1 in./2 ft., Horiz: 1 in./6 ft.

Ninyo & Moore

TEST PIT LOG

FORTUNA DUMP
ROHNERVILLE, CALIFORNIA

PROJECT NO.	DATE
104690020	1/07

DATE EXCAVATED 12/06 TEST PIT NO. T-8

GROUND ELEVATION 436.0'± (MSL) LOGGED BY BAB

METHOD OF EXCAVATION Excavator

LOCATION Upper level area, near milled wood pile.

DESCRIPTION

UNITS

Ⓐ COVER/FILL:
Brown, dry, hard, slightly sandy silty CLAY.

Ⓑ MUNICIPAL SOLID WASTES AND FILL:
Highly mixed brown and brownish yellowish, sandy silty CLAY and municipal solid wastes. Municipal solid wastes comprise approximately 40-50%, and consist primarily of plastic, paper, aluminum cans, plastic containers, tires, cobbles, bricks, wood, rugs, metal piping and other miscellaneous debris.

Ⓒ TOPSOIL:
Brown, damp to moist, hard, slightly sandy silty CLAY.

Ⓓ COLLUVIUM (?)/HOOKTON FORMATION (?):
Brownish yellowish red, moist, very silty CLAY.

NOTES

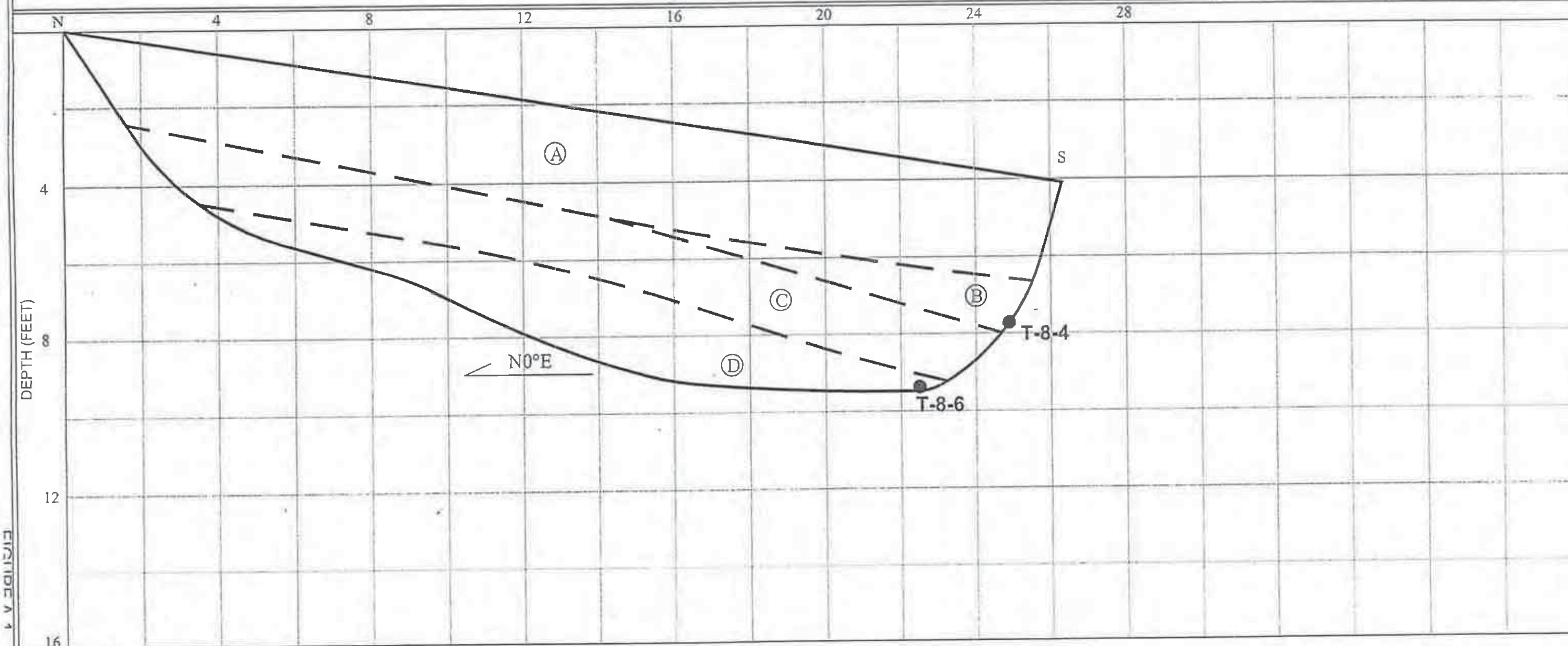
Slope wash and municipal solid wastes appears to have been pushed over the edge of the slope.

Municipal solid wastes pinches out to the north at approximately 10 feet from south end of trench.

Total Depth = 8 feet.
Groundwater not encountered during trench excavating.

Depths of subsurface materials encountered vary and are estimates only due to trench length, sloping ground surfaces, and accessibility.

SAMPLE ID	LEAD TTLC (mg/kg)	LEAD STLC (mg/L)	LEAD TCLP (mg/L)	LEAD DIWET (mg/L)
T-8-4	120	3.6	NA	NA
T-8-6	7.5	NA	NA	NA



SCALE = 1 in./4 ft.

FIGURE A-1

Kleinfelder (Ninyo & Moore)

TEST PIT LOG

FORTUNA DUMP
ROHNERVILLE, CALIFORNIA

PROJECT NO.	DATE
104690020	1/07

DATE EXCAVATED _ ,2/06 TEST PIT NO. T-9

GROUND ELEVATION 387.3'± (MSL) LOGGED BY BAB

METHOD OF EXCAVATION Excavator

LOCATION Eastern property area, new road, southeastern area.

DESCRIPTION

UNITS

Ⓐ TOPSOIL, SLOPE WASH, BURNED AND MUNICIPAL SOLID WASTES AND DEBRIS:
Brown, damp, silty CLAY, burned and municipal solid wastes and debris. Wastes comprise approximately 40-45 %, and consist primarily of aluminum cans, metal debris, metal pipe, wood, and plastic bags.

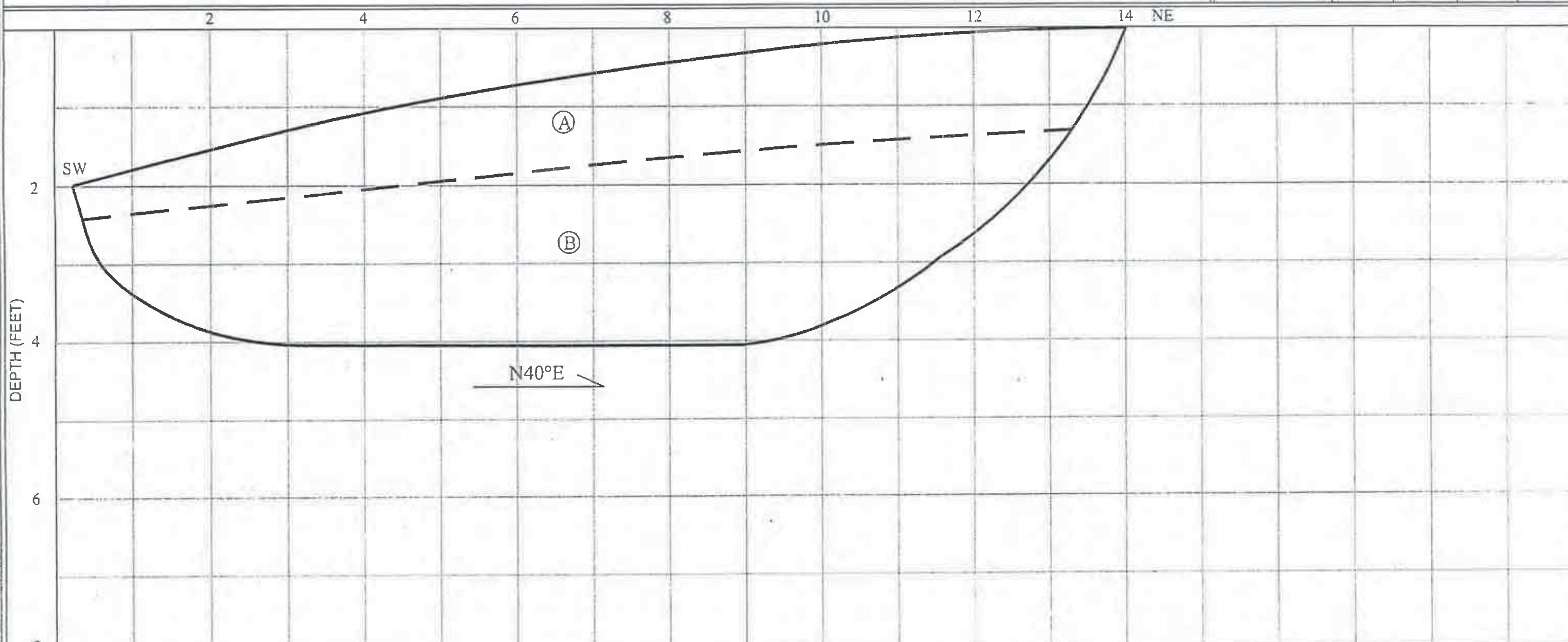
Ⓑ COLLUVIUM (?)/HOOKTON FORMATION (?):
Brownish yellowish red, moist, silty CLAY.

NOTES

Total Depth = 4 feet.
Groundwater not encountered during trench excavating.

Depths of subsurface materials encountered vary and are estimates only due to trench length, sloping ground surfaces, and accessibility.

SAMPLE ID	LEAD TTLC (mg/kg)	LEAD STLC (mg/L)	LEAD TCLP (mg/L)	LEAD DIWET (mg/L)



SCALE = 1 in./2 ft.

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TEST PIT LOG

FORTUNA DUMP
ROHNERVILLE, CALIFORNIA

PROJECT NO.	DATE
104690020	1/07

DATE EXCAVATED 02/06 TEST PIT NO. T-9A

GROUND ELEVATION 382.3'± (MSL) LOGGED BY BAB

METHOD OF EXCAVATION Excavator

LOCATION West of T-9, downslope of road.

SAMPLE ID	LEAD TTLC (mg/kg)	LEAD STLC (mg/L)	LEAD TCLP (mg/L)	LEAD DIWET (mg/L)

DESCRIPTION

UNITS

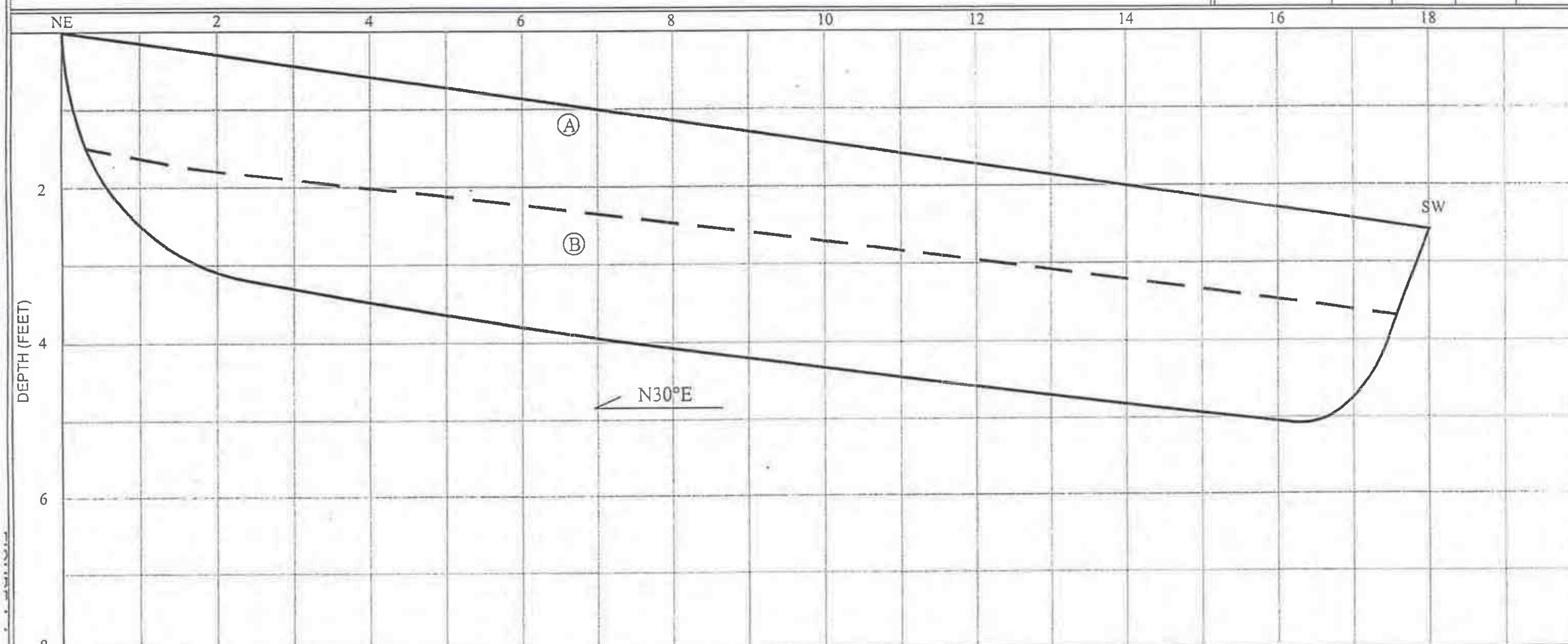
Ⓐ TOPSOIL, SLOPE WASH, BURNED AND MUNICIPAL SOLID WASTES AND DEBRIS:
Brown, damp, silty CLAY, burned and municipal solid wastes and debris. Wastes comprise approximately 40-45 %, and consist primarily of aluminum cans, metal debris, metal pipe, wood, and plastic bags.

Ⓑ COLLUVIUM (?)/HOOKTON FORMATION (?):
Brownish yellowish red, moist, silty CLAY.

NOTES

Total Depth = 4 feet.
Groundwater not encountered during trench excavating.

Depths of subsurface materials encountered vary and are estimates only due to trench length, sloping ground surfaces, and accessibility.



SCALE = 1 in./2 ft.

nyo & Moore

TEST PIT LOG

FORTUNA DUMP
ROHNERVILLE, CALIFORNIA

PROJECT NO.	DATE
104690020	1/07

DATE EXCAVATED)2/06 TEST PIT NO. T-10

GROUND ELEVATION 442.1'± (MSL) LOGGED BY BAB

METHOD OF EXCAVATION Excavator

LOCATION Upper level area, cut westerly into slope face.

SAMPLE ID	LEAD TTLC (mg/kg)	LEAD STLC (mg/L)	LEAD TCLP (mg/L)	LEAD DIWET (mg/L)

DESCRIPTION

UNITS

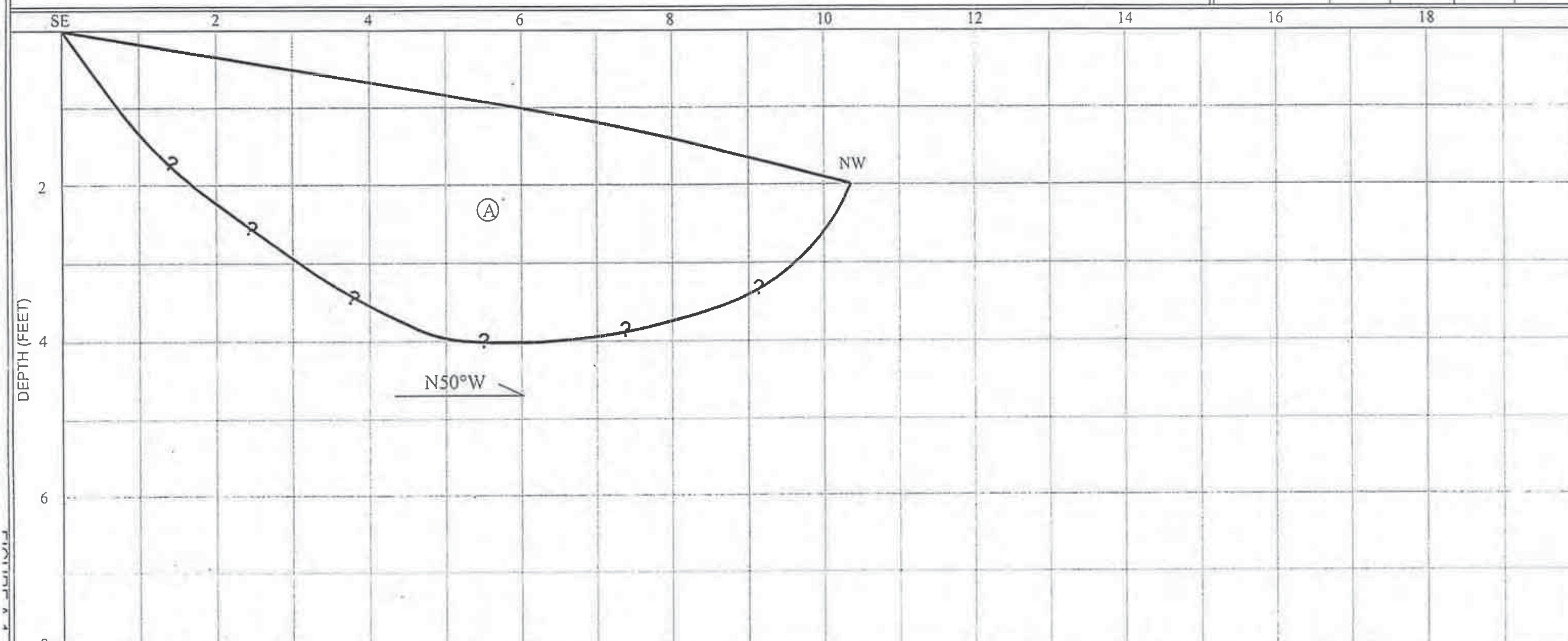
Ⓐ FILL, DEBRIS AND MUNICIPAL SOLID WASTES:
Minor surficial fill with debris and municipal solid wastes. Wastes consist primarily of wood, abundant plastic, abundant cobbles, containers, hose, corrugated metal, aluminum cans, lumber, plastic containers, metal debris, cardboard, pepsi cans, and other soft drink cans.

NOTES

Trench excavation completely caving in, vertical waste extent unknown.

Total Depth = 4 feet.
Groundwater not encountered during trench excavating.

Depths of subsurface materials encountered vary and are estimates only due to trench length, sloping ground surfaces, and accessibility.



SCALE = 1 in./2 ft.

Ninyo & Moore

TEST PIT LOG

FORTUNA DUMP
ROHNERVILLE, CALIFORNIA

PROJECT NO.	DATE
104690020	1/07

DATE EXCAVATED ?2/06 TEST PIT NO. T-10A

GROUND ELEVATION 441.7'± (MSL) LOGGED BY BAB

METHOD OF EXCAVATION Excavator

LOCATION Upper level area, ~14' from southeast end of T-10.

SAMPLE ID	LEAD TTLC (mg/kg)	LEAD STLC (mg/L)	LEAD TCLP (mg/L)	LEAD DIWET (mg/L)

DESCRIPTION

UNITS

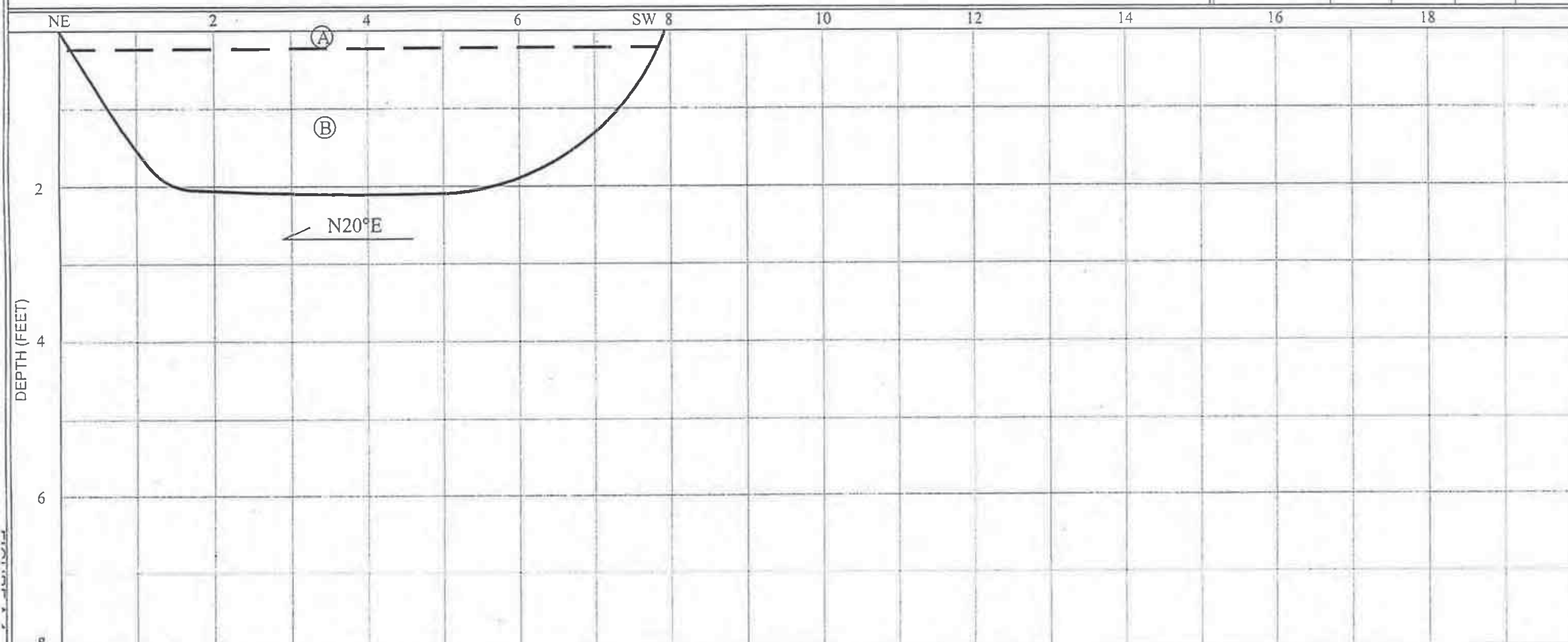
Ⓐ COVER/FILL:
Light brownish yellowish red, dry, slightly fine sandy silty CLAY.

Ⓑ COLLUVIUM (?)/HOOKTON FORMATION (?):
Brownish yellowish red, damp to slightly moist, very slightly fine sandy silty CLAY.

NOTES

Total Depth = 4 feet.
Groundwater not encountered during trench excavating.

Depths of subsurface materials encountered vary and are estimates only due to trench length, sloping ground surfaces, and accessibility.



SCALE = 1 in./2 ft.

Tetra Tech/Ninyo & Moore (logo)

TEST PIT LOG

FORTUNA DUMP
ROHNERVILLE, CALIFORNIA

PROJECT NO.	DATE
104690020	1/07

DATE EXCAVATED ?2/06 TEST PIT NO. T-12

GROUND ELEVATION 372.0'± (MSL) LOGGED BY BAB

METHOD OF EXCAVATION Excavator

LOCATION Upper dirt road.

DESCRIPTION

UNITS

Ⓐ BURNED MATERIALS AND SLOPE WASH:
Highly mixed burned materials and slope wash. Burned materials comprise approximately 80-90%, and consist primarily of glass bottles and jars, broken glass, fused glass, and metal debris.

Ⓑ COLLUVIUM (?)/HOOKTON FORMATION (?):
Brownish yellowish red, moist, very silty CLAY with minor rounded. gravels and pebbles.

NOTES

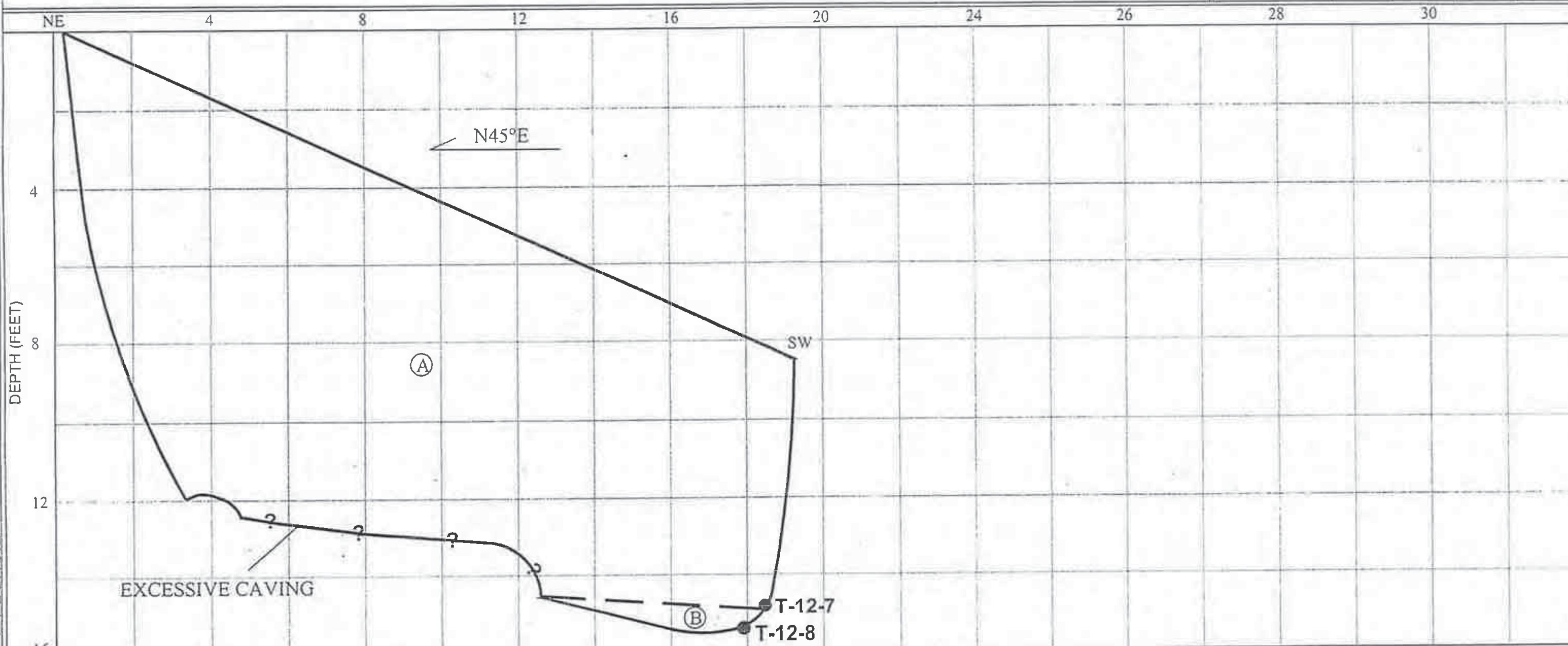
Excessive caving on northeast side of trench.

Burned materials are approximately 12 feet thick on northeast end of trench and 7 feet thick at southwest end of trench.

Total Depth = 17.5 feet.
Groundwater not encountered during trench excavating.

Depths of subsurface materials encountered vary and are estimates only due to trench length, sloping ground surfaces, and accessibility.

SAMPLE ID	LEAD TTLC (mg/kg)	LEAD STLC (mg/L)	LEAD TCLP (mg/L)	LEAD DIWET (mg/L)
T-12-7	1800	170	1	ND
T-12-8	12	NA	NA	NA



SCALE = 1 in./4 ft.

Ninyo & Moore

TEST PIT LOG

FORTUNA DUMP
ROHNERVILLE, CALIFORNIA

PROJECT NO.	DATE
104690020	1/07

DATE EXCAVATED ?2/06 TEST PIT NO. T-13

GROUND ELEVATION 370.8'± (MSL) LOGGED BY BAB

METHOD OF EXCAVATION Excavator

LOCATION West property area, trench cut across upper dirt road.

DESCRIPTION

UNITS

Southeast wall

(A) BURNED MATERIALS AND SLOPE WASH:
Highly mixed brown, silty clay and burned materials consisting consisting primarily of bottles, glass, broken and fused glass.

(B) COLLUVIUM (?)/HOOKTON FORMATION (?):
Brownish yellowish red, damp to moist, silty CLAY.

Northwest Wall

(B) COLLUVIUM (?)/HOOKTON FORMATION (?):
Brownish yellowish red, damp to moist, silty CLAY.

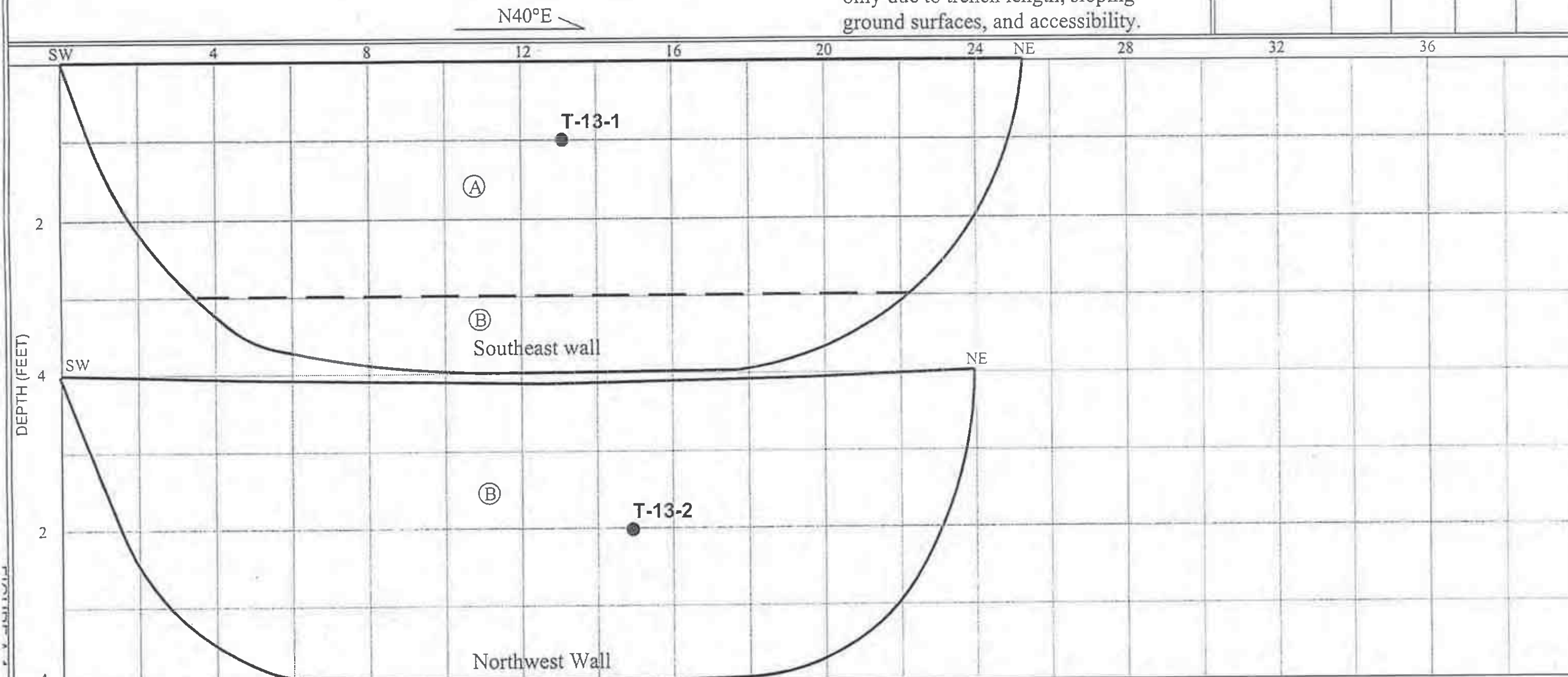
NOTES

Trench excavated parallel to wastes/formation contact; southeast wall of trench is burned materials to approximately 3 feet and northwest wall is formation.

Total Depth = 4 feet.
Groundwater not encountered during trench excavating.

Depths of subsurface materials encountered vary and are estimates only due to trench length, sloping ground surfaces, and accessibility.

SAMPLE ID	LEAD TTLC (mg/kg)	LEAD STLC (mg/L)	LEAD TCLP (mg/L)	LEAD DIWET (mg/L)
T-13-1	2000	29	1.6	0.17
T-13-2	6.3	NA	NA	NA



SCALE = Horiz: 1 in./4 ft., Vert: 1 in./2 ft.

Ninyo & Moore

TEST PIT LOG

FORTUNA DUMP
ROHNERVILLE, CALIFORNIA

PROJECT NO.	DATE
104690020	1/07

DATE EXCAVATED 12/06 TEST PIT NO. T-14

GROUND ELEVATION 394.3'± (MSL) LOGGED BY BAB

METHOD OF EXCAVATION Excavator

LOCATION Uphill of upper dirt road.

DESCRIPTION

UNITS

Ⓐ BURNED MATERIALS, MUNICIPAL SOLID WASTES, AND SLOPE WASH:
Highly mixed and mottled burned materials and fill. Burned materials comprise approximately 80-85%, and consist primarily of abundant bottles, broken glass, fused glass, metal debris, wood, metal and hubcaps, pipes, wires mixed with municipal solid wastes consisting primarily of plastic debris and plastic bags.

Ⓑ COLLUVIUM (?)/HOOKTON FORMATION (?):
Brownish yellowish red, moist, silty CLAY with cobbles.

NOTES

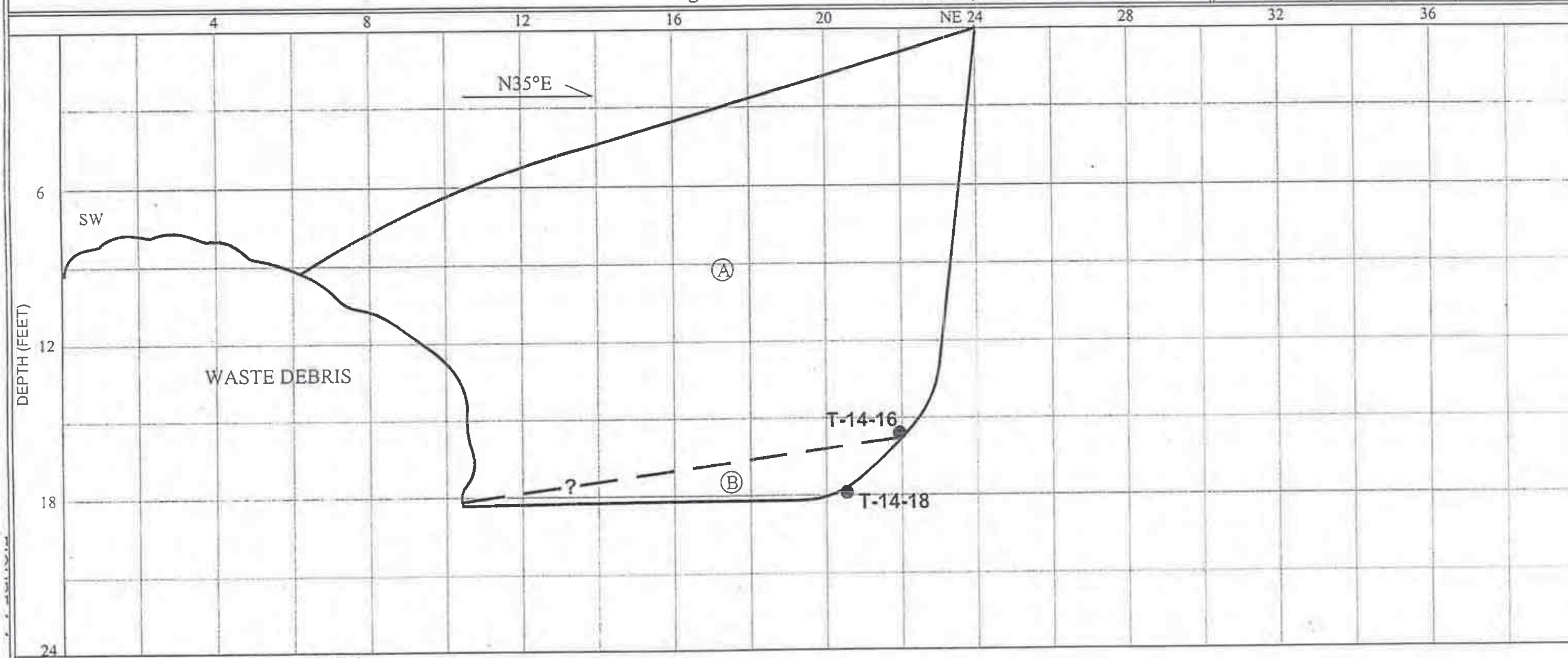
Wastes to depths of approximately 16 feet on the northeast side of trench.
Very steep slope, debris covered southwest side of trench.

Abundant trench caving, municipal solid wastes and burned materials are mixed to depths of approximately 14 feet.

Total Depth = 18 feet.
Groundwater not encountered during trench excavating.

Depths of subsurface materials encountered vary and are estimates only due to trench length, sloping ground surfaces, and accessibility.

SAMPLE ID	LEAD TTLC (mg/kg)	LEAD STLC (mg/L)	LEAD TCLP (mg/L)	LEAD DIWET (mg/L)
T-14-16	1900	420	3	ND
T-14-18	8	NA	NA	NA



SCALE = Horiz: 1 in./4 ft., Vert: 1 in./6 ft.

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TEST PIT LOG

FORTUNA DUMP
ROHNERVILLE, CALIFORNIA

PROJECT NO.	DATE
104690020	1/07

DATE EXCAVATED 2/06 TEST PIT NO. T-15

GROUND ELEVATION 446.9'± (MSL) LOGGED BY BAB

METHOD OF EXCAVATION Excavator

LOCATION Northeast property area, upper, relatively level area

DESCRIPTION

SAMPLE ID	LEAD TTLC (mg/kg)	LEAD STLC (mg/L)	LEAD TCLP (mg/L)	LEAD DIWET (mg/L)

UNITS

Ⓐ COVER/FILL/MINOR DEBRIS:
Highly mixed light brown to brown, dry, slightly sandy silty CLAY; with cobbles, some asphalt, wood, and miscellaneous debris.

Ⓑ MUNICIPAL SOLID WASTES:
Minor zone of municipal solid wastes consisting primarily of plastic, wood and metal debris.

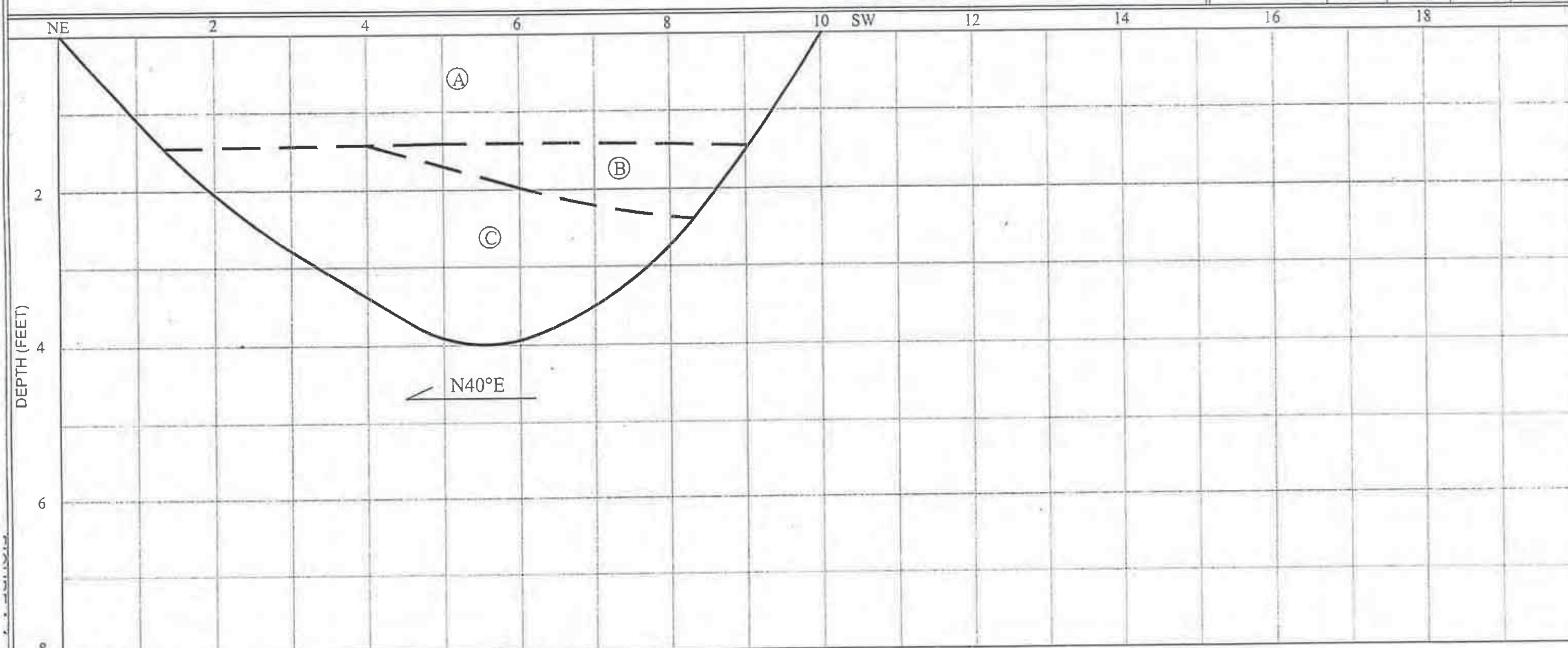
Ⓒ COLLUVIUM (?)/HOOKTON FORMATION (?):
Brownish yellowish red, moist, hard, silty CLAY.

NOTES

NOTES
Wastes pinch out to the northeast.

Total Depth = 4 feet.
Groundwater not encountered during trench excavating.

Depths of subsurface materials encountered vary and are estimates only due to trench length, sloping ground surfaces, and accessibility.



SCALE = 1 in./2 ft.

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TEST PIT LOG

FORTUNA DUMP
ROHNERVILLE, CALIFORNIA

PROJECT NO.	DATE
104690020	1/07

DATE EXCAVATED _)2/06 TEST PIT NO. T-16

GROUND ELEVATION 418.0'± (MSL) LOGGED BY BAB

METHOD OF EXCAVATION Excavator

LOCATION Northwest property area, near entrance road to property.

DESCRIPTION

UNITS

Ⓐ COVER/FILL:
Light brown, damp, sandy silty CLAY; thins to the southwest where wastes are thicker.

Ⓑ BURNED MATERIALS AND FILL:
High mottled brown black burned materials and fill. Burned materials comprise approximately 90-95%, and consist primarily of abundant metal, debris, glass bottles, and broken glass.

Ⓒ COLLUVIUM (?)/HOOKTON FORMATION (?):
Brownish yellowish red, moist, sandy clayey SILT; with small cobbles.

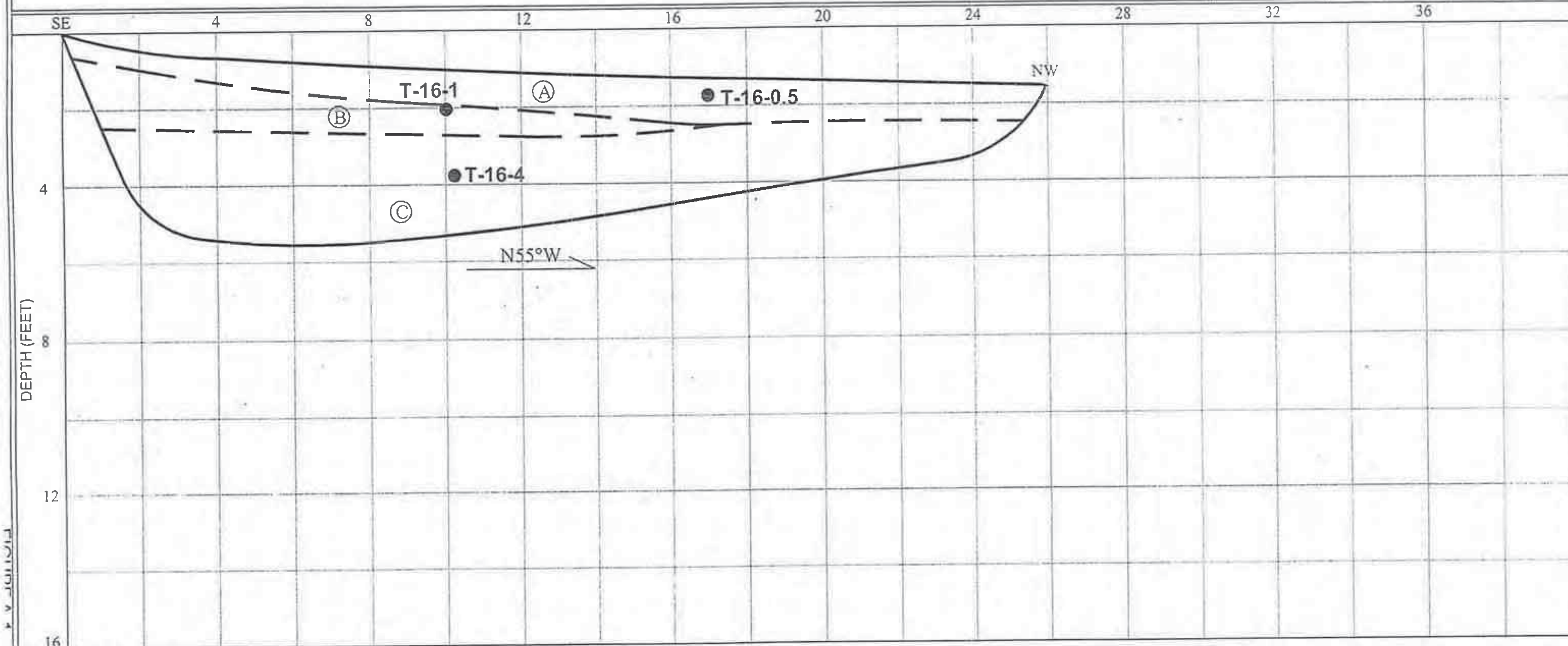
NOTES

Burned materials thin to the southwest and pinch out approximately 10 feet from the northwest end of the trench.

Total Depth = 5.5 feet.
Groundwater not encountered during trench excavating.

Depths of subsurface materials encountered vary and are estimates only due to trench length, sloping ground surfaces, and accessibility.

SAMPLE ID	LEAD TTLC (mg/kg)	LEAD STLC (mg/L)	LEAD TCLP (mg/L)	LEAD DIWET (mg/L)
T-16-0.5	150	6.5	NA	NA
T-16-1	640	16	NA	NA
T-16-4	7.6	NA	NA	NA



SCALE = 1 in./4 ft.

Ninyo & Moore

TEST PIT LOG

FORTUNA DUMP
ROHNERVILLE, CALIFORNIA

PROJECT NO.	DATE
104690020	1/07

DATE EXCAVATED 02/06 TEST PIT NO. T-17

GROUND ELEVATION 428.3'± (MSL) LOGGED BY BAB

METHOD OF EXCAVATION Excavator

LOCATION Main level area, west of slope.

DESCRIPTION

SAMPLE ID	LEAD TTLC (mg/kg)	LEAD STLC (mg/L)	LEAD TCLP (mg/L)	LEAD DIWET (mg/L)

UNITS

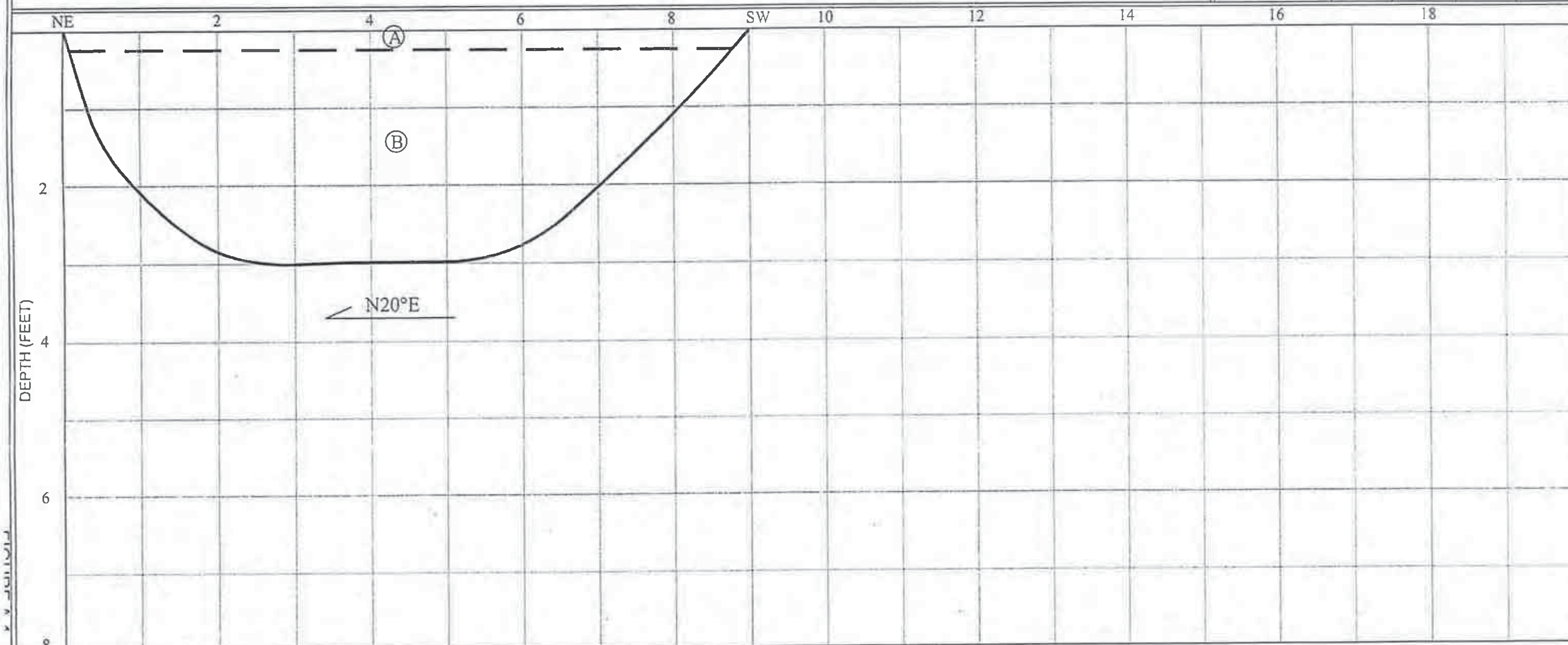
Ⓐ COVER/FILL:
Brown, dry to damp, hard, slightly sandy silty CLAY.

Ⓑ COLLUVIUM (?)/HOOKTON FORMATION (?):
Brownish yellowish red, moist, very slightly fine sandy silty CLAY.

NOTES

Total Depth = 3 feet.
Groundwater not encountered during trench excavating.

Depths of subsurface materials encountered vary and are estimates only due to trench length, sloping ground surfaces, and accessibility.



SCALE = 1 in./2 ft.

Ninyo & Moore

TEST PIT LOG

FORTUNA DUMP
ROHNERVILLE, CALIFORNIA

PROJECT NO.	DATE
104690020	1/07

DATE EXCAVATED ?2/06 TEST PIT NO. T-18

GROUND ELEVATION 429.5'± (MSL) LOGGED BY BAB

METHOD OF EXCAVATION Excavator

LOCATION Traverse dirt road, west of new shed.

DESCRIPTION

UNITS

Ⓐ BURNED MATERIALS AND MINOR FILL:
Mottled brown black and highly mixed burned materials and some fill. Burned materials comprise approximately 90% and consist primarily of glass bottles, broken glass, fused glass and metal debris. Burned materials appear to be mixed with wastes that do not appear as much burned.

Ⓑ COLLUVIUM (?)/HOOKTON FORMATION (?):
Brownish yellowish red, moist, very silty CLAY.

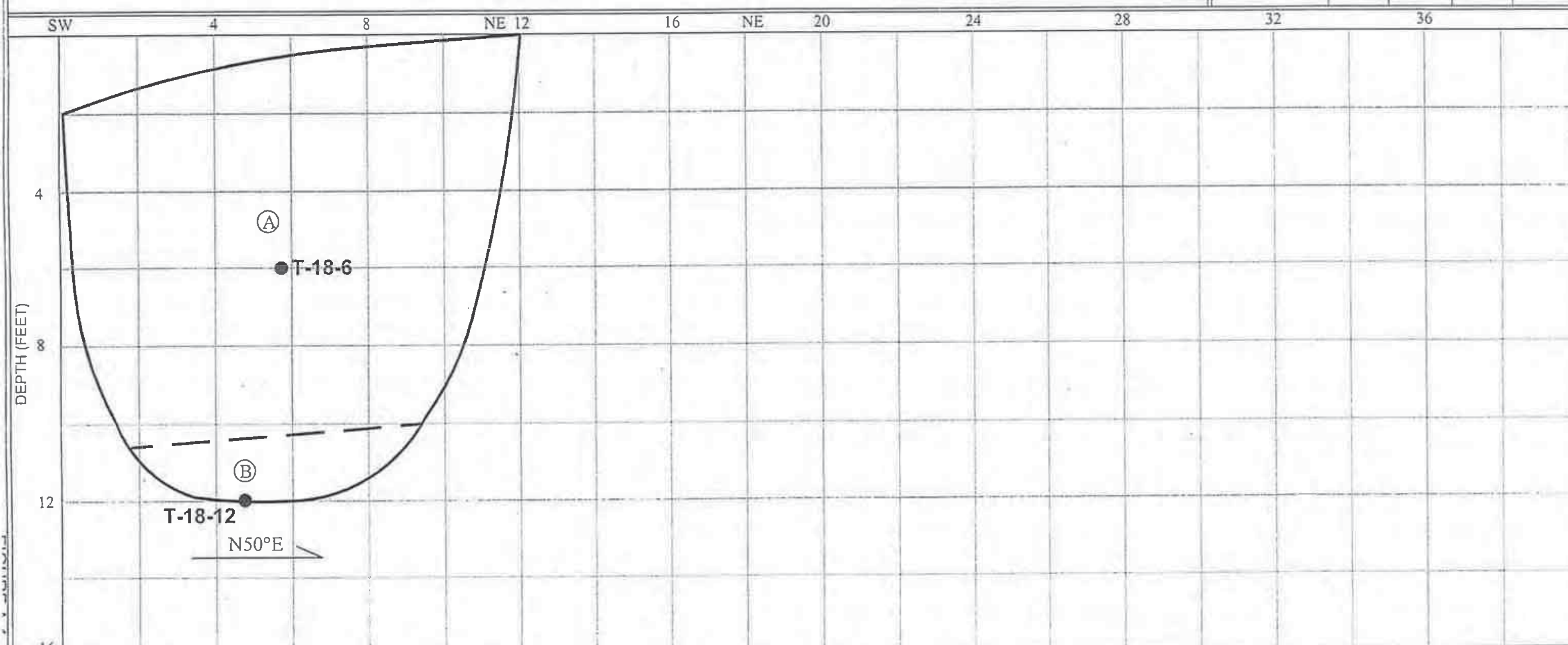
NOTES

Wastes extend to depths of approximately 11 feet on the northeast end of the trench and approximately 10 feet on the southwest side of the trench.

Total Depth = 12 feet.
Groundwater not encountered during trench excavating.

Depths of subsurface materials encountered vary and are estimates only due to trench length, sloping ground surfaces, and accessibility.

SAMPLE ID	LEAD TTLC (mg/kg)	LEAD STLC (mg/L)	LEAD TCLP (mg/L)	LEAD DIWET (mg/L)
T-18-6	1500	120	3.2	ND
T-18-12	5.3	NA	NA	NA



SCALE = 1 in./4 ft.

Kleinfelder/Ninyo & Moore

TEST PIT LOG

FORTUNA DUMP
ROHNERVILLE, CALIFORNIA

PROJECT NO.	DATE
104690020	1/07

DATE EXCAVATED]2/06 TEST PIT NO. T-19
GROUND ELEVATION 363.5 ± (MSL) LOGGED BY BAB
METHOD OF EXCAVATION Excavator
LOCATION Within and approximately parallel to lower road.

DESCRIPTION

UNITS

(A) BURNED MATERIALS AND SLOPE WASH:
Mottled brown and brownish yellowish red burned materials. Burned materials comprise approximately 80% and consist primarily of glass bottles, brown grass, metal, band saw, metal debris and porcelain.

(B) COLLUVIUM (?)/HOOKTON FORMATION (?):
Brownish yellowish red, moist, silty CLAY; with cobbles.

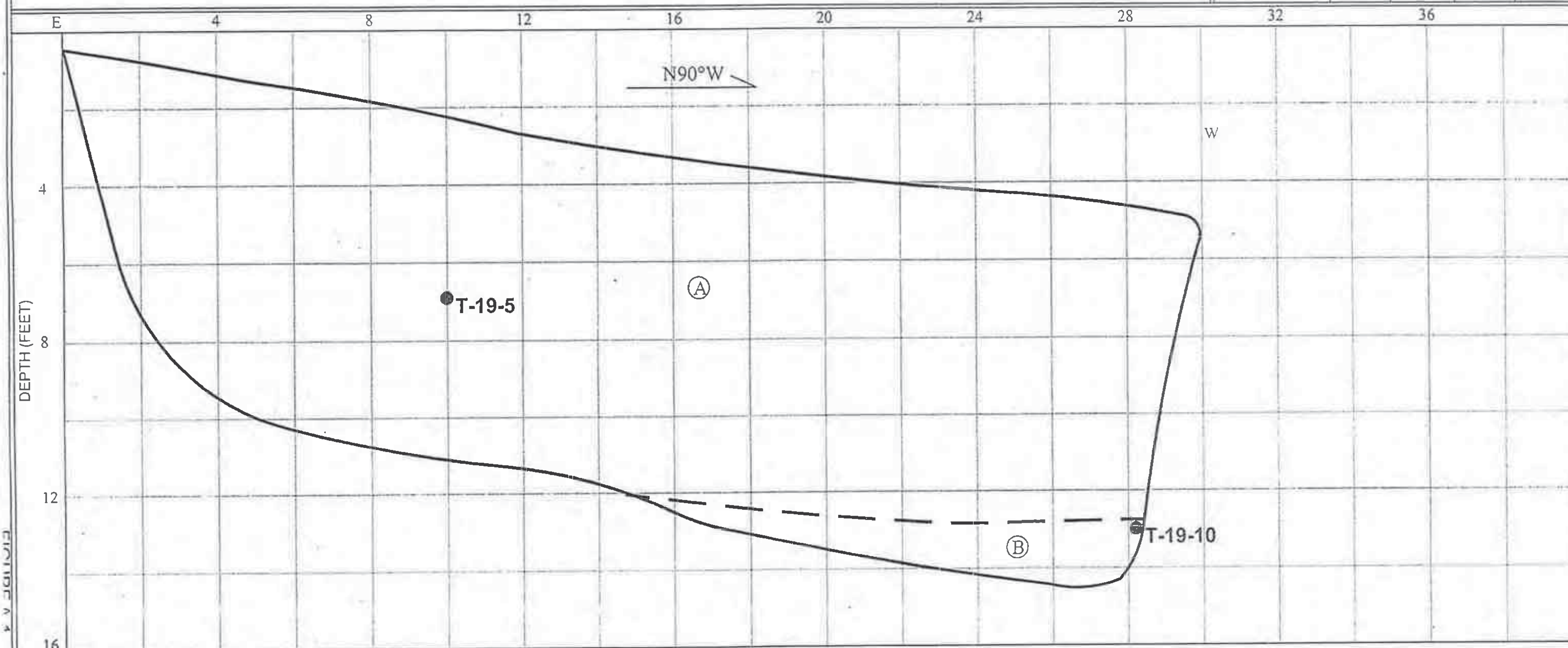
NOTES

Cover soil is absent.

Total Depth = 14.5 feet.
Groundwater not encountered during trench excavating.

Depths of subsurface materials encountered vary and are estimates only due to trench length, sloping ground surfaces, and accessibility.

SAMPLE ID	LEAD TTLC (mg/kg)	LEAD STLC (mg/L)	LEAD TCLP (mg/L)	LEAD DIWET (mg/L)
T-19-5	2700	48	0.34	ND
T-19-10	9.2	NA	NA	NA



SCALE = 1 in./4 ft.

FIGURE A-4

Ninyo & Moore

TEST PIT LOG

FORTUNA DUMP
ROHNERVILLE, CALIFORNIA

PROJECT NO.	DATE
104690020	1/07

DATE EXCAVATED ..2/06 TEST PIT NO. T-20

GROUND ELEVATION 344.5'± (MSL) LOGGED BY BAB

METHOD OF EXCAVATION Excavator

LOCATION Logged road cut, looking northeast.

SAMPLE ID	LEAD TTLC (mg/kg)	LEAD STLC (mg/L)	LEAD TCLP (mg/L)	LEAD DIWET (mg/L)

DESCRIPTION

UNITS

Ⓐ BURNED MATERIALS AND SLOPE WASH:
High mixed and highly mottled black to black brown, damp, silty CLAY and burned materials. Burned materials comprise approximately 80% and consist primarily of glass bottles and jars, broken glass, abundant miscellaneous metal debris, metal wire, porcelain, plastic, shoes, and miscellaneous debris.

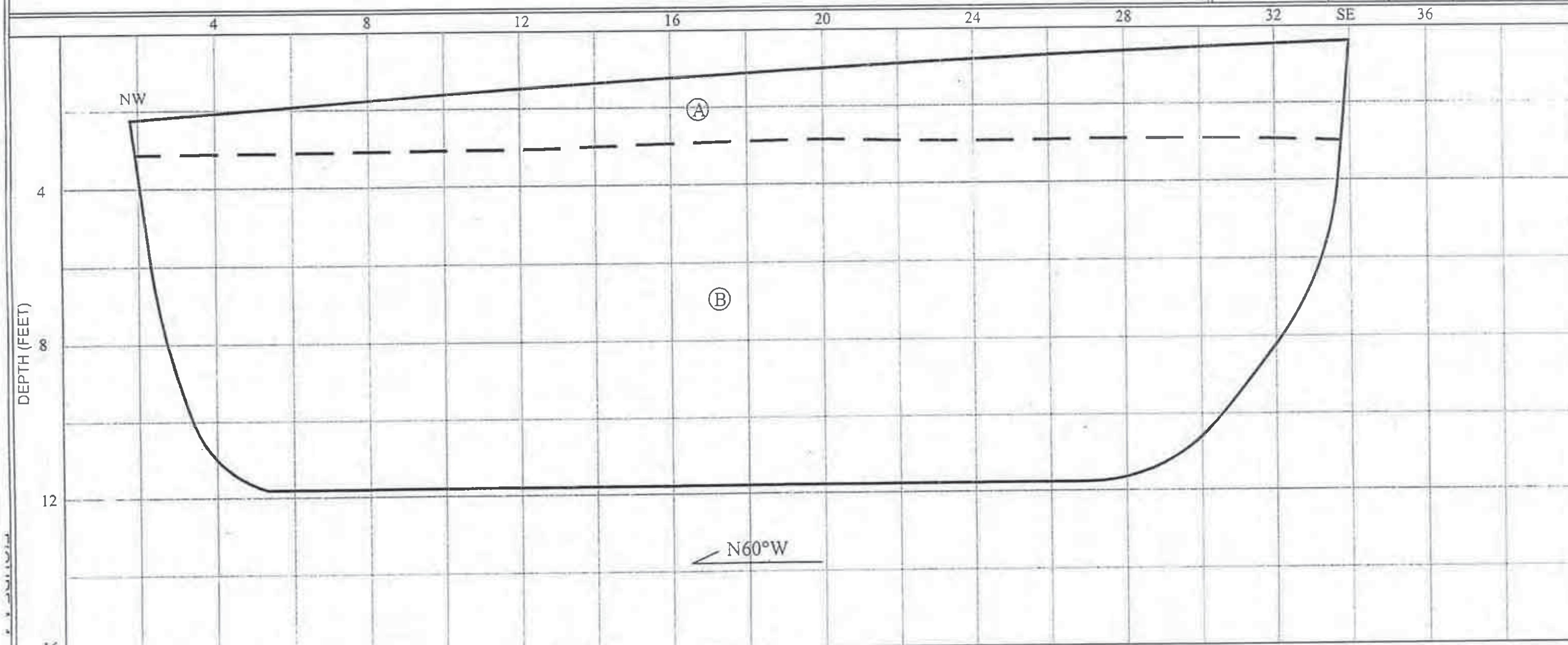
Ⓑ COLLUVIUM (?)/HOOKTON FORMATION (?):
Brownish yellowish red, moist, silty CLAY.

NOTES

Road cut face is approximately 6 feet in height.

Trench not actually excavated rather, road cut was logged exposing burned wastes and slope wash that is approximately1.5 feet thick and overlies the Hookton Fromation (?)

Depths of materials encountered vary and are estimates only due to length, sloping ground surfaces, and accessibility.



SCALE = 1 in./4 ft.

Ninyo & Moore

TEST PIT LOG

FORTUNA DUMP
ROHNERVILLE, CALIFORNIA

PROJECT NO.	DATE
104690020	1/07

DATE EXCAVATED]2/06 TEST PIT NO. T-21

GROUND ELEVATION 347.7'± (MSL) LOGGED BY BAB

METHOD OF EXCAVATION Excavator

LOCATION Lower road.

DESCRIPTION

UNITS

(A) BURNED MATERIALS AND SLOPE WASH:
Highly mixed and highly mottled, black to dark brown, silty CLAY and burned materials. Burned material comprise approximately 80% and consist primarily of glass bottles, broken glass, ceramics, porcelain, metal, and metal wire debris.

(B) COLLUVIUM (?)/HOOKTON FORMATION (?):
Brownish yellowish red, wet, silty CLAY; becomes gray at approximately 9 feet.

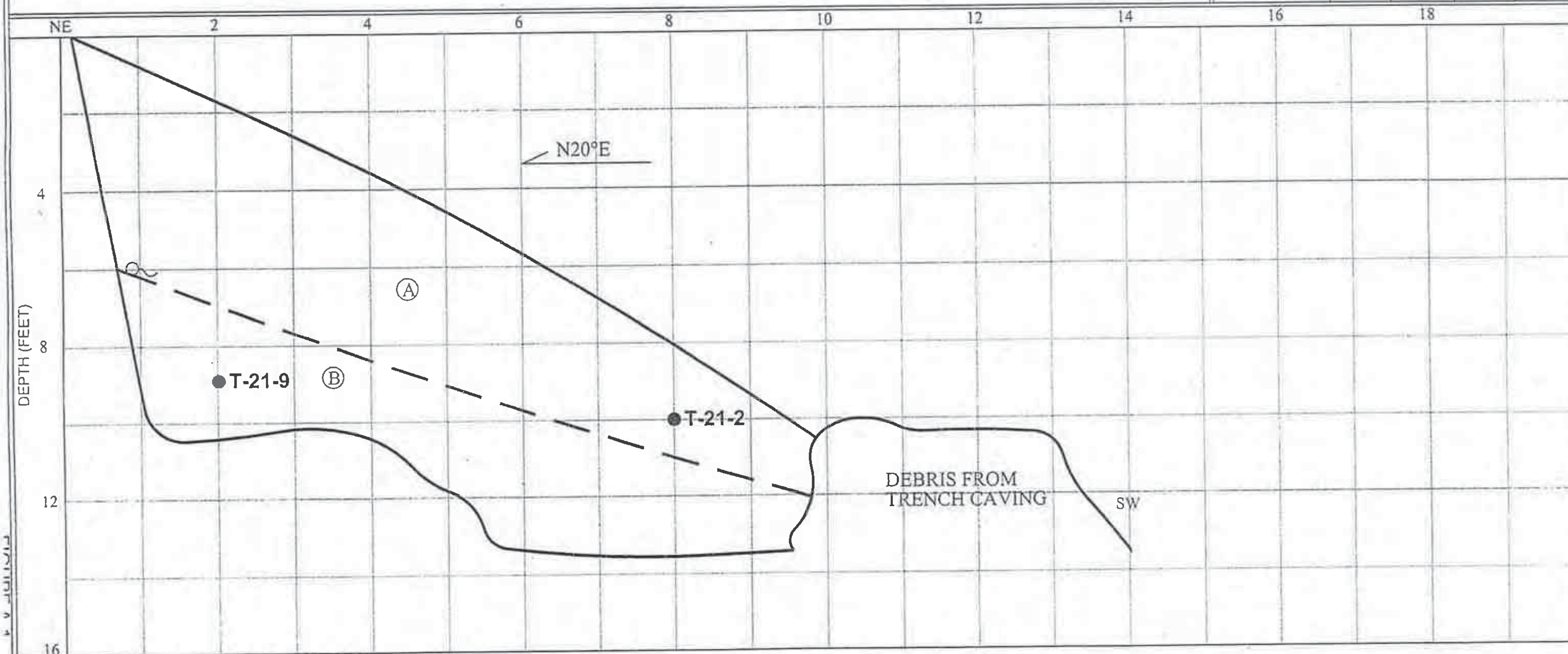
NOTES

Total Depth = 14 feet.
Groundwater seepage at approximately 6.5 feet at the northeast wall at approximate formation contact.

Based on visual observations, assume wastes extend southwesterly to the creek.

Depths of subsurface materials encountered vary and are estimates only due to trench length, sloping ground surfaces, and accessibility.

SAMPLE ID	LEAD TTLC (mg/kg)	LEAD STLC (mg/L)	LEAD TCLP (mg/L)	LEAD DIWET (mg/L)
T-21-2	1800	40	1	ND
T-21-9	23	NA	NA	NA



SCALE = Vert: 1 in./4 ft., Horiz: 1 in./2 ft.

APPENDIX B

AIR QUALITY MEMORANDUM

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URS # Memorandum

Date: February 6, 2013

To: Michelle Dunn, Environmental Planner, URS Corporation

From: Jennifer Schulte, Air Quality Specialist, URS Corporation

Subject: ***Fortuna Burn Dump: Air Quality Analysis***

This memorandum discusses the air quality impacts associated with the re-grade and cap of the former Fortuna Burn Dump. The memo will briefly describe the project description, summarize relevant air regulations and plans, and quantify air emissions associated with the Project.

The California Department of Resources Recycling and Recovery (CalRecycle) proposes to re-grade and cap the former Fortuna Burn Dump with two feet of soil cover. The project site has operated as a burn dump since the mid-1950s. Currently, it is estimated that over 20,000 cubic yards (CY) of waste is located within the project site[1] CalRecycle proposes to cap the burn dump area to reduce the potential for environmental and personal health and safety risks.

The Fortuna Burn Dump is located at 4498 Mill Street Fortuna, California. The project site is approximately nine acres with the inactive burn dump area covering 5.6 acres. The project proposes re-grading the 5.6-acre burn dump area and relocating some existing burn dump material to outside of the current burn dump footprint to improve the burn dump's underlying soil's slope stability. Re-grading and relocating the burn dump material would increase the size of the burn dump area to a total project impact area of 6 acres.

EMISSION ESTIMATION

The Project is anticipated to start construction in the summer of 2013. It is anticipated that approximately 75 days will be required to complete construction of the Project. This is based on the Project schedule shown in Table 1. The Project construction will consist of land clearing, placing the soil cap, enhancing the ditch for stream flows, stabilizing the land, and landscaping.

Table 1: Project Construction Schedule[2]

Phase Name	Duration (Days)
Mobilization	1
Clearing	7
Cut to fill excavation	16
Capping soil placement	10
Place ditch lining material	4
Assemble gabion rock baskets	2
Hydro seeding	3
Jute netting	8
Landscaping and irrigation	24

[1] California Integrated Waste Management Board (CIWMB), 2007. Site Investigation Report, Fortuna Burn Dump, January 2007.
[2] Based on information provided from Pete Timmerman. Pete Timmerman. 2013 Email Communication with Attachment "Equipment Summary.pdf". January 28.

Vehicles and heavy equipment used during the construction will include various pieces of off-road construction equipment such as scrapers, loaders, dozers, backhoes, skid steer loaders, and water trucks. The complete list of construction equipment by phase is shown in Table 2.

Table 2: Construction Equipment[3]

Phase Name	Equipment	Quantity	Hours per Day	Horsepower	Load Factor
Mobilization	Crawler Tractors	1	1	253	0.64
	Other Construction Equipment	1	1	327	0.62
	Rubber Tired Loaders	1	1	555	0.54
	Scrapers	1	1	265	0.72
	Scrapers	1	1	265	0.72
	Scrapers	1	3	265	0.72
Clearing	Excavators	1	8	221	0.57
	Off-Highway Trucks	2	8	469	0.57
	Off-Highway Trucks	1	8	207	0.57
	Other Construction Equipment	1	8	327	0.62
	Rubber Tired Dozers	2	8	347	0.59
	Skid Steer Loaders	1	8	37	0.55
Cut to fill excavation	Excavators	1	8	221	0.57
	Off-Highway Trucks	1	8	207	0.57
	Other Construction Equipment	1	8	327	0.62
	Rubber Tired Dozers	2	8	347	0.59
Capping soil placement	Crawler Tractors	1	8	253	0.64
	Off-Highway Trucks	1	8	207	0.57
	Other Construction Equipment	1	8	327	0.62
	Rubber Tired Dozers	2	8	347	0.59
	Scrapers	1	8	265	0.72
	Skid Steer Loaders	1	8	37	0.55
	Sweepers/Scrubbers	1	8	88	0.68
Place ditch lining material	Excavators	1	8	221	0.57
	Off-Highway Trucks	1	8	207	0.57
	Other Construction Equipment	1	8	327	0.62
	Rubber Tired Loaders	1	8	197	0.54
Assemble gabion rock baskets	Excavators	1	8	221	0.57
	Off-Highway Trucks	1	8	381	0.57
	Other Construction Equipment	1	8	327	0.62
	Rubber Tired Loaders	1	8	197	0.54
Hydro seeding	Off-Highway Trucks	1	8	381	0.57
Jute netting	Air Compressors	1	8	78	0.48
	Other Construction Equipment	1	8	327	0.62

[3] Equipment list is based on representative equipment classes found in CalEEMod based on the equipment list provided by Pete Timmerman and using equipment specific horsepower if available. A skid steer loader was added to the landscaping & irrigation phase to represent a minimal amount of diesel fueled landscaping equipment that may be needed. Pete Timmerman. 2013 Email Communication with Attachment “Equipment Summary.pdf”. January 28.

	Tractors/Loaders/Backhoes	1	8	117	0.55
Landscaping & irrigation	Skid Steer Loaders	1	8	37	0.55

In addition to the off-road construction equipment, there will be on-road motor vehicles from workers commuting to the Project site and trucks importing and exporting material to the site. It is estimated that about 2,000 cubic yards of material will be removed during clearing of the Project site. During the excavation it is estimated that 19,000 cubic yards of material will be removed from the site. It is estimated that 19,000 cubic yards of fill will be imported to create the two foot thick cap. Additional material hauling trips were assumed for the import of other project materials such as ditch lining material and gabions. Default trip lengths for Humboldt County were utilized for the Project. Table 3 indicates the number of trips and trip lengths assumed for the workers and material hauling. Worker and hauling trips utilized the default fleet mix.

Table 3: Vehicle Trips

Phase Name	Worker Trips (Daily per phase)[4]	Hauling Trips (Total for phase)[5]	Worker Trip Length (miles)	Hauling Trip Length (miles)
Mobilization	15	0	16.8	20
Clearing	20	250	16.8	20
Cut to fill excavation	13	2375	16.8	20
Capping soil placement	20	2375	16.8	20
Place ditch lining material	10	15	16.8	20
Assemble gabion rock baskets	10	15	16.8	20
Hydro seeding	3	2	16.8	20
Jute netting	8	2	16.8	20
Landscaping and irrigation	18	2	16.8	20

Emissions for the Project construction were estimated using the California Emission Estimator Model (CalEEMod) version 2011.1.1. CalEEMod is a statewide land use project emissions model designed as a uniform platform to quantify potential criteria pollutant and greenhouse gas (GHG) emissions associated with construction and operation from a variety of land uses, such as residential and commercial facilities. CalEEMod utilizes basic land use information to estimate default construction equipment and mobile source trips and lengths. This model incorporates both ARB's OFFROAD 2007 and EMFAC2007 models. The following conservative inputs into the model were utilized:

- Location is Humboldt County

[4] Worker trip rates were conservatively assumed to be 1.5 workers per piece of equipment which is slightly greater than 1 operator per piece plus 2 laborers.
[5] Hauling trips utilized the CalEEMod default truck capacity. Additional trip was added to any phase that did not specify a specific amount of material.

- Project Year is 2013
- Climate Zone is 1
- Utility is Pacific Gas & Electric
- Land use was user defined industrial with a site acreage of 6 acres
- Construction phases and equipment is as listed in Tables 1 and 2 above
- Defaults were utilized for all other necessary inputs

Based on this information, the estimated emissions from CalEEMod are shown in Table 4. The complete CalEEMod output can be found in Appendix A.

Table 4: Construction Emissions

Tons										Metric Tons
ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	CO2e
0.33	**3.02**	**1.61**	**0.00**	**0.72**	**0.11**	**0.83**	**0.12**	**0.11**	**0.23**	**389.58**

SUMMARY OF FINDINGS

Conflict with or obstruct applicable air quality plan?

The Project site is located within the North Coast Air Basin (NCAB) which is under the jurisdiction of the North Coast Unified Air Quality Management District (NCUAQMD). The NCAB is comprised of three air districts, the NCUAQMD, the Mendocino County AQMD, and the Northern Sonoma County APCD. The NCUAQMD includes Del Norte, Humboldt, and Trinity Counties. The NCAB currently meets all federal air quality standards; however, the entire air basin is currently designated as nonattainment for the state 24-hour and annual average particulate matter smaller than 10 microns in size (PM_{10}) standards. The air basin is designated as unclassified for the state and federal annual $PM_{2.5}$ standard. Both natural and anthropogenic sources of particulate matter (including vehicle emissions, wind generated dust, construction dust, wildfire and human caused wood smoke, and sea salts) in the NCAB have led to the PM_{10} nonattainment designation.

To address nonattainment for PM_{10}, the NCUAQMD adopted a Particulate Matter Attainment Plan in 1995. This plan presents available information about the nature and causes of PM_{10} standard exceedance and identified cost-effective control measures to reduce PM_{10} emissions to levels necessary to meet California Ambient Air Quality Standards. The Fortuna General Plan calls for the City to coordinate with the NCUAQMD, which has the primary role in achieving air quality goals.

The NCUAQMD has created rule 104 section 4 Fugitive Dust Emissions which requires that reasonable precautions shall be taken to prevent particulate matter from becoming airborne. Some of the relevant precautions for this Project include the following:

- Covering open bodied trucks when used for transporting materials likely to give rise to airborne dust.
- The use of water or chemicals for control of dust in the grading of roads or the clearing of land.

- Application of asphalt, oil, water or suitable chemicals on dirt roads, materials stockpiles, and other surfaces which can give rise to airborne dusts.
- The prompt removal of earth or other track out material from paved streets onto which earth or other material has been transported by trucking or earth moving equipment, erosion by water, or other means.

The Project would generate a minor amount of particulate emissions over the duration of construction in the form of dust and vehicle emissions as a result of earthwork, grading and related construction activities. The Project would not cause any long term increase in the emission of particulate matter or other air pollutants. The Project would be subject to Rule 104 and thus control fugitive dust emissions associated with construction of the Project. While the NCAB is in nonattainment for PM_{10}, the temporary nature of construction activities combined with compliance with Rule 104 for control of fugitive dust would result in negligible increases in PM_{10} for the local area..

In the long term, the Project would not substantially add to the level of PM_{10} or other emissions. There are not anticipated to be any operational emissions associated with the Project and the Project site will be vegetated minimizing fugitive dust emissions from the Project site. Therefore, the Project would not obstruct implementation of the NCUAQMD particulate matter attainment plan. The Project would also be consistent with applicable City of Fortuna General Plan policies related to air resources and no impact would occur.

Violate air quality standard or contribute substantially to existing or projected air quality violation?

Under the federal Clean Air Act of 1977, the US Environmental Protection Agency (US EPA) is required to identify National Ambient Air Quality Standards (NAAQS) to protect public health and welfare. The US EPA has established NAAQS for six criteria air pollutants. The NCAB does not meet or exceed any of these NAAQS. Under the California Clean Air Act, the California Air Resources Board has adopted more stringent standards for the criteria air pollutants. The NCAB is in nonattainment with the California PM_{10} standards (both 24-hour and annual). The NCUAQMD has adopted a particulate matter attainment plan. Recent air monitoring data, November 2011 to October 2012, did not show any PM_{10} exceedances and had one $PM_{2.5}$ exceedance of the 24-hour NAAQS[6]. The NCUAQMD does not have a mass emissions significance threshold for criteria air pollutants. The NCUAQMD does require Best Achievable Control Technology (BACT) for stationary sources. This project will not have any stationary sources.

In the NCAB, most particulate matter is caused by vehicle emissions, wind generated dust, construction dust, wildfire and human caused wood smoke, and sea salts. Health effects from particulate matter include reduced lung function, aggravation of respiratory and cardiovascular diseases, increases in mortality rate, and reduced lung function and growth in children.

Project construction activities would cause the release of a small amount of PM_{10} and $PM_{2.5}$ emissions related to fugitive dust, exhaust emissions from on-road haul trucks, worker commute vehicles, and off-road construction equipment. However, because of the small footprint and duration of the proposed

[6] NCUAQMD. 2012. District Air Quality Report. December 20. Available online at: http://www.ncuaqmd.org/files/Air%20Data/District%20AM%20Report.pdf Accessed February 5, 2013.

construction, and with compliance with Rule 104, construction of the Project would not cause a violation of air quality standard or contribute substantially to existing or projected air quality violation. The Project is to re-grade and cap a former burn dump area, thus there would be no operational emissions. The Project would cause only negligible release of air quality pollutants and would not substantially contribute to any air quality standard violation.

Result in cumulatively considerable net increase of any criteria pollutant for which the region is in non-attainment?

As described above, the NCAB is in nonattainment for the criteria air pollutant PM_{10}. Project construction would cause only minor and short-term production of PM_{10} and would not significantly increase the background levels. There would be no emissions associated with Project operation.

Expose sensitive receptors to substantial pollutant concentrations?

Construction of the Project would create temporary emissions of toxic air contaminants, primarily as a component of diesel emissions. Due to the variable nature of construction activity, the generation of toxic air contaminant emissions in most cases would be temporary, particularly considering the short amount of time such equipment is typically within an influential distance of sensitive receptors. Current methodologies for conducting health risk assessments are associated with longer-term exposure periods which do not correlate well with the temporary and highly variable nature of construction activities. The project would result in only a minor and short-term construction related air emissions. As these emissions are temporary in nature, health risks from Project construction are not anticipated.

Create objectionable odors?

During construction the various diesel-powered vehicles and equipment could create localized odors. Furthermore, since the site is a former burn dump, substrates could be encountered in sub-surface construction that may create objectionable localized odors. These odors would be temporary and not likely to be noticeable for extended periods of time beyond the construction zone due to atmospheric dissipation and natural vegetation screens surrounding the Project site. Project operation would not create any objectionable odors as the site will have capped and placed a vegetative cover over the site.

Generate greenhouse gas emissions that may have a significant impact on the environment?

Project construction activities would cause the release of a small amount of greenhouse gas (GHG) emissions related to exhaust emissions from on-road haul trucks, worker commute vehicles, and off-road construction equipment. However, because of the small footprint and duration of the proposed construction, the Project would cause only a negligible release of GHG emissions. Furthermore there would be no operational emissions associated with the Project.

Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emission of greenhouse gases?

The California Global Warming Solutions Act of 2006 (Assembly Bill 32) definitively established the state's climate change policy and set GHG reduction targets. This target is to reduce GHG emissions to 1990 levels by 2020. The California Air Resources Board (CARB) has established several regulations aimed at guiding the state to meet this target. These strategies are outlined in the Scoping Plan[7] and

[7] California Air Resources Board. 2008. Climate Change Scoping Plan. December.

include various measures across numerous source categories aimed at reducing GHG emissions. Through this plan and subsequent enactment of regulations, the state is on the path toward meeting the goals of Assembly Bill 32.

The NCUAQMD does not have any rules, regulations, or thresholds of significance for non-stationary or construction related GHG emissions.

The Fortuna General Plan does not address GHG emissions and global warming in detail, but does establish related goals and policies that will assist in reducing GHG emissions. This includes encouragement of infill development, promoting energy conservation, energy efficiency and reliance on alternative energy sources in new and existing development.

The construction of this site with its negligible amount of GHG emissions generated from non-stationary sources will not conflict with Assembly Bill 32 nor will it conflict with local goals aimed at GHG emission reductions.

Fortuna Burn Dump

Humboldt County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric
User Defined Industrial	1	User Defined Unit

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Utility Company**	Pacific Gas & Electric Company
Climate Zone	1	**Precipitation Freq (Days)**	103		

1.3 User Entered Comments

Project Characteristics -

Land Use - Land Use is "User defined industrial" with unit amount of 1 and lot acreage of 6. Zero square feet was entered as there will be no buildings.

Construction Phase - User defined construction phases. All assumed to be grading phase type to calculate fugitive dust emissions.

Off-road Equipment - User defined equipment list and horsepower.

Off-road Equipment - User defined equipment list and horsepower.

Off-road Equipment - User defined equipment list and horsepower.

Off-road Equipment - User defined equipment list and horsepower.

Off-road Equipment - User defined equipment list and horsepower.

Off-road Equipment - User defined equipment list and horsepower.

Off-road Equipment - User defined equipment list and horsepower.

Off-road Equipment - User defined equipment list and horsepowers.

Off-road Equipment - User defined equipment list and horsepower.

Trips and VMT - Added 2 hauling trips for hydroseed, jute netting, and landscaping & irrigation phases.

Grading -

Construction Off-road Equipment Mitigation -

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2013	0.33	3.02	1.61	0.00	0.72	0.11	0.83	0.12	0.11	0.23	0.00	389.11	389.11	0.02	0.00	389.58
Total	**0.33**	**3.02**	**1.61**	**0.00**	**0.72**	**0.11**	**0.83**	**0.12**	**0.11**	**0.23**	**0.00**	**389.11**	**389.11**	**0.02**	**0.00**	**389.58**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2013	0.33	3.02	1.61	0.00	0.72	0.11	0.83	0.12	0.11	0.23	0.00	389.11	389.11	0.02	0.00	389.58
Total	**0.33**	**3.02**	**1.61**	**0.00**	**0.72**	**0.11**	**0.83**	**0.12**	**0.11**	**0.23**	**0.00**	**389.11**	**389.11**	**0.02**	**0.00**	**389.58**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Energy	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mobile	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Waste						0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water						0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Energy	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mobile	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Waste						0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water						0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

3.1 Mitigation Measures Construction

Clean Paved Roads

3.2 Mobilization - 2013

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Off-Road	0.00	0.01	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.92	0.92	0.00	0.00	0.92
Total	**0.00**	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.92**	**0.92**	**0.00**	**0.00**	**0.92**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.09	0.00	0.00	0.09
Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.09**	**0.09**	**0.00**	**0.00**	**0.09**

3.2 Mobilization - 2013

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Off-Road	0.00	0.01	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.92	0.92	0.00	0.00	0.92
Total	**0.00**	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.92**	**0.92**	**0.00**	**0.00**	**0.92**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.09	0.00	0.00	0.09
Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.09**	**0.09**	**0.00**	**0.00**	**0.09**

3.3 Clearing - 2013

Unmitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Fugitive Dust					0.04	0.00	0.04	0.02	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00
Off-Road	0.04	0.38	0.16	0.00		0.01	0.01		0.01	0.01	0.00	44.86	44.86	0.00	0.00	44.93
Total	**0.04**	**0.38**	**0.16**	**0.00**	**0.04**	**0.01**	**0.05**	**0.02**	**0.01**	**0.03**	**0.00**	**44.86**	**44.86**	**0.00**	**0.00**	**44.93**

Unmitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Hauling	0.01	0.06	0.04	0.00	0.01	0.00	0.02	0.00	0.00	0.00	0.00	9.39	9.39	0.00	0.00	9.40
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.85	0.85	0.00	0.00	0.86
Total	**0.01**	**0.06**	**0.05**	**0.00**	**0.01**	**0.00**	**0.02**	**0.00**	**0.00**	**0.00**	**0.00**	**10.24**	**10.24**	**0.00**	**0.00**	**10.26**

3.3 Clearing - 2013

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.04	0.00	0.04	0.02	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00
Off-Road	0.04	0.38	0.16	0.00		0.01	0.01		0.01	0.01	0.00	44.86	44.86	0.00	0.00	44.93
Total	**0.04**	**0.38**	**0.16**	**0.00**	**0.04**	**0.01**	**0.05**	**0.02**	**0.01**	**0.03**	**0.00**	**44.86**	**44.86**	**0.00**	**0.00**	**44.93**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.01	0.06	0.04	0.00	0.01	0.00	0.02	0.00	0.00	0.00	0.00	9.39	9.39	0.00	0.00	9.40
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.85	0.85	0.00	0.00	0.86
Total	**0.01**	**0.06**	**0.05**	**0.00**	**0.01**	**0.00**	**0.02**	**0.00**	**0.00**	**0.00**	**0.00**	**10.24**	**10.24**	**0.00**	**0.00**	**10.26**

3.4 Cut to fill excavation - 2013

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.10	0.00	0.10	0.05	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00
Off-Road	0.06	0.58	0.25	0.00		0.02	0.02		0.02	0.02	0.00	62.20	62.20	0.01	0.00	62.32
Total	**0.06**	**0.58**	**0.25**	**0.00**	**0.10**	**0.02**	**0.12**	**0.05**	**0.02**	**0.07**	**0.00**	**62.20**	**62.20**	**0.01**	**0.00**	**62.32**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.06	0.60	0.35	0.00	0.30	0.02	0.32	0.00	0.02	0.02	0.00	89.24	89.24	0.00	0.00	89.29
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.27	1.27	0.00	0.00	1.27
Total	**0.06**	**0.60**	**0.37**	**0.00**	**0.30**	**0.02**	**0.32**	**0.00**	**0.02**	**0.02**	**0.00**	**90.51**	**90.51**	**0.00**	**0.00**	**90.56**

3.4 Cut to fill excavation - 2013

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.10	0.00	0.10	0.05	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00
Off-Road	0.06	0.58	0.25	0.00		0.02	0.02		0.02	0.02	0.00	62.20	62.20	0.01	0.00	62.32
Total	**0.06**	**0.58**	**0.25**	**0.00**	**0.10**	**0.02**	**0.12**	**0.05**	**0.02**	**0.07**	**0.00**	**62.20**	**62.20**	**0.01**	**0.00**	**62.32**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.06	0.60	0.35	0.00	0.30	0.02	0.32	0.00	0.02	0.02	0.00	89.24	89.24	0.00	0.00	89.29
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.27	1.27	0.00	0.00	1.27
Total	**0.06**	**0.60**	**0.37**	**0.00**	**0.30**	**0.02**	**0.32**	**0.00**	**0.02**	**0.02**	**0.00**	**90.51**	**90.51**	**0.00**	**0.00**	**90.56**

3.5 Capping soil placement - 2013

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.07	0.00	0.07	0.03	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00
Off-Road	0.06	0.51	0.24	0.00		0.02	0.02		0.02	0.02	0.00	52.82	52.82	0.00	0.00	52.92
Total	**0.06**	**0.51**	**0.24**	**0.00**	**0.07**	**0.02**	**0.09**	**0.03**	**0.02**	**0.05**	**0.00**	**52.82**	**52.82**	**0.00**	**0.00**	**52.92**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.06	0.60	0.35	0.00	0.19	0.02	0.21	0.00	0.02	0.02	0.00	89.24	89.24	0.00	0.00	89.29
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.22	1.22	0.00	0.00	1.22
Total	**0.06**	**0.60**	**0.37**	**0.00**	**0.19**	**0.02**	**0.21**	**0.00**	**0.02**	**0.02**	**0.00**	**90.46**	**90.46**	**0.00**	**0.00**	**90.51**

3.5 Capping soil placement - 2013

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.07	0.00	0.07	0.03	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00
Off-Road	0.06	0.51	0.24	0.00		0.02	0.02		0.02	0.02	0.00	52.82	52.82	0.00	0.00	52.92
Total	**0.06**	**0.51**	**0.24**	**0.00**	**0.07**	**0.02**	**0.09**	**0.03**	**0.02**	**0.05**	**0.00**	**52.82**	**52.82**	**0.00**	**0.00**	**52.92**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.06	0.60	0.35	0.00	0.19	0.02	0.21	0.00	0.02	0.02	0.00	89.24	89.24	0.00	0.00	89.29
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.22	1.22	0.00	0.00	1.22
Total	**0.06**	**0.60**	**0.37**	**0.00**	**0.19**	**0.02**	**0.21**	**0.00**	**0.02**	**0.02**	**0.00**	**90.46**	**90.46**	**0.00**	**0.00**	**90.51**

3.6 Place ditch lining material - 2013

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Off-Road	0.01	0.08	0.02	0.00		0.00	0.00		0.00	0.00	0.00	10.05	10.05	0.00	0.00	10.06
Total	**0.01**	**0.08**	**0.02**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**10.05**	**10.05**	**0.00**	**0.00**	**10.06**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.56	0.00	0.00	0.56
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24	0.24	0.00	0.00	0.24
Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.80**	**0.80**	**0.00**	**0.00**	**0.80**

3.6 Place ditch lining material - 2013

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Off-Road	0.01	0.08	0.02	0.00		0.00	0.00		0.00	0.00	0.00	10.05	10.05	0.00	0.00	10.06
Total	**0.01**	**0.08**	**0.02**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**10.05**	**10.05**	**0.00**	**0.00**	**10.06**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.56	0.00	0.00	0.56
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24	0.24	0.00	0.00	0.24
Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.80**	**0.80**	**0.00**	**0.00**	**0.80**

3.7 Assemble gabion rock baskets - 2013

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Off-Road	0.00	0.04	0.01	0.00		0.00	0.00		0.00	0.00	0.00	5.92	5.92	0.00	0.00	5.93
Total	**0.00**	**0.04**	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**5.92**	**5.92**	**0.00**	**0.00**	**5.93**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.56	0.00	0.00	0.56
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.12	0.00	0.00	0.12
Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.68**	**0.68**	**0.00**	**0.00**	**0.68**

3.7 Assemble gabion rock baskets - 2013

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Off-Road	0.00	0.04	0.01	0.00		0.00	0.00		0.00	0.00	0.00	5.92	5.92	0.00	0.00	5.93
Total	**0.00**	**0.04**	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**5.92**	**5.92**	**0.00**	**0.00**	**5.93**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.56	0.00	0.00	0.56
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.12	0.00	0.00	0.12
Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.68**	**0.68**	**0.00**	**0.00**	**0.68**

3.8 Hydroseed - 2013

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Off-Road	0.00	0.02	0.01	0.00		0.00	0.00		0.00	0.00	0.00	2.96	2.96	0.00	0.00	2.96
Total	**0.00**	**0.02**	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**2.96**	**2.96**	**0.00**	**0.00**	**2.96**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.08	0.00	0.00	0.08
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.05	0.00	0.00	0.06
Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.13**	**0.13**	**0.00**	**0.00**	**0.14**

3.8 Hydroseed - 2013

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Off-Road	0.00	0.02	0.01	0.00		0.00	0.00		0.00	0.00	0.00	2.96	2.96	0.00	0.00	2.96
Total	**0.00**	**0.02**	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**2.96**	**2.96**	**0.00**	**0.00**	**2.96**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.08	0.00	0.00	0.08
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.05	0.00	0.00	0.06
Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.13**	**0.13**	**0.00**	**0.00**	**0.14**

3.9 Jute netting - 2013

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Off-Road	0.01	0.09	0.04	0.00		0.00	0.00		0.00	0.00	0.00	11.06	11.06	0.00	0.00	11.08
Total	**0.01**	**0.09**	**0.04**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**11.06**	**11.06**	**0.00**	**0.00**	**11.08**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.08	0.00	0.00	0.08
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.39	0.39	0.00	0.00	0.39
Total	**0.00**	**0.00**	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.47**	**0.47**	**0.00**	**0.00**	**0.47**

3.9 Jute netting - 2013

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Off-Road	0.01	0.09	0.04	0.00		0.00	0.00		0.00	0.00	0.00	11.06	11.06	0.00	0.00	11.08
Total	**0.01**	**0.09**	**0.04**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**11.06**	**11.06**	**0.00**	**0.00**	**11.08**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.08	0.00	0.00	0.08
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.39	0.39	0.00	0.00	0.39
Total	**0.00**	**0.00**	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.47**	**0.47**	**0.00**	**0.00**	**0.47**

3.10 Landscaping and irrigation - 2013

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Off-Road	0.00	0.02	0.02	0.00		0.00	0.00		0.00	0.00	0.00	2.22	2.22	0.00	0.00	2.23
Total	**0.00**	**0.02**	**0.02**	**0.00**	**0.01**	**0.00**	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**	**2.22**	**2.22**	**0.00**	**0.00**	**2.23**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.08	0.00	0.00	0.08
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.64	2.64	0.00	0.00	2.64
Total	**0.00**	**0.00**	**0.04**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**2.72**	**2.72**	**0.00**	**0.00**	**2.72**

3.10 Landscaping and irrigation - 2013

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Off-Road	0.00	0.02	0.02	0.00		0.00	0.00		0.00	0.00	0.00	2.22	2.22	0.00	0.00	2.23
Total	**0.00**	**0.02**	**0.02**	**0.00**	**0.01**	**0.00**	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**	**2.22**	**2.22**	**0.00**	**0.00**	**2.23**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.08	0.00	0.00	0.08
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.64	2.64	0.00	0.00	2.64
Total	**0.00**	**0.00**	**0.04**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**2.72**	**2.72**	**0.00**	**0.00**	**2.72**

4.0 Mobile Detail

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Unmitigated	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Industrial	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW
User Defined Industrial	14.70	6.60	6.60	0.00	0.00	0.00

5.0 Energy Detail

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Electricity Unmitigated						0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NaturalGas Mitigated	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NaturalGas Unmitigated	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU	tons/yr										MT/yr					
User Defined Industrial	0	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		**0.00**	**0.00**	**0.00**	**0.00**		**0.00**	**0.00**		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU	tons/yr										MT/yr					
User Defined Industrial	0	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		**0.00**	**0.00**	**0.00**	**0.00**		**0.00**	**0.00**		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Land Use	kWh	tons/yr				MT/yr			
User Defined Industrial	0					0.00	0.00	0.00	0.00
Total						**0.00**	**0.00**	**0.00**	**0.00**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Land Use	kWh	tons/yr				MT/yr			
User Defined Industrial	0					0.00	0.00	0.00	0.00
Total						**0.00**	**0.00**	**0.00**	**0.00**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Unmitigated	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.00					0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Consumer Products	0.00					0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Landscaping	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**0.00**	**0.00**	**0.00**	**0.00**		**0.00**	**0.00**		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.00					0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Consumer Products	0.00					0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Landscaping	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**0.00**	**0.00**	**0.00**	**0.00**		**0.00**	**0.00**		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

7.0 Water Detail

7.1 Mitigation Measures Water

	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr				MT/yr			
Mitigated					0.00	0.00	0.00	0.00
Unmitigated					0.00	0.00	0.00	0.00
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

7.2 Water by Land Use

<u>Unmitigated</u>

	Indoor/Outdoor Use	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	tons/yr				MT/yr			
User Defined Industrial	0 / 0					0.00	0.00	0.00	0.00
Total						**0.00**	**0.00**	**0.00**	**0.00**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	tons/yr				MT/yr			
User Defined Industrial	0 / 0					0.00	0.00	0.00	0.00
Total						**0.00**	**0.00**	**0.00**	**0.00**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
	tons/yr				MT/yr			
Mitigated					0.00	0.00	0.00	0.00
Unmitigated					0.00	0.00	0.00	0.00
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Land Use	tons	tons/yr				MT/yr			
User Defined Industrial	0					0.00	0.00	0.00	0.00
Total						**0.00**	**0.00**	**0.00**	**0.00**

Mitigated

	Waste Disposed	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Land Use	tons	tons/yr				MT/yr			
User Defined Industrial	0					0.00	0.00	0.00	0.00
Total						**0.00**	**0.00**	**0.00**	**0.00**

9.0 Vegetation

Fortuna Burn Dump

Humboldt County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric
User Defined Industrial	1	User Defined Unit

1.2 Other Project Characteristics

Urbanization Rural **Wind Speed (m/s)** 2.2 **Utility Company** Pacific Gas & Electric Company

Climate Zone 1 **Precipitation Freq (Days)** 103

1.3 User Entered Comments

Project Characteristics -

Land Use - Land Use is "User defined industrial" with unit amount of 1 and lot acreage of 6. Zero square feet was entered as there will be no buildings.

Construction Phase - User defined construction phases. All assumed to be grading phase type to calculate fugitive dust emissions.

Off-road Equipment - User defined equipment list and horsepower.

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Off-road Equipment - User defined equipment list and horsepower.

Trips and VMT - Added 2 hauling trips for hydroseed, jute netting, and landscaping & irrigation phases.

Grading -

Construction Off-road Equipment Mitigation -

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2013	22.76	226.28	111.48	0.30	70.18	8.21	78.40	7.33	8.21	15.55	0.00	31,670.79	0.00	1.60	0.00	31,704.34
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2013	22.76	226.28	111.48	0.30	70.18	8.21	78.40	7.33	8.21	15.55	0.00	31,670.79	0.00	1.60	0.00	31,704.34
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00		0.00
Energy	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00	0.00	0.00
Mobile	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**		**0.00**		**0.00**	**0.00**	**0.00**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00		0.00
Energy	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00	0.00	0.00
Mobile	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**		**0.00**		**0.00**	**0.00**	**0.00**

3.0 Construction Detail

3.1 Mitigation Measures Construction

Clean Paved Roads

3.2 Mobilization - 2013

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.59	0.00	0.59	0.00	0.00	0.00						0.00
Off-Road	1.82	16.56	6.78	0.02		0.62	0.62		0.62	0.62		2,025.76		0.16		2,029.17
Total	**1.82**	**16.56**	**6.78**	**0.02**	**0.59**	**0.62**	**1.21**	**0.00**	**0.62**	**0.62**		**2,025.76**		**0.16**		**2,029.17**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Worker	0.26	0.32	2.59	0.00	0.30	0.01	0.31	0.01	0.01	0.02		209.31		0.02		209.78
Total	**0.26**	**0.32**	**2.59**	**0.00**	**0.30**	**0.01**	**0.31**	**0.01**	**0.01**	**0.02**		**209.31**		**0.02**		**209.78**

3.2 Mobilization - 2013

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.59	0.00	0.59	0.00	0.00	0.00						0.00
Off-Road	1.82	16.56	6.78	0.02		0.62	0.62		0.62	0.62	0.00	2,025.76		0.16		2,029.17
Total	**1.82**	**16.56**	**6.78**	**0.02**	**0.59**	**0.62**	**1.21**	**0.00**	**0.62**	**0.62**	**0.00**	**2,025.76**		**0.16**		**2,029.17**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Worker	0.26	0.32	2.59	0.00	0.30	0.01	0.31	0.01	0.01	0.02		209.31		0.02		209.78
Total	**0.26**	**0.32**	**2.59**	**0.00**	**0.30**	**0.01**	**0.31**	**0.01**	**0.01**	**0.02**		**209.31**		**0.02**		**209.78**

3.3 Clearing - 2013

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					12.08	0.00	12.08	6.63	0.00	6.63						0.00
Off-Road	12.77	109.14	46.04	0.13		4.10	4.10		4.10	4.10		14,131.29		1.14		14,155.29
Total	**12.77**	**109.14**	**46.04**	**0.13**	**12.08**	**4.10**	**16.18**	**6.63**	**4.10**	**10.73**		**14,131.29**		**1.14**		**14,155.29**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	1.59	18.72	9.03	0.03	5.92	0.60	6.51	0.10	0.60	0.70		2,969.11		0.08		2,970.69
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Worker	0.34	0.43	3.45	0.00	0.41	0.01	0.42	0.02	0.01	0.03		279.08		0.03		279.71
Total	**1.93**	**19.15**	**12.48**	**0.03**	**6.33**	**0.61**	**6.93**	**0.12**	**0.61**	**0.73**		**3,248.19**		**0.11**		**3,250.40**

3.3 Clearing - 2013

Mitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Fugitive Dust					12.08	0.00	12.08	6.63	0.00	6.63						0.00
Off-Road	12.77	109.14	46.04	0.13		4.10	4.10		4.10	4.10	0.00	14,131.29		1.14		14,155.29
Total	**12.77**	**109.14**	**46.04**	**0.13**	**12.08**	**4.10**	**16.18**	**6.63**	**4.10**	**10.73**	**0.00**	**14,131.29**		**1.14**		**14,155.29**

Mitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Hauling	1.59	18.72	9.03	0.03	5.92	0.60	6.51	0.10	0.60	0.70		2,969.11		0.08		2,970.69
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Worker	0.34	0.43	3.45	0.00	0.41	0.01	0.42	0.02	0.01	0.03		279.08		0.03		279.71
Total	**1.93**	**19.15**	**12.48**	**0.03**	**6.33**	**0.61**	**6.93**	**0.12**	**0.61**	**0.73**		**3,248.19**		**0.11**		**3,250.40**

3.4 Cut to fill excavation - 2013

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					12.18	0.00	12.18	6.64	0.00	6.64						0.00
Off-Road	8.10	72.20	31.74	0.08		2.73	2.73		2.73	2.73		8,573.49		0.73		8,588.80
Total	**8.10**	**72.20**	**31.74**	**0.08**	**12.18**	**2.73**	**14.91**	**6.64**	**2.73**	**9.37**		**8,573.49**		**0.73**		**8,588.80**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	6.59	77.81	37.54	0.12	55.68	2.47	58.15	0.42	2.47	2.89		12,340.35		0.31		12,346.93
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Worker	0.22	0.28	2.25	0.00	0.26	0.01	0.27	0.01	0.01	0.02		181.40		0.02		181.81
Total	**6.81**	**78.09**	**39.79**	**0.12**	**55.94**	**2.48**	**58.42**	**0.43**	**2.48**	**2.91**		**12,521.75**		**0.33**		**12,528.74**

3.4 Cut to fill excavation - 2013

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					12.18	0.00	12.18	6.64	0.00	6.64						0.00
Off-Road	8.10	72.20	31.74	0.08		2.73	2.73		2.73	2.73	0.00	8,573.49		0.73		8,588.80
Total	**8.10**	**72.20**	**31.74**	**0.08**	**12.18**	**2.73**	**14.91**	**6.64**	**2.73**	**9.37**	**0.00**	**8,573.49**		**0.73**		**8,588.80**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	6.59	77.81	37.54	0.12	55.68	2.47	58.15	0.42	2.47	2.89		12,340.35		0.31		12,346.93
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Worker	0.22	0.28	2.25	0.00	0.26	0.01	0.27	0.01	0.01	0.02		181.40		0.02		181.81
Total	**6.81**	**78.09**	**39.79**	**0.12**	**55.94**	**2.48**	**58.42**	**0.43**	**2.48**	**2.91**		**12,521.75**		**0.33**		**12,528.74**

3.5 Capping soil placement - 2013

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					13.85	0.00	13.85	6.65	0.00	6.65						0.00
Off-Road	11.88	101.34	47.97	0.11		4.24	4.24		4.24	4.24		11,647.15		1.07		11,669.54
Total	**11.88**	**101.34**	**47.97**	**0.11**	**13.85**	**4.24**	**18.09**	**6.65**	**4.24**	**10.89**		**11,647.15**		**1.07**		**11,669.54**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	10.54	124.50	60.06	0.19	55.93	3.96	59.88	0.67	3.96	4.62		19,744.55		0.50		19,755.09
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Worker	0.34	0.43	3.45	0.00	0.41	0.01	0.42	0.02	0.01	0.03		279.08		0.03		279.71
Total	**10.88**	**124.93**	**63.51**	**0.19**	**56.34**	**3.97**	**60.30**	**0.69**	**3.97**	**4.65**		**20,023.63**		**0.53**		**20,034.80**

3.5 Capping soil placement - 2013

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					13.85	0.00	13.85	6.65	0.00	6.65						0.00
Off-Road	11.88	101.34	47.97	0.11		4.24	4.24		4.24	4.24	0.00	11,647.15		1.07		11,669.54
Total	**11.88**	**101.34**	**47.97**	**0.11**	**13.85**	**4.24**	**18.09**	**6.65**	**4.24**	**10.89**	**0.00**	**11,647.15**		**1.07**		**11,669.54**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	10.54	124.50	60.06	0.19	55.93	3.96	59.88	0.67	3.96	4.62		19,744.55		0.50		19,755.09
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Worker	0.34	0.43	3.45	0.00	0.41	0.01	0.42	0.02	0.01	0.03		279.08		0.03		279.71
Total	**10.88**	**124.93**	**63.51**	**0.19**	**56.34**	**3.97**	**60.30**	**0.69**	**3.97**	**4.65**		**20,023.63**		**0.53**		**20,034.80**

3.6 Place ditch lining material - 2013

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.00	0.00	0.00	0.00	0.00	0.00						0.00
Off-Road	4.03	38.60	12.35	0.05		1.27	1.27		1.27	1.27		5,538.48		0.36		5,546.09
Total	**4.03**	**38.60**	**12.35**	**0.05**	**0.00**	**1.27**	**1.27**	**0.00**	**1.27**	**1.27**		**5,538.48**		**0.36**		**5,546.09**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.17	1.97	0.95	0.00	0.36	0.06	0.42	0.01	0.06	0.07		311.76		0.01		311.92
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Worker	0.17	0.22	1.73	0.00	0.20	0.01	0.21	0.01	0.01	0.01		139.54		0.01		139.85
Total	**0.34**	**2.19**	**2.68**	**0.00**	**0.56**	**0.07**	**0.63**	**0.02**	**0.07**	**0.08**		**451.30**		**0.02**		**451.77**

3.6 Place ditch lining material - 2013

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.00	0.00	0.00	0.00	0.00	0.00						0.00
Off-Road	4.03	38.60	12.35	0.05		1.27	1.27		1.27	1.27	0.00	5,538.48		0.36		5,546.09
Total	**4.03**	**38.60**	**12.35**	**0.05**	**0.00**	**1.27**	**1.27**	**0.00**	**1.27**	**1.27**	**0.00**	**5,538.48**		**0.36**		**5,546.09**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.17	1.97	0.95	0.00	0.36	0.06	0.42	0.01	0.06	0.07		311.76		0.01		311.92
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Worker	0.17	0.22	1.73	0.00	0.20	0.01	0.21	0.01	0.01	0.01		139.54		0.01		139.85
Total	**0.34**	**2.19**	**2.68**	**0.00**	**0.56**	**0.07**	**0.63**	**0.02**	**0.07**	**0.08**		**451.30**		**0.02**		**451.77**

3.7 Assemble gabion rock baskets - 2013

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.01	0.00	0.01	0.00	0.00	0.00						0.00
Off-Road	4.77	44.09	14.71	0.06		1.49	1.49		1.49	1.49		6,531.66		0.43		6,540.60
Total	**4.77**	**44.09**	**14.71**	**0.06**	**0.01**	**1.49**	**1.50**	**0.00**	**1.49**	**1.49**		**6,531.66**		**0.43**		**6,540.60**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.33	3.93	1.90	0.01	0.37	0.12	0.50	0.02	0.12	0.15		623.51		0.02		623.85
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Worker	0.17	0.22	1.73	0.00	0.20	0.01	0.21	0.01	0.01	0.01		139.54		0.01		139.85
Total	**0.50**	**4.15**	**3.63**	**0.01**	**0.57**	**0.13**	**0.71**	**0.03**	**0.13**	**0.16**		**763.05**		**0.03**		**763.70**

3.7 Assemble gabion rock baskets - 2013

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.01	0.00	0.01	0.00	0.00	0.00						0.00
Off-Road	4.77	44.09	14.71	0.06		1.49	1.49		1.49	1.49	0.00	6,531.66		0.43		6,540.60
Total	**4.77**	**44.09**	**14.71**	**0.06**	**0.01**	**1.49**	**1.50**	**0.00**	**1.49**	**1.49**	**0.00**	**6,531.66**		**0.43**		**6,540.60**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.33	3.93	1.90	0.01	0.37	0.12	0.50	0.02	0.12	0.15		623.51		0.02		623.85
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Worker	0.17	0.22	1.73	0.00	0.20	0.01	0.21	0.01	0.01	0.01		139.54		0.01		139.85
Total	**0.50**	**4.15**	**3.63**	**0.01**	**0.57**	**0.13**	**0.71**	**0.03**	**0.13**	**0.16**		**763.05**		**0.03**		**763.70**

3.8 Hydroseed - 2013

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.00	0.00	0.00	0.00	0.00	0.00						0.00
Off-Road	1.73	14.27	5.08	0.02		0.51	0.51		0.51	0.51		2,174.71		0.15		2,177.93
Total	**1.73**	**14.27**	**5.08**	**0.02**	**0.00**	**0.51**	**0.51**	**0.00**	**0.51**	**0.51**		**2,174.71**		**0.15**		**2,177.93**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.03	0.35	0.17	0.00	0.05	0.01	0.06	0.00	0.01	0.01		55.42		0.00		55.45
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Worker	0.05	0.06	0.52	0.00	0.06	0.00	0.06	0.00	0.00	0.00		41.86		0.00		41.96
Total	**0.08**	**0.41**	**0.69**	**0.00**	**0.11**	**0.01**	**0.12**	**0.00**	**0.01**	**0.01**		**97.28**		**0.00**		**97.41**

3.8 Hydroseed - 2013

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.00	0.00	0.00	0.00	0.00	0.00						0.00
Off-Road	1.73	14.27	5.08	0.02		0.51	0.51		0.51	0.51	0.00	2,174.71		0.15		2,177.93
Total	**1.73**	**14.27**	**5.08**	**0.02**	**0.00**	**0.51**	**0.51**	**0.00**	**0.51**	**0.51**	**0.00**	**2,174.71**		**0.15**		**2,177.93**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.03	0.35	0.17	0.00	0.05	0.01	0.06	0.00	0.01	0.01		55.42		0.00		55.45
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Worker	0.05	0.06	0.52	0.00	0.06	0.00	0.06	0.00	0.00	0.00		41.86		0.00		41.96
Total	**0.08**	**0.41**	**0.69**	**0.00**	**0.11**	**0.01**	**0.12**	**0.00**	**0.01**	**0.01**		**97.28**		**0.00**		**97.41**

3.9 Jute netting - 2013

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.00	0.00	0.00	0.00	0.00	0.00						0.00
Off-Road	2.67	21.76	11.16	0.03		1.22	1.22		1.22	1.22		3,049.53		0.24		3,054.54
Total	**2.67**	**21.76**	**11.16**	**0.03**	**0.00**	**1.22**	**1.22**	**0.00**	**1.22**	**1.22**		**3,049.53**		**0.24**		**3,054.54**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.01	0.13	0.06	0.00	0.05	0.00	0.05	0.00	0.00	0.00		20.78		0.00		20.79
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Worker	0.14	0.17	1.38	0.00	0.16	0.01	0.17	0.01	0.01	0.01		111.63		0.01		111.88
Total	**0.15**	**0.30**	**1.44**	**0.00**	**0.21**	**0.01**	**0.22**	**0.01**	**0.01**	**0.01**		**132.41**		**0.01**		**132.67**

3.9 Jute netting - 2013

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.00	0.00	0.00	0.00	0.00	0.00						0.00
Off-Road	2.67	21.76	11.16	0.03		1.22	1.22		1.22	1.22	0.00	3,049.53		0.24		3,054.54
Total	**2.67**	**21.76**	**11.16**	**0.03**	**0.00**	**1.22**	**1.22**	**0.00**	**1.22**	**1.22**	**0.00**	**3,049.53**		**0.24**		**3,054.54**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.01	0.13	0.06	0.00	0.05	0.00	0.05	0.00	0.00	0.00		20.78		0.00		20.79
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Worker	0.14	0.17	1.38	0.00	0.16	0.01	0.17	0.01	0.01	0.01		111.63		0.01		111.88
Total	**0.15**	**0.30**	**1.44**	**0.00**	**0.21**	**0.01**	**0.22**	**0.01**	**0.01**	**0.01**		**132.41**		**0.01**		**132.67**

3.10 Landscaping and irrigation - 2013

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.53	0.00	0.53	0.00	0.00	0.00						0.00
Off-Road	0.41	1.82	1.81	0.00		0.13	0.13		0.13	0.13		203.78		0.04		204.56
Total	**0.41**	**1.82**	**1.81**	**0.00**	**0.53**	**0.13**	**0.66**	**0.00**	**0.13**	**0.13**		**203.78**		**0.04**		**204.56**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.00	0.04	0.02	0.00	0.05	0.00	0.05	0.00	0.00	0.00		6.93		0.00		6.93
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Worker	0.31	0.39	3.11	0.00	0.37	0.01	0.38	0.01	0.01	0.03		251.17		0.03		251.74
Total	**0.31**	**0.43**	**3.13**	**0.00**	**0.42**	**0.01**	**0.43**	**0.01**	**0.01**	**0.03**		**258.10**		**0.03**		**258.67**

3.10 Landscaping and irrigation - 2013

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.53	0.00	0.53	0.00	0.00	0.00						0.00
Off-Road	0.41	1.82	1.81	0.00		0.13	0.13		0.13	0.13	0.00	203.78		0.04		204.56
Total	**0.41**	**1.82**	**1.81**	**0.00**	**0.53**	**0.13**	**0.66**	**0.00**	**0.13**	**0.13**	**0.00**	**203.78**		**0.04**		**204.56**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.00	0.04	0.02	0.00	0.05	0.00	0.05	0.00	0.00	0.00		6.93		0.00		6.93
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Worker	0.31	0.39	3.11	0.00	0.37	0.01	0.38	0.01	0.01	0.03		251.17		0.03		251.74
Total	**0.31**	**0.43**	**3.13**	**0.00**	**0.42**	**0.01**	**0.43**	**0.01**	**0.01**	**0.03**		**258.10**		**0.03**		**258.67**

4.0 Mobile Detail

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Unmitigated	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Industrial	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW
User Defined Industrial	14.70	6.60	6.60	0.00	0.00	0.00

5.0 Energy Detail

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00	0.00	0.00
NaturalGas Unmitigated	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00	0.00	0.00
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU	lb/day										lb/day					
User Defined Industrial	0	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00	0.00	0.00
Total		**0.00**	**0.00**	**0.00**	**0.00**		**0.00**	**0.00**		**0.00**	**0.00**		**0.00**		**0.00**	**0.00**	**0.00**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU	lb/day										lb/day					
User Defined Industrial	0	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00	0.00	0.00
Total		**0.00**	**0.00**	**0.00**	**0.00**		**0.00**	**0.00**		**0.00**	**0.00**		**0.00**		**0.00**	**0.00**	**0.00**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00		0.00
Unmitigated	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00		0.00
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.00					0.00	0.00		0.00	0.00						0.00
Consumer Products	0.00					0.00	0.00		0.00	0.00						0.00
Landscaping	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00		0.00
Total	**0.00**	**0.00**	**0.00**	**0.00**		**0.00**	**0.00**		**0.00**	**0.00**		**0.00**		**0.00**		**0.00**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.00					0.00	0.00		0.00	0.00						0.00
Consumer Products	0.00					0.00	0.00		0.00	0.00						0.00
Landscaping	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00		0.00
Total	**0.00**	**0.00**	**0.00**	**0.00**		**0.00**	**0.00**		**0.00**	**0.00**		**0.00**		**0.00**		**0.00**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Vegetation

Fortuna Burn Dump

Humboldt County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric
User Defined Industrial	1	User Defined Unit

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Utility Company**	Pacific Gas & Electric Company
Climate Zone	1	**Precipitation Freq (Days)**	103		

1.3 User Entered Comments

Project Characteristics -

Land Use - Land Use is "User defined industrial" with unit amount of 1 and lot acreage of 6. Zero square feet was entered as there will be no buildings.

Construction Phase - User defined construction phases. All assumed to be grading phase type to calculate fugitive dust emissions.

Off-road Equipment - User defined equipment list and horsepower.

Off-road Equipment - User defined equipment list and horsepower.

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Off-road Equipment - User defined equipment list and horsepower.

Trips and VMT - Added 2 hauling trips for hydroseed, jute netting, and landscaping & irrigation phases.

Grading -

Construction Off-road Equipment Mitigation -

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2013	23.40	222.86	120.98	0.30	70.18	8.27	78.45	7.33	8.27	15.60	0.00	31,553.82	0.00	1.63	0.00	31,587.99
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2013	23.40	222.86	120.98	0.30	70.18	8.27	78.45	7.33	8.27	15.60	0.00	31,553.82	0.00	1.63	0.00	31,587.99
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00		0.00
Energy	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00	0.00	0.00
Mobile	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**		**0.00**		**0.00**	**0.00**	**0.00**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00		0.00
Energy	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00	0.00	0.00
Mobile	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**		**0.00**		**0.00**	**0.00**	**0.00**

3.0 Construction Detail

3.1 Mitigation Measures Construction

Clean Paved Roads

3.2 Mobilization - 2013

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.59	0.00	0.59	0.00	0.00	0.00						0.00
Off-Road	1.82	16.56	6.78	0.02		0.62	0.62		0.62	0.62		2,025.76		0.16		2,029.17
Total	**1.82**	**16.56**	**6.78**	**0.02**	**0.59**	**0.62**	**1.21**	**0.00**	**0.62**	**0.62**		**2,025.76**		**0.16**		**2,029.17**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Worker	0.30	0.34	2.65	0.00	0.30	0.01	0.31	0.01	0.01	0.02		201.83		0.02		202.30
Total	**0.30**	**0.34**	**2.65**	**0.00**	**0.30**	**0.01**	**0.31**	**0.01**	**0.01**	**0.02**		**201.83**		**0.02**		**202.30**

3.2 Mobilization - 2013

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.59	0.00	0.59	0.00	0.00	0.00						0.00
Off-Road	1.82	16.56	6.78	0.02		0.62	0.62		0.62	0.62	0.00	2,025.76		0.16		2,029.17
Total	**1.82**	**16.56**	**6.78**	**0.02**	**0.59**	**0.62**	**1.21**	**0.00**	**0.62**	**0.62**	**0.00**	**2,025.76**		**0.16**		**2,029.17**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Worker	0.30	0.34	2.65	0.00	0.30	0.01	0.31	0.01	0.01	0.02		201.83		0.02		202.30
Total	**0.30**	**0.34**	**2.65**	**0.00**	**0.30**	**0.01**	**0.31**	**0.01**	**0.01**	**0.02**		**201.83**		**0.02**		**202.30**

3.3 Clearing - 2013

<u>Unmitigated Construction On-Site</u>

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					12.08	0.00	12.08	6.63	0.00	6.63						0.00
Off-Road	12.77	109.14	46.04	0.13		4.10	4.10		4.10	4.10		14,131.29		1.14		14,155.29
Total	**12.77**	**109.14**	**46.04**	**0.13**	**12.08**	**4.10**	**16.18**	**6.63**	**4.10**	**10.73**		**14,131.29**		**1.14**		**14,155.29**

<u>Unmitigated Construction Off-Site</u>

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	1.67	18.20	10.45	0.03	5.92	0.60	6.52	0.10	0.60	0.70		2,953.02		0.08		2,954.69
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Worker	0.40	0.46	3.54	0.00	0.41	0.01	0.42	0.02	0.01	0.03		269.11		0.03		269.73
Total	**2.07**	**18.66**	**13.99**	**0.03**	**6.33**	**0.61**	**6.94**	**0.12**	**0.61**	**0.73**		**3,222.13**		**0.11**		**3,224.42**

3.3 Clearing - 2013

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					12.08	0.00	12.08	6.63	0.00	6.63						0.00
Off-Road	12.77	109.14	46.04	0.13		4.10	4.10		4.10	4.10	0.00	14,131.29		1.14		14,155.29
Total	**12.77**	**109.14**	**46.04**	**0.13**	**12.08**	**4.10**	**16.18**	**6.63**	**4.10**	**10.73**	**0.00**	**14,131.29**		**1.14**		**14,155.29**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	1.67	18.20	10.45	0.03	5.92	0.60	6.52	0.10	0.60	0.70		2,953.02		0.08		2,954.69
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Worker	0.40	0.46	3.54	0.00	0.41	0.01	0.42	0.02	0.01	0.03		269.11		0.03		269.73
Total	**2.07**	**18.66**	**13.99**	**0.03**	**6.33**	**0.61**	**6.94**	**0.12**	**0.61**	**0.73**		**3,222.13**		**0.11**		**3,224.42**

3.4 Cut to fill excavation - 2013

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					12.18	0.00	12.18	6.64	0.00	6.64						0.00
Off-Road	8.10	72.20	31.74	0.08		2.73	2.73		2.73	2.73		8,573.49		0.73		8,588.80
Total	**8.10**	**72.20**	**31.74**	**0.08**	**12.18**	**2.73**	**14.91**	**6.64**	**2.73**	**9.37**		**8,573.49**		**0.73**		**8,588.80**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	6.95	75.66	43.42	0.12	55.68	2.51	58.18	0.42	2.51	2.92		12,273.48		0.33		12,280.45
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Worker	0.26	0.30	2.30	0.00	0.26	0.01	0.27	0.01	0.01	0.02		174.92		0.02		175.32
Total	**7.21**	**75.96**	**45.72**	**0.12**	**55.94**	**2.52**	**58.45**	**0.43**	**2.52**	**2.94**		**12,448.40**		**0.35**		**12,455.77**

3.4 Cut to fill excavation - 2013

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					12.18	0.00	12.18	6.64	0.00	6.64						0.00
Off-Road	8.10	72.20	31.74	0.08		2.73	2.73		2.73	2.73	0.00	8,573.49		0.73		8,588.80
Total	**8.10**	**72.20**	**31.74**	**0.08**	**12.18**	**2.73**	**14.91**	**6.64**	**2.73**	**9.37**	**0.00**	**8,573.49**		**0.73**		**8,588.80**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	6.95	75.66	43.42	0.12	55.68	2.51	58.18	0.42	2.51	2.92		12,273.48		0.33		12,280.45
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Worker	0.26	0.30	2.30	0.00	0.26	0.01	0.27	0.01	0.01	0.02		174.92		0.02		175.32
Total	**7.21**	**75.96**	**45.72**	**0.12**	**55.94**	**2.52**	**58.45**	**0.43**	**2.52**	**2.94**		**12,448.40**		**0.35**		**12,455.77**

3.5 Capping soil placement - 2013

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					13.85	0.00	13.85	6.65	0.00	6.65						0.00
Off-Road	11.88	101.34	47.97	0.11		4.24	4.24		4.24	4.24		11,647.15		1.07		11,669.54
Total	**11.88**	**101.34**	**47.97**	**0.11**	**13.85**	**4.24**	**18.09**	**6.65**	**4.24**	**10.89**		**11,647.15**		**1.07**		**11,669.54**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	11.12	121.06	69.47	0.19	55.93	4.01	59.94	0.67	4.01	4.68		19,637.56		0.53		19,648.72
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Worker	0.40	0.46	3.54	0.00	0.41	0.01	0.42	0.02	0.01	0.03		269.11		0.03		269.73
Total	**11.52**	**121.52**	**73.01**	**0.19**	**56.34**	**4.02**	**60.36**	**0.69**	**4.02**	**4.71**		**19,906.67**		**0.56**		**19,918.45**

3.5 Capping soil placement - 2013

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					13.85	0.00	13.85	6.65	0.00	6.65						0.00
Off-Road	11.88	101.34	47.97	0.11		4.24	4.24		4.24	4.24	0.00	11,647.15		1.07		11,669.54
Total	**11.88**	**101.34**	**47.97**	**0.11**	**13.85**	**4.24**	**18.09**	**6.65**	**4.24**	**10.89**	**0.00**	**11,647.15**		**1.07**		**11,669.54**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	11.12	121.06	69.47	0.19	55.93	4.01	59.94	0.67	4.01	4.68		19,637.56		0.53		19,648.72
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Worker	0.40	0.46	3.54	0.00	0.41	0.01	0.42	0.02	0.01	0.03		269.11		0.03		269.73
Total	**11.52**	**121.52**	**73.01**	**0.19**	**56.34**	**4.02**	**60.36**	**0.69**	**4.02**	**4.71**		**19,906.67**		**0.56**		**19,918.45**

3.6 Place ditch lining material - 2013

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.00	0.00	0.00	0.00	0.00	0.00						0.00
Off-Road	4.03	38.60	12.35	0.05		1.27	1.27		1.27	1.27		5,538.48		0.36		5,546.09
Total	**4.03**	**38.60**	**12.35**	**0.05**	**0.00**	**1.27**	**1.27**	**0.00**	**1.27**	**1.27**		**5,538.48**		**0.36**		**5,546.09**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.18	1.91	1.10	0.00	0.36	0.06	0.42	0.01	0.06	0.07		310.07		0.01		310.24
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Worker	0.20	0.23	1.77	0.00	0.20	0.01	0.21	0.01	0.01	0.01		134.55		0.01		134.86
Total	**0.38**	**2.14**	**2.87**	**0.00**	**0.56**	**0.07**	**0.63**	**0.02**	**0.07**	**0.08**		**444.62**		**0.02**		**445.10**

3.6 Place ditch lining material - 2013

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.00	0.00	0.00	0.00	0.00	0.00						0.00
Off-Road	4.03	38.60	12.35	0.05		1.27	1.27		1.27	1.27	0.00	5,538.48		0.36		5,546.09
Total	**4.03**	**38.60**	**12.35**	**0.05**	**0.00**	**1.27**	**1.27**	**0.00**	**1.27**	**1.27**	**0.00**	**5,538.48**		**0.36**		**5,546.09**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.18	1.91	1.10	0.00	0.36	0.06	0.42	0.01	0.06	0.07		310.07		0.01		310.24
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Worker	0.20	0.23	1.77	0.00	0.20	0.01	0.21	0.01	0.01	0.01		134.55		0.01		134.86
Total	**0.38**	**2.14**	**2.87**	**0.00**	**0.56**	**0.07**	**0.63**	**0.02**	**0.07**	**0.08**		**444.62**		**0.02**		**445.10**

3.7 Assemble gabion rock baskets - 2013

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.01	0.00	0.01	0.00	0.00	0.00						0.00
Off-Road	4.77	44.09	14.71	0.06		1.49	1.49		1.49	1.49		6,531.66		0.43		6,540.60
Total	**4.77**	**44.09**	**14.71**	**0.06**	**0.01**	**1.49**	**1.50**	**0.00**	**1.49**	**1.49**		**6,531.66**		**0.43**		**6,540.60**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.35	3.82	2.19	0.01	0.37	0.13	0.50	0.02	0.13	0.15		620.13		0.02		620.49
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Worker	0.20	0.23	1.77	0.00	0.20	0.01	0.21	0.01	0.01	0.01		134.55		0.01		134.86
Total	**0.55**	**4.05**	**3.96**	**0.01**	**0.57**	**0.14**	**0.71**	**0.03**	**0.14**	**0.16**		**754.68**		**0.03**		**755.35**

3.7 Assemble gabion rock baskets - 2013

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.01	0.00	0.01	0.00	0.00	0.00						0.00
Off-Road	4.77	44.09	14.71	0.06		1.49	1.49		1.49	1.49	0.00	6,531.66		0.43		6,540.60
Total	**4.77**	**44.09**	**14.71**	**0.06**	**0.01**	**1.49**	**1.50**	**0.00**	**1.49**	**1.49**	**0.00**	**6,531.66**		**0.43**		**6,540.60**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.35	3.82	2.19	0.01	0.37	0.13	0.50	0.02	0.13	0.15		620.13		0.02		620.49
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Worker	0.20	0.23	1.77	0.00	0.20	0.01	0.21	0.01	0.01	0.01		134.55		0.01		134.86
Total	**0.55**	**4.05**	**3.96**	**0.01**	**0.57**	**0.14**	**0.71**	**0.03**	**0.14**	**0.16**		**754.68**		**0.03**		**755.35**

3.8 Hydroseed - 2013

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.00	0.00	0.00	0.00	0.00	0.00						0.00
Off-Road	1.73	14.27	5.08	0.02		0.51	0.51		0.51	0.51		2,174.71		0.15		2,177.93
Total	**1.73**	**14.27**	**5.08**	**0.02**	**0.00**	**0.51**	**0.51**	**0.00**	**0.51**	**0.51**		**2,174.71**		**0.15**		**2,177.93**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.03	0.34	0.20	0.00	0.05	0.01	0.06	0.00	0.01	0.01		55.12		0.00		55.15
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Worker	0.06	0.07	0.53	0.00	0.06	0.00	0.06	0.00	0.00	0.00		40.37		0.00		40.46
Total	**0.09**	**0.41**	**0.73**	**0.00**	**0.11**	**0.01**	**0.12**	**0.00**	**0.01**	**0.01**		**95.49**		**0.00**		**95.61**

3.8 Hydroseed - 2013

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.00	0.00	0.00	0.00	0.00	0.00						0.00
Off-Road	1.73	14.27	5.08	0.02		0.51	0.51		0.51	0.51	0.00	2,174.71		0.15		2,177.93
Total	**1.73**	**14.27**	**5.08**	**0.02**	**0.00**	**0.51**	**0.51**	**0.00**	**0.51**	**0.51**	**0.00**	**2,174.71**		**0.15**		**2,177.93**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.03	0.34	0.20	0.00	0.05	0.01	0.06	0.00	0.01	0.01		55.12		0.00		55.15
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Worker	0.06	0.07	0.53	0.00	0.06	0.00	0.06	0.00	0.00	0.00		40.37		0.00		40.46
Total	**0.09**	**0.41**	**0.73**	**0.00**	**0.11**	**0.01**	**0.12**	**0.00**	**0.01**	**0.01**		**95.49**		**0.00**		**95.61**

3.9 Jute netting - 2013

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.00	0.00	0.00	0.00	0.00	0.00						0.00
Off-Road	2.67	21.76	11.16	0.03		1.22	1.22		1.22	1.22		3,049.53		0.24		3,054.54
Total	**2.67**	**21.76**	**11.16**	**0.03**	**0.00**	**1.22**	**1.22**	**0.00**	**1.22**	**1.22**		**3,049.53**		**0.24**		**3,054.54**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.01	0.13	0.07	0.00	0.05	0.00	0.05	0.00	0.00	0.00		20.67		0.00		20.68
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Worker	0.16	0.18	1.41	0.00	0.16	0.01	0.17	0.01	0.01	0.01		107.64		0.01		107.89
Total	**0.17**	**0.31**	**1.48**	**0.00**	**0.21**	**0.01**	**0.22**	**0.01**	**0.01**	**0.01**		**128.31**		**0.01**		**128.57**

3.9 Jute netting - 2013

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.00	0.00	0.00	0.00	0.00	0.00						0.00
Off-Road	2.67	21.76	11.16	0.03		1.22	1.22		1.22	1.22	0.00	3,049.53		0.24		3,054.54
Total	**2.67**	**21.76**	**11.16**	**0.03**	**0.00**	**1.22**	**1.22**	**0.00**	**1.22**	**1.22**	**0.00**	**3,049.53**		**0.24**		**3,054.54**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.01	0.13	0.07	0.00	0.05	0.00	0.05	0.00	0.00	0.00		20.67		0.00		20.68
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Worker	0.16	0.18	1.41	0.00	0.16	0.01	0.17	0.01	0.01	0.01		107.64		0.01		107.89
Total	**0.17**	**0.31**	**1.48**	**0.00**	**0.21**	**0.01**	**0.22**	**0.01**	**0.01**	**0.01**		**128.31**		**0.01**		**128.57**

3.10 Landscaping and irrigation - 2013

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.53	0.00	0.53	0.00	0.00	0.00						0.00
Off-Road	0.41	1.82	1.81	0.00		0.13	0.13		0.13	0.13		203.78		0.04		204.56
Total	**0.41**	**1.82**	**1.81**	**0.00**	**0.53**	**0.13**	**0.66**	**0.00**	**0.13**	**0.13**		**203.78**		**0.04**		**204.56**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.00	0.04	0.02	0.00	0.05	0.00	0.05	0.00	0.00	0.00		6.89		0.00		6.89
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Worker	0.36	0.41	3.18	0.00	0.37	0.01	0.38	0.01	0.01	0.03		242.20		0.03		242.76
Total	**0.36**	**0.45**	**3.20**	**0.00**	**0.42**	**0.01**	**0.43**	**0.01**	**0.01**	**0.03**		**249.09**		**0.03**		**249.65**

3.10 Landscaping and irrigation - 2013

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.53	0.00	0.53	0.00	0.00	0.00						0.00
Off-Road	0.41	1.82	1.81	0.00		0.13	0.13		0.13	0.13	0.00	203.78		0.04		204.56
Total	**0.41**	**1.82**	**1.81**	**0.00**	**0.53**	**0.13**	**0.66**	**0.00**	**0.13**	**0.13**	**0.00**	**203.78**		**0.04**		**204.56**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.00	0.04	0.02	0.00	0.05	0.00	0.05	0.00	0.00	0.00		6.89		0.00		6.89
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Worker	0.36	0.41	3.18	0.00	0.37	0.01	0.38	0.01	0.01	0.03		242.20		0.03		242.76
Total	**0.36**	**0.45**	**3.20**	**0.00**	**0.42**	**0.01**	**0.43**	**0.01**	**0.01**	**0.03**		**249.09**		**0.03**		**249.65**

4.0 Mobile Detail

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Unmitigated	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Industrial	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW
User Defined Industrial	14.70	6.60	6.60	0.00	0.00	0.00

5.0 Energy Detail

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00	0.00	0.00
NaturalGas Unmitigated	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00	0.00	0.00
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU	lb/day										lb/day					
User Defined Industrial	0	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00	0.00	0.00
Total		**0.00**	**0.00**	**0.00**	**0.00**		**0.00**	**0.00**		**0.00**	**0.00**		**0.00**		**0.00**	**0.00**	**0.00**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU	lb/day										lb/day					
User Defined Industrial	0	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00	0.00	0.00
Total		**0.00**	**0.00**	**0.00**	**0.00**		**0.00**	**0.00**		**0.00**	**0.00**		**0.00**		**0.00**	**0.00**	**0.00**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00		0.00
Unmitigated	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00		0.00
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.00					0.00	0.00		0.00	0.00						0.00
Consumer Products	0.00					0.00	0.00		0.00	0.00						0.00
Landscaping	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00		0.00
Total	**0.00**	**0.00**	**0.00**	**0.00**		**0.00**	**0.00**		**0.00**	**0.00**		**0.00**		**0.00**		**0.00**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.00					0.00	0.00		0.00	0.00						0.00
Consumer Products	0.00					0.00	0.00		0.00	0.00						0.00
Landscaping	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00		0.00
Total	**0.00**	**0.00**	**0.00**	**0.00**		**0.00**	**0.00**		**0.00**	**0.00**		**0.00**		**0.00**		**0.00**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Vegetation

APPENDIX C

BIOLOGICAL ADDENDUM

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<u>Addendum to Fortuna Burn Dump Remediation Projects Biological Constraints Analysis and Wetland Delineation Report</u>

On December 12, 2012, URS Biologist Joe Bandel and URS Planner Michelle Dunn conducted a site visit of the Fortuna Burn Dump Remediation Project Site (see site photos in Appendix A). The purpose was to gather information for the proposed Initial Study/Mitigated Negative Declaration and survey the current conditions for biological resources at the project site. Previous biological surveys at the Fortuna Burn Dump site were conducted as outlined below:

- June 9, 2009 a biological survey was conducted by Senior URS Biologist Casey Stewman and a Biological Constraints Analysis was prepared by URS Biologist Joe Bandel (Appendix B)
- June 14, 2011 a wetland delineation was conducted by Casey Stewman and a Jurisdictional Delineation Report was prepared by URS Biologist Joe Bandel (Appendix C)

<u>Environmental Setting</u>
The Fortuna Burn Dump is an approximately 9 acre parcel of land that is located roughly 0.8 miles from the community of Rohnerville, City of Fortuna, Humboldt County, California. The disposal site is on a steep south, southwest facing slope that extends upwards from Mill Creek which runs along the southwestern boundary of the parcel. The disposal site covers approximately 5.6 acres of the 9 acre parcel; however the entire parcel was surveyed for this report. The study area is located in Section 7, Township 2 North and Range 1 East of the *Hydesville* 7.5 minute U.S.G.S. Quadrangle. Two parallel dirt haul roads run across the slope through the middle of the property. A third road leading northwest from the property is the main access point and connects to Mill Street. The elevations at the site range from approximately 300 feet above sea level at the southwestern edge of the property near Mill Creek to about 500 feet above sea level at the northwestern edge of the property, along a ridgeline.

The vegetation at the site was similar to what was documented in the 2009 survey. However, in general the undergrowth vegetation in the unforested areas has become denser, and more overgrown. Non-native vines such as English ivy (*Hedera helix*) and Himalayan blackberry (*Rubus discolor*) have taken over certain areas of disturbed grassland on the slopes of the site. Weeds such as French broom (*Genista monspessulana*) and poison hemlock (*Conium maculatum*) and shrubs such as pampas grass (*Cortaderia jubata*) and coyote brush (*Baccharis pilularis*) have grown taller and thicker since the last survey. The area up slope from the creek is largely composed of redwood forest and a large area of disturbed ruderal non-native grassland. The area along Mill Creek is composed of riparian vegetation including red alder (*Alnus rubra*), black cottonwood (*Populus trichocarpa*) and bigleaf maple (*Acer macrophyllum*) trees. The skunk cabbage (*Lysichiton americanum*) wetlands that were documented in the creek at two different locations during previous surveys were still present during the current survey; however the skunk cabbage had been pummeled and scoured by previous storms. The skunk cabbage vegetation is likely to regrow when the larger storms subside toward the end of the rainy season.

Trash and burn dump debris was readily apparent all over the site particularly about midway up the slope in the middle of the disturbed grassland. Pieces of glass, bottles, drums, tanks, tires, motorcycles, boats, appliances, cars, trucks are just some of the many items observed at the site. Some trash and debris had made it all the way down to the creek including some tires and a large orange unidentified tank. Also observed was a large blue plastic reservoir full of murky water containing mosquito larvae. This reservoir appears to be a breeding area for mosquitos which may be of concern for transmitting diseases such as the West Nile virus.

<u>Special Status Species</u>
California's special status species which includes the Federal Endangered Species Act (FESA) listed species, the California Endangered Species Act CESA) listed species, the California Native Plant Society's (CNPS) Inventory of Rare and Endangered Plants of California and the California Department of Fish and Games (CDFG) and U.S. Fish and Wildlife Services lists of species of special concern are updated continually. In addition, new occurrences of these species are also being documented and uploaded to databases such as the California Natural Diversity Database (CNDDB) that may extend the previously known range of a species. Therefore to have the most current information available for special status species for this project, the special status species list was updated for the 2012 survey.

The biological survey conducted on June 9, 2009, identified special status species potentially present at the Fortuna Burn Dump site from the following literature and database sources:

- California Natural Diversity Database (CNDDB), Rarefind 3 Program, query of the *Hydesville* 7.5 minute U.S.G.S. Quadrangle.
- A query of the online U.S. Fish and Wildlife Service (USFWS) species list for the *Hydesville* 7.5 minute U.S.G.S. Quadrangle.
- A query of the California Native Plant Society's (CNPS) Inventory of Rare and Endangered Plants of California (sixth edition) (California Native Plant Society, 2001) for the *Hydesville*, Scotia, Taylor Peak, Inqua Buttes, Owl Creek, Redcrest, Mcwhinney Creek, Fields Landing and Fortuna 7.5 minute U.S.G.S. Quadrangles.
- The Jepson Manual: Higher Plants of California (Hickman 1996)

Prior to the recent survey on December 12, 2012, Joe Bandel updated the special status species lists identified above by performing a CNDDB query of the *Hydesville* 7.5 minute U.S.G.S. Quadrangle, updating the USFWS species list for the *Hydesville* 7.5 minute U.S.G.S. Quadrangle, and executing a query of the CNPS Inventory of Rare and Endangered Plants of California for the *Hydesville, Scotia, Taylor Peak, Inqua Buttes, Owl Creek, Redcrest, Mcwhinney Creek, Fields Landing* and *Fortuna* 7.5 minute U.S.G.S. Quadrangles.

The following special status species in Table 1 were identified from the updated queries and species lists that were not identified in the species lists for the previous 2009 survey. In addition, the potential of these species to occur was determined based on the habitat of that species and the site specific habitat conditions observed during the 2012 survey.

Table 1: Special-Status Species Added as a Result of Updating CNDDB, CNPS and USFWS Species Lists for the Fortuna Burn Dump Project Site

Plant or Wildlife Species	Status Federal/State/ CNPS	Habitat Associations/ Period of Identification	Potential to Occur
Acipenser medirostris Green sturgeon	FT/--/--	Spawns in upstream portions of large river systems. Juveniles move into bays and coastal waters to develop.	**None.** There is no habitat for this species at the project site
Chloropyron maritimum ssp.palustre Point Reyes bird's beak	--/--/1B	Coastal marshes and Swamps; prefers elevations of less than 10 meters.	**None.** There is no coastal habitat for this species and the elevation is greater than 10 meters.
Martes pennant Pacific fisher	FC/--/--	This species prefers old growth or undisturbed coniferous forest, closed canopy habitats. This species prefers slopes and avoids open areas.	**Low.** The redwood forest at the project site is not old growth, is substantially disturbed and contains many open areas. The project site is poor habitat for this species.

Plant or Wildlife Species	Status Federal/State/ CNPS	Habitat Associations/ Period of Identification	Potential to Occur
Riparia riparia Bank swallow	--/CT/--	Low areas along rivers, streams, ocean coasts, or reservoirs. Nest in colonies on vertical cliffs, natural bluffs or eroding streamside banks, more and more often these swallows populate human-made sites, such as sand and gravel quarries or road cuts.	**Low.** No potential nesting habitats in the project area and marginal potential foraging habitat

Based on this review, all of the added special status species above have a low or no chance of occurring at the project site. Green sturgeon or any other anadromous fish cannot access the site due to a downstream barrier documented in the 2009 survey and verified in the field again in the 2012 survey. The Point Reyes bird's beak is known to occur in really low elevation coastal marshes which were not present at the site. No or poor quality habitat was present for the pacific fisher and bank swallow.

For the special status species evaluated in the 2009 survey, the northern red-legged frog (*Rana aurora aurora*), the foothill yellow-legged frog (*Rana boyii*), the Cooper's hawk (*Accipiter cooperii*) and the sharp-shinned hawk (*Accipiter striatus*) all have medium or high potential to occur at the site. All four of these species are not federally or state listed species under FESA or CESA, but rather California Department of Fish and Game (CDFG) species of special concern or on CDFG's Watch List. During the December 12, 2012 survey, potential habitat for all four species was observed including Mill Creek which is habitat for the amphibian species (northern red-legged frog and foothill yellow-legged frog). Riparian forest trees and trees of the redwood and grand fir forests provide potential nesting habitat for the two hawk species (Cooper's hawk and sharp-shinned hawk).

Wetlands and Other Waters

A formal wetland delineation was conducted on June 14, 2011. The report describes Mill Creek as the main drainage feature which flows in a northwest direction at the bottom of the slope of the project site. Mill Creek is an intermittent stream that originates from the north side of the Redwood Empire Country Club and then flows east to west past the town of Rohnerville to the intersection of Kenmar Road and Fortuna Boulevard where on most maps including the USGS 7.5 minute quad map the creek disappears underneath Kenmar Road and Fortuna Boulevard in a diagonal direction across the intersection until the creek reappears on the other side and confluences with Strongs Creek a few hundred feet downstream. Strongs Creek is a tributary to Eel River a navigable river. During the 2012 survey, Mill Creek was observed with a strong flow of water from recent storms. The upstream portion of the creek had a less steep gradient then the downstream portion and contained sand and gravel substrate where the creek meandered through fallen woody debris and riparian vegetation. The downstream section was steeper gradient with higher velocity flows creating cascades, pools and exposed bedrock. Despite trash and debris that had occurred in some areas of the creek, the creek provided good quality riparian habitat and habitat for wildlife species.

The perennial freshwater skunk cabbage wetlands described in the jurisdictional delineation report were also observed during the 2012 survey occurring on the floodplain bench areas toward the southeast end of the project site. The western skunk cabbage that had dominated these wetlands during the June 2011 surveys had now mostly been pummeled or scoured by previous storm flows. Other vegetation such as salmonberry (*Rubus spectabilis*) was present and had mostly survived the storm flows. Overall the wetlands remain intact since the wetland delineation survey and the boundaries of the wetlands remain consistent with that survey. No additional wetlands or other waters of the U.S. were discovered during the 2012 survey.

Recommendations

Based on the follow up survey conducted on December 12, 2012 and the information from previous surveys, the following biological resources were located or have potential to be located at the site and have the potential to be affected by the Fortuna Burn Dump Remediation Project:

- Mill Creek and skunk cabbage wetlands associated with the creek
- Riparian vegetation surrounding Mill creek
- Habitat for CDFG species of special concern northern red-legged frog and foothill yellow-legged frog at Mill Creek
- Nests for Coopers hawk, sharp-shinned hawks or other migratory birds

Measures to avoid or minimize the risk to these resources should include:

- preconstruction nesting bird and amphibian surveys;
- installing environmental sensitive area fencing to prevent work from occurring in wetlands, Mill Creek, or habitat areas for sensitive amphibians
- silt fencing or wildlife exclusion fencing along border of project near Mill Creek to prevent sensitive amphibian species from entering worksite
- biological monitoring during silt fence and ESA fencing installation and all construction activities near Mill Creek

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Appendix A: Photo Appendix of December 12, 2012 Site Visit

Photo 1: Lower portion of Mill Creek cascading over instream woody debris

Photo 2: Burn dump debris and fallen logs in middle portion of Mill Creek


Photo 3: Skunk cabbage wetland on the edge of Mill Creek


Photo 4: Unidentified orange metal tank in Mill Creek


Photo 5: Plastic blue reservoir tank at north east end of project area with mosquito larvae

Photo 6: Junk on top of the slope including vehicles and drums


Photo 7: Blackberry vines and grassland covering burn dump debris on slope


Photo 8: Grassland and redwood forest on top of the slope

BIOLOGICAL CONSTRAINTS ANALYSIS FOR FORTUNA DUMP SITE

Humboldt County, California

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URS Project Number 17326173

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Appendices

Tables

Figures

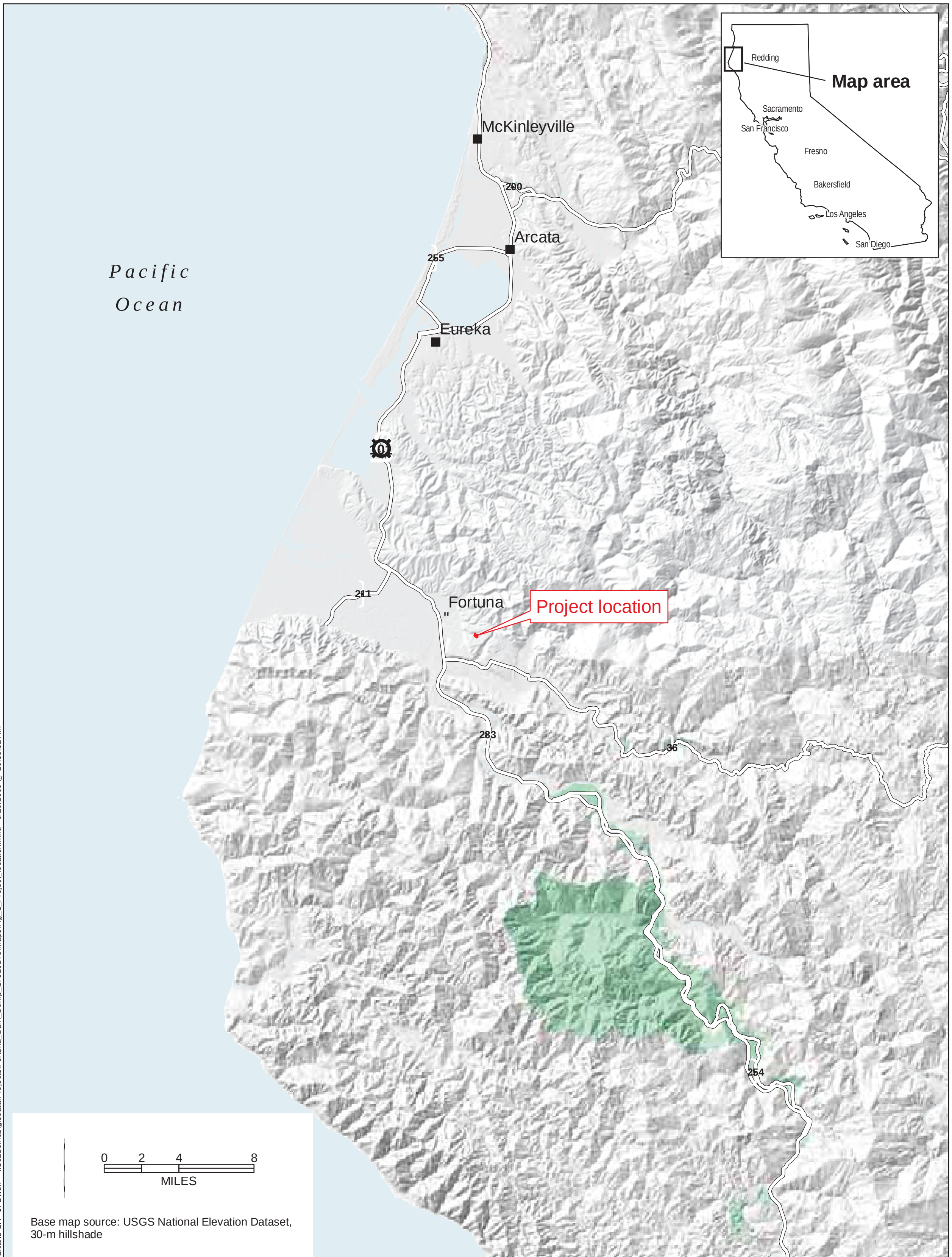
I. Summary

URS Senior Biologist Casey Stewman completed a biological constraints analysis of the Fortuna burn dump site on June 9, 2009. This document identifies potential special-status species that could occur in the study area using U.S. Fish and Wildlife Service (USFWS) listed and proposed species and all special-status species as defined by Section 15380 of the California Environmental Quality Act (CEQA). Definitions of Special-Status Species are given below. This analysis included a fish and wildlife habitat assessment, rare plant survey, special-status species survey and a reconnaissance-level assessment for any potentially jurisdictional wetlands and waters within the study area. A query of the California Natural Diversity Database and other databases was also completed for the project vicinity.

The Fortuna Dump site study area consisted of an approximately 9 acre burn dump site in a rural section of redwood forest just east of Fortuna (**Figure 1**). The burn dump extended from the top of the slope at the head of the northeast corner of the property down to Mill Creek at the bottom of the slope. The study area consisted predominantly of coniferous forest habitat which included redwood forest which dominated the perimeter of the property and the area along Mill Creek. The center of the property and the roadsides were dominated by ruderal, disturbed non-native grasslands and, in places, non-native shrubs. The entire dump site and study area contained scattered pieces of debris and refuse. The redwood forest, the other forest communities and all the communities on the site contain the scattered remains of the burn dump. These communities were historically and are presently impacted by the burn dump. No rare plants were found during this survey.

The Fortuna Dump site study area is potential habitat for wildlife including many bird, mammal, amphibian, and reptile species. The study area is potential habitat for nesting raptors as evidenced by the large occupied stick nest observed in the Grand fir tree (*Abies grandis*) in the northeast corner of the property. The redwood forest in the study area is not old growth and is composed of both second growth, in the southwest corner, and third growth, remaining stands on property, coastal redwood forest. Haul roads located on the site were used previously to transfer garbage up and down the slope. Nonetheless the coniferous forests on the property represent potential nesting habitat for Cooper's hawk (*Accipiter cooperii*) and the sharp shinned hawk (*Accipiter striatus*). Foraging habitat in the study area exists in the forests and in the grassland areas for these raptors.

Mill Creek flowing on the southwest side of the property also provides potential habitat for special status amphibian species. A northern red-legged frog (*Rana aurora aurora*) was observed near the banks of Mill Creek and potential habitat also exists for foothill yellow-legged frog (*Rana boyii*). Special status anadromous fish species like steelhead (*Oncorhynchus mykiss*), chinook salmon (*Oncorhynchus tshawytscha*) and coho salmon (*Oncorhynchus kisutch*) do not use the section of Mill Creek in the study area for any life stage because they are unable to access the stream reach due to a passage barrier. However activities at the site may impact water quality downstream in areas that are habitat for these salmonid species, particularly the Van Duzen River. A small wetland along Mill Creek was observed that was dominated by skunk cabbage (*Lysichiton americanum*) and was approximately 0.04 acre. The estimated acreage of total waters of the U.S. at the site equals 0.09 acre.



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Fortuna Burn Dump
Environmental Constraints Analysis

Figure 1
Project location and regional setting

II. Setting

The Fortuna Burn Dump is an approximately 9 acre parcel of land that is located roughly 0.8 miles from the community of Rohnerville, City of Fortuna, Humboldt County, California (**Figure 1**). The disposal site is on a steep south, southwest facing slope that extends upwards from Mill Creek which runs along the southwestern boundary of the parcel. The disposal site covers approximately 5.6 acres of the 9 acre parcel, however the entire parcel was surveyed for this report. The study area is located in Section 7, Township 2 North and Range 1 East of the *Hydesville* 7.5 minute U.S.G.S. Quadrangle. Two parallel dirt haul roads run across the slope through the middle of the property. A third road leading northwest from the property is the main access point and connects to Mill Street. The elevations at the site range from approximately 300 feet above sea level at the southwestern edge of the property near Mill Creek to about 500 feet above sea level at the northwestern edge of the property, along a ridgeline.

From the mid-1950's to 1972 the project area operated as a burn dump. Wastes were deposited near the top of the slope, burned for volume reduction and then pushed down onto the side of the slope. In 1972 the burn dump became a transfer station for waste operated by the Eel River Garbage Company and on May 1, 1987 activity at the burn dump ceased. Remnants of the burn dump are still very much present at the site. Non-combustible materials such as glass metal and pottery as well as large appliances and car bodies are scattered along the slope. Forest and vegetation has grown over the waste. The current owner has used the site for storage of his logging and lumber milling equipment.

III. Methods

Before visiting the site URS reviewed the following literature and databases to determine the potential species or sensitive habitats of concern in the project area:

- California Natural Diversity Database (CNDDB), Rarefind 3 Program, query of the *Hydesville* 7.5 minute U.S.G.S. Quadrangle.
- A query of the online U.S. Fish and Wildlife Service species list for the *Hydesville* 7.5 minute U.S.G.S. Quadrangle.
- A query of the California Native Plant Society's (CNPS) Inventory of Rare and Endangered Plants of California (sixth edition) (California Native Plant Society, 2001) for the Hydesville, Scotia, Taylor Peak, Inqua Buttes, Owl Creek, Redcrest, Mcwhinney Creek, Fields Landing and Fortuna 7.5 minute U.S.G.S. Quadrangles.
- The Jepson Manual: Higher Plants of California (Hickman 1996)

The approximately nine acre Fortuna Burn Dum Site was surveyed on June 9, 2009 by Senior Biologist Casey Stewman. The reconnaissance-level survey covered the entire project study area, using transects and intuitive survey methods. The survey included an assessment of the wetlands and waters of the U.S. at the site. This comprised inspecting for the three components of a U.S. Army Corps of Engineers jurisdictional wetland which includes hydrology, hydric soils and hydric plants. The ordinary high water mark of Mill Creek and the outline of wetlands along the creek were mapped with a survey quality sub meter accuracy Trimble © GPS unit.

Vascular plant species identified during the survey are listed in Appendix A and nomenclature follows the Jepson Manual (Hickman 1996). A rare plant survey and wildlife habitat assessment was conducted for the special status plant and animal species resulting from the CNBBB and CNPS search queries. Vegetation community types and habitat for wildlife were characterized for the entire project area. Mill Creek at the southwest edge of the project site was inspected for signs of fish and fish habitat, wildlife and rare plants. Special status species with the potential to occur at the project site are considered in the analysis below. Species were excluded from consideration in this analysis if they were restricted to habitats not found within the study area.

Special-Status Species

Definitions of Special-Status Species

Special-status species are plants and animals that are legally protected under state and federal Endangered Species Acts or other regulations and species that are considered sufficiently rare by the scientific community to qualify for such listing. These species are in the following categories:

- plants or animals listed or proposed for listing as threatened or endangered under the federal ESA (50 Code of Federal regulations [CFR] 17.12 [listed plants], 17.11 [listed animals] and various notices in the Federal Register [FR] [proposed species]).
- plants or animals that are candidates for possible future listing as threatened or endangered under the federal ESA (61 FR 40, February 28, 1996);
- plants or animals designated as “special concern” (former C2 candidates) by Region 1 of the U.S. Fish and Wildlife Service (USFWS);
- plants or animals listed or proposed for listing by the State of California as threatened or endangered under the California ESA (14 California Code of Regulations [CCR] 670.5);
- plants listed as rare or endangered under the California Native Plant Protection Act (California Fish and Game Code, Section 1900 et seq.);
- plants that meet the definitions of rare and endangered under CEQA (State CEQA Guidelines, Section 15380);
- plants considered under the California Native Plant Society (CNPS) to be “rare, threatened or endangered in California” (Lists 1A, 1B, and 2 in CNPS 2001);
- plants listed by CNPS as plants about which more information is needed to determine their status and plants of limited distribution (Lists 3 and 4 in CNPS 2001), which may be included as special-status species on the basis of local significance or recent biological information;
- animal species of special concern to CDFG; and
- animals fully protected in California (California Fish and Game Code, Sections 3511 [birds], 4700 [mammals], and 5050 [reptiles and amphibians]).

IV. Results

Plant Communities and Wildlife Habitats

This section describes the botanical and wildlife resources with the potential to occur within the study area. Biological resources discussed in this section include plants, wetlands, wildlife and special-status species. Information is based on the sources listed above, and the current survey effort. The existing biological resources and habitats within the study area are described below.

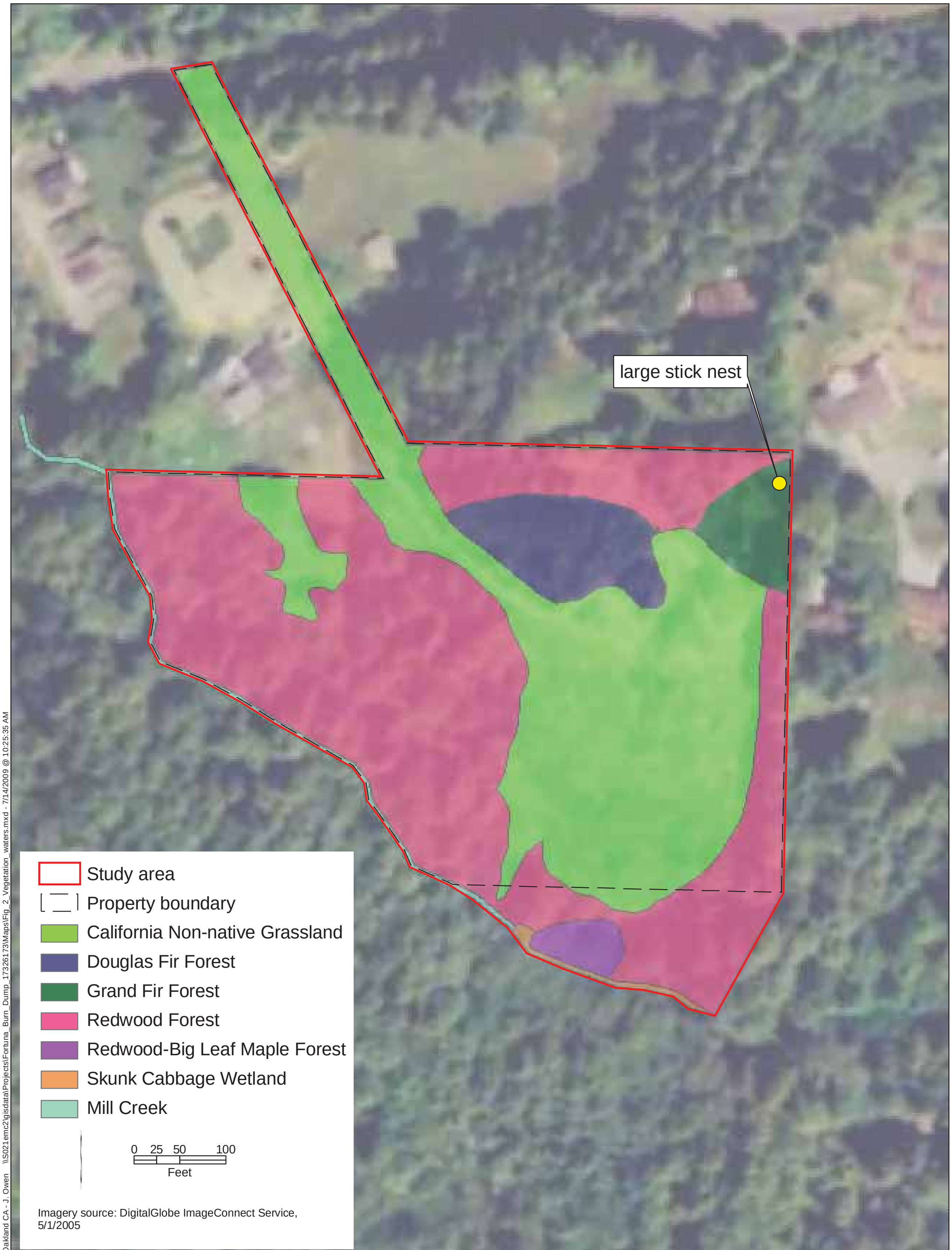
Plant communities are assemblages of plant species that occur together in the same area, which are defined by species composition and relative abundance. The plant communities were classified using *A Manual of California Vegetation* (Sawyer and Keeler-Wolf 1995 and updated list from CDFG 2003). The plant communities described below generally correlate with wildlife habitat types. The locations of each plant community are shown in **Figure 2** and the estimated approximate acreages for each plant community are provided in **Table 1**.

FORESTS

Redwood Forest Series

The redwood forest community is a mixed conifer forest dominated by redwood trees (*Sequoia sempervirens*) and includes other trees such as Douglas fir (*Pseudotsuga menziesii*) and big leaf maple (*Acer macrophyllum*). The understory of this forest community was dominated by sword fern (*Polystichum munitum*), but also included salmonberry (*Rubus spectabilis*), California huckleberry (*Vaccinium ovatum*), wood rose (*Rosa gymnocarpa*), and redwood sorrel (*Oxalis oreganus*). The redwood forest communities were located all along the perimeter of the property, and were most extensive along the southwestern slope from the disturbed burn dump areas to Mill Creek at the southwestern edge of the property. The redwood forest along Mill Creek and up the slope from the creek in the western portion of the study area appeared to be a third-growth forest (meaning the forest has been logged on two separate occasions in the past), while the redwood forest along the southeastern side of the property appeared to be second-growth forest (**Figure 2**). In small pockets within the redwood forest at the northern part of the property there were small stands of blue blossom plants (*Ceanothus thyrsiflorus*).

Redwood forests harbor a diversity of wildlife including Black bear (*Ursus americanus*), bobcat (*Lynx rufus*), black-tailed deer (*Odocoileus hemionus*), California slender salamander (*Batrachoseps attenuatus*), Pacific tree frog (*Hyla regilla*), western gray squirrel (*Sciurus griseus*), Chestnut-backed chickadee (*Parus rufescens*) and Stellar’s jay (*Cyanocitta stellari*). Raptors that may be found in redwood forests include great horned owl (*Bubo virginianus*), red tailed hawk (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), Coopers hawk (*Accipiter cooperii*), and sharp-shinned hawk (*Accipiter striatus*). These wildlife species are found in most coniferous forests along the north coast of California including the forest communities listed below.



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Fortuna Burn Dump
Environmental Constraints Analysis

Figure 2
Vegetation communities, wetlands, and waters

Grand Fir Forest Series

This forest community was located in the north-eastern corner of the property and was dominated by the Grand fir trees (*Abies grandis*), a large evergreen coniferous tree native to the Pacific Northwest including northern California. The forest provides habitat for a variety of wildlife species including the ones mentioned previously for the redwood forest community.

Douglas Fir Forest Series

At the northern edge of the property in between the road and the Grand fir forest community was a community of young Douglas fir (*Pseudotsuga menziesii)* trees. The Douglas fir forest community like the other coniferous forest communities described here provide habitat for a variety of wildlife species including many bird and raptor species that use the trees for nests.

Redwood-Big Leaf Maple Series

Big leaf maple trees (*Acer macrophyllum*) are often found within redwood forests in mesic or riparian sites and in small openings in the forest canopy. A large stand of big-leaf maple occurs along Mill Creek on the southern part of the property (See **Figure 2**). Big leaf maple trees are heavy seed producers that provide abundant food for foraging birds and mammals of the redwood forest.

GRASSLANDS

Non-native Grassland/Ruderal/Disturbed

This previously disturbed habitat is found in the center of the project area, along roads, landings and in pockets of other disturbed areas. The plant community is dominated by annual and perennial non-native grasses that thrive in ruderal disturbed landscapes including vernal grass (Anthoxanthum odoratum), wild oats (*Avena barbata*), soft chess (*Bromus hordeaceus*) and ripgut brome (*Bromus diandrus*). This community also includes other non-natives common along roadsides and disturbed areas such as French broom (*Genista monspessulana*), Italian thistle (*Carduus pycnocephalus*), pampas grass (*Cortaderia jubata*) and Scotch broom (*Lotus scoparius*). Scattered throughout this plant community were debris from the dump site. This community provides foraging habitat for raptor species including red-tailed hawks (*Buteo jamaicensis*), and American kestrel (*Falco sparverius*).

WETLAND

Skunk Cabbage Wetland Series

Along a portion of the eastern side of Mill Creek, western skunk cabbage (*Lysichiton americanum*) occupied the lower bench adjacent to the creek. Skunk cabbage are characterized by their very large leaves and the pungent odor they emit to attract flies and beetles for pollination. Skunk cabbage is often found in wet woods, along streams or other low wet areas. This vegetation type qualifies as a wetland as defined by the U.S. Army Corps of Engineers.

Table 1 Area and Type of Plant Communities in the Study Area

Plant Community Type	Acres
Redwood Forest	3.76
Grand Fir Forest	0.22
Douglas Fir Forest	0.45
Redwood-Big Leaf Maple Forest	0.10
Non-native Grassland/Ruderal/Disturbed	2.85
Skunk Cabbage Wetland	0.04
Plant Communities Total:	**7.43**

Source: URS Field Survey 2009

Special Status Species

Table 2 summarizes the potential for sensitive-status species of concern to occur within the proposed project area. Addressed within this table are the species current status, general habitat description, period of identification and potential to occur in the project area. Species having a medium or higher potential to occur or be impacted by this project are listed in bold.

Table 2 Potential Special-Status Species of Concern for the Fortuna Burn Dump Project Site

Vascular Plants	Status Federal/State/ CNPS	Habitat Associations/ Period of Identification	Potential to Occur
Astragalus agnicidus Humboldt County milk-vetch	--/--/1B	Broadleafed upland forest, North Coast coniferous forest, openings, disturbed areas, sometimes roadsides/ Blooms April-September	**Low.** Potential habitat for this species occurs in the redwood, Douglas fir and grand fir forests within the study area. However, the species was not located in the study area during the current survey.
Carex arcta northern clustered sedge	--/--/2	Bogs and fens, North Coast coniferous forest/ Blooms June-September	**Low.** Potential habitat for this species occurs in the redwood and Douglas fir forests within the study area. However, the species was not located in the study area during the current survey.
Coptis laciniata Oregon goldthread	--/--/2	Meadows and seeps, North Coast coniferous forest/ March-April	**Low.** Potential habitat for this species is present in the coniferous forests in the project area. However the species was not observed during the current survey effort.
Erythronium revolutum coast fawn lily	--/--/2	Bogs and fens, Broadleafed upland forest, North Coast coniferous forest/ Blooms March-July	**Low.** Potential habitat for this species occurs in the redwood and Douglas fir forests within the study area. However, the species was not located in the study area during the current survey.
Gilia capitata ssp. pacifica Pacific gilia	--/--/1B	Coastal bluff scrub, Chaparral, Coastal prairie, Valley and foothill grassland/ April-August	**Low.** Though the study area has some grassland habitat, the grassland is primarily composed of ruderal, invasive species of grass; no plants were observed during current survey efforts.

Vascular Plants	Status Federal/State/ CNPS	Habitat Associations/ Period of Identification	Potential to Occur
Hesperolinon adenophyllum glandular western flax	--/--/1B	Chaparral, cismontane woodland, valley and foothill grassland, usually serpentinite/ May-August	**Low.** Though the study area has some grassland habitat, the grassland is primarily composed of ruderal, invasive species of grass, also no serpentine found at project site; no plants were observed during current survey efforts.
Lilium occidentale western lily	--/--/1B	Bogs and fens, coastal bluff scrub, coastal prairie, coastal scrub, marshes and swamps, north coast coniferous forest/ June-July	**Unlikely.** Marginal habitat for this species occurs in the redwood and Douglas fir forests within the study area. However, the species was not located in the study area during the current survey
Montia howellii Howell's montia	--/--/2	Meadows and seeps, north coast coniferous forest , vernal pools vernally mesic, sometimes roadsides/ Blooms March-May	**Low.** Potential habitat for this species occurs in the redwood and Douglas fir forests within the study area. No vernal pools or seeps occur at the project site. The species was not located in the study area during the current survey.
Packera bolanderi var. bolanderi seacoast ragwort	--/--/2	Coastal scrub, north coast coniferous forest sometimes roadsides/ Blooms February- April	**Low.** Potential habitat for this species occurs in the redwood and Douglas fir forests and along roadsides within the study area. However the species was not observed during the current survey effort.
Piperia candida white-flowered rein orchid	--/--/1B	Broadleafed upland forest, lower montane coniferous forest, north coast coniferous forest sometimes serpentinite/ Blooms May-September	**Low.** Potential habitat for this species occurs in the redwood and Douglas fir forests within the study area. However, the species was not located in the study area during the current survey
Polemonium carneum Oregon polemonium	--/--/2	Coastal prairie, coastal scrub, lower montane coniferous forest/ Blooms April-September	**Low.** Though the study area provides potential habitat for this species, no plants were observed during current survey efforts.
Sidalcea malviflora ssp. patula Siskiyou checkerbloom	--/--/1B	Coastal bluff scrub, coastal prairie, north coast coniferous forest often roadcuts/ May-August	**Low.** Though the study area provides potential habitat for this species, no plants were observed during current survey efforts.
Sidalcea oregana ssp. eximia coast checkerbloom	--/--/1B	Lower montane coniferous forest, meadows and seeps, north coast coniferous forest/ June-August	**Low.** Though the study area provides potential habitat for this species, no plants were observed during current survey efforts.

Amphibians	Status Federal/State/ CNPS	Habitat Associations	Potential to Occur
Rana aurora aurora Northern red-legged frog	--/CSC/--	Ponds, marshes or stream pools for breeding; Prefers thickly vegetated areas in riparian zone	**High.** An adult individual of the species was observed along the banks of Mill Creek during the survey
Rana boyii Foothill yellow-legged frog	--/CSC/--	Low gradient rocky stream riffles and runs, cobble bar confluences and rocky streams	**Medium.** Mill Creek provides potential habitat for this species. This species was not observed during the survey however no focused surveys were conducted for this species.
Birds	**Status Federal/State/ CNPS**	**Habitat Associations**	**Potential to Occur**
Accipiter cooperii Cooper's hawk	--/--/--	Nests in woodlands, forests, riparian areas. Forages in woodlands, forests and open areas often near water.	**High.** The study area provides nesting habitat and abundant foraging habitat for the species. The species was observed nesting in a large stick nest in a large grand fir tree on the northeast ridgeline of the property during the survey of the project area.
Accipiter striatus Sharp-shinned hawk	--/--/--	Coniferous or mixed woodlands, often forage in dense forests. Nests in conifer trees.	**Medium.** The study area provides nesting habitat and abundant foraging habitat for the species. The species was not observed during surveys of the project area.
Brachyramphus marmoratus marbled murrelet	FT/--/--	Nests in dense, mossy, old-growth conifer forests usually within 45 miles of the coast. Forage along coast and bays of Pacific Ocean.	**Low.** The conifer forests in the project area are not old growth and probably do not provide suitable nesting habitat for this species. The species was not observed during surveys of the project area.
Strix occidentalis caurina northern spotted owl	FT/--/--	Nests in cavities or platforms of large trees in conifer forests, prefers large expanses of undisturbed old growth forest	**Low.** The conifer forests in the project area are not old growth and have been disturbed. The site probably does not provide suitable nesting habitat for this species. The species was not observed during surveys of the project area.
Fish	**Status Federal/State/ CNPS**	**Habitat Associations**	**Potential to Occur**
Onchorhynchus mykiss Northern California steelhead	FT/--/--	Known to spawn in rivers and tributaries flowing into the Pacific Ocean including the Van Duzen River. Spawning period is generally from December to March.	**Low.** The stream habitat of Mill Creek is not available to this species because of the barrier downstream. However steelhead habitat is available in Van Duzen River which is downstream of the project. Critical habitat for steelhead is designated in the Van Duzen River.

Onchorhynchus kisutch Southern Oregon/Northern California Coho salmon	FT/--/--	Known to spawn in rivers and tributaries flowing into the Pacific Ocean including the Van Duzen River. Spawning period is generally from October through January.	**Low.** The stream habitat of Mill Creek is not available to this species because of the barrier downstream. However coho habitat is available in Van Duzen River which is downstream of the project.
Onchorhynchus tshawytscha California Coastal Chinook Salmon	FT/--/--	Known to spawn in rivers and large coastal streams flowing into the Pacific Ocean from Cape Blanco in Oregon to San Francisco Bay.	**Low.** The stream habitat of Mill Creek is not available to this species because of the barrier downstream. The Van Duzen River downstream from the project may provide habitat for this species.
Mammals	**Status Federal/State/ CNPS**	**Habitat Associations**	**Potential to Occur**
Arborimus pomo Sonoma tree vole	--/CSC/--	Humid coastal old growth conifer forests. Prefer to feed on Douglas fir needles.	**Low.** The conifer forests in the project area are not old growth and have been disturbed. The habitat at the site is not optimal for this species. The species is very hard to locate because it nests high in tress and is very small. The species was not observed during surveys of the project area.
Martes americana humboltensis Humboldt marten	--/CSC/--	This reclusive mammal occurs in mature or old growth conifer forests near dense shrub cover	**Low.** The conifer forests in the project area are not old growth, have been disturbed and do not have dense shrub cover. The site does not provide suitable habitat for this species. The species was not observed during surveys of the project area.

United States Fish and Wildlife Service classifications:
FE = Species in danger of extinction throughout all or significant portion of its range.
FT = Species likely to become endangered within foreseeable future throughout all or significant portion of its range.
PE = Species proposed endangered.
PT = Species proposed threatened.
FC = Candidate information now available indicates that listing may be appropriate with supporting data currently on file.
SLC = Species of local concern

California Department of Fish and Game classifications:
CE = State listed as endangered. Species who's continued existence in California is jeopardized.
CT = State listed as threatened. Species, although not presently threatened with extinction, may become endangered in the foreseeable future.
CR = State listed as rare. Plant species, although not presently threatened with extinction, may become endangered in the foreseeable future.
CSC = California species of special concern. Animal species with California breeding populations that may face extinction in the near future.
CP = Fully protected by the State of California under Section 3511 and 4700 of the CDFG Code.

California Native Plant Society classifications:
List 1A = Plants that are presumed extinct in California.
List 1B = Plants that are Rare, Threatened, or Endangered in California and elsewhere.
List 2 = Plants that are Rare, Threatened or Endangered in California but more common elsewhere.
List 3 = Plants for which more information is needed.
List 4 = Plants of limited distribution.

SOURCE: CDFG, 2009; CNPS, 2001; USFWS, 2009

Potentially Affected Species and Resources

PLANTS

No special-status plant species with potential to occur based on habitat and local occurrences were discovered in the study area. A complete list of the vascular plants discovered at the project site is provided in Appendix A. The blooming period and time for best identification for most of the plant species with potential habitat in the project area coincided with the survey . The potential for special-status plants to occur on the site or be impacted by the project is considered low.

BIRDS

Cooper's hawk (Accipiter cooperii)

The Cooper's hawk (*Accipiter cooperii*) is a medium sized hawk that hunts by surprising its prey from cover or flying quickly through dense vegetation. It is considered a species of special concern by DFG. The hawks primarily feed on small birds such as robins, jays, doves and pigeons. The hawks breed in forested areas, and build nests in trees of forested areas usually about 25 to 50 feet high in the canopy. Cooper's hawk populations are beginning to bounce back from previous lows caused from the use of pesticides such as DDT and widespread shooting. A large nest likely a raptor nest was observed in one of the Grand fir trees in the northern part of the property. The nest was occupied by a Cooper's hawk. Abundant potential nesting habitat and foraging habitat is available in the study area.

Sharp Shinned Hawk (Accipiter striatus)

The sharp shinned hawk (*Accipiter striatus*) is a small hawk that feeds in a similar way as the Cooper's hawk by surprising its prey from the cover of dense vegetation. The sharp shinned hawk is adept at flying through dense thickets. The hawks feed on small birds such as robins, sparrows and various songbirds, but will occasionally feed on small rodents or amphibians. Sharp Shinned hawks construct stick nests in large conifer trees or dense group of deciduous trees. Similar to Cooper's hawk, the populations of sharp shinned hawks are also rebounding because of the ban on DDT. Potential nesting and foraging habitat at the Fortuna Dump site is abundant. Although a sharp shinned hawk was not observed during the survey there is potential for the hawks to use the site for foraging or nesting.

AMPHIBIANS

Northern Red-legged Frog (Rana aurora aurora)

The northern red-legged frog (*Rana aurora aurora*) can be found in the region from Mendocino county northward on the west side of the coastal mountains of California. The frog feeds on a wide variety of invertebrates that it catches with its sticky tongue. The frogs prefer habitat near wooded streams with a thickly vegetated shoreline where it can take cover from predators. For breeding the frog requires ponds, marshes or still pools of streams that are moderately deep and inundated at least till the end of June. The frogs prefer to spend the summer near slow sections of streams with a dense forest canopy. This species is considered a species of special concern by CDFG. One adult northern red-legged frog was observed during the survey along the stream banks of Mill Creek. Potential foraging and dispersal habitat is available for the species near Mill Creek in the study area. Several of the pools along Mill Creek within the project site appear to be of sufficient depth to provide breeding habitat for this species.

Foothill Yellow-legged Frog (Rana boyii)

The foothill yellow-legged frog (*Rana boylii*) prefers riffles and runs with gently flowing water in rocky or gravelly streams. The frogs will often bask on boulders along the shoreline of streams just above the water. The species breed during the spring and lay their eggs in flowing streams and rivers when the velocities are lower. This species has disappeared over a large part of its range in California and is considered a species of special concern by CDFG. Mill Creek in the study area provides potential habitat for this species.

FISH

Northern California Steelhead (Oncorhynchus mykiss)

No anadromous fish habitat occurs in the study area because of a passage barrier on Mill Creek at the northwest edge which is the most downstream side of the study area. The barrier is a 10 ft. vertical cliff within the creekbed. Nonetheless, storm water from the project site does drain off the property into Mill Creek and downstream into anadromous fish habitat. Downstream of the property Mill Creek is a tributary to the Van Duzen River which is considered critical habitat for steelhead by the National Marine Fisheries Service (NMFS). Erosion, sedimentation, leaching of metal compounds and toxic substances from the dump site and destruction of headwater vegetation can all have a deleterious effect on the water quality of Mill Creek, downstream watercourses and the watershed as a whole. Degradation to the water quality can potentially adversely impact steelhead in all life stages in the habitat downstream.

Southern Oregon/Northern California Coho Salmon (Oncorhynchus kisutch)

As described above, no anadromous fish habitat occurs in the project area because of a passage barrier on Mill Creek at the northwest edge of the study area. However there is Coho salmon habitat in the streams and rivers downstream of the study area. Degradation to the water quality of Mill Creek and downstream watercourses could potentially adversely impact the Coho salmon life stages downstream of the study area.

Coastal Chinook Salmon (Oncorhynchus tshawytscha)

As described above, no anadromous fish habitat occurs in the project area because of a passage barrier on Mill Creek at the northwest edge of the project area. However critical habitat has been designated by NMFS for this species in Van Duzen River downstream of the study area. Degradation to the water quality of Mill Creek and downstream watercourses could potentially adversely impact the Chinook salmon life stages downstream of the study area.

WETLANDS AND OTHER WATERS

The one semi-permanent hydrologic feature at the site was Mill Creek, an intermittent drainage with connectivity to groundwater, which runs the length of the southwest boundary of the property at the base of the dump site slope. At the time of the survey in June water was visible in the bed and banks of the stream and within multiple pools along the bed. Though surface flow does not appear to be perennial throughout the year, the creek likely flows 9 to 11 months of the year based on varying annual precipitation, and several pools within the creek have water year-round due to connectivity to existing groundwater. The edge of the stream bank at ordinary high water (OHWM) was estimated from channel observations, vegetation changes and other cues. The width of the stream at the OHWM generally varied between 4 and 9 feet wide. A portion of the Mill Creek channel functions as "wetlands within waters" where there is skunk cabbage (a wetland indicator species) in the channel. There are also a few places where skunk cabbage wetland occurs on the lower floodplain of the creek immediately adjacent to the creek but outside the OHWM. No seeps, springs or other hydrologic features were found in the study area. For the area and locations of the wetlands and other waters see **Figure 2** and for estimates of the acreages of these features see **Table 3** below.

Table 3 Potential Jurisdictional Waters of the United States in the Study Area

Feature Type and Label	Square Feet	Acres
Other Waters of the U.S.		
OW-1 – Intermittent Stream (Mill Creek)	2347	0.05
OTHER WATERS OF THE U.S. SUBTOTAL	2347	***0.05***
Wetlands		
WL-1 - Skunk Cabbage Wetland	1598	0.04
WETLANDS SUBTOTAL	1598	*0.04*
TOTAL WATERS OF THE U.S.	3945	**0.09**

Source: URS Field Survey 2009

V. RECOMMENDATIONS

PLANTS

No special status plant species were found during the floristic-level rare plant survey. All special-status plant species that had potential to occur on the site would have been in identifiable phenology (e.g. vegetative, flowering or fruiting) during the current survey effort. No further plant surveys are recommended prior to project implementation.

BIRDS

A large active nest was discovered at the project site that appeared to be occupied by a resident Cooper's hawk. The coniferous forests on the property provide potential nesting habitat for raptors and other birds. In order to prevent the disturbance or take of Cooper's hawk, sharp shinned hawk or other protected nesting birds, a qualified biologist should perform a pre-construction/disturbance nesting bird survey to do a comprehensive search for active nests prior to construction/disturbance at the site. The California Department of Fish and Game should be consulted regarding adequate buffer zones to be maintained around active nests discovered in the preconstruction survey. The buffer zone should remain in effect until the young have fledged and the nest is abandoned. Construction activities taking place outside the nesting period (February-August) would not require a survey.

AMPHIBIANS

A CDFG-approved biologist should be present on site during any construction activities near Mill Creek where there is habitat for northern red-legged frog and foothill yellow-legged frog. If either amphibian species is found in the work area, all work should cease until the identified frog leaves the work area.

FISH

Due to the presence of steelhead, Chinook and coho salmon in the Van Duzen River and potentially downstream portions of Mill Creek, there is potential for construction work or disturbance at the site to adversely affect these species particularly from degraded water quality. Erosion control measures, design measures along with best management practices (BMPs) should be utilized to avoid and minimize potential adverse impacts to water quality. When feasible the water quality in Mill Creek should be monitored for increases in pollutant levels caused by disturbances to the site. These could include increased run-off of lead, cadmium and other toxic substances previously documented on the site that could be released into the creek through disturbance of soil during construction activities.

WETLANDS AND OTHER WATERS

For the purposes of this biological constraints analysis, landscape hydrologic features at the site were classified as wetland and other waters similarly to how they are labeled in a formal wetland delineation as described in the U.S. Army Corps of Engineers (USACE) 1987 Wetlands Delineation Manual. However, a formal wetland delineation was not conducted at the project site as described in that manual. General observations of hydrology, hydric soils and hydric plants were made at the site to classify them as wetland or other waters for the purposes of this biological constraints analysis. For any activities where dredge or fill material permanently or temporarily will be placed into Mill Creek or the skunk cabbage wetland described in this survey, then a formal wetland delineation should be conducted for the Fortuna dump study area as described in the USACE 1987 Wetland Delineation Manual. After the delineation has been verified by the USACE the wetland areas should be clearly marked and all construction activities and fill soils should be routed to avoid any permanent impacts, fill or degradation of these habitats. Degradation would include fill of wetlands or reduced water quality due to erosion or run-off from adjacent fill soil piles into these waters and wetlands. Additionally, these dredge or fill activities within the wetlands or waters will also require a 1602 Lake and Streambed Alteration Agreement from CDFG and a Waste Discharge Permit or 401 Water Quality Certification form the Regional Water Quality Control Board.

VI. References

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Appendix A - Vascular Plant List

Appendix A - Fortuna Burn Dump Vascular Plant List

Scientific Name[1]	**Common Name**	**Listing or Status (if any)**
CONIFERS		
PINACEAE		
Abies grandis	grand fir	
Pseudotsuga menziesii	Douglas-fir	
TAXODIACEAE		
Sequoia sempervirens	coast redwood	
FERNS & FERN ALLIES		
DENNSTAEDTIACEAE		
Pteridium aquilinum var. *pubsecens*	bracken fern	
DRYOPTERIDACEAE		
Athyrium filix-femina	lady fern	
Polystichum munitum	sword fern	
EQUISETACEAE		
Equisetum arvense	common horsetail	
POLYPODIACEAE		
Polypodium glycyrrhiza	Licorice fern	
PTERIDACEAE		
Adiantum aleuticum	five-finger fern	
Pentagramma triangularis	goldback fern	
FLOWERING PLANTS - DICOTS		
ACERACEAE		
Acer macrophyllum	big-leaf maple	
ANACARDIACEAE		
Toxicodendron diversilobum	poison-oak	
APIACEAE		
*Conium maculatum**	poison hemlock	
Heracleum lanatum	cow parsnip	
Sanicula crassicaulis	Pacific sanicle	
*Torilis nodosa**	meadow parsley	
APOCYNACEAE		
*Vinca major**	periwinkle	

Appendix A - Fortuna Burn Dump Vascular Plant List

Scientific Name[1]	Common Name	Listing or Status (if any)
ARALIACEAE		
Aralia californica	elk's clover	
*Hedera helix**	English ivy	
ARISTOLOCHIACEAE		
Asarum caudatum	wild ginger	
ASTERACEAE		
Baccharis pilularis	coyote brush	
*Carduus pycnocephalus**	Italian thistle	
*Cirsium arvense**	Canada thistle	
*Filago gallica**	filago	
*Gnaphalium luteo-album**	cudweed	
*Hypochaeris radicata**	hairy cat's ear	
*Leontodon taraxicoides**	hawk-bit	
*Leucanthemum vulgare**	ox-eye daisy	
*Picris echioides**	bristly ox-tongue	
*Sonchus oleraceus**	sow thistle	
*Tragopogon porrifolius**	salsify	
BERBERIDACEAE		
Vancouveria planipetala	redwood ivy	
BETULACEAE		
Alnus rubra	red alder	
BRASSICACEAE		
*Brassica nigra**	black mustard	
Cardamine californica	milk maid	
Cardamine oligosperma	bittercress	
*Raphanus sativus**	wild radish	
CAPRIFOLIACEAE		
Lonicera hispidula	honeysuckle	
Lonicera involucrata	twinberry	
Sambucus racemosa var. *racemosa*	red elderberry	
CELASTRACEAE		
Euonymus occidentalis var. *occidentalis*	western burning bush	
CUCURBITACEAE		
Marah oreganus	wild cucumber	
DIPSACEAE		
Dipsacus fullonum*	teasel	

Appendix A - Fortuna Burn Dump Vascular Plant List

Scientific Name[1]	Common Name	Listing or Status (if any)
ERICACEAE		
Gaultheria shallon	salal	
Vaccinium parvifolium	red huckleberry	
Vaccinium ovatum	black huckleberry	
EUPHORBIACEAE		
*Euphorbia peplus**	petty spurge	
FABACEAE		
*Genista monspesuulana**	French broom	
*Lathyrus odoratus**	sweetpea	
*Lotus corniculatus**	bird's foot trefoil	
*Lotus scoparius**	Scotch broom	
*Medicago polymorpha**	bur-clover	
*Trifolium dubium**	small hop clover	
*Trifolium repens**	creeping clover	
Vicia	vetch	
Vicia sativa var. sativa	vetch	
GERIANACEAE		
*Geranium dissectum**		
*Geranium molle**		
GROSSULARIACEAE		
Ribes sanguineum	red flowering currant	
HYDROPHYLLACEAE		
Hydrophyllum occidentale	waterleaf	
LAMIACEAE		
*Prunella vulgaris var. vulgaris**	self heal	
Stachys ajugoides	hedgenettle	
LAURACEAE		
Umbellularia californica	California bay	
LINACEAE		
*Linum bienne**	blue flax	
LYTHRACEAE		
*Lythrum hyssopifolium**	loosestrife	
MORACEAE		
*Ficus carica**	fig tree	
MYRICACEAE		
Myrica californica	Pacific wax myrtle	

Appendix A - Fortuna Burn Dump Vascular Plant List

Scientific Name[1]	Common Name	Listing or Status (if any)
ONAGRACEAE		
Epilobium ciliatum	fireweed	
OXALIDACEAE		
Oxalis oregana	redwood sorrel	
PAPAVERACEAE		
Eschscholzia californica	California poppy	
PLANTAGINACEAE		
*Plantago lanceolata**	European plantain	
POLEMONIACEAE		
Navarretia mellita	skunkweed	
POLYGONACEAE		
*Polygonum arenastrum**	smartweed	
*Rumex acetosella**	sheep sorrel	
*Rumex crispus**	curly dock	
PORTULACACEAE		
Calandrinia ciliata	red maids	
Claytonia perfoliata	miner's lettuce	
Claytonia sibirica	candyflower	
PRIMULACEAE		
*Anagallis arvensis**	scarlet pimpernel	
Trientalis latifolia	western starflower	
RANUNCULACEAE		
*Ranunculus repens**	creeping buttercup	
Ranunculus occidentalis	western buttercup	
RHAMNACEAE		
Ceanothus thyrsiflorus	blue blossom	
Rhamnus purshiana	cascara	
ROSACEAE		
*Cotoneaster pannosa**	cotoneaster	
*Prunus domestica**	cultivated plum	
Rosa californica	California rose	
Rosa gymnocarpa	wood rose	
*Rubus discolor**	Himalaya berry	
Rubus parviflorus	thimbleberry	
Rubus spectabilis	salmonberry	
Rubus ursinus	California blackberry	
RUBIACEAE		

Appendix A - Fortuna Burn Dump Vascular Plant List

Scientific Name[1]	Common Name	Listing or Status (if any)
Galium aparine	goose grass	
SALICACEAE		
Populus balsamifera var. *trichocarpa*	black cottonwood	
Salix lasiolepis	arroyo willow	
Salix scouleriana	Scouler's willow	
SCROPHULARIACEAE		
*Digitalis purpurea**	foxglove	
*Parentucellia viscosa**	parentucellia	
Scrophularia californica	California bee-plant	
SOLANACEAE		
*Solanum sp.**	nightshade	
URTICACEAE		
Urtica dioica ssp. *holosericea*	stinging nettle	
VALERIANACEAE		
*Centranthus ruber**	red valerian	
VIOLACEAE		
Viola adunca	western dog violet	
FLOWERING PLANTS - MONOCOTS		
ARACEAE		
Lysichiton americanum	skunk cabbage	
CYPERACEAE		
Carex deweyana	sedge	
Cyperus eragrostis	nutsedge	
JUNCACEAE		
Juncus bufonius	toad rush	
Juncus effusus var. brunneus	Pacific rush	
Luzula comosa	hairy wood rush	
LILIACEAE		
Disporum smithii	fairybells	
Maianthemum dilatatum	false lily-of-the-valley	
Scoliopus bigelovii	fetid adder's tongue	
Smilicina stellata	false Solomon's seal	
Trillium ovatum ssp. *ovatum*	western trillium	
POACEAE		
Agrostis exarata	bentgrass	
*Aira caryophyllea**	European silver hairgrass	

Appendix A - Fortuna Burn Dump Vascular Plant List

Scientific Name[1]	Common Name	Listing or Status (if any)
*Ammophila arenaria**	European beach grass	
*Anthoxanthum odoratum**	vernal grass	
*Arrhenatherum elatius**		
*Avena barbata**	slender wild oat	
*Briza maxima**	rattlesnake grass	
*Briza minor**	little rattlesnake grass	
Bromus carinatus	California brome	
*Bromus diandrus**	ripgut brome	
*Bromus hordeaceus**	soft chess	
*Bromus madritensis ssp. madritensis**	red brome	
*Cortaderia jubata**	Jubata (Pampas) grass	
*Cynodon dactylon**	bermuda grass	
*Cynosurus echinatus**	dogstail grass	
*Dactylis glomerata**	orchard grass	
*Eragrostis minor**	lovegrass	
*Festuca pratensis**	meadow fescue	
*Holcus lanatus**	velvet grass	
*Lolium multiflorum**	Italian ryegrass	
*Hordeum murinum**	barley	
*Phalaris aquatica**	Harding grass	
*Poa annua**	annual bluegrass	
*Polypogon monspeliensis**	rabbitsfoot grass	
*Vulpia myuros**	rattail fescue	

Notes:

1. Scientific names from Hickman 1993. * = non-native species

Appendix B – Photo Log of Survey

Fortuna Dump Site Photo Appendix B

Photo 1. Road near top of slope on property with heavy equipment and motor vehicles along roadsides

Photo 2. Ruderal grassland in center of project area with scattered debris


Photo 3. Ruderal non-native grassland with scattered debris


Photo 4. Grand fir and Douglas fir forests


Photo 5. Redwood-big leaf maple forest with sword ferns in the foreground


Photo 6. Redwood forest community


Photo 7. Skunk cabbage wetland located along Mill Creek


Photo 8. Skunk cabbage wetland located along Mill Creek

Photo 9. Bed and banks of Mill Creek

Photo 10. Vertical cliff within Mill Creek streambed

Appendix C

Jurisdictional Delineation

Fortuna Burn Dump Remediation Project

Prepared for the California Department of Resources Recycling and Recovery
for a property located in Humboldt County, CA

August 2011

Jurisdictional Delineation

Fortuna Burn Dump Remediation Project

Prepared for the California Department of Resources Recycling and Recovery
for a property in Humboldt County, CA

August 2011

This report is prepared for a United States Army Corps of Engineers Approved Jurisdictional Delineation

Prepared By: ______________________________ Date: __________

Joe Bandel, Biologist
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Summary

This jurisdictional delineation report presents the results of a survey for wetlands and other waters of the United States under the jurisdiction of the U.S. Army Corps of Engineers. This report contains all the information required by the “San Francisco District Information Requested for Verification of Corps Jurisdiction” document posted on the U.S. Army Corps of Engineers San Francisco District website. The wetland delineation survey was conducted within the study area under contract with the California Department of Resources Recycling and Recovery (CalRecycle) for its Fortuna Burn Dump Remediation Project, located in Humboldt County, California. On June 14, 2011, a URS Corporation biologist delineated potential wetlands and other waters of the United States using the routine onsite methodology described in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and guidance from the *Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (USACE 2008).

Within the 8.5-acre study area, 0.19 acre of U.S. Army Corps of Engineers jurisdictional waters of the United States were delineated; 0.11 acres function as non-wetland other waters of the United States; 0.08 acres function as wetlands within waters of the United States.

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Contents

Figures

Tables

Abbreviated Terms

APN	assessor's parcel number
BSA	Biological Study Area
CalRecycle	California Department of Resources Recycling and Recovery
CIWMB	California Integrated Waste Management Board
CWA	Clean Water Act of 1977
EPA	U.S. Environmental Protection Agency
FACW	facultative wetland
GIS	Geographic Information System
NRCS	Natural Resources Conservation Service
OBL	obligate wetland
OW	other waters of the United States
project	Fortuna Burn Dump Project
Rapanos	*Rapanos v. United States* and *Carabell v. Army Corps of Engineers*
RPW	relatively permanent water
RWQCB	Regional Water Quality Control Board
TNW	traditional navigable water
URS	URS Corporation
USACE	U.S. Army Corps of Engineers
USGS	United States Geological Survey
WL	Wetland

WRAPP	Wetland and Riparian Area Protection Policy

1 Introduction

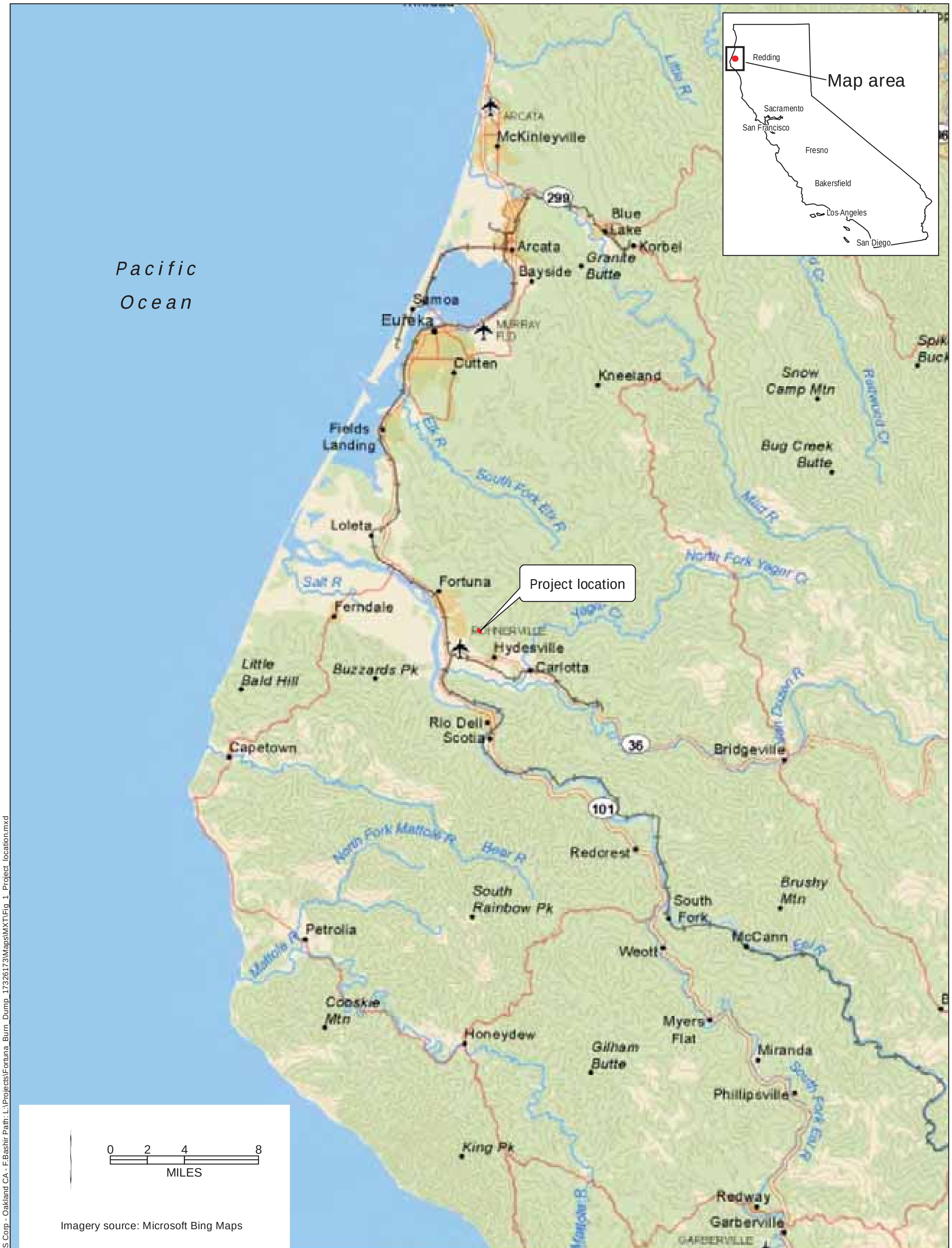
This report describes the methods and results of a delineation of jurisdictional waters of the United States, including wetlands. URS Corporation (URS) biologists conducted the jurisdictional delineation under contract to the California Department of Resources Recycling and Recovery (CalRecycle) for the proposed Fortuna Burn Dump Project (project) located near the city of Fortuna in Humboldt County, California (**Figure 1**). The objective of the delineation was to define, record, and map the portions of the project's Biological Study Area (BSA) that qualify as wetlands or other waters of the United States under federal jurisdiction pursuant to Section 404 of the Clean Water Act of 1977 (CWA).

1.1 Project Description

CalRecycle proposes to re-grade and cap the former Fortuna Burn Dump site with up to 3 feet of soil cover. The existing site operated as a burn dump site from the mid-1950's to 1972. Wastes were deposited near the top of the slope, burned for volume reduction and then pushed down the natural slope towards Mill Creek. Currently, it is estimated that over 20,000 cubic yards of waste is located within the project site.

The former Fortuna Burn Dump is located at 4498 Mill Street, assessor's parcel number (APN) 202-321-13, approximately 0.8 miles east of the community of Rohnerville, City of Fortuna, Humboldt County, California (**Figure 1**). This property itself comprises approximately 9 acres within which is located the inactive burn dump, which covers only an approximately 5.6 acres portion.

The proposed remediation project involves re-grading the on-site wastes and capping them with up to 3-feet of soil cover. The design of the cap or soil cover may include one or more retaining walls to provide for slope stability. The specific location and height of retaining walls will be determined during final design of the cap and will be based on a site-specific geotechnical evaluation to be conducted for the project. The project will include re-grading of the capping area to provide maximum design slopes ranging between 2:1 and 3:1 throughout the capped area. There will be a buffer area created between the edge of the cap and Mill Creek to limit future potential contamination of the creek.



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URS	FORTUNE BURN DUMP Jurisdictional Delineation	Figure 1 Project Location

Back of Figure 1

As part of the project, a stormwater drainage system will be designed and constructed to divert potential stormwater run-on around the perimeter of the entire capped area. Any water runoff will be diverted to flow around the waste cap footprint, and directed toward Mill Creek. This is to limit both soil erosion and saturation of the cap soils. If the cap soils were to become saturated, the stability of a portion up to all of these soils could be negatively impacted. Once the cap has been properly installed, a permanent vegetation cover will be established to help prevent erosion of the new cap.

Construction will include re-grading and placing the soil cap over the final waste footprint located on the site. During construction, large metal or bulky materials such as vehicles, refrigerators, and washing machines will be removed and recycled, properly disposed off-site, or size reduced and incorporated into the waste footprint.

1.2 Project Footprint and Biological Study Area

The *project footprint* is defined as the area that may be affected during construction of the project. The project footprint includes: the inactive burn dump area, or waste footprint, covering approximately 5.6 acres; the existing CalRecycle right-of-way north and south of the Fortuna Burn Dump Project; and the access corridors for equipment and crews.

The *biological study area* (BSA) is a larger area surrounding the proposed project footprint and includes areas outside of the 9 acre-parcel where the burn dump occurs. The 8.50-acre BSA is the area in which the delineation was conducted. The BSA is broader than the proposed project footprint because of the need to consider potentially jurisdictional features adjacent to the project footprint.

1.3 Definitions

This section states the definition of wetlands and other water resources, and describes any recent changes to the definition of "waters of the United States." Also discussed are wetlands and other waters potentially exempt from U.S. Army Corps of Engineers' (USACE) jurisdiction and waters of the State, which are regulated by the North Coast Regional Water Quality Control Board (RWQCB).

1.3.1 Wetlands and Other Waters of the United States

Wetlands and other water resources (e.g., rivers, streams, and natural basins) are subsets of "waters of the United States" and receive protection under Section 404 of the Clean Water Act (CWA). The USACE has federal responsibility for administering regulations that concern waters and wetlands. The USACE acts under two statutory authorities, the Rivers and Harbors Act (Sections 9 and 10), which governs specified activities in "navigable waters," and the CWA (Section 404), which governs specified activities in "waters of the United States," which include wetlands.

As defined in the *Code of Federal Regulations* (33 CFR 328.3[a]; 40 CFR 230.3[s]), the term *waters of the United States* refers to:

> (1) All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (2) All interstate waters including interstate wetlands; (3) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mud flats, sand flats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural basins, the use, degradation, or destruction of which could affect interstate or foreign commerce including any such waters which are or could be used by interstate or foreign travelers for recreational or other purposes; or from which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or which are used or could be used for industrial purposes by industries in interstate commerce; (4) All impoundments of waters otherwise defined as waters of the United States under the definition; (5) Tributaries of waters identified in paragraphs (1) through (4); (6) Territorial seas; and (7) Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (1) through (6).

The USACE and the U.S. Environmental Protection Agency (EPA) define wetlands as follows: "those areas that are saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for the life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas."

The term *other waters of the United States* is used to characterize waterbodies (e.g., intermittent streams) that do not meet the full criteria for wetlands designation.

1.3.2 Rapanos v. United States and Carabell v. Army Corps of Engineers

Two cases brought before the U.S. Supreme Court, *Rapanos v. United States* (No. 04-1034) and *Carabell v. Army Corps of Engineers* (No. 04-1384) (hereafter referred to together as *Rapanos*), challenged the USACE's interpretation of waters of the United States. USACE had interpreted 33 U.S.C. 1362(7) of the CWA to regulate wetland areas that are separated from a tributary of a navigable water by a narrow, constructed berm, where evidence of an occasional hydrologic connection existed between the wetland and the tributary.

On June 19, 2006, the court ruling in *Rapanos* tightened the definition of waters of the United States. The decision stated that a water or wetland constitutes “navigable waters” under the CWA if it possesses a “significant nexus” to waters that are currently navigable or could feasibly be made navigable. On June 5, 2007, USACE and the EPA, in response to the ruling, issued a joint memorandum that put forth new guidelines for establishing whether wetlands or other waters of the United States fall within USACE jurisdiction. In the guidelines, the agencies assert jurisdiction over traditional navigable waters (TNWs), wetlands adjacent to TNWs, non-navigable tributaries to TNWs that are relatively permanent waters (RPWs), and wetlands that abut RPWs. The agencies may take jurisdiction over non-navigable tributaries that are not RPWs, wetlands that are adjacent to non-RPWs, and wetlands adjacent to but not directly abutting a relatively permanent non-navigable tributary. The agencies will generally not assert jurisdiction over swales, erosional features, or ditches that are excavated wholly in and draining only uplands and that do not carry a relatively permanent flow of water.

1.3.3 Wetlands and Other Waters Potentially Exempt from USACE Jurisdiction

A number of exemptions from CWA regulations exist for areas that would otherwise qualify as waters of the United States. These exemptions are classified as either discretionary or non-discretionary exemptions. The ruling in *Solid Waste Agency of Northern Cook County v. United States Army Corps of Engineers* also created another type of exemption.

Discretionary Exemptions

Exemption Criteria. As described in the preamble discussion of USACE regulations in the November 13, 1986, *Federal Register*, certain areas that meet the technical definition of wetlands generally are not considered waters of the United States (33 CFR 328.3[a]). However, USACE and EPA reserve the right to determine that a particular waterbody within the categories listed below is a water of the United States on a case-by-case basis. These categories are:

- Non-tidal drainage and irrigation ditches excavated on dry land.
- Artificially irrigated areas that would revert to upland if the irrigation ceased.
- Artificial lakes or ponds created by excavating and/or diking dry land to collect and retain water and that are used exclusively for such purposes as stock watering, irrigation, settling basins, or rice production.

- Artificial reflecting or swimming pools or other small ornamental bodies of water created by excavating and/or diking dry land to retain water for primarily aesthetic reasons.
- Water-filled depressions created in dry land incidental to construction activity, and pits excavated in dry land for the purpose of obtaining fill, sand, or gravel, unless and until the construction or excavation operation is abandoned and the resulting body of water meets the definition of waters of the United States.

Determination of Exemption. The technical definition of a wetland or non-wetland water of the United States that does not meet the USACE criteria for jurisdiction on the basis of *Rapanos* is briefly summarized below.

Features such as roadside ditches, drainage ditches, or irrigation canals that appear to have been excavated in uplands and do not convey or connect to other waters of the United States are considered non-jurisdictional waters under the new USACE methodology. Many of these features are in areas with little or no topography indicative of a flow path to a seasonal stream (a stream that flows approximately 3 months a year) that eventually discharges to a TNW. Canals and ditches that do not maintain a flow connection with a TNW are considered isolated. Canals that transport water from a RPW and that do not reconnect or recirculate water back to a RPW draining to a TNW are not considered jurisdictional. Likewise, any man-made drainage ditch that drains uplands to a RPW is not jurisdictional. An exception to this exemption may be a flood-irrigated field that is watered by a jurisdictional canal that is found to drain to a ditch leading to a RPW connected to a TNW. No features meeting criteria for an exemption were identified in the BSA.

Non-Discretionary Exemptions

Exemption Criteria. In addition to the discretionary exemptions described above, USACE regulations contain a non-discretionary exemption for waste treatment systems designed to meet the requirements of the CWA (33 CFR 328.3[a][7]). Such areas, which include treatment ponds and lagoons, are not considered waters of the United States.

Determination of Exemption. No areas were found in the BSA that met the criteria for a non-discretionary exemption.

Solid Waste Agency of Northern Cook County v. United States Army Corps of Engineers

Exemption Criteria. On January 9, 2001, the U.S. Supreme Court issued a decision in *Solid Waste Agency of Northern Cook County v. United States Army Corps of Engineers*. The case involved the filling of hydrologically isolated waters that had formed from remnant excavation ditches on a 533-acre parcel. In the decision, the court denied USACE jurisdiction over isolated waterbodies; USACE had previously regulated these waterbodies using the Migratory Bird Treaty Act, which was established in 1986. The court defined isolated waters as “any body of water that is non-navigable, intrastate, and lacking any significant nexus to navigable bodies of water” (Pooley 2002).

Determination of Exemption. No wetlands or non-wetland waters of the United States are present in the BSA, which before the 2001 decision would have been designated as jurisdictional solely on the basis of the Migratory Bird Rule. Therefore, this ruling does not apply to the BSA.

1.3.4 Waters of the State and the Regional Water Quality Control Boards

The RWQCB protects the beneficial uses of surface water and groundwater in California under the provisions of the Porter-Cologne Act, with a focus on water quality. The RWQCBs regulate all pollutant or nuisance discharges that may affect either surface water or groundwater. The RWQCBs may exercise jurisdiction over discharges into waters of the State pursuant to the Porter-Cologne Act in cases where the waters are excluded from regulation under the federal CWA.

At the time this delineation was performed, no formal protocol existed for delineating waters of the State. Waters of the State are broadly defined under the Porter-Cologne Water Quality Control Act (§ 1305[e]). Under this definition, isolated wetlands that may not be subject to regulations under federal law are considered waters of the State. However, the SWRCB has not yet adopted a wetland definition. As required by State Water Board Resolution No 2008-0026, a wetland definition will be developed as part of the Wetland and Riparian Area Protection Policy (WRAPP). In October 2009, the Technical Advisory Team for the Wetland and Riparian Area Protection Policy presented a definition that would reliably define the diverse array of California wetlands based on the USACE wetland delineation methods, to the extent feasible. Specifically, the proposed wetland definition is as follows:

“An area is a wetland if, under normal circumstances, it (1) is saturated by ground water or inundated by shallow surface water for a duration sufficient to cause anaerobic conditions within the upper substrate; (2) exhibits hydric substrate conditions indicative of such hydrology; and (3) either lacks vegetation or the vegetation is dominated by hydrophytes."

Although some Regional Water Quality Control Boards (RWQCBs) have adopted a definition of a wetland in their respective basin plans, the North Coast RWQCB has not adopted a wetland definition within their latest basin plan.

2 Environmental Setting

2.1 Project Area

The Fortuna Burn Dump is located on an approximately 9 acre parcel of land that is located roughly 0.8 miles from the community of Rohnerville, City of Fortuna, Humboldt County, California (**Figure 1**). The burn dump site covers approximately 5.6 acres of the 9 acre parcel, however the area surveyed for this report is approximately 8.5 acres. The project area is located in Section 7, Township 2 North and Range 1 East of the Hydesville 7.5 minute United States Geological Survey (USGS) Quadrangle. Two parallel dirt haul roads run across the slope through the middle of the property. A third road leading northwest from the property is the main access point and connects to Mill Street. The burn dump site is located at 40.566° north latitude and 124.112° west longitude.

2.2 Climate and Topography

The Fortuna Burn Dump site is located on a steep south, southwest facing slope that extends upwards from Mill Creek, which runs along the southwestern boundary of the parcel. At the northeast end of the site the slope of the terrain levels off near existing buildings and roads. The elevations at the site range from approximately 300 feet above sea level at the southwestern edge of the property near Mill Creek to about 500 feet above sea level at the northwestern edge of the property, along a ridgeline.

The climate of the site, which is located very near to the City of Fortuna, like many other places in California near the Pacific Ocean is strongly influenced by the oceans moderating effect on temperatures, resulting in relatively cool summers and warm winters. Temperatures along the coast vary only 10 degrees from summer to winter. Because of the moisture and moderate temperature the average relative humidity is high. Largely as a result of the proximity of the cool Pacific Ocean, the adjoining coastal area has a cool, stable temperature regime.

In most years, rainfall is experienced each month of the year, although amounts are negligible from June through August. Seasonal totals average more than 40 inches and in higher elevations can exceed 100 inches. About 90 percent of the seasonal total rainfall falls in the seven months from October through April. Most of this is associated with storm fronts that move in from the Pacific Ocean. There are few thunder showers in the mountains during the summer, but they are not frequent (Humboldt County, 2005).

2.3 Hydrology

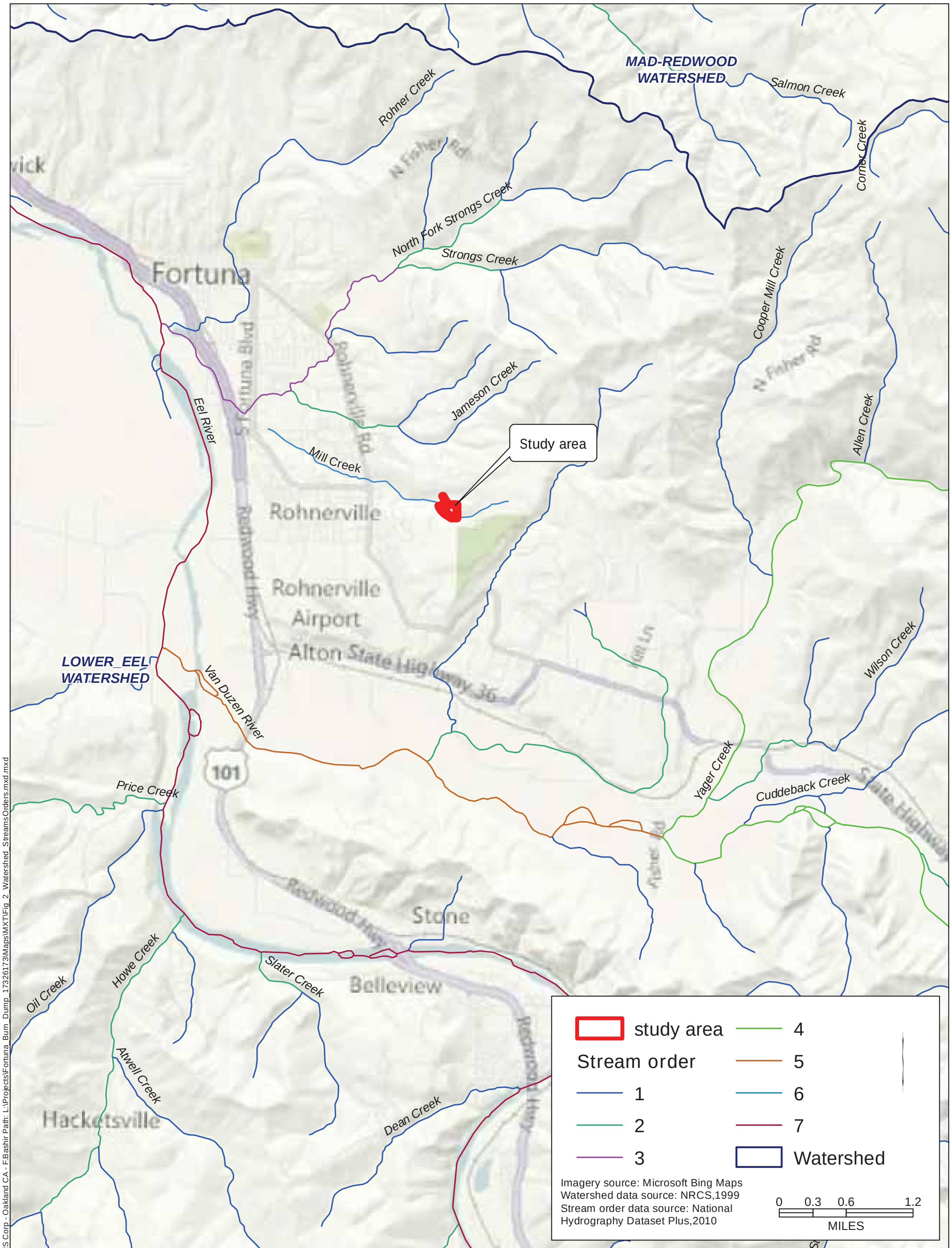
Precipitation that falls in the BSA drains down the slope of the site in a mostly southwest direction into Mill Creek at the base of the slope at the southwest end of the BSA. Mill Creek is an intermittent stream that originates from the north side of the Redwood Empire Country Club and then flows east to west past the town of Rohnerville to the intersection of Kenmar Road and Fortuna Boulevard where on most maps including the USGS 7.5 minute quad map the creek disappears underneath Kenmar Road and Fortuna Boulevard in a diagonal direction across the intersection until the creek reappears on the other side and confluences with Strongs Creek a few hundred feet downstream. Strongs Creek is a tributary to Eel River a navigable river. A map of the watershed including Strahler stream orders is included as **Figure 2**. The map shows Mill Creek downstream of the BSA until it gets to the Kenmar Road/Fortuna Boulevard intersection. Geographic Information System (GIS) information to show the path of the creek to its confluence with Strongs Creek was not available for this report.

The portion of the creek within the BSA is primarily incised with pools and riffles, with broader alluvial floodplain with associated wetlands in the uppermost section. A small ephemeral drainage joins Mill Creek from the slopes west of the creek at the southeast end of the BSA.

2.4 Soils in the Biological Study Area

Online soil surveys from Humboldt County (NRCS 2011) were consulted to identify the soil types within the BSA, however the BSA has not been mapped and therefore the soil is classified as NOTCOM (see **Figure 3)**.

Based on geologic information obtained from the CIWMB Site Investigation Report, the BSA is underlain by the Hookton formation and younger terrace deposits that unconformably overlies the Carlotta formation. The Hookton formation primarily consists of non-marine, poorly consolidated, clay, sand and gravel. The soils found in previous investigations according to the report consisted of silty clay, sandy clay, sandy silty clay, clay and clayey silt mixed in with some gravels and cobbles (CIWMB 2007). The wetland delineation site visit identified similar types of soil composition when digging the pits for the upland and wetland data points. The soil in the two feet deep data point soil pits consisted of sand, sandy clay loam, clay loam and loamy clay.



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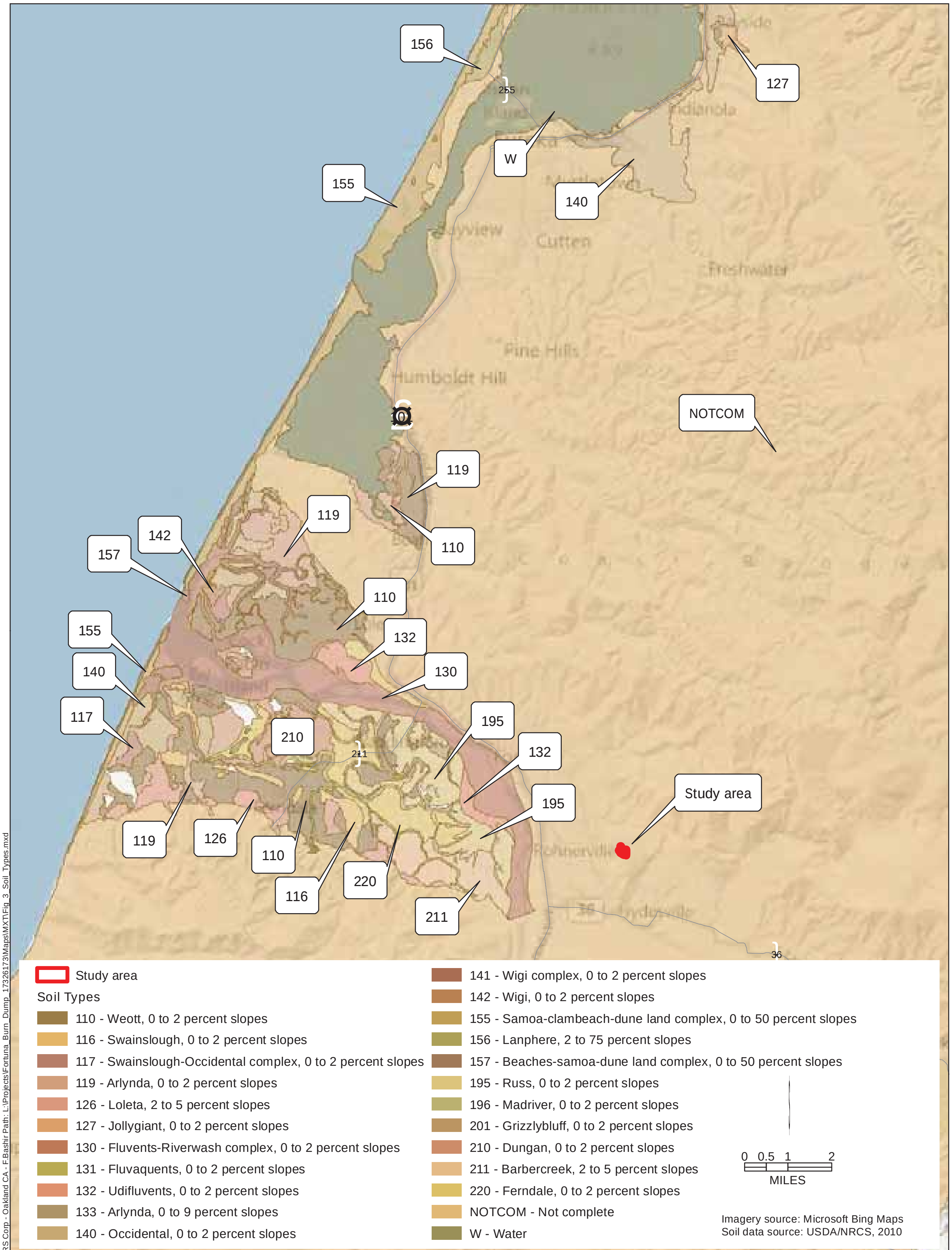
URS	Fortuna Burn Dump Jurisdictional Delineation	Figure 2 Watersheds and stream order in the study area region

Back of Figure 2



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URS	Fortuna Burn Dump Jurisdictional Delineation	Figure 3 Soil types of the study area region

Back of Figure 3

2.5 Vegetation Communities

Vegetation communities are assemblages of plant species defined by species composition and relative abundance, which occur together in the same area. These natural communities are based on the classification are presented in *A Manual of California Vegetation* (Sawyer et al. 2009).

Six vegetation communities were observed in the BSA. These communities consisted of five upland communities, including redwood forest, Grand fir forest, Douglas fir forest, redwood-big leaf maple forest, and disturbed annual grassland. The one wetland community is the skunk cabbage wetland that occurs at the base of the slope right next to the creek.

FORESTS

2.5.1 Redwood Forest Series

The redwood forest community is a mixed conifer forest dominated by redwood trees (*Sequoia sempervirens*) and includes other trees such as Douglas fir (*Pseudotsuga menziesii*) and big leaf maple (*Acer macrophyllum*). The understory of this forest community was dominated by sword fern (*Polystichum munitum*), but also included salmonberry (*Rubus spectabilis*), California huckleberry (*Vaccinium ovatum*), wood rose (*Rosa gymnocarpa*), and redwood sorrel (*Oxalis oreganus*). The redwood forest communities were located along the perimeter of the property, and were most extensive along the southwestern slope from the disturbed burn dump areas to Mill Creek. The redwood forest along Mill Creek and up the slope from the creek in the western portion of the study area appeared to be a third-growth forest (meaning the forest has been logged on two separate occasions in the past), while the redwood forest along the southeastern side of the property appeared to be second-growth forest. In small pockets within the redwood forest at the northern part of the property there were small stands of blue blossom (*Ceanothus thyrsiflorus*).

2.5.2 Grand Fir Forest Series

This forest community was located in the northeastern corner of the property and was dominated by the Grand fir trees (*Abies grandis*), a large evergreen coniferous tree native to the Pacific Northwest including northern California.

2.5.3 Douglas Fir Forest Series

At the northern edge of the property in between the road and the Grand fir forest community was a community of young Douglas fir (*Pseudotsuga menziesii)* trees.

2.5.4 Redwood-Big Leaf Maple Series

Big leaf maple trees are often found within redwood forests in mesic or riparian sites and in small openings in the forest canopy. A large stand of big leaf maple occurs along Mill Creek on the southern part of the property.

GRASSLANDS

2.5.5 Non-native Grassland/Ruderal/Disturbed

This disturbed habitat is found in the center of the BSA, along roads, landings and in pockets of other disturbed areas. The vegetation community is dominated by annual and perennial non-native grasses that thrive in ruderal disturbed landscapes including vernal grass (*Anthoxanthum odoratum*), wild oats (*Avena barbata*), soft chess (*Bromus hordeaceus*) and ripgut brome (*Bromus diandrus*). This community also includes non-natives common along roadsides and disturbed areas such as French broom (*Genista monspessulana*), Italian thistle (*Carduus pycnocephalus*), pampas grass (*Cortaderia jubata*) and Scotch broom (*Lotus scoparius*). Scattered throughout this vegetation community were debris from the burn dump site.

WETLAND

2.5.6 Skunk Cabbage Wetland Series

Along a portion of the eastern side of Mill Creek, western skunk cabbage (*Lysichiton americanum*) occupied the lower bench adjacent to the creek. Skunk cabbage are characterized by their very large leaves and the pungent odor they emit to attract flies and beetles for pollination. Skunk cabbage is often found in wet woodlands, along streams or other low areas. This vegetation type qualifies as a wetland as defined by the USACE.

3 Methods

This section describes the methods used to delineate jurisdictional wetlands and other waters of the United States in the BSA.

3.1 Literature Review

URS biologists reviewed the following sources for information relevant to this delineation:

- Aerial photographs of the BSA and vicinity
- Soil Survey of Humboldt County, Central Part, California (NRCS 2011)
- Standard biological references and field guides, including *The Jepson Manual* (Hickman 1996)

3.2 Field Surveys

URS biologist Casey Stewman conducted a jurisdictional delineation of waters of the United States in the BSA on June 14, 2011. Waters of the United States were formally delineated in accordance with the routine onsite method described in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and under guidance from the *Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (USACE 2008).

Vegetation, hydrology, and soils were analyzed to determine the location and boundaries of wetlands within the BSA. Boundaries of waters of the United States and wetlands were mapped on aerial photographs at a scale of 1:2,400. Wetlands in the BSA were clearly delineated within the ordinary high-water mark of the defined bed and bank of the streambed. After evaluating the vegetation, hydrology, and soils, the biologists extrapolated the boundaries of the wetlands by following contours, wetland vegetation boundaries, and/or clear hydrologic boundaries. Data points were recorded at representative locations in each potential wetland type in the BSA. Sample pits were dug, and soils were analyzed in areas with marginal wetland characteristics adjacent to the streambed to determine whether further analysis of the area was needed. All wetlands within the BSA occurred within or immediately adjacent to the defined stream channel and are mapped in **Appendix A**. Western Mountains, Valleys, and Coast Region data sheets for each mapped feature are provided in **Appendix B** along with a jurisdictional determination form in adherence to post-*Rapanos* methodology. Representative site photographs documenting wetland features are presented in **Appendix C**. A list of all vascular plants identified in the BSA during the survey is presented in **Appendix D**. Nomenclature follows that used in *The Jepson Manual* (Hickman 1996).

Locations of the ordinary high-water mark of the streambed, wetland boundaries, and wetland sample data points were marked with a Trimble© backpack XHT sub-meter accuracy global positioning system (GPS) unit and recorded on the aerial images. Representative widths of the channel were measured with a tape throughout the BSA for reference. Features were later edited and digitized in ArcGIS 9.3. Polygons were used to represent these features in the BSA. Acreages for wetlands and other waters of the United States were calculated from digitized data in ArcGIS. Areas not included in these features are considered upland habitat. Paired data points on vegetation, soils, and hydrology were collected at two locations within the BSA. Locations of data points are shown in the 1:2,400-scale map in **Appendix A**.

3.2.1 Hydric Soils

Soils are considered hydric if classified as hydric by the Natural Resources Conservation Service (NRCS) or if field indicators associated with hydric soils are present. The NRCS defines a hydric soil as a soil that formed where conditions of saturation, flooding, or ponding occurred long enough during the growing season to develop anaerobic conditions, or conditions where oxygen is absent, in the upper portion of the soil profile. Field indicators of hydric soils are identified in *Field Indicators of Hydric Soils in the United States: Guide for Identifying and Delineating Hydric Soils* (USDA-NRCS 2003). Field indicators of hydric soils include organic hydric soils (or histisols), histic epipedons, sulfidic material, aquic or peraquic moisture regimes, reduced soil conditions indicated by oxidized rhizospheres, soil color, including gleyed soils, soils with mottles and/or low-matrix chroma, and iron and manganese concretions.

Paired soil pits were used to evaluate wetland soil indicators at sites within the BSA where borderline hydrologic and wetland plant indicators were present. Soil texture was determined by a texture-by-feel analysis, and soil matrix and mottling color were determined using a Munsell Soil Color Chart. Hydric soil indicators were recorded if observed.

3.2.2 Wetland Hydrology

Wetland hydrology is defined as inundation or saturation in the upper 12 inches of the soil for at least 5% of the growing season in most years (Environmental Laboratory

1987). The growing season in the BSA is year-round; 5% of the growing season consists of approximately 18 days. Factors that influence hydrology include precipitation, topography, soil permeability, and plant cover. A site was determined positive for wetland hydrology if one or more of the following primary indicators of wetland hydrology were present: inundation or saturation in the upper 12 inches, drift lines, water marks, sediment deposits, and drainage patterns. Secondary indicators include oxidized rhizospheres, water-stained leaves, local soil survey data, and the facultative (FAC)-neutral test of the vegetation. The jurisdictional boundary of Mill Creek and other drainage features were defined using the ordinary high-water mark.

3.2.3 Hydrophytic Vegetation

A visual estimate of absolute vegetation cover was recorded within a 5-foot radius at each survey point. Survey points are shown in **Appendix A**. The definition of Wetland indicator status was based on that established by Reed (1988), which categorized plant species on the basis of their response to wetland conditions.

According to the dominance test, an area meets the hydrophytic vegetation requirement for a wetland if more than 50% of the dominant plant species are hydrophytic (i.e., have an indicator status as facultative [FAC], facultative wetland [FACW], or obligate wetland [OBL] vegetation) (Reed 1988). Hydrophytic vegetation is "the sum total of macrophytic plant life that occurs in areas where the frequency and duration of inundation or soil saturation produce permanently or periodically saturated soils of sufficient duration to exert a controlling influence on the plant species present" (Environmental Laboratory 1987, p. 12). Plant indicator status definitions are listed in **Table 1**.

Table 1: Plant Indicator Status Categories

Indicator Category	Indicator Symbol	Definition
Obligate Wetland Plants	OBL	Plants that occur almost always (>99%) in wetlands under natural conditions but may also occur rarely (<1%) in non-wetlands.
Facultative Wetland Plants	FACW	Plants that occur usually (>67% to 99%) in wetlands but also occur (1% to 33%) in non-wetlands.
Facultative Plants	FAC	Plants with a similar likelihood (34% to 66%) of occurring both in wetlands and non-wetlands.
Facultative Upland Plants	FACU	Plants that occur sometimes (1% to 33%) in wetlands, but occur more often (>67% to 99%) in non-wetlands.
Obligate Upland Plants	UPL	Plants that occur rarely (<1%) in wetlands, but occur almost always (>99%) in non-wetlands under natural conditions.

Source: Reed 1988.

According to the *USACE Wetlands Delineation Manual* (Environmental Laboratory 1987), facultative indicator categories may also be amended with the addition of a plus (+) or minus (-) modifier, which more specifically defines the regional frequency of occurrence in wetlands. The plus modifier indicates a frequency toward the higher end of the category (more frequently found in wetlands), and a minus modifier indicates a frequency toward the lower end of the category (less frequently found in wetlands).

If the U.S. Fish and Wildlife Service scientists who compile the *National List of Plant Species that Occur in Wetlands* (Reed 1988) are unable to reach a unanimous decision on the status of a species, a “no agreement” (NA) designation is recorded. If insufficient information exists to determine the status of a species, a “no indicator” (NI) designation is recorded. Species recorded as NA or NI are not considered in the calculation of the percentage of dominant species. Species that are not included in the *National List of Plant Species that Occur in Wetlands* are assigned a “not listed” (NL) designation in this report. Species designated as NL are assumed to be upland (UPL) plants. An asterisk (*) following an indicator symbol identifies tentative assignments based on limited information from which to determine the indicator status.

Hydrophytic vegetation was determined to be present if greater than 50% of the dominant plant species were facultative (FAC), facultative wetland (FACW), or obligate wetland (OBL) species.

3.3 Survey Dates and Personnel

Casey Stewman, a URS senior plant ecologist, rare plant botanist & wetland specialist conducted the jurisdictional delineation survey on June 14, 2011. Both Casey Stewman and URS biologist Joe Bandel prepared this report, with assistance from URS GIS specialist Fozia Bashir.

3.4 Survey Conditions

The jurisdictional delineation was conducted in late spring of 2011, at the end of the normal rainy season. Somewhat above-average precipitation (approximately 3 to 6 inches more precipitation than normal) occurred during the 2010–2011 rainy season (Western Regional Climate Center 2011). Considering rainfall in this region usually lies within the 40 to 50 inch range for the rainy season the hydrology was assumed to be relatively normal in the BSA.

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4 Results

4.1 Summary of Results

Potentially jurisdictional waters are present in the BSA. The total area of waters of the United States (under Section 404 of the CWA) within the BSA is 0.190 acres (8,259 square feet); 0.108 acres (4,697 square feet) function as other waters of the United States, and 0.082 acre (3,562 square feet) function as wetlands within waters of the United States.

Table 2 summarizes the area of each type of potential jurisdictional feature in the BSA. All waters of the United States are depicted on the 1:2,400-scale map in **Appendix A**.

Table 2: Potential Waters of the United States within the Biological Study Area

Feature Type and Label	Length (feet)	Square Feet	Delineated Acres
Other Waters of the United States			
OW-1: Intermittent stream (Mill Creek)	2,071	4,568	0.11
OW-2: Ephemeral stream (Unnamed drainage)	90	129	0.00
Other Waters of the United States Subtotal	*2,161*	*4,697*	*0.11*
Wetlands			
WL-1: Perennial freshwater wetland (Mill Creek)	191	1,561	0.04
WL-2: Perennial freshwater wetland (Mill Creek)	163	928	0.02
WL-3: Perennial freshwater wetland (Mill Creek)	152	970	0.02
WL-4: Perennial freshwater wetland (Mill Creek)	45	103	0.00
Wetlands Subtotal	*551*	*3,562*	*0.08*
Total Waters of the United States	**2712**	**8,259**	**0.19**

Source: URS Field Survey 2011.

Note: Due to rounding of acreages the sum of wetland acreages does not equal subtotal.

Acronyms:
OW = other waters of the United States
WL = wetlands (waters of the United States)

4.2 Waters of the United States

Approximately 0.19 acres of potentially jurisdictional features were identified in the BSA. Two jurisdictional other water features and four wetland features occur within the BSA. Mill Creek (OW-1), an intermittent stream, receives runoff from the hill sides and slopes of the BSA. Emergent freshwater wetlands (WL-1 and WL-2) occur along the floodplain and within the ordinary high-water mark of Mill Creek. Unnamed drainage (OW-2) is an ephemeral drainage that drains the area south of the

BSA and confluences with Mill Creek in an area with freshwater wetlands (WL-3 and WL-4). The estimated areas of these resources are listed in **Table 2**. All estimates of resources presented here are from the preliminary delineation and are subject to change pending USACE official review and final jurisdictional determination.

4.2.1 Other Waters of the United States

Mill Creek (OW-1) and the unnamed ephemeral stream (OW-2) are other waters of the United States, which were identified within the BSA.

Mill Creek (OW-1): This intermittent stream (0.11 acres, 4,568 square feet) goes the length of the southwest boundary of the property at the base of the burn dump site slope. The creek likely contains flow 9 to 11 months of the year based on varying annual precipitation, and several pools within the creek have water year-round due to connectivity to existing groundwater. The width of the stream at the ordinary high water mark (OHWM) generally varies between 4 and 9 feet wide. The stream has natural meander with deeply cut banks; the bed of the channel is composed of sand and gravel. The creek is deeply incised for much of the length of the creek in the BSA. Vegetation along the banks of the stream include big leaf maple, white alder (*Alnus rhombifolia*), redwood trees and Dewey's sedge (*Carex deweyana*).

Ephemeral Stream (OW-2): This ephemeral stream (0.00 acres, 129 square feet) flows north from slopes south of the BSA into Mill Creek at the location of the perennial freshwater wetland (WL-3).

4.2.2 Wetlands

Four wetlands occur along the lower stream banks of Mill Creek within the BSA. These perennial freshwater wetlands are vegetated with western skunk cabbage, salmonberry, and threeleaf foamflower (*Tiarella trifoliata*) with an overstory cover of big leaf maple, and white alder.

WL-1: This perennial freshwater wetland (0.04 acre, 1,561 square feet) occurs in a reach of Mill creek where the floodplain broadens along the northern bank of the creek. The wetland is dominated by western skunk cabbage, an obligate wetland species and contains other facultative wetland species including salmonberry, big leaf maple and threeleaf foamflower.

WL-2: This perennial freshwater wetland (0.02 acre, 928 square feet) occurs upstream of WL-1 in the floodplain of Mill Creek along the north bank of the creek.

This wetland contains western skunk cabbage, salmonberry, threeleaf foamflower, big leaf maple and white alder.

WL-3: This perennial freshwater wetland (0.02 acre, 970 square feet) occurs in the floodplain of Mill Creek and the ephemeral stream on the opposite (south) side of Mill Creek from WL-2. This wetland is composed of the same vegetation as WL-2.

WL-4: This freshwater wetland (0.00 acre, 103 square feet) occurs in the floodplain of Mill Creek and the ephemeral stream on the upstream side of the two drainages. This wetland is composed of the same vegetation as WL-2 and WL-3.

The locations of the wetland sampling points and the jurisdictional wetlands and other waters of the United States, which were delineated within the BSA, are depicted in **Appendix A**. Copies of the Western Mountains, Valleys, and Coast Region wetland delineation data forms and the Mill Creek *Rapanos* form are provided in **Appendix B**. **Appendix C** provides labeled photographs of representative features that are located within the BSA.

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Appendix A Potentially Jurisdictional Waters of the United States in the BSA

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URS Corp - Oakland CA - F.Bashir Path: L:\Projects\Fortuna_Burn_Dump_17326173\Maps\MXT\Appendix A.mxd

URS California Integrated Waste Management Board
Fortuna Burn Dump

Appendix A
Jurisdictional Waters of the U.S. in the BSA

Appendix B Wetland Delineation Data Forms

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Mill Creek *Rapanos* Form

APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD):

B. DISTRICT OFFICE, FILE NAME, AND NUMBER:

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State:California County/parish/borough: Humboldt County City: Fortuna
Center coordinates of site (lat/long in degree decimal format): Lat. 40.566° **N**, Long. -124.112° **W**.
Universal Transverse Mercator:
Name of nearest waterbody: Mill Creek
Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Eel River
Name of watershed or Hydrologic Unit Code (HUC): 18010105 Lower Eel Watershed
☒ Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.
☐ Check if other sites (e.g., offsite mitigation sites, disposal sites, etc…) are associated with this action and are recorded on a different JD form.

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

☐ Office (Desk) Determination. Date:
☒ Field Determination. Date(s): June 14, 2011

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There **Are** "*navigable waters of the U.S.*" within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [*Required*]

☐ Waters subject to the ebb and flow of the tide.
☐ Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Explain: .

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There **Are** "*waters of the U.S.*" within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [*Required*]

1. **Waters of the U.S.**
   a. **Indicate presence of waters of U.S. in review area (check all that apply):** [1]
      ☐ TNWs, including territorial seas
      ☐ Wetlands adjacent to TNWs
      ☒ Relatively permanent waters[2] (RPWs) that flow directly or indirectly into TNWs
      ☐ Non-RPWs that flow directly or indirectly into TNWs
      ☐ Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
      ☐ Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
      ☒ Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
      ☐ Impoundments of jurisdictional waters
      ☐ Isolated (interstate or intrastate) waters, including isolated wetlands

   b. **Identify (estimate) size of waters of the U.S. in the review area:**
      Non-wetland waters: linear feet: width (ft) and/or 0.109 acres.
      Wetlands: 0.082 acres.

   c. **Limits (boundaries) of jurisdiction** based on: **Pick List**
      Elevation of established OHWM (if known):310 to 340 ft above mean sea level.

2. **Non-regulated waters/wetlands (check if applicable):**[3]
   ☐ Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Explain: .

---

[1] Boxes checked below shall be supported by completing the appropriate sections in Section III below.
[2] For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).
[3] Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. TNW
Identify TNW: .

Summarize rationale supporting determination: .

2. Wetland adjacent to TNW
Summarize rationale supporting conclusion that wetland is "adjacent": .

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody[4] is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. Characteristics of non-TNWs that flow directly or indirectly into TNW

(i) General Area Conditions:
Watershed size: 1.6 **square miles**
Drainage area: 1.6 **square miles**
Average annual rainfall: 40-50 inches
Average annual snowfall: 0 inches

(ii) Physical Characteristics:
(a) Relationship with TNW:
☐ Tributary flows directly into TNW.
☒ Tributary flows through **2** tributaries before entering TNW.

Project waters are **2-5** river miles from TNW.
Project waters are **1-2** river miles from RPW.
Project waters are **2-5** aerial (straight) miles from TNW.
Project waters are **1-2** aerial (straight) miles from RPW.
Project waters cross or serve as state boundaries. Explain: NA.

[4] Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

Identify flow route to TNW[5]: Mill Creek flows west from the study area, goes into culverts underneath Kenmar Road and Fortuna Blvd. and the confluences with Strongs Creek. Strongs Creek then goes further west into Eel River, a navigable river..
Tributary stream order, if known: Mill Creek flows into Strongs Creek, which is then tributary to the Eel River.

(b) General Tributary Characteristics (check all that apply):
Tributary is: ☒ Natural
☐ Artificial (man-made). Explain: .
☐ Manipulated (man-altered). Explain: .

Tributary properties with respect to top of bank (estimate):
Average width: 4-9 feet
Average depth: 1-2 feet
Average side slopes: **2:1.**

Primary tributary substrate composition (check all that apply):
☐ Silts ☒ Sands ☐ Concrete
☐ Cobbles ☒ Gravel ☐ Muck
☐ Bedrock ☐ Vegetation. Type/% cover:
☐ Other. Explain: .

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: Stream banks are highly incised.
Presence of run/riffle/pool complexes. Explain: runs, riffles and pools present. Connectivity to groundwater.
Tributary geometry: **Meandering**
Tributary gradient (approximate average slope): %

(c) Flow:
Tributary provides for: **Intermittent but not seasonal flow**
Estimate average number of flow events in review area/year: **20 (or greater)**
Describe flow regime: Higher flows are experienced in winter and early spring especially after storms. In a normal year there is flow in the creek approximately 9-11 months of the year.
Other information on duration and volume: .

Surface flow is: **Discrete and confined.** Characteristics: .

Subsurface flow: **Yes**. Explain findings: Based on visual assessment of creek corridor, the creek likely has subsurface flow.
☐ Dye (or other) test performed: .

Tributary has (check all that apply):
☒ Bed and banks
☒ OHWM[6] (check all indicators that apply):
☒ clear, natural line impressed on the bank
☐ changes in the character of soil
☒ shelving
☐ vegetation matted down, bent, or absent
☒ leaf litter disturbed or washed away
☐ sediment deposition
☐ water staining
☐ other (list):
☒ the presence of litter and debris
☐ destruction of terrestrial vegetation
☐ the presence of wrack line
☐ sediment sorting
☒ scour
☐ multiple observed or predicted flow events
☒ abrupt change in plant community
☐ Discontinuous OHWM.[7] Explain: .

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):
☐ High Tide Line indicated by:
☐ oil or scum line along shore objects
☐ fine shell or debris deposits (foreshore)
☐ physical markings/characteristics
☐ tidal gauges
☐ other (list):
☐ Mean High Water Mark indicated by:
☐ survey to available datum;
☐ physical markings;
☐ vegetation lines/changes in vegetation types.

[5] Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.
[6] A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.
[7] Ibid.

(iii) Chemical Characteristics:

Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).

Explain: .

Identify specific pollutants, if known: Water is clear, watershed consists of mostly second to third growth redwood forest. The water quality is influenced by adjacent burn dump.

(iv) Biological Characteristics. Channel supports (check all that apply):

☒ Riparian corridor. Characteristics (type, average width): Riparian corridor with overstory of bigleaf maple and White Alder, the average width of corridor is approximately 30-40 feet.

☒ Wetland fringe. Characteristics: A few freshwater wetlands are present within the floodplain of the creek in .

☐ Habitat for:

☐ Federally Listed species. Explain findings: .

☐ Fish/spawn areas. Explain findings: .

☒ Other environmentally-sensitive species. Explain findings: Species of concern-Northern red-legged frog and foothill yellow legged frog could use the creek and associated wetlands for habitat.

☐ Aquatic/wildlife diversity. Explain findings: .

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) Physical Characteristics:

(a) General Wetland Characteristics:

Properties:

Wetland size: 0.08acres

Wetland type. Explain: Freshwater wetland within floodplain of intermittent tributary.

Wetland quality. Explain: wetland was dominated by skunk cabbage and contained other Fac species such as salmonberry and threeleaf foamflower. Consistent source of water during the wet season is higher flows from Mill Creek that pour into wetland area. Wetlands contained hydric soils as evidence by soil pits .

Project wetlands cross or serve as state boundaries. Explain: NA.

(b) General Flow Relationship with Non-TNW:

Flow is: **Intermittent flow**. Explain: .

Surface flow is**: Discrete**

Characteristics: .

Subsurface flow: **Unknown**. Explain findings: .

☐ Dye (or other) test performed: .

(c) Wetland Adjacency Determination with Non-TNW:

☒ Directly abutting

☐ Not directly abutting

☒ Discrete wetland hydrologic connection. Explain: The wetlands are within the floodplain of Mill Creek and are connected hydrologically during higher flows and via groundwater inputs.

☒ Ecological connection. Explain: Aquatic and non-aquatic willdlife species will use both the stream and wetland environments for habitat.

☐ Separated by berm/barrier. Explain: .

(d) Proximity (Relationship) to TNW

Project wetlands are **5-10** river miles from TNW.

Project waters are **5-10** aerial (straight) miles from TNW.

Flow is from: **Wetland to/from navigable waters.**

Estimate approximate location of wetland as within the **Pick List** floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain: .

Identify specific pollutants, if known: .

(iii) Biological Characteristics. Wetland supports (check all that apply):

☐ Riparian buffer. Characteristics (type, average width): .

☒ Vegetation type/percent cover. Explain:Vegetation consist of skunk cabbage, salmonberry, .

☐ Habitat for:

☐ Federally Listed species. Explain findings: .

☐ Fish/spawn areas. Explain findings: .

☒ Other environmentally-sensitive species. Explain findings: .

☐ Aquatic/wildlife diversity. Explain findings: .

3. Characteristics of all wetlands adjacent to the tributary (if any)

All wetland(s) being considered in the cumulative analysis: **Pick List**

Approximately ( ) acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Directly abuts? (Y/N)		Size (in acres)	Directly abuts? (Y/N)	Size (in acres)
WL-1	Y	0.04		
WL-2	Y	0.02		
WL-3	Y	0.02		
WL-4	Y	< 0.01		

Summarize overall biological, chemical and physical functions being performed: The wetlands are within the OHWM of Mill Creek and essentially function as wetlands within waters.

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. **Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D: .

2. **Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: .

3. **Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: .

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. **TNWs and Adjacent Wetlands.** Check all that apply and provide size estimates in review area:
   - ☐ TNWs: linear feet width (ft), Or, acres.
   - ☐ Wetlands adjacent to TNWs: acres.

2. **RPWs that flow directly or indirectly into TNWs.**
   - ☐ Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: .
   - ☒ Tributaries of TNW where tributaries have continuous flow “seasonally” (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally: In a normal year tribuatry contains water 9-11 month out of the year. In an above average precipitation year, flow was observed in the creek during June 14, 2011.

Provide estimates for jurisdictional waters in the review area (check all that apply):

☒ Tributary waters: **2,071** linear feet **4-9** width (ft).

☐ Other non-wetland waters: acres.

Identify type(s) of waters: .

3. **Non-RPWs[8] that flow directly or indirectly into TNWs.**

☒ Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):

☒ Tributary waters: **90** linear feet **2** width (ft).

☐ Other non-wetland waters: acres.

Identify type(s) of waters: **.**

4. **Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.**

☒ Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.

☐ Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: **.**

☒ Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .

Provide acreage estimates for jurisdictional wetlands in the review area: **0.08** acres.

5. **Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.**

☐ Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

6. **Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.**

☐ Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: acres.

7. **Impoundments of jurisdictional waters.[9]**

As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.

☐ Demonstrate that impoundment was created from "waters of the U.S.," or

☐ Demonstrate that water meets the criteria for one of the categories presented above (1-6), or

☐ Demonstrate that water is isolated with a nexus to commerce (see E below).

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):[10]

☐ which are or could be used by interstate or foreign travelers for recreational or other purposes.

☐ from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.

☐ which are or could be used for industrial purposes by industries in interstate commerce.

☐ Interstate isolated waters. Explain: .

---

[8]See Footnote # 3.

[9] To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

[10] Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA *Memorandum Regarding CWA Act Jurisdiction Following Rapanos.*

☐ Other factors. Explain: .

Identify water body and summarize rationale supporting determination: .

Provide estimates for jurisdictional waters in the review area (check all that apply):
☐ Tributary waters: linear feet width (ft).
☐ Other non-wetland waters: acres.
Identify type(s) of waters: **.**
☐ Wetlands: acres.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):
☐ If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
☐ Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
☐ Prior to the Jan 2001 Supreme Court decision in "*SWANCC*," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
☐ Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain: **.**
☐ Other: (explain, if not covered above): **.**

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):
☐ Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
☐ Lakes/ponds: acres.
☐ Other non-wetland waters: acres. List type of aquatic resource: .
☐ Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):
☐ Non-wetland waters (i.e., rivers, streams): linear feet, width (ft).
☐ Lakes/ponds: acres.
☐ Other non-wetland waters: acres. List type of aquatic resource: .
☐ Wetlands: acres.

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):
☒ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: .
☒ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
☐ Office concurs with data sheets/delineation report.
☐ Office does not concur with data sheets/delineation report.
☐ Data sheets prepared by the Corps: .
☐ Corps navigable waters' study: .
☐ U.S. Geological Survey Hydrologic Atlas: .
☐ USGS NHD data.
☐ USGS 8 and 12 digit HUC maps.
☒ U.S. Geological Survey map(s). Cite scale & quad name:Hydesville 7.5 Minute U.S.G.S.
☐ USDA Natural Resources Conservation Service Soil Survey. Citation: .
☐ National wetlands inventory map(s). Cite name: .
☐ State/Local wetland inventory map(s): .
☐ FEMA/FIRM maps: .
☐ 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
☒ Photographs: ☐ Aerial (Name & Date): .
or ☒ Other (Name & Date):Site photos taken on June 14, 2011 during delineation.
☐ Previous determination(s). File no. and date of response letter: .
☐ Applicable/supporting case law: .
☐ Applicable/supporting scientific literature: .
☐ Other information (please specify): .

B. ADDITIONAL COMMENTS TO SUPPORT JD: Mill Creek contains water for most of the year (9-11 months) and has a connection to a traditional navigable waterway (Eel River) via another tribuatry Strongs creek that lies a couple mile west of the study area. The freshwater wetlands abutting Mill Creek receive inputs of freshwater at many times during the wet season as flows in the creek increase and the water spreads over the floodplain. Freshwater wetlands were postive for all three wetland parameters, hydrology, hydric soils and hydrophytes.

Wetland Determination Data Forms–Western Mountains, Valleys, and Coast Region

WETLAND DETERMINATION DATA FORM —Western Mountains, Valleys, and Coast Region (DRAFT)

Project/Site: Fortuna Burn Dump City/County: Fortuna / Humboldt Sampling Date: 6/14/11

Applicant/Owner: Cal-Recycle State: CA Sampling Point: 1A

Investigator(s): Casey Stowman Section, Township, Range: Section 7, T2N, R1E

Landform (hillslope, terrace, etc.): floodplain terrace Local relief (concave, convex, none): flat Slope (%): ______

Subregion (LRR): LRR-A Northwest forests and coast Lat: 40.56651263 Long: -124.11269808 Datum: NAD83

Soil Map Unit Name: NOTCOM - Not completed NWI classification: R4SBC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ______ (If no, explain in Remarks.)

Are Vegetation ______ Soil ______ or Hydrology ______ significantly disturbed? No Are "Normal Circumstances" present? Yes ✓ No ______

Are Vegetation ______, Soil ______ or Hydrology ______ naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS — Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ______
Hydric Soil Present?	Yes ✓	No ______
Wetland Hydrology Present?	Yes ✓	No ______

Is the Sampled Area within a Wetland? Yes ✓ No ______

Remarks: Skunk cabbage and salmonberry wetland within ordinary high watermark and lower floodplain of Mill Creek

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer macrophyllum	60	Y	FAC
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1. Rubus spectabilis	5		FAC+
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. Tiarella trifoliata	20	N	FAC
2. Lysichiton americanum	70	Y	OBL
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover	90		
Woody Vine Stratum			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum 10 % Cover of Biotic Crust ______

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	2	(A)
Total Number of Dominant Species Across All Strata:	2	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	______	x 1 = ______
FACW species	______	x 2 = ______
FAC species	______	x 3 = ______
FACU species	______	x 4 = ______
UPL species	______	x 5 = ______
Column Totals:	______ (A)	______ (B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

✓ Prevalence Index is ≤3.0[1]

✓ Morphological Adaptation& (Provide supporting data in Remarks or on a separate sheet)

— Problematic Hydrophytic Vegetation' (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ✓ No ______

Remarks: Lower floodplain terrace of Mills Creek w/ dominance of hydrophytes in canopy, shrub and herb layers

SOIL

Sampling Point: 1A

Profile Description: (Describe to the depth needed to document the Indicator or confirm the absence of Indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR3/2	100					Clay loam	fine texture
10-18	10YR3/2	60	7.5YR5/8	20	C	M	clay loam	
			Gley 1 4/N	20	RM	M	clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ____Histosol (A1)
- ____Histic Epipedon (A2)
- ____Black Histic (A3)
- ____Hydrogen Sulfide (A4)
- ____Depleted Below Dark Surface (A11)
- ____Thick Dark Surface (A12)
- ____Sandy Mucky Mineral (S1)
- ____Sandy Gleyed Matrix (S4)
- ____Sandy Redox (S5)
- ____Stripped Matrix (S6)
- ____Loamy Mucky Mineral (F1) (except **MLRA 1**)
- _✓_Loamy Gleyed Matrix (F2)
- ____Depleted Matrix (F3)
- ____Redox Dark Surface (F6)
- ____Depleted Dark Surface (F7)
- ____Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ____2 cm Muck (A10)
- ____Red Parent Material (TF2)
- ____Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):
Type: ____
Depth (inches): ____

Hydric Soil Present? Yes ✓ No ____

Remarks: Strong redoximorphic indicators @ ± 10 inches, gleyed soil and mottling on lower floodplain

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ____Surface Water (A1)
- _✓_High Water Table (A2)
- _✓_Saturation (A3)
- ____Water Marks (B1)
- ____Sediment Deposits (B2)
- ____Drift Deposits (B3)
- ____Algal Mat or Crust (B4)
- ____Iron Deposits (B5)
- ____Surface Soil Cracks (B6)
- ____Inundation Visible on Aerial Imagery (B7)
- ____Water-Stained Leaves (B9) **(except NW coast)**
- ____Salt Crust (B11)
- ____Aquatic Invertebrates (B13)
- ____Hydrogen Sulfide Odor (C1)
- ____Oxidized Rhizospheres along Living Roots (C3)
- ____Presence of Reduced Iron (C4)
- ____Recent Iron Reduction in Plowed Soils (C6)
- ____Stunted or Stressed Plants (D1) **(LRR A)**
- ____Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ____Water-Stained Leaves (B9) **(NW coast)**
- ____Sparsely Vegetated Concave Surface (B8)
- ____Drainage Patterns (B10)
- ____Dry-Season Water Table (C2)
- ____Saturation Visible on Aerial Imagery (C9)
- ____Geomorphic Position (D2)
- ____Shallow Aquitard (D3)
- ____Frost-Heave Hummocks (D4)
- ____FAC-Neutral Test (D5)
- ____Raised Ant Mounds (D6) **(LRR A)**

Field Observations:

	Yes	No	Depth (inches)
Surface Water Present?		✓	
Water Table Present?	✓		18"
Saturation Present? (includes capillary fringe)	✓		10"

Wetland Hydrology Present? Yes ✓ No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Sample point is 5 lateral ~~feet~~ from low flow channel of CREEK and ~ 18" above water level in CREEK
Saturation @ 10"

WETLAND DETERMINATION DATA FORM —Western Mountains, Valleys, and Coast Region (DRAFT)

Project/Site: Fortuna Burn Dump City/County: Fortuna / Humboldt Sampling Date: 6/14/11

Applicant/Owner: Cal-Recycle State: CA Sampling Point: 1B

Investigator(s): Casey Stewman Section, Township, Range: Section 7, T2N, R1E

Landform (hillslope, terrace, etc.): Toeslope Local relief (concave, convex, none): ______ Slope (%): ______

Subregion (LRR): LRR-A NW Forest and Coast Lat: 40.56657885 Long: -124.11266773 Datum: NAD 83

Soil Map Unit Name: NOT COM - Mapping not completed NWI classification: U

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ______ (If no, explain in Remarks.)

Are Vegetation ______ Soil ______ or Hydrology ______ significantly disturbed? No Are "Normal Circumstances" present? Yes ✓ No ______

Are Vegetation ______, Soil ______ or Hydrology ______ naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS — Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ______ No ✓		Is the Sampled Area within a Wetland? Yes ______ No ✓
Hydric Soil Present? Yes ______ No ✓		
Wetland Hydrology Present? Yes ______ No ✓		

Remarks: Upland slope adjacent to creek

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer macrophyllum	60	Y	FAC
2. Sequoia sempervirens	40	Y	UPL
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover			
Woody Vine Stratum			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum ______ % Cover of Biotic Crust ______

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	______	x 1 = ______
FACW species	______	x 2 = ______
FAC species	______	x 3 = ______
FACU species	______	x 4 = ______
UPL species	______	x 5 = ______
Column Totals:	______ (A)	______ (B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptation& (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation' (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ______ No ✓

Remarks: -Toeslope of creek under big-leaf maple and redwood

SOIL

Sampling Point: 1B

Profile Description: (Describe to the depth needed to document the Indicator or confirm the absence of Indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 3/2	100	—	—	—	—	loamy clay	50-65% debris in soil profile

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ____Histosol (A1)
- ____Histic Epipedon (A2)
- ____Black Histic (A3)
- ____Hydrogen Sulfide (A4)
- ____Depleted Below Dark Surface (A11)
- ____Thick Dark Surface (A12)
- ____Sandy Mucky Mineral (S1)
- ____Sandy Gleyed Matrix (S4)
- ____Sandy Redox (S5)
- ____Stripped Matrix (S6)
- ____Loamy Mucky Mineral (F1) (except **MLRA 1**)
- ____Loamy Gleyed Matrix (F2)
- ____Depleted Matrix (F3)
- ____Redox Dark Surface (F6)
- ____Depleted Dark Surface (F7)
- ____Redox Depressions (F8)

NA

Indicators for Problematic Hydric Soils[3]:

- ____2 cm Muck (A10)
- ____Red Parent Material (TF2)
- ____Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? Yes ____ No ✓

Remarks:

No redoximorphic indicators, trash, broken glass + dump debris is prevalent in soil profile w/ some small chunks of sandstone

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ____Surface Water (A1)
- ____High Water Table (A2)
- ____Saturation (A3)
- ____Water Marks (B1)
- ____Sediment Deposits (B2)
- ____Drift Deposits (B3)
- ____Algal Mat or Crust (B4)
- ____Iron Deposits (B5)
- ____Surface Soil Cracks (B6)
- ____Inundation Visible on Aerial Imagery (B7)
- ____Water-Stained Leaves (B9) **(except NW coast)**
- ____Salt Crust (B11)
- ____Aquatic Invertebrates (B13)
- ____Hydrogen Sulfide Odor (C1)
- ____Oxidized Rhizospheres along Living Roots (C3)
- ____Presence of Reduced Iron (C4)
- ____Recent Iron Reduction in Plowed Soils (C6)
- ____Stunted or Stressed Plants (D1) (**LRR A**)
- ____Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ____Water-Stained Leaves (B9) **(NW coast)**
- ____Sparsely Vegetated Concave Surface (B8)
- ____Drainage Patterns (B10)
- ____Dry-Season Water Table (C2)
- ____Saturation Visible on Aerial Imagery (C9)
- ____Geomorphic Position (D2)
- ____Shallow Aquitard (D3)
- ____Frost-Heave Hummocks (D4)
- ____FAC-Neutral Test (D5)
- ____Raised Ant Mounds (D6) (**LRR A**)

Field Observations:

Surface Water Present? Yes ____ No ✓ Depth (inches): ____________

Water Table Present? Yes ____ No ✓ Depth (inches): ____________

Saturation Present? (includes capillary fringe) Yes ____ No ✓ Depth (inches): ____________

Wetland Hydrology Present? Yes ____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No hydrology indicators present, toeslope location of 1B is approximately 2' vertically higher than point 1B

WETLAND DETERMINATION DATA FORM —Western Mountains, Valleys, and Coast Region (DRAFT)

Project/Site: Fortuna Burn Dump City/County: Fortuna/Humboldt Sampling Date: 6/14/11

Applicant/Owner: Cal Recycle State: ______ Sampling Point: 2A

Investigator(s): Casey Stemman Section, Township, Range: Section 7, T2N, R1E

Landform (hillslope, terrace, etc.): Lower floodplain Local relief (concave, convex, none): ______ Slope (%): ______

Subregion (LRR): A - NW forests & Coast Lat: 40.56635655 Long: -124.11204496 Datum: NAD 83

Soil Map Unit Name: Not Com - mapping not completed NWI classification: R4SBC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ______ (If no, explain in Remarks.)

Are Vegetation ______ Soil ______ or Hydrology ______ significantly disturbed? No Are "Normal Circumstances" present? Yes ✓ No ______

Are Vegetation ______, Soil ______ or Hydrology ______ naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS — Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No ______	Is the Sampled Area within a Wetland? Yes ✓ No ______
Hydric Soil Present?	Yes ✓ No ______	
Wetland Hydrology Present?	Yes ✓ No ______	

Remarks: Skunk cabbage and salmonberry wetland within ordinary high water mark and lower floodplain of Mill Crk.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer macrophyllum	60	Y	FAC
2. Alnus rhombifolia	20	N	FACW
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1. Rubus spectabilis	25	Y	FAC
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. Lysichiton americanum	60	Y	OBL
2. Tiarella trifoliata	30	Y	
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover			
Woody Vine Stratum			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum 10 % Cover of Biotic Crust ______

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	______	x 1 = ______
FACW species	______	x 2 = ______
FAC species	______	x 3 = ______
FACU species	______	x 4 = ______
UPL species	______	x 5 = ______
Column Totals:	______ (A)	______ (B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptation& (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation' (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ✓ No ______

Remarks: Dominance of hydrophytes in tree, shrub and herb layer

SOIL

Sampling Point: 2A

Profile Description: (Describe to the depth needed to document the Indicator or confirm the absence of Indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 3/2	80	10YR 3/1	20	RM	M	sandy clay loam	fine sandy clay loam
5-8	10YR 3/2	100					sand	gravelly sand w/ 30-50% coarse fragments
8-18	10YR 3/1	30	Gley 1 3/N	60	RM	M	sandy clay loam	
			7.5YR 5/8	10	C	M	"	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (except **MLRA 1**)
- ✓ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):
Type: ______
Depth (inches): ______

Hydric Soil Present? Yes ✓ No ___

Remarks: Strong redoximorphic indicators, including gleyed matrix and mottling @ 8" and reduced matrix to near surface

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9) **(except NW coast)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(NW coast)**
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Frost-Heave Hummocks (D4)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**

Field Observations:

Surface Water Present?	Yes ___	No ✓	Depth (inches): ___
Water Table Present?	Yes ✓	No ___	Depth (inches): 14"
Saturation Present? (includes capillary fringe)	Yes ✓	No ___	Depth (inches): 10"

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Water in pit @ 14" w/ saturation to 10"

WETLAND DETERMINATION DATA FORM —Western Mountains, Valleys, and Coast Region (DRAFT)

Project/Site: Fortuna Burn Dump City/County: Fortuna / Humboldt Sampling Date: 6/14/11

Applicant/Owner: CalRecycle State: CA Sampling Point: 2B

Investigator(s): Casey, Stenman Section, Township, Range: Section 7, T2N, R1E

Landform (hillslope, terrace, etc.): Toeslope Local relief (concave, convex, none): Convex Slope (%): ____

Subregion (LRR): A - NW forests & Coast Lat: 40.56638519 Long: -124.11202730 Datum: NAD 83

Soil Map Unit Name: Not Com - mapping not completed NWI classification: U

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____ Soil ____ or Hydrology ____ significantly disturbed? No Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____ or Hydrology ____ naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS — Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No ✓
Hydric Soil Present?	Yes ____	No ✓
Wetland Hydrology Present?	Yes ____	No ✓

Is the Sampled Area within a Wetland? Yes ____ No ✓

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer macrophyllum	70	Y	FAC
2. Pseudotsuga menziesii	20	N	UPL
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1. Vaccinium parvifolium (red)	3	N	UPL
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. Polystichum munitum	75	Y	UPL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover			
Woody Vine Stratum			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum 5 % Cover of Biotic Crust 5 (organic layer)

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	____	x 1 = ____
FACW species	____	x 2 = ____
FAC species	____	x 3 = ____
FACU species	____	x 4 = ____
UPL species	____	x 5 = ____
Column Totals:	____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

____ Dominance Test is >50% NO

____ Prevalence Index is ≤3.0[1]

____ Morphological Adaptation& (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation' (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ____ No ✓

Remarks: Dominance of upland shrubs and herbs, dominant canopy is facultative species

SOIL

Sampling Point: 2B

Profile Description: (Describe to the depth needed to document the Indicator or confirm the absence of Indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 3/2	100	—				loamy clay	w/ 30-50% redwood roots

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ____Histosol (A1)
- ____Histic Epipedon (A2)
- ____Black Histic (A3)
- ____Hydrogen Sulfide (A4)
- ____Depleted Below Dark Surface (A11)
- ____Thick Dark Surface (A12)
- ____Sandy Mucky Mineral (S1)
- ____Sandy Gleyed Matrix (S4)
- ____Sandy Redox (S5)
- ____Stripped Matrix (S6)
- ____Loamy Mucky Mineral (F1) (except **MLRA 1**)
- ____Loamy Gleyed Matrix (F2)
- ____Depleted Matrix (F3)
- ____Redox Dark Surface (F6)
- ____Depleted Dark Surface (F7)
- ____Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ____2 cm Muck (A10)
- ____Red Parent Material (TF2)
- ____Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? Yes ____ No ✓

Remarks:

No redoximorphic indicators present

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ____Surface Water (A1)
- ____High Water Table (A2)
- ____Saturation (A3)
- ____Water Marks (B1)
- ____Sediment Deposits (B2)
- ____Drift Deposits (B3)
- ____Algal Mat or Crust (B4)
- ____Iron Deposits (B5)
- ____Surface Soil Cracks (B6)
- ____Inundation Visible on Aerial Imagery (B7)
- ____Water-Stained Leaves (B9) **(except NW coast)**
- ____Salt Crust (B11)
- ____Aquatic Invertebrates (B13)
- ____Hydrogen Sulfide Odor (C1)
- ____Oxidized Rhizospheres along Living Roots (C3)
- ____Presence of Reduced Iron (C4)
- ____Recent Iron Reduction in Plowed Soils (C6)
- ____Stunted or Stressed Plants (D1) (**LRR A**)
- ____Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ____Water-Stained Leaves (B9) **(NW coast)**
- ____Sparsely Vegetated Concave Surface (B8)
- ____Drainage Patterns (B10)
- ____Dry-Season Water Table (C2)
- ____Saturation Visible on Aerial Imagery (C9)
- ____Geomorphic Position (D2)
- ____Shallow Aquitard (D3)
- ____Frost-Heave Hummocks (D4)
- ____FAC-Neutral Test (D5)
- ____Raised Ant Mounds (D6) (**LRR A**)

Field Observations:

Surface Water Present? Yes ____ No ✓ Depth (inches): ____

Water Table Present? Yes ____ No ✓ Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ____ No ✓ Depth (inches): ____

Wetland Hydrology Present? Yes ____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No hydrology on toeslope above creek floodplain

Appendix C Photos of Representative Wetlands and Other Waters of the United States

Photo 1. OW-1 Mill Creek

Photo 1. OW-1 Mill Creek, gravel bottom substrate

Photo 3. OW-1 Mill Creek

Photo 4. OW-1 Mill Creek

Photo 5. OW-1 Mill Creek

Photo 6. OW-1 Mill Creek, deeply incised portion of the creek

Photo 7. WL-1 freshwater skunk cabbage wetland adjacent to Mill Creek.

Photo 8. WL-1 freshwater skunk cabbage wetland.

Photo 9. Wetland data point 1A, a soil pit excavated in the skunk cabbage wetland


Photo 10. Soil removed from wetland data point 1A showing gleyed soils with mottling, strong redoximorphic indicators.

Photo 11. Upland data point 1B, soil pit on slope adjacent to creek.

Photo 12. WL-2 and WL-3, freshwater skunk cabbage wetlands on north and south side of Mill Creek.

Photo 13. WL-2, freshwater skunk cabbage wetland

Photo 14. Wetland data point 2A, soil pit in freshwater wetland WL-2

Photo 15. Wetland data point 2A, showing standing water inside 2 ft. deep soil pit.

Photo 16. Upland data point 2B, on toe of slope above Mill Creek

Appendix D Vascular Plant List

Scientific Name[1]	**Common Name**
CONIFERS	
PINACEAE	
Abies grandis	grand fir
Pseudotsuga menziesii	Douglas-fir
TAXODIACEAE	
Sequoia sempervirens	coast redwood
FERNS & FERN ALLIES	
DENNSTAEDTIACEAE	
Pteridium aquilinum var. *pubsecens*	bracken fern
DRYOPTERIDACEAE	
Athyrium filix-femina	lady fern
Polystichum munitum	sword fern
EQUISETACEAE	
Equisetum arvense	common horsetail
POLYPODIACEAE	
Polypodium glycyrrhiza	Licorice fern
PTERIDACEAE	
Adiantum aleuticum	five-finger fern
Pentagramma triangularis	goldback fern
FLOWERING PLANTS - DICOTS	
ACERACEAE	
Acer macrophyllum	big-leaf maple
ANACARDIACEAE	
Toxicodendron diversilobum	poison-oak
APIACEAE	
*Conium maculatum**	poison hemlock
Heracleum lanatum	cow parsnip
Sanicula crassicaulis	Pacific sanicle
*Torilis nodosa**	meadow parsley

APOCYNACEAE	
*Vinca major**	periwinkle
ARALIACEAE	
Aralia californica	elk's clover
*Hedera helix**	English ivy
ARISTOLOCHIACEAE	
Asarum caudatum	wild ginger
ASTERACEAE	
Baccharis pilularis	coyote brush
*Carduus pycnocephalus**	Italian thistle
*Cirsium arvense**	Canada thistle
*Filago gallica**	filago
*Gnaphalium luteo-album**	cudweed
*Hypochaeris radicata**	hairy cat's ear
*Leontodon taraxicoides**	hawk-bit
*Leucanthemum vulgare**	ox-eye daisy
*Picris echioides**	bristly ox-tongue
*Sonchus oleraceus**	sow thistle
*Tragopogon porrifolius**	salsify
BERBERIDACEAE	
Vancouveria planipetala	redwood ivy
BETULACEAE	
Alnus rubra	red alder
BRASSICACEAE	
*Brassica nigra**	black mustard
Cardamine californica	milk maid
Cardamine oligosperma	bittercress
*Raphanus sativus**	wild radish
CAPRIFOLIACEAE	
Lonicera hispidula	honeysuckle
Lonicera involucrata	twinberry
Sambucus racemosa var. *racemosa*	red elderberry
CELASTRACEAE	
Euonymus occidentalis var. *occidentalis*	western burning bush
CUCURBITACEAE	
Marah oreganus	wild cucumber

DIPSACEAE	
Dipsacus fullonum*	teasel
ERICACEAE	
Gaultheria shallon	salal
Vaccinium parvifolium	red huckleberry
Vaccinium ovatum	black huckleberry
EUPHORBIACEAE	
*Euphorbia peplus**	petty spurge
FABACEAE	
*Genista monspesuulana**	French broom
*Lathyrus odoratus**	sweetpea
*Lotus corniculatus**	bird's foot trefoil
*Lotus scoparius**	Scotch broom
*Medicago polymorpha**	bur-clover
*Trifolium dubium**	small hop clover
*Trifolium repens**	creeping clover
Vicia sp.	vetch
Vicia sativa var. sativa	vetch
GERIANACEAE	
*Geranium dissectum**	
*Geranium molle**	
GROSSULARIACEAE	
Ribes sanguineum	red flowering currant
HYDROPHYLLACEAE	
Hydrophyllum occidentale	waterleaf
LAMIACEAE	
Prunella vulgaris var. *vulgaris**	self heal
Stachys ajugoides	hedgenettle
LAURACEAE	
Umbellularia californica	California bay
LINACEAE	
*Linum bienne**	blue flax
LYTHRACEAE	
*Lythrum hyssopifolium**	loosestrife
MYRICACEAE	
Myrica californica	Pacific waxmyrtle

MORACEAE	
*Ficus carica**	fig tree
MYRICACEAE	
Myrica californica	Pacific wax myrtle
ONAGRACEAE	
Epilobium ciliatum	fireweed
OXALIDACEAE	
Oxalis oregana	redwood sorrel
PAPAVERACEAE	
Eschscholzia californica	California poppy
PLANTAGINACEAE	
*Plantago lanceolata**	European plantain
POLEMONIACEAE	
Navarretia mellita	skunkweed
POLYGONACEAE	
*Polygonum arenastrum**	smartweed
*Rumex acetosella**	sheep sorrel
*Rumex crispus**	curly dock
PORTULACACEAE	
Calandrinia ciliata	red maids
Claytonia perfoliata	miner's lettuce
Claytonia sibirica	candyflower
PRIMULACEAE	
*Anagallis arvensis**	scarlet pimpernel
Trientalis latifolia	western starflower
RANUNCULACEAE	
*Ranunculus repens**	creeping buttercup
Ranunculus occidentalis	western buttercup
RHAMNACEAE	
Ceanothus thyrsiflorus	blue blossom
Rhamnus purshiana	cascara
ROSACEAE	
*Cotoneaster pannosa**	cotoneaster
*Prunus domestica**	cultivated plum
Rosa californica	California rose

Rosa gymnocarpa	wood rose
*Rubus discolor**	Himalaya berry
Rubus parviflorus	thimbleberry
Rubus spectabilis	salmonberry
Rubus ursinus	California blackberry
RUBIACEAE	
Galium aparine	goose grass
SALICACEAE	
Populus balsamifera var. *trichocarpa*	black cottonwood
Salix lasiolepis	arroyo willow
Salix scouleriana	Scouler's willow
SCROPHULARIACEAE	
*Digitalis purpurea**	foxglove
*Parentucellia viscosa**	parentucellia
Scrophularia californica	California bee-plant
SOLANACEAE	
*Solanum sp.**	nightshade
URTICACEAE	
Urtica dioica ssp. *holosericea*	stinging nettle
VALERIANACEAE	
*Centranthus ruber**	red valerian
VIOLACEAE	
Viola adunca	western dog violet
FLOWERING PLANTS - MONOCOTS	
ARACEAE	
Lysichiton americanum	skunk cabbage
CYPERACEAE	
Carex deweyana	sedge
Cyperus eragrostis	nutsedge
JUNCACEAE	
Juncus bufonius	toad rush
Juncus effusus var. brunneus	Pacific rush
Luzula comosa	hairy wood rush
LILIACEAE	

Disporum smithii	fairybells
Maianthemum dilatatum	false lily-of-the-valley
Scoliopus bigelovii	fetid adder's tongue
Smilicina stellata	false Solomon's seal
Trillium ovatum ssp. *ovatum*	western trillium
POACEAE	
Agrostis exarata	bentgrass
*Aira caryophyllea**	European silver hairgrass
*Ammophila arenaria**	European beach grass
*Anthoxanthum odoratum**	vernal grass
*Arrhenatherum elatius**	Tall oatgrass
*Avena barbata**	slender wild oat
*Briza maxima**	rattlesnake grass
*Briza minor**	little rattlesnake grass
Bromus carinatus	California brome
*Bromus diandrus**	ripgut brome
*Bromus hordeaceus**	soft chess
Bromus madritensis ssp. *madritensis**	red brome
*Cortaderia jubata**	Jubata (Pampas) grass
*Cynodon dactylon**	bermuda grass
*Cynosurus echinatus**	dogstail grass
*Dactylis glomerata**	orchard grass
*Eragrostis minor**	lovegrass
*Festuca pratensis**	meadow fescue
*Holcus lanatus**	velvet grass
*Lolium multiflorum**	Italian ryegrass
*Hordeum murinum**	barley
*Phalaris aquatica**	Harding grass
*Poa annua**	annual bluegrass
*Polypogon monspeliensis**	rabbitsfoot grass
*Vulpia myuros**	rattail fescue

Notes: 1: Botanical nomenclature follows Hickman 1996;
* denotes non-native species

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APPENDIX D

CULTURAL RESOURCES REPORT

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CULTURAL RESOURCES SURVEY AND SITE EVALUATION OF THE FORTUNA BURN DUMP, COMMUNITY OF ROHNERVILLE, HUMBOLDT COUNTY, CALIFORNIA

by

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Prepared for:

California Integrated Waste Management Board
1001 I Street
Sacramento, California 95812-4025

June 2009

PROJECT DESCRIPTION

In March 2009, the California Integrated Waste Management Board (CIWMB) contracted with URS Group, Inc. (URS) to conduct environmental evaluations of the Fortuna Burn Dump, located in the community of Rohnerville, Humboldt County, California. These studies include a cultural resources inventory and significance evaluation. The Fortuna Burn Dump is located on a 9-acre parcel belonging to Patrick Thompson of Fortuna. The parcel is located between Mill Street and the South Fork Mill Creek, within the NE¼ of the SW¼ of Section 7, Township 2 North, Range 1 East (Figure 1). The project area includes a driveway extending south from Mill Street to a locked gate at the northern boundary of the parcel, and extends from a fence line on the eastern boundary to the slope above the creek at the west (Figure 2).

The current evaluations are being conducted for a CIWMB project that may include capping the dump wastes in place, or the removal and consolidation of wastes on flatter, adjacent areas that will be safer to place a cap atop. The environmental evaluations are being conducted to determine the potential need for preparing CEQA documents, depending on the determination of what final remedial action will take place on the site.

The cultural resources study was conducted in compliance with state historic preservation law, namely the California Environmental Quality Act (CEQA) of 1979, as amended. According to Section 15064.5 of CEQA, a project with an effect that may cause a substantial adverse change in the significance of a historical resource is a project that may have a significant effect on the environment. Lead agencies are required to identify any historic resources that may be affected by any undertaking involving state or county lands, funds, or permitting. In addition, the significance of such resources that may be affected by the undertaking must be evaluated using the criteria for listing on the California Register of Historical Resources (Pub. Res. Code SS5024.1, Title 14 CCR, Section 4852). The criteria for significance are as follows:

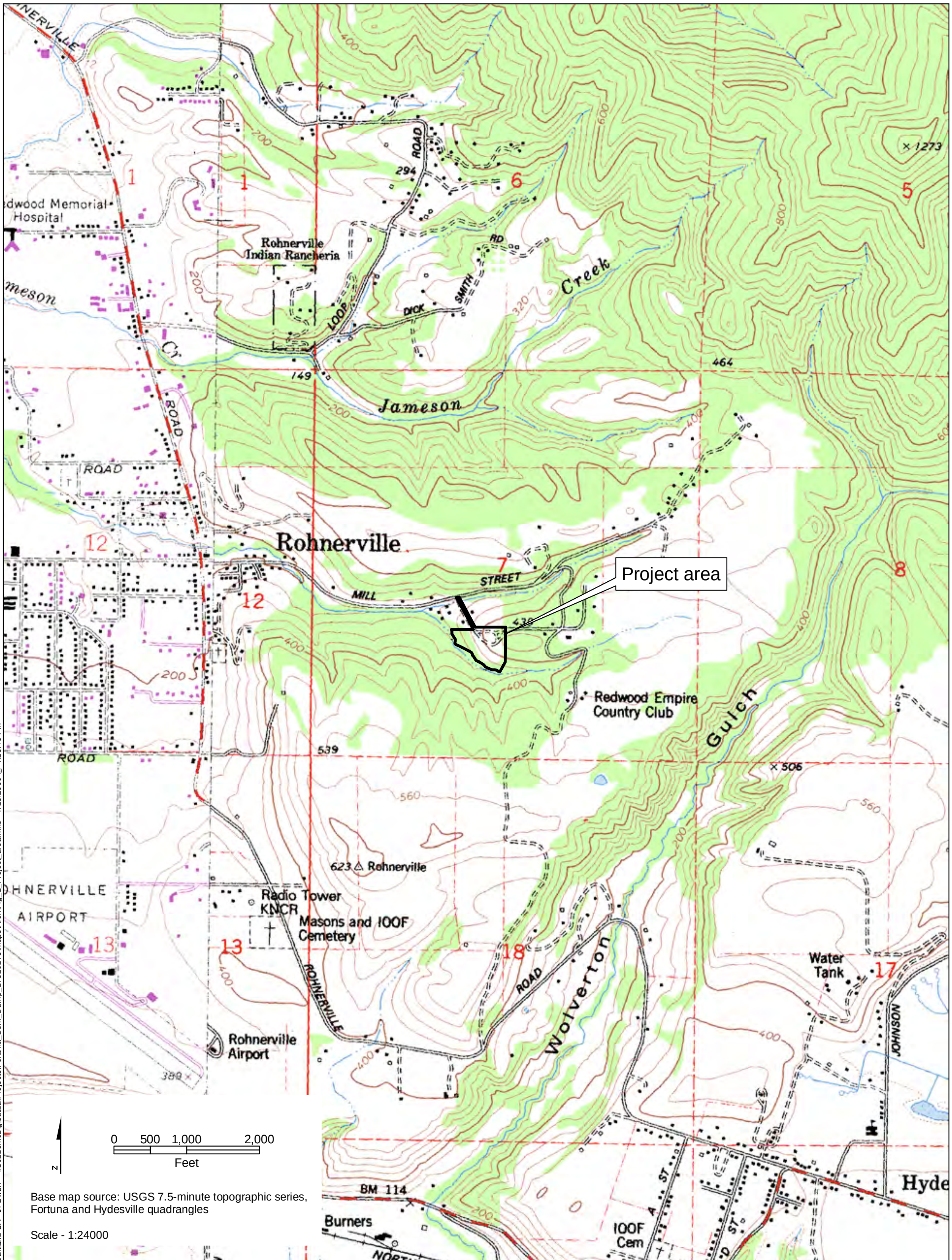
(a) is associated with events that have made a significant contribution to the broad patterns of history or the cultural heritage of California or the United States;

(b) is associated with the lives of persons important in our past;

(c) embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or

(d) has yielded, or may be likely to yield, information important in prehistory or history.

Furthermore, it is recommended by CEQA that all cultural resources be preserved in-situ whenever possible by avoidance. Whenever a historical resource or unique archaeological resource (Public Resources Code SS21083.2) cannot be avoided by project activities, effects shall be addressed and mitigated as outlined in SS15126.4 and SS15331 of CEQA.



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Fortuna Burn Dump
Archaeological Constraints Analysis

Figure 1
Project area map (USGS Fortuna and Hydesville 7.5' Quadrangles)

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URS

Fortuna Burn Dump
Archaeological Constraints Analysis

Figure 2
Detail of survey area

BACKGROUND

ENVIRONMENT

The Fortuna Burn Dump is located on a hill slope on the northern side of the South Fork Mill Creek, a tributary of the Eel River. It is underlain by the Hookton Formation and younger terrace deposits that overlie the Carlotta Formation. The Hookton Formation consists primarily of non-marine, poorly-consolidated clay, sand, and gravel. Trenching within the site revealed silty clay, sandy silty clay, and clayey silt with some gravel and cobbles (CIWMB 2007:11). Exposed cobbles on the site include sandstone, siltstone, and chert.

The site occurs within a secondary and tertiary growth redwood forest (Figure 3). The overstory includes coast redwood, Douglas fir, grand fir, red elderberry, Pacific waxmyrtle, California bay, black cottonwood, and willow. Several introduced fruit trees are also present, including fig, apple, and cherry. The understory consists of poison hemlock, cow parsnip, wild mustard, honeysuckle, coyote brush, huckleberry, California blackberry, salmonberry, thimbleberry, wild rose, thistles, ivy, sword fern, cattail, and horsetail. Grasses include rattlesnake grass, Bermuda grass, orchard grass, ryegrass, bromes, and chess. A number of small perching birds were noted in the project area during survey, as well as several crows and Stellar's jays.

Figure 3. Overview of terrace and redwood stump near north property line.

ETHNOGRAPHY AND PREHISTORY

Ethnography Background

The Fortuna Burn Dump is situated within the ethnographic territory of the Wiyot Indians, whose homeland at historic contact was centered on Humboldt Bay. The Wiyot spoke a language similar to that of the neighboring Yurok Indians, with both belonging to the larger Algonquian language group. Wiyot territory was bounded to the south by Bear River Ridge, to the north by the Little River, to the east by the crest of the first mountain range behind the coastal plain, and to the west by the Pacific Ocean. This territory was almost entirely within the redwood forest belt. Within this area, the Wiyot were divided into three principal groups, including people of the lower Mad River, Humboldt Bay, and Eel River delta (Elsasser 1978:156, 162).

Although the Wiyot claimed many miles of ocean front and bay, they were known to have used the ocean very little for subsistence and travel, as compared to other coastal populations. The Wiyot were more inclined to live near still water, such as the shore of Humboldt Bay and the mouths of the Eel and Mad rivers. Fish, principally salmon, was the main source of animal protein in the Wiyot diet, although mollusks, deer, elk, and other game animals were regularly exploited (Elsasser 1978:156). Sea mammals were also eaten. Berries, including huckleberries, were an important plant food, as were acorns.

Wiyot dwellings were rectangular in outline, fashioned from split redwood planks with a two- or three-pitch roof containing a smoke hole. Side entrances had sliding wood doors. Two or more families could occupy a single house, with both men and women sleeping together. There was usually one sweathouse for each Wiyot village. The sweathouse was of a similar style as the living house, but on a smaller scale. It contained a stone-lined fire pit and wooden foot drum (Elsasser 1978:158).

The Wiyot wore robes of deerhide and woven rabbit skins. The hair was kept on deer skin blankets for warmth, while rabbit skin blankets could be made of as many as one hundred cottontail rabbits. Coon skins and fox skins were also made into blankets. Men wore a breechclout of buckskin, fox, or ring-tail cat (Merriam 1967:179). Also, both men and women both wore one-piece shirts or aprons of deerhide or inner tree bark. Women sometimes wore short skirts of buckskin (Merriam 1967:178). Their dresses consisted of double aprons of buckskin falling to between the knee and ankle. These were often fringed and strung with shells and nuts. Moccasins were worn by both sexes (Elsasser 1978:158).

Wiyot basketry was of the twined type and included the basketry hat. Wiyot basketry hats most often displayed a dome-shaped peak, rather than a flat top. Twined cooking baskets were distinctive in that they flared from the bottom and were incurving near the top, above reinforcing rows (Elsasser 1978:159).

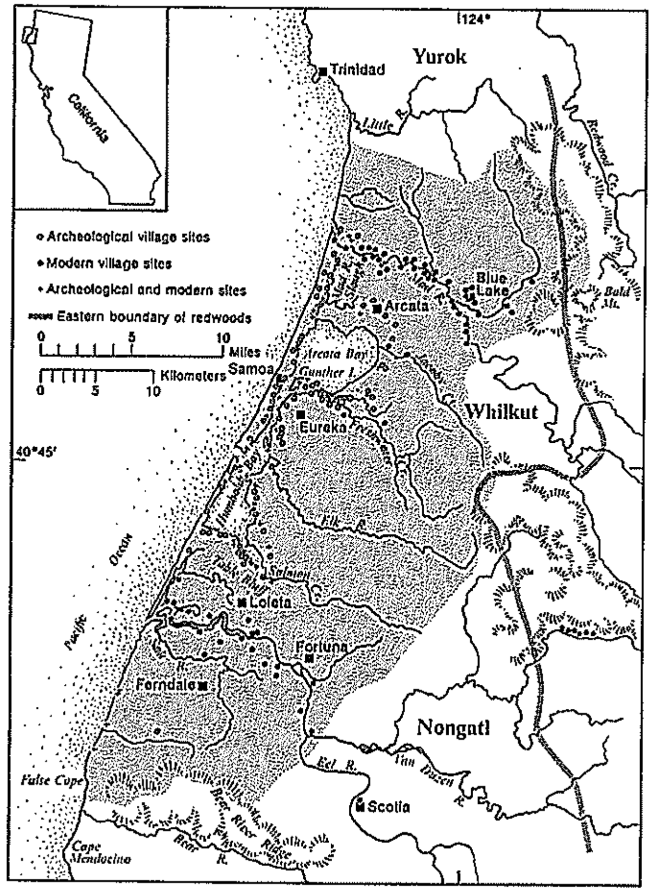

Figure 4. Ethnographic Wiyot territory (shaded).
Adapted from Elsasser (1978).

Similar to other peoples of Northwestern California, the Wiyot had neither formal tribal organizations nor clans. Descent was patrilineal and postnuptial residence was patrilocal. An exception occurred in the case of a "half marriage," executed when a man did not own a home or did not pay the full bride price, which resulted in matrilocal residence. Wealth was the chief basis of social stratification among the Wiyot; however, they did not hold slaves. While women did not have equality with men, regulations governing their behavior were more casual than among neighboring groups. In addition, the Wiyot celebrated girls' adolescence with more elaboration than did their northern neighbors. Wiyot women were allowed to participate in victory dances, carried out when an enemy was killed. Other ceremonies included the Jumping Dance, related to the World Renewal ritual. This was more common among the northern Wiyot groups, often held with Yurok people in attendance (Elsasser 1978:159).

The Wiyot, like other California Indian groups, believed that diseases or sickness were sometimes caused by the intrusion of poison objects, by soul loss, or by certain breaches of taboo. Shamans, or doctors, were of two types. The herb doctor gave medicine and recited curative formulas to weaken or check disease objects. A sucking doctor was an expert at removing poison objects from the body and could be a man or woman (Elsasser 1978:160).

Because the Wiyot inhabited the fertile valleys and redwood forests surrounding Humboldt Bay, they were among those that suffered the most in terms of displacement in historic times. This land was highly desirable for White settlers in the nineteenth century. Beginning around 1852, the shooting of Wiyots became common, often in retaliation for the killing of Whites or for transgressions of the settlers' law. Occasionally, the killing of entire groups took place, culminating in the massacre of more than 50 people on Gunther Island in 1860. In this attack, a group of American settlers, under the cover of darkness, slipped into the Wiyot village of *Tolowot* and brutally killed many of its sleeping inhabitants (Moratto 1973:46, 1984:484). Surviving Wiyot were removed to reservations on the Klamath and Smith rivers to the north (Elsasser 1978:162).

Prehistory Background

The current project falls within an area described by Moratto (1984) as the Northwest Coast subregion of the North Coastal region. The people of this subregion differed significantly from those of the Eel River and Russian River subregions to the south, having much in common with the Northwest Coast culture area of Oregon, Washington, and British Columbia (Moratto 1984:473).

A hypothetical reconstruction of cultural sequences in the Northwest Coast subregion was developed by K.W. Whistler (1979) based on linguistic and archaeological data. Whistler proposed that this area was first occupied by ancestors of the Karok Indians, who lived inland and relied on hunting and gathering strategies. According to Whistler's (1979) reconstruction, the Wiyot entered this region at about A.D. 900, followed several hundred years later by the Yurok. The Wiyot may have come from the Columbia River Plateau, entering northwestern California by way of the Deschutes River Valley and the Klamath River. The Wiyot are presumed to have settled in the coastal strip, an area little used by the Karok. The Yurok arrived at a later point in time, possibly displacing the Wiyot along the lower Klamath River. The Yurok apparently brought with them a fishing and woodworking technology suitable for their new home (Moratto 1984:483).

The settlement of the Northwest Coast subregion by the Wiyot and Yurok is marked archaeologically by the emergence of the Gunther Pattern, characterized by assemblages of harpoon points, woodworking tools, *Dentalium* shells, and other distinctive artifacts (Moratto 1984:484). The first systematic archaeological investigation reported for the Humboldt County area was a survey conducted in 1918 by L. L. Loud of the University of California's Anthropology Museum in San Francisco. Loud recorded 172 sites at Humboldt Bay and along the lower reaches of the Mad and Eel rivers. He also excavated a trench within midden at site CA-Hum-67, the former Wiyot village of *Tolowot* on Gunther Island (Moratto 1984:484).

Loud's (1918) excavations yielded an extensive collection of artifacts, attributable to the Gunther Pattern, which reflected strong influences from the greater Northwest Coast culture area to the north (Moratto 1984:485). The artifacts included Dentalium shells; harpoon points of bone and antler; woodworking tools, such as adzes, wedges, and mauls; and ground stone zoomorphs. In addition, extended burials and earlier cremations were exposed. A radiocarbon date of 1050 ± 200 B.P. was later obtained from peat gathered from the base of the Gunther Island midden deposit (Elsasser and Heizer 1966:2).

Beginning prior to 1920, additional, large-scale excavation at CA-Hum-67 was conducted over a period of 30 years by H. H. Stuart, a Eureka dentist. During this time, Stuart dug approximately 382 graves, removing the artifacts associated with them. In 1948, archaeologists from the University of California examined Stuart's collection, which at that time represented approximately 142 grave lots. The artifacts from the additional grave lots had already been sold, traded, or given away. What remained included red and black obsidian bifaces; Gunther Barbed arrow points; stone mauls and flanged and offset pestles; grooved and notched net weights; steatite vessels and ground stone zoomorphs; baked clay figurines; shell ornaments; and antler and bone wedges, chisels, harpoons, hairpins, and head scratchers (Moratto 1984:487). The similarity of items throughout the deposit suggests that CA-Hum-67 was occupied by the Wiyot and their direct ancestors throughout its history. In addition, the association of zoomorphs and obsidian blades with burials throughout the midden suggests that a wealth emphasis figured prominently during the span of occupation. Finally, the zoomorphs are similar to ones found in Siskiyou and Trinity counties, as well as in locations from Oregon to Vancouver. Such items are virtually absent in central and southern California (Moratto 1984:487).

Other sites in the Humboldt County area that have yielded additional archaeological materials include CA-Hum-118 at Patricks Point, CA-Hum-169 at Trinidad Bay, and CA-Hum-174 on an offshore rock near Patricks Point (Moratto 1984:488-491).

More recent projects within adjacent interior mountains of Humboldt and Trinity counties have provided evidence of earlier prehistoric occupations of the region. These include surveys and excavations at Hoopa Valley Indian Reservation, the headwaters of Redwood Creek, portions of Redwood National Park, and the Pilot Ridge and South Fork Mountain areas (Moratto 1984:492). Projects within these areas, particularly at Pilot Ridge, South Fork Mountain, Hostler Ridge, and Pine Ridge, yielded evidence of Borax Lake Pattern occupations on high elevation sites. These occupations are represented by wide-stem, indented base projectile points, chert flaking debris, and millingstones and manos. Such items are similar to ones found at Clear Lake in Lake County, at Shasta Lake in Shasta County, and along the Middle Fork Cottonwood Creek in Shasta County. Sites of the Borax Lake Pattern in the mountains of Northwest California date to 3000 to 6000 years B.P., a warm period of the mid-Holocene marked by a upland habitat rich in resource abundance and diversity. After 2800 years B.P., the climate cooled, and effective moisture increased. At this time, Mendocino Pattern occupations were represented by medium to large corner-and side-notched projectile points, serrated Oregon series projectile points, and unifaces (Hildebrandt and Hayes 1993).

HISTORY

The Fortuna Burn Dump is located in central Humboldt County, just east of the Eel River and north of the Van Duzen River, some 15 miles south of Eureka. It is in the community of Rohnerville and two miles southwest of Fortuna. Humboldt County was created March 12, 1853 from a portion of Trinity County, and it received additional territory from Klamath County in 1875 (Frickstad 1955:369).

The Humboldt County area was visited by Europeans as early as 1775, when Spanish explorer Bruno de Hezeta sailed the ship *Santiago* along the California coast, landing at Trinidad and holding mass in June of that year. In the summer of 1806, American Jonathan Winship, master of the ship *O'Cain*, discovered Humboldt Bay while attempting to locate otter fur trapping sites. American fur trapper Jedediah Strong Smith entered the Humboldt area with a party of trappers in 1828, traveling from the Sacramento Valley to Fort Vancouver. Smith traversed the coastal mountain range, reaching the Pacific Ocean at the mouth of Wilson Creek, just north of the Klamath River (Savage 1991:2-3).

After the discovery of gold in 1848, the Klamath Mountains were overrun by gold seekers, and a number of mining towns were soon established, such as Weaverville. This led to attempts to locate the mouth of the Trinity River and a travel route from the coast to provide needed supplies to the mining camps. The port of Trinidad was the first coastal supply center, followed by Arcata (TCR 1980:13). The town of Arcata was founded as Union Town in April 1850, and a post office was established there in October 1852. By 1853, Union Town became the seat of Humboldt County, and in May 1860, the post office was renamed Arcata (Frickstad 1955:47). The settlement of Eureka was established in May 1850, and a post office was opened at Eureka by June 1853 (Frickstad 1955:43).

As settlements were established during the 1850s, aggressions between whites and Native Americans escalated and settlers began taking valuable property. To protect both Indians and settlers, Fort Humboldt was established at Humboldt Bay in 1853 and operated until 1866. Future President Ulysses S. Grant served as Captain at Fort Humboldt in 1854, spending much of his free time in Eureka (Savage 1991:11). Additional forts were established along the north coast during ensuing years, including forts Terwah and Capell near Crescent City, Fort Anderson near Arcata, Fort Lyon east of Arcata, and Fort Baker near Bridgeville.

Although a number of economic pursuits quickly developed within the Humboldt area, none made as great an impression as the local timber industry. The redwood forest was described in 1893 as the richest available resource in Humboldt County (Eddy 1893:5). At that time, it formed an almost unbroken belt, stretching from the northern end of the county to the southern boundary, and nearly eight miles wide. The first commercial use of timber in the West occurred in the 1820s along the Pacific Coast, where lumber could be transported by ship to distant population centers. At that time, the Pacific Ocean was the only artery of commerce in use, with a hide and tallow trade established by 1820 between California and New England. As one author writes:

> It was those who came by sea who first put the western forests to practical use. Initially the trees they cut were used to replace masts, spars, yards or other gear that had been damaged during long voyages. Later, though, supplies of timber were taken aboard, to be sold or traded for other goods at later ports of call (Lewis 1963:187).

The earliest lumber activities in northern California occurred at Fort Ross, an outpost near Bodega Bay built in the 1820s by Russian-American fur trappers (Hutchinson 1974). By 1827, lumber processing at the fort consisted of whipsawing and splitting redwood timbers and planks to be exported by ship to settlements in Alaska and the Sandwich (Hawaiian) Islands. A style of pre-fabricated house was also reportedly built at Fort Ross and exported to distant colonies (Hutchinson 1969:159, 1974).

In 1834, the first powered sawmill in the state was erected at the *El Molino Rancho* in Sonoma County (Hutchinson 1974). This mill, built by Juan Bautista Rogers Cooper, was powered by a water-driven wheel, and during the next few years, additional water-powered mills were built along the Pacific Coast. In the fall of 1843, the first steam-powered sawmill in the state, erected on Salmon Creek near Bodega Bay, was carried by ship from Baltimore.

The California gold rush brought thousands of settlers into the state, and due to the lack of productive sawmills, an urgent and immediate need for lumber arose in the mining settlements. Not only were California miners in need of milled lumber, they were willing to pay high prices for it. At first, lumber was imported from China and Australia, while some came around Cape Horn from Maine, selling for high prices (Hutchinson 1974). This resulted in a boom for the lumber business along the Pacific Coast and, by the early 1850s, numerous sawmills and logging ventures were operating at dozens of bays and inlets along the Washington and Oregon seaboard (Lewis 1963:187). Wood from the Pacific Northwest, referred to as "Oregon Pine," was shipped to San Francisco. From there, it could be sent inland by boat or wagon to distribution centers such as Sacramento, Marysville, and Red Bluff.

Miners in the Sierra Nevada, North Coast Ranges, and Klamath Mountains regions quickly realized the economic potential of the vast timberlands surrounding the mines. Small sawmills were soon established, including tow-man sawpits and water-powered whipsaws, and every mining section had its own sawmill. As one author writes:

> With the increasing number of settlers the demand for lumber spread like a forest fire, and sawmills sprang up like magic (Giles 1949:146).

Coast redwood (*Sequoia sempervirens*) was first described by Fray Juan Crespi, diarist of the 1769 Portola expedition that reached the area of Monterey Bay. On October 10, 1769, Crespi described well forested hills with high trees of an unknown red cedar. He named them redwoods based on their color. Once discovered, the coast redwoods remained untouched for many years, although Russian colonists conducted minor logging along the Russian River and at Fort Ross during the early 1800s. With the advent of the gold rush, redwood was in big demand as a building material because of its natural resistance to fire. Within a short time, sawmills and lumber camps were operating all along the northern California coast (Johnston 1983:13-14).

By the summer of 1850, the first sawmill was opened on Humboldt Bay near Eureka. This mill was known as the Papoose, built and operated by Martin White and James Eddy (Savage 1991:7-8). Although that mill was short lived, others were soon established in surrounding areas. Lumber was loaded onto ships at both Humboldt Bay and Trinidad Bay, including sailing vessels and steamships. In the early 1890s, sailing vessels and half the steamships leaving Humboldt Bay carried lumber and other forest products exclusively (Eddy 1893:34). Such products were shipped both to foreign countries and domestic ports. A complex system of roads and short line railroads was constructed by the late 1800s to deliver wood products from the forest and mills to Humboldt Bay.

Beginning in late 1878, misuse of the Timber and Stone Act began on a large scale with land speculators attempting to acquire redwood tracts in northern California. A group of timberland speculators from California and Wisconsin formed an enterprise known as the California Redwood Company, backed by several Scottish capitalists. This group hired local residents to file land claims for selected quarter sections of timberland, quickly taking up vast amounts of prime timber. In a period of one day alone, 349 deeds were filed for registration in Humboldt County (Savage 1991:21). By 1878, the Joe Russ Lumber Company was operating a sawmill on Gunther Island. By the early 1880s, additional mills were in operation, including the Excelsior mill at Eureka and the Dodge Lumber Company at Fortuna (McCormick 1999:12-13).

Rohnerville was one of the first settled communities in Eel River valley, situated on the first upland plain that intervenes between Eel River bottom and the steep hills (Eddy 1893). It is situated in a rich agricultural district that produced fine hay and fruit by the late 1800s. Henry Rohner, a Swiss immigrant, and one of the initial pioneers in Eel River Valley in 1851, built the first store at the location of Rohnerville in 1856. Many Eel River Valley settlers were originally drawn to California by the prospects of gold, but they soon returned to the farming life they had known in the East, settling the rich lands of the Rohnerville area to raise livestock, grains, and a variety of fruits. In 1862, major land holdings in Section 12 (T2N;RlW), where Rohnerville is located, belonged to six men: A.P. Campton, a farmer from Ohio; Joseph Feiganbaum, a merchant from Bavaria; Jacob O. Showers, a farmer from Ohio; William McNamara, a Eureka resident whose holdings eventually passed into the hands of Showers; Benjamin F. Jameson, a farmer from Kentucky; and Walter Van Dyke, a future state senator who sold his land in 1863 to James Degnan. During the late 1860's and the 1870's, when building lots were sold west of Main Street, almost all the transactions involved either Jacob Showers, James Degnan, or the nine-acre Coates and Walsh Addition, subdivided in the mid-1870's. By 1860, there was sufficient population in the community to build a schoolhouse on Walter Van Dyke's land near the Rohner and Feiganbaum Store (http://sunnyfortuna.com/history/rohnerville/index_02.htm).

Rapid settlement and commercial development during the next ten years brought Rohnerville some distinction as the third largest population in Humboldt County by 1870, with 250 people in the "village" and an additional 450 in the voting precinct. Served by a daily stage between neighboring Hydesville and the county seat at Eureka, the growing community included two stores, two hotels, a drug store, three blacksmith shops, a saloon, cabinet maker's shop, saddle and harness shop, cooper's shop, carriage maker's shop, a barber and a physician. A steam-run mill, used in summer to produce lumber and in winter to process locally produced grain, served as the only industry (http://sunnyfortuna.com/history/rohnerville/index_02.htm). By the early 1890s, Rohnerville boasted a population of up to 600 people. At that time, the Rohnerville district contained two or three shingle mills, a tannery, two nurseries, a brick and tile yard, three hotels, numerous stores, a new schoolhouse, numerous churches, and a weekly newspaper (Eddy 1893:93).

The town of Fortuna was established in the late 1870s (Savage 1991:21). The town was originally known as Slide, named for large landslides between the Eel River and a hill north of town (McCormick 1999:3). The Slide post office was established in May 1876 (Frickstad 1955:46). By the late 1870s, the community became known as Springville, named for the Springville Mill, a lumber mill built by Henry Rohner, Frank Gushaw, Henry Mason, and Nicholas Webber. By the 1890s, Fortuna contained 700 inhabitants and was known as a manufacturing town with a rich agricultural region (Eddy 1893:92). By that time, the Eel River Valley Lumber Company was harvesting timber near Fortuna and transporting it from their large mill to the Eel River and Eureka Railroad, built in 1884, by way of a short line railroad (Eddy 1893:107).

METHODS

BACKGROUND RESEARCH

At the request of URS, an archaeological records search was completed by the staff of the North Coastal Information Center at Klamath, California (Appendix A). The rapid response records search reviewed previous archaeological studies conducted within a one-half mile radius of the Fortuna Burn Dump. Also reviewed were previously recorded site records (archaeological and historic), historic maps, and other historic and ethnographic documents filed at the information center.

The records search revealed that 10 archaeological surveys have been completed within the immediate vicinity of the Fortuna Burn Dump, and that no archaeological sites were recorded as a result of these survey projects (Appendix B). In addition, it was found that the Thompson property had not been previously surveyed for cultural resources, and no other ethnographic or historic sites were identified near the project area. As a result of the records search, it was determined by the information center that the current project area had a low to moderate probability of containing archaeological sites.

Prior to survey, URS also contacted the Native American Heritage Commission in Sacramento to request a list of appropriate individuals or groups to contact regarding the proposed project (Appendix A). To date, no response has been received from the commission.

SITE RECORDATION

An intuitive pedestrian survey of the 9-acre Thompson property was performed by URS archaeologist Russell Bevill on June 9, 2009. Given the dense vegetation of the parcel, efforts were concentrated on examining all areas of exposed soil and stream bed, rather than attempting to walk parallel transects across the site. Prior to survey, Mr. Bevill was shown the property boundaries and extent of the Fortuna Burn Dump by licensed land surveyor Wallace E. Wright. Mr. Bevill was also accompanied by a representative of the Humboldt County Health Department and URS ecologist Casey Stewman of San Jose.

To determine boundaries of the Fortuna Burn Dump, pockets of exposed soil were inspected for the presence of historic features and artifacts, including skid roads, cleared slopes, open terraces, and the bed of the South Fork Mill Creek. Exposed sediments were also examined for the presence of prehistoric archaeological materials. In addition, neighbors Gayle and Steve Rafferty were interviewed for their knowledge of cultural resources in the site vicinity.

The Fortuna Burn Dump site was recorded using California Department of Parks and Recreation (DPR) forms. These included DPR Primary Record, Archaeological Site Record, Artifact Record, and Photographic Record forms. Site recordation also included photo-documentation using digital color photos. A to-scale sketch map was prepared for the dump and the site was plotted onto a USGS topographic map using a hand-held global positioning system (GPS) unit.

STUDY FINDINGS

Prior to conducting the archaeological survey of the Thompson parcel, the author visited with neighbors Gayle and Steve Rafferty, who occupy the parcel immediately north of the project area. The Raffertys reported finding prehistoric artifacts at a point along the property line, near the northwest corner of the Thompson property. These artifacts consisted of two basalt contracting stem projectile points (Figure 5) and one piece of green crypto-crystalline (CCS) debitage. Although prehistoric cultural materials have been reported from neighboring Rafferty property, the current survey effort did not locate any prehistoric artifacts within the Thompson property.

Figure 5. Basalt projectile points from the Rafferty property.

The pedestrian survey revealed substantial evidence of the Fortuna Burn Dump, primarily located on the south-facing slope, within the eastern half of the parcel. The burn dump was established in the middle to late 1950s and was operated until 1972. From 1972 until 1987, the site was used as a solid waste transfer station (CIWMB 2007:2). This site operated as a burn dump, at least as early as the middle 1950s, under the ownership of Albert Nichols. The owners from 1959 to 1975 were William Sproat and Milton Nichols. From 1959 to 1972, Mr. Sproat provided a municipal solid waste collection service for the Fortuna area under the name of Eel River Garbage Company. The wastes were deposited near the slope and were burned to reduce volume. The remaining waste and ash were then pushed down onto the slope towards the South Fork Mill Creek. In 1972, burning of waste ceased at the site and the dump became a waste transfer station operated by the Eel River Garbage Company, for the Table Bluff Sanitary Landfill. Truck hauled the waste to a concrete pad at the site and dumped it through a chute into 55-cubic yard bins located below. The bins were removed to the landfill on a daily basis. Operations at the site ended in 1987 when the company was sold and became Eel River Disposal. Mr. Sproat owned the site solely from 1975 to 1981, and from 1981 to 1998, the site was owned by Lilyann Sproat. The southern portion of the property, including the main dump slope, was logged in 1995. The property currently belongs to Patrick Thompson, the owner of Thompson Timber Company (CIWMB 2007:1-2).

Just north of the project boundary at the western end of the parcel, at the Rafferty property line, were found three concrete foundation slabs atop an artificial terrace. Several skid roads from the Thompson property lead onto this small terrace, which contains several large redwood springboard stumps. Modern refuse was also found dumped alongside the foundations, including rubber hose, tools, lawnmower parts, a plastic milk crate, an automobile axle with tires, electronics, and other items (Figure 6). The concrete pads were likely associated with the garbage transfer station (post-1970s), since they do not appear old.

Figure 6. Concrete foundation pad and modern refuse.

An archaeological site record was completed for the Fortuna Burn Dump, including a Primary Record, an Artifact Record, and a Sketch Map (Appendix C). Included in the site were the concrete pads at the western end of the property, two standing structures (sheds) near the eastern property line, several large excavated terraces at the northeastern end of the parcel, numerous skid roads on the hill slope above the creek, and a main dumping area on the slope crossed by the skid roads (see Sketch Map, Appendix C). The main dump area included one automobile tire concentration on the surface, as well as numerous appliances on the slope. Artifacts were readily visible on the slope and on the skid road at the base of the slope. This lower skid road runs parallel to the creek. Additional artifacts were found in piles and within a plastic garbage can at a shed atop the slope, evidence of bottle collecting and scavenging of metal objects, such as silverware.

Artifacts inventoried at the base of the main dump slope included abundant glass bottles, consisting primarily of condiment bottles, medicinal bottles, and bleach bottles (Figure 7). In addition, milk class cold cream jars were noted, as well as ceramic tableware fragments. Such tableware consisted of cups, mugs, saucers, and dinner plates. Most appeared as heavy hotel ware china, including brands such as "TEPCO," "WALLACE," and "SANTONE." One cup base exhibited a date of 1947. Other ceramics included Franciscan Ware, Fiesta Ware, crock pots, and ceramic figurines, all typical of the 1940s and 1950s. Several soda pop bottles and liquor bottles also were noted.

Figure 7. Metal and glass bottles at base of main dump slope.

Other artifacts visible on the slope were clay building and furnace bricks, slate roofing tiles, nails, electrical hardware, and other construction debris. Automobile parts and tires are present, as are household appliances, such as refrigerators and kitchen stoves. Personal items, including buttons and a rubber hair comb were noted, as well as leather shoe parts. Sawcut cow bones were also seen. Overall, the artifacts within the burn dump represent both domestic materials and construction debris, at least within the areas of exposed artifacts. Such materials are consistent with dates ranging from the early 1950s to the 1970s.

Based on the physical evidence at the burn dump, the property qualifies as a historic site given the presence of artifacts more than 50 years old, although most materials are likely younger in age. Given the fact that this was a burn dump, the deposit is limited primarily to metal, glass, ceramic, and calcined bone. Some items of rubber, plastic, and leather have also survived, but are fewer in number. The automobile tires are stacked on the surface and are of a more recent date. The artifacts deposited within the Fortuna Burn Dump may be described as ordinary, domestic refuse mixed with discarded structural materials and automotive parts.

RECOMMENDATIONS

The features and artifacts at the Fortuna Burn Dump do not meet the eligibility criteria for listing on the California Register. Under Criterion A, the dump's structures and deposit lack association with events that have made a significant contribution to the broad patterns of the history of Humboldt County, California, or the United States. This site appears to be an ordinary burn dump typical of small communities. Such dumps were most often located in areas considered to be of little value. While small solid waste dumps were more common before the 20th century, the Fortuna Dump is of a relatively recent date. It is therefore not associated with the early pioneer period of Humboldt County. The artifacts that occur within the Fortuna Burn Dump were trucked in from various locales within the Fortuna area and are not associated with any particular family or event.

As stated in Criterion B, the site is not clearly associated with the lives of persons important to our past. The artifacts deposited within the dump represent numerous households and businesses within the Fortuna area; however, given the burning and extensive mixing, there is no way to directly associate any of the materials with a particular person or place. Since the dump contains vernacular structures of common construction, the site does not embody the distinctive characteristics of a type, period, region, or method of construction, nor represents the work of an important creative individual, nor possesses high artistic values as designated in Criteria C.

Finally, under Criterion D, the Fortuna Burn Dump does not include features or artifacts that would yield information important in prehistory or history. Most artifacts deposited within the dump are younger than 50 years, dating to a period after ca. 1955. They consist primarily of typical domestic refuse and do not represent unique types of artifacts. In addition, much of the deposited materials lack physical integrity, having been incinerated to reduce volume and subsequently crushed. Because the Fortuna Burn Dump does not meet eligibility requirements for listing on the California Register given its lacks research potential, archaeological clearance is recommended for the proposed clean-up project.

Because prehistoric artifacts, including flaked stone projectile points and debitage, have been reported from neighboring property, it is possible that such materials exist within the project area. Ground disturbance activities may reveal a subsurface deposit of prehistoric cultural remains, particularly in areas near the creek. It is recommended that if such artifacts are found during future excavations at the site, then a professional archaeologist should be contacted to evaluate the findings before any further disturbance occurs.

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Appendix A

Correspondence

URS

May 26, 2009

Ms. Debbie Pilas-Treadway
Native American Heritage Commission
915 Capitol Mall, Room 364
Sacramento, CA 95814

RE: Fortuna Burn Dump Project- Contact Request

Dear Ms. Pilas-Treadway,

URS Corporation has been retained by CIWMB to conduct environmental and archaeological constraints analysis of the Fortuna Burn Dump site, 4498 Mill Street, community of Rohnerville, Fortuna, CA. This analysis will encompass an approximate 9-acre area surrounding the burn dump, which is located in Township 2N, Range 1E, SW ¼ of Section 7, as depicted on the attached USGS Hydesville, CA topographic map. As part of the study, URS would like to contact local Native American representatives to request their comments or concerns regarding the proposed project. We would appreciate the Commission's assistance in providing a list of names and addresses of the appropriate individuals or groups to contact. If you have any questions or need additional information, please contact me at (530) 893-9675 or by e-mail at Elena_nilsson@urscorp.com. Thank you for your assistance.

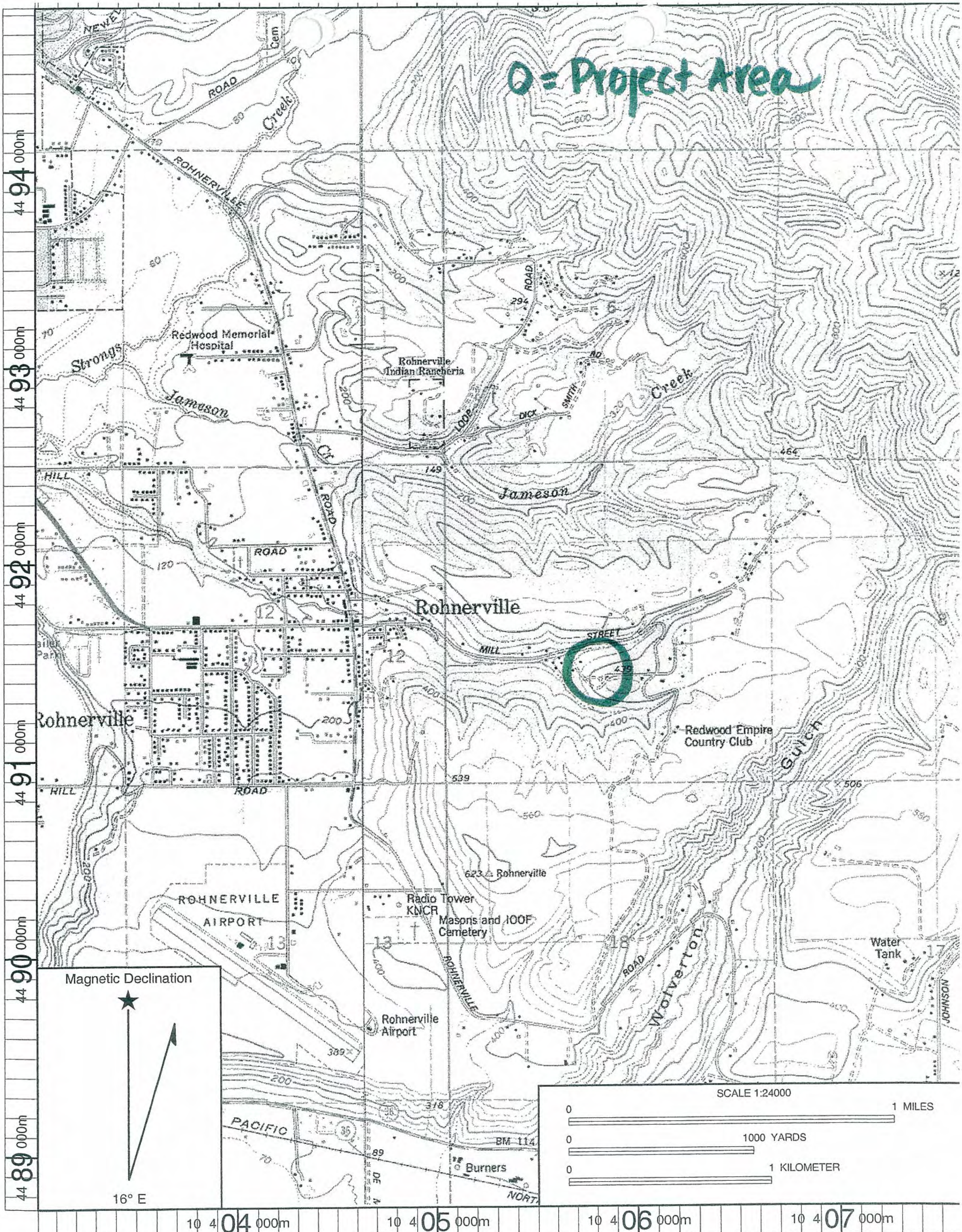
Sincerely,

URS Corporation

Elena Nilsson

Elena Nilsson
Principal Archaeologist

URS Corporation
1550 Humboldt Road, Suite 2
Chico, CA 95928
Tel: 530.893.9675
Fax: 530.893.9682


O = Project Area
Rohnerville
Redwood Memorial Hospital
Rohnerville Indian Rancheria
Strongs
Jameson
Creek
Jameson Creek
ROHNERVILLE ROAD
DICK SMITH RD
LOOP ROAD
MILL STREET
HILL ROAD
Redwood Empire Country Club
Gulch
Wolverton
ROHNERVILLE AIRPORT
Rohnerville Airport
Radio Tower KNCR
Masons and IOOF Cemetery
623 Rohnerville
Water Tank
PACIFIC
Burners
BM 114
JOHNSON
Magnetic Declination
16° E
SCALE 1:24000
0 1 MILES
0 1000 YARDS
0 1 KILOMETER
44 94 000m
44 93 000m
44 92 000m
44 91 000m
44 90 000m
44 89 000m
10 4 04 000m
10 4 05 000m
10 4 06 000m
10 4 07 000m

URS

May 19, 2009

Ms. Vicky Bates
North Coastal Information Center
Yurok Tribe
15900 Highway 101 N
Klamath, CA 95548

RE: Fortuna Burn Dump, Record Search Request

Dear Ms. Bates,

URS Corporation has been retained by CIWMB to conduct environmental and archaeological constraints analysis of the Fortuna Burn Dump site, 4498 Mill Street, community of Rohnerville, Fortuna, CA. This analysis will encompass an approximate 9 acre area surrounding the burn dump, which is located in Township 2N, Range 1E, SW ¼ of Section 7, as depicted on the attached USGS Hydesville, CA topographic map. This letter serves as a request for a priority-response records search and literature review for archaeological, historical, or National and California Register properties within a one-mile radius of the project area. We would appreciate copies of any cultural resources sites and survey reports for the record search area.

If you have any questions regarding the project, please contact me at 530-893-9675. Thank you for your assistance.

Sincerely,

URS Corporation

Elena Nilsson

Elena Nilsson
Principal Archaeologist

URS Corporation
1550 Humboldt Road, Suite 2
Chico, CA 95928
Tel: 530.893.9675
Fax: 530.893.9682

California Historical Resources Information System

CONFIDENTIAL RECORDS SEARCH REQUEST FORM

Date: May 19, 2009 Access Agreement Number: ______

TO: North Coastal Information Center

Name: Elena Nilsson

Affiliation: URS Corporation

Address: 1550 Humboldt Road, Ste. 2

City: Chico State: CA Zip: 95928

Email: elena_nilsson@urscorp.com

Phone: 530-893-9675 Cell Phone: ______ Fax: 530-893-9682

Project Name / Reference: Fortuna Burn Dump

Project Street Address: 4498 Mill Street, Fortuna, CA

Project Description: Enivornmental Constraints Analysis for biology and cultural resources

County: Humboldt

USGS 7.5' Quad: Hydesville, CA

Township/Range/Section or UTMs: T2N, R1E, SW 1/4 of Section 7, HM

PRIORITY RESPONSE (Additional Fee): ◉yes / ◯no

EMERGENCY RESPONSE (Additional Fee): ◯yes / ◯no

TOTAL FEE NOT TO EXCEED: $ 300.00

Special Instructions: Please see attached map for record search area. Requesting search for a 1-mile area.

California Historical Resources Information System

CONFIDENTIAL RECORDS SEARCH REQUEST FORM (continued)

Include the following information (check as necessary) for the records search area shown on the attached map. Any selection left unmarked will be considered a "0" or a "no."

Map of Resource Locations:	within search area	[x] yes	[ ] no
	within 1 mi radius	[x] yes	[ ] no
Resource Database Printout:	within search area	[x] yes	[ ] no
	within 1 mi radius	[x] yes	[ ] no
Copy of Resource Records:	within search area	[x] yes	[ ] no
	within 1 mi radius	[x] yes	[ ] no
Map of Report Locations:	within search area	[x] yes	[ ] no
	within 1 mi radius	[x] yes	[ ] no
Report Database Printout:	within search area	[x] yes	[ ] no
	within 1 mi radius	[x] yes	[ ] no
Copy of Entire Report:	within search area	[x] yes	[ ] no
	within 1 mi radius	[x] yes	[ ] no
Copy of Title Page Only:	within search area	[ ] yes	[x] no
	within 1 mi radius	[ ] yes	[x] no

		REVIEW	PROVIDE DOCUMENTATION
OHP Historic Properties Directory*:	within search area	[x] yes [ ] no	[ ] yes [ ] no
	within 1 mi radius	[x] yes [ ] no	[ ] yes [ ] no
OHP Archaeological Determinations of Eligibility:	within search area	[x] yes [ ] no	[ ] yes [ ] no
	within 1 mi radius	[x] yes [ ] no	[ ] yes [ ] no
California Inventory of Historical Resources (1976):	within search area	[x] yes [ ] no	[ ] yes [ ] no
	within 1 mi radius	[x] yes [ ] no	[ ] yes [ ] no

*Includes, but not limited to, information regarding National Register of Historic Places, California Register of Historical Resources, California State Historical Landmarks, California State Points of Historical Interest, and historic building surveys.

Listed below are sources of additional information that may be available at the Information Center. Indicate if a review and documentation of any of the following types of information is requested.

Caltrans Bridge Survey	[x] yes	[ ] no
Ethnographic Information	[x] yes	[ ] no
Historical Literature	[x] yes	[ ] no
Historical Maps	[x] yes	[ ] no
Local Inventories	[x] yes	[ ] no
Plat Maps	[x] yes	[ ] no
Shipwreck Inventory	[x] yes	[ ] no
Soil Survey Maps	[x] yes	[ ] no

Appendix B

Records Search Results

CALIFORNIA HISTORICAL RESOURCES INFORMATION SYSTEM	DEL NORTE and HUMBOLDT COUNTIES	North Coastal Information Center Yurok Tribe 15900 Hwy 101 North Klamath, California 95548 Phone(707) 482-1822

May 28, 2009

File Number: Nilsson 09-01

Elena Nilsson, Principal Archaeologist
URS Corporation
1550 Humboldt Road, Ste 2
Chico, CA 95928

RE: Fortuna Burn Dump, Section 7, T2N, R1E, Hydesville Quad

Dear Ms. Nilsson,

Per your request of May 21, 2009, a Rapid Response records search was conducted for the area that you indicated on the attached map. This record search included review of previous studies conducted in the vicinity of the project, review of any previously recorded site records (archeological and historic), review of historic maps, and review of applicable historic and ethnographic documents.

Previous Studies Conducted in Vicinity
The following reports and accompanying survey areas have been plotted on your attached map in green. Any relevant information is summarized below.

S-19432	No sites.
S-20874	No sites.
S-23002	No sites.
S-23208	No sites.
S-23280	No sites.
S-23527	No sites.
S-24271	No sites.
S-24272	No sites.
S-24277	No sites.
S-24370	No sites.

Historic and Cultural Resources
This office does not have records of previously recorded historic resources that have been found in or near your project area.

Literature Review
The following literature and maps were reviewed for possible unrecorded historic resources. No further information was obtained from these sources.

Ethnography & Archaeology of the Wiyot Territory (Loud)	No sites.
Place Names of Humboldt County (Turner)	No sites.
California Inventory of Historic Resources (OHP)	No sites.

California Historic Property Inventory (OHP)	No sites.
1855 GLO Land Plat Map	No sites.

Recommendations

These recommendations are based only on the information on file in this office. There is always the possibility that additional documents and records exist elsewhere or that unrecorded historic and cultural resources exist within your project area.

We predict that there is a **low to moderate** probability of finding sites or other evidence of human cultural activity in your project area. Please be advised that the locations of historic and cultural resources do not always follow predictive patterns.

Your project area has not been surveyed.

Thank you for your efforts to preserve Northwest California historic and cultural resources. Should you have further questions concerning your project or this correspondence please do not hesitate to call us at (707) 482-1822.

Sincerely,

Vicky Bates

Vicky Bates, Interim Coordinator
North Coastal Information Center

BIBLIOGRAPHY

S-19432

1997 Grunden, Paul. Confidential Archaeological Addendum for Timber Operations on Non-Federal Lands in California for the Golf Course THP. On file at North Coastal Information Center.

S-20874

1998 Gary, Mark. Archaeological Review of 1-98NTMP-025 HUM (Oliveira). On file at North Coastal Information Center.

S-23002

1998 Elsbree, Andrew. Confidential Archaeological Addendum for Timber Operations on Non-Federal Lands in California for the Seneca THP. On file at North Coastal Information Center.

S-23208

1999 Elsbree, Andrew. Confidential Archaeological Addendum for Timber Operations on Non-Federal Lands in California for the Seneca NTMP. On file at North Coastal Information Center.

S-23280

2000 Elsbree, Andrew. Confidential Archaeological Addendum for Timber Operations on Non-Federal Lands in California for the Dick Smith THP. On file at North Coastal Information Center.

S-23527

1999 Carroll, Chris. Confidential Archaeological Addendum for Timber Operations on Non-Federal Lands in California for the Boomer NTMP. On file at North Coastal Information Center.

S-24271

1998 Hess, Keith and Pierper, John E. Confidential Archaeological Addendum for Timber Operations on Non-Federal Lands in California – Middleton*Mill St. MTHP 1-98-339. On file at the North Coastal Information Center.

S-24272

1998 Hiney, William H. Confidential Archaeological Addendum for Timber Operations on Non-Federal Lands in California-Oliverira NTMP 1-98NTMP-026. On file at the North Coastal Information Center.

S-24277

2005 Carroll, Chris. An Archaeological Survey Report for the Mill Creek Timber Harvest Plan, Humboldt County, California, 1-05-012. On file at the North Coastal Information Center.

S-24370

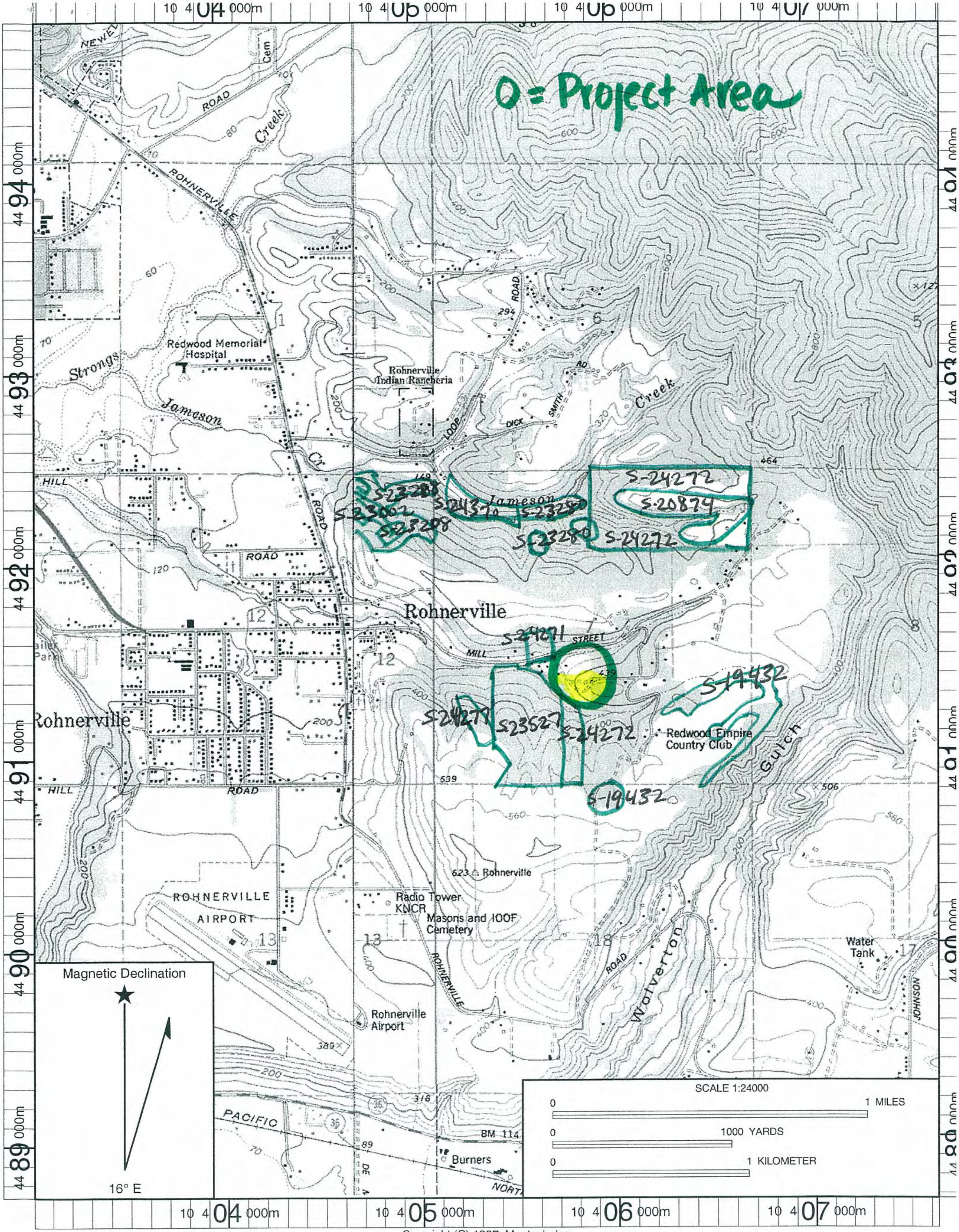
2006 Blair, Thomas. An Archaeological Survey Report for the Walker Timber Harvesting Plan, Humboldt County, California 1-06-128. On file at the North Coastal Information Center.

Loud, L.L.
1918 Ethnography and Archaeology of the Wiyot Territory. Univeristy of California Publications in American Archaeology and Ethnology. 14(3): 221-436. Berkeley.

Turner, Dennis
1993 Place Names of Humboldt County, California. A Compendium 1542-1992. Eureka Printing Company. Eureka, CA.

Office of Historic Preservation
2003 California Historic Property Inventory. On file at North Coastal Information Center.

Office of Historic Preservation
2003 California Inventory of Historic Resources. On file at North Coastal Information Center.


O = Project Area
S-24272
S-20874
S-23280
S-23002
S-23298
S-24370
S-24271
S-19432
S-24279
S-23527
Rohnerville
Rohnerville Indian Rancheria
Redwood Memorial Hospital
Redwood Empire Country Club
ROHNERVILLE AIRPORT
Rohnerville Airport
Radio Tower KNCR
Masons and IOOF Cemetery
Water Tank
Magnetic Declination
16° E
SCALE 1:24000
0 1 MILES
0 1000 YARDS
0 1 KILOMETER

Appendix C

Archaeological Site Record

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary #
HRI #
Trinomial CA-HUM-
NRHP Status Code 7

Other Listings
Review Code   Reviewer   Date

    *Resource Name or #: Fortuna Burn Dump

P1. Other Identifier:
***P2. Location:** ☒ Not for Publication ☐ Unrestricted   ***a. County:** Humboldt
and (P2b and P2c or P2d. Attach a Location Map as necessary.)
***b. USGS 7.5' Quad:** Hydesville   **Date:** 1975   T2N; R1E; SE ¼ **of** NE ¼ **of** SW ¼ **of Sec** 7 ; M.D.**B.M.**
c. Address: 4498 Mill Street, Community of Rohnerville   City: Fortuna   Zip: 95540
d. UTM: Zone: 10 ; 405816 mE/ 4491334 mN (G.P.S. / NAD83)
e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate) Elevation: 330-445 ft.

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)
This historic site, known as the Fortuna Burn Dump, contains buried and surficial waste materials dating primarily from the mid-1950s to 1972. The surface of the site is littered with non-combustible debris such as metal, glass, and ceramics, including bottles, tableware, bricks, automobile parts, and appliances. One concentration of automobile tires is also present. The site occurs on a 9.0 acre parcel, with the dump concentrated in a 5.6 acre area of steep, south and southwest facing hill slope. Besides the dump, several recent historic features are present, including concrete pads, skid roads, several artifical terraces, and two small structures. A portable sawmill, lumber piles, a logging truck, a boat, and several automobiles are also found on the property. Tall springboard stumps common to the surrounding forest occur within the dump, with the most recent logging of secondary growth dating to 1995.

***P3b. Resource Attributes:** AH4 (Dump)
***P4. Resources Present:** ☐Building ☐Structure ☐Object ☒Site ☐District ☐Element of District ☐Other (Isolates, etc.)

P5b. Description of Photo: (View, date, accession #) Appliance dump on slope, looking west. 6/9/2009.

***P6. Date Constructed/Age and Sources:** ☒Historic ☐Prehistoric ☐Both
ca. 1955-1972

***P7. Owner and Address:**
Patrick Thompson
4498 Mill Street
Fortuna, CA 95540

***P8. Recorded by:**
Russell W. Bevill
URS Corporation
1550 Humboldt Road, Suite 2
Chico, CA 95928

***P9. Date Recorded:** 6/9/2009
***P10. Survey Type:**
Intuitive pedestrian survey.

***P11. Report Citation:** Bevill, Russell (2009) *Archaeological Survey and Evaluation of the Fortuna Burn Dump, Community of Rohnerville, Humboldt County, California.* URS Corporation, Chico.

***Attachments:** ☐NONE ☒Location Map ☒Sketch Map ☒Continuation Sheet ☐Building, Structure, and Object Record ☒Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☒Artifact Record ☒Photograph Record ☐ Other (List):

*A1. Dimensions: a. Length: **170 m.** (N/S) × b. Width: **160 m.** (E/W) / 558 ft. (N/S) x 525 ft. (E/W)
Method of Measurement: ☒ **Paced** ☐ **Taped** ☐ **Visual estimate** ☒ **Other:** topographic maps
Method of Determination (Check any that apply.): ☒ **Artifacts** ☒ **Features** ☐ **Soil** ☐ **Vegetation** ☒ **Topography** ☒ **Cut bank** ☐ **Animal burrow** ☐ **Excavation** ☐ **Property boundary** ☐ **Other (Explain):**

Reliability of Determination: ☐ **High** ☒ **Medium** ☐ **Low** **Explain:** Dense vegetation over much of site.

Limitations (Check any that apply): ☐ **Restricted access** ☐ **Paved/built over** ☐ **Site limits incompletely defined** ☒ **Disturbances** ☒ **Vegetation** ☐ **Other (Explain):**

A2. Depth: 6 inches to 16 feet ☐ **None** ☐ **Unknown** **Method of Determination:** Trenching
*A3. Human Remains: ☐ **Present** ☒ **Absent** ☐ **Possible** ☐ **Unknown (Explain):**

*A4. Features **(Number, briefly describe, indicate size, list associated cultural constituents, and show location of each feature on sketch map.):** Two wooden storage sheds occur on the property, each measuring approximately 10-x-20 ft. in size. Also noted three concrete slab foundations at the northwest corner of the property, on the property line marked by several fenceposts. One slab measures roughly 6-x-10 ft. in size, while the other two slabs are about 25 ft. long by 5 ft. wide. These slabs may be associated with the solid waste transfer station once located on the property. Several skid roads crossing the slope of the main dump area were likely bladed for recent logging of the property.

*A5. Cultural Constituents **(Describe and quantify artifacts, ecofacts, cultural residues, etc., not associated with features.):** See attached Artifact List.
*A6. Were Specimens Collected? ☒ **No** ☐ **Yes (If yes, attach Artifact Record or catalog and identify where specimens are curated.)**
*A7. Site Condition: ☒ **Good** ☐ **Fair** ☐ **Poor (Describe disturbances.):** Recent dumping and past logging activities.
*A8. Nearest Water **(Type, distance, and direction.):** South Fork Mill Creek – seasonal stream located along south edge of site.
*A9. Elevation: 330-445 ft. amsl.
A10. Environmental Setting (Describe culturally relevant variables such as vegetation, fauna, soils, geology, landform, slope, aspect, exposure, etc.): The site is located on a hill slope on the north side of the South Fork Mill Creek, a tributary of the Eel River. The site is underlain by the Hookton Formation and younger terrace deposits that overlie the Carlotta Formation. The Hookton Formation consists primarily of non-marine, poorly-consolidated clay, sand, and gravel. Explorations within the site revealed silty clay, sandy silty clay, and clayey silt with some gravel and cobbles (CIWMB 2007:11). Cobbles exposed on the site include sandstone, siltstone, and chert. The site occurs within a secondary growth redwood forest. The overstory includes coast redwood, Douglas fir, grand fir, red elderberry, Pacific waxmyrtle, California bay, black cottonwood, and willow. Several introduced fruit trees are also present, including fig, apple, and cherry. The understory includes poison hemlock, cow parsnip, wild mustard, honeysuckle, coyote brush, huckleberry, California blackberry, salmonberry, thimbleberry, wild rose, thistles, ivy, sword fern, cattail, and horsetail. Grasses include rattlesnake grass, Bermuda grass, orchard grass, ryegrass, bromes, and chess.

A11. Historical Information: see Continuation Sheet

*A12. Age: ☐ **Prehistoric** ☐ **Protohistoric** ☐ **1542-1769** ☐ **1769-1848** ☐ **1848-1880** ☐ **1880-1914** ☐ **1914-1945** ☒ **Post 1945** ☐ **Undetermined** Describe position in regional prehistoric chronology or factual historic dates if known: The burn dump was established in the middle to late 1950s and was operated until 1972. From 1972 until 1987, the site was used as a solid waste transfer station (CIWMB 2007:2).

A13. Interpretations (Discuss data potential, function[s], ethnic affiliation, and other interpretations): Modern historic dump site containing waste from the Fortuna area.
A14. Remarks: None
A15. References (Documents, informants, maps, and other references): California Integrated Waste Management Board (CIWMB) 2007, Site Investigation Report: Fortuna Burn Dump, 4498 Mill Street, Community of Rohnerville, Fortuna, CA 95540. Sacramento.
A16. Photographs (List subjects, direction of view, and accession numbers or attach a Photograph Record.): Fortuna Burn Dump Digital Photos, Frames 1-73 (see attach Photograph Record).
Original Media/Negatives Kept at: URS Corpration, 1550 Humboldt Road, Chico, CA 95928
*A17. Form Prepared by: Russ Bevill Date: 6/17/2009
Affiliation and Address: **URS Corpration, 1550 Humboldt Road, Chico, CA 95928**

A11. Historical Information: This site operated as a burn dump, at least as early as the middle 1950s, under the ownership of Albert Nichols. The owners from 1959 to 1975 were William Sproat and Milton Nichols. From 1959 to 1972, Mr. Sproat provided a municipal solid waste collection service for the Fortuna area under the name of Eel River Garbage Company. The wastes were deposited near the slope and were burned to reduce volume. The remaining waste and ash were then pushed down onto the slope towards the South Fork Mill Creek. In 1972, burning of waste ceased at the site and the dump became a waste transfer station operated by the Eel River Garbage Company, for the Table Bluff Sanitary Landfill. Truck hauled the waste to a concrete pad at the site and dumped it through a chute into 55-cubic yard bins located below. The bins were removed to the landfill on a daily basis. Operations at the site ended in 1987 when the company was sold and became Eel River Disposal. Mr. Sproat owned the site solely from 1975 to 1981, and from 1981 to 1998, the site was owned by Lilyann Sproat. The southern portion of the property, including the main dump slope, was logged in 1995. The property currently belongs to Patrick Thompson, the owner of Thompson Timber Company (CIWMB 2007:1-2).

Exposed artifact concentration at skid road below slope.

Primary #
HRI#
Trinomial CA-HUM-

 *Resource Name or # **Fortuna Burn Dump**

*Recorded by: **Russ Bevill** *Date: **6/9/2009** ☒ **Continuation** ☐ **Update**

Ceramic coffee mug base.

Ceramic saucer base.

Resource Name or #: Fortuna Burn Dump

Location Where Collected Specimens are Curated: n/a

A5. The following artifacts were noted within an exposed concentration of burnt and unburnt materials at the base of the open slope, most located atop the skid road that runs parallel to the South Fork Mill Creek:

- milk glass threaded top cold cream type jars, one embossed "Oven/Fire King/Ware".
- Broken Fiesta Ware bowls and plates (red, green, yellow).
- Franciscan Ware ceramic china fragments "Made in California"
- White seramic hotelware sauce with green stripes, marked "WALLACE / CHINA / 12-S / LOS ANGELES, CALIF/®"
- Cream colored stoneware coffee mug with red stripes, marked "SANTONE / WARWICK CHINA / 1947 S / MADE IN USA".
- Tan colored ceramic saucer marked "TEPCO / U.S.A. / CHINA".
- Ceramic crock pot fragments.
- Porcelain electrical insulators.
- Red clay bricks and tan clay fire bricks.
- Aqua glass canning jar fragments.
- Ketchup, mustard, and other condiment bottles of clear glass with threaded tops.
- Decorative ceramic figurine fragments.
- Clay flower pot fragments.
- A variety of brown and clear glass bleach bottles, including "PUREX" and "CLOROX" brands.
- Broken "Coca-Cola" bottles.
- Liquor and medicinal bottles of clear, green, and amber glass (including Anchor Hocking, Owens-Illinois, Hazel-Atlas, and T.C. Wheaton Company glass makers' marks).
- Clear glass bottles with threaded metal caps embossed on the side with "ACE" below a spade symbol containing the letter "A". On the base occurs the mark "2¼ FL. OZ. / 244 / Ⓟ". These bottles measure 5" tall by 2¼" wide.
- Threaded top condiment jar of aqua colored glass embossed on the side with "THE A-1 SAUCE" and on the base with "Ⓟ / MAYFAIR BRAND & CO. LTD."
- A rubber hair comb.
- Saw cut cow bones.
- Leather shoe parts.
- A "GILLETTE" shaving cream aerosol can.
- Wire scraps.
- A light bulb.
- Enamelware and aluminum cooking pots.
- Aluminum beer cans, including "COORS" and "HAMM'S" brands.
- A metal "SPAM" can.
- Automotive parts.
- Metal appliances.
- Cut slate roofing tile fragments.

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PHOTOGRAPH RECORD

Primary #
HRI#
Trinomial CA-HUM-

 Resource Name or #: Fortuna Burn Dump **Year** 2009

Camera Format: Fujifilm Finepix S1000 Lens Size: 5.9-70.8 mm zoom
Film Type and Speed: Digital 10.0 megapixels Negatives Kept at: n/a

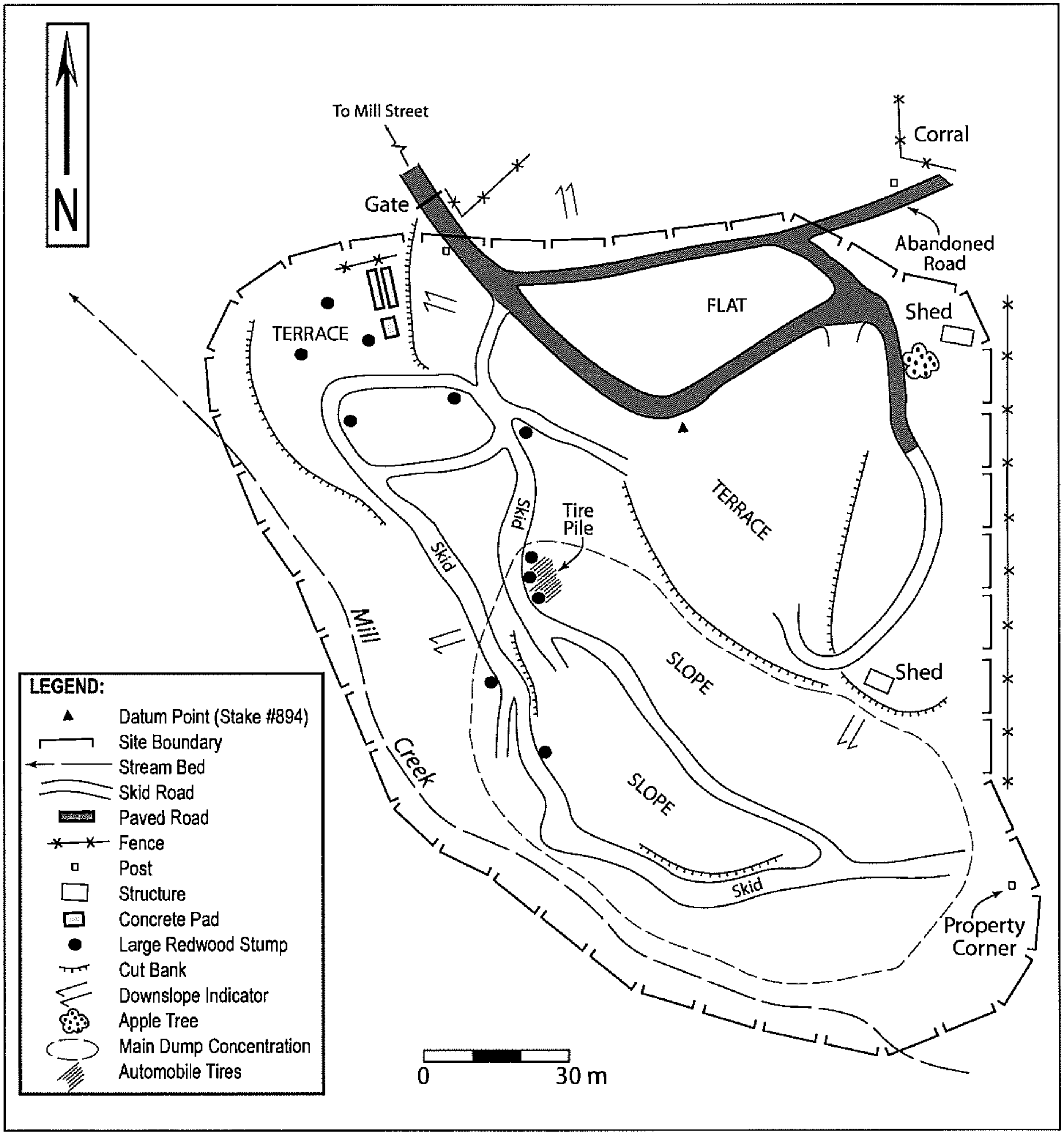
Mo.	Day	Time	Exp./Frame	Subject/Description	View Toward	Accession #
6	9	10:30	1	Red CCS biface from Hwy 36 area, shown by neighbors Gayle and Steve Rafferty.	Down	
6	9	10:30	2	Red CCS biface from Hwy 36 area, shown by neighbors Gayle and Steve Rafferty.	Down	
6	9	10:30	3	Red CCS biface from Hwy 36 area, shown by neighbors Gayle and Steve Rafferty.	Down	
6	9	10:35	4	Basalt projectile points from the Rafferty property, north of the burn dump.	Down	
6	9	11:00	5	Springboard stump above Rafferty house.	North	
6	9	11:00	6	Springboard stump above Rafferty house.	North	
6	9	11:15	7	Concrete foundation at NW end of dump.	East	
6	9	11:15	8	Concrete foundation at NW end of dump.	North	
6	9	11:15	9	Modern garbage discarded at foundations.	Northeast	
6	9	11:15	10	Modern garbage discarded at foundations.	East	
6	9	11:30	11	Lower skid road leading to main dump.	Southeast	
6	9	11:35	12	Automobile tire located above creek.	Southwest	
6	9	11:45	13	Overview of main dump slope from creek.	North	
6	9	11:45	14	Overview of main dump slope from creek.	East	
6	9	12:00	15	Artifact concentration.	East	
6	9	12:00	16	Artifact concentration.	North	
6	9	12:05	17	Ceramic crock pot fragment.	Down	
6	9	12:10	18	Appliances at main dump slope.	North	
6	9	1:00	19	Artifact collector pile on ground at red shed.	Down	
6	9	1:00	20	Bottles in trash can at red shed.	East	
6	9	1:05	21	Wildflowers near red shed.	Down	
6	9	1:10	22	Red storage shed above main dump slope.	South	
6	9	1:20	23	Appliance dump on slope below red shed.	West	
6	9	1:45	24	Older shed containing furniture, car parts, machinery, and other items.	North	
6	9	1:45	25	View of the older shed from access road.	East	
6	9	1:50	26	Thompson Timber Company truck.	North	
6	9	2:00	27	Portable sawmill on large terrace above main dump slope.	South	
6	9	2:30	28-73	Photos of wildflowers, grasses, and other plants within the dump area.	---	

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
SKETCH MAP

Primary #
HRI#
Trinomial CA-HUM-

*Resource Name or # **Fortuna Burn Dump**

*Drawn By: **Russ Bevill**
*Date: **6/9/2009**



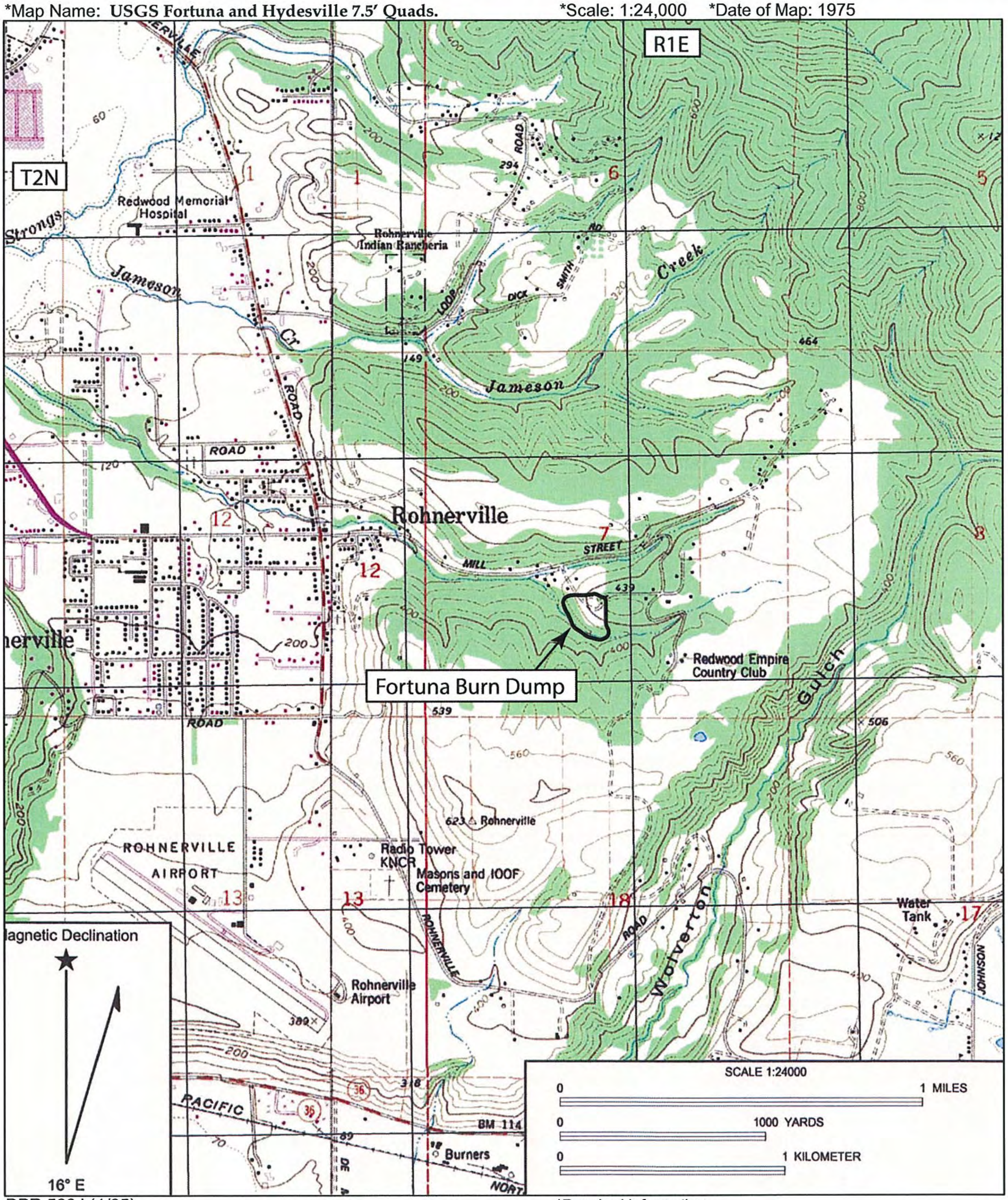
State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

LOCATION MAP

Primary #
HRI#
Trinomial **CA-HUM-**

*Resource Name or #: **Fortuna Burn Dump**

*Map Name: **USGS Fortuna and Hydesville 7.5′ Quads.** *Scale: 1:24,000 *Date of Map: 1975



STATE OF CALIFORNIA Arnold Schwarzenegger, Governor

NATIVE AMERICAN HERITAGE COMMISSION
915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-4082
Fax (916) 657-5390

October 12, 2009

Elena Nilsson
URS Corporation
1550 Humboldt Road, Suite 2
Chico, CA 95928

Sent by Fax: 530-893-9682
Number of Pages: 3

RE: Proposed Fortuna Burn Dump site, Fortuna, Humboldt County

Dear Ms. Nilsson:

A record search of the sacred lands file has failed to indicate the presence of Native American cultural resources in the immediate project area. The absence of specific site information in the sacred lands file does not indicate the absence of cultural resources in any project area. Other sources of cultural resources should also be contacted for information regarding known and recorded sites.

Enclosed is a list of Native Americans individuals/organizations who may have knowledge of cultural resources in the project area. The Commission makes no recommendation or preference of a single individual, or group over another. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. I suggest you contact all of those indicated, if they cannot supply information, they might recommend others with specific knowledge. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from any of these individuals or groups, please notify me. With your assistance we are able to assure that our lists contain current information. If you have any questions or need additional information, please contact me at (916) 653-4040.

Sincerely,

Karen

for: Katy Sanchez
Program Analyst

Native American Contact
Humboldt County
October 8, 2009

Blue Lake Rancheria
Claudia Brundin, Chairperson
P.O. Box 428 Wiyot
Blue Lake , CA 95525 Yurok
blrt@tidepool.com Tolowa
(707) 668-5101
(707) 668-4272 Fax

Bear River Band of Rohnerville Rancheria
Len Bowman, Jr., Chairperson
27 Bear River Drive Wiyot
Loleta , CA 95551 Mattole
lbowman@bearriver.com
(707) 733-1900
(707) 733-1972 Fax

Wiyot Tribe
Gail Green, Chairperson
1000 Wiyot Drive Wiyot
Loleta , CA 95551
wiyotone@yahoo.com
(707) 733-5055
(707) 733-5601 Fax

Wiyot Tribe THPO
Helene Rouvier, Tribal Historic Preservation Officer
1000 Wiyot Drive Wiyot
Loleta , CA 95551
cultural@wiyot.us
(707) 733-5055
(707) 733-5601 Fax

Bear River Band of Rohnerville Rancheria
Bruce Merson, Tribal Administrator
27 Bear River Drive Wiyot
Loleta , CA 95551 Mattole
(707) 733-1900
(707) 733-1972 (FAX)

Wiyot Tribe
Andrea Davis, Environmental Coordinator
1000 Wiyot Drive Wiyot
Loleta , CA 95551
(707) 733-5055
(707) 733-5601 Fax

Bear River Band of Rohnerville Rancheria
Edwin Smith, Environmental Coordinator/Cultural
27 Bear River Drive Wiyot
Loleta , CA 95551 Mattole
(707) 733-1900
(707) 733-1972 (FAX)

Blue Lake Rancheria
Arla Ramsey, Tribal Administrator
P.O. Box 428 Wiyot
Blue Lake , CA 95525 Yurok
blrt@tidepool.com Tolowa
(707) 668-5101
(707) 668-4272 Fax

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources for the proposed Fortuna Burn Dump Site, Rohnerville; Humboldt County.

Native American Contact
Humboldt County
October 8, 2009

Blue Lake Rancheria THPO
Janet Eidsness, Historic Preservation Officer
P.O. Box 428 Wiyot
Blue Lake , CA 95525
jeidsness@bluelakerancheria-nsn.
(707) 668-5101 ext 329
707-668-4272

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources for the proposed Fortuna Burn Dump Site, Rohnerville; Humboldt County.

RESPONSE SHEET

Cultural Resource Inventory
Fortuna Burn Dump, 4498 Mill Street, Rohnerville

Name: Janet Eidsness

Affiliation: THPO for Blue Lake Rancheria Tribes

☐ I have no cultural resources concerns for the project.

☐ I have cultural resources concerns for the project.

☐ I can identify cultural resources which may be affected by the project.

☑ I can refer others who can identify cultural resources that may be affected by the project.

Referrals:

Name: Nick Angeloff, THPO for Bear River Band
Address: 25 Bear River Dr.
Loleta CA 95551
Phone: (707) 407-6205 Cell

Name: Maura Eastman - Tribal Admin, Wiyot Tribe
Address: 1000 Wiyot Drive
Loleta CA 95551
Phone:

Comments: Project is located outside Tribe's area of geographic concern for cultural resources

BEAR RIVER BAND of ROHNERVILLE RANCHERIA
27 BEAR RIVER DR. LOLETA, CA 95551 707.733.1900, fax 733.1972

11-17-09

Russ Bevill
URS Corporation
1550 Humboldt Road, Suite 2
Chico, CA 95928

RE: APN Fortuna Burn Dump

Dear, Mr. Bevill

We have no knowledge of any cultural resources within your project area and have no further comment regarding this project. If you identify cultural resources during your survey or project implementation please inform us and send copies of the appropriate site forms for our records. If you have any questions please contact our THPO Asst. Eli Sanderson at 707-733-1900 x229.

Sincerely,

11/17/2009

X

Nick Angeloff
THPO

thpo@bearrivertribe.com

RESPONSE SHEET

Cultural Resource Inventory
Fortuna Burn Dump, 4498 Mill Street, Rohnerville

Name: Elijah Sanderson

Affiliation: Archaeological TECH

- [x] I have no cultural resources concerns for the project.
- [ ] I have cultural resources concerns for the project.
- [ ] I can identify cultural resources which may be affected by the project.
- [ ] I can refer others who can identify cultural resources that may be affected by the project.

Referrals:

Name: ___

Address: ___

Phone: ___

Name: ___

Address: ___

Phone: ___

Comments: Mr. Angeloff my Supervisor Has no known intrest in the fortuna Burn Dump Site. We have Sent a letter to your address with our regaurds

thank you

El. S

THPO ASST.

APPENDIX E

PUBLIC NOTICE, COMMENTS RECEIVED, AND SUMMARY OF CHANGES

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PUBLIC NOTICE AND REVIEW

Pursuant to CEQA Guidelines Section 15105, CalRecycle issued a Notice of Availability and Notice of Intent to Adopt a Mitigated Negative Declaration for the Fortuna Dump Remediation Project Draft IS/MND. The Draft IS/MND was released for a 30-day public review and comment period beginning on March 26, 2013, and ending April 24, 2013. For reference, the Notice of Availability and Notice of Intent to Adopt a Mitigated Negative Declaration for the Fortuna Dump Remediation Project Draft IS/MND and the newspaper publication affidavit are enclosed below.

COMMENTS RECEIVED

During the public review and comment period, one letter was received:

- **California Office of Planning and Research (OPR)** – The letter from the California OPR acknowledged the close of the public review period and indicated that no state agencies had submitted comments. The California OPR review is identified as SCH# 2013032064 and their response letter is provided below.

No other written comments from governmental agencies or the public were received during the 30-day comment period, and no response to the California OPR is necessary.

SUMMARY OF CHANGES

The Final IS/MND contains minor revisions to the Draft IS/MND as indicated below. New information added is shown in double underlined text. There were no deletions to the Draft IS/MND text.

The following paragraph was added to Section 1, *Introduction and Project Description*, Subsection 1.5.2, *Construction Details*:

Since the preparation of the Draft IS/MND, there is a minor revision to the proposed construction action. This revision includes the removal of approximately four pieces of debris observed within Mill Creek. These items are approximately three- by four-feet in size and are characterized as metal tanks and tires. They would be removed by hand or with mechanical equipment with an extended gripping attachment. The machine would be situated outside the creek's ordinary high water mark, which will be clearly marked by a qualified ecologist as part of previously proposed construction-period actions and monitoring measures. These objects would also be collected, removed, and recycled, disposed at an appropriate disposal site, or left within the project site to be crushed and buried.

The following paragraphs were added to Section 1, *Introduction and Project Description*, Subsection 1.6, *Required Approvals*:

Regarding the removal of approximately four pieces of debris within Mill Creek, Mr. Kelley Reid of the U.S. Army Corps of Engineers (Department of the Army), Eureka Field Office, has indicated, that due to the number and location of debris in Mill Creek, the type of debris to be removed, and the proposed removal methods, no Department of the Army permit or other authorization is required relative to their jurisdiction under Section 404 of the Clean Water Act (Reid, 2013).

With regard to California Department of Fish and Wildlife responsibility under the Fish and Game Code (Section 1602), the proposed activity would not substantially divert or obstruct the natural flow of Mill Creek, or substantially change or use any material from the bed, channel or bank. No debris or waste would be deposited. For this reason, notification to this agency is not required regarding these modifications to the proposed project.

The change to the proposed project is minor, and consistent with CEQA Guidelines, Section 15073.5, does not require recirculation of the Draft IS/MND prior to adoption of the Mitigated Negative Declaration because a new, avoidable significant effect was not identified and no new mitigation measures, or other actions, are needed to reduce potential effects.

A Mitigation Monitoring and Reporting Program (MMRP) for the project that identifies the procedural steps of implementing the mitigation measures identified for the project was also added as Appendix F of the Final IS/MND.

Notice of Availability and Notice of Intent to Adopt a Mitigated Negative Declaration for the

CALIFORNIA DEPARTMENT OF RESOURCE RECYCLING AND RECOVERY FORTUNA DUMP REMEDIATION PROJECT

Pursuant to the California Environmental Quality Act (CEQA) Guidelines Section 15105, the California Department of Resource Recycling and Recovery (CalRecycle) has issued this notice to inform you of the availability of the Draft Initial Study/Mitigated Negative Declaration (IS/MND) prepared for the Fortuna Dump Remediation Project (proposed project). The document is available for public review and comment and copies of this document have been sent to the County of Humboldt County Clerk and the State Clearinghouse for mandatory review under CEQA. Preparation of a Draft IS/MND does not represent a decision by CalRecycle to approve the proposed project. The Draft IS/MND will be considered for adoption and the proposed project will be considered for approval by CalRecycle.

The project site is approximately 9 acres, with the inactive burn dump area covering 5.6 acres. The project proposes re-grading the 5.6-acre burn dump area and relocating some existing burn dump material to outside of the current burn dump footprint to improve the underlying slope stability increasing the size of the burn dump area to a total of six acres. The project impact area would be capped with up to two-feet of soil or approximately 11,000 CY of imported soil. In addition, debris that is located adjacent to Mill Creek would be relocated within the project impact area and a 30-foot buffer created between the edge of the cap and Mill Creek. Gabions would be constructed to reduce the potential for soil cap erosion and possible contamination to the creek. A surface drainage pattern would be created diverting the flow of water to the perimeter of the soil cap. In addition, two soil berms and gabion retaining walls would be constructed to further stabilize the cap.

Upon placement of the cap, a vegetative cover of native grasses and small shrubs would be established to help limit erosion. No operational uses are proposed.

The Draft IS/MND indicates that the proposed project would not result in potentially significant impacts that cannot be mitigated to a less-than-significant level. As such, CalRecycle, as the lead agency, is prepared a Mitigated Negative Declaration. Copies of the Draft IS/MND may be reviewed at County of Humboldt Planning Department located at 3015 H Street, Eureka, CA. Copies are also available for review at the Humboldt County Library at the Fortuna Branch Library, 753 14th Street, Fortuna, and the Humboldt County Library Main Library, 1313 3rd Street, Eureka, California.

Public Review of the Draft IS/MND begins on **March 26, 2013**, and ends 30 days after issuance of this document, by the close of business on **April 24, 2013**. Comments on the Draft IS/MND may be submitted during this public review period. All comments must be received by **5:00 p.m. on April 24, 2013**. Please submit any comments on the Draft IS/MND in writing to the name and address below:

Mr. Mustafe Botan
Waste Management Engineer
Department of Resources Recycling and Recovery (CalRecycle)
Waste Permitting, Compliance and Mitigation Division
1001 I Street, P.O. Box 4025
Sacramento, CA 95812-4025
Email: Mustafe.Botan@CalRecycle.ca.gov

The Times-Standard

PO Box 3580
Eureka, CA 95502
707-441-0571
legals@times-standard.com

URS CORPORATION
100 W. SAN FERNANDO ST ,SUITE 200
SAN JOSE CA 95113

PROOF OF PUBLICATION
(2015.5 C.C.P.)

STATE OF CALIFORNIA
County of Humboldt

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years, and not a party to or interested in the above-mentioned matter. I am the principal clerk of the printer of THE TIMES-STANDARD, a newspaper of general circulation, printed and published daily in the City of Eureka, County of Humboldt, and which newspaper has been adjudged a newspaper of general circulation by the Superior Court of the County of Humboldt, State of California, under the date of June 15, 1967, Consolidated Case Numbers 27009 and 27010; that the notice, of which the annexed is a printed copy (set in type not smaller than nonpareil), has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to-wit,

3/26/2013, 3/27/2013

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Dated at Eureka, California,
This 4th day of April, 2013

Signature

This space is for the County Clerk's Filing Stamp

Legal No. **0004811330**

Notice of Availability and Notice of Intent to Adopt a Mitigated Negative Declaration for the CALIFORNIA DEPARTMENT OF RESOURCE RECYCLING AND RECOVERY FORTUNA DUMP REMEDIATION PROJECT

Pursuant to the California Environmental Quality Act (CEQA), the California Department of Resource Recycling and Recovery (CalRecycle) announces the availability of a Draft Initial Study/Mitigated Negative Declaration (IS/MND) for its proposed Fortuna Dump Remediation Project in Fortuna, California. CalRecycle proposes to re-grade a 9-acre burn dump area and relocate material to improve slope stability. The affected area would be capped with up to two-feet of imported soil. Gabions would reduce erosion to Mill Creek and surface drainage would be diverted to the perimeter of the soil cap; a vegetative cover of native grasses and small shrubs would be established. No operational uses are proposed.

A Draft IS/MND is available for public review at the County of Humboldt Planning Department located at 3015 H Street, Eureka, CA. Copies are also available at the Humboldt County Library's Fortuna Branch at 753 14th Street in Fortuna and the Main Library at 1313 3rd Street in Eureka, California. A 30-day public review period to receive written comments on the Draft IS/MND begins March 26, 2013 and ends April 24, 2013. Written comments will be considered prior to adoption of the Draft IS/MND and must be received prior to 5:00 p.m. on April 24, 2013. You may direct written comments to Mr. Mustafe Botan, CalRecycle, Waste Permitting, Compliance and Mitigation Division, 1001 I Street, Sacramento, CA 95812, or via email to: Mustafe.Botan@CalRecycle.ca.gov.
3/26,27

STATE OF CALIFORNIA

GOVERNOR'S OFFICE *of* PLANNING AND RESEARCH

STATE CLEARINGHOUSE AND PLANNING UNIT

EDMUND G. BROWN JR.
GOVERNOR

KEN ALEX
DIRECTOR

April 25, 2013

Mustafe Botan
California Department of Resources Recycling and Recovery
1001 I Street
Sacramento, CA 95812

Subject: Fortuna Dump Remediation Project
SCH#: 2013032064

Dear Mustafe Botan:

The State Clearinghouse submitted the above named Mitigated Negative Declaration to selected state agencies for review. The review period closed on April 24, 2013, and no state agencies submitted comments by that date. This letter acknowledges that you have complied with the State Clearinghouse review requirements for draft environmental documents, pursuant to the California Environmental Quality Act.

Please call the State Clearinghouse at (916) 445-0613 if you have any questions regarding the environmental review process. If you have a question about the above-named project, please refer to the ten-digit State Clearinghouse number when contacting this office.

Sincerely,

Scott Morgan
Scott Morgan
Director, State Clearinghouse

RECEIVED
APR 30 2013
By__________________

Document Details Report
State Clearinghouse Data Base

SCH#	**2013032064**
Project Title	Fortuna Dump Remediation Project
Lead Agency	Resources Recycling and Recovery, Department of

Type **MND** Mitigated Negative Declaration

Description The project site is approximately 9-acres with the inactive burn dump area covering 5.6 acres. The project proposes re-grading the 5.6-acre burn dump area and increasing the size of the burn dump area to a total of six acres. The project impact area would be capped with up to two-feet of soil or approximately 11,000 CY of imported soil. Debris that is located adjacent to Mill Creek would be relocated within the project impact area and a 30-foot buffer created between the edge of the cap and Mill Creek. Gabions and soil berms would be constructed to reduce the potential for soil cap erosion and possible contamination to the creek. A new drainage pattern would be created diverting the flow of water to the perimeter of the soil cap. A vegetative cover of native grasses and small shrubs would be established to help limit erosion. No operational uses are proposed.

Lead Agency Contact

Name	Mustafe Botan		
Agency	California Department of Resources Recycling and Recovery		
Phone	916 341 6367	***Fax***	
email			
Address	1001 I Street		
City	Sacramento	***State*** CA	***Zip*** 95812

Project Location

County	Humboldt						
City	Fortuna						
Region							
Lat / Long	40° 34' 2" N / 124° 6' 45" W						
Cross Streets	Mill Street and Pinecrest Drive						
Parcel No.	202-321-13						
Township	2N	***Range***	1E	***Section***	7	***Base***	

Proximity to:

Highways	US Route 101
Airports	Rohnerville Airport
Railways	
Waterways	Mill Creek and Eel River
Schools	Toddy Thomas ES
Land Use	County of Humboldt General Plan designation: Agriculture and Suburban; it's zoned Residential Suburban (RS)

Project Issues Air Quality; Archaeologic-Historic; Biological Resources; Geologic/Seismic; Noise; Soil Erosion/Compaction/Grading; Traffic/Circulation; Vegetation; Wetland/Riparian

Reviewing Agencies Resources Agency; Department of Fish and Wildlife, Region 1E; Cal Fire; Department of Parks and Recreation; Department of Water Resources; Caltrans, Division of Aeronautics; California Highway Patrol; Caltrans, District 1; Regional Water Quality Control Board, Region 1; Department of Toxic Substances Control; Native American Heritage Commission; State Lands Commission

Date Received 03/26/2013 ***Start of Review*** 03/26/2013 ***End of Review*** 04/24/2013

Note: Blanks in data fields result from insufficient information provided by lead agency.

APPENDIX F

MITIGATION MONITORING AND REPORTING PROGRAM

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MITIGATION MONITORING AND REPORTING PROGRAM

This Mitigation Monitoring and Reporting Program (MMRP) for the Fortuna Dump Remediation Project Initial Study/Mitigated Negative Declaration (IS/MND) (SCH# 2013032064) was prepared in accordance with the California Environmental Quality Act (CEQA) and is designed to aid in the implementation of necessary and appropriate mitigation measures during various phases of the proposed project, when relevant. Table 1, Mitigation Monitoring and Reporting Program, includes those measures necessary to ensure that anticipated impacts would be less than significant.

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Table 1, Mitigation Monitoring and Reporting Program

Mitigation Number	Mitigation Measure	Responsible Party	Mitigation Timing	Implementation Procedures
BIO-1	Prior to initiating any construction activity during the nesting period (February 1 to August 31), a pre-construction nesting bird survey for the presence of raptors and Migratory Bird Treaty Act (MBTA) species shall be conducted by a qualified biologist within 30 days prior to construction activities to establish the status of these species on the project site and identify any active nests within 200 feet of the project site. If ground-disturbing activities are delayed or suspended for more than 30 days after the pre-construction survey during the nesting period, the site shall be resurveyed. If occupied raptor nests or other nesting MBTA species are observed within 200 feet of the proposed project site, the USFWS shall be consulted to develop measures, including establishing an appropriate buffer distance to avoid disturbance of nesting species, prior to the initiation of any construction activities. If nesting raptors or MBTA species are discovered within 200 feet of the project site after initiation of ground disturbing activities, then notification shall be provided to the USFWS.	CalRecycle	If project construction is scheduled between February 1 and August 31, conduct survey 30-days prior to construction activities.	If nesting birds are found, establish buffer distance in consultation with USFWS and notification shall be provided to USFWS. Retain results of survey in project file.
BIO-2	A CDFW-approved biologist shall be present on site during all construction activities within 50 feet of Mill Creek where there is habitat for northern red-legged frog and foothill yellow-legged frog. If either amphibian species is found, all work shall cease until the identified frog leaves the work area.	CalRecycle	During construction activities	CDFW-approved biologist shall be present on site. Retain biologist's monitoring log in project file.
BIO-3	Prior to any construction activity, the wetland areas shall be clearly marked by a qualified biologist using readily	CalRecycle	Prior to and during	Qualified biologist shall clearly mark wetland areas with fencing

Table 1, Mitigation Monitoring and Reporting Program

Mitigation Number	Mitigation Measure	Responsible Party	Mitigation Timing	Implementation Procedures
	visible temporary construction fencing that shall be maintained throughout the construction period. All construction activities and deposition of imported soil material shall avoid any degradation of wetlands functions, including reduced water quality due to erosion or run-off from adjacent construction activities.		construction activities	and maintained during construction activities. Retain biologist's monitoring log in project file.
CR-1	An inadvertent discovery clause for paleontological resources shall be incorporated into the construction contract for the proposed project. CalRecycle shall notify a qualified paleontologist of unanticipated discoveries, made by construction personnel and subsequently document the discovery as needed. In the event of an unanticipated discovery of a breas, true, and/or trace fossil during construction, excavations within 50 feet of the find shall be temporarily halted or diverted until the discovery is examined by a qualified paleontologist. The paleontologist shall notify the appropriate agencies to determine procedures that shall be followed before construction is allowed to resume at the location of the find.	CalRecycle	Prior to construction	Include inadvertent discovery clause in construction contracts. Confirm clause included in bid documents. Implement CR-1; if necessary. Document compliance in project file.
CR-2	If human remains of Native American origin are discovered during project construction, it is necessary to comply with state laws relating to the disposition of Native American burials, which fall within the jurisdiction of the NAHC (Public Resources Code Section 5097). If any human remains are discovered in any location on the project site, there shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human	CalRecycle	During construction activities	As per mitigation. Retain and document compliance in project file.

Table 1, Mitigation Monitoring and Reporting Program

MITIGATION NUMBER	MITIGATION MEASURE	RESPONSIBLE PARTY	MITIGATION TIMING	IMPLEMENTATION PROCEDURES

	remains until:
	• The Humboldt County coroner has been informed and has determined that no investigation of the cause of death is required; and
	• If the remains are of Native American origin:
	  ○ The descendants of the deceased Native Americans have made a recommendation regarding the disposition of remains and any associated grave goods, as provided in Public Resources Code Section 5097.98; or
	  ○ The NAHC was unable to identify a descendant or the descendant failed to make a recommendation within 24 hours after being notified.			

GEO-1	All site preparation and earth-work shall be completed under the observation of a qualified Geotechnical Engineer and in accordance with applicable Caltrans Standard Specifications, including Section 19, Earthwork. In addition, the construction contractor shall comply with the California Geological Survey's Guidelines for Evaluating and Mitigating Seismic Hazards in California (Special Publication 117), which specifically address the mitigation of liquefaction and landslide hazards in designated Seismic Hazard Zones. All recommendations of the geotechnical investigation shall be incorporated into project designs.	CalRecycle	During project design and construction activities	Confirm construction contractor complies with Geotechnical Study prepared for project. Confirm recommendations are incorporated into design and document in project file. Procure a qualified Geotechnical Engineer to conduct observations/monitoring and to prepare documentation, including recommendations for implementation. Retain

Table 1, Mitigation Monitoring and Reporting Program

Mitigation Number	Mitigation Measure	Responsible Party	Mitigation Timing	Implementation Procedures
				documentation in the project file.
N-1	The Construction Contractor shall implement, to the satisfaction of the County of Humboldt and to the greatest extent feasible, the following measures to ensure that, during construction, construction noise would be reduced by the greatest extent feasible when within 100 feet of a residential use or sensitive receptor: • Construction activities shall occur during daytime hours only on Monday through Saturday, except holidays, from 6:00 a.m. through 10:00 p.m. • Construction contracts shall specify that all construction equipment, fixed or mobile, shall be equipped with properly operating and maintained mufflers and other State required noise attenuation devices. • All construction equipment shall use the best available noise suppression devices and properly maintained mufflers. All internal combustion engines used in the project area shall be equipped with the type of muffler recommended by the vehicle manufacturer. In addition, all equipment shall be maintained in good mechanical condition to minimize noise created by faulty or poorly maintained engine, drive-train, and other components. • Construction noise reduction methods (i.e., shutting off idling equipment, installing temporary acoustic	Construction Contractor and County of Humboldt	Prior and during construction activities	Prepare and develop noise attenuation plan. Incorporate into construction contract specifications. Confirm measures and noise attenuation plan are included in bid documents. Post signs at construction site. Periodically inspect to ensure that measures and noise attenuation plan are implemented throughout construction activities. Notify nearby property owners per mitigation. Document notification in project file. Document compliance in project file.

Table 1, Mitigation Monitoring and Reporting Program

MITIGATION NUMBER	MITIGATION MEASURE	RESPONSIBLE PARTY	MITIGATION TIMING	IMPLEMENTATION PROCEDURES
	barriers around stationary construction noise sources, maximizing the distance between construction equipment staging areas and occupied residential areas, and use of electric air compressors and similar power tools, rather than diesel equipment) shall be employed where feasible. Staging of construction equipment and unnecessary idling of equipment shall be avoided whenever feasible. "Feasible," as used here, means that the implementation of this measure would not have a notable effect on construction operations or schedule. • Property owners and occupants located within 100 feet of the construction site shall be sent a notice, at least 15 days prior to commencement of construction, regarding the construction schedule of the proposed project. A sign, legible at a distance of 25 feet shall also be posted at the project construction site. All notices and signs shall be reviewed and approved by the City, prior to mailing or posting and shall indicate the dates and duration of construction activities, as well as provide a contact name and a telephone number where residents can inquire about the construction process and register complaints. • During construction, stationary construction equipment shall be placed such that emitted noise is directed away from sensitive noise receptors. • During construction, stockpiling and vehicle staging			

Table 1, Mitigation Monitoring and Reporting Program

Mitigation Number	Mitigation Measure	Responsible Party	Mitigation Timing	Implementation Procedures
	areas shall be located as far as practical from noise sensitive receptors. • The contractor shall develop and implement a construction noise attenuation plan to reduce noise-related impacts to nearby sensitive receptors to the degree feasible. • Signs shall be posted at the construction site that includes permitted construction days and hours and a contact number for noise complaints.			
TR-1	Prior to the commencement of construction activities, CalRecycle shall prepare a Construction Traffic Control Plan that would need to be approved by the City of Fortuna Public Works Department and the County of Humboldt Public Works Department. The Construction Traffic Control Plan shall include the following: • Construction-related truck traffic shall be scheduled to travel during non-peak hours (8:30 a.m. to 4:00 p.m.) on surrounding roadways. • Proposed routing for all delivery and haul trucks shall be identified. To the extent feasible, truck routing shall avoid or minimize travel through residential areas. • Notification shall be sent to all neighboring property owners two working days in advance of beginning work. The notice shall describe the anticipated duration of construction, and the name and daytime telephone number of the person performing the	CalRecycle	Prior to and during construction activities	Prepare and develop construction traffic control plan. Incorporate construction traffic control plan into construction bid documents and confirm its inclusion. Confirm traffic control plan incorporates mitigation measure items. Document compliance in project file.

Table 1, Mitigation Monitoring and Reporting Program

MITIGATION NUMBER	MITIGATION MEASURE	RESPONSIBLE PARTY	MITIGATION TIMING	IMPLEMENTATION PROCEDURES
	work, as well as the CalRecycle project manager.			